ALASKA RETIREMENT MANAGEMENT BOARD

September 23-24, 2021

BOARD OF TRUSTEES MEETING

Alaska Retirement Management Board

Board of Trustees Meeting

Thursday, September 23, 2021

Call In (Audio Only) : 1-907-202-7104	**Code:** 661 403 907#

I. **9:00 AM** **Call to Order**

II. **Roll Call**

III. **Public Meeting Notice**

IV. **Approval of Agenda**

V. **Public/Member Participation, Communications, and Appearances**
(Three Minute Limit)

VI. **Approval of Minutes – June 17-18, 2021**

VII. **9:15 AM** **Staff Reports**

A. Retirement & Benefits Division Report

1. Buck Consulting Invoices
2. Membership Statistics
3. DRB Update/ Legislative Summary

Ajay Desai, Director, Division of Retirement & Benefits
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits

B. Treasury Division Report

1. ARMB FY2023 Budget
   Action: FY2023 Budget Proposal

Pamela Leary, Director, Division of Treasury

C. Liaison Report

1. Disclosures Report
2. Communication Report
3. Meeting Calendar

Alysia Jones, ARMB Liaison

D. CIO Report
Zachary Hanna, Chief Investment Officer

E. Fund Financial Presentation
Kayla Wisner, State Comptroller
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits

VIII. 9:45 AM Trustee & Legal Reports

A. Chair Report, *Rob Johnson*

B. Committee Reports

1. Audit Committee, *Gayle Harbo, Chair*
2. DC Plan Committee, *Bob Williams, Chair*
3. Actuarial Committee, *Allen Hippler, Chair*
4. Operations Committee, *Rob Johnson, Chair*
5. Alaska Retiree Health Plan Advisory Board, *Lorne Bretz, ARMB Member*

C. Legal Report, *Ben Hofmeister, Assistant Attorney General, Dept of Law*

BREAK @ 10:15am (15 MINUTES)

IX. 10:30 AM Presentations

A. Performance Measurement – 2nd Quarter
Steve Center, Senior Vice President, Callan LLC

11:30 – 11:50 **B. Risk Report**
Shane Carson, State Investment Officer

LUNCH @ 11:50am (85 MINUTES)

1:15 – 2:00 **C. JPM Strategic Property Fund**
Steve Zaun, Portfolio Manager
Jeff Shields, Executive Director
Tom Klugherz, Executive Director

2:00 – 2:45 **D. UBS Farmland LLC**
Darren Rabenou, Head of Food & Agriculture and Head of ESG Investment Strategies
Jim McCandless, Managing Director
Dan Murray, CFO/Head of Asset Management

BREAK @ 2:45pm (10 MINUTES)

2:55 – 3:40 **E. Timberland Investment Resources**
Tom Johnson, Managing Director, Client Relationship Management
Hong Fu, Director of Economic Research and Analysis
Mark Seaman, Chief Investment Officer
Chris Mathis, Managing Director, Real Estate and Corporate Development

3:40 – 4:25 **F. IFM Global Infrastructure Fund**
Julio Garcia, Head of Infrastructure, North America
David Altshuler, Head of Global Relationship Group, North America

RECESS for the DAY @ 4:25 pm

Friday, September 24, 2021

Call In (Audio Only) : 1-907-202-7104	**Code:** 844 263 00#

9:00 – 9:40 **G. Crypto, Bitcoin, and Blockchain - Pathway**
Nick Siemsen, Director

9:40 - 10:20 **H. Abbott Private Equity Presentation**
Jonathan Roth, Managing Director, Co-President
Leonard Pangburn, Managing Director, Co-President
Dillon Booth, Senior Analyst, Client Relations

BREAK @ 10:20am (10 MINUTES)

10:30 – 11:10 **I. Real Assets Annual Plan**
Stephen Sikes, State Investment Officer

11:10 – 11:50 **J. Callan Real Assets Plan/ Performance Review**
Avery Robinson, Senior Vice President
Jonathan Gould, Senior Vice President

11:50 – 12:00 **K. Real Assets Action Items – Plan & Guidelines**
Stephen Sikes, State Investment Officer
Action: *Resolution 2021-11 – FY22 Real Assets Plan*

12:20 – 12: 30 **L. Actuarial Resolutions – FY23 Contribution Rate Setting**
Allen Hippler, Chair, Actuarial Committee

a. History of PERS/TRS Employer Contribution Rates
Action: *Resolution 2021-05 - FY23 PERS RMMI Contribution Rate*
Action: *Resolution 2021-06 - FY23 PERS ODD Contribution Rate*
Action: *Resolution 2021-08 - FY23 TRS RMMI Contribution Rate*
Action: *Resolution 2021-09 - FY23 TRS ODD Contribution Rate*

b. JRS Contribution

X.. **Unfinished Business**
XI. **New Business**
XII. **Other Matters to Properly Come Before the Board**
XIII. **Public/Member Comments**
XIV. **Investment Advisory Council Comments**
XV. **Trustee Comments**
XVI. **Future Agenda Items**
XVII. **Adjournment**

NOTE: Times are approximate, every attempt will be made to stay on schedule; however, adjustments may be made.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
MEETING

Videoconference

MINUTES OF
June 17 - 18, 2021

Thursday, June 17, 2021

CALL TO ORDER

CHAIR JOHNSON called the videoconference of the Alaska Retirement Management Board (ARMB) to order at 9:00 a.m.

ROLL CALL

Eight ARMB trustees were present at roll call to form a quorum.

Board Members Present
Robert Johnson, *Chair*
Bob Williams, *Vice Chair*
Gayle Harbo, *Secretary*
Lorne Bretz
Allen Hippler
Commissioner Lucinda Mahoney
Dennis Moen
Donald Krohn

Board Members Absent
Acting Commissioner Amanda Holland

Investment Advisory Council Members Present
Dr. William Jennings
Dr. Jerrold Mitchell
Ruth Ryerson

Department of Revenue Staff Present
Zachary Hanna, Deputy Chief Investment Officer
Pamela Leary, Director, Treasury Division
Mike Barnhill, Deputy Commissioner
Kayla Wisner, State Comptroller

Scott Jones, Head of Investment Operations, Performance & Analytics
Michelle Prebula, Public Equity & DC Investment Officer
Sean Howard, Portfolio Manager Alternatives
Shane Carson, State Investment Officer
Casey Colton, State Investment Officer
Kevin Elliot, State Investment Officer
Victor Djajalie, State Investment Officer
Mark Moon, State Investment Officer
Benjamin Garrett, Assistant Investment Officer
Ryan Kauzlarich, Accountant V
Hunter Romberg, Investment Data Analyst
Grant Ficek, Business Analyst
Alysia Jones, Board Liaison

Department of Administration Staff Present
Ajay Desai, Director, Division of Retirement & Benefits
Kevin Worley, Chief Financial Officer, Division of Retirement & Benefits
James Puckett, Deputy Director, Division of Retirement & Benefits
Emily Ricci, Health Care Policy Administrator, Division of Retirement & Benefits
Paula Varna, Deputy Commissioner, Department of Administration

ARMB Legal Counsel Present
Benjamin Hofmeister, AAG, Department of Law
Rob Schmidt, AAG, Department of Law

Consultants, Invited Participants
Paul Erlendson, Callan LLC
Steve Center, Callan LLC
Jay Kloepfer, Callan LLC
David Kershner, Buck
Scott Young, Buck
Tonya Manning, Buck
Paul Wood, Gabriel Roeder Smith
Bill Detweiler, Gabriel Roeder Smith
Kristin Shofner, Fidelity
Jeffrey Moore, Fidelity
Michael Plage, Fidelity
Beau Coash, Fidelity
Stephen Rosen, Fidelity
William Maclay, Fidelity
Andrew Rubin, Fidelity
Jim Chambliss, Pathway
Canyon Lew, Pathway
Wyatt Geiger, Pathway
Jim Simon Arrowstreet

Alex Ogan, Arrowstreet

Others Present:
Heather Evoy, Public
Elaine Schroeder, Public
Michael Tobin, Public
Randall Burns, Public/RPEA
Jim Simard, Public

PUBLIC MEETING NOTICE

Board Liaison ALYSIA JONES confirmed that public meeting notice requirements had been met.

CHAIR JOHNSON announced the passing of a former Trustee Mr. Pat Wellington. He noted that MR. WELLINGTON was a dedicated protector of the systems. He had been elected several times to the PERS Board from the early 80's till 2005. He said that Mr. Wellington had a long history of law enforcement in the state and the stories he told of his experiences were legendary, as were his actions as a Board member. He said that he had been instrumental in getting the real estate, real property investments and the private equity styles for the Board and that he would be greatly missed.

APPROVAL OF AGENDA

MS. HARBO moved to approve the agenda. MR. WILLIAMS seconded the motion.

PUBLIC/MEMBER PARTICIPATION, COMMUNICATIONS AND APPEARANCES

MS. HEATHER EVOY introduced herself saying that she was from the Eagle Clan. She said that President Biden referred to climate change as an existential emergency which demanded a clean energy revolution. She said that the revolution would require the extinction of fossil fuel. She said that with all the changes made by President Biden, it would be wise for the pension fund Board to look close at the investments associated with fossil fuels and how they could change during a global clean energy revolution.

MS. ELAINE SCHROEDER introduced herself by stating that she was a long-term Juneau resident and co-chair of 350 Juneau Climate Action for Alaska. She discussed a recent report commissioned by the comptroller of New York City who also acts as custodian for New York City's teacher retirement system written by BlackRock. She said the report noted that institutions with $12 trillion in assets have committed to immediately divest from fossil fuels. She noted that the institutions cited risk management and materiality as a basis of forming their decisions. She said that it had been found that dropping fossil fuel investments appeared to have helped the bottom line and prevent future underperformance. She said that BlackRock used its own carbon price sensitivity tool and low carbon transition readiness tool as part of its risk assessment. This tool discovered that 95 percent of all fossil-fuel-linked securities had either or both negative carbon price sensitivities and transition readiness which equaled bad future investments.

MS. SCHROEDER also referred to a report by International Energy Agency (IEA) titled "Net Zero by 2050" that had been recently released. She said the report outlined a pathway to limiting global heating to 1.5 degrees centigrade which would avoid more catastrophic climate changes. She said the IEA predicts the price of oil would drop to $25 a barrel in 2050 and oil and gas production would drop about 25 percent. She noted that investment in clean energy was projected to exceed $4 trillion yearly in the decades before 2050.

MR. MICHAEL TOBIN introduced himself saying he was a resident of Juneau. He explained the BlackRock report notes that in the past year, people had seen the mounting physical toll of climate change with fires, draughts, flooding, and hurricanes as well as the direct financial impact as energy companies take billions in climate-related write-offs on stranded assets. He noted that BlackRock, who owned 6.7 percent of Exxon-Mobil stock, sided with a shareholder revolt, and successfully replaced two Exxon board members with candidates that urged Exxon toward a greener future. He said that similar events had occurred at Conoco Phillips and Phillips 66 and Chevron shareholders had rebelled against its board by voting 61 percent in favor of a proposal to force the group to cut carbon emissions. He stated that the retirement fund was the last place that should invest in companies whose business plan involves progressive destruction of the climate.

APPROVAL OF MINUTES - MARCH 18 - 19, 2021

MS. HARBO moved to approve the minutes of the March 18-19, 2021, meeting of the ARM Board. MR. WILLIAMS seconded the motion.

With no objections, the minutes were approved.

STAFF REPORTS

A. RETIREMENT & BENEFITS DIVISION REPORT

1. Buck Consulting Invoices

MR. WORLEY presented the report for Buck Global LLC which was a summary of the quarterly invoices paid to Buck. He said the information begins on page 39 of the presentation.

MS. HARBO asked if the Senate Finance Committee presentation was done by Buck; MR. WORLEY stated that the Division of Retirement and Benefits produces the presentation but worked with Buck for follow-up questions from the Committee and noted that a copy of that presentation could be found on the website.

2. Membership Statistic

MR. WORLEY noted that the staff report for the Division showing membership statistics as of March 31, 2021, could be found on page 42 of the presentation. He said that report was started during the DB termination and the start of the DCR Plan and that the report itself was located on page 44 of the presentation.

3. Legislative Summary

MR. DESAI said that there had been two major bills to discuss. The first was HB55 which would

open up a new PERS Defined Benefit tier, allowing current police and firefighters to elect the new tier. The other bill was SB55 on page 49 of the presentation which removed the 22 percent cap on the payroll contributions to the PERS for the State of Alaska as a PERS employer and that all other PERS employers' rates would remain capped at 22 percent of the payroll.

CHAIR JOHNSON asked if passage of the bill would not result in a lower level of appropriations and contributions by the state to the PERS retirement system; MR. WORLEY confirmed that based on testimony through OMB, there would be an increase in the amount of contributions to the plan by the state employer which would come in every two weeks as a pay period payment versus a lump-sum payment in July of each fiscal year. He noted that there was a projected $3.7 million decrease in investment income, but in terms of contributions, that level would increase.

MR. WILLIAMS asked if MR. WORLEY thought the decreases and increases would balance out and if the benefit was only for the defined benefit members or would it also benefit DC members: MR. WORLEY stated that the amount of money the state had projected to contribute for the next fiscal year was going to be higher than what had been projected by Buck. He said that the $3.7 million could be spread out over the amortization time frame built into the additional state contribution. He said that although they would not get $3.7 million this year, it would be captured through additional state contributions in later years at higher rates.

MR. WILLIAMS asked if there would be impacts to members of the DC Plan; MR. WORLEY stated that there would be none.

B. TREASURY DIVISION REPORT

MS. LEARY introduced herself as the Director of the Treasury division. She said the budget had passed with some details to still be worked out, but the budget that the ARM Board adopted in September was included in the budget that passed.

MS. LEARY said they were completing the contracts that they had been directed to complete and were at the stage of having them signed. The contracts included the custodial contract with State Street Bank and two contracts with GRS. The GRS contracts were renewal for actuarial review services and for the independent actuarial audit performed once every four years.

MS. LEARY reported that Treasury continues to telework with the majority of the staff teleworking full-time. There are a few people in office either part-time or full-time and they are in the process of developing a Treasury telework policy that has a hybrid approach. She said they should have the policy developed by the next meeting and would report on it at that time.

MR. BRETZ asked if telework would be 100 percent and if there were any requirements that employees ever come into the office, and will they be hiring from out of state; MS. LEARY said that they do not envision 100 percent telework and that they envision having all members of Treasury in the office for some period of time but have not settled on exactly what that would be. She stated that out-of-state work was not something that they had thought about but may do so in the future.

COMMISSIONER MAHONEY added that they were currently working on a department-wide

telework policy which would allow the Division to establish telework within the umbrella of the DOR policy. This would work out to a minimum of two to three days a week of in-office work. She said that working successfully as a team involves face-to-face interaction, mentoring newer employees coming into the offices, establishing teamwork, and creating a culture of sharing information and establishing best practices.

C. LIAISON REPORT

1. Disclosures Report

MS. JONES stated that for the first quarter there had been no disclosure transactions that required additional review or discussion.

2. Communication Report

MS. JONES stated that the communications memorandum listed communications directed to the Board since the March 18-19, 2021, Board of Trustees meeting. She noted that the Division of Treasury had received an additional 21 fossil fuel divestment e-mails since the most recent report provided on June 11th that was included in the Board packet. CHAIR JOHNSON stated that MS. JONES had delivered summaries of letters received. He said the issue of fossil fuels investment or divestment were a matter of importance and suggested that at some point they provide written responses on the matter. He said that they hoped that the investment managers would take into account issues that had been presented. He said that they appreciated the testimony that has been given on the subject and look forward to taking the issues into account.

3. Meeting Calendar

MS. JONES said the September meeting was proposed for Juneau, and the December meeting for Anchorage. She said that she had also drafted the 2022 meeting calendar and there was a potential action item for Trustees to adopt the 2022 calendar.

MS. HARBO moved to adopt the 2022 calendar. MR. HIPPLER seconded the motion. The motion was approved without objection.

D. CIO REPORT

MR. HANNA gave a general update and a preview of the upcoming meeting. He said they have had four quarters in a row of positive equity performance. That including the pandemic quarter, domestic equities were up 28 percent from the start of 2020 through the first quarter of 2021. He said that stocks were priced to near perfection and continued to test new highs as the economy reopens. He said the bond market also had a strong first quarter. He said the quarterly bond returns were a negative 3.4 percent, the worst in almost 40 years. He said the Feds have had a difficult balance to strike between supporting the expansion and controlling long term inflation, but they moved closer towards controlling longer-term risks and were expected to raise rates in 2023. He added that they still expect inflation to be transitory.

MR. HANNA said that he had received questions on how the rise in lumber prices had impacted the timber investments. He said the short-term answer was that it had not benefited the timber portfolio as of yet but did expect a longer-term benefit to the portfolio with increased demand for building

products.

MR. HANNA noted that the ARM Board had a large allocation to real assets which should provide diversified returns and protection to inflation and that he would recommend increasing the allocation by 100 basis points. He would also recommend a 200 basis-point increase in private equity.

MR. HANNA then move to Item 2 in the CIO report which was the watch list. He said they had no recommended additions to the list. He said that Capital Group informed them that one of the five portfolio managers investing in the international equity strategy was being replaced by another experienced investor and to have each PM manage a global portfolio versus the EM-only portfolio managed by the exiting PM. He said the Capital Group had successfully made many of those changes over time and the staff did not recommend placing them on the watch list. He also said that the corporate CIO of the Man Group had retired, and Man is not replacing the position but would rely on business unit CIOs instead. He said they were comfortable keeping Man on the watch status as a result.

MR. HANNA said that there were 10 contracts completed; they included an amendment to the BlackRock Defined Contribution contract, a $25 million private equity commitment to GenstarX, amendments to the Fidelity and PineBridge contracts, repeat commitments to two real estate partnerships with KKR and Almanac, an update to the wrap contract with Stable Value, a provider in New York Life, JP Morgan SmartSpend contract to add the spend-down option to the Defined Contribution lineup, and a $40 million private equity commitment to Insight XII.

MR. HANNA stated that rebalancing focused on risk management and bringing the portfolio back towards the ARM Board's established asset allocation and risk profile which involved selling what had done well and buying back into those assets that had not done well. That meant selling equities and buying back fixed income and other less risky assets. He said that during the period they bought $642 million in fixed income and cash, $125 million in REITS funded by sales of $202 million in international equity and $565 million in domestic equity. He said that they continued to add $100 million per quarter to the internally managed multifactor strategy which continued to do well. They also conducted four internal rebalance transactions to equalize the relative allocations across the plans.

E. FUND FINANCIAL PRESENTATION

MS. WISNER noted that the financial report ending April 2021 started on page 60 of the Board Packet. She stated that PERS invested assets were $22.3 billion, TRS assets were $10.5 billion, JRS assets were $281 million and MRS assets were $49.1 million. She said the total for nonparticipant-direct assets were $33.1 billion, year-to-date withdrawals were $888.5 Million, and $16.3 billion of invested assets were under internal management.

MR. WORLEY explained that the Board had requested information regarding the makeup – revenues and expenses of the column titled "Net Contributions (withdrawals)".. He stated that on page 87 of the Board Packet was the breakdown of that year-to-date number of net contributions and withdrawals, and the number by month and page 88 showed the breakdown of contributions as well as the expenses fund which represented benefit payments and the investment expenses incurred.

TRUSTEE & LEGAL REPORTS

A. CHAIR REPORT

CHAIR JOHNSON had nothing specific to report except that he thought that they needed to work in coordination with the Department of Revenue with respect to the number of inquiries that were received relating to the investment in fossil fuels. He said that something needed to be done in terms of responsiveness and to be as transparent as they could be considering those investments were discussed in the meetings as well as on the website.

B. COMMITTEE REPORTS

1. AUDIT COMMITTEE

MS. HARBO reported that the Audit Committee heard a presentation by KPMG where they reviewed the 2021 audit plan which included PERS, TRS, JRS, Naval and Militia, Deferred Comp, SBS, the ARM Board invested assets and the schedules of employer allocations for each of the DB Plans for GASB 68 and 75. She said they had discussed risk assessment regarding management override of controls and valuation of alternative investments. They also discussed cyber security and the involvement of KPMG experts in the audit.

MS. HARBO reported that the Audit Committee will meet by teleconference on October 11, 2021, to discuss the draft financial statement. She said they also were made aware of the renaming of the annual financial report, which is now the Annual Comprehensive Financial Report.

MS. HARBO said that MS. HELMICK reported they had hired a new lead Accountant V to work on compliance and to share the work with the other two auditors to audit 165 PERS employers and 58 TRS employers. She said that in 2020 mostly desk audits had been performed but there was a need to travel to perform the audits for the large employers. She said that MS. HELMICK had identified noncompliance areas and had a summary of the FY2019 audits as well. She said there had been 39 audits completed with three still in progress. For FY2020 there had been 15 audits completed and 29 still in progress.

MS. HARBO reported that MS. WISNER had given a presentation on the SOC 1, reporting that State Street Bank submits to an annual independent audit regarding its internal controls.

MS. HARBO reported that MS. RYERSON had raised concern about internal controls in DRB and DOR where more auditors were needed as to not overburden those that were currently doing the job. She also noted that MR. BRETZ had expressed concern about cyber security and potential for improper benefits to be issued and said that would be a topic for future discussion.

COMMISSIONER MAHONEY asked what the role of the KPMG actuary in the audit was. MR. WORLEY stated that the actuary reviews the assumption and reviews the reports for the calculations done within the required supplementary information of the financial statements.

2. DC PLAN COMMITTEE

MR. WILLIAMS reported that MR. PUCKETT gave an update on the brokerage window which had

high interest from members and was supposed to go live in January 2021 but had not yet and no date had been set. He said Empower had offered a bundle of funds that contained restrictions of no load and no transaction fee. He said it was important to get the best value for the members and the best choices. He said that MR. PUCKETT also noted that the death rate was up and that it usually happened during the holidays and then would go back down, but it has stayed up. He said there had been public testimony about the delays in processing paperwork regarding the deaths by as much as two months and they would follow-up on those cases.

MR. WILLIAMS reported that they had a presentation by Empower regarding the registration process when members have a general delivery address; they were unable to register online when they have a general delivery address, instead, they would have to call a number and speak with a representative who would then be able to register them.

MR. WILLIAMS reported about the discussion with Empower about the annuity option and how many members choose an annuity. He said that the number of members between 2011 and 2021that had either taken a full distribution or a partial distribution was over 60,000 and under 300 people had chosen an annuity as an option. He said they did not understand what the fee structure for the annuity was.

MR. WILLIAMS reported that MR. HANNA had shared that the SmartSpend implementation would be running by July 1st.

MR. WILLIAMS reported that most of the members that were DC were going into target date funds. He said that MR. HANNA was in conversations with T. Rowe Price about ways to obtain a better price for those offerings or improve the quality of those offerings.

MR. WILLIAMS reported that for future agenda items they would look at member fees and structures, how those were done and how to reduce them.

MR. WILLIAMS also reported that MR. MOEN and MR. KROHN joined the committee.

3. ACTUARIAL COMMITTEE

MR. HIPPLER reported that they had discussed GRS's review of Buck's actuarial valuation reports and that the summation of that discussion would be presented after the legal report, due to action items forwarded by the Actuarial Committee. He said they had also discussed the charter which the Actuarial Committee had recently adopted, specifically the mandate to self-assess on a periodic basis. He said the self-assessment mandate does apply to certain other committees that serve at the pleasure of the ARM Board. He said they informally requested the Operations Committee or another body to assist with simple guidelines so they could perform a proper self-assessment.

4. ALASKA RETIREE HEALTH PLAN ADVISORY BOARD

MR. BRETZ reported that in the packet was a written report regarding the May 14th meeting. He said Teladoc for Retirees had been in place temporarily in response to the COVID outbreak and would not be available after July 30th. He said the plan would continue to cover telemedicine services delivered by regular providers. He said that COVID-19 testing and vaccines were permanently available to all

AlaskaCare members and that they were looking to expand preventive coverage for the retirees. He said the Division had proposed adding two different member cost-sharing options for a preventive services plan that were provided in most employee plans per the Affordable Care Act. He said the AlaskaCare Defined Benefit retiree health plan was going to increase the use of preventive services to support members. He said it would impact the annual cost by .45 percent from $3 million to $3.35 million. He said there would be a subcommittee meeting to continue discussion on the expansion of preventive care coverage.

MR. HIPPLER commented that he was disappointed that Teladoc would no longer be available as it seemed to be an efficient way to provide quick services to the members.

MR. BRETZ said that it came with considerable expense to the plan. He said Telemedicine was still covered but not through Teledoc.

C. LEGAL REPORT

MR. BENJAMIN HOFMEISTER introduced himself and explained that he worked for the public corporations and government services section which was a new section in the Attorney General's office that was formed to consolidate the resources and experiences of attorneys in other sections who were representing agencies that handled the finances and assets of the state. He noted that he would be the primary attorney for the ARM Board.

MR. HOFMEISTER reported on the Metcalfe case. He said Mr. Metcalfe worked for the state in the 70's and was Tier I and left service prior to 1981, cashed out his contributions to the PERS program and did not return to state service. In 2005 Division of Retirement and Benefits sent out a notice and a lot of people were reinstated to get to the five-year mark if they had been in Tier 1 or Tier 2. He said in 2012 Mr. Metcalfe had requested information about his right to return to service and if he could come back as a Tier 1 employee. He had been told that it had been phased out in 2010. Mr. Metcalfe filed the lawsuit in 2013 which became a class action and involved all prior DB members. He said the case had been to the Supreme Court twice, the first in 2018 with a Constitutional question as to whether or not the statutory right could be impacted by the diminishment clause that affected retirement plans. The court did not issue a decision on the Constitutional question but did issue a decision stating that contractual damages in the form of a lump sum which Mr. Metcalfe was seeking was not something that he could do. The case was then sent back to the Superior Court and a decision was issued by the District Court judge, Judge Miller, saying that the statutory right to reinstatement and restoration was not protected by the diminishment clause. The Supreme Court reversed that decision in April. The Superior Court must now implement the decision consistent with what they wrote in their opinion.

MR. HOFMEISTER said that there would probably be a lot of people that were in Tier 2 that returned after 2010 and put into the Defined Contribution program and had additional service under Tier 4 and there may be people from Tier 3 as well, but the vesting period was not 10 years for Tier 3. He said MR. PUCKETT mentioned that the DRB identified a little over 1,000 employees currently working that came back into the Defined Contribution Plan that would be able to take advantage of Metcalfe and be returned to the Defined Benefit Plan.

MS. HARBO asked if those people would have to pay back what they cashed out as well as have to pay 7 or 8 percent interest for each year they had money out of the plan; MR. HOFMEISTER said that yes, there would be interest and there is a provision that speaks directly to what the percentage and interest would be to pay back in..

D. ACTUARIAL REVIEW/ACCEPTANCE - CERTIFICATION OF FY2020 REVIEW REPORTS & VALUATIONS

Action: Board Acceptance of GRS Certification for FY2020 PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

MR. HIPPLER motioned that the Alaska Retirement Management Board accept the review and certification of FY2020 actuarial reports by Gabriel Roeder Smith & Company.

CHAIR JOHNSON noted that since the motion came from the committee, there was no need for a second and requested MS. JONES perform a roll call vote.

A roll call vote was taken, and the motion was passed unanimously.

Action: Board Acceptance of FY2020 Buck Valuations for PERS, TRS, NGNMRS, JRS, and DC Plan Valuations

MR. HIPPLER motioned that the Alaska Retirement Management Board accept the actuarial valuation reports prepared by Buck for the Public Employees' Teachers', Public Employees' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits), Teachers' Defined Contribution (for Occupational Death and Disability and Retiree Medical Benefits). Judicial, and National Guard and Naval Militia Retirement Systems as of June 30, 2020.

CHAIR JOHNSON noted that since the motion came from the committee, there was no need for a second and requested MS. JONES perform a roll call vote.

A roll call vote was taken, and the motion was passed unanimously.

CHAIR JOHNSON recessed the meeting from 10:35 a.m. until 10:51 a.m.

PRESENTATIONS

A. PERFORMANCE MEASUREMENT - Q1

MR. ERLENDSON noted that page 2 of the slides showed a range of 80 percentage points, from plus 40 to minus 40 due to the second quarter of 2020 when the GDP was down over 31 percent then bounced back up to 33 percent in the third quarter. He stated that the numbers were unprecedented. He said the GDP for the first quarter of 2020 was up 6.4 percent which followed an increase of 4.3 percent from the fourth quarter of last year. He noted that the U.S. Treasury yields were down close to zero, where a year ago the 30-year Treasuries were yielding 1.3 percent and the 10-year Treasuries were yielding 1.74 percent at the end of March but had come down to 1.57 percent. He said the rates

would be good on the liability side and that new money going into fixed income would be getting higher yields and long-term higher interest rates would show an expectation the economy was going to be growing.

MR. ERLENDSON said that on the inflation side, the CPI-U which measures the cost of goods for urban wage-earners, was up 5 percent as of the end of May. He said that basically these items in the graph show that the economy is growing, which was good for stock prices, but the interest rates are rising as well which was harmful to the bond market for a short term, on top of inflation concerns which means that liabilities would grow as well.

MR. ERLENDSON stated that the U.S. inflation rate of 5 percent is on par with Brazil, India, and Russia where Japan had an inflation rate of 1 percent, and Western Europe was at 3.5 percent. He said the high inflation rate of the U.S. was due to the economy growing much faster than the other regions.

MR. ERLENDSON mentioned that one of the stressors of the economy was the employment landscape with leisure and hospitality taking the hardest hit in payroll. He further explained that geographic areas that depend on tourism were the hardest hit and were also driving inflation. He explained that these areas whose economy was heavy with leisure and hospitality lost the most jobs and population with people leaving to find work elsewhere. He also noted that according to the Bureau of Labor Statistics, the number of job openings the end of March was 8.1 million, then at the end of April it jumped to 9.3 million. He said that caused wage inflation because in order to fill the jobs, employers have to offer more money. He also noted that there were a lot of people that were of working age that were not working or even looking for jobs. He said many governors had turned off the federal payroll subsidy payments in an attempt to get people to go back to work.

MR. ERLENDSON noted that the IHS shows excess savings that was above historical averages due to the three major acts passed last year that put $1.8 trillion into the bank accounts of Americans to support the economy.

MR. ERLENDSON explained that they had seen a significant drawdown in GDP during the second quarter of last year. He said that the GDP was at $21.7 trillion in the fourth quarter of 2019 then came down to 19.5 trillion at the end of the second quarter of 2020, however as of the end of the first quarter for 2021 the GDP was up to $22 trillion but it took five quarters to reach that point.

MR. ERLENDSON noted that the energy portion of the stock market was up 31 percent in the first quarter, whereas a year ago, it was down over 50. He said the rates of growth were not sustainable and would start to taper off and they would be seeing more normal returns. He also noted that growth stocks were up less than 1 percent in the first quarter, whereas the same types of value stocks were up over 11 percent.

MR. ERLENDSON pointed out through Slide 23 that over time, public pension funds had been investing in the private markets which cost more in management fees and tie up liquidity to see higher returns.

MR. WILLIAMS commented on slide 24 saying that it showed the shifting in domestic stocks from 43 percent down to 27 percent and non-U.S. fixed income was at 2 percent then climbed to 6 percent then went back down to 2 percent. He then asked if there was a factor or change that caused that to happen; MR. ERLENDSON said that he thought it had to do with currency and adjusting for the stronger dollar. MR. WILLIAMS then asked why stay in if they were going to be in at such a low allocation; MR. ERLENDSON said that most of their clients do not use them; that when the averages are figured and many of them are zero, the average number comes down.

CHAIR JOHNSON mentioned the criticisms received by the public participants about investments in fossil fuels which are part of the energy sector and asked how to square the tremendous performance in the energy sector with the reports from the public participants of that morning; MR. ERLENDSON said that an argument in support of fossil fuels would be that until the energy production and utilization is converted away from carbon to alternative energy and the limitations for distance driving with electric cars due to lack of charging stations, change will come slowly.

MR. CENTER further explained that equity investments for the ARM Board were invested passively, so they were not making an active decision to overweight or under-weight the energy sector; they were investing along with how the index was structured and energy had become a sliver of the S&P 500.

MR. CENTER started on page 26 of the presentation referencing charts in the Performance Dashboard. He noted that the trends for PERS, TRS and Judicial over longer time periods and the near term were looking good, as was the healthcare plans shown on page 27.

MS. HARBO asked when they discuss the peer groups and member count, were they peers with respect to total assets invested and not systems like CalSTRS and CalPERS; MR. CENTER stated that the peer group they looked at was the broad public fund sponsored database which included large, midsize, and small public retirement plans.

MR. CENTER then referenced page 28 which showed the military plan with a different asset allocation that was at a lower risk structure than peers and also PERS, TRS, and Judicial, which resulted in a lower return but similar to its target benchmark.

MR. CENTER stated that as of the end of March, the PERS plan was very close to targets across various asset classes. He noted that where the equity market rallied, the fixed income market dipped a bit. He said that there had been a higher need to rebalance during the last year. He also noted that the PERS plan was slightly underweight to fixed income and slightly overweight to domestic equities but overall close to target, as shown on page 30. He noted that the next four pages showed the performance of the PERS plan and that it was above median over all time periods.

MR. CENTER noted that the top performing public fund last year was up 41 percent and the worst performing public fund was up 27 percent which created a 15 percent dispersion of performance over 12 months. Spread out over 10 years the dispersion comes down to 2.5 percent, but because asset allocation can drive performance, it gets magnified in periods when the equity market is up over 50 percent, and the bond market is negative.

MR. CENTER explained that page 32 showed the Sharpe Ratio which was a risk-adjusted measure of excess return and the PERS fund had done very well relative to the peer group, in the top quartile over the three, five, and 10-year periods. He explained page 33 showed the maximum drawdown, noting that the first quarter of 2020 had the largest peak-to-trough loss and the drawdown experienced by the PERS fund was the largest over the last 10 years. He said the standard deviation on page 35 showed that the PERS fund was below median from a realized standard deviation standpoint over all time periods. He then pointed out that pages 36, 37, and 38 discussed the annualized total fund returns, longer-term total fund returns, and the calendar period for the total fund performance stating that the overall performance was very strong for PERS and TRS.

MR. WILLIAMS asked what would they see that showed underperformance; MR. CENTER stated that the peer group performance was the key they used for the total plan's attribution calculation; MR. WILLIAMS asked if there was a way to show that in the slides as well; MR. CENTER stated that they could add a slide to the quarterly performance presentation that would cover private equity.

MR. HANNA commented that page 21 of the Callan presentation does show a public market equivalent version of how investments in private equity would compare to indices and that they do the same analysis annually for the ARM Board.

MR. CENTER stated that the domestic equity portfolio had a strong quarter, particularly the investments in Scientific Beta. The performance of value stocks versus growth and small cap relative to large cap showed both had done well. The domestic equity portfolio outperformed the S&P 500 and the Russell 3000 during the most recent quarter and the longer-term domestic equity performance had trailed the benchmark. MR. CENTER then skipped ahead to page 46 which showed the global equity portfolio. He said that had done very well and was ahead of the target over all time periods - up by almost 50 basis points ahead of the international equity target benchmark. He noted that all managers were ahead of the EAFE benchmark as well as the ACWI. He said the emerging market pool was up 3.2 percent versus the benchmark return of 2.3 percent for a strong performance. He noted that the total fixed income portfolio had outperformed its target over all time periods. The aggregate portfolio was up 1.37 percent over last year and the Bloomberg Aggregate was up .07 percent, ahead of the benchmark by 60 basis points. The opportunistic fixed income portfolio which contains two investments with Fidelity were up a combined 13.6 percent and the alternative fixed income portfolio was up 2 percent over last year.

MR. CENTER said the opportunistic allocation which included an alternative equity allocation managed by McKinley was up 26 percent last year, the tactical portfolios managed by PineBridge, and Fidelity were up a combined 37 percent as well. The alternative beta strategy managed by Man Group was down 13.5 percent. The real assets were up 6.75 percent, the real assets target up 20 percent, the real estate portfolio was up 12.3 percent. He noted that private real estate was up 6.3 percent relative to the NCREIF ODCE benchmark. Farmland was up 7 percent, but timber and energy were a drag on the performance, timber was up 4 percent and energy was up 1.5 percent. However, the infrastructure portfolios were up 10 percent.

MR. HIPPLER asked if the Man Group performance was in accordance with how they would have

modeled it to fit the portfolio - was it supposed to reduce the risk by having diverse returns from the rest of the portfolio - was that what they should have expected; MR. CENTER stated that he expected a return somewhere between stocks and bonds, he stated, stocks were up 50 percent and bonds were down, so they would not have modeled a negative 8 percent return for the portfolio.

COMMISSIONER MAHONEY noted that, in regard to the Man Group, the returns were up significantly and that by the next meeting they would see the quarter end results and see that it would be up.

MR. CENTER stated that the PERS DC Plan ended the quarter at $1.8 billion with 60 percent allocated to the target date funds and the remainder split between active and passive. He said more participants were contributing than withdrawing. The TRS DC Plan ended the quarter at $750 million in assets with 60 percent allocated to the target date funds. The Deferred Comp Plan was under $1.2 billion in assets as of the end of the first quarter with 25 percent of the portfolio allocated to the target date funds and the remainder split between the active and passive options. The SBS fund ended the quarter at $4.8 billion in assets with 60 percent allocated to the target date funds. He said the target date trusts used by the participant-directed plan continued to perform very well relative to both their benchmarks and relative to peers. The longer dated target retirement funds had fallen into the third quartile but had outperformed their target benchmarks. The passive options had performed in line with their benchmarks.

MR. CENTER noted the BlackRock Completion Fund - designed to invest in a basket of inflation-sensitive investments, was up 23.7 percent, in line with its benchmark but ranked in the bottom quartile. The International Equity Fund, a blend of two active equity managers that were also in the DB Plan, Brandes and Baillie Gifford, were up 60.5 percent last year. The T. Rowe Price Small Cap Fund fell below median over the last year with a return of 83.7 percent where the Russell 2000 was up 95 percent last year.

MR. ERLENDSON mentioned their conference would be July 19th through the 21st and noted that some of the Board would be joining either in person in Salt Lake or virtually. He said there would be presentations from Niall Ferguson, an economic historian and Scott Gottlieb who will discuss healthcare initiatives and implications of the pandemic.

CHAIR JOHNSON recessed the meeting from 12:12 p.m. to 1:35 p.m.

B. PRIVATE EQUITY, WITH EDUCATIONAL DISCUSSION OF SPACS

MR. HANNA introduced MR. CHAMBLISS, MR. LEW, and MR. GEIGER of Pathway, explaining that Pathway was a longstanding private equity investment manager for the ARM Board.

MR. CHAMBLISS noted that Pathway was celebrating their 30th anniversary and next year would mark 20 years of partnering with the ARM Board. He stated that Pathway is a global private markets firm with over $75 billion in assets under management and they invest in equity, credit, and infrastructure. They make private investments through primary fund investments, secondary investments, and co-investments.

MR. LEW presented page 8 as the plan for three years and their progress to that plan. He noted that they were on track to the targeted $200 million fully put to work, they were at $127 million in commitments to date which was across 12 primaries, 3 secondary investments, and 10 co-investments. He said since inception the portfolio had grown to include over $3 billion in commitments across 302 investments and 78 different managers and included nearly 3,500 active portfolios. He said the IRR of 15.4 percent was 160 basis points higher than the 13.8 percent showed at the last Board update in September of 2018.

MR. LEW said that $2.5 billion of the $2.9 billion that had been committed had been invested and grown to over $4.5 billion in total value and generated the 15.4 percent IRR. He said the portfolio's current diversification was split at 53 percent acquisitions, 24 percent ventures capital and 23 percent in special situations which was in line with what they were targeting. He noted that the pie charts on page 12 of the presentation showed that the portfolio remained well diversified by strategy, industry, and geographic region with no significant changes since their last Board update.

MR. LEW referred to page 13 that showed the contribution and distribution activity since inception and stated that distribution activity had achieved an all-time high of $300 million and that annual distributions had exceeded annual contributions for the year which shows the portfolio had been cash flow positive for the last decade, except for 2018. He said for 2021 activity to date was running at record pace with $179 million distributed in the first five months of the year which was 60 percent of last year's full total.

MR. LEW noted that page 14 showed highlights of the 2020 performance, even with the sizeable loss of approximately $100 million in the first quarter, it was the strongest year since the program's inception with a one-year return of 38 percent and $530 million in gains. He said 2021 was looking to be another strong year.

MR. LEW noted that page 16 showed the individual portfolio companies. He said CCC information Services in the IPO box was a software provider to the auto collision and insurance industries, that it was currently valued at 4.3 times its cost and was ranked the No. 5 holding by market value in the portfolio. In the M&A side, EllieMae provided software to the mortgage finance industry.

MR. LEW said that as far as the co-investment activity within the portfolio, it was up to $168 million in commitments across 60 co-investments from 22 different managers, which made it nicely diversified by both vintage year and by industry. He said that the ability to add co-investments to the portfolio on a no-fee, no-carry basis had benefited the private equity program. He said the table on page 18 showed co-investment performance by vintage year, showing how strong across the board the performance had been and generating a 33 percent net return and $111 million of gains. He said they estimated that the decision to add co-investments had saved the Board over $28 million in management fees and carried interest.

MR. CHAMBLISS compared the ARM Board vintage year performance against the private market index. He said they use the Burgiss Private IQ index for their performance comparison noting that the years 2018 or later were too immature to make a meaningful assessment so he only compared 2001 through 2017. He said the performance was really strong above the index median IRR for all

17 years with 12 of those years outperforming that median by a significant margin.

MR. WILLIAMS asked regarding the geographical diversification, if they were designed for an asset allocation or just to make sure they were diversified, or were they sorting for quality and ensuring they were as diversified as possible; MR. CHAMBLISS said that with that asset class, they focused on getting access to investing with the best managers and search for high-quality partnerships. He said they consider U.S. non-U.S., industry, etc., and time diversification, but with a portfolio of over 300 investments over a 20-year period, it would naturally be hyper-diversified. He said they were willing to sacrifice short-term diversification to get access to the best managers, but the portfolio would diversify itself over the long term.

DR. MITCHELL asked how many of the GP's invested with were new and how many were re-ups from firms already invested in; MR. LEW said that in recent years it leaned heavier to existing managers and that they had not been able to do as many new managers as they would have liked but on average they have added two new managers per year. He said that through the co-investment portfolio which invests both in opportunities from managers in the portfolio as well as opportunities from Pathway's broader portfolio, they could introduce exposures to additional managers.

MR. GEIGER provided an overview of Special Purpose Acquisition Companies (SPACs). He explained that SPACs were not tied to private equity but had become increasingly relevant to both private equity and the financial markets. He said in the past SPACs had a less favorable reputation, that they were seen as a potential solution for companies that were not fit for a traditional IPO process. He said that issuance began picking up in 2015 and by 2020 had an explosion of activity and continues to grow.

MR. GEIGER explained how a SPAC works. He said a SPAC was a form of a blank check or shell company that raises capital in an IPO with the intent of merging with one or more privately held companies. He described it as an alternative path for private companies to access public markets without going through the IPO process. He explained that SPACs do not invest in a company but bank on the SPAC sponsor's reputation, experience, and ability to find a company and complete a merger. He said sponsors could be private equity mangers, corporations, industry executives, and investment banks. He said when a SPAC raises an IPO, investors in the IPO receive an offering of units. The shares typically get listed on an exchange and trade and sponsors have two years to find and complete a transaction or the cash is returned to the initial investors and the SPAC would be drawn down. He said once a company is found and the deal negotiated, the shareholders would be allowed to vote to continue with the transaction or redeem their shares. Once the deal closes, the SPAC begins trading on the public markets as a public company.

MR. GEIGER stated that SPACs are becoming more popular due to the increase in the quality of sponsors and target companies which related to the involvement of high-quality equity firms raising SPACs and high-quality private-equity-backed companies choosing to exit through that route. He said they had found over 100 private equity managers that had raised a SPAC for the first time since the start of 2020. He said the most notable impact of SPACs was that they had offered private equity firms another method of exit beyond the traditional M&A or IPO process. He noted that the speed of a SPAC transaction, the certainty of the price that could be set, and the ability to negotiate the structure

and take cash proceeds, were the primary benefits of pursuing an exit through that route as opposed to a traditional IPO.

C. THE FED'S NOT CONCERNED ABOUT INFLATION. SHOULD YOU BE?

MR. HANNA introduced MR. KLOEPFER from Callan.

MR. KLOEPFER said that the Fed was considering moving up their interest rate as a response to inflation and commented that they had raised their inflation assumption for this year. He said they believe they can control and/or restrain inflation, that they feel more comfortable trying to control inflation rather than controlling deflation and are still targeting 2 percent.

MR. KLOEPFER said the impact of inflation on the ARMB would be the increase in cost directly tied to a CPI and would have an impact on salary. He said the important thing with inflation was the timing: very short time period, a longer time period and a transitional time period in between those. He then referenced slides that discussed the mechanics of inflation. He then discussed fiscal stimulus, stating that the stimulus was a short-term jolt to personal income which provided an offset to the decline in employment. He said when the lockdown happened, it limited the ability to buy, so savings increased.

MR. KLOEPFER explained that velocity is a term used to describe how many times a dollar turns over, the greater the velocity, the more it's turning over in the economy. So, the product of money stock and the velocity of money should equal the price of goods, services, and quantities. He said that if the supply of money is increased and velocity stayed the same, there would be greater demand. He said what happened was money stock increased dramatically, but velocity took an unexpected drop to historic lows because people put money into their savings and not into the economy.

MR. KLOEPFER turned to slide 18 and noted that real assets were deemed to be inflation-sensitive because they had cash flows, replacement costs or both that would adjust for inflation. He said that they were a hedge against losses in rising or high inflation. He said the biggest concern was unexpected inflation. He said if there was sharply rising inflation, which would trigger a short-run and intermediate-run underperformance in all asset classes, bonds particularly.

MR. KLOEPFER said that portfolios should provide diversification relative to traditional public equity and fixed income asset classes, seek sensitivity to near-term movements in price levels and positive returns over longer periods.

MR. ERLENDSON asked if there was a cautionary note or was what happened back then just something completely different: MR. KLOEPFER said the cautionary note was that as portfolios are put together, past relationships should be carefully looked at. He said for example commodities look to be a fantastic diversifier, but the return was not there and there was a possibility that they were going to break a long cycle of extreme underperformance, maybe that is not the avenue to a real asset portfolio that would be desired.

D. USING FUTURES FOR REBALANCING AND LIQUIDITY

MR. HANNA introduced MR. MARK MOON stating that he headed up the internal equity research team.

MR. MOON said there were two main uses of futures, the first was speculating use of futures where an investor would use contracts in a particular commodity or index future as a way of adding economic exposure. The second was a hedging use which denotes putting on contracts in a way that would reduce overall economic exposure. He explained that investors maintain a small margin account that would be used to have collateral and using the collateral, investors could execute and maintain short or long positions in futures contracts subject to specific contract margin requirements. He noted that contracts expire on a quarterly basis and at the time of expiration the contract would settle, and if the investor wanted to maintain a futures past the date of expiration, the investor would roll the contract into the next expiration date.

MR. MOON explained that the ARM Board staff had a fair amount of experience with futures within past ARM Board programs as well as previous experience using S&P 500 futures contracts, Eurodollar futures, currency futures, and gold futures in the context of institutional investor hedging activities.

MR. MOON said the current state of the ARM Board staff authorizations was split into different areas including. the ARMB Domestic and International Equity Guidelines and ARMB Fixed Income Guidelines and 2016 Board Action.

MR. MOON noted to mitigate managing plan level tracking errors, the staff maintains portfolio weights consistent with the approved targets and within bounds by rebalancing in the underlying asset mix at the end of each quarter, which can take up to two weeks and a lag between rebalancing the assets and where the benchmark targets are. He said what they were proposing was to utilize futures as a tool to aid in the rebalancing efforts.

MR. MOON explained that to do so, the staff would identify desired asset class weight changes that would need to be made by the end of the quarter, then would identify significant weight changes difficult to make quickly, they would then consider proxy weight changes by utilizing futures with the idea of making all the changes in the underlying cash asset portfolios and execute the trades in the underlying assets as well as some futures in order to efficiently move plan asset weights closer to a rebalanced target. He said that broad economic exposure could be changed with small numbers of trades in futures giving time for underlying positions involving several trades to be done and shortening the timeframe for rebalancing economic exposures would reduce plan tracking errors.

MR. MOON referred to pages 11-13 of his slide presentation showing an example of tactical rebalancing, noting the types of trades suggested as well as the steps needed for the rebalancing process. He said as far as cost, they would have to pay commission at approximately $1.50 per contract plus the cost of futures positions, that using the types of futures contracts they were anticipating, they did not see them as a significant factor in thinking about the costs of using futures. He also noted that futures are a way to add leverage to plan assets.

MR. MOON stated that the benefits of rebalancing in such a manner would de-link trades across asset

classes from cash settlements, allowing for economic exposures to be changed quickly.

MR. MOON explained that tracking futures would involve monitoring notional value of futures contracts held and margin requirements, they would need to integrate the economic risk and tracking error effects of futures positions with cash asset positions, monitor potential leverage induced on futures positions, monitor daily mark-to-market on futures positions, and augment plan performance. He said operationally they see having sub-accounts at the individual asset pool level for the different asset classes. They would also be submitting quarterly rebalancing plans to MR. HANNA for his approval.

MR. MOON mentioned other potential uses of futures that the Board may want to consider down the road, including strategic use of futures and as a way to add leverage.
CHAIR JOHNSON asked the IAC members to offer their observations.

MR. HANNA suggested feedback from Callan as well.

DR. MITCHELL commented that it was a reasonable proposal. He then asked if the time element had been so long that they were out of the ranges, were the expenses too high, or was it something they were working on to make a good thing better; MR. MOON stated that the rebalancing process had been more complicated than they would like it to be. He said they were looking at it as a way to shorten the timeframe and utilizing futures would do so, as well as make the process more efficient.

DR. JENNINGS noted that futures are very low cost and a quick and efficient way to get asset allocation implemented and that it was a sound idea. He in turn asked what the risk controls were: MR. HANNA stated that segregation of duties, that only the CIO or designees can move margin into accounts. He said they would not have people trade futures and there would not be crossover between the ability to move large amounts of money into that account versus trading. He said they also had a Middle Office compliance group that sets trading constraints that were built into the Bloomberg trading system. He said anything that was added to the portfolio was viewed by the compliance group; MR. MOON noted that all trading they would contemplate in futures would be done through the Bloomberg system which allows for the compliance department to place filters and controls on the trading that is performed. He said the Bloomberg system allows them to integrate the risk measurements so they could provide the potential for daily risk reporting as well as view, on a daily basis, any future trading that was performed.

MS. RYERSON noted that the Wyoming Retirement System did the same thing before she left, and it worked very well for both rebalancing and keeping transitionary cash invested as well as adding several basis points.

COMMISSIONER MAHONEY asked MS. RYERSON if the controls that were in place were the same as what was communicated in the presentation; MS. RYERSON said that she thought the controls were more extensive, which she would be comfortable with due to the number of staff compared to Wyoming.

MR. HIPPLER asked if the balancing could be performed more frequently than quarterly to reduce

the need for liquidity; MR. HANNA said that they could do marginal rebalancing; they use cash flows to rebalance quite frequently to a drifted target which was how Callan tracks the performance and ultimately the tracking error. He also commented that even though they target a quarterly rebalancing cycle, they are still governed by the bands set in the asset allocation and that if any asset class was potentially going to breach those bands, they would take action to rebalance them.

MR. ERLENDSON said that they had received the draft policy from staff and had circulated it within. He said they had identified a couple of categories of issues. The first being contract liquidity where some contracts have greater liquidity and others do not trade much. The other issue they found was aggregate limits in terms of how much exposure there would be. Both of these concerns were answered satisfactorily, and they were supportive of the proposed policy.

CHAIR HIPPLER asked MR. HANNA if the issue of over-frequent rebalancing was the loss of momentum and hence have some yield; MR. HANNA said that there was a cost to rebalance, that the less frequently it is performed, the lower the cost would be. He also noted that as the plan was a mature one, they needed to be particularly careful as the risk goes beyond the targets for the strategic asset allocation. He said they think that rebalancing with a reasonable frequency would be the right thing to do, and that quarterly made the best sense for them.

MR. HIPPLER asked MR. MOON to walk through the disadvantages of using classic leverage for two weeks once a quarter, to deal with the short-term problem of trying to match cash from sales with cash from purchases; MR. MOON said that if they needed to add to equity exposures and liquidate fixed income and cash, and add enough leverage to be able to immediately make equity purchases, that might mitigate the expense of having too much in fixed income for such a short period of time. He said that utilizing leverage was not something he'd been asked to look at as far as a potential quarterly rebalancing tool, but noted that it may be helpful, but not as much as the futures.

MR. ERLENDSON said futures eliminates the risk of having to realize losses in one asset class to rebalance into another asset class that was performing badly.
MR. HIPPLER asked MR. MOON and MS. RYERSON how much of a tracking error would there be; MR. MOON said it would depend on the quarter, but temporary tracking error relative to plan benchmarks could be 10 to 30 basis points. He said the key to all of it would be that the staff would be able to measure the economic risk impacts and report on them daily; MS. RYERSON stated that it would be dependent on the volatility of the market and how impacted the tracking error would be if it could not be rebalanced quickly.

MR. WILLIAMS asked MR. HANNA if he was confident of what was being used, what they were doing, and that his team fully understood the risk with derivatives; MR. HANNA said that the issues that were involved with derivatives had to do with either counterparty risk or putting on a sizeable leverage with respect to derivatives, neither of which were being explored. He said they were looking to do all of the work within the confines of the Board's preexisting guidelines and that it was a useful incremental tool for making the rebalancing process more efficient; MR. WILLIAMS asked if it would solve everything for the foreseeable future; MR. HANNA said that they were not looking to do away with cash rebalancing but to augment it to allow them to rebalance in a way that was comfortable for the cash managers so they would not be in a position where they would have to

liquidate or buy assets quickly and incur excessive transaction costs.

MR. BRETZ asked how many years would the tool be useful; MR. HANNA said that it would be perpetual with a caveat of the degree to which they would use it and depended upon market volatility and length of time lag. He said it does have operational and reporting complexities, but it is a strong tool to have in the rebalancing tool set; MR. BRETZ asked about the latter years of the plan when withdrawals exceed the income; MR. HANNA said that with high cash flow comes natural rebalancing.

CHAIR JOHNSON commented that his concern was the sense of letting too much of the unknown occur with respect to going forward with the process. He said that he was perplexed with the Derivative Guidelines attached to the proposed resolution order. He asked why they were addressing derivatives guidelines generally in the context and not attaching the language related specifically to futures contracts to the resolution; MR. HANNA explained that it was ultimately approved in 2016 and there had been a number of Board actions that collectively added up to that approval and that it was best practice to codify in the guideline itself; CHAIR JOHNSON said that a statement was made in the addendum that "There are no specific performance objectives for derivatives." and noted that was vague giving no cap on the amount; MR. HANNA said ultimately there was no way to have a specific performance objective and that he thought that was just a nod to that.

CHAIR JOHNSON said that he would prefer that the resolution presented would have guidelines attached limited to just the futures contract and they would not have to mess with the existing resolutions and languages related to derivatives. He said if there was a way it could be extracted and re-written he would be satisfied, but at that time, he was not certain how to vote on it.

COMMISSIONER MAHONEY agreed with CHAIR JOHNSON as to lack of controls being incorporated in the policy. She then asked MS. RYERSON if controls were embedded in the policy when it was implemented: MS. RYERSON said not the specific ones and commented that she was looking up the policy.

MR. HIPPLER asked MS. RYERSON her opinion on the appropriateness of the size of the exposures and the swap exposure, $500 million was the aggregate limit overall or could it be multiple $500 million transaction limits: MR. MOON said the intent was to be notional limits applying to the underlying referenced assets that they were using as futures; MR. HIPPLER asked if the swap offsets the future; MR. MOON said that was correct, that if they had a swap and the futures contracts both reference to the S&P 500, the overall exposure, notional exposure would not be allowed to be more than $500 million.

COMMISSIONER MAHONEY asked if it was accurate to say that because there were six contracts that were referenced in the policy at $500 million notional, there could be potential exposure of $500 million; MR. MOON said that was potentially accurate and was not something that was being contemplated.

MR. HANNA said that swaps were not something they thought of using and that he was not uncomfortable removing swaps entirely from the guideline and suggested that it could be retitled

"Futures Guidelines." He said what they were looking for was to be able to use specific futures contracts with notional values.

CHAIR JOHNSON suggested that they hold off voting on the resolution until a more appropriate time so that the guideline language could be revised to specifically focus on futures contracts.

COMMISSIONER MAHONEY agreed and said that she would like the key controls MR. HANNA referenced built into the policy and would also like to see in writing the CIO was the one that approves the moving in and out of the margin accounts, as well as the Middle Office and the controls they anticipate through the Bloomberg system - not necessarily saying "Bloomberg system" but identifying the control itself.

MR. HANNA said that they would be happy to revise the guidelines and bring it back to the Board after they discuss asset allocation action items; CHAIR JOHNSON said that it would be fine if it was necessary to bring it up at the next Board meeting.

MR. WILLIAMS asked if they were at zero leverage because they have not authorized it, or just have not used it; MR. HANNA said he did not think it was necessary in terms of what they were envisioning doing with it in terms of rebalancing; MR. WILLIAMS asked if they have authorization to use leverage if they wanted; MR. HANNA said they do have the authorization in pieces of the portfolio; MR. WILLIAMS asked if there was a reason they did not have general authorization for leverage and futures in one guiding document: MR. HANNA said that he did not believe they needed to use leverage and would not come to the Board asking for authorization on that unless they really felt it would be beneficial.

CHAIR JOHNSON asked if there were any objections to defer the action until MR. HANNA elects to present it back to the Board. As no motion had been made the action was deferred.

CHAIR JOHNSON recessed the meeting from 4:00 p.m. until 4:13 p.m.

E. EXECUTIVE SESSION

CHAIR JOHNSON introduced MR. JONES from the Department of Revenue.

MR. JONES explained that Buck Consultants were going to discuss the measures they take to ensure data about Alaska Retirement System members was secure.

CHAIR JOHNSON asked MR. JONES to verify that the presentation proposed was necessary to go into Executive Session; MR. JONES confirmed that was correct.

CHAIR JOHNSON requested a motion to go into Executive Session to consider two matters. The first matter was related to security issues, the immediate knowledge of which would clearly have an adverse effect on the finances of the public entity. And the second issue relates to the ongoing litigation in the Metcalfe case, which involves a matter that is confidential by virtue of the attorney-client privilege.

MS. HARBO so moved. MR. MOEN seconded the motion. The motion was approved without objection.

A roll call vote was taken, and the motion passed unanimously.

CHAIR JOHNSON noted that in addition to the Trustees, the three IAC members, Treasury staff members: MR. HANNA, MS. LEARY, MR. JONES, and the liaison MS. JONES; from the Division of Retirement and Benefits, MR. WORLEY; from the AG's office, MR. HOFMEISTER and MR. SCHMIDT; and from Buck, MR. MAT GROUSE, MR. MARK SCONYERS, MR. KERSHNER, MS. MANNING, and MR. YOUNG; and Deputy Commissioner of the Department of Administration, MR. DAVE DONLEY as well.

CHAIR JOHNSON recessed the public session of the meeting at 4:16 p.m.

Buck attendees were excused at 4:50 p.m.

Friday, June 18, 2021
CALL BACK TO ORDER

CHAIR JOHNSON announced the ARM Board came out of Executive Session yesterday at 5:05 p.m. No actions or decisions were taken by the Board.

CHAIR JOHNSON reconvened the meeting at 9:00 a.m.

F. INTERNATIONAL EQUITY, WITH EDUCATION DISCUSSION OF BIG DATA

MR. HANNA introduced MR. ALEX OGAN and MR. JON SIMON of Arrowstreet, explaining Arrowstreet was hired in 2014 and manages approximately $700 million in assets for the ARM Board.

MR. SIMON explained who Arrowstreet was and that at the end of the first quarter they were at $143 billion in assets for 228 clients. He said the firm was growing and had 350 people most of which all based in their headquarters in Boston. He noted that the strategy that the Board chose was ACWI (All County World Index) and as of May 31st they had 23.1 billion invested in that strategy. He said that all the mandates they manage were managed by the same team with the same investment process.

MR. OGAN discussed their investment philosophy noting that they rely on data and quantitative tools. He said that at the heart of what they do is return forecasting, or the alpha generation which builds explicit expected return forecasts for a broad universe of equity securities which in turn were the main ingredients of how they managed the portfolios. He said in addition to expected return, they also watch both risk control and transaction costs. He said they relied heavily on data and signal construction when building forecasting models, but the data was not the starting point, human-generated investment ideas were the actual starting point. He explained that they use the data and quantitative tools to evaluate whether the idea had been successful in forecasting returns and if they expected the idea to continue to be useful.

MR. OGAN explained that the quantitative approach was effective because it allowed them to leverage their investment ideas across a broad investment universe. He said this allowed them to find mispricing across equity markets at any point in time which meant they could be flexible to the countries, regions, or sectors in which they invested by directing the alpha-seeking behavior to different segments of the market. He said they continued to get information about companies that was relevant to valuation and future price movements.

MR. OGAN stated that in their models, they employed a concept called signal groups and explained it as economic themes that they organized the individual signals into, which were listed on page 25 of their slide presentation. He explained that the catalyst signals were a higher-frequency signal group and were event-based signals. He said they looked for events in the equity markets that they thought would trigger investor attention and a price response. He noted that the high-frequency signals they identified would play out over a multi-week period and would be effective in forecasting alongside more stable, longer-term signals such as quality and value signals. He described extreme sentiment signals as a balance group against the momentum signals. He said extreme sentiment signal group would recognize what they see in the historical data. He said extreme sentiment signal group became very useful during the late first quarter and early second quarter of 2020 with the extreme market response to the pandemic.

MR. OGAN said another tool they used was direct effect signals versus indirect effect signals. He explained direct effect signals as signals that were based upon information of single companies in isolation, helping form a forecast of a company.

MR. WILLIAMS asked what their proxy was that they were using for quality and as they make decisions, do some of the signal groups have a stronger impact in the decision-making than others; MR. OGAN explained that he could not share details about the individual signals because they are intellectual property. He then explained that they look at similar measures to ones seen in commoditized smart beta version of quality strategies, that they always think about the leverage and profitability, stability of earnings growth, as well as the companies' balance sheets and how their debt obligations relate to ongoing cash flows. He noted that the higher quality characteristics a company had, the higher the valuation of the company would be. He further explained that there were different environments where different signal groups were more promising or less promising, such as the value signals which they viewed as likely to be more effective when value spreads are wider. He noted that it was important to look at the underlying ratios and identify whether the difference in the multiples was larger or smaller between the expensive companies and the cheap companies.

MR. OGAN said indirect effect signals are signals that are based on groups of related companies. He explained that they discover relevant information about the companies by looking at the related companies to each individual security that they try to forecast. He noted that the slide on page 26 showed an example of identifying related companies.

MR. OGAN said they also have a process called expanded linkages which allows them to better identify relationships between companies than just thinking about the country-sector classification. They use a large number of individual signals in the linkage model; they look for each piece of

information that could be indicative of a relationship between pairs of companies. He said they look at geographic breakdowns, business operations, subindustry breakdowns of where companies were active within the sectors, the headquarters' location, individuals on the company boards, the trailing stock price return correlation. He said these are all combined to produce a unified measure of how closely related each pair of companies are. Then they identify forecasting signals based upon the related company information, which improves their forecasts.

MR. OGAN then explained portfolio construction. He said they were very conscious not only of expected return but also of risk. He said they think about risk control on a benchmark-related basis and their primary risk measure was benchmark-relative tracking error which is at the heart of the portfolio construction. They try to maximize expected return while trying to minimize the benchmark-relative tracking error.

MR. OGAN said they believed that big data and machine learning were relatively limited utilities in their core forecasting model. He said big data referred to cars learning to drive, natural language recognition, and credit card data, and that they are all data sets with trillions of observations that were available to employ big data tools and machine-learning-type tools. He said there was not enough data out there for machine learning to be an attractive alternative for them. He said the other reason big data was less helpful for them was because forecasting monthly frequency stock returns was difficult, and they know the degree of predictability their models need to achieve in order to meet their investment targets were low.

MR. OGAN noted that there were some areas of their process where they do think big data would have useful applications. He said the expanded linkage model was about forecasting pairs of companies and the relationships between pairs of companies and adding that dimension meant that they could have 50 million observations per month to look at which would make them a good candidate for big data approaches. He also noted that big data approaches would be useful in the higher-frequency return forecasting.

MR. OGAN then turned to the portfolio results for the last 12 months and noted that they had been a strong run with value added at 19.2 percent. He said the second quarter of 2021 had been successful with valued added at 1.1 percent, which puts the portfolio ahead of the full year target of 3 percent. He explained that the forecasts generated by the alpha model were the most important determiner of the positions that they take in portfolios. He noted that the portfolio results were driven by how successful they were in forecasting stock returns.

MR. OGAN said that page 19 of their presentation showed expected forecasts generated by their alpha models. He said the basket model was an indirect effect model, based on country sector basket groups. The stock model, shown below, was a combination of direct effect signals and indirect effect signals that were based upon the expanded linkage model which identifies the stock-specific successful sectors. He said the models had been very consistent and successful over the period shown in slide 20, particularly over the trailing five months. He said the most successful signal group in the trailing single-quarter was the value signal in the basket model. He said for the stock model on slide 21 the best and the worst performing groups were the two signal groups that rely most heavily on the expanded linkage model.

DR. MITCHELL asked if their approach worked better in international than in domestic, or in small cap rather than large cap or if they had noticed differences in success across different investment strategies; MR. OGAN said yes, they employed a single forecasting model across geography and market capitalization ranges and expect the model to be more effective in some areas. He noted that the value-added target and information ratio target was higher for the dedicated small cap portfolios compared to their all-cap portfolios.

MR. WILLIAMS asked why weren't they comparing net of fees to net of fees or gross of fees to gross of fees and were the times shown on the timeline meant to show performance only in the most favorable light possible, or was there a reason that it was being shown in such a short time period; MR. OGAN said that as far as gross versus net, he said what it was showing was that in terms of the net benchmark, was net of dividend withholding, so he was talking about gross of fees across the board, there was no distinction of what they would get in a net-of-fees index product, it was about the dividend treatment in the benchmark. He said in terms of the trailing performance, they always have month, quarter, year and have shared with the staff a calendar-year basis performance that they would be happy to share with anyone on the Board that would like to see it.

MR. HIPPLER asked how the over and under-allocation to certain segments impact the beta; MR. OGAN asked MR. SIMON to switch to slide 18 to show the active beta exposures of the portfolio. He said they were allowing tactical variation in the beta exposures - that the portfolio construction process was able to have tilts and sometimes the tilts could be meaningful, however they only take tilts when the expected return forecast suggested it would be worth it.

G. FIDELITY TACTICAL BOND

MR. HANNA reminded the board that Fidelity has managed the tactical bond strategy since 2014 and currently managed close to $1 million for the ARM Board. He then introduced MS. KRISTIN SHOFNER from Fidelity.

MS. SHOFNER introduced herself and her team. She explained that she had worked with Alaska since 2014. She then introduced MR. MICHAEL PLAGE, who was the co-PM with MR. JEFF MOORE on the strategy and he had been with Fidelity since 2005. She also introduced MR. BEAU COASH, the institutional PM. She then handed the presentation over to MR. COASH.

MR. COASH explained Fidelity's approach was a team-based process which was different from a star system that relied on one person. He said they had four portfolio managers in the core team and preferred the team-based process. He said the other thing that makes them unique was their unparalleled C-Suite access to corporate America. He said in 2019 they averaged 2,700 meetings per quarter with corporates across the globe, in 2020 they had 3,300 meetings per quarter.

MR. COASH referenced page 12 of the slide presentation which was the performance review showing year-to-date numbers. He explained that the 1.24 percent negative was now a small positive and that it is up by 6 basis points which was 200 basis points better than the Aggregate. He said that looking at the longer-term numbers, the one year was up 1,100 basis points, the three year was up 200 basis points, the five year was up 300 basis points, and since inception, up 230 basis points and hitting

the alpha targets. He said the alpha targets over market cycles were 125 to 250 basis points and the calendar year was up 9.4 percent.

MR. COASH referred to page 11 and explained that they had a five-step investment process as shown in the chart. He said that they had taken the risk down significantly heading into 2020 because the valuations in the market were getting lean. He said their macro assessment was that the economies were being shut down and the Fed and Treasury were going to respond and bring in cheap capital, so they held off until the high yield issuance started in earnest in March of 2020.

MR. PLAGE referred to page 13 of the presentation saying that tactical bonds were their most flexible bond offering as it had a similar level of volatility in most market environments as the Bloomberg's Aggregate Bond index, with more yield and alpha through active management. He said they take a bit more duration risk in terms of deviating from the benchmark, it was not an absolute return strategy, rather it was a bond strategy which typically had between three and six years of duration. He said tactical bond volatility was similar to that of the investment grade bond market which was the Aggregate.

MR. PLAGE said they like the Aggregate as a benchmark because it had only three negative-return calendar years in the last 35 years and had a nice proportion of income to volatility. He explained it was a bond production with positive duration but not an absolute return and there was value to owning duration in the market, even at low yields that currently exist.

MR. PLAGE also referenced the five-step investment process on page 11 of the slide presentation. He said the Macro Assessment was where they evaluate the fixed income markets around the world. He said they have a team in Merrimack focused on the central banks around the world and other analysts focused on other sovereign developed market and emerging market risks. He said they do that in several different venues, with one being a sovereign meeting that occurs every Monday. They also have ad hoc meetings with all the analysts on a regular basis to determine how much return would be available in the fixed income markets which drives how much risk is being taken in the portfolio at any given time.

MR. PLAGE explained Sector Analysis which was where he and MR. MOORE speak with portfolio managers at Fidelity and asked them if they love their sector, was there a great beta opportunity in loans, international credit, high yield bonds, or government securities. They also ask if there was a lot of spread dispersion and if so, was it ripe for alpha generation through security selection. He said that allows them to form their views on how they want to start allocating resources.

MR. PLAGE explained Asset Allocation, the third step, where they perform scenario analysis looking for correlations amongst all asset classes that they consider. They decide how much risk they want to take in emerging markets or investment grade credit, and they consider simulated duration which tells them the amount of sensitivity the portfolios have to lose in Treasury rates. He said one way to hide from a rising Treasury rate environment was to buy loans or European credit-hedged dollars that were benchmarked off the Euro curve, the Boone's curve, denominated in Euros. They consider scenario analysis - where rates were rising 100 basis points or falling 100 basis points, the performance of the stock market and how the portfolio would perform.

MR. PLAGE explained Security Selection was their fourth step. He said this was where the equity managers look for ideas and find the issuers that would perform regardless of the market environment.

MR. PLAGE explained Portfolio Construction as the fifth step in the process as being where they have risk oversight. He said they meet with their CIOs on a monthly basis to have market reviews with the entire quantitative team on compliance and technology in terms of markets surveillance and management tools.

MR. PLAGE referred to page 4 of the slide presentation which showed the Treasury Curve Evolution pre-pandemic, mid-pandemic and current. He said that the market activity could be chalked up to some position squaring ahead of what many expected to be a quiet summer, the curve had flattened, and the focus had shifted from 30 years to a seven-year part of the curve. He said the Aggregate was still down 2 percent and it could get its fourth negative draw this year in the last 35 years. He said they had reduced the credit risk in the portfolio and what was left was idiosyncratic risk.

MR. WILLIAMS asked if they hedge currency, or do they let that ride and not worry about it; MR. PLAGE said they do hedge currency risk. He said that the Board has a bond portfolio that generally delivers between 3 and 5 or 3 and 6 percent volatility on an annual basis and that cross-currency basis was north of 10 percent and some emerging market currencies were north of 10 percent. He said any currency position unhinged in the portfolio could blow up the volatility, so they hedge all of the currency exposure except for some idiosyncratic risks.

MS. SHOFNER said that it was their most flexible bond strategy in the investment grade space and the last year and a half it had shined and proven its place in the bond lineup as they were able to move quickly into areas where there were opportunities for yield, returns, and hit the idiosyncratic opportunities.

H. FIDELITY REAL ESTATE HIGH INCOME

MR. HANNA said Fidelity manages roughly $200 million in a real estate high income strategy for the ARM Board and introduced MS. SHOFNER to discuss the real estate high income portion of the presentation.

MS. SHOFNER introduced MR. ANDY RUBIN who was the institutional PM, MR. STEVE ROSEN, and MR. BILL MACLAY, also PMs. She said the team had been together for over 25 years and described the team as boutique-like within Fidelity as they manage a smaller group of assets that has been extremely successful. She then turned the presentation over to MR. RUBIN.

MR. RUBIN he said although there was an initial downdraft in the fund last March and April driven by price mark declines, the strategy weathered the storm very well and emerged in a position of strength. He said the key factor of that was during the heart of the pandemic and being in the position that they were in, it allowed them to invest opportunistically and lean in during the second and third quarter of 2020, which allowed them to invest at historically attractive yields and low prices. He said that even though 2020 was only a one fourth negative return year in over 26 years of history managing the strategy, he described the negative 5 percent total return on a net of fee basis as a relative win

during the pandemic. He said that commercial real estate was the epicenter of a lot of pressure and negative sentiment during that time when indoor gatherings were prohibited. He said they were currently up 6 percent year-to-date on a net fee basis.

MR. RUBIN explained that they had learned firsthand that the key to delivering successful outcomes for clients was to rely on trusting their teams credit research expertise, building in a margin of safety and cushion into the investments they make. He said that most relevant was investing with conviction during the most opportune points in the cycle when emerging from a recession or crises. When other market participants were fearful, they tried to remain calm and disciplined and last year was a good example of their work ethic. He stated that the portfolio was optimally positioned for the future and thanked the Trustees as well as the investment staff for their ongoing stewardship for entrusting Fidelity with a portion of the fund's assets.

MR. ROSEN explained the history of Fidelity's real estate debt team. He said it was formed in 1994-95 to invest via the securities market and today managed nearly $11 billion.

MR. ROSEN referred to page 5 of the presentation which showed investments and discussed the strategy points and benefits. He said that in 1995 they launched their flagship institutional offering called Real Estate High Income and it was the vehicle through which they invest on behalf of the ARM Board. He said the objective was to complement portfolios by offering niche strategy investing in high yielding commercial mortgage-backed securities (CMBS) that would generate, over the long run, a competitive return in high yield corporates. He said it was dependent on their research and trading abilities to exploit inefficient factors relative to others.

MR. ROSEN explained that their analysts were real estate professionals with prior experience and skills valuing commercial property and discerning the risks. He explained that commercial mortgage-backed securities were structured bonds that were backed by commercial mortgage loans and the loans could be backed by virtually any property type and be located anywhere in the United States. He explained that after a bank has originated a critical mass of loans, the loans were brought to a rating agency and assessed, then dropped into a trust and then the bank, on behalf of the trust, sells the bond packages through investors. As the property owners make their monthly payments to the services, those payments are then passed to the bond holders. As a risk factor, if one of the underlying mortgage loans defaults then the bond holders that are last in line have first risk to a loss. He said to help them decide which bonds to purchase, they conduct a credit analysis on the loans that back the bonds. He said they visit the site, asses the quality of the location and building, the tenancy, and the competitive set, in order to come up with the value and compare that to the loan balance.

MR. MACLAY referred to page 8 of their presentation that showed the capital structure of a transaction. He explained the way a capital structure works was when loans mature and pay off, it starts to pay down the top of the structure. He said to date approximately 20 loans had paid off and the top 4 classes listed on page 8 had been paid off. He said if a loan defaults, the underlying property would be sold and the sales proceeds, if there was not enough to cover the mortgage, the loss would be incurred at the bottom of the structure, class H. He said that they believe there would be a handful of loans at risk of default and expect if those defaults did happen it would be less than the $34 million cushion in Class H. He said they own Classes D through G which were protected from a principal

loss.

MR. MACLAY referenced page 9 of the presentation stating that rent collections were challenged at the beginning of the pandemic, but the renters were currently paying, and hotels have been consistently recovering. He said page 10 showed the initial drop in housing prices and that they have been steadily increasing. He said page 11 showed that loan delinquency had spiked and the amount of new loans that were becoming delinquent was low and with loans curing, the delinquency rates had gone down further.

MR. ROSEN discussed page 12 of the presentation, explaining how the fund stacked up against other fixed income measures and why it did so well in the past and would continue to do well in the future. He said those were the conditions that the pandemic put into play a year ago that resulted in the big return in the ensuing period. He said although there had been recovery, a lot of the dollar price decline the market took into the high 70s was back to 93, but there was still a long way to go. He said relative to the alternative fixed income investments, the dollar price was substantially lower than the 105-dollar price they would see in other benchmarks or indexes. He said that they did not think they were taking undue risk with the high-income fund and the average credit quality was at the top at Double B plus. He said he thought they were being conservative in their presentation and that they were well positioned with true credits, a low dollar price, high yield, and a low interest rate sensitivity.

MR. ROSEN said that page 13 of the presentation showed more characteristics of the fund with two pie charts, one showing that they cut CMBS into three different types that added up to more than 80 percent of the fund which was their principal mandate. He said they do offer other types of high yield and real estate securities but in smaller amounts. He said the pie chart on the right showed distribution by ratings and that they had more Triple B's than any other type of rating category.

MR. ROSEN stated that page 14 showed a pie chart of different types of properties that were in the portfolio with a representation of virtually every property type available.

CHAIR JOHNSON asked how exposed they were to changes by the rating agencies, the rates that they were assigning to the various investments; MR. ROSEN said they were showing ratings to be transparent about the portfolio and construct the weighted average for points of comparison. He said they were not constrained at all by ratings, and it was not a large component of what they do or think about. He said if they were caught by surprise by a downgrade, it would have negative implications for the price of a holding, but the goal was to be ahead of the agencies.

MR. WILLIAMS asked if they thought money invested now, three years from now and then five years from now, that the passive benchmark would still be beating them or do they feel like they have outperformed it; MR. ROSEN said that they thought their numbers looked really strong across the board and over the course of about six weeks their sector got pummeled and that was what drew down their three- and five- year numbers.

MS. SHOFNER explained that the thing about the strategy was that it was in mutual fund form and was not something they could address and so they addressed it as a whole, as Fidelity as a partner with the Board by discounting other strategies and giving a price break in tactical bonds as well as the

signaling strategy. She said that she thought the Board was in a great position with the opportunities and the loans that were in the portfolio.

MR. MACLAY said that the performance over the past year had been very strong but still has a way to go before reaching the goal of gaining back the pre-pandemic points. He said with the economy continuing to reopen they expected to gain the lost appreciation back.

CHAIR JOHNSON recessed the meeting from 11:09 a.m. until 11:18 a.m.

I. ARMB 2021 ASSET ALLOCATION STRATEGY CALLAN LLC

MR. HANNA introduced MR. KLOEPFER explaining that he would be discussing Callan's approach to asset allocation.

MR. KLOEPFER started with page 4 of his slide presentation explaining that it was a summary of important changes they had made. He explained they had to do a reset of last year for the capital market expectations with fixed income, resetting back to a zero-interest rate policy. He said they lowered the fixed income expectations by a full percentage point from 2.75 to 1.75 for broad market fixed income and lowered public equity returns by between 45 to 55 points, which widened the equity risk premium. They also lowered their inflation from 2.25 to 2.

MR. KLOEPFER stated the next slide showed the specific expectations for ARMB for the PERS and TRS for the next 10 years, with the following slide showing the 29-year expectation with the target rate shown in the left column. He said there was a long-term equilibrium set of assumptions and a 10-year set of assumptions and a path to get between the two. He said the 10-year assumptions for equity were 6.5, the long term was 8.5, and bonds were 5 percent nominal bond return over a long-term time horizon.

MR. KLOEPFER said the next slide showed the 10-year assumptions, the 20-year forecast, a 30-year, and a very long-term equilibrium. He noted that the 20-year has to include the first 10-years, the 30-year has to include the 10 and the 20-year. He said they lowered the 10-year expectations which had little impact on the 20-year because there were still the out years particularly in fixed income where there would be a higher yield.

MR. KLOEPFER said the next slide focused on the PERS and TRS 20-year horizon, the duration, cash flow and demographic all suggested that there was a long-time horizon for both plans. He explained the current 10-year capital market forecast was modest due to the reset in fixed income and the high value for equities suggested the need to take on risk to get to the target of 4.88 percent real return. He also stated portfolios had some optimization. He said opportunistic was modeled as 60/40 (60 percent public market stocks and 40 percent public market bonds) because they believed it was a representation of what they could expect from those investments. He said fixed income was modeled as 95 percent aggregate and broad market at 5 percent in cash. He said on a 10-year basis in comparing last year versus this year, the returns were down from 6.80 to 6.15, a 65-basis point drop. He said they didn't lower the 20-year numbers as much and since they lowered the inflation number by 25 basis points, the real return expectation was 10 basis points lower from the projection a year ago.

MR. KLOEPFER explained that they discussed some modest changes to the current target with MR. HANNA and staff to help move the portfolio toward the 4.88 percent real return. He said Mix 1 through 3 looked at portfolios that move in 5 percent increments of fixed income. Mix 2, represented a mix with 19.6 percent fixed income and was expected to meet the 4.88 percent real return goal. He explained that the final column displayed what could happen if diversification of the private markets was not pursued - there would be no allocation to real assets and no allocation to private equity. He said a better return would be achieved by adding diversifying private investments. He discussed the current target along with two potential alternatives that would be a modest increase in risk, for a meaningful increase in return.

MR. HIPPLER asked why they should lower the inflation profile when all the professional forecasters were saying they should raise it; MR. KLOEPFER said 2 percent was still reasonable for many reasons, one of which was they had not been anywhere near 2 percent realized inflation until the previous three months. He noted the Fed had struggled for a decade or more to get inflation back up to at least 2 so they had changed their language to say that they were going to try to overshoot on purpose so they could at least average 2 percent over the next 10 years. He said that over the last 20 years, anytime the Fed got near 2 percent, they would get nervous, and the rate would drop back down.

MS. HARBO stated that they were still using 2.5 precent for actuarial rate of return.

CHAIR JOHNSON asked if they had any concerns that the realities in the last two or three weeks might make some of their projections a bit out of date; MR. KLOEPFER stated that he was not worried about that, that he was expecting that to happen.

MR. HIPPLER asked if the Board disagrees on the nominal inflation that Callan was projecting, if it impacts the recommended allocations of asset classes, or was it that they were looking at the real rate of return and inflation did not impact it much; MR. KLOEPFER said they get the real rate of return employing the inflation assumption, so there is an impact, but it would not change their recommended policy.

MR. KLOEPFER said that for the military plan, the target had been historically conservative. He noted the plan was overfunded and that had to do with refining the benefits and how they were calculated. He explained that last year they were projecting to be at 4.13 percent rate of return and this year it was at 3.68 rate of return. He said it was more of a qualitative assessment as to what the right exposure was and in the past, the Board had been comfortable with the current target of 46 percent in fixed income. He noted that there was consideration of costs, complexity, and illiquidity and that they did not believe there were liquidity issues with the fund.

MR. HIPPLER said that he was concerned that Callan was the only major advisor that was suggesting people lower their inflation expectations and then asked the IAC members what their comments were about lowering the inflation expectations.

DR. MITCHELL said that his concerns were that the Fed thinks it could do something that it may not be able to do, that a lot of faith was put into the Fed's ability to increase and decrease inflation. He

said that he thought 2 percent was a reasonable number.

DR. JENNINGS added that he would look at multiple sources such as consulting firms and a survey that comes out in August that involves 30 different investment consultants. He also noted that break-even inflation that is embedded in the Treasury versus TIPS rate was another source. He said inflation indicators might give pause, but it was not about the forecast, it was about the asset allocation.

MS. RYERSON noted that she thought a lot of it was going to depend on how the actuaries were lowering their rate and that timing would make a big difference in liabilities; MR. HIPPLER asked if they changed their inflation to 2 percent and the liabilities on the actuary side were calculated with a 2.5 percent inflation rate, would that artificially make the liabilities look smaller than they are - if the actuaries follow and reduce the inflation rate; MS. RYERSON said then the liabilities would follow.

COMMISSIONER MAHONEY said that in her opinion, the 2 percent was consistent with what the Fed was saying.

J. ASSET ALLOCATION DISCUSSION AND ACTION ITEMS

Action: Resolution 2021-01 Asset Allocation for the PERS DB and DC Plans, TRS DB and DC Plans, and JRS Defined Benefit Plans

Action: Resolution 2021-02 Asset Allocation for the Alaska NGNM Retirement Systems

MR. HANNA noted that asset allocation started with understanding the liabilities and the goal was to pay all benefits when due. He said one of the charts showed the PERS and TRS benefit payments and showed the projected benefits for the next 97 years and in excess of a billion dollars a year for over three decades.

MR. HANNA said they currently had in excess of $30 billion in assets which was a combination of forward investment returns and forward contributions for both unfunded liability and future benefits that are still in the system that would bridge the gap between $32 billion in assets and $75 billion in payments.

CHAIR JOHNSON asked if the proposed changes fall within the bands of what currently exists in terms of what the investments would be, that the changes were more to develop a projection number than to compel significant changes in the investments; MR. HANNA said that he mostly agreed with that, but it would move the midpoint of the band so the variance would be potentially higher. He said from an asset allocation perspective it would give the Board credit for higher levels of exposure.

COMMISSIONER MAHONEY commented that on an earlier slide he had indicated that the standard deviation was around 14 percent for the portfolio, then asked with the additional risk through alternative investments where it would land; MR. HANNA said last year's standard deviation was 13.56 percent and the recommendation for this year was 13.89 percent, which is a modest, worthwhile uptick. He said the staff had done a lot of modeling on the issue and would continue to do so.

DR. JENNINGS commented that it was a big enough allocation to move the needle and important in order to get the required returns. He said some non-profits he worked with target a 15 percent.

MR. HANNA explained that there was one action memo with two resolutions and that his recommendation was that the Alaska Retirement Management Board adopt both resolutions, moving asset allocations for fiscal year 2022 as per the recommended asset allocations attached to the resolutions.

MS. HARBO so moved to approve Resolution 2021-01. MR. HIPPLER seconded the motion.

A roll call vote was taken, and the motion passed unanimously.

MS. HARBO so moved to approve Resolution 2021-02. MR. WILLIAMS seconded the motion.

A roll call vote was taken, and the motion passed unanimously.

Action: Resolution 2021-03 Derivatives Guidelines

MR. HANNA said that using futures for rebalancing should allow the system to better target risk and reduce costs, cash drag, and tracking errors. He presented several slides with brief comments for each slide.

MR. HANNA explained that he had handed out the revisions to the guidelines to the Board earlier in the day and that they had changed the title to Futures Guidelines and removed the references to swaps and other derivatives. He said they deleted the Russell 1000 contract and the $500 million notional value that went along with that. He said they also reduced the notional value of the Russell 2000 and the EM contract to $250 million each, which brought down the potential notional value to $2 billion or 6 percent of assets.

MR. HANNA stated rebalancing was a tool they use to rebalance 2 to 4 percent of the asset allocation using futures, which staff believed to be a reasonable sizing.

MR. HANNA said they had added Section 6 which were risk controls discussed previously. He noted that the controls in the guideline reflected the minimum and that additional controls were used in everything they do. He said they also recommended setting broker limits consistent with the guidelines. He stated that the ARM Board compliance team that monitors compliance daily on all of the trading that is performed in the portfolio reports to one of the deputy commissioners.

MR. WILLIAMS asked how big the pool of delegates was and were there minimum qualifications those people must have in order for the Board to have total confidence in them; MR. HANNA said that it worked the same way the Board currently delegates authority to the CIO for certain responsibilities. He said when he is out of the office, the authority was delegated to Shane Carson to sign things of a certain nature on his behalf. He said it was all senior staff and the Board has that list and when the list changes the Board would then have a new list so they would all be aware of who the CIO had delegated to act with CIO authority. He said the tweak to the guidelines would be the same list but with the exception of anyone that would be able to trade futures.

MR. BRETZ said that he had received a copy of the red-lined changes to the resolutions and asked that he articulate what the difference was between the resolution and the original authorization from 2016; MR. HANNA said that there had been a series of authorizations in 2016 that established the initial limits. He said they had added the other contracts that they thought were necessary to rebalance the ARM Board's asset allocation which were Treasury futures, the EAFE, and the EM contracts. He said initially the contracts that had been approved all had a notional value of $500 million, and that there was a prior discussion that notional exposure was constricted to $750 million, meaning there was still the ability to use each contract up to $500 million but the impact of all of the contracts together could not exceed $750 million. He said that as these contracts are added up, they totaled $2 billion in notional value and that they were looking to increase the notional amount from $750 million to $2 billion because they thought that to be a useful rebalance; MR. BRETZ asked if the resolution would replace the previous policy; MR. HANNA stated that the original authorization was not a policy, that this would be the policy.

CHAIR JOHNSON asked if there was an intent behind the resolution that this would replace it and be the guidelines that it would operate under; MR. HANNA confirmed it would be.

COMMISSIONER MAHONEY asked MR. HANNA to explain it to the Board as he had explained it to her. MR. HANNA did so; MR. WILLIAMS then clarified MR. HANNA's explanation by saying that to get to the target, he would have to rebalance and if he wanted to move a billion dollars he would need to rebalance. If it dropped 20 percent, he would still be down 20 percent or $200 million, but if he did it with futures, he would put up less money up front, but there would still be a 20 percent loss. He said the difference was that there would be a margin call, he would still have to put up more money, but he would not materially be losing more or less than if he had just rebalanced. MR. HANNA confirmed that was correct. He said if you don't manage the collateral well, you may not have the money to make that margin call and would be forced to sell something you do not want to sell.

CHAIR JOHNSON asked if the Permanent Fund Corporation utilized futures; MR. HANNA said they did but was not sure if they did it from a rebalancing perspective; MR. CENTER confirmed that the Permanent Fund does utilize futures for rebalance.

CHAIR JOHNSON recessed the meeting from 12:54 p.m. until 12:58 p.m.

UNFINISHED BUSINESS - None.

NEW BUSINESS

CHAIR JOHNSON noted that there had been matters of discussion that had come up and that they would be presented to the Operations Committee at the next meeting of how to deal with self-assessment with the various committees.

OTHER MATTERS TO PROPERLY COME BEFORE THE BOARD - None.

PUBLIC/MEMBER COMMENTS

MR. SIMARD introduced himself as a member of 350 Juneau's board, a librarian, retired from the State of Alaska, and a grandfather. He said that in previous meetings he had spoken about the climate-related litigation against the major oil companies based on damages caused by the use of the companies' products, that the companies were aware of the dangers and hid the information from the public.

MR. SIMARD gave an update as to the ruling in May for Royal Dutch Shell from the Supreme Court of the Netherlands. He said six environmental groups and more than 17,000 citizens enjoined in a complaint that alleged that Shell's business practices violated human rights laws in the Netherlands and the EU. The court ordered Royal Dutch Shell, by means of its corporate policy, to reduce its co2 emissions by 45 percent by 2030 with respect to the level of 2019 for the Shell group and the suppliers and the customers of the group.

MR. SIMARD said that in the United States, 26 cities and states had brought public nuisance suits against major oil companies seeking damages in the billions for climate-related destruction related to fossil fuel emissions. He said the state courts had shown willingness to side with the municipalities, while the federal courts were reluctant to rule on what they saw as issues so large they required legislative or executive action. He said the oil producers were trying to force the cases into federal courts. He said that on June 14th the U.S. Supreme Court had issued a ruling in the case of San Francisco versus Chevron, Exxon Mobil, Shell, BP, and ConocoPhillips upholding a 2020 ruling by the Ninth Circuit rejecting the oil companies claims that the San Francisco and Oakland cases belonged in federal court. He said it was clear that financial investments in fossil fuel companies were increasingly threatened by well-founded legal action worldwide.

CHAIR JOHNSON thanked MR. SIMARD for his input. He then turned the focus back to consideration of Resolution 2021-03 and asked MR. HANNA if he could introduce the motion.

MR. HANNA said the staff recommendation is that the ARM Board approve Resolution 2021-03 which would adopt the Futures Guidelines.

MS. HARBO so moved to approve Resolution 2021-03. MR. WILLIAMS seconded the motion.

A roll call vote was taken, and the motion passed unanimously.

INVESTMENT ADVISORY COUNCIL COMMENTS -.

DR. JENNINGS gave a shout-out to the Board and staff for the robust information sharing and said that anything they can do to enhance that will lead to robust investment decisions and was part of a good investment program.

MS. RYERSON expressed her appreciation for being able to meet in-person. She also commented that the experience study will be interesting to see with respect to the disconnect between 10-year forward looking consultants and the actuaries looking 30 years forward. She said other large state pension funds are continuing to decrease assumptions and that Buck and GRS may have some interesting discussions with Callan when that review comes up. She also congratulated the investment

and asset allocation staff for being consistently being above average over the long term.

TRUSTEE COMMENTS

MR. WILLIAMS welcomed MS. RYERSON to their first in-person meeting and commented on how good it was to see people in person again. He said he appreciated MR. KROHN and MR. MOEN's for being on the Defined Contribution Committee. He also commented on how nice it was to see the IAC members and be able to have conversations with them.

MR. WILLIAMS noted that the benchmark with private equity was a bit messy, that it did not line up and they may want to take a look at the long run. He said he thought the presentations were thoughtful and was impressed by all the conversations.

FUTURE AGENDA ITEMS - None.

ADJOURNMENT

There being no objection and no further business to come before the board, the meeting was adjourned at 1:10 p.m. on June 18, 2021, on a motion made by MS. HARBO and seconded by MR. KROHN.

Chair of the Board of Trustees
Alaska Retirement Management Board

ATTEST:

Gayle Harbo

_____

Corporate Secretary

Note: An outside contractor recorded the meeting and prepared the summary minutes. For in-depth discussion and more presentation details, please refer to the recording of the meeting and presentation materials on file at the ARMB office.

ALASKA RETIREMENT MANAGEMENT BOARD
STAFF REPORT
Division of Retirement & Benefits Report
September 23, 2021

Summary of Monthly Billings / Buck Global LLC

Attached for your information are the quarterly payments related to actuarial services provided by the Division's consulting actuary, Buck Global LLC.

Items listed represent regular and non-regular costs incurred under our current contract.

The listed costs are charged to the System or Plan noted on the column headings.

Summary through the twelve months ended June 30, 2021

New for this quarter is the ARMB Trustee online video education modules, PERS Additional State Contribution modeling, Legislative Audit/GFOA questions, effects of 4-year JRS salary freeze, effects of AlaskaCare plan design changes, and Legislative questions.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Summary of Monthly Billings - Buck Global LLC

DATE: September 23, 2021

ACTION: _____

INFORMATION: X

BACKGROUND:

AS 37.10.220(a)(8) prescribes that the Alaska Retirement Management Board (Board) "coordinate with the retirement system administrator to have an annual actuarial valuation of each retirement system prepared to determine system assets, accrued liabilities, and funding ratios…."

As part of the oversight process, the Board has requested that the Division of Retirement & Benefits provide quarterly summary updates to review billings and services provided for actuarial valuations and other systems' request.

STATUS:

Attached are the summary totals for the twelve months ended June 30, 2021.

Buck
Billing Summary
For the Three Months Ended September 30, 2020

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 54,560	43,653	5,457	5,455	-	-	-	-	-	$ 109,125
KPMG audit information request	1,245	498	10	35	-	-	-	-	-	1,788
ARMB presentations and meeting attendance	3,411	3,414	-	-	-	-	-	-	-	6,825
FY20 final PERS/TRS contribution rates	3,411	3,414	-	-	-	-	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	-	-	-	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	-	-	-	-	45,450
Salary floor discussion	1,375	-	-	-	-	-	-	-	-	1,375
Projections	6,750	6,750	-	-	-	-	-	-	-	13,500
TOTAL	$ 101,046	81,969	8,500	8,523	-	-	-	-	-	$ 200,038
For the Three Months Ended September 30, 2019	$ 147,695	107,666	17,109	15,503	-	-	8,799	-	-	$ 296,772

For the Three Months Ended December 31, 2020

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 54,560	43,653	5,457	5,455	-	-	-	-	-	$ 109,125
KPMG audit information request	2,908	1,163	22	82	-	-	-	-	-	4,175
ARMB presentations and meeting attendance	3,411	3,414	-	-	-	-	-	-	-	6,825
FY20 final PERS/TRS contribution rates	3,411	3,414	-	-	-	-	-	-	-	6,825
GASB 67/74	7,572	6,060	759	759	-	-	-	-	-	15,150
GASB 68/75	22,722	18,180	2,274	2,274	-	-	-	-	-	45,450
Projections	6,750	6,750	-	-	-	-	-	-	-	13,500
TOTAL	$ 101,334	82,634	8,512	8,570	-	-	-	-	-	$ 201,050
For the Three Months Ended December 31, 2019	$ 274,942	137,641	17,165	7,722	-	-	5,747	-	-	$ 443,217

For the Three Months Ended March 31, 2021

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 18,186	14,553	1,818	1,818	-	-	-	-	-	$ 36,375
ARMB presentations and meeting attendance	1,125	1,125	-	-	-	-	-	-	-	2,250
FY20 final PERS/TRS contribution rates	1,125	1,125	-	-	-	-	-	-	-	2,250
JRS Alternative Contribution Rate FY23	-	-	2,851	-	-	-	-	-	-	2,851
100-Year Projection	20,293	8,115	-	-	-	-	-	-	-	28,408
Projections	2,325	2,325	-	-	-	-	-	-	-	4,650
Senate Finance Committee preparation	2,743	1,097	-	-	-	-	-	-	-	3,840
TOTAL	$ 45,797	28,340	4,669	1,818	-	-	-	-	-	$ 80,624
For the Three Months Ended March 31, 2020	$ 51,561	34,497	11,277	7,121	-	-	10	-	-	$ 104,466

For the Three Months Ended June 30, 2021

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 18,286	14,633	1,828	1,828	-	-	-	-	-	$ 36,575
ARMB presentations and meeting attendance	1,125	1,125	-	-	-	-	-	-	-	2,250
FY20 final PERS/TRS contribution rates	1,125	1,125	-	-	-	-	-	-	-	2,250
ARMB Trustee online video education modules	28,546	10,750	163	474	-	-	51	-	-	39,984
PERS Additional State Contribution modeling	11,880	-	-	-	-	-	-	-	-	11,880
Legislative Audit/GFOA questions	1,758	661	-	-	-	-	-	-	-	2,419
Effects of 4-year JRS salary freeze	-	-	15,503	-	-	-	-	-	-	15,503
Effects of AlaskaCare plan design changes	10,934	4,054	38	-	-	-	44	-	-	15,070
Legislative questions	2,378	5,892	-	-	-	-	-	-	-	8,270
Projections	2,325	2,325	-	-	-	-	-	-	-	4,650
TOTAL	$ 78,357	40,565	17,532	2,302	-	-	95	-	-	$ 138,851
For the Three Months Ended June 30, 2020	$ 25,760	11,241	4,466	2,941	-	-	-	-	-	$ 44,408

Summary through the Twelve Months Ended June 30, 2021

	PERS	TRS	JRS	NGNMRS	EPORS	AHF	RHF	SBS	DCP	TOTAL
Actuarial valuations	$ 145,592	116,492	14,560	14,556	-	-	-	-	-	$ 291,200
KPMG audit information request	4,153	1,661	32	117	-	-	-	-	-	5,963
ARMB presentations and meeting attendance	9,072	9,078	-	-	-	-	-	-	-	18,150
ARMB Trustee online video education modules	28,546	10,750	163	474	-	-	51	-	-	39,984
FY20 final PERS/TRS contribution rates	9,072	9,078	-	-	-	-	-	-	-	18,150
JRS Alternative Contribution Rate FY23	-	-	2,851	-	-	-	-	-	-	2,851
100-Year Projection	20,293	8,115	-	-	-	-	-	-	-	28,408
GASB 67/74	15,144	12,120	1,518	1,518	-	-	-	-	-	30,300
GASB 68/75	45,444	36,360	4,548	4,548	-	-	-	-	-	90,900
Salary floor discussion	1,375	-	-	-	-	-	-	-	-	1,375
PERS Additional State Contribution modeling	11,880	-	-	-	-	-	-	-	-	11,880
Legislative Audit/GFOA questions	1,758	661	-	-	-	-	-	-	-	2,419
Effects of 4-year JRS salary freeze	-	-	15,503	-	-	-	-	-	-	15,503
Effects of AlaskaCare plan design changes	10,934	4,054	38	-	-	-	44	-	-	15,070
Legislative questions	2,378	5,892	-	-	-	-	-	-	-	8,270
Projections	18,150	18,150	-	-	-	-	-	-	-	36,300
Senate Finance Committee preparation	2,743	1,097	-	-	-	-	-	-	-	3,840
TOTAL	$ 326,534	233,508	39,213	21,213	-	-	95	-	-	620,563
Summary through the Twelve Months Ended June 30, 2020	$ 499,958	291,045	50,017	33,287	-	-	14,556	-	-	888,863

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Retirement System Membership Activity as of June 30, 2021

ACTION: _____

DATE: September 23, 2021

INFORMATION: **X**

BACKGROUND:

Information related to PERS, TRS, JRS, NGNMRS, SBS, and DCP membership activity as requested by the Board.

STATUS:

Membership information as of June 30, 2021.

MEMBERSHIP STATISTICS AS OF SEPTEMBER 30, 2020

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	795	2,550	7,618	10,963	23,755	34,718	199	3,609	3,808	6,051	9,859	72	n/a	19,567	6,463
Terminated Members															
Entitled to Future Benefits	268	1,767	3,166	5,201	1,788	6,989	26	638	664	726	1,390	2	n/a	28,873	5,628
Other Terminated Members	1,019	2,054	7,469	10,542	14,969	25,511	237	1,496	1,733	2,649	4,382	1	n/a	n/a	n/a
Total Terminated Members	1,287	3,821	10,635	15,743	16,757	32,500	263	2,134	2,397	3,375	5,772	3	n/a	28,873	5,628
Retirees & Beneficiaries	22,623	8,862	4,835	36,320	146	36,466	10,111	3,189	13,300	40	13,340	145	711	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,878	5,878	n/a	n/a	n/a	1,508	1,508	n/a	n/a	2,870	2,731
Retirements - 1st QTR FY21	68	167	171	406	17	423	61	237	298	4	302	2	25	n/a	n/a
Full Disbursements - 1st QTR FY21	9	47	79	135	138	273	2	2	4	33	37	-	n/a	123	45
Partial Disbursements - 1st QTR FY21	n/a	n/a	n/a	n/a	33	33	n/a	n/a	n/a	12	12	n/a	n/a	1,199	465

MEMBERSHIP STATISTICS AS OF DECEMBER 31, 2020

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	752	2,499	7,529	10,780	24,352	35,132	196	3,623	3,819	6,432	10,251	73	n/a	20,381	6,450
Terminated Members															
Entitled to Future Benefits	261	1,701	3,128	5,090	1,830	6,920	24	607	631	689	1,320	2	n/a	28,652	5,830
Other Terminated Members	1,010	2,033	7,428	10,471	15,175	25,646	234	1,471	1,705	2,613	4,318	1	n/a	n/a	n/a
Total Terminated Members	1,271	3,734	10,556	15,561	17,005	32,566	258	2,078	2,336	3,302	5,638	3	n/a	28,652	5,830
Retirees & Beneficiaries	22,502	8,970	4,949	36,421	144	36,565	10,062	3,223	13,285	42	13,327	142	713	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,911	5,911	n/a	n/a	n/a	1,508	1,508	n/a	n/a	3,006	2,884
Retirements - 2nd QTR FY21	52	144	129	325	-	325	8	33	41	2	43	-	23	n/a	n/a
Full Disbursements - 2nd QTR FY21	16	51	86	153	390	543	1	13	14	74	88	-	n/a	471	151
Partial Disbursements - 2nd QTR FY21	n/a	n/a	n/a	n/a	106	106	n/a	n/a	n/a	28	28	n/a	n/a	1,900	692

MEMBERSHIP STATISTICS AS OF MARCH 31, 2021

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	732	2,440	7,434	10,606	24,666	35,272	190	3,608	3,798	6,405	10,203	72	n/a	20,126	6,571
Terminated Members															
Entitled to Future Benefits	250	1,666	3,129	5,045	1,896	6,941	21	604	625	701	1,326	2	n/a	28,943	5,780
Other Terminated Members	1,002	2,020	7,380	10,402	15,455	25,857	229	1,461	1,690	2,630	4,320	1	n/a	n/a	n/a
Total Terminated Members	1,252	3,686	10,509	15,447	17,351	32,798	250	2,065	2,315	3,331	5,646	3	n/a	28,943	5,780
Retirees & Beneficiaries	22,363	9,031	5,044	36,438	163	36,601	10,010	3,233	13,243	45	13,288	143	711	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,939	5,939	n/a	n/a	n/a	1,503	1,503	n/a	n/a	3,121	2,970
Retirements - 3rd QTR FY21	36	84	102	222	19	241	7	16	23	3	26	1	14	n/a	n/a
Full Disbursements - 3rd QTR FY21	6	42	84	132	445	577	6	9	15	63	78	-	n/a	512	175
Partial Disbursements - 3rd QTR FY21	n/a	n/a	n/a	n/a	105	105	n/a	n/a	n/a	31	31	n/a	n/a	1,305	591

MEMBERSHIP STATISTICS AS OF JUNE 30, 2021

	PERS						TRS					JRS	NGNMRS	SBS	DCP
	DB				DCR	SYSTEM	DB			DCR	SYSTEM				
	Tier I	Tier II	Tier III	Total	Tier IV	TOTAL	Tier I	Tier II	Total	Tier III	TOTAL				
Active Members	655	2,243	7,168	10,066	24,481	34,547	150	3,342	3,492	6,009	9,501	72	n/a	20,745	6,770
Terminated Members															
Entitled to Future Benefits	250	1,675	3,187	5,112	2,082	7,194	38	703	741	832	1,573	2	n/a	28,807	5,684
Other Terminated Members	997	2,006	7,363	10,366	16,249	26,615	225	1,453	1,678	2,848	4,526	1	n/a	n/a	n/a
Total Terminated Members	1,247	3,681	10,550	15,478	18,331	33,809	263	2,156	2,419	3,680	6,099	3	n/a	28,807	5,684
Retirees & Beneficiaries	22,310	9,205	5,189	36,704	127 [A]	36,831	9,971	3,254	13,225	30 [B]	13,255	144	704	n/a	n/a
Managed Accounts	n/a	n/a	n/a	n/a	5,968	5,968	n/a	n/a	n/a	1,506	1,506	n/a	n/a	3,269	3,101
Retirements - 4th QTR FY21	66	172	160	398	50	448	12	97	109	7	116	1	15	n/a	n/a
Full Disbursements - 4th QTR FY21	8	62	87	157	320	477	2	10	12	55	67	-	n/a	383	121
Partial Disbursements - 4th QTR FY21	n/a	n/a	n/a	n/a	64	64	n/a	n/a	n/a	10	10	n/a	n/a	1,460	593

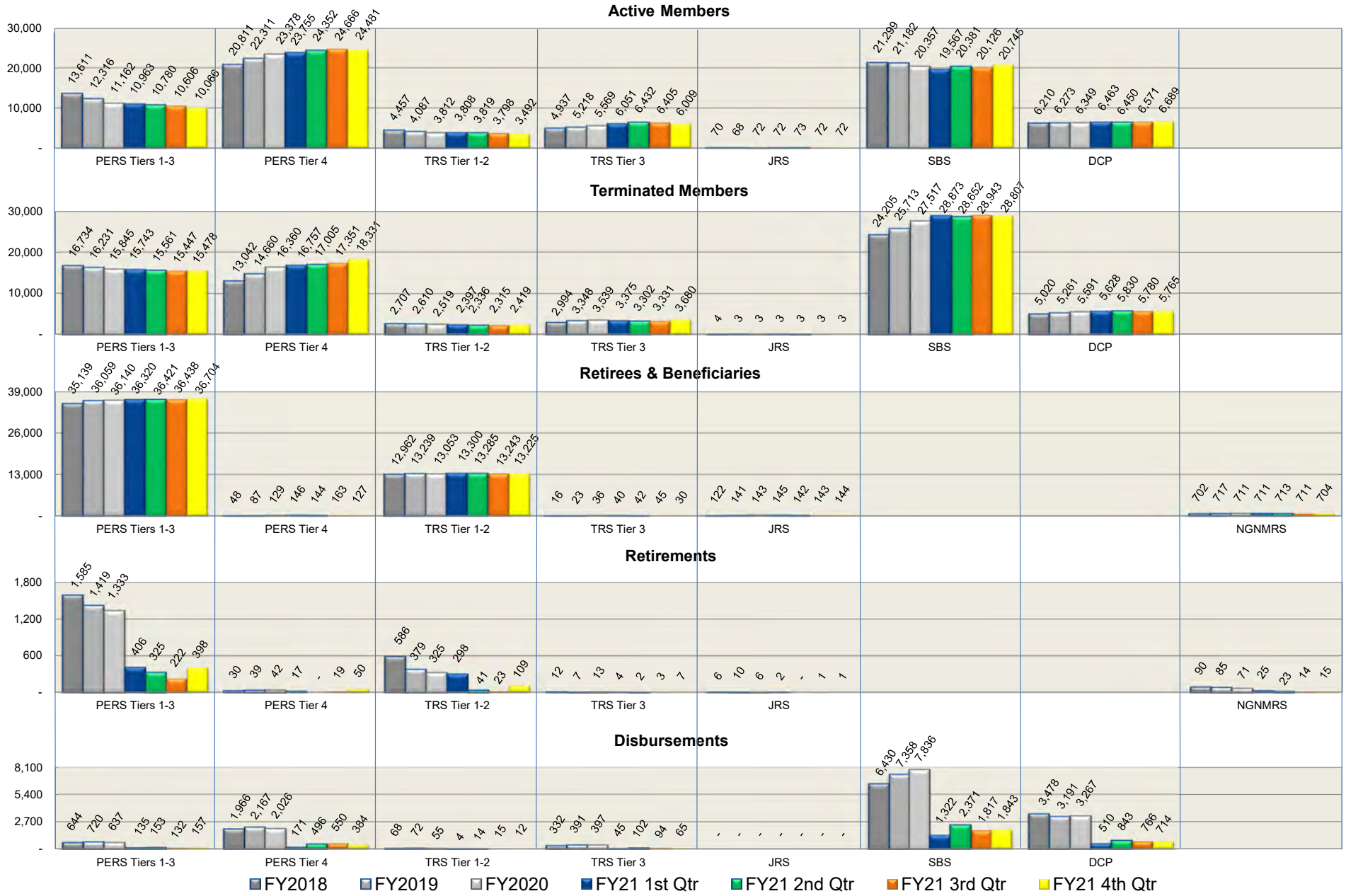
[A] *Starting FY21 Q4 this count shows individuals rather than benefits. It includes 113 HRA, 69 RMP, 5 ODD OA (all disability), 9 ODD PF (1 death, 8 disability). It excludes individuals receiving DC Pension disbursements.*

[B] *Starting FY21 Q4 this count shows individuals rather than benefits. It includes 29 HRA, 20 RMP, 1 ODD (disability). It excludes individuals receiving DC Pension disbursements.*

Alaska Division of Retirement and Benefits

FY 2021 QUARTERLY REPORT OF MEMBERSHIP STATISTICS

Annual & Quarterly Trends as of June 30, 2021



LEGEND

Active Members - All active members at the time of the data pull,
except SBS & DCP, which are counts of contributors during the final quarter of each period.

Terminated Members - All members who have terminated without refunding their account,
except SBS & DCP, which are counts of members with balances at the end of the period less active members.

Retirees & Beneficiaries - All members who have retired from the plans, including beneficiaries eligible for benefits.

Managed Accounts - Individuals who have elected to participate in the managed accounts option with Empower.

Retirements - The number of retirement applications processed.

Full Disbursements - All types of disbursements that leave the member balance at zero.

Partial Disbursements - All types of disbursements that leave the member balance above zero. If more than one
partial disbursement is completed during the quarter for a member, they are counted only once for statistical purposes.

Amending the Alaska 457(b) Deferred Compensation Program

Effective August 30, 2021

Issue:

Updating the 457(b) plan - implementing three IRS approved in-service distribution options: (1) Age 59 ½, (2) Birth & Adoption, and (3) one time only Small Account. These options make funds available to participants shortly before age 60 in preparation for retirement, help parents cover expenses of a birth or adopting a child, and administratively reduce workload managing small, inactive accounts.

Background:

Major purpose for sponsoring a 457(b) is to help employees set aside more money for future retirement needs. Contributions are pre-tax enabling employees to contribute more than they originally thought possible. IRS rules for withdrawals are stringent requiring: termination of employment, QDRO, death, or retirement. Congress included these new permanent provisions in the SECURE ACT so participants can access their account if desired or needed near the end of their careers, after the birth or adoption of a child and reduce administrative burden of small accounts.

Financial Considerations:

This change to the 457(b) will not cost the DRB budget or the retirement systems any money.

Potential Challenges:

Effectively communicating the changes to the members of the PERS and TRS populations. Recordkeeper, Empower Retirement, and the DRB Communications team will coordinate joint efforts to notify the pertinent employee populations.

Stakeholder Viewpoints:

Expected to be very positive. DRB has heard from participants for many years their desire to have access to their funds prior to termination and retirement. Such a change was never available due to IRS regulations. We expect more employees will participate in the 457(b) plan now that they know they'll have access later in their career and without terminating employment.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: FY2023 ARMB Budget Proposal

ACTION: X

DATE: September 23, 2021

INFORMATION: _____

BACKGROUND:

Pursuant to its charter, the Alaska Retirement Management Board (ARMB) Operations Committee meets at least annually to review the actual expenditures in the immediately preceding fiscal year budget; consider and review the current fiscal year budget as approved by the legislature; and review a proposed budget for the next fiscal year to make appropriate recommendations for action to the Board. The ARMB budget is presented in the Alaska Budget System in two budget components: ARMB Operations component and the ARMB Custody and Management component. For presentation purposes, the attached schedule combines these into one schedule for FY2018 through FY2021 actuals and for FY2022 and FY2023 projected and proposed amounts.

STATUS:

Personal Services Costs

The ARMB purchases personal services from the Treasury division each year. The FY2022 budget includes $6.5 million for personal services. The FY2023 proposed amount includes increases to accommodate potential salary increases funded by ARMB plans.

Investment Management Fees

Total appropriated public management fees decreased from $34.4 million in FY2019 to $23.6 million in FY2021. This decrease is a result of moving assets managed by external firms to internally managed mandates and consolidating external mandates. Total unappropriated private investment fees (netted from investments and historically not included in budget appropriations) decreased from $65.1 million in FY2019 to $43.5 million in FY2021 primarily due to the divestment of the Absolute Return asset class. A summary of actual management fees for FY2012-2021 is attached.

Other Budgeted Costs

Other costs reflected in the attached working budget are based on prior year amounts and expected increases or decreases that are currently known. Sufficient FY2022 budget authority exists for these costs. Similar amounts are anticipated to be included in the FY2023 budget proposal during discussions with the OMB and Legislature.

RECOMMENDATION:

The Alaska Retirement Management Board adopt the FY2023 Proposed Budget as attached, with the understanding that components will be subject to appropriation by OMB and the Legislature.

Attachments: ARMB Working FY23 Budget and Investment Management Fee Summary 2012-2021.

State of Alaska

FY23 ARMB Working Budget

		FY18 Actuals	FY19 Actuals	FY20 Actuals	FY21 Actuals	FY21 Authorized	FY22 Projected	FY23 Proposed	
Personal Services	ARMB Personal Services	$5,031,087	$6,049,367	$6,074,893	$5,501,551	$6,538,700	$6,545,000	$6,675,900	
	Board Honorarium	$56,019	$74,059	$46,529	$33,170	$75,000	$75,000	$75,000	
		$5,087,106	**$6,123,426**	**$6,121,421**	**$5,534,722**	**$6,613,700**	**$6,620,000**	**$6,750,900**	**$130,900**
Travel	Travel Costs	$187,952	$136,046	$26,525	$14,697	$134,100	$134,100	$134,100	
		$187,952	**$136,046**	**$26,525**	**$14,697**	**$134,100**	**$134,100**	**134,100**	**$0**
Management & Custody Fees	Custody Fees	$1,388,486	$1,454,178	$1,468,319	$1,502,242	$1,500,000	$1,500,000	$1,500,000	
	External Public Investment Fees	$44,508,963	$34,357,984	$23,653,586	$23,644,485	$42,650,000	$32,650,000	$32,650,000	
	Investment/Performance Consultant	$807,158	$871,301	$736,695	$695,250	$850,000	$850,000	$850,000	
	Unbudgeted Private Investment Fees	$60,309,727	$65,099,788	$46,015,033	$43,539,233	$50,000,000	$50,000,000	$50,000,000	
		$107,014,334	**$101,783,251**	**$71,873,634**	**$69,381,211**	**$95,000,000**	**$85,000,000**	**$85,000,000**	**$0**
Investment Information Systems	Bloomberg	$498,964	$506,871	$420,960	$455,537	$490,000	$675,000	$675,000	
	CreditSights	$5,804	$6,990	$13,347	$14,805	$15,000	$15,000	$15,000	
	ISS Proxy Voting	$51,595	$48,110	$48,110	$48,110	$51,000	$51,000	$51,000	
	Moodys	$38,029	$40,397	$70,806	$82,203	$70,000	$85,000	$85,000	
	Other Investment Costs	$49,337	$27,870	$10,324	$5,194	$14,000	$60,000	$60,000	
	PITCHBOOK DATA INC	$0	$0	$0	$20,000	$20,000	$20,000	$20,000	
	Risk Management Products	$87,050	$95,018	$59,619	$100,843	$100,000	$100,000	$100,000	
	Standard and Poors Financial Services	$164,643	$402,067	$423,195	$403,778	$450,000	$450,000	$450,000	
	SWIFT	$0	$0	$0	$3,405	$0	$35,000	$35,000	
	TradeWeb	$10,613	$10,401	$17,084	$18,048	$20,000	$20,000	$20,000	
	Yieldbook	$46,640	$38,633	$68,600	$73,890	$70,000	$75,000	$75,000	
	Terminated Investment Services	$381,270	$43,663	$0	$0	$0	$0	$0	
		$1,333,944	**$1,220,020**	**$1,132,046**	**$1,225,813**	**$1,300,000**	**$1,586,000**	**$1,586,000**	**$0**
Other Professional Services	Actuarial Services	$246,634	$221,085	$235,707	$205,450	$250,000	$340,000	$250,000	
	DOA Finance (IRIS, ALDER, ADA, INS)	$33,161	$33,888	$37,214	$20,332	$50,000	$40,000	$40,000	
	DOA Human Resources	$20,400	$22,275	$22,905	$16,838	$21,000	$21,000	$21,000	
	DOR ASD/OOC Support Service	$562,758	$244,898	$110,923	$116,671	$200,000	$150,000	$150,000	
	Financial Audit	$91,670	$95,832	$96,000	$101,056	$100,000	$100,000	$100,000	
	International Tax Preparation	$9,695	$13,000	$6,000	$27,621	$10,500	$25,000	$25,000	
	Investment Advisory Council	$98,909	$108,673	$58,456	$78,846	$130,000	$100,000	$130,000	
	IT Support	$39,296	$125,019	$130,378	$153,594	$175,000	$235,000	$235,000	
	Legal	$83,687	$132,370	$100,506	$55,770	$150,000	$150,000	$150,000	
	Other Professional Services	$5,466	5,204	936	$5,612	$6,500	$6,500	$6,500	
		$1,191,678	**$1,002,246**	**$799,024**	**$781,790**	**$1,093,000**	**$1,167,500**	**$1,107,500**	**($60,000)**
Subscriptions and Training	Books and Educational Supplies	$7,645	$3,484	$1,877	$959	$10,000	$10,000	$10,000	
	Memberships	$15,790	$12,402	$6,698	$9,518	$15,000	$15,000	$15,000	
	News and Magazine Subscriptions	$10,322	$6,406	$8,529	$8,676	$10,000	$10,000	$10,000	
	Training and Conferences	$12,952	$9,467	$2,824	$2,008	$10,000	$10,000	$10,000	
		$46,708	**$31,760**	**$19,927**	**$21,161**	**$45,000**	**$45,000**	**$45,000**	**$0**
General Office Expenses	Building Related Expenses	$148,212	$161,207	$157,342	$148,619	$165,000	$165,000	$165,000	
	Business Supplies	$7,620	$3,648	$2,278	$1,497	$7,000	$7,000	$7,000	
	Equipment and Machinery	$34,459	$17,946	$27,242	$6,446	$30,000	$30,000	$30,000	
	Mail/Courier Services	$4,676	$5,028	$3,114	$1,609	$7,500	$7,500	$7,500	
	Public Notices	$1,652	$2,775	$1,683	$2,183	$7,500	$5,000	$5,000	
	Software	$68,576	$21,173	$41,990	$43,418	$40,000	$45,000	$45,000	
	Telecommunications	$72,439	$43,674	$37,666	$18,866	$50,000	$50,000	$50,000	
		$337,635	**$255,451**	**$271,316**	**$222,638**	**$307,000**	**$309,500**	**$309,500**	**$0**
Board Meeting Expenses	Board Meeting Expenses	$67,896	$58,509	$20,771	$43,082	$75,000	$75,000	$75,000	
		$67,896	**$58,509**	**$20,771**	**$43,082**	**$75,000**	**$75,000**	**$75,000**	**$0**
Total all Expenses		**$115,267,253**	**$110,610,709**	**$80,264,664**	**$77,225,114**	**$104,567,800**	**$94,937,100**	**$95,008,000**	**$70,900**

Investment fees and custody	$107,014,334	$101,783,251	$71,873,634	$69,381,211	$95,000,000	$85,000,000	$85,000,000	$0
Operations	$8,252,919	$8,827,458	$8,391,030	$7,843,903	$9,567,800	$9,937,100	$10,008,000	$70,900
Total all Expenses	**$115,267,253**	**$110,610,709**	**$80,264,664**	**$77,225,114**	**$104,567,800**	**$94,937,100**	**$95,008,000**	**$70,900**

ARMB Historic Manager Fees Paid, FY 2012 to FY 2021

	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
Broad Domestic Equity	$10,043,289	$11,559,501	$13,243,266	$12,654,891	$11,730,056	$14,459,724	$12,319,726	$8,387,794	$1,163,922	$1,058,327
Global Equity Ex-US	$15,814,643	$14,688,634	$17,142,130	$21,381,074	$20,815,819	$22,460,312	$23,094,420	$18,572,009	$10,402,732	$8,541,227
Alternative Equity/Opportunistic	$3,796,483	$3,454,480	$1,512,333	$3,012,605	$2,055,605	$2,162,504	$9,094,818	$7,633,781	$7,733,434	$6,845,528
Private Equity	$7,666,847	$6,653,443	$7,453,571	$7,793,757	$9,328,973	$11,765,183	$12,260,133	$14,350,011	$14,277,305	$15,460,744
Real Assets	$19,100,864	$23,608,330	$24,670,853	$25,175,085	$27,820,023	$28,648,117	$29,761,682	$30,083,965	$24,764,107	$22,768,170
Absolute Return	$6,056,485	$5,176,521	$5,985,676	$11,487,059	$23,558,243	$21,731,258	$18,287,912	$20,428,820	$0	$0
Fixed Income	$3,335,470	$3,685,272	$4,143,522	$5,010,475	$5,928,825	$7,390,994	$0	$1,386	$11,327,119	$12,509,723
Total Fees	$65,814,081	$68,826,182	$74,151,352	$86,514,945	$101,237,544	$108,618,092	$104,818,690	$99,457,766	$69,668,619	$67,183,719
Year End Total Assets	$16,242,119,030	$18,075,627,711	$21,171,071,086	$23,989,926,930	$23,068,284,972	$25,122,989,358	$26,161,838,719	$26,719,147,591	$26,517,235,705	$33,167,896,054
Total Fees as a % of Assets	0.41%	0.38%	0.35%	0.36%	0.44%	0.43%	0.40%	0.37%	0.26%	0.20%

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Disclosure – Communications – Calendar Update
September 23, 2021

The 2nd Quarter Disclosure Memorandum is included in the packet; no disclosure transactions require additional review or discussion.

The Communications Memorandum lists communications directed to and sent on behalf of the Board since the last communication report, dated June 11, 2021, and a summary of public records requests received between May 1 and August 31, 2021.

Also included is a copy of the letter sent to 73 individuals in response to 128 emails received by Treasury Division staff regarding fossil fuel divestment is provided. The letter, signed by Commissioner Mahoney and Chair Johnson, is also posted on the ARMB and Department of Revenue home pages.

The remaining 2021 meeting calendar is attached, along with the 2022 meeting calendar approved by the Board at the June meeting.

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Alysia Jones
Date: September 8, 2021
Subject: Financial Disclosures

As required by AS 37.10.230 and Alaska Retirement Management Board policy relating to investment conduct and reporting, trustees and staff must disclose certain financial interests. We are hereby submitting to you a list of disclosures for individual transactions made by trustees and staff.

2nd Quarter April 1, 2021 - June 30, 2021

Name	Position Title	Disclosure Type	Disclosure Date
Hunter Romberg	State Investment Officer	Equities	7/06/2021
Jerrold Mitchell	Investment Advisory Council Member	Equities	7/08/2021
Donald Krohn	ARMB Trustee	Equities	7/22/2021
Allen Hippler	ARMB Trustee	Equities	8/4/2021

ALASKA RETIREMENT MANAGEMENT BOARD
M E M O R A N D U M

To: ARMB Trustees
From: Alysia Jones
Date: September 13, 2021
Subject: Communications & Information Requests

Communications to Trustees

The following is a list of communications directed to the Board, that were received since the last communication report, dated June 11, 2021.

Name	Type	Contact Date	Topic
Multiple Individuals	Email	6/14/21-7/9/21	You are putting my pension in jeopardy (29)
Multiple Individuals	Email	6/14/21-7/9/21	Stop Funding the greatest global threat (21)
Multiple Individuals	Email	6/14/21-7/9/21	Protect our pension funds (17)

Communications Sent on behalf of the Board

Name	Type	Date	Topic
Multiple Individuals	Email	7/09/2021	Response to Emails RE: Fossil Fuel Related Investments

Public Records Requests

From June 1 – August 31, 2021

Topics	# of Requests	Description
Investment Information	4	Investment management firms, private equity report; China-focused investment managers or mandates; commitment information; TRS investment portfolio; fossil fuel related investments
Meeting Materials	3	Board actions from June 17-18, 2021 Meeting
Procurement / Contracts	1	General consultant services, real assets consultant services, & actuarial audit services
Other	1	Fossil Fuel Holdings

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.4397

July 9, 2021

Thank you for your correspondence regarding the Alaska Retirement Management Board's ("ARMB") fossil fuel related investments.

The ARMB is guided by Alaska Statutes and prudent investor considerations in exercising its duties on behalf of the funds. To meet the obligations of the systems, the ARMB "shall apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the fund" and shall diversify investments consistent with this duty (AS 37.10.071(c) and AS 13.36.235). This fiduciary duty is narrower in scope and more restrictive than the typical prudent investor rule that most institutional investors are held to.

Fossil fuel investments comprise less than 5% of the portfolio and most of the exposure is through broad-market passive index funds. The ARMB does not view divestment of these investments to be in the sole financial best interest of the funds because it reduces the investable opportunity set and diversification.

The ARMB and its managers evaluate investment opportunities with consideration for all relevant sources of risk and return and will continue to do so in the sole financial best interest of the fund.

For a fuller discussion of these issues, please reference item 12 from the June 2020 ARMB meeting on the incorporation of ESG into the investment process:

> https://treasury.dor.alaska.gov/armb/Meetings-and-Minutes/Meetings-and-Minutes-Archive.aspx?folderId=513&view=gridview&pageSize=10

Thank you again for reaching out on this matter.

Sincerely,

lucinda mahoney

Lucinda Mahoney
Commissioner, Department of Revenue

Robert M. Johnson
ARMB Chair

ALASKA RETIREMENT MANAGEMENT BOARD
2021 Meeting Calendar

DATE	LOCATION	DESCRIPTION
October 11 Monday	Videoconference	Audit Committee
December 1 Wednesday	*TBD*	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 2-3 Thursday-Friday	***TBD***	**Board of Trustees Meeting:** *Audit Report - DRB Auditor* *Performance Measurement – 3rd Quarter* *Manager Review (Questionnaire)* *Private Equity Evaluation - Callan LLC* *Review Private Equity Annual Plan* *Manager Presentations*

NOTE: Meeting locations and topics are subject to change.

Updated 9/09/2021

ALASKA RETIREMENT MANAGEMENT BOARD
2022 Meeting Calendar

DATE	LOCATION	DESCRIPTION
March 16 Wednesday	Juneau, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
March 17-18 Thursday-Friday	**Juneau, AK**	**Board of Trustees Meeting:** *Performance Measurement – 4th Quarter* *Buck Draft Actuarial Report/GRS Draft Actuary Certification* *Capital Markets – Asset Allocation* *Manager Presentations*
April 28* Thursday	Videoconference	Actuarial Committee *Follow-up/additional discussion/questions on valuations*
April 29* Friday	**Videoconference**	**Board of Trustees Meeting**
June 15 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
June 16-17 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Final Actuary Reports/Adopt Valuation* *Adopt Asset Allocation* *Performance Measurement - 1st Quarter* *Manager Presentations*
September 14 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
September 15-16 Thursday - Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Set Contribution Rates* *Audit Results/Assets – Auditor* *Approve Budget* *Performance Measurement – 2nd Quarter* *Real Estate Annual Plan* *Real Assets Evaluation – Callan LLC* *Manager Presentations*
October 11 Tuesday (placeholder)	Videoconference	Audit Committee
November 30 Wednesday	Anchorage, AK	Actuarial Committee Audit Committee Operations Committee Defined Contribution Plan Committee
December 1-2 Thursday-Friday	**Anchorage, AK**	**Board of Trustees Meeting:** *Audit Report - DRB Auditor* *Performance Measurement – 3rd Quarter* *Manager Review (Questionnaire)* *Private Equity Evaluation - Callan LLC* *Review Private Equity Annual Plan* *Manager Presentations*

NOTE: Meeting locations and topics are subject to change.

**Meetings to be held as necessary*

Approved: 6/17/2021

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Revenue

ALASKA RETIREMENT MANAGEMENT BOARD

PO Box 110405
Juneau, Alaska 99811-0405
Main: 907.465.3749
Fax: 907.465.4397

Chief Investment Officer Report

September 2021

1. CIO Update

2. Watch List:
   a. No recommended additions

3. Material contract and investment actions:
   a. 07/29/21 Riverside Micro-cap Fund VI $25 million private equity commitment
   b. 08/09/21 Schroders ILS Fund $3 million redemption
   c. 09/09/21 Summit XI $50 million private equity commitment
   d. 09/10/21 Clearlake VII $50 million private equity commitment

4. Portfolio Transaction Update from June 2021 through August 2021

Individual Manager Transactions

June 2021 - August 2021

Asset Class Net Summary	Total
Domestic Equity	199,957,114
Real Assets	50,000,000
International Equity	(193,111,191)
Fixed Income	(56,828,358)
Opportunistic	(17,566)
Private Equity	-
Total Net Buys	249,957,114
Total Net Sells	*(249,957,114)*

Manager Detail	Total	Asset Class	Description - Large Transactions
ARMB Aggregate Bond Fund	157,549,500	Fixed Income	Rebalancing
ARMB S&P 900	135,600,000	Domestic Equity	Rebalancing
Ballie Gifford	106,000,000	International Equity	Rebalancing
ARMB Multi-factor	100,000,000	Domestic Equity	Rebalance Factor Allocation
Brandes Investment Partners	76,000,000	International Equity	Rebalancing
ARMB S&P 600	64,400,000	Domestic Equity	Rebalancing
ARMB REIT	50,000,000	Real Assets	Rebalancing
SSGA Emerging Markets	27,000,000	International Equity	Rebalancing
Barrow Hanley Mewhinney & Strauss Inc.	(26)	Domestic Equity	
Alternative Equity Transition Account	(17,566)	Opportunistic	
Domestic Residual Assets	(20,068)	Domestic Equity	
SSGA Transition	(22,792)	Domestic Equity	
International Equity Residual Asset	(111,191)	International Equity	
LGIMA Sci Beta Emerging Markets	(15,000,000)	International Equity	Rebalancing
Capital Group	(30,000,000)	International Equity	Rebalancing
LGIMA Sci Beta Developed Non-US	(50,000,000)	International Equity	Rebalancing
Arrowstreet Capital	(90,000,000)	International Equity	Rebalancing
ARMB Scientific Beta	(100,000,000)	Domestic Equity	Rebalance Factor Allocation
Short Term Pool	(214,377,858)	Fixed Income	Rebalancing
SSGA World ex-US IMI	(217,000,000)	International Equity	Rebalancing
Total Buys	*716,549,500*		
Total Sells	*(716,549,500)*		

ALASKA RETIREMENT MANAGEMENT BOARD

STAFF REPORT

Fund Financials – Cash Flow Report
September 23, 2021

Kayla Wisner, State Comptroller, Department of Revenue

As of July 2021 month-end, total plan assets were as follows: PERS - $24.5 billion, TRS - $11.6 billion, JRS - $244.8 million, NGNMRS - $42.9 million, SBS - $5.1 billion, DCP - $1.2 billion. Total non-participant directed plans totaled $33.6 billion, and participant-directed plans totaled $9.1 billion. Total assets were $42.7 billion.

Year-to-date income was $319.8 million, and the plans experienced a net contribution of $119.0 million. Total assets were up 1.04% year-to-date.

Internally managed assets totaled $17.3 billion.

As of month-end, all plans were within the bands of their asset allocations.

Kevin Worley, Chief Financial Officer, Division of Retirement and Benefits

Presented is the Division of Retirement and Benefits (DRB) Supplement to the Treasury Division's Financial Report as of July 31, 2021.

DRB's supplement report expands on the ARMB Financial Report column "Net Contributions (Withdrawals)" located on pages 1 and 2. DRB reports the summary totals of actual employee and employer, State of Alaska, and other revenue items, as well as benefit payments, refunds & disbursements, and combined administrative & investment expenditures. DRB's supplement report presents cash inflows and outflows for the 1-month ended July 31, 2021 (page 1) and for the month of July 2021 (page 2).

Also presented are participant-directed distributions by plan and by type for the 1-month period on page 3. This page includes Tier information on the defined benefit refunds, and vested percentage on defined contribution distributions.

"Notes for the DRB Supplement to the Treasury Report" includes information for the pension and healthcare plans. Additional information regarding other income is also presented on pages 4 and 5.

We are also including for informational purposes the Supplement to the Treasury Division's Financial Report as of June 30, 2021.

ALASKA RETIREMENT MANAGEMENT BOARD
FINANCIAL REPORT

As of July 31, 2021

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
Fiscal Year-to-Date through July 31, 2021

	Beginning Invested Assets	Investment Income [1]	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income [2]
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 11,697,812,951	$ 88,792,613	$ 52,745,363	$ 11,839,350,927	1.21%	0.76%
Retirement Health Care Trust	9,655,275,640	72,550,769	(27,596,054)	9,700,230,355	0.47%	0.75%
Total Defined Benefit Plans	21,353,088,591	161,343,382	25,149,309	21,539,581,282	0.87%	0.76%
Defined Contribution Plans:						
Participant Directed Retirement	1,964,383,666	12,808,894	6,098,209	1,983,290,769	0.96%	0.65%
Health Reimbursement Arrangement	670,208,687	5,038,744	3,975,578	679,223,009	1.35%	0.75%
Retiree Medical Plan	200,227,739	1,505,418	1,445,811	203,178,968	1.47%	0.75%
Defined Benefit Occupational Death and Disability:						
Public Employees	41,171,441	309,525	311,364	41,792,330	1.51%	0.75%
Police and Firefighters	17,708,969	133,182	109,822	17,951,973	1.37%	0.75%
Total Defined Contribution Plans	2,893,700,502	19,795,763	11,940,784	2,925,437,049	1.10%	0.68%
Total PERS	**24,246,789,093**	**181,139,145**	**37,090,093**	**24,465,018,331**	0.90%	0.75%
Teachers' Retirement System (TRS)						
Defined Benefit Plans:						
Retirement Trust	6,614,621,768	50,520,665	105,713,303	6,770,855,736	2.36%	0.76%
Retirement Health Care Trust	3,671,369,667	27,590,000	(8,840,774)	3,690,118,893	0.51%	0.75%
Total Defined Benefit Plans	10,285,991,435	78,110,665	96,872,529	10,460,974,629	1.70%	0.76%
Defined Contribution Plans:						
Participant Directed Retirement	812,550,138	5,163,845	1,941,682	819,655,665	0.87%	0.63%
Health Reimbursement Arrangement	196,700,402	1,480,415	1,108,385	199,289,202	1.32%	0.75%
Retiree Medical Plan	65,764,221	494,971	380,521	66,639,713	1.33%	0.75%
Defined Benefit Occupational Death and Disability	6,479,434	48,763	31,396	6,559,593	1.24%	0.75%
Total Defined Contribution Plans	1,081,494,195	7,187,994	3,461,984	1,092,144,173	0.98%	0.66%
Total TRS	**11,367,485,630**	**85,298,659**	**100,334,513**	**11,553,118,802**	1.63%	0.75%
Judicial Retirement System (JRS)						
Defined Benefit Plan Retirement Trust	238,747,285	1,819,481	4,239,270	244,806,036	2.54%	0.76%
Defined Benefit Retirement Health Care Trust	42,511,516	319,499	41,647	42,872,662	0.85%	0.75%
Total JRS	**281,258,801**	**2,138,980**	**4,280,917**	**287,678,698**	2.28%	0.75%
National Guard/Naval Militia Retirement System (MRS)						
Defined Benefit Plan Retirement Trust	49,296,334	417,217	(127,971)	49,585,580	0.59%	0.85%
Other Participant Directed Plans						
Supplemental Annuity Plan	5,064,367,505	40,529,849	(18,977,653)	5,085,919,701	0.43%	0.80%
Deferred Compensation Plan	1,217,085,734	10,325,278	(3,581,072)	1,223,829,940	0.55%	0.85%
Total All Funds	**42,226,283,097**	**319,849,128**	**119,018,827**	**42,665,151,052**		
Total Non-Participant Directed	33,167,896,054	251,021,262	133,537,661	33,552,454,977	1.16%	0.76%
Total Participant Directed	9,058,387,043	68,827,866	(14,518,834)	9,112,696,075	0.60%	0.76%
Total All Funds	**$ 42,226,283,097**	**$ 319,849,128**	**$ 119,018,827**	**$ 42,665,151,052**	**1.04%**	**0.76%**

Notes:

(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

(2) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates and can be found at http://treasury.dor.alaska.gov/armb/Reports-and-Policies/Investment-Performance.aspx

ALASKA RETIREMENT MANAGEMENT BOARD
Schedule of Investment Income and Changes in Invested Assets by Fund
For the Month Ended July 31, 2021

	Beginning Invested Assets	Investment Income (1)	Net Contributions (Withdrawals)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (2)
Public Employees' Retirement System (PERS)						
Defined Benefit Plans:						
Retirement Trust	$ 11,697,812,951	$ 88,792,613	$ 52,745,363	$ 11,839,350,927	1.21%	0.76%
Retirement Health Care Trust	9,655,275,640	72,550,769	(27,596,054)	9,700,230,355	0.47%	0.75%
Total Defined Benefit Plans	21,353,088,591	161,343,382	25,149,309	21,539,581,282	0.87%	0.76%
Defined Contribution Plans:						
Participant Directed Retirement	1,964,383,666	12,808,894	6,098,209	1,983,290,769	0.96%	0.65%
Health Reimbursement Arrangement	670,208,687	5,038,744	3,975,578	679,223,009	1.35%	0.75%
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Public Employees	41,171,441	309,525	311,364	41,792,330	1.51%	0.75%
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Notes:

(1) Includes interest, dividends, securities lending, expenses, realized and unrealized gains/losses

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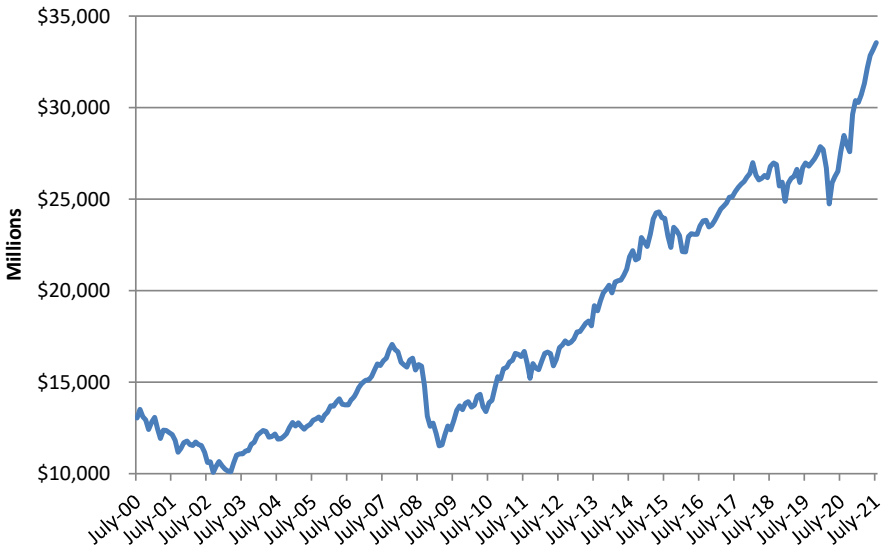
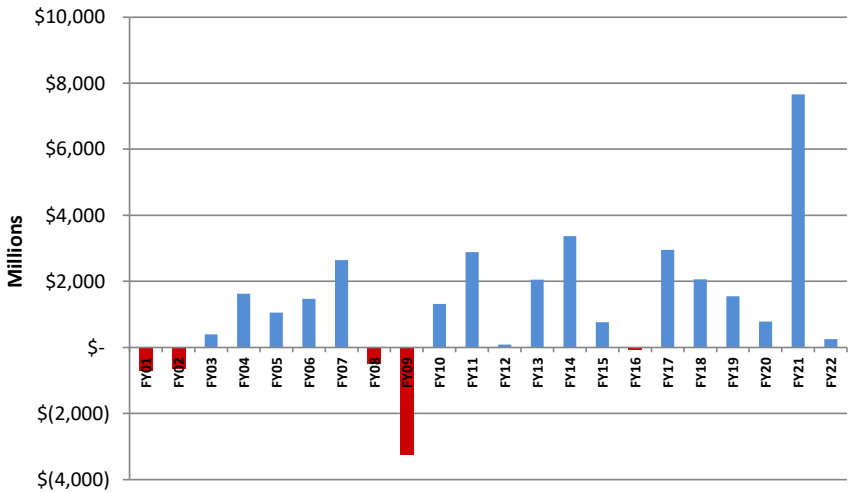
Total Non Participant Directed Assets

As of July 31, 2021

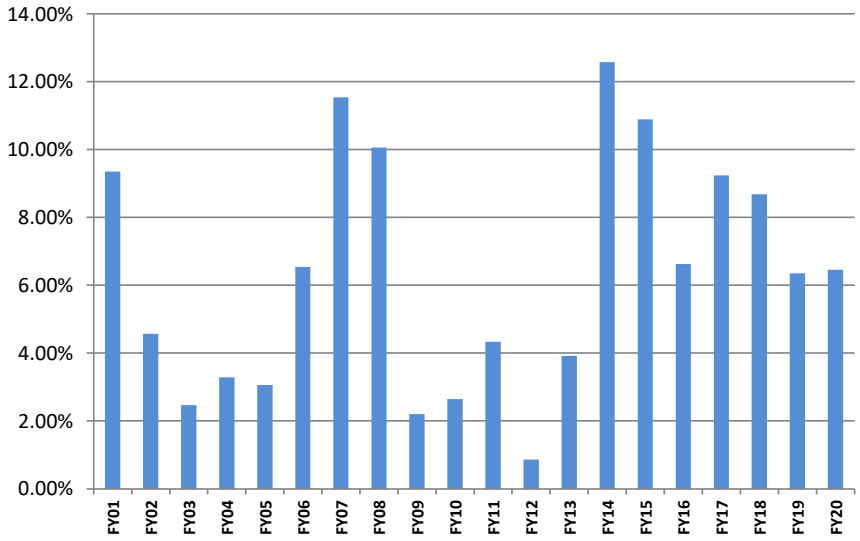
Total Assets History



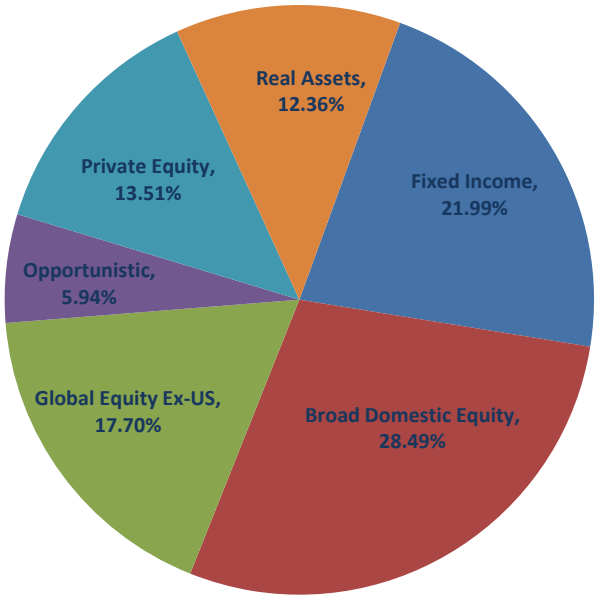
Income by Fiscal Year



5-year Annualized Returns as of Fiscal Year End

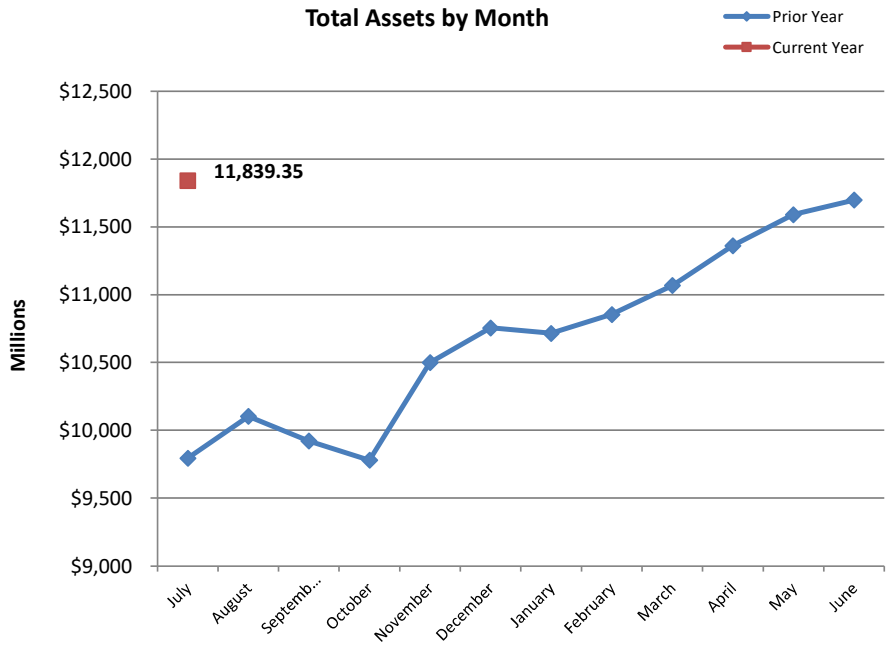


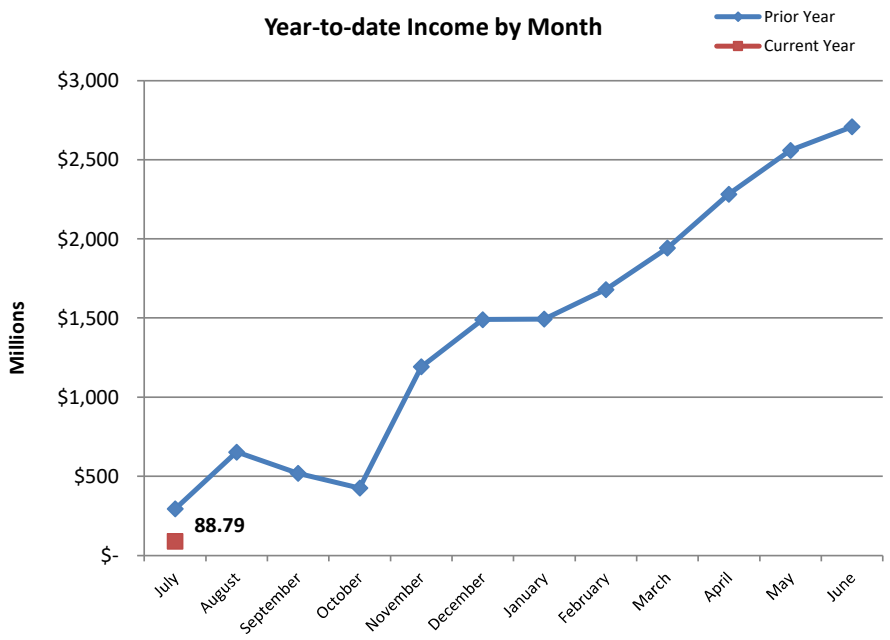
Actual Asset Allocation

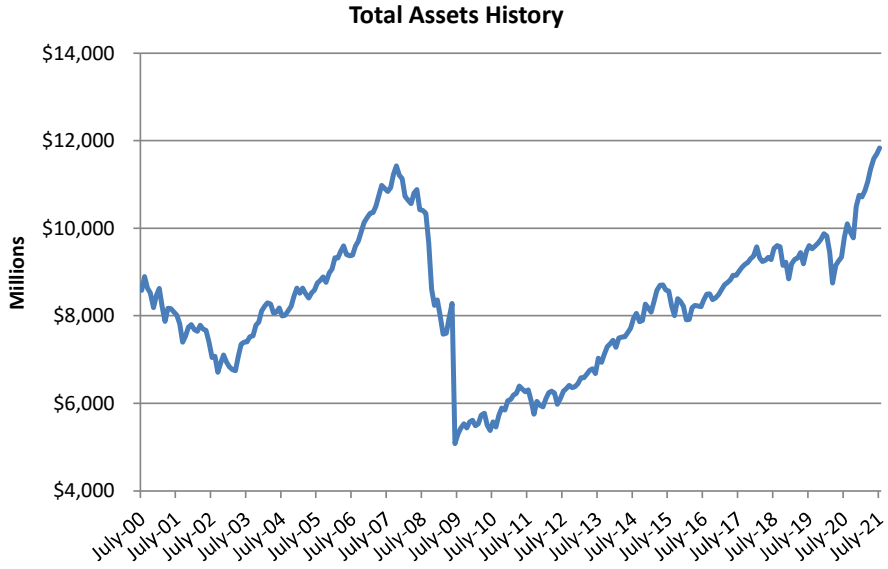


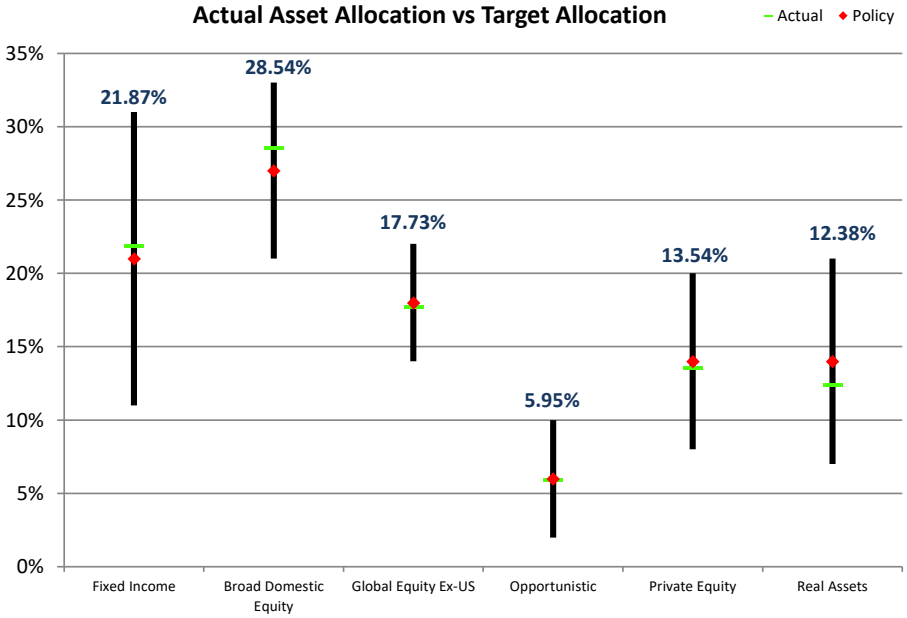
Public Employees' Retirement Pension Trust Fund

Fiscal Year-to-Date through July 31, 2021



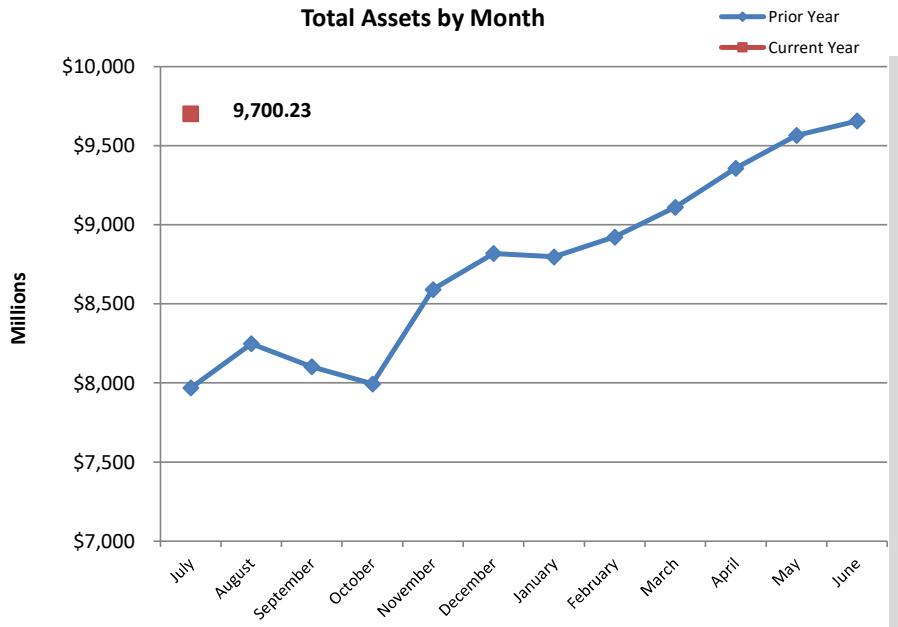


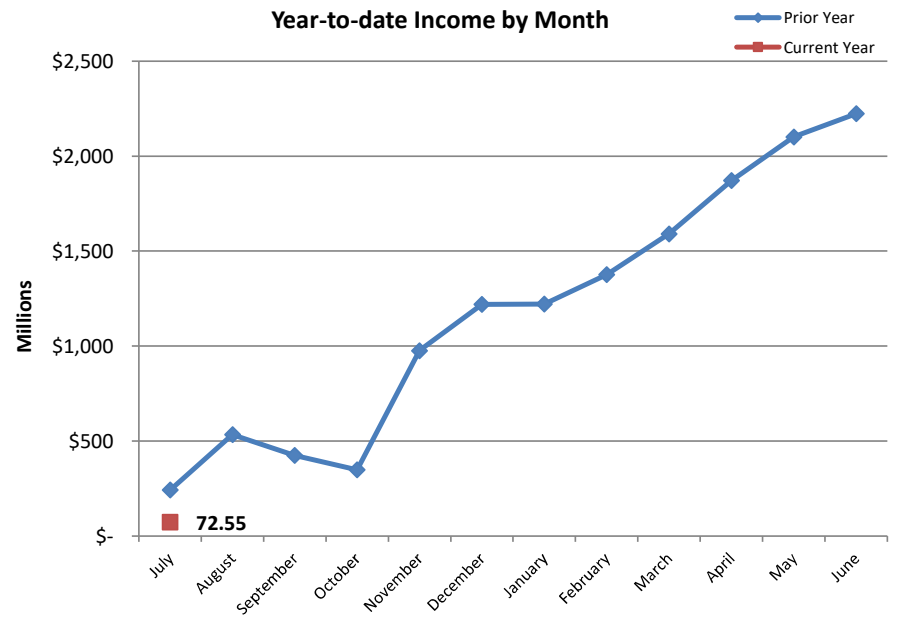


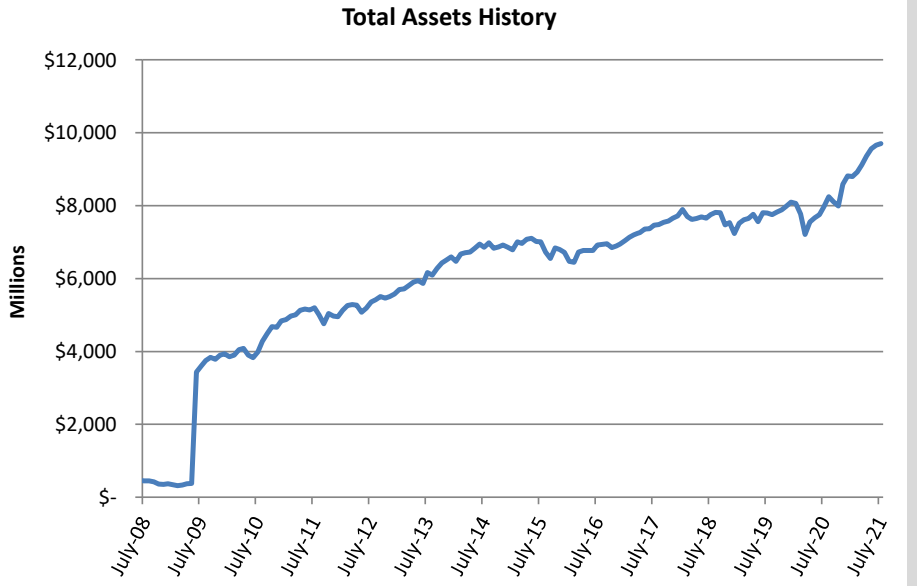


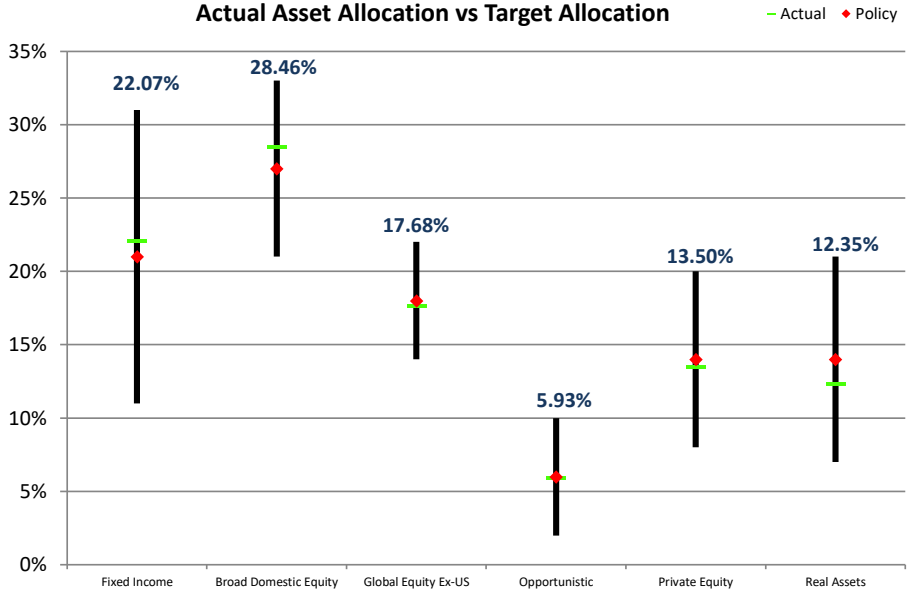
Public Employees' Retirement Health Care Trust Fund

Fiscal Year-to-Date through July 31, 2021



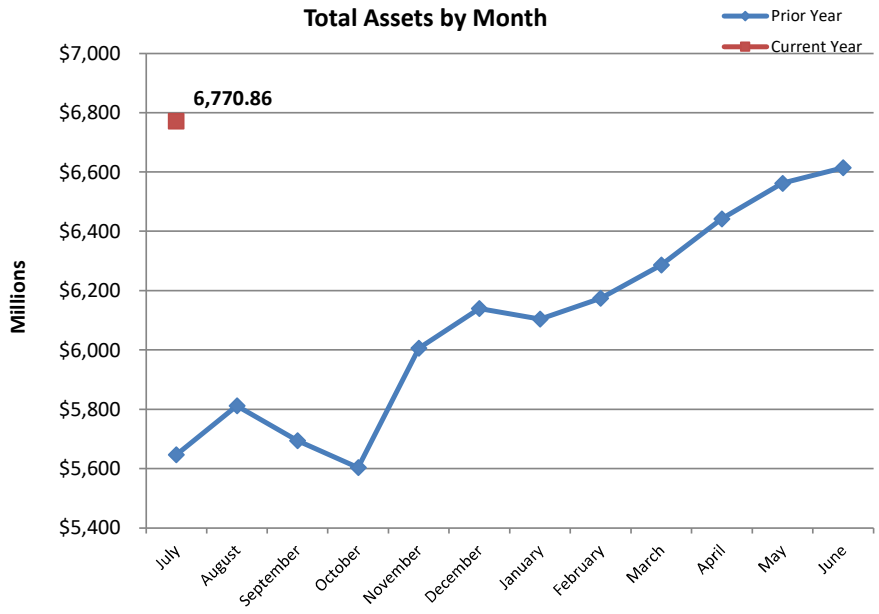


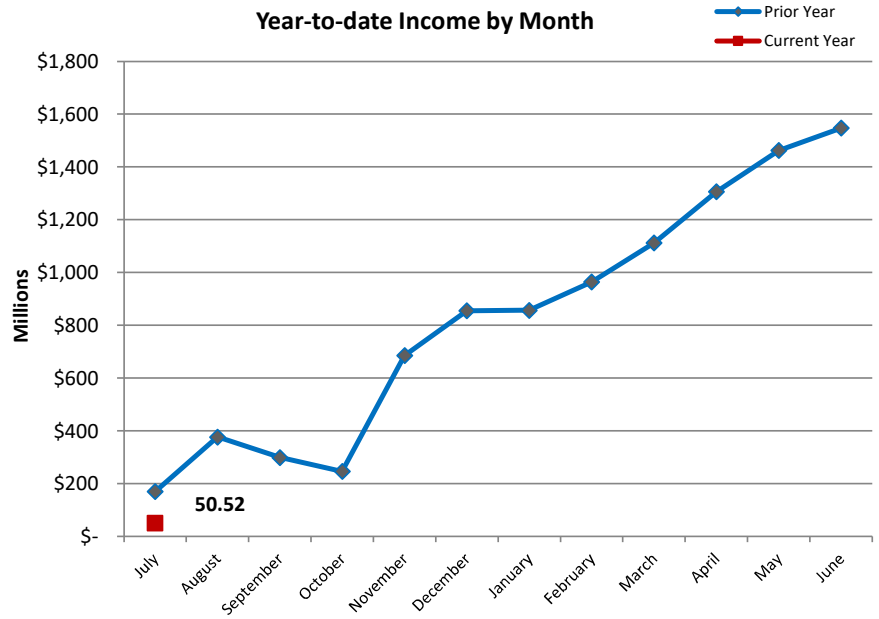


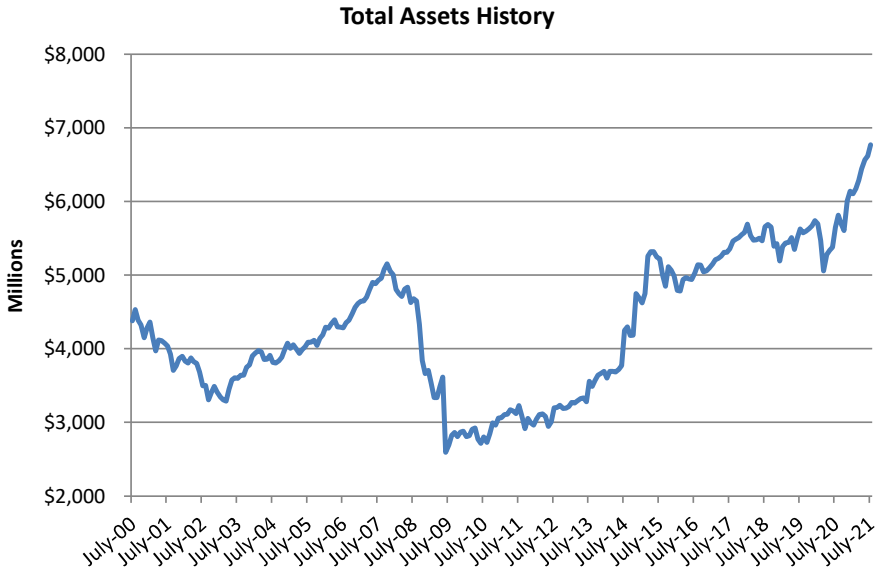


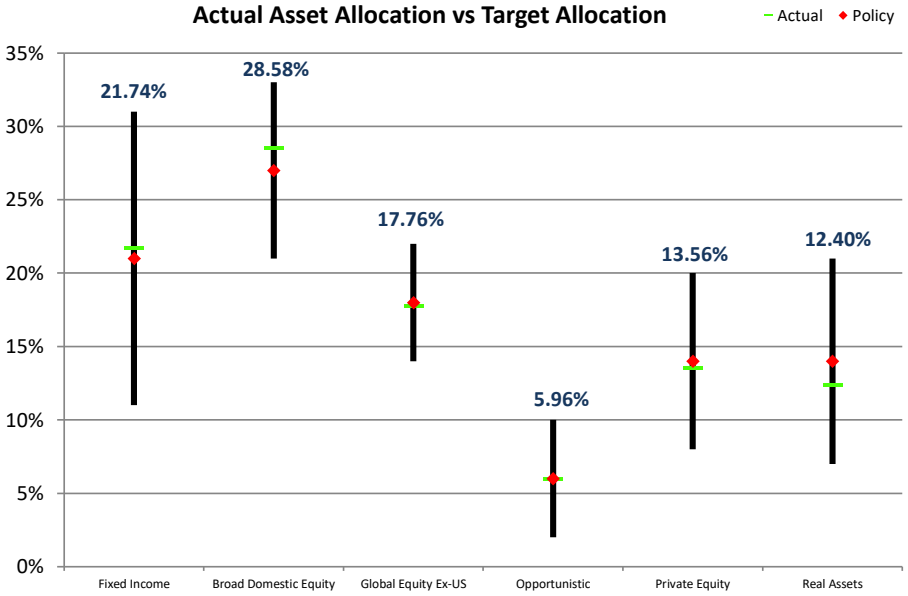
Teachers' Retirement Pension Trust Fund

Fiscal Year-to-Date through July 31, 2021



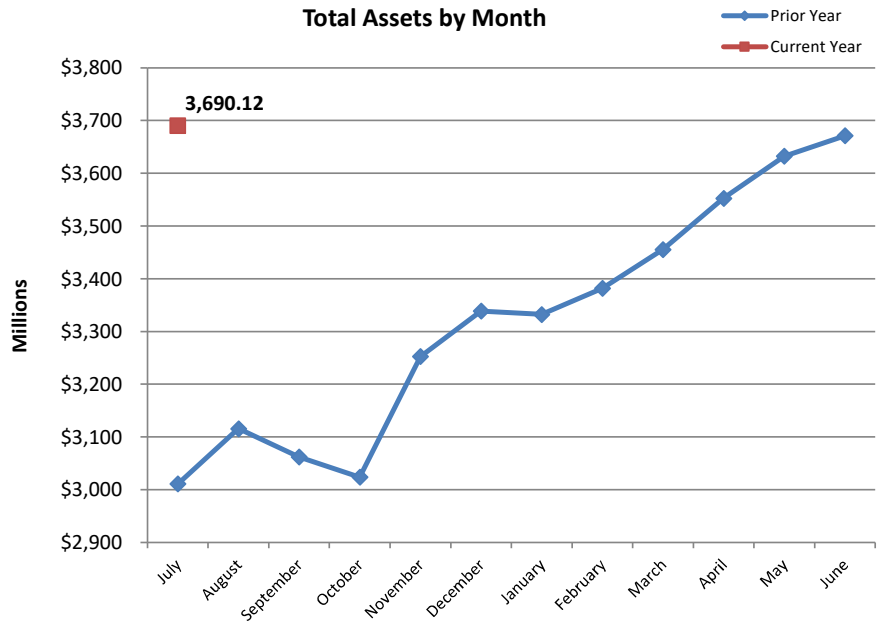


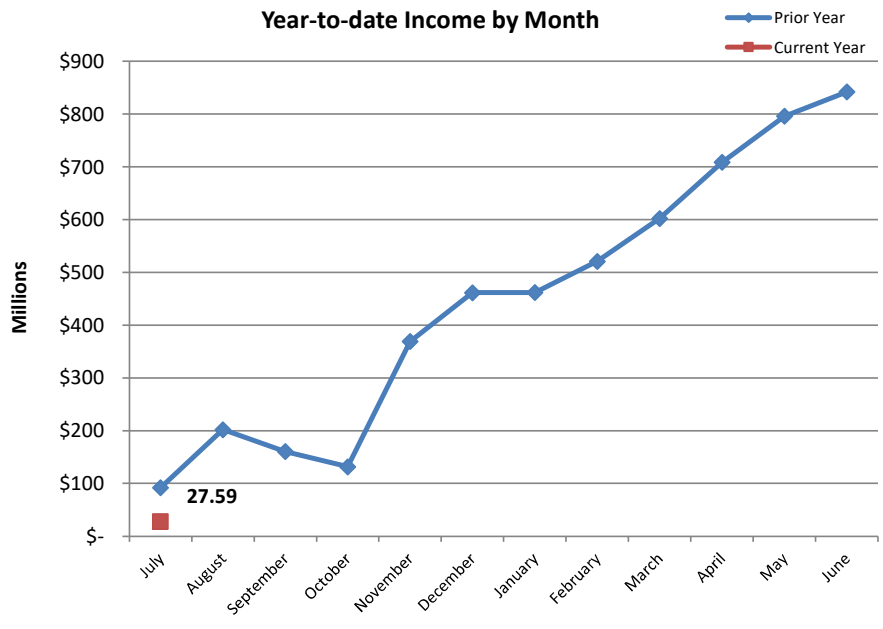


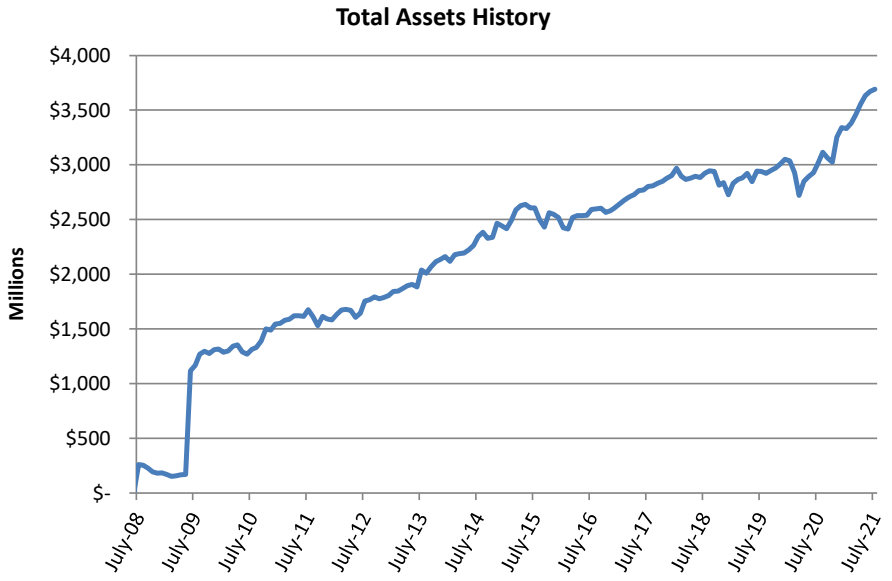


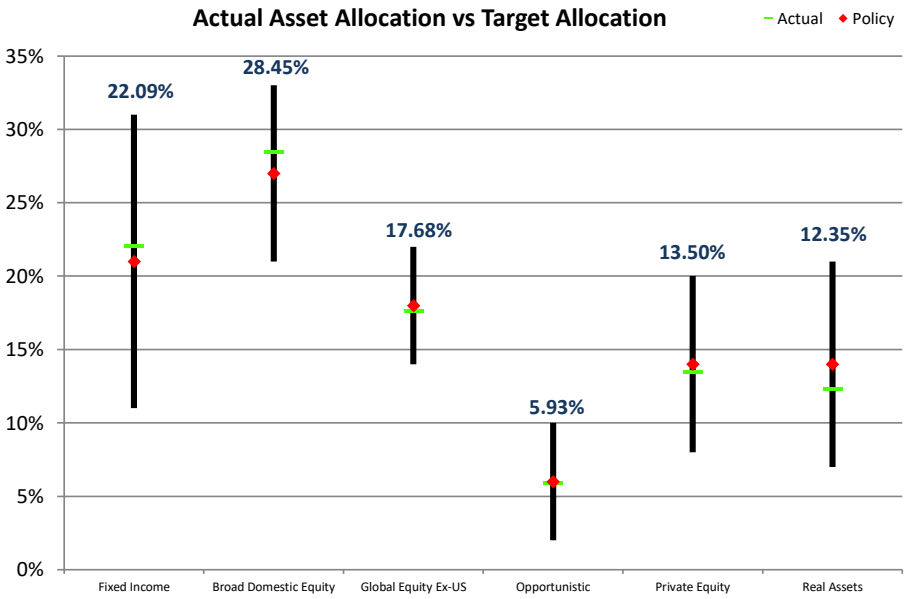
Teachers' Retirement Health Care Trust Fund

Fiscal Year-to-Date through July 31, 2021



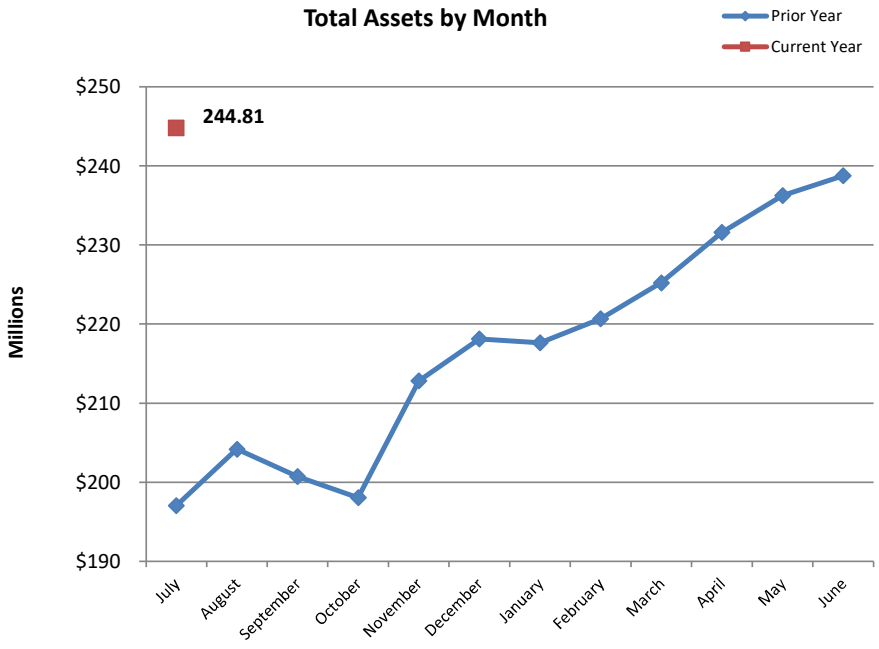


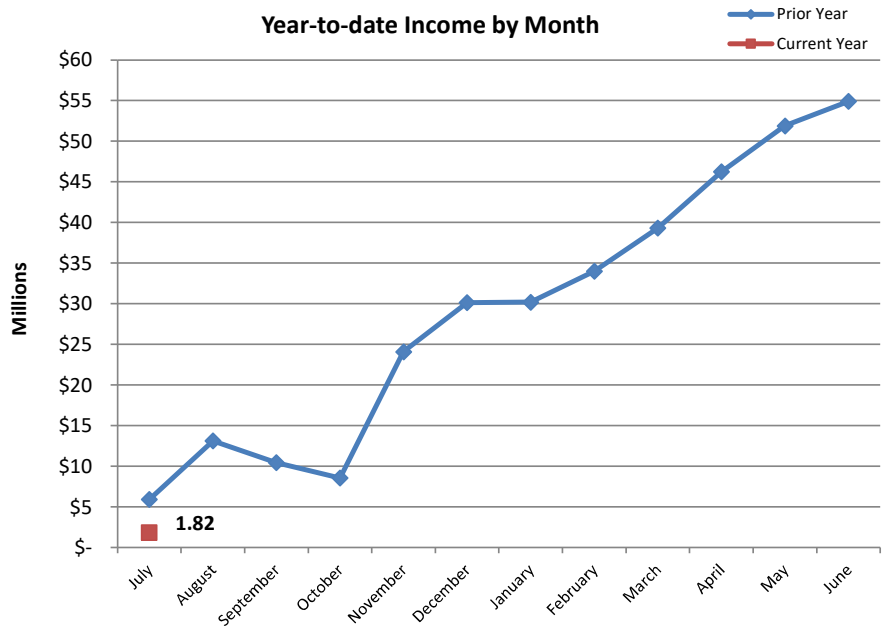


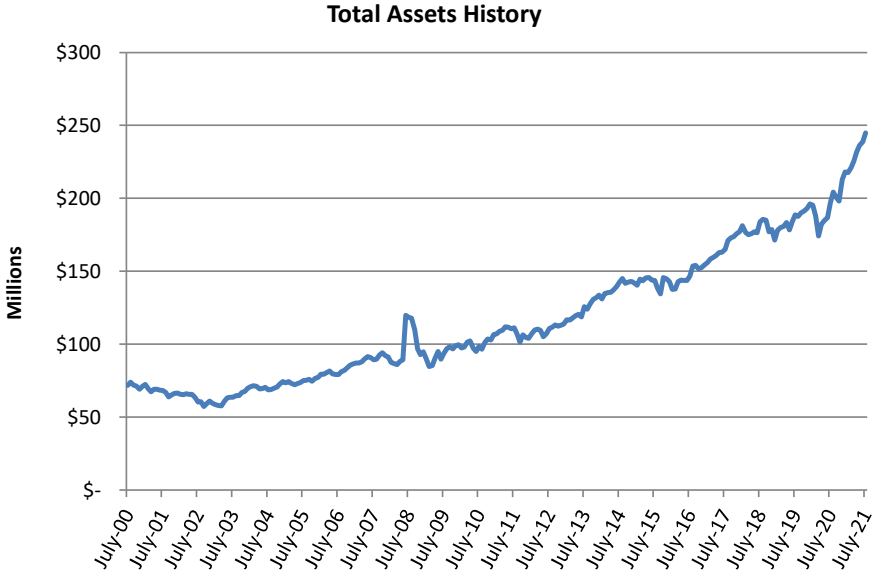


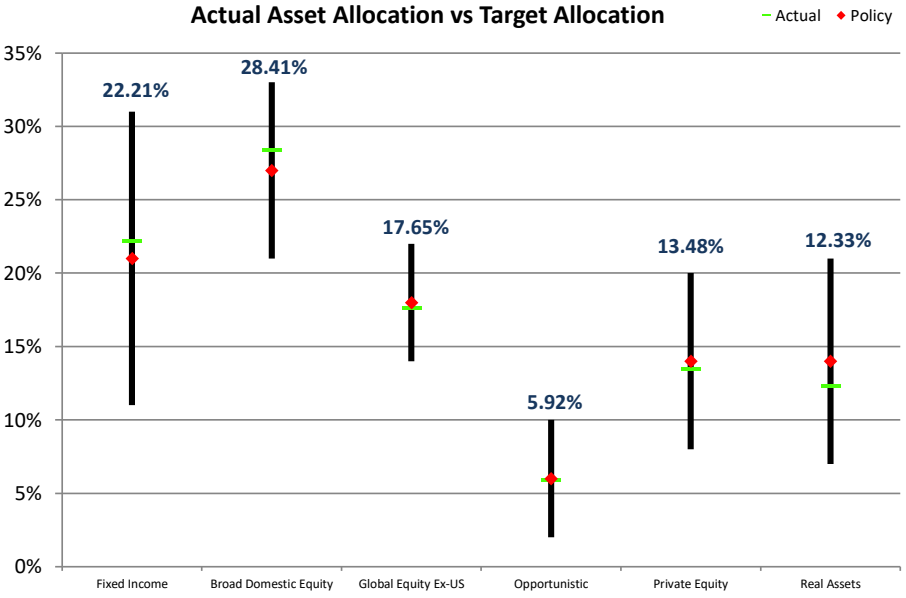
Judicial Retirement Pension Trust Fund

Fiscal Year-to-Date through July 31, 2021



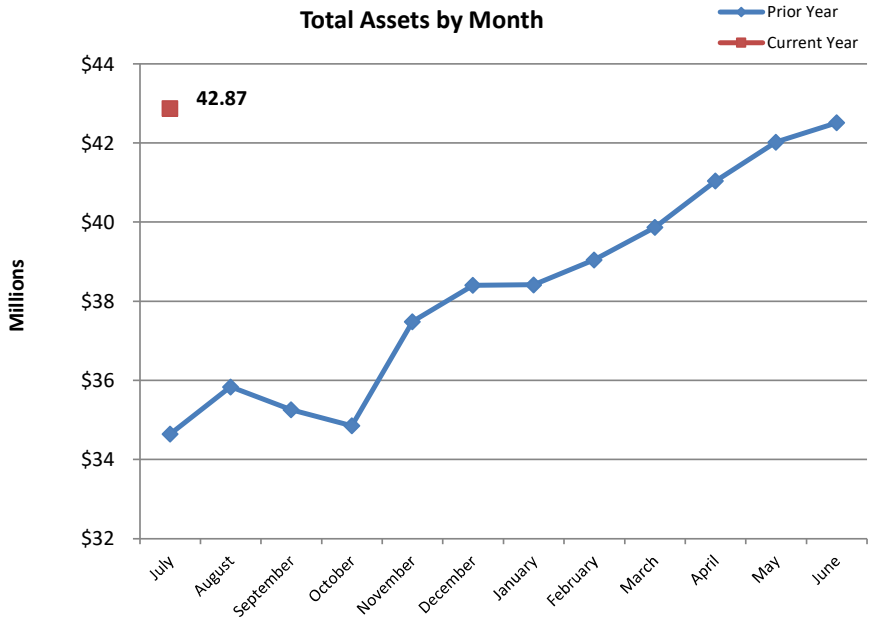


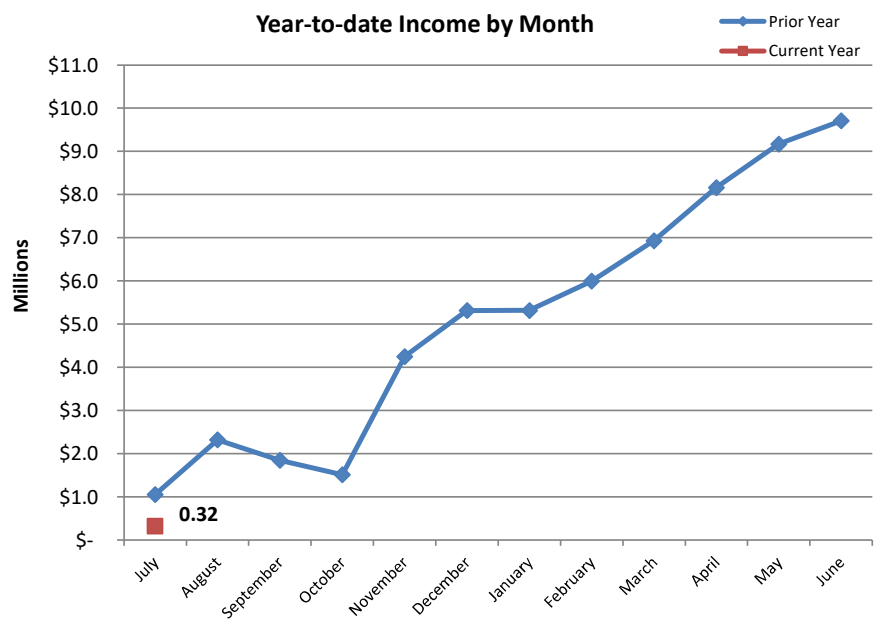


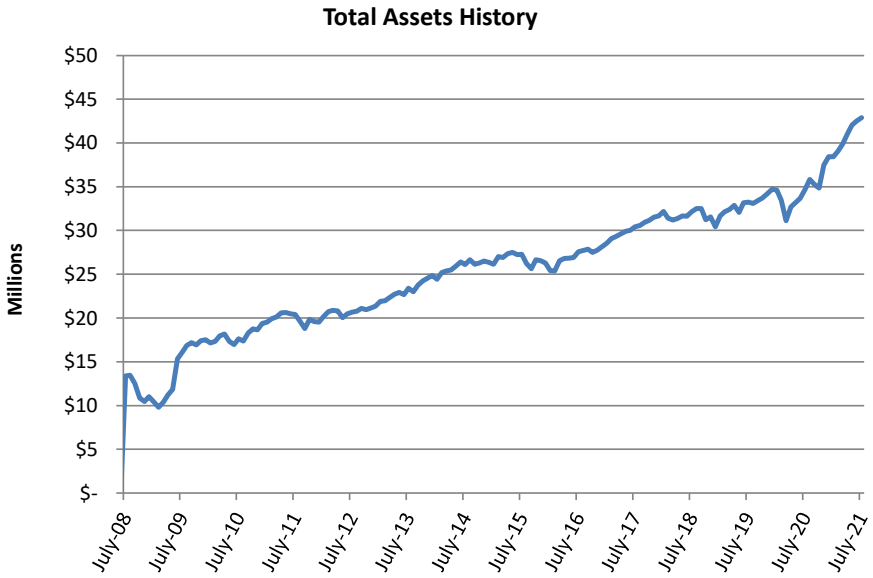


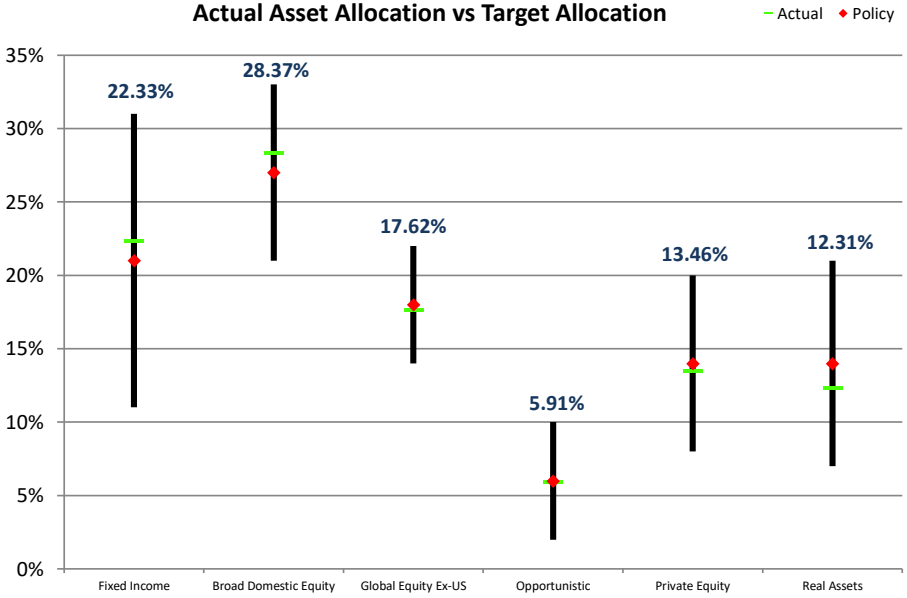
Judicial Retirement Health Care Trust Fund

Fiscal Year-to-Date through July 31, 2021



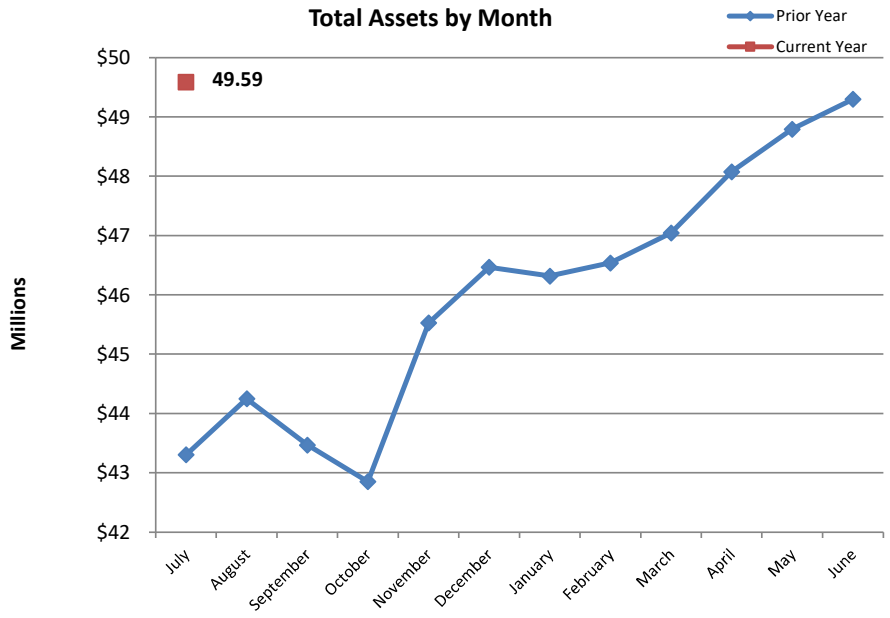


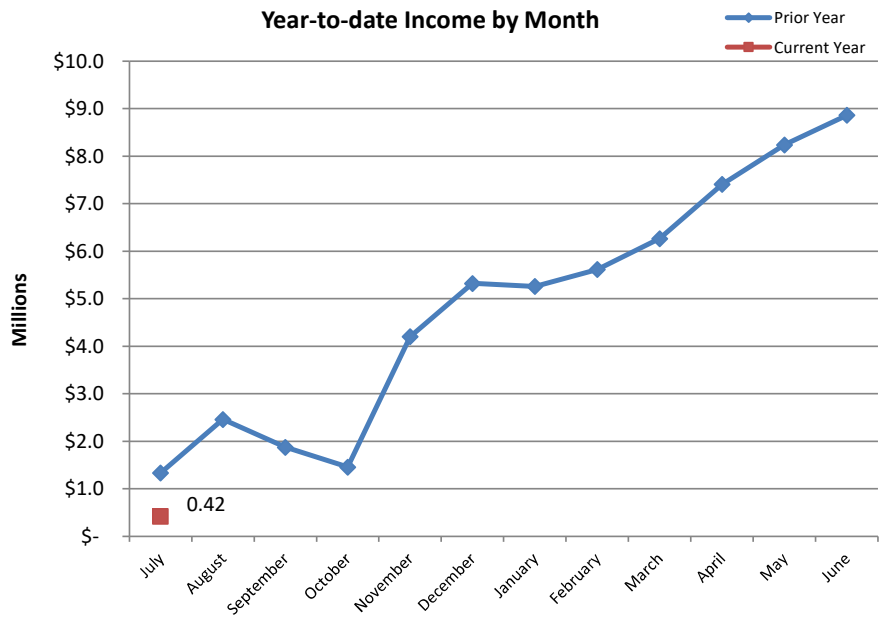


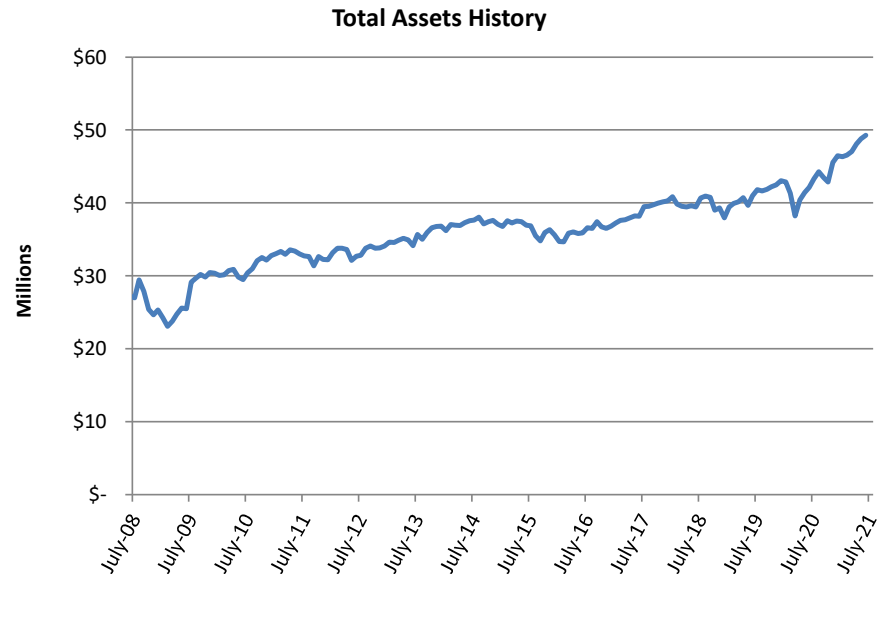


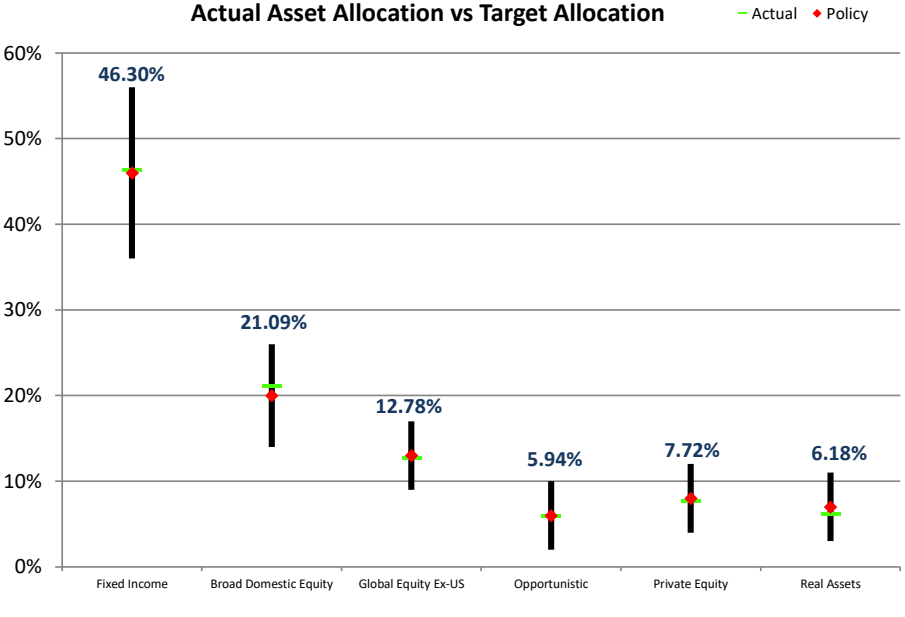
Military Retirement Trust Fund

Fiscal Year-to-Date through July 31, 2021









ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

All Non-Participant Directed Plans

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended July 31, 2021

	Beginning Invested Assets	Investment Income	Net Contributions and (Withdrawals)	Ending Invested Assets	% increase (decrease)	% Change due to Investment Income
Cash						
Short-Term Fixed Income Pool	$ 280,106,893	$ 37,220	$ 85,089,701	$ 365,233,814	30.39%	0.01%
Securities Lending Income Pool	52,095	74,577	(51,767)	74,905	43.79%	284.52%
Total Cash	280,158,988	111,797	85,037,934	365,308,719	30.39%	0.03%
Fixed Income						
Alternative Fixed Income						
Crestline Investors, Inc.	629,405,571	2,586,210	(27,470,152)	604,521,629	-3.95%	0.42%
Prisma Capital Partners	82,859,084	-	(7,000,000)	75,859,084	-8.45%	-
Crestline Specialty Fund	8,599,438	-	(2,327,931)	6,271,507	-27.07%	-
Crestline Specialty Lending Fund II	43,279,394	-	3,189,944	46,469,338	7.37%	-
Crestline Specialty Lending Fund III	21,703,511	-	-	21,703,511	-	-
Total Alternative Fixed Income	785,846,998	2,586,210	(33,608,139)	754,825,069	-3.95%	0.34%
Opportunistic Fixed Income						
Fidelity Inst. Asset Mgmt. High Yield CMBS	217,761,933	2,182,115	-	219,944,048	1.00%	1.00%
Fidelity Institutional Asset Management	987,758,274	10,702,791	-	998,461,065	1.08%	1.08%
MacKay Shields, LLC	2,086,658	-	-	2,086,658	-	-
Total Opportunistic Fixed Income	1,207,606,865	12,884,906	-	1,220,491,771	1.07%	1.07%
ARMB Barclays Agg Bond Fund	4,823,075,568	56,860,741	157,549,500	5,037,485,809	4.45%	1.16%
Total Fixed Income	6,816,529,431	72,331,857	123,941,361	7,012,802,649	2.88%	1.05%
Domestic Equities						
Small Cap						
Passively Managed						
ARMB S&P 600	723,432,060	(17,545,181)	39,400,000	745,286,879	3.02%	-2.36%
Total Passive	723,432,060	(17,545,181)	39,400,000	745,286,879	3.02%	-2.36%
Actively Managed						
Transition Account	-	-	-	-	-	-
Total Active	-	-	-	-	-	-
Total Small Cap	723,432,060	(17,545,181)	39,400,000	745,286,879	3.02%	-2.36%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended July 31, 2021

Large Cap						
Passively Managed						
ARMB S&P 900	5,981,411,271	135,160,788	105,600,000	6,222,172,059	4.03%	2.24%
Total Passive	5,981,411,271	135,160,788	105,600,000	6,222,172,059	4.03%	2.24%
Actively Managed						
ARMB Domestic Residual Assets	5,539	64,877	-	70,416	1171.28%	1171.28%
ARMB Large Cap Multi-Factor	479,897,528	9,436,068	-	489,333,596	1.97%	1.97%
ARMB Scientific Beta	2,075,830,316	27,379,283	185,128	2,103,394,727	1.33%	1.32%
Barrow, Hanley, Mewhinney & Strauss	-	-	-	-	-	-
Transition Account	-	-	-	-	-	-
Total Active	2,555,733,383	36,880,228	185,128	2,592,798,739	1.45%	1.44%
Total Large Cap	8,537,144,654	172,041,016	105,785,128	8,814,970,798	3.25%	2.00%
Total Domestic Equity	9,260,576,714	154,495,835	145,185,128	9,560,257,677	3.24%	1.66%
Large Cap						
Arrow Street Capital	741,855,227	2,348,605	(89,213,790)	654,990,042	-11.71%	0.34%
Baillie Gifford Overseas Limited	303,459,266	(5,072,127)	106,303,640	404,690,779	33.36%	-1.42%
Brandes Investment Partners	330,836,746	(6,067,082)	76,270,446	401,040,110	21.22%	-1.64%
Cap Guardian Trust Co	628,257,835	(1,431,580)	(30,000,000)	596,826,255	-5.00%	-0.23%
Legal & General	948,796,811	5,233,643	(49,917,520)	904,112,934	-4.71%	0.57%
McKinley Capital Management	2,701,373	(6,403)	-	2,694,970	-0.24%	-0.24%
SSgA MSCI World Ex-US IMI Index Fund	2,147,335,706	15,285,621	(217,000,000)	1,945,621,327	-9.39%	0.75%
State Street Global Advisors	201,663	-	-	201,663	-	-
Total Large Cap	5,103,444,627	10,290,677	(203,557,224)	4,910,178,080	-3.79%	0.21%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended July 31, 2021

Emerging Markets Equity						
MSCI Emerging Markets Index Fund	768,312,295	(52,262,495)	27,000,000	743,049,800	-3.29%	-6.68%
Legal & General Sci-Beta Emerging Markets	315,837,262	(14,431,876)	(14,972,356)	286,433,030	-9.31%	-4.68%
Total Emerging Markets	1,084,149,557	(66,694,371)	12,027,644	1,029,482,830	-5.04%	-6.12%
Total Global Equities	6,187,594,184	(56,403,694)	(191,529,580)	5,939,660,910	-4.01%	-0.93%
Opportunistic						
Alternative Equity Strategy						
Alternative Equity Strategies Transition Account	-	17,566	(17,566)	-	-	0.00%
McKinley Global Health Care	389,645,262	10,659,016	445,553	400,749,831	2.85%	2.73%
Total Alternative Equity Strategy	389,645,262	10,676,582	427,987	400,749,831	2.85%	2.74%
Alternative Beta						
Man Group Alternative Risk Premia	312,763,945	(1,615,181)	-	311,148,764	-0.52%	-0.52%
Total Alternative Beta	312,763,945	(1,615,181)	-	311,148,764	-0.52%	-0.52%
Other Opportunities						
Project Pearl	8,398,766	-	-	8,398,766	-	-
Schroders Insurance Linked Securities	12,083,629	241,688	-	12,325,317	2.00%	2.00%
Total Other Opportunities	20,482,395	241,688	-	20,724,083	1.18%	1.18%
Tactical Allocation Strategies						
Fidelity Signals	632,001,388	4,359,230	-	636,360,618	0.69%	0.69%
PineBridge	620,002,327	4,767,325	-	624,769,652	0.77%	0.77%
Total Tactical Allocation Strategies	1,252,003,715	9,126,555	-	1,261,130,270	0.73%	0.73%
Total Opportunistic	1,974,895,317	18,429,644	427,987	1,993,752,948	0.95%	0.93%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended July 31, 2021

Private Equity						
Abbott Capital	1,775,785,329	9,731,618	(307,134)	1,785,209,813	0.53%	0.55%
Advent International GPE Fund VIII-B	41,032,692	-	(2,816,742)	38,215,950	-6.86%	-
Advent International GPE Fund IX	18,444,976	-	-	18,444,976	-	-
Angelo, Gordon & Co.	5,406	-	-	5,406	-	-
Clearlake Capital Partners VI	16,224,297	-	2,898,042	19,122,339	17.86%	-
Dyal Capital Partners III	38,336,236	-	(634,425)	37,701,811	-1.65%	-
Dyal Capital Partners IV	14,877,369	969,393	(769,489)	15,077,273	1.34%	6.69%
Glendon Opportunities	24,118,243	-	(1,260,370)	22,857,873	-5.23%	-
Glendon Opportunities II	58,706,885	-	-	58,706,885	-	-
Insight XII	-	-	5,000,000	5,000,000	100.00%	-
KKR Lending Partners II	14,878,555	-	-	14,878,555	-	-
Lexington Capital Partners VIII	35,962,260	-	(1,085,525)	34,876,735	-3.02%	-
Lexington Partners VII	14,720,661	-	(491,878)	14,228,783	-3.34%	-
Merit Capital Partners	10,184,473	-	(135,777)	10,048,696	-1.33%	-
NB SOF III	16,797,960	-	-	16,797,960	-	-
NB SOF IV	37,165,802	-	(2,211,231)	34,954,571	-5.95%	-
New Mountain Partners IV	19,763,882	-	(753,682)	19,010,200	-3.81%	-
New Mountain Partners V	69,085,514	-	-	69,085,514	-	-
New Mountain Partners VI	4,813,253	-	336,700	5,149,953	7.00%	-
NGP XI	35,692,600	-	(1,679,567)	34,013,033	-4.71%	-
NGP XII	22,319,218	-	-	22,319,218	-	-
Onex Partnership III	5,531,429	-	-	5,531,429	-	-
Pathway Capital Management LLC	2,003,263,834	(225,165)	(22,845,312)	1,980,193,357	-1.15%	-0.01%
Resolute Fund III	10,504,385	-	-	10,504,385	-	-
Resolute Fund IV	50,703,165	-	-	50,703,165	-	-
Summit Partners GE IX	71,833,306	-	(4,430,911)	67,402,395	-6.17%	-
Summit Partners GE X	21,785,435	-	(2,862,801)	18,922,634	-13.14%	-
Warburg Pincus Global Growth Fund	29,434,898	-	-	29,434,898	-	-
Warburg Pincus X	786,150	-	-	786,150	-	-
Warburg Pincus XI	16,946,879	-	-	16,946,879	-	-
Warburg Pincus XII	82,729,542	-	(4,473,560)	78,255,982	-5.41%	-
Total Private Equity	4,562,434,634	10,475,846	(38,523,662)	4,534,386,818	-0.61%	0.23%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended July 31, 2021

Real Assets						
Farmland						
UBS Agrivest, LLC	893,316,810	-	-	893,316,810	-	-
Total Farmland	893,316,810	-	-	893,316,810	-	-
Timber						
Timberland Invt Resource LLC	360,587,245	-	(7,800,000)	352,787,245	-2.16%	-
Total Timber	360,587,245	-	(7,800,000)	352,787,245	-2.16%	-
Energy						
EIG Energy Fund XIV-A	4,830,058	(227,609)	-	4,602,449	-4.71%	-4.71%
EIG Energy Fund XV	8,350,675	572,078	(452,691)	8,470,062	1.43%	7.04%
EIG Energy Fund XVI	49,699,899	(1,013,258)	-	48,686,641	-2.04%	-2.04%
Total Energy	62,880,632	(668,789)	(452,691)	61,759,152	-1.78%	-1.07%
REIT						
REIT Transition Account	-	-	-	-	-	-
ARMB REIT	541,331,321	25,743,424	50,000,000	617,074,745	13.99%	4.55%
Total REIT	541,331,321	25,743,424	50,000,000	617,074,745	13.99%	4.55%
Infrastructure Private						
IFM Global Infrastructure Fund-Private	596,397,246	13,189,409	(24,957,053)	584,629,602	-1.97%	2.26%
JP Morgan Infrastructure Fund-Private	135,259,825	-	-	135,259,825	-	-
Total Infrastructure Private	731,657,071	13,189,409	(24,957,053)	719,889,427	-1.61%	1.83%

Alaska Retirement Management Board
All Non-Participant Directed Plans by Manager
Schedule of Investment Income and Changes in Invested Assets
For the Month Ended July 31, 2021

Real Estate						
Core Commingled Accounts						
BlackRock US Core Property Fund	337,858,287	10,003,563	-	347,861,850	2.96%	2.96%
JP Morgan	157,383,903	2,130,878	(1,032,629)	158,482,152	0.70%	1.36%
UBS Trumbull Property Fund	44,477,589	1,183,492	(3,428,589)	42,232,492	-5.05%	2.77%
Total Core Commingled	539,719,779	13,317,933	(4,461,218)	548,576,494	1.64%	2.48%
Core Separate Accounts						
UBS Realty	346,864	(2,000)	(344,864)	-	-100.00%	-1.15%
Sentinel Separate Account	183,640,524	-	(317,728)	183,322,796	-0.17%	-
UBS Realty	670,715,796	-	(3,945,039)	666,770,757	-0.59%	-
Total Core Separate	854,703,184	(2,000)	(4,607,631)	850,093,553	-0.54%	0.00%
Non-Core Commingled Accounts						
Almanac Realty Securities V	58,740	-	-	58,740	-	-
Almanac Realty Securities VII	25,982,172	-	-	25,982,172	-	-
Almanac Realty Securities VIII	14,868,476	-	-	14,868,476	-	-
Clarion Ventures 4	28,441,415	-	-	28,441,415	-	-
Colony Investors VIII, L.P.	1,282,041	-	-	1,282,041	-	-
ING Clarion Development Ventures III	1,292,292	-	-	1,292,292	-	-
KKR Real Estate Partners Americas II	19,077,984	-	1,277,086	20,355,070	6.69%	-
KKR Real Estate Partners Americas L.P.	4,630,484	-	-	4,630,484	-	-
Silverpeak Legacy Pension Partners II, L.P.	1,062,351	-	-	1,062,351	-	-
Silverpeak Legacy Pension Partners III, L.P.	2,590,301	-	-	2,590,301	-	-
Tishman Speyer Real Estate Venture VI	2,028,012	-	-	2,028,012	-	-
Tishman Speyer Real Estate Venture VII	196,476	-	-	196,476	-	-
Total Non-Core Commingled	101,510,744	-	1,277,086	102,787,830	1.26%	-
Total Real Estate	1,495,933,707	13,315,933	(7,791,763)	1,501,457,877	0.37%	0.89%
Total Real Assets	4,085,706,786	51,579,977	8,998,493	4,146,285,256	1.48%	1.26%
Total Assets	$ 33,167,896,054	$ 251,021,262	$ 133,537,661	$ 33,552,454,977	1.16%	0.76%

ALASKA RETIREMENT MANAGEMENT BOARD

Reporting of Funds by Manager

Participant Directed Plans

Supplemental Annuity Plan
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
July 31, 2021

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Stable Value Fund	$ 491,867,200	$ 709,063	$ (5,243,106)	$ 1,144,839	$ 488,477,996	-0.69%	0.14%
Small Cap Stock Fund	284,470,145	(1,941,831)	(2,017,892)	(2,753,886)	277,756,536	-2.36%	-0.69%
Alaska Balanced Trust	1,217,643,520	9,146,006	(6,096,883)	3,047,825	1,223,740,468	0.50%	0.75%
Long Term Balanced Fund	771,484,878	5,821,832	(1,312,110)	(1,205,712)	774,788,888	0.43%	0.76%
AK Target Date 2010 Trust	10,060,640	61,685	(47,759)	10,258	10,084,824	0.24%	0.61%
AK Target Date 2015 Trust	83,148,533	528,132	(81,897)	(270,876)	83,323,892	0.21%	0.64%
AK Target Date 2020 Trust	93,311,825	621,033	(718,547)	(215,419)	92,998,892	-0.34%	0.67%
AK Target Date 2025 Trust	115,256,954	829,647	(20,575)	703,898	116,769,924	1.31%	0.72%
AK Target Date 2030 Trust	96,585,736	706,805	(548,250)	591,239	97,335,530	0.78%	0.73%
AK Target Date 2035 Trust	97,531,041	728,480	96,835	869,129	99,225,485	1.74%	0.74%
AK Target Date 2040 Trust	94,295,689	715,619	242,766	(266,307)	94,987,767	0.73%	0.76%
AK Target Date 2045 Trust	111,641,504	850,141	545,662	187,093	113,224,400	1.42%	0.76%
AK Target Date 2050 Trust	124,901,299	954,216	894,805	(61,302)	126,689,018	1.43%	0.76%
AK Target Date 2055 Trust	126,304,490	965,357	1,065,938	(226,557)	128,109,228	1.43%	0.76%
AK Target Date 2060 Trust	7,261,766	48,901	338,029	(313,186)	7,335,510	1.02%	0.67%
AK Target Date 2065 Trust	2,875,943	21,254	186,945	44,364	3,128,506	8.78%	0.71%
Total Investments with T. Rowe Price	3,728,641,163	20,766,340	(12,716,039)	1,285,400	3,737,976,864		
JP Morgan							
JPMorgan SmartSpending 2015 R6	-	56	136	13,625	13,817	0.00%	0.81%
JPMorgan SmartSpending 2020 R6	-	25	-	8,622	8,647	0.00%	0.58%
Total Investments with JP Morgan	-	81	136	22,247	22,464		
State Street Global Advisors							
Money Market	67,593,273	292	(483,780)	(394,170)	66,715,615	-1.30%	0.00%
S&P 500 Stock Index Fund Series A	525,481,821	12,379,876	(2,051,446)	(1,663,221)	534,147,030	1.65%	2.36%
Russell 3000 Index	136,279,953	2,324,611	(351,926)	1,525,135	139,777,773	2.57%	1.70%
World Equity Ex-US Index	58,738,364	(960,861)	(384,150)	(3,602,910)	53,790,443	-8.42%	-1.69%
Total Investments with SSgA	788,093,411	13,743,918	(3,271,302)	(4,135,166)	794,430,861		
BlackRock							
Passive U.S. Bond Index Fund	190,148,818	2,134,919	(1,122,248)	(1,248,069)	189,913,420	-0.12%	1.13%
Strategic Completion Fund	36,405,066	1,081,185	(418,109)	542,617	37,610,759	3.31%	2.96%
Total Investments with BlackRock	226,553,884	3,216,104	(1,540,357)	(705,452)	227,524,179		
Brandes and Baillie Gifford							
AK International Equity Fund	150,615,060	(2,182,854)	(736,865)	2,673,590	150,368,931	-0.16%	-1.44%
Northern Trust							
Environmental, Social, and Governance Fund	170,463,987	4,986,260	(713,226)	859,381	175,596,402	3.01%	2.92%
Total All Funds	$ 5,064,367,505	$ 40,529,849	$ (18,977,653)	$ -	$ 5,085,919,701	0.43%	0.80%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Supplemental Annuity Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
July 31, 2021
$ (Thousands)

Invested Assets (at fair value)		**July**
Investments with T. Rowe Price		
Stable Value Fund	$	488,478
Small Cap Stock Fund		277,757
Alaska Balanced Trust		1,223,740
Long Term Balanced Fund		774,789
AK Target Date 2010 Trust		10,085
AK Target Date 2015 Trust		83,324
AK Target Date 2020 Trust		92,999
AK Target Date 2025 Trust		116,770
AK Target Date 2030 Trust		97,336
AK Target Date 2035 Trust		99,225
AK Target Date 2040 Trust		94,988
AK Target Date 2045 Trust		113,224
AK Target Date 2050 Trust		126,689
AK Target Date 2055 Trust		128,109
AK Target Date 2060 Trust		7,336
AK Target Date 2065 Trust		3,129
Investments with JP Morgan		
JPMorgan SmartSpending 2015 R6		14
JPMorgan SmartSpending 2020 R6		9
Investments with State Street Global Advisors		
Money Market		66,716
S&P 500 Stock Index Fund Series A		534,147
Russell 3000 Index		139,778
World Equity Ex-US Index		53,790
Investments with BlackRock		
Passive U.S. Bond Index Fund		189,913
Strategic Completion Fund		37,611
Investments with Brandes and Baillie Gifford		
AK International Equity Fund		150,369
Investments with Northern Trust		
Environmental, Social, and Governance Fund		175,596
Total Invested Assets	**$**	**5,085,920**

Change in Invested Assets		
Beginning Assets	$	5,064,368
Investment Earnings		40,530
Net Contributions (Withdrawals)		(18,978)
Ending Invested Assets	**$**	**5,085,920**

Source data provided by the record keeper, Empower Retirement.

Deferred Compensation Plan
Schedule of Invested Assets and Changes in Invested Assets
for the Month Ended
July 31, 2021

	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
Participant Options							
T. Rowe Price							
Stable Value Fund	$ 206,109,426	$ 297,661	$ (1,586,163)	$ 116,014	$ 204,936,938	-0.57%	0.14%
Small Cap Stock Fund	155,397,451	(1,064,815)	(144,158)	(1,191,564)	152,996,914	-1.54%	-0.69%
Alaska Balanced Trust	44,249,655	335,154	(113,080)	1,477,483	45,949,212	3.84%	0.75%
Long Term Balanced Fund	92,254,869	691,726	(334,112)	(757,781)	91,854,702	-0.43%	0.75%
AK Target Date 2010 Trust	3,334,348	20,414	7,406	4,783	3,366,951	0.98%	0.61%
AK Target Date 2015 Trust	9,957,926	63,649	(350)	410	10,021,635	0.64%	0.64%
AK Target Date 2020 Trust	26,015,610	171,667	(263,614)	307,150	26,230,813	0.83%	0.66%
AK Target Date 2025 Trust	32,318,250	232,300	127,313	(207,475)	32,470,388	0.47%	0.72%
AK Target Date 2030 Trust	19,093,312	137,112	(554,913)	30,079	18,705,590	-2.03%	0.73%
AK Target Date 2035 Trust	13,474,392	99,993	132,324	673,730	14,380,439	6.72%	0.72%
AK Target Date 2040 Trust	13,410,767	101,715	102,641	(53,371)	13,561,752	1.13%	0.76%
AK Target Date 2045 Trust	10,127,886	78,212	99,330	103,147	10,408,575	2.77%	0.76%
AK Target Date 2050 Trust	7,953,072	60,715	98,501	(1,087)	8,111,201	1.99%	0.76%
AK Target Date 2055 Trust	6,370,396	48,670	88,765	(86,091)	6,421,740	0.81%	0.76%
AK Target Date 2060 Trust	1,462,398	8,867	(19,838)	(1,286)	1,450,141	-0.84%	0.61%
AK Target Date 2065 Trust	514,579	4,387	12,408	97,409	628,783	22.19%	0.77%
Total Investments with T. Rowe Price	642,044,337	1,287,427	(2,347,540)	511,550	641,495,774		
JP Morgan							
JPMorgan SmartSpending 2020 R6	-	15	44	3,051	3,110	0.00%	0.97%
Total Investments with JP Morgan	-	15	44	3,051	3,110		
State Street Global Advisors							
Money Market	20,818,239	91	(206,862)	469,985	21,081,453	1.26%	0.00%
S&P 500 Stock Index	270,931,481	6,369,849	(424,202)	(1,246,270)	275,630,858	1.73%	2.36%
Russell 3000 Index	51,363,302	872,919	137,834	283,530	52,657,585	2.52%	1.69%
World Equity Ex-US Index	20,185,642	(336,350)	66,246	(886,567)	19,028,971	-5.73%	-1.70%
Total Investments with SSgA	363,298,664	6,906,509	(426,984)	(1,379,322)	368,398,867		
BlackRock							
Passive U.S. Bond Index Fund	80,472,976	903,488	(276,236)	(295,802)	80,804,426	0.41%	1.13%
Strategic Completion Fund	15,809,590	473,643	(9,419)	615,309	16,889,123	6.83%	2.94%
Total Investments with BlackRock	96,282,566	1,377,131	(285,655)	319,507	97,693,549		
Brandes and Baillie Gifford							
AK International Equity Fund	59,797,250	(864,846)	(311,128)	205,194	58,826,470	-1.62%	-1.45%
Northern Trust							
Environmental, Social, and Governance Fund	55,662,917	1,619,042	(209,809)	340,020	57,412,170	3.14%	2.91%
Total All Funds	$ 1,217,085,734	$ 10,325,278	$ (3,581,072)	$ -	$ 1,223,829,940	0.55%	0.85%

Notes: Source data provided by the record keeper, Empower Retirement.

(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Deferred Compensation Plan
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
July 31, 2021
$ (Thousands)

Invested Assets (at fair value)		**July**
Investments with T. Rowe Price		
Stable Value Fund	**$**	204,937
Small Cap Stock Fund		152,997
Alaska Balanced Trust		45,949
Long Term Balanced Fund		91,855
AK Target Date 2010 Trust		3,367
AK Target Date 2015 Trust		10,022
AK Target Date 2020 Trust		26,231
AK Target Date 2025 Trust		32,470
AK Target Date 2030 Trust		18,706
AK Target Date 2035 Trust		14,380
AK Target Date 2040 Trust		13,562
AK Target Date 2045 Trust		10,409
AK Target Date 2050 Trust		8,111
AK Target Date 2055 Trust		6,422
AK Target Date 2060 Trust		1,450
AK Target Date 2065 Trust		629
Investments with JP Morgan		
JPMorgan SmartSpending 2020 R6		3
Investments with State Street Global Advisors		
Money Market		21,081
S&P 500 Stock Index		275,631
Russell 3000 Index		52,658
World Equity Ex-US Index		19,029
Investments with BlackRock		
Passive U.S. Bond Index Fund		80,804
Strategic Completion Fund		16,889
Investments with Brandes and Baillie Gifford		
AK International Equity Fund		58,826
Investments with Northern Trust		
Environmental, Social, and Governance Fund		57,412
Total Invested Assets	**$**	**1,223,830**

Change in Invested Assets		
Beginning Assets	**$**	1,217,086
Investment Earnings		10,325
Net Contributions (Withdrawals)		(3,581)
Ending Invested Assets	**$**	**1,223,830**

Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
July 31, 2021

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 116,260,978	$ 169,492	$ (111,558)	$ 1,756,777	$ 118,075,689	1.56%	0.14%
Small Cap Stock Fund	127,261,938	(857,345)	114,288	(1,670,483)	124,848,398	-1.90%	-0.68%
Alaska Balanced Trust	44,298,322	342,425	(4,207)	2,746,574	47,383,114	6.96%	0.75%
Long Term Balanced Fund	11,956,072	96,179	3,990	1,800,543	13,856,784	15.90%	0.75%
AK Target Date 2010 Trust	3,404,609	20,034	(4,390)	47,080	3,467,333	1.84%	0.58%
AK Target Date 2015 Trust	13,572,228	87,012	(97,512)	12,744	13,574,472	0.02%	0.64%
AK Target Date 2020 Trust	46,723,992	313,593	104,258	(295,467)	46,846,376	0.26%	0.67%
AK Target Date 2025 Trust	86,402,973	607,756	55,017	(355,437)	86,710,309	0.36%	0.70%
AK Target Date 2030 Trust	96,286,537	706,486	248,755	(107,424)	97,134,354	0.88%	0.73%
AK Target Date 2035 Trust	122,014,565	915,354	378,445	(81,430)	123,226,934	0.99%	0.75%
AK Target Date 2040 Trust	143,537,670	1,085,953	744,542	(303,051)	145,065,114	1.06%	0.76%
AK Target Date 2045 Trust	188,052,793	1,417,458	569,737	(60,216)	189,979,772	1.02%	0.75%
AK Target Date 2050 Trust	224,781,525	1,697,224	869,262	(870,710)	226,477,301	0.75%	0.76%
AK Target Date 2055 Trust	235,993,307	1,793,078	2,014,524	(372,067)	239,428,842	1.46%	0.76%
AK Target Date 2060 Trust	6,954,908	52,306	483,997	(31,684)	7,459,527	7.26%	0.73%
AK Target Date 2065 Trust	3,009,964	22,510	228,502	(10,877)	3,250,099	7.98%	0.72%
Total Investments with T. Rowe Price	1,470,512,381	8,469,515	5,597,650	2,204,872	1,486,784,418		
JP Morgan							
JPMorgan SmartSpending 2015 R6	-	25	(5)	4,699	4,719	0.00%	1.07%
Total Investments with JP Morgan	-	25	(5)	4,699	4,719		
State Street Global Advisors							
Money Market	15,559,765	68	(257,336)	(492,057)	14,810,440	-4.82%	0.00%
S&P 500 Stock Index Fund Series A	77,308,205	1,810,577	353,408	(894,210)	78,577,980	1.64%	2.35%
Russell 3000 Index	69,617,762	1,194,407	215,397	1,774,885	72,802,451	4.57%	1.69%
World Equity Ex-US Index	46,414,803	(753,941)	77,884	(3,072,065)	42,666,681	-8.08%	-1.68%
Total Investments with SSgA	208,900,535	2,251,111	389,353	(2,683,447)	208,857,552		
BlackRock							
Passive U.S. Bond Index Fund	83,001,738	933,716	(60,055)	(656,275)	83,219,124	0.26%	1.13%
Strategic Completion Fund	5,538,613	169,311	29,302	219,133	5,956,359	7.54%	2.99%
Total Investments with BlackRock	88,540,351	1,103,027	(30,753)	(437,142)	89,175,483		
Brandes and Baillie Gifford							
AK International Equity Fund	108,638,215	(1,577,459)	123,259	1,731,475	108,915,490	0.26%	-1.44%
Northern Trust							
Environmental, Social, and Governance Fund	87,792,184	2,562,675	18,705	(820,457)	89,553,107	2.01%	2.93%
Total All Funds	$ 1,964,383,666	$ 12,808,894	$ 6,098,209	$ -	$ 1,983,290,769	0.96%	0.65%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Defined Contribution Retirement - Participant Directed PERS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
July 31, 2021
$ (Thousands)

Invested Assets (at fair value)		**July**
Investments with T. Rowe Price		
Stable Value Fund	$	118,076
Small Cap Stock Fund		124,848
Alaska Balanced Trust		47,383
Long Term Balanced Fund		13,857
AK Target Date 2010 Trust		3,467
AK Target Date 2015 Trust		13,574
AK Target Date 2020 Trust		46,846
AK Target Date 2025 Trust		86,710
AK Target Date 2030 Trust		97,134
AK Target Date 2035 Trust		123,227
AK Target Date 2040 Trust		145,065
AK Target Date 2045 Trust		189,980
AK Target Date 2050 Trust		226,477
AK Target Date 2055 Trust		239,429
AK Target Date 2060 Trust		7,460
AK Target Date 2065 Trust		3,250
Investments with JP Morgan		
JPMorgan SmartSpending 2015 R6		5
State Street Global Advisors		
Money Market		14,810
S&P 500 Stock Index Fund Series A		78,578
Russell 3000 Index		72,802
World Equity Ex-US Index		42,667
Investments with BlackRock		
Passive U.S. Bond Index Fund		83,219
Strategic Completion Fund		5,956
Investments with Brandes and Baillie Gifford		
AK International Equity Fund		108,915
Investments with Northern Trust		
Environmental, Social, and Governance Fund		89,553
Total Invested Assets	**$**	**1,983,291**

Change in Invested Assets		
Beginning Assets	$	1,964,384
Investment Earnings		12,809
Net Contributions (Withdrawals)		6,098
Ending Invested Assets	**$**	**1,983,291**

Source data provided by the record keeper, Empower Retirement.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Investment Income and Changes in Invested Assets
for the Month Ended
July 31, 2021

Participant Options	Beginning Invested Assets	Investment Income	Net Contributions (Withdrawals)	Transfers In (Out)	Ending Invested Assets	% Change in Invested Assets	% Change due to Investment Income (1)
T. Rowe Price							
Stable Value Fund	$ 46,286,810	$ 67,575	$ (63,743)	$ 664,566	$ 46,955,208	1.44%	0.15%
Small Cap Stock Fund	51,685,088	(353,093)	(63,136)	(889,453)	50,379,406	-2.53%	-0.69%
Alaska Balanced Trust	18,572,972	144,536	(65,825)	1,410,885	20,062,568	8.02%	0.75%
Long Term Balanced Fund	4,654,938	38,701	(30,312)	909,944	5,573,271	19.73%	0.76%
AK Target Date 2010 Trust	1,253,900	7,519	7,916	(73,515)	1,195,820	-4.63%	0.62%
AK Target Date 2015 Trust	3,974,748	25,615	23,691	1	4,024,055	1.24%	0.64%
AK Target Date 2020 Trust	13,913,874	93,584	34,728	(24,387)	14,017,799	0.75%	0.67%
AK Target Date 2025 Trust	27,777,801	192,539	(358,071)	(184,950)	27,427,319	-1.26%	0.70%
AK Target Date 2030 Trust	37,548,956	277,399	9,760	-	37,836,115	0.76%	0.74%
AK Target Date 2035 Trust	52,115,685	393,624	449,401	-	52,958,710	1.62%	0.75%
AK Target Date 2040 Trust	61,784,151	471,153	562,476	-	62,817,780	1.67%	0.76%
AK Target Date 2045 Trust	89,547,333	683,067	691,145	-	90,921,545	1.53%	0.76%
AK Target Date 2050 Trust	125,553,857	960,619	(1,016)	109,822	126,623,282	0.85%	0.76%
AK Target Date 2055 Trust	81,061,672	621,752	809,203	(99,151)	82,393,476	1.64%	0.76%
AK Target Date 2060 Trust	2,354,998	18,521	147,451	1	2,520,971	7.05%	0.76%
AK Target Date 2065 Trust	345,054	2,676	17,587	(1)	365,316	5.87%	0.76%
Total Investments with T. Rowe Price	618,431,837	3,645,787	2,171,255	1,823,762	626,072,641		
JP Morgan							
JPMorgan SmartSpending 2015 R6	-	110	-	(110)	-	0.00%	-200.00%
JPMorgan SmartSpending 2020 R6	-	108	-	(108)	-	0.00%	-200.00%
Total Investments with JP Morgan	-	218	-	(218)	-		
State Street Global Advisors							
Money Market	4,310,003	20	12,831	178,165	4,501,019	4.43%	0.00%
S&P 500 Stock Index Fund Series A	22,456,354	523,958	43,154	(868,593)	22,154,873	-1.34%	2.38%
Russell 3000 Index	28,401,014	485,061	(111,774)	727,424	29,501,725	3.88%	1.69%
World Equity Ex-US Index	19,922,530	(324,940)	(15,430)	(1,383,444)	18,198,716	-8.65%	-1.69%
Total Investments with SSgA	75,089,901	684,099	(71,219)	(1,346,448)	74,356,333		
BlackRock							
Passive U.S. Bond Index Fund	32,589,462	366,053	(31,727)	(360,526)	32,563,262	-0.08%	1.13%
Strategic Completion Fund	1,548,006	45,873	(20)	(3,021)	1,590,838	2.77%	2.97%
Total Investments with BlackRock	34,137,468	411,926	(31,747)	(363,547)	34,154,100		
Brandes and Baillie Gifford							
AK International Equity Fund	46,952,239	(681,037)	(56,881.00)	543,099	46,757,420	-0.41%	-1.44%
Northern Trust							
Environmental, Social, and Governance Fund	37,938,693	1,102,852	(69,726.00)	(656,648)	38,315,171	0.99%	2.94%
Total All Funds	$ 812,550,138	$ 5,163,845	$ 1,941,682	$ -	$ 819,655,665	0.87%	0.63%

Notes: Source data provided by the record keeper, Empower Retirement.
(1) Income divided by beginning assets plus half of net contributions/(withdrawals). Actual returns are calculated by Callan and Associates.

Defined Contribution Retirement - Participant Directed TRS
Schedule of Invested Assets with
Schedule of Investment Income and Changes in Invested Assets
By Month Through the Month Ended
July 31, 2021
$ (Thousands)

Invested Assets (at fair value)		**July**
Investments with T. Rowe Price		
Stable Value Fund	$	46,955
Small Cap Stock Fund		50,379
Alaska Balanced Trust		20,063
Long Term Balanced Fund		5,573
AK Target Date 2010 Trust		1,196
AK Target Date 2015 Trust		4,024
AK Target Date 2020 Trust		14,018
AK Target Date 2025 Trust		27,427
AK Target Date 2030 Trust		37,836
AK Target Date 2035 Trust		52,959
AK Target Date 2040 Trust		62,818
AK Target Date 2045 Trust		90,922
AK Target Date 2050 Trust		126,623
AK Target Date 2055 Trust		82,393
AK Target Date 2060 Trust		2,521
AK Target Date 2065 Trust		365
Investments with JP Morgan		
JPMorgan SmartSpending 2015 R6		0
JPMorgan SmartSpending 2020 R6		0
Investments with State Street Global Advisors		
Money Market		4,501
S&P 500 Stock Index Fund Series A		22,155
Russell 3000 Index		29,502
World Equity Ex-US Index		18,199
Investments with BlackRock		
Passive U.S. Bond Index Fund		32,563
Strategic Completion Fund		1,591
Investments with Brandes and Baillie Gifford		
AK International Equity Fund		46,757
Investments with Northern Trust		
Environmental, Social, and Governance Fund		38,315
Total Invested Assets	**$**	**819,656**
Change in Invested Assets		
Beginning Assets	$	812,550
Investment Earnings		5,164
Net Contributions (Withdrawals)		1,942
Ending Invested Assets	**$**	**819,656**

Source data provided by the record keeper, Empower Retirement.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of July 31, 2021

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the One Months Ending July 31, 2021

	Contributions				Expenditures				Net
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	**Contributions/ (Withdrawals)**
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 35,412,267	$ 97,699,500	$ 12,952	$ 133,124,719	$ (79,054,569)	$ (864,215)	$ (460,572)	$ (80,379,356)	$ 52,745,363
Retirement Health Care Trust	5,676,295	-	6,689,764	12,366,059	(38,013,380)	-	(1,948,733)	(39,962,113)	(27,596,054)
Total Defined Benefit Plans	41,088,562	97,699,500	6,702,716	145,490,778	(117,067,949)	(864,215)	(2,409,305)	(120,341,469)	25,149,309
Defined Contribution Plans:									
Participant Directed Retirement	16,054,599	-	-	16,054,599	-	(7,964,424)	(1,991,966)	(9,956,390)	6,098,209
Health Reimbursement Arrangement [(a)]	4,015,780	-	-	4,015,780	(30,745)	-	(9,457)	(40,202)	3,975,578
Retiree Medical Plan [(a)]	1,520,040	-	3,316	1,523,356	(69,011)	-	(8,534)	(77,545)	1,445,811
Occupational Death and Disability: [(a)]									
All Others	321,648	-	-	321,648	(9,078)	-	(1,206)	(10,284)	311,364
Peace Officers and Firefighters	139,396	-	-	139,396	(27,352)	-	(2,222)	(29,574)	109,822
Total Defined Contribution Plans	22,051,463	-	3,316	22,054,779	(136,186)	(7,964,424)	(2,013,385)	(10,113,995)	11,940,784
Total PERS	**63,140,025**	**97,699,500**	**6,706,032**	**167,545,557**	**(117,204,135)**	**(8,828,639)**	**(4,422,690)**	**(130,455,464)**	**37,090,093**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	5,641,296	142,665,000	2,811	148,309,107	(42,246,685)	(124,385)	(224,734)	(42,595,804)	105,713,303
Retirement Health Care Trust	2,343,374	-	2,326,835	4,670,209	(12,799,641)	-	(711,342)	(13,510,983)	(8,840,774)
Total Defined Benefit Plans	7,984,670	142,665,000	2,329,646	152,979,316	(55,046,326)	(124,385)	(936,076)	(56,106,787)	96,872,529
Defined Contribution Plans:									
Participant Directed Retirement	6,450,366	-	-	6,450,366	-	(3,929,307)	(579,377)	(4,508,684)	1,941,682
Health Reimbursement Arrangement [(a)]	1,119,085	-	-	1,119,085	(7,924)	-	(2,776)	(10,700)	1,108,385
Retiree Medical Plan [(a)]	409,471	-	279	409,750	(24,832)	-	(4,397)	(29,229)	380,521
Occupational Death and Disability [(a)]	34,337	-	-	34,337	(2,025)	-	(916)	(2,941)	31,396
Total Defined Contribution Plans	8,013,259	-	279	8,013,538	(34,781)	(3,929,307)	(587,466)	(4,551,554)	3,461,984
Total TRS	**15,997,929**	**142,665,000**	**2,329,925**	**160,992,854**	**(55,081,107)**	**(4,053,692)**	**(1,523,542)**	**(60,658,341)**	**100,334,513**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	1,293,730	4,185,000	4	5,478,734	(1,221,399)	-	(18,065)	(1,239,464)	4,239,270
Defined Benefit Plan Retirement Health Care Trust	108,178	-	22,255	130,433	(78,522)	-	(10,264)	(88,786)	41,647
Total JRS	**1,401,908**	**4,185,000**	**22,259**	**5,609,167**	**(1,299,921)**	**-**	**(28,329)**	**(1,328,250)**	**4,280,917**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(118,937)	-	(9,034)	(127,971)	(127,971)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	14,212,324	-	-	14,212,324	-	(32,251,832)	(938,145)	(33,189,977)	(18,977,653)
Deferred Compensation Plan [(b)] (DCP)	4,004,606	-	-	4,004,606	-	(7,302,091)	(283,587)	(7,585,678)	(3,581,072)
Total All Funds	**98,756,792**	**244,549,500**	**9,058,216**	**352,364,508**	**(173,704,100)**	**(52,436,254)**	**(7,205,327)**	**(233,345,681)**	**119,018,827**
Total Non-Participant Directed	58,034,897	244,549,500	9,058,216	311,642,613	(173,704,100)	(988,600)	(3,412,252)	(178,104,952)	133,537,661
Total Participant Directed	40,721,895	-	-	40,721,895	-	(51,447,654)	(3,793,075)	(55,240,729)	(14,518,834)
Total All Funds	**$ 98,756,792**	**$ 244,549,500**	**$ 9,058,216**	**$ 352,364,508**	**$ (173,704,100)**	**$ (52,436,254)**	**$ (7,205,327)**	**$ (233,345,681)**	**$ 119,018,827**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended July 31, 2021

	Contributions				Expenditures				Net
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement PensionsTrust	$ 35,412,267	$ 97,699,500	$ 12,952	$ 133,124,719	$ (79,054,569)	$ (864,215)	$ (460,572)	$ (80,379,356)	$ 52,745,363
Retirement Health Care Trust	5,676,295	-	6,689,764	12,366,059	(38,013,380)	-	(1,948,733)	(39,962,113)	(27,596,054)
Total Defined Benefit Plans	41,088,562	97,699,500	6,702,716	145,490,778	(117,067,949)	(864,215)	(2,409,305)	(120,341,469)	25,149,309
Defined Contribution Plans:									
Participant Directed Retirement	16,054,599	-	-	16,054,599	-	(7,964,424)	(1,991,966)	(9,956,390)	6,098,209
Health Reimbursement Arrangement [(a)]	4,015,780	-	-	4,015,780	(30,745)	-	(9,457)	(40,202)	3,975,578
Retiree Medical Plan [(a)]	1,520,040	-	3,316	1,523,356	(69,011)	-	(8,534)	(77,545)	1,445,811
Occupational Death and Disability: [(a)]									
All Others	321,648	-	-	321,648	(9,078)	-	(1,206)	(10,284)	311,364
Peace Officers and Firefighters	139,396	-	-	139,396	(27,352)	-	(2,222)	(29,574)	109,822
Total Defined Contribution Plans	22,051,463	-	3,316	22,054,779	(136,186)	(7,964,424)	(2,013,385)	(10,113,995)	11,940,784
Total PERS	**63,140,025**	**97,699,500**	**6,706,032**	**167,545,557**	**(117,204,135)**	**(8,828,639)**	**(4,422,690)**	**(130,455,464)**	**37,090,093**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement PensionsTrust	5,641,296	142,665,000	2,811	148,309,107	(42,246,685)	(124,385)	(224,734)	(42,595,804)	105,713,303
Retirement Health Care Trust	2,343,374	-	2,326,835	4,670,209	(12,799,641)	-	(711,342)	(13,510,983)	(8,840,774)
Total Defined Benefit Plans	7,984,670	142,665,000	2,329,646	152,979,316	(55,046,326)	(124,385)	(936,076)	(56,106,787)	96,872,529
Defined Contribution Plans:									
Participant Directed Retirement	6,450,366	-	-	6,450,366	-	(3,929,307)	(579,377)	(4,508,684)	1,941,682
Health Reimbursement Arrangement [(a)]	1,119,085	-	-	1,119,085	(7,924)	-	(2,776)	(10,700)	1,108,385
Retiree Medical Plan [(a)]	409,471	-	279	409,750	(24,832)	-	(4,397)	(29,229)	380,521
Occupational Death and Disability [(a)]	34,337	-	-	34,337	(2,025)	-	(916)	(2,941)	31,396
Total Defined Contribution Plans	8,013,259	-	279	8,013,538	(34,781)	(3,929,307)	(587,466)	(4,551,554)	3,461,984
Total TRS	**15,997,929**	**142,665,000**	**2,329,925**	**160,992,854**	**(55,081,107)**	**(4,053,692)**	**(1,523,542)**	**(60,658,341)**	**100,334,513**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	1,293,730	4,185,000	4	5,478,734	(1,221,399)	-	(18,065)	(1,239,464)	4,239,270
Defined Benefit Plan Retirement Health Care Trust	108,178	-	22,255	130,433	(78,522)	-	(10,264)	(88,786)	41,647
Total JRS	**1,401,908**	**4,185,000**	**22,259**	**5,609,167**	**(1,299,921)**	**-**	**(28,329)**	**(1,328,250)**	**4,280,917**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(118,937)	-	(9,034)	(127,971)	(127,971)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	14,212,324	-	-	14,212,324	-	(32,251,832)	(938,145)	(33,189,977)	(18,977,653)
Deferred Compensation Plan [(b)] (DCP)	4,004,606	-	-	4,004,606	-	(7,302,091)	(283,587)	(7,585,678)	(3,581,072)
Total All Funds	**98,756,792**	**244,549,500**	**9,058,216**	**352,364,508**	**(173,704,100)**	**(52,436,254)**	**(7,205,327)**	**(233,345,681)**	**119,018,827**
Total Non-Participant Directed	58,034,897	244,549,500	9,058,216	311,642,613	(173,704,100)	(988,600)	(3,412,252)	(178,104,952)	133,537,661
Total Participant Directed	40,721,895	-	-	40,721,895	-	(51,447,654)	(3,793,075)	(55,240,729)	(14,518,834)
Total All Funds	**$ 98,756,792**	**$ 244,549,500**	**$ 9,058,216**	**$ 352,364,508**	**$ (173,704,100)**	**$ (52,436,254)**	**$ (7,205,327)**	**$ (233,345,681)**	**$ 119,018,827**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the One Months Ending July 31, 2021

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

Type	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 5,726	$ -	$ 45,275	$ 53,102	$ 104,103	0.2%
Death Benefit	193,941	208,334	889,091	61,017	1,352,383	2.6%
Disability / Hardship	-	-	16,603	4,074	20,677	0.0%
Minimum Required Distribution	4,824	143	939,695	282,387	1,227,049	2.4%
Qualified Domestic Relations Order	20,884	-	940,101	115,037	1,076,022	2.1%
Separation from Service / Retirement	7,739,049	3,720,830	29,367,213	6,734,354	47,561,446	92.5%
Purchase of Service Credit	-	-	53,854	52,120	105,974	0.2%
CARES Act Distributions	-	-	-	-	-	0.0%
TOTAL	$ 7,964,424	$ 3,929,307	$ 32,251,832	$ 7,302,091	$ 51,447,654	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	$ 7,081,810	$ 3,622,471	$ 10,704,281	89.9%
75% Vested	128,170	101,422	229,592	1.9%
50% Vested	241,889	79,273	321,162	2.7%
25% Vested	312,515	53,542	366,057	3.1%
0% Vested	200,040	72,599	272,639	2.3%
TOTAL	$ 7,964,424	$ 3,929,307	$ 11,893,731	99.9%

DEFINED BENEFIT REFUNDS BY PLAN, TIER, CONTRIBUTION TYPE AND VESTED STATUS

	PERS DB Pension Plan				TRS DB Pension Plan			JRS	TOTAL
Contribution Type	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan	DB Pension Plan
Mandatory Vested	$ 92,958	$ 371,742	$ 2,130,659	$ 2,595,359	$ 60,162	$ 390,410	$ 450,572	$ -	$ 3,045,931.00
Mandatory Non-Vested	203,043	435,051	817,613	1,455,707	242,471	734,188	976,659	-	2,432,366
Geographic Differential	-	227,773	123,043	350,816	-	-	-	-	350,816
Voluntary Full	467,058	1,120,125	1,821,314	3,408,497	-	-	-	-	3,408,497
Indebtedness, Lagging & Partial	(651,436)	(1,967,460)	(4,327,268)	(6,946,164)	(302,633)	(1,000,213)	(1,302,846)	-	(8,249,010)
TOTAL	$ 111,623	$ 187,231	$ 565,361	$ 864,215	$ -	$ 124,385	$ 124,385	$ -	$ 988,600

Notes for the DRB Supplement to the Treasury Report

July 2021

This report is the DRB supplement to the Treasury Division's Financial Report. It expands the "Net Contributions/(Withdrawals)" column into contributions and expenditures. It shows contributions received from both employees and employers, contributions from the State of Alaska, and other non-investment income. This report also expands expenditures into benefits, refunds & disbursements, and administrative & investment expenditures.

The net amount of total contributions and total expenditures, presented as "Net Contributions/(Withdrawals)", agrees with the same column in the Treasury Division's Report. Page one shows the year-to-date totals for the first one months of Fiscal Year 2022, while page two shows only the month of July 2021.

Highlights – On page one, for the one month ending July 31, 2021:

- PERS DB Pension – Average employer and employee contributions of $32.1 million per month; benefit payments of approximately $77.9 million per month; refunds average $796 thousand; and administrative and investment expenditures of $344 thousand per month (DOR and DRB).
- PERS DB Healthcare – Average employer contributions of $5.5 million per month; benefit payments of approximately $37 million per month; other income of $1.5 million from OptumRx EGWP Subsidies; $5.2 million from EGWP coverage gap discount plan (CGDP) (most recently received in July for 1st Qtr 2021); and average administrative and investment expenditures of $1.6 million per month (DOR and DRB).
- PERS DC Pension – Average employer and employee contributions of $15.7 million per month; participant disbursements average $5.8 million per month; and average administrative and investment expenditures of $779 thousand per month (DOR and DRB).
- PERS DCR Health – For HRA, RMP, and OD&D, only employer contributions average $5.9 million per month on behalf of participating employees; benefit payments of approximately $120 thousand per month. Currently, 14 benefits are being paid from the Occupational Death & Disability plans, 73 retirees are participating in RMP, and 115 retirees are participating in HRA. Other income of $3 thousand from OptumRx EGWP Subsidies; for ; 437 thousand from EGWP coverage gap discount plan (CGDP) (most recently received in July for 1st Qtr 2021); and administrative and investment expenditures were approximately $14 thousand per month (DOR and DRB).
- TRS DB Pension - Average employer and employee contributions of $5.4 million per month; benefit payments of approximately $42 million per month; refunds average $136 thousand; and average administrative and investment expenditures of $164 thousand per month (DOR and DRB).
- TRS DB Healthcare – Average employer contributions of $2.2 million per month; benefit payments of approximately $12.1 million per month; other income of $528 thousand from OptumRx EGWP Subsidies; $1.8 million from EGWP coverage gap discount plan (CGDP) (most recently received in July for 1st Qtr 2021); and average administrative and investment expenditures of $594 thousand per month (DOR and DRB).
- TRS DC Pension – Average employer and employee contributions of $6 million per month; participant disbursements average $2.5 million per month; and average administrative and investment expenditures of $238 thousand per month (DOR and DRB).

- TRS DCR Health – For HRA, RMP, and OD&D only, employer contributions average $1.5 million per month on behalf of participating employees; benefit payments of approximately $45 thousand per month. Currently, 1 benefit is being paid from the Occupational Death & Disability plans, 21 retirees are participating in RMP, and 31 retirees are participating in HRA. Other income of $280 was received from monthly OptumRx EGWP Subsidies; and administrative and investment expenditures were approximately $5 thousand per month (DOR and DRB).
- JRS Pension – Average employer and employee contributions of $653 thousand per month; benefit payments of approximately $1.2 million per month; and average administrative and investment expenditures of $8 thousand per month (DOR and DRB).
- JRS Healthcare – Average employer contributions of $59 thousand per month; benefit payments of approximately $91 thousand per month. Other income of $4 thousand from OptumRx EGWP Subsidies; $18 thousand from EGWP coverage gap discount plan (CGDP) (most recently received in July for 1st Qtr 2021); and average administrative and investment expenditures of $7 thousand per month (DOR and DRB).
- NGNMRS – A combination of lump-sum and monthly benefit payments of $98 thousand per month; and average administrative and investment expenditures of $7 thousand per month (DOR and DRB).
- SBS – Average employer and employee contributions and transfers in of $13.6 million per month. Participant disbursements average of $23.1 million per month; and average administrative and investment expenditures of $605 thousand per month (DOR and DRB).
- Deferred Compensation – Average member-only contributions and transfers in of $3.5 million per month; participant disbursements average of $6.6 million per month; and average administrative and investment expenditures of $200 thousand per month (DOR and DRB).

Highlights – On page two, activity for the one month of July 2021 only:

- PERS DB Pension – State of Alaska additional contributions of $97.7 million.
- PERS DB Healthcare – Other Income of $6.7 million from OptumRx EGWP subsidies and Coverage Gap Discount Plan.
- TRS DB Pension – State of Alaska additional contributions of $142.7 million
- TRS DB Healthcare – Other Income of $2.3 million from OptumRx EGWP subsidies and Coverage Gap Discount Plan.
- JRS DB Healthcare – Other Income of $22 thousand from OptumRx EGWP subsidies and Coverage Gap Discount Plan.
- All other funds – Nothing significant to report.

If you have any questions or comments, please let me know.

ALASKA RETIREMENT MANAGEMENT BOARD

FINANCIAL REPORT
(Supplement to the Treasury Division Report)

As of June 30, 2021

Prepared by the Division of Retirement & Benefits

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Twelve Months Ending June 30, 2021

	Contributions				Expenditures				Net
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 380,892,572	$ 203,585,000	$ 118,308	$ 584,595,880	$ (926,641,551)	$ (8,106,952)	$ (4,640,617)	$ (939,389,120)	$ (354,793,240)
Retirement Health Care Trust	71,370,051	-	87,384,347	158,754,398	(458,166,028)	-	(24,169,408)	(482,335,436)	(323,581,038)
Total Defined Benefit Plans	452,262,623	203,585,000	87,502,655	743,350,278	(1,384,807,579)	(8,106,952)	(28,810,025)	(1,421,724,556)	(678,374,278)
Defined Contribution Plans:									
Participant Directed Retirement	190,297,728	-	-	190,297,728	-	(67,515,127)	(5,085,146)	(72,600,273)	117,697,455
Health Reimbursement Arrangement [(a)]	47,771,183	-	-	47,771,183	(270,681)	-	(156,254)	(426,935)	47,344,248
Retiree Medical Plan [(a)]	18,879,624	-	97,331	18,976,955	(594,405)	-	(96,636)	(691,041)	18,285,914
Occupational Death and Disability: [(a)]									
All Others	3,823,977	-	-	3,823,977	(108,869)	-	(15,871)	(124,740)	3,699,237
Peace Officers and Firefighters	1,479,360	-	-	1,479,360	(336,288)	-	(24,335)	(360,623)	1,118,737
Total Defined Contribution Plans	262,251,872	-	97,331	262,349,203	(1,310,243)	(67,515,127)	(5,378,242)	(74,203,612)	188,145,591
Total PERS	**714,514,495**	**203,585,000**	**87,599,986**	**1,005,699,481**	**(1,386,117,822)**	**(75,622,079)**	**(34,188,267)**	**(1,495,928,168)**	**(490,228,687)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	62,724,820	134,976,000	44,564	197,745,384	(501,880,066)	(1,486,851)	(2,482,617)	(505,849,534)	(308,104,150)
Retirement Health Care Trust	24,605,999	-	29,455,724	54,061,723	(146,227,592)	-	(6,794,435)	(153,022,027)	(98,960,304)
Total Defined Benefit Plans	87,330,819	134,976,000	29,500,288	251,807,107	(648,107,658)	(1,486,851)	(9,277,052)	(658,871,561)	(407,064,454)
Defined Contribution Plans:									
Participant Directed Retirement	68,249,221	-	-	68,249,221	-	(23,899,240)	(1,897,819)	(25,797,059)	42,452,162
Health Reimbursement Arrangement [(a)]	13,185,156	-	-	13,185,156	(110,591)	-	(46,438)	(157,029)	13,028,127
Retiree Medical Plan [(a)]	4,401,390	-	4,941	4,406,331	(274,900)	-	(52,047)	(326,947)	4,079,384
Occupational Death and Disability [(a)]	362,331	-	-	362,331	(24,292)	-	(9,936)	(34,228)	328,103
Total Defined Contribution Plans	86,198,098	-	4,941	86,203,039	(409,783)	(23,899,240)	(2,006,240)	(26,315,263)	59,887,776
Total TRS	**173,528,917**	**134,976,000**	**29,505,229**	**338,010,146**	**(648,517,441)**	**(25,386,091)**	**(11,283,292)**	**(685,186,824)**	**(347,176,678)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	6,452,569	5,145,000	-	11,597,569	(14,388,159)	-	(114,667)	(14,502,826)	(2,905,257)
Defined Benefit Plan Retirement Health Care Trust	668,504	-	246,623	915,127	(1,696,059)	-	(68,376)	(1,764,435)	(849,308)
Total JRS	**7,121,073**	**5,145,000**	**246,623**	**12,512,696**	**(16,084,218)**	**-**	**(183,043)**	**(16,267,261)**	**(3,754,565)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [(a)]	-	-	-	-	(1,576,365)	-	(109,424)	(1,685,789)	(1,685,789)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	176,124,142	-	-	176,124,142	-	(270,450,701)	(8,172,300)	(278,623,001)	(102,498,859)
Deferred Compensation Plan [(b)] (DCP)	47,108,653	-	-	47,108,653	-	(79,593,391)	(2,259,766)	(81,853,157)	(34,744,504)
Total All Funds	**1,118,397,280**	**343,706,000**	**117,351,838**	**1,579,455,118**	**(2,052,295,846)**	**(451,052,262)**	**(56,196,092)**	**(2,559,544,200)**	**(980,089,082)**
Total Non-Participant Directed	636,617,536	343,706,000	117,351,838	1,097,675,374	(2,052,295,846)	(9,593,803)	(38,781,061)	(2,100,670,710)	(1,002,995,336)
Total Participant Directed	481,779,744	-	-	481,779,744	-	(441,458,459)	(17,415,031)	(458,873,490)	22,906,254
Total All Funds	**$ 1,118,397,280**	**$ 343,706,000**	**$ 117,351,838**	**$ 1,579,455,118**	**$ (2,052,295,846)**	**$ (451,052,262)**	**$ (56,196,092)**	**$ (2,559,544,200)**	**$ (980,089,082)**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Month Ended June 30, 2021

	Contributions				Expenditures				Net
	Contributions EE and/or ER	State of Alaska	Other	Total Contributions	Benefits	Refunds & Disbursements	Administrative & Investment	Total Expenditures	Contributions/ (Withdrawals)
Public Employees' Retirement System (PERS)									
Defined Benefit Plans:									
Retirement Pension Trust	$ 38,423,386	$ -	$ 12,740	$ 38,436,126	$ (78,664,846)	$ (874,880)	$ (422,078)	$ (79,961,804)	$ (41,525,678)
Retirement Health Care Trust	6,624,085	-	9,877,837	16,501,922	(46,553,642)	-	(1,389,404)	(47,943,046)	(31,441,124)
Total Defined Benefit Plans	45,047,471	-	9,890,577	54,938,048	(125,218,488)	(874,880)	(1,811,482)	(127,904,850)	(72,966,802)
Defined Contribution Plans:									
Participant Directed Retirement	19,720,977	-	-	19,720,977	-	(6,900,252)	(189,382)	(7,089,634)	12,631,343
Health Reimbursement Arrangement [a]	4,884,650	-	-	4,884,650	(32,051)	-	(16,155)	(48,206)	4,836,444
Retiree Medical Plan [a]	1,957,734	-	9,748	1,967,482	(88,872)	-	(6,470)	(95,342)	1,872,140
Occupational Death and Disability: [a]									
All Others	401,265	-	-	401,265	(9,070)	-	(915)	(9,985)	391,280
Peace Officers and Firefighters	150,610	-	-	150,610	(27,348)	-	(458)	(27,806)	122,804
Total Defined Contribution Plans	27,115,236	-	9,748	27,124,984	(157,341)	(6,900,252)	(213,380)	(7,270,973)	19,854,011
Total PERS	**72,162,707**	**-**	**9,900,325**	**82,063,032**	**(125,375,829)**	**(7,775,132)**	**(2,024,862)**	**(135,175,823)**	**(53,112,791)**
Teachers' Retirement System (TRS)									
Defined Benefit Plans:									
Retirement Pension Trust	10,268,491	-	1,765	10,270,256	(41,619,401)	(135,369)	(223,786)	(41,978,556)	(31,708,300)
Retirement Health Care Trust	4,196,865	-	3,092,301	7,289,166	(14,317,777)	-	(497,591)	(14,815,368)	(7,526,202)
Total Defined Benefit Plans	14,465,356	-	3,094,066	17,559,422	(55,937,178)	(135,369)	(721,377)	(56,793,924)	(39,234,502)
Defined Contribution Plans:									
Participant Directed Retirement	11,343,628	-	-	11,343,628	-	(1,754,188)	(72,824)	(1,827,012)	9,516,616
Health Reimbursement Arrangement [a]	1,953,694	-	-	1,953,694	(11,611)	-	(4,766)	(16,377)	1,937,317
Retiree Medical Plan [a]	711,644	-	695	712,339	(26,403)	-	(2,071)	(28,474)	683,865
Occupational Death and Disability [a]	60,503	-	-	60,503	(2,024)	-	(162)	(2,186)	58,317
Total Defined Contribution Plans	14,069,469	-	695	14,070,164	(40,038)	(1,754,188)	(79,823)	(1,874,049)	12,196,115
Total TRS	**28,534,825**	**-**	**3,094,761**	**31,629,586**	**(55,977,216)**	**(1,889,557)**	**(801,200)**	**(58,667,973)**	**(27,038,387)**
Judicial Retirement System (JRS)									
Defined Benefit Plan Retirement Pension Trust	668,683	-	-	668,683	(1,207,553)	-	(5,459)	(1,213,012)	(544,329)
Defined Benefit Plan Retirement Health Care Trust	69,105	-	25,245	94,350	(139,090)	-	(4,277)	(143,367)	(49,017)
Total JRS	**737,788**	**-**	**25,245**	**763,033**	**(1,346,643)**	**-**	**(9,736)**	**(1,356,379)**	**(593,346)**
National Guard/Naval Militia Retirement System (NGNMRS)									
Defined Benefit Plan Retirement Pension Trust [a]	-	-	-	-	(119,991)	-	(126)	(120,117)	(120,117)
Other Participant Directed Plans									
Supplemental Annuity Plan (SBS)	20,701,110	-	-	20,701,110	-	(18,917,468)	(469,116)	(19,386,584)	1,314,526
Deferred Compensation Plan [b] (DCP)	5,831,510	-	-	5,831,510	-	(6,154,468)	(170,055)	(6,324,523)	(493,013)
Total All Funds	**127,967,940**	**-**	**13,020,331**	**140,988,271**	**(182,819,679)**	**(34,736,625)**	**-**	**(221,031,399)**	**(80,043,128)**
Total Non-Participant Directed	70,370,715	-	13,020,331	83,391,046	(182,819,679)	(1,010,249)	(2,573,718)	(186,403,646)	(103,012,600)
Total Participant Directed	57,597,225	-	-	57,597,225	-	(33,726,376)	(901,377)	(34,627,753)	22,969,472
Total All Funds	**$ 127,967,940**	**$ -**	**$ 13,020,331**	**$ 140,988,271**	**$ (182,819,679)**	**$ (34,736,625)**	**$ (3,475,095)**	**$ (221,031,399)**	**$ (80,043,128)**

(a) Employer only contributions.
(b) Employee only contributions.

ALASKA RETIREMENT MANAGEMENT BOARD
SCHEDULE OF NON-INVESTMENT CHANGES BY FUND
(Supplement to the Treasury Division Report)
For the Twelve Months Ending June 30, 2021

PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND TYPE

Type	PERS DCR Plan	TRS DCR Plan	Supplemental Annuity Plan	Deferred Compensation	TOTAL	% of Total
Payment to Beneficiary	$ 108,166	$ -	$ 714,582	$ 125,934	$ 948,682	0.2%
Death Benefit	1,895,458	818,444	16,607,653	5,247,860	24,569,415	5.6%
Disability / Hardship	109,191	113,179	172,674	95,079	490,123	0.1%
Minimum Required Distribution	79,401	17,288	8,310,733	2,548,418	10,955,840	2.5%
Qualified Domestic Relations Order	861,269	267,711	5,745,745	840,412	7,715,137	1.7%
Separation from Service / Retirement	64,461,642	22,682,618	209,937,673	66,649,270	363,731,203	82.4%
Purchase of Service Credit	-	-	951,507	328,059	1,279,566	0.3%
CARES Act Distributions	-	-	28,010,134	3,758,359	31,768,493	7.2%
TOTAL	$ 67,515,127	$ 23,899,240	$ 270,450,701	$ 79,593,391	$ 441,458,459	100.0%

PERS & TRS PARTICIPANT DIRECTED DISBURSEMENTS BY PLAN AND VESTED PERCENTAGE

Vesting	PERS DCR Plan	TRS DCR Plan	TOTAL	% of Total
100% Vested	$ 59,046,001	$ 21,336,866	$ 80,382,867	88.0%
75% Vested	1,843,870	714,253	2,558,123	2.8%
50% Vested	1,810,302	499,340	2,309,642	2.5%
25% Vested	1,835,843	661,633	2,497,476	2.7%
0% Vested	2,979,111	687,148	3,666,259	4.0%
TOTAL	$ 67,515,127	$ 23,899,240	$ 91,414,367	100.0%

DEFINED BENEFIT REFUNDS BY PLAN, TIER, CONTRIBUTION TYPE AND VESTED STATUS

	PERS DB Pension Plan				TRS DB Pension Plan			JRS	TOTAL
Contribution Type	Tier 1	Tier 2	Tier 3	Total	Tier 1	Tier 2	Total	DB Pension Plan	DB Pension Plan
Mandatory Vested	$ 92,958	$ 371,742	$ 2,130,659	$ 2,595,359	$ 60,162	$ 390,410	$ 450,572	$ -	$ 3,045,931.00
Mandatory Non-Vested	203,043	435,051	817,613	1,455,707	242,471	734,188	976,659	-	2,432,366
Geographic Differential	-	227,773	123,043	350,816	-	-	-	-	350,816
Voluntary Full	467,058	1,120,125	1,821,314	3,408,497	-	-	-	-	3,408,497
Indebtedness, Lagging & Partial	11,505	101,881	183,187	296,573	91	59,529	59,620	-	356,193
TOTAL	$ 774,564	$ 2,256,572	$ 5,075,816	$ 8,106,952	$ 302,724	$ 1,184,127	$ 1,486,851	$ -	$ 9,593,803

Callan

September 23, 2021

ARMB Board Meeting

Preliminary Investment Performance
Periods Ended June 30, 2021

Steve Center, CFA
Senior Vice President

Paul Erlendson
Senior Vice President

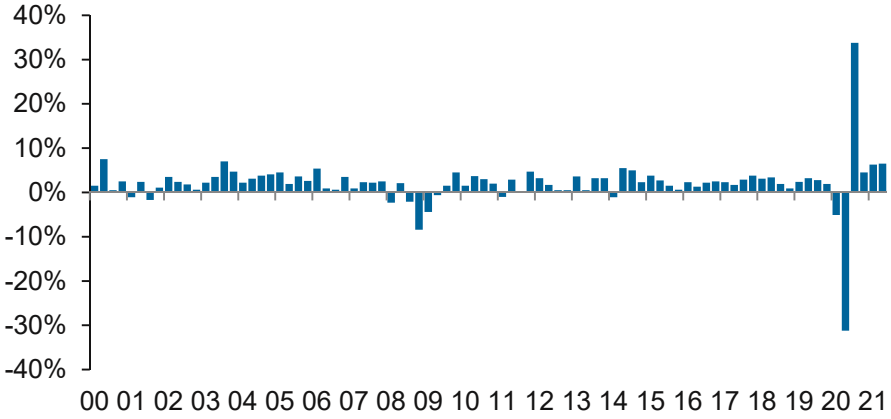
Agenda

- Market and Economic Environment
- Total Fund Performance
  - Defined Benefit Plans' Major Asset Classes
  - Participant-Directed Plans

U.S. Economy—Summary

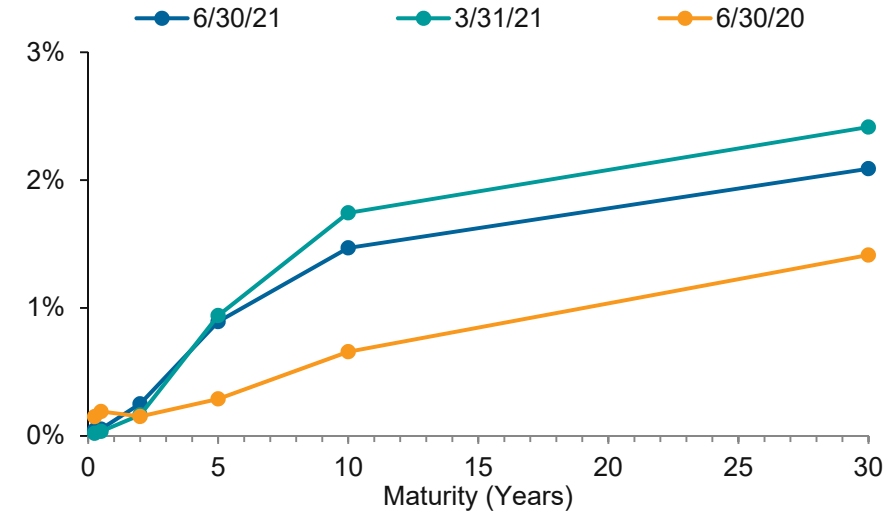
For periods ended 6/30/21

Quarterly Real GDP Growth

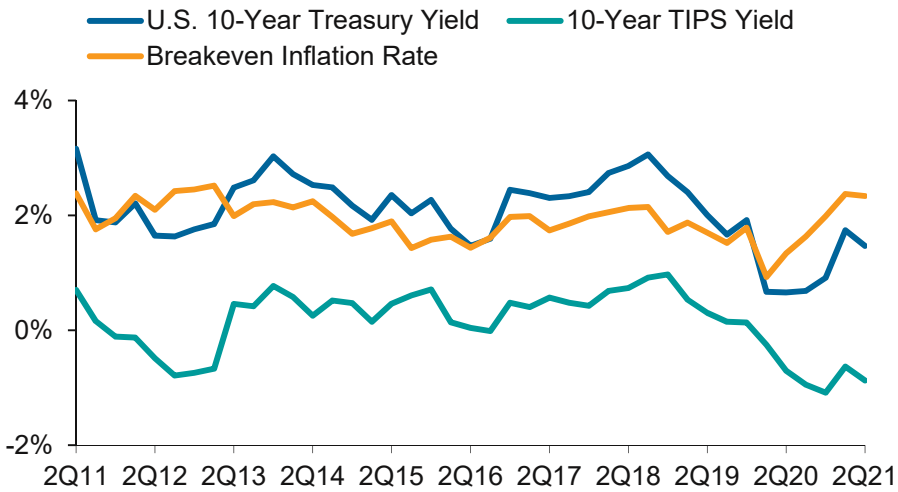


Inflation Year-Over-Year

U.S. Treasury Yield Curves



Historical 10-Year Yields



Sources: Bloomberg, Bureau of Labor Statistics, Callan

Market Environment: 2Q21

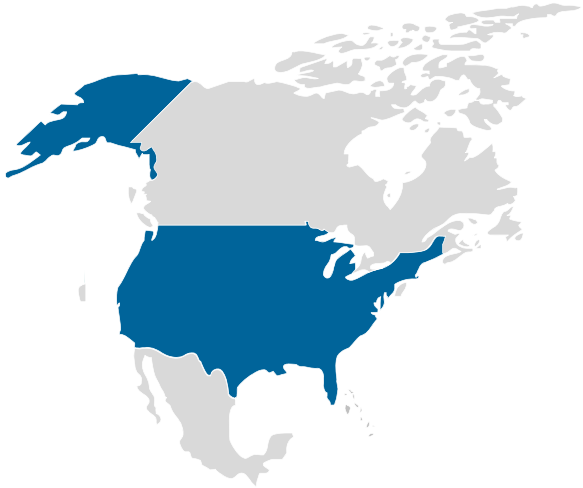
Strong growth worldwide, but continued uncertainty from uneven vaccine rollout

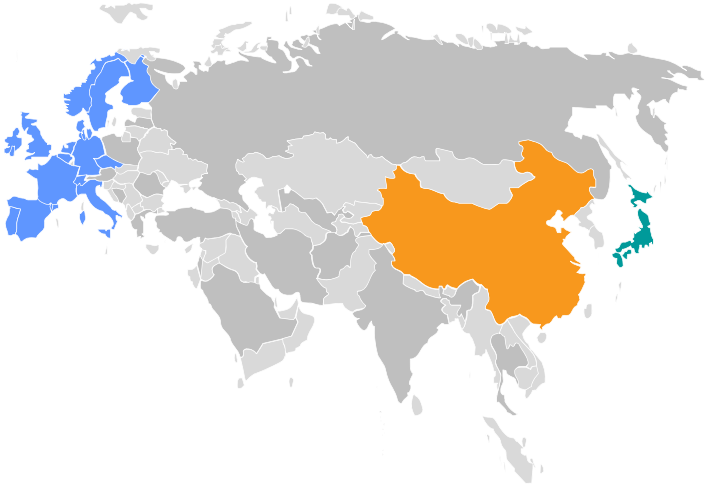
U.S.

- 2020 GDP loss of 3.4% for the year is the deepest recession in 75 years. GDP rose 6.5% in the second quarter, and the Fed still expects 7.0% growth for the year.
- Consumer spending, non-residential investment, and exports drove GDP gains. Consumers ramped up spending on food services, accommodations, and recreation services (gambling!), along with motor vehicles.
- Unemployment dropped to 6.0% in March but held steady at 5.9% through June, despite another large monthly gain of 850,000 jobs.
  - Considerable slack left in the job market, as measured by number of jobs still lost and the number unemployed compared to pre-pandemic levels.

Global

- Euro zone GDP expanded 8.2% in 2Q21, after shrinking in 4Q20 and 1Q21.
- U.K. GDP on track for 7.2% growth in 2021, per OECD, although the organization warns the U.K. may face a longer road to recovery than the euro zone due to the double-whammy of the pandemic and Brexit.
- Japan's economy is expected to grow much more modestly than other developed nations in 2021; OECD expects 2.6% for the year.
- China's GDP grew 5.3% in 2Q21, after slowing to just 1.6% in 1Q21. China was one of the few economies to see growth in GDP during 2020.



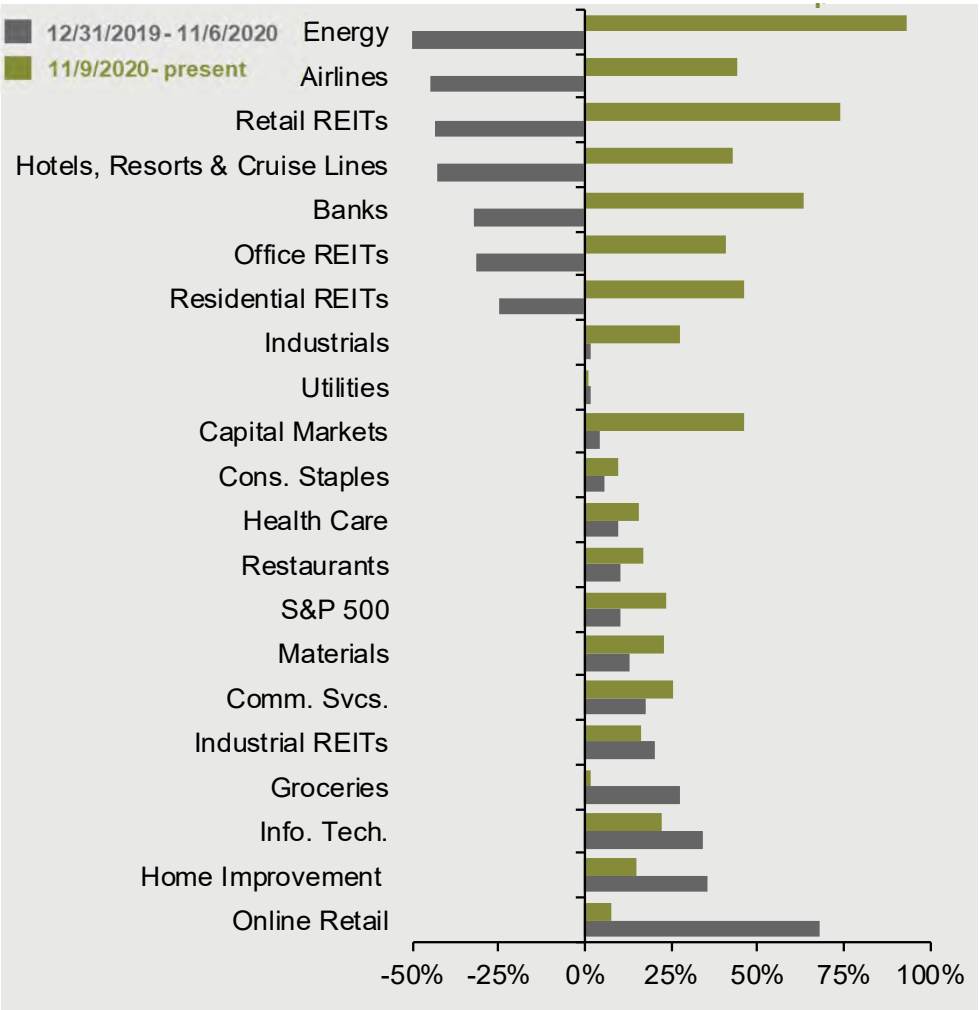


U.S. Stock Market Sector Leadership Through the Pandemic

COVID trade flipped to a 'GDP growth trade' with the announcement of vaccines in November

- Best-performing sectors employ far fewer workers than many of the underperforming sectors (health care, capital markets, banks, hospitality, transportation, energy).

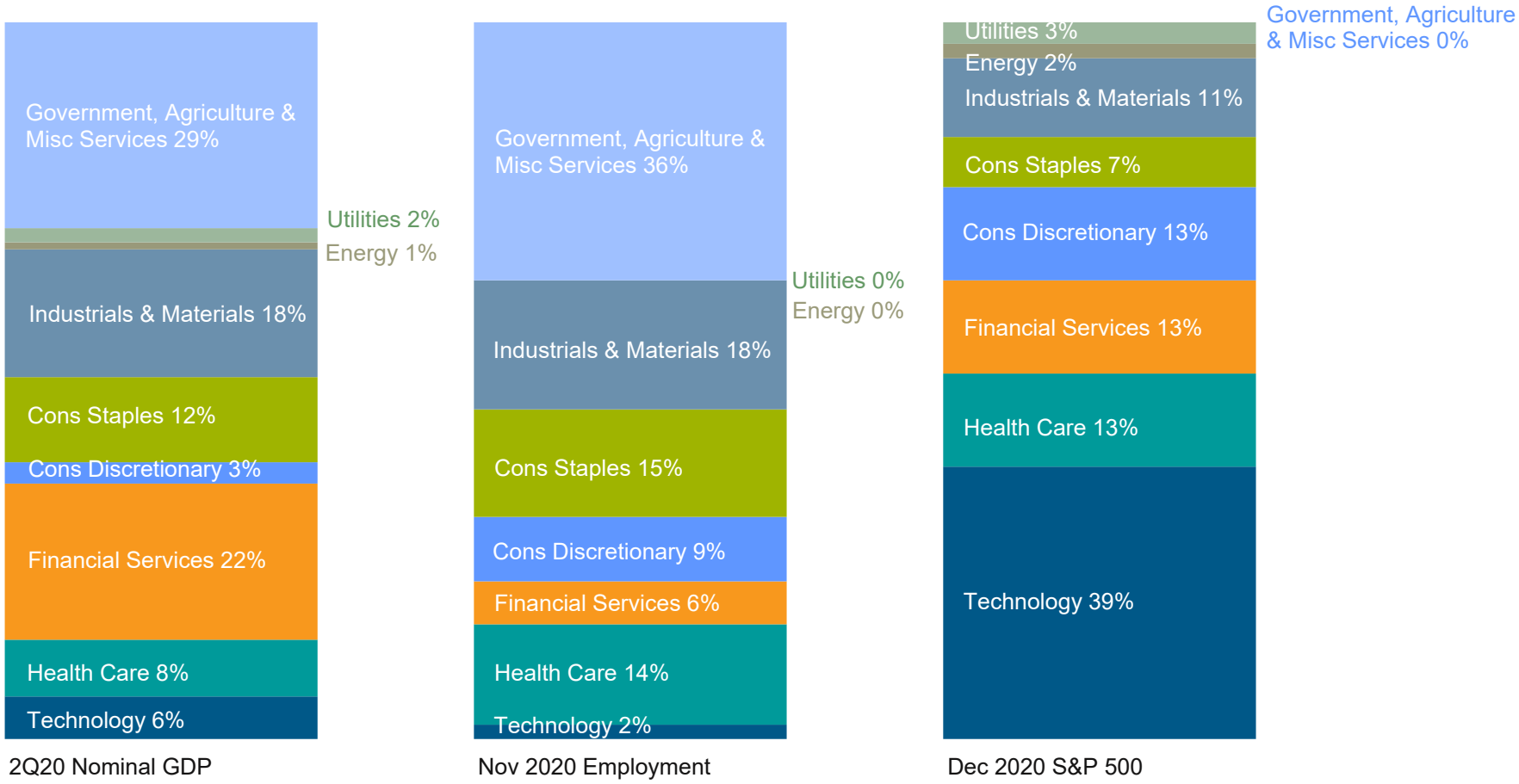
Performance by sector and industry (total returns, USD)



Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management. Nov. 6, 2020, chosen as the last business day before vaccine candidate is revealed to have more than 90% efficacy against the COVID-19 virus in global trials. Guide to the Markets – U.S. Data are as of June 30, 2021.

The Stock Market Is Not the Economy

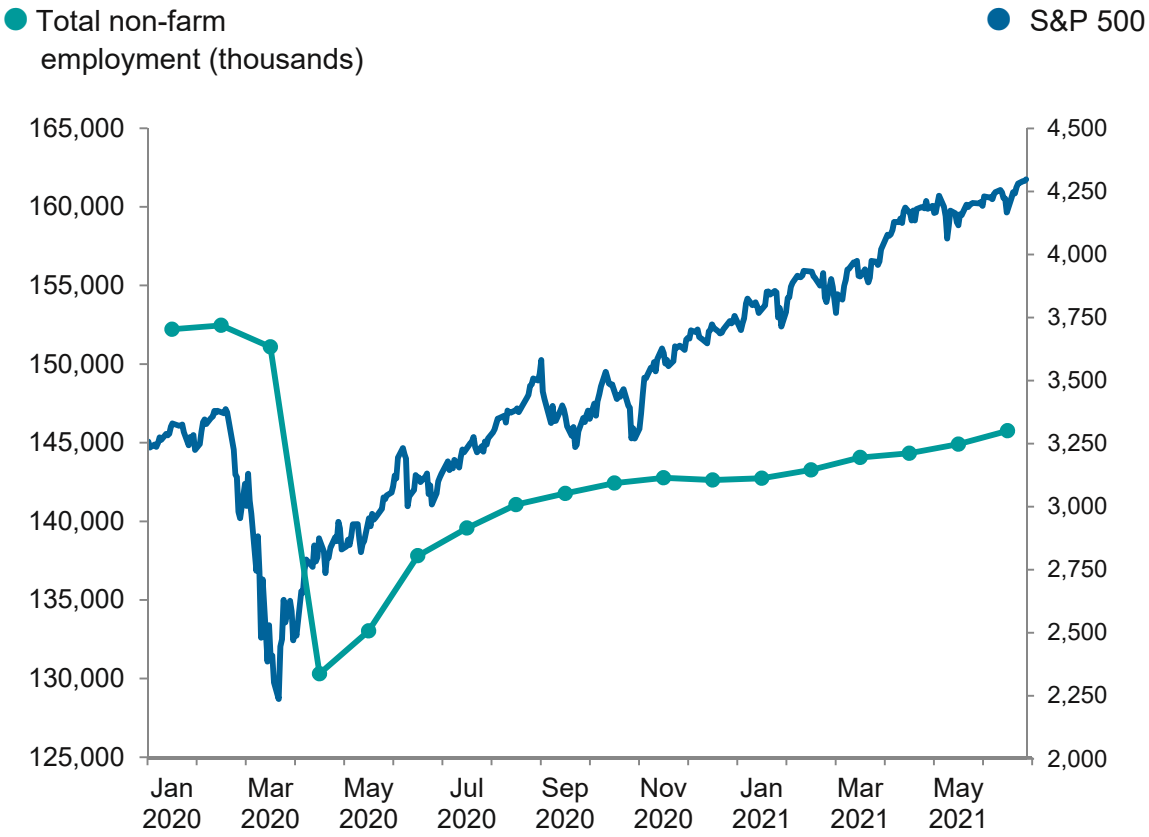
Sector share of GDP, employment, and S&P 500 at 12/31/20



Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, S&P Dow Jones Indices, J.P. Morgan Asset Management Guide to the Markets – U.S. Data are as of 12/31/20. Technology: information (economy, employment), technology and communication services (S&P 500). Financial services includes real estate (S&P 500). Consumer discretionary: Arts, entertainment, recreation, accommodation, and food services (economy), leisure and hospitality (employment). Consumer staples: wholesale trade and retail trade (economy, employment). Industrials and materials: construction, manufacturing, transportation and warehousing (economy, employment). Energy: mining (economy), mining and logging (employment). Government, agriculture & misc. services: government, other services, professional and business services, education and agriculture, forestry, fishing, and hunting (economy), government, other services, professional and business services, and education (employment).

The Stock Market Is Not the Economy

- U.S. equity market has already recovered from the March 2020 plunge. Large cap (S&P 500) is up 96% from the bottom.
- U.S. job market created 22.8 million jobs in the decade from Feb 2010 – Feb 2020. The job market lost over 22.4 million jobs in March and April, and has recovered just 15.5 million since May.
- GDP has regained its pre-pandemic peak in June 2021, just 16 months.
- Steep structural challenges face many job-laden sectors of the economy that are underrepresented in the current stock market valuation.
- Containment of COVID-19 surges and continued increase in the rate of vaccination are key to retaining confidence in the recovery.

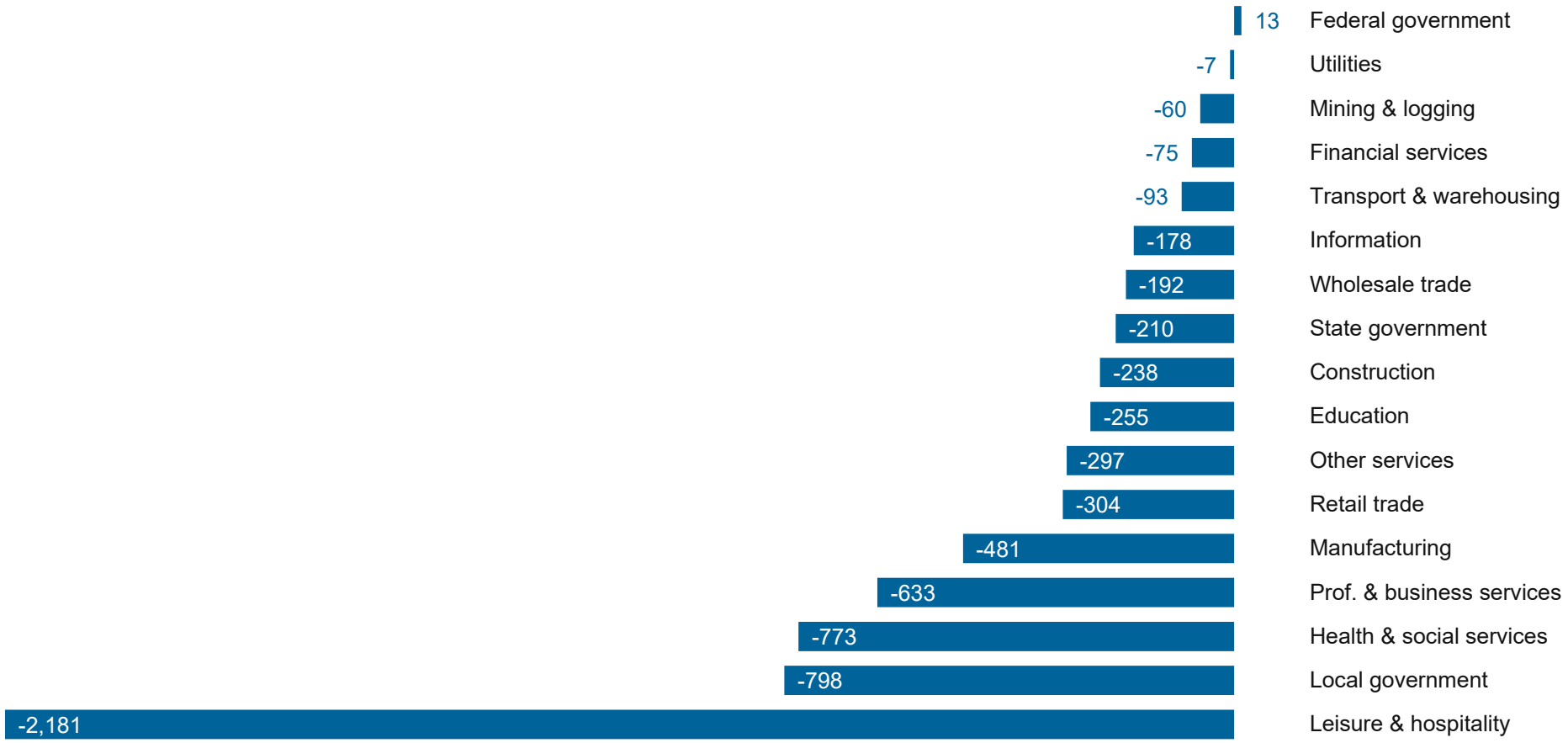


Sources: St. Louis FRED, S&P Dow Jones Indices

While the Recovery Continues, Employment Landscape Remains Depressed

Leisure/hospitality remains by far the hardest-hit sector for job losses

February 2020-June 2021 Change in Payroll Employment (thousands)

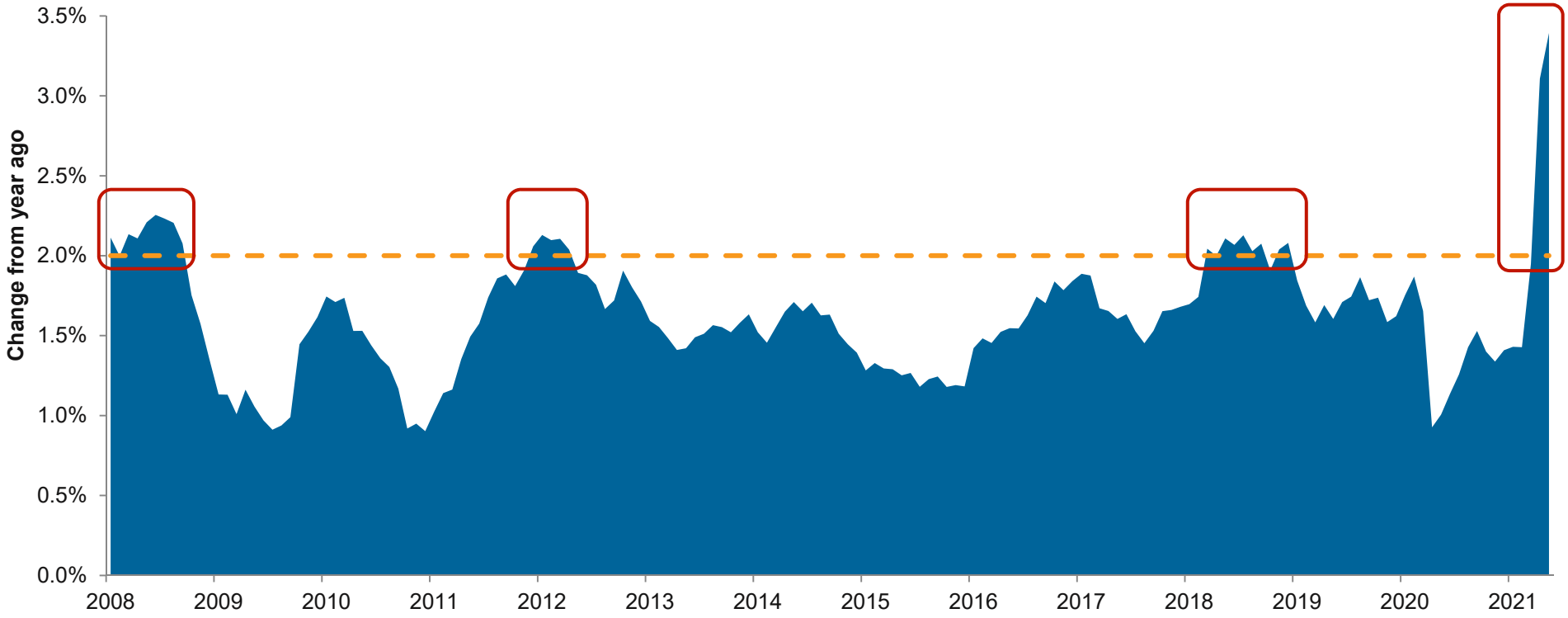


Sources: IHS Markit, Department of Labor

The Fed's New Inflation Framework

Targeting core personal consumption expenditures index

Personal Consumption Expenditures Excluding Food and Energy (Chain-Type Price Index)



- Inflation worries are in the headlines, but the data are not signaling a rise in inflation yet.
- Inflation has consistently undershot the Fed's 2% target, prompting a change in its inflation framework.
- Fed's aim is to achieve an average of 2% inflation over the medium term, not specifically defined.
- PCE is the Fed's target, different from and typically lower than CPI-U, which flashed a year-over-year change of 2.6% in March 2021.

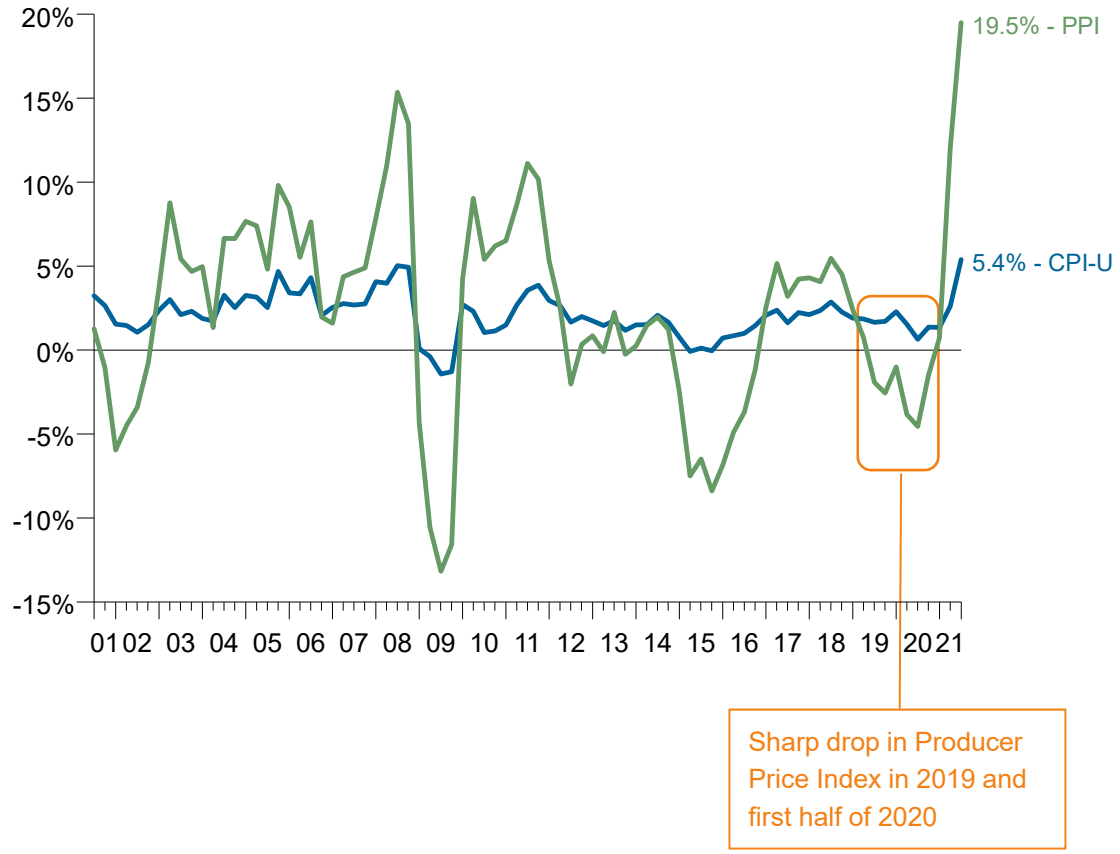
Sources: FRED, U.S. Bureau of Economic Analysis

Inflation Rebounds and Spurs Headline Concerns

CPI and PPI shoot up in 2Q21, but off a depressed base from one year ago

- Inflation fell sharply at the onset of the pandemic, starting in February 2020.
  - The recovery to pre-pandemic levels in the Consumer Price Index required a 2.6% year-over-year change
  - 5.4% jump in CPI-U represents kinks in supply chains and labor markets after a year of global economic disruption and shutdown; many markets cannot simply restart instantaneously
  - Producer prices had been tumbling for more than a year prior to the pandemic; recovery to 2018 price ***levels*** generates eye-popping year-over-year percent change that misrepresents whether we're seeing a "true" spike in inflation.

Consumer and Producer Price Indexes – Inflation Year-Over-Year

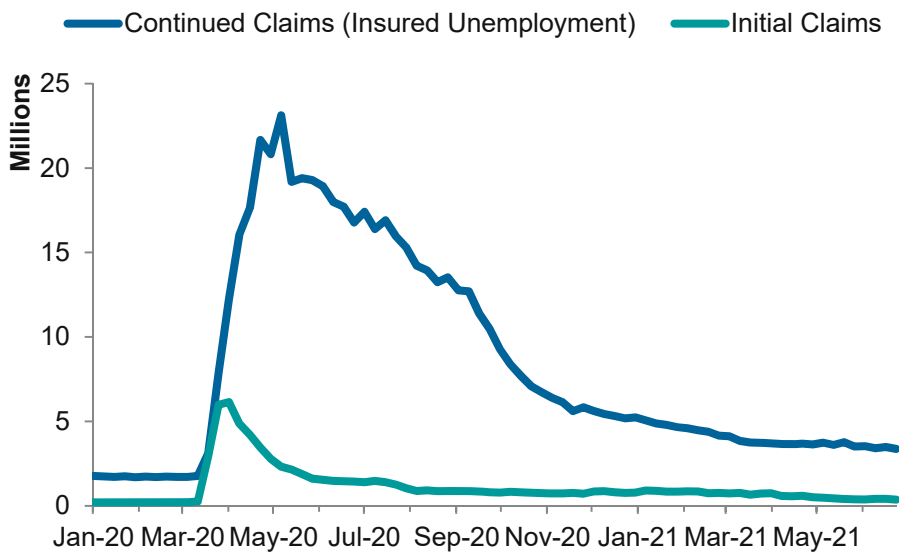


Sources: FRED, Federal Reserve Bank of St. Louis

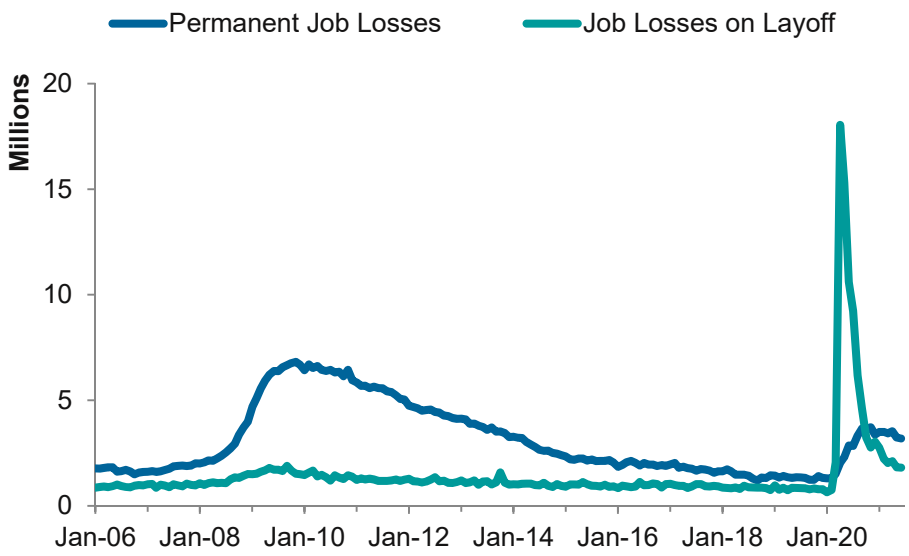
U.S. Job Market

Initial claims, total unemployed

Number of Unemployment Claims



Unemployment Level



- Spike in initial claims to over 6 *million* per week in April 2020
- Remain stubbornly high at 730,000 at the end of March 2021
  - *Far above prior periods of stress*
  - *665,000 in March 2009*
- Job increases (>13 million) surprised on the upside during 2020 and 1Q21; still 9.5 million lost jobs to be regained.

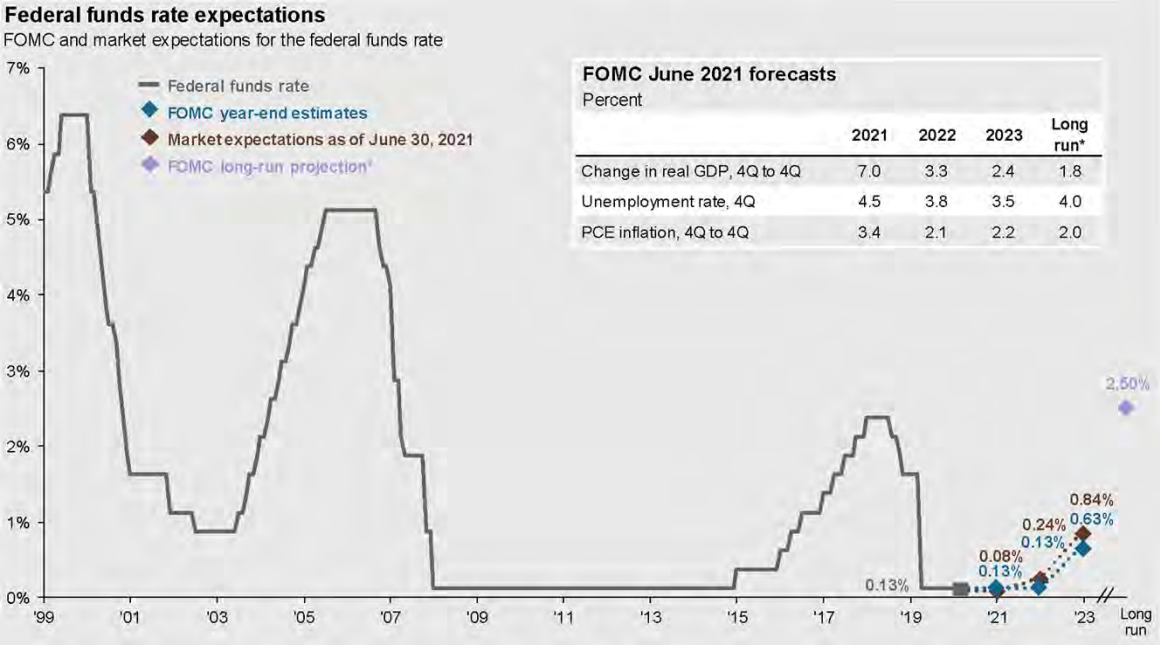
- Permanent job losses have accumulated, but at a much lower level than during the GFC.
- Substantial state and federal unemployment aid has led many workers to believe their jobs will be restored, if not their actual job then one like it in the same industry.
- The number of people seeking work did not spike with the surge in layoffs as in previous downturns, supporting this expectation that layoffs were temporary.

Sources: Federal Reserve, Department of Labor. Note: regular state unemployment programs, excludes Federal programs such as Pandemic Unemployment Assistance

Government Intervention

Monetary policy expected to remain loose for some time

- The Federal Reserve Open Market Committee voted to continue 0% Fed Funds Rate and “sizeable asset purchases” at June meeting.
- Median FOMC member forecast expects zero interest rate policy through mid-year 2022.
- Powell: “Fed will continue to provide the economy the support it needs for as long as it takes.”
- Fed confirms a new inflation targeting regime, with willingness to overshoot target to get desired outcome of 2%.
- Markets do not expect the Fed to raise the rate in the near future.
- “Longer run” projection remains at 2.5% for Fed Funds Rate, but it has no specific anchor date.



FOMC June 2021 forecasts
Percent

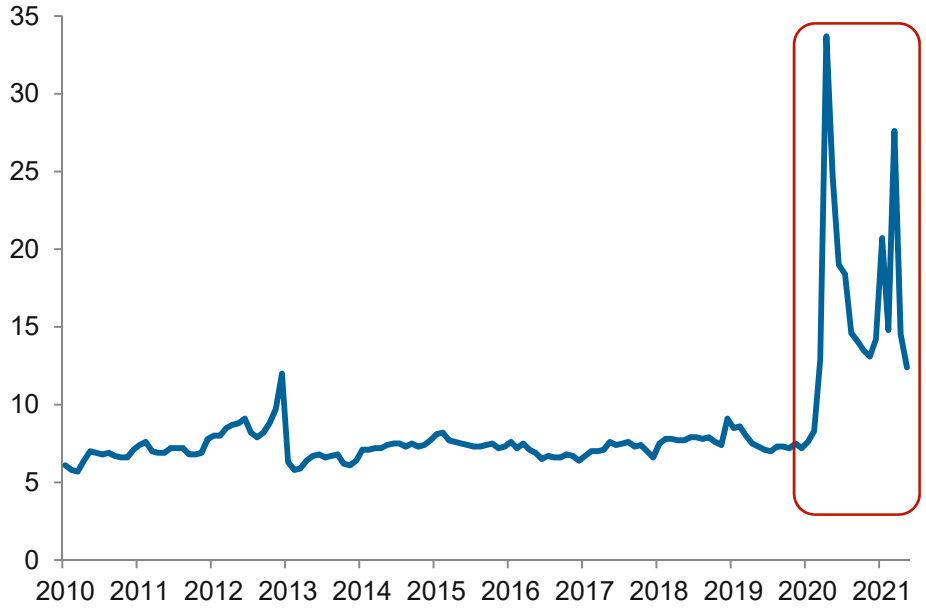
	2021	2022	2023	Long run*
Change in real GDP, 4Q to 4Q	7.0	3.3	2.4	1.8
Unemployment rate, 4Q	4.5	3.8	3.5	4.0
PCE inflation, 4Q to 4Q	3.4	2.1	2.2	2.0

Sources: Federal Reserve, J.P. Morgan Guide to the Markets – U.S. Data are as of 6/30/21

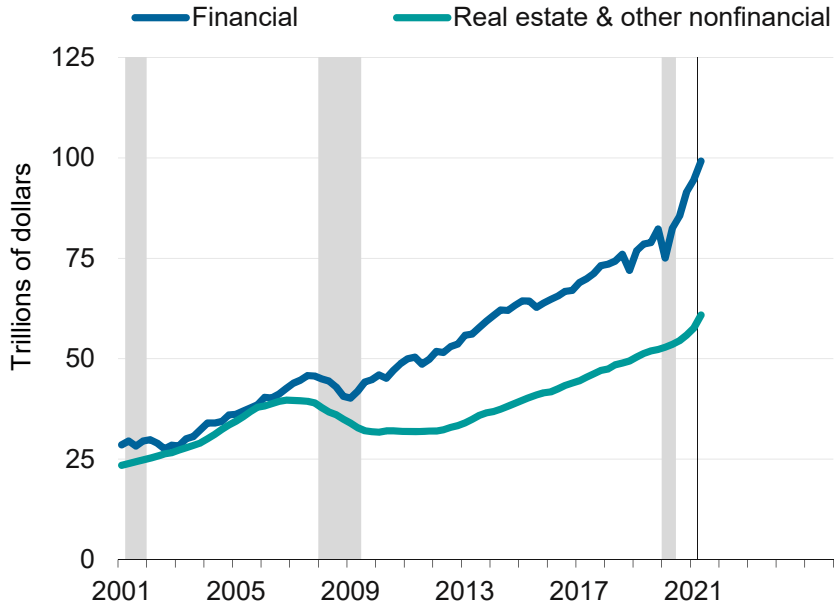
Liquidity Supporting Economy (and Driving Markets)

Consumers = more money, fewer problems; investors = dry powder abundant

U.S. Personal Savings Rate



Household Financial Assets Are Swelling

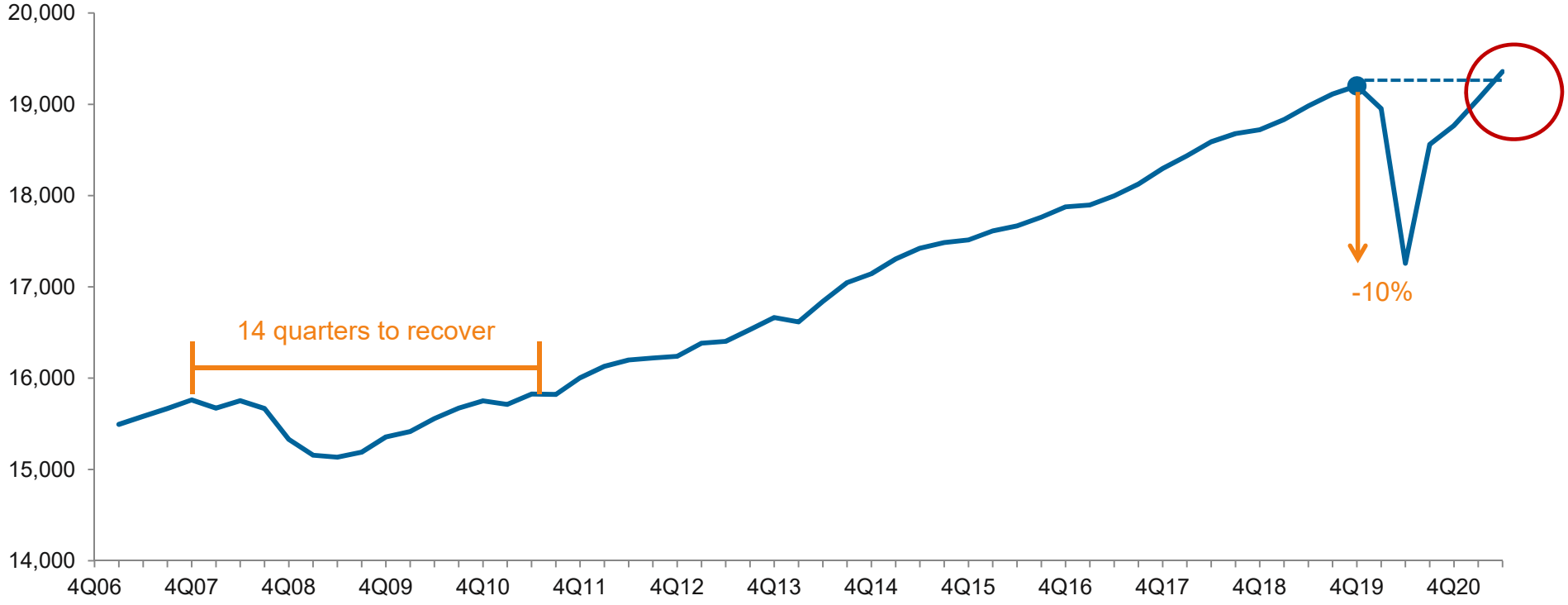


- U.S. personal savings rate far exceeds levels seen in the post-WWII era; shot up to 34% last April, spiked again to 20% with new lockdowns imposed at the end of 2020.
  - *Savings usually FALLS in a recession. Disposable income rose under congressional pandemic relief measures, and state and local government restrictions on activities hindered spending.*
- Household financial assets have swelled through the pandemic, and excess savings (above the normal rate) will insulate consumer spending during economic wobbles and through the winding down of fiscal stimulus.

Sources: Federal Reserve, IHS Markit

GDP Has Recovered Pre-Pandemic Level in 2Q21 After Deepest Drop in 75 Years

Seasonally Adjusted Real GDP in Billions of Dollars



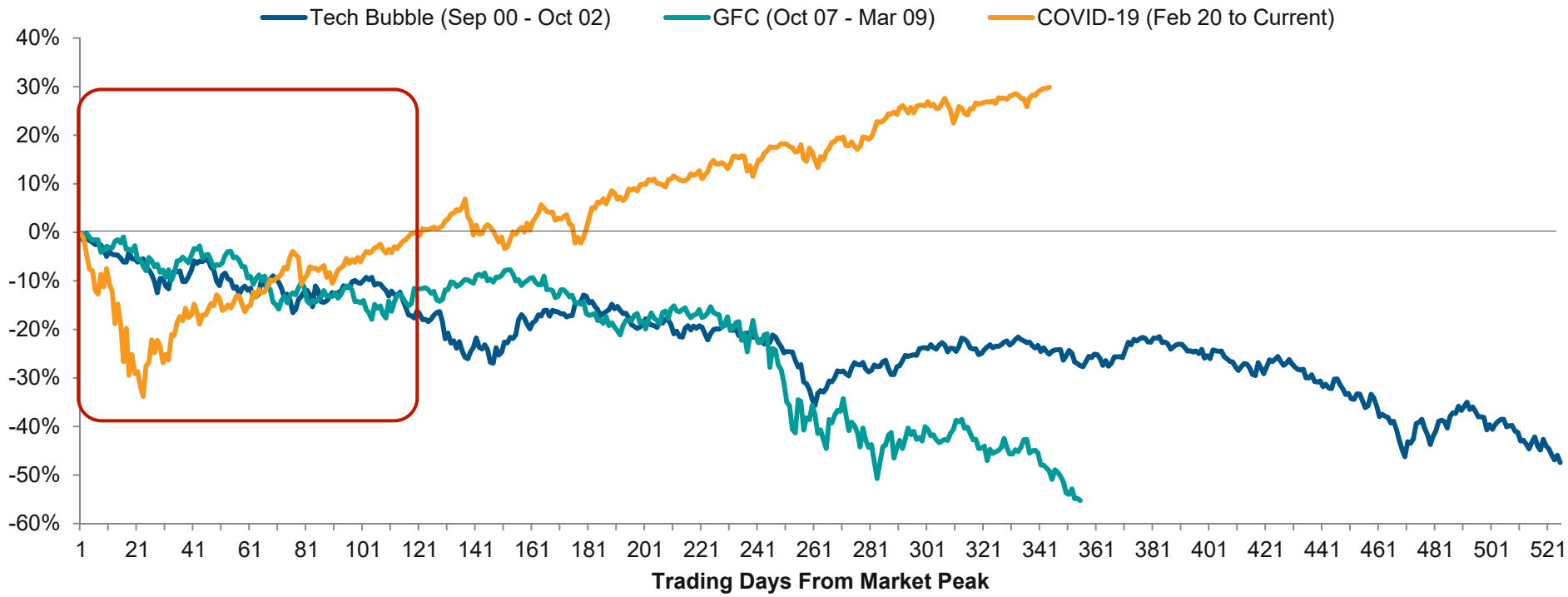
- After the Global Financial Crisis, it took 3.5 years before real GDP reclaimed its pre-recession highs.
- GFC peak to trough was down 4%.
- 2Q20 real GDP level was down over 10% from 4Q19, annual GDP declined 3.4% over 2019.
- Pre-pandemic peak level of GDP reached in 2Q21 – preliminary estimate is $19.358T vs $19.202T for 4Q19

Source: St. Louis FRED

Unprecedented Shock to Global Capital Markets—But It Was Over in a Flash!

V-shaped recovery in equity—back in black by mid-August 2020, up 96% from market bottom!

S&P 500 Cumulative Returns
Market Peak-to-Trough for Recent Corrections vs. Current Path of COVID-19 Correction Through 6/30/21



Sharpest and fastest equity market decline ever: 16 trading days to reach bear market; -33% after just 23 days

- S&P 500 recovered all of its COVID-19 related losses by Aug. 10, only 97 days from the bottom
- S&P 500 up 15.3% YTD in 2021
- Fun facts: At June 30, 2021, S&P is up nearly 30% from previous market peak on 2/19/20, or 344 trading days. In contrast, the GFC was down -49% after 344 trading days following the previous market peak, and fell further to -55% before recovering

Sources: Callan, S&P Dow Jones Indices

Callan Periodic Table of Investment Returns

Annual Returns						Monthly Returns						
2015	2016	2017	2018	2019	2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	YTD 2021
Large Cap Equity 1.38%	Small Cap Equity 21.31%	Emerging Market Equity 37.28%	U.S. Fixed Income 0.01%	Large Cap Equity 31.49%	Small Cap Equity 19.96%	Small Cap Equity 5.03%	Small Cap Equity 6.23%	Large Cap Equity 4.38%	Real Estate 6.42%	Dev ex-U.S. Equity 3.48%	Large Cap Equity 2.33%	Small Cap Equity 17.54%
U.S. Fixed Income 0.55%	High Yield 17.13%	Dev ex-U.S. Equity 24.21%	High Yield -2.08%	Small Cap Equity 25.52%	Large Cap Equity 18.40%	Emerging Market Equity 3.07%	Real Estate 3.70%	Real Estate 2.85%	Large Cap Equity 5.34%	Emerging Market Equity 2.32%	Small Cap Equity 1.94%	Real Estate 15.50%
Real Estate -0.79%	Large Cap Equity 11.96%	Large Cap Equity 21.83%	Global ex-U.S. Fixed Income -2.15%	Dev ex-U.S. Equity 22.49%	Emerging Market Equity 18.31%	High Yield 0.33%	Large Cap Equity 2.76%	Dev ex-U.S. Equity 2.55%	Dev ex-U.S. Equity 3.15%	Real Estate 1.79%	High Yield 1.34%	Large Cap Equity 15.25%
Dev ex-U.S. Equity -3.04%	Emerging Market Equity 11.19%	Small Cap Equity 14.65%	Large Cap Equity -4.38%	Real Estate 21.91%	Global ex-U.S. Fixed Income 10.11%	U.S. Fixed Income -0.72%	Dev ex-U.S. Equity 2.55%	Small Cap Equity 1.00%	Emerging Market Equity 2.49%	Global ex-U.S. Fixed Income 1.36%	Real Estate 0.78%	Dev ex-U.S. Equity 9.92%
Small Cap Equity -4.41%	Real Estate 4.06%	Global ex-U.S. Fixed Income 10.51%	Real Estate -5.63%	Emerging Market Equity 18.44%	Dev ex-U.S. Equity 7.59%	Real Estate -0.81%	Emerging Market Equity 0.76%	High Yield 0.15%	Small Cap Equity 2.10%	Large Cap Equity 0.70%	U.S. Fixed Income 0.70%	Emerging Market Equity 7.45%
High Yield -4.47%	Dev ex-U.S. Equity 2.75%	Real Estate 10.36%	Small Cap Equity -11.01%	High Yield 14.32%	U.S. Fixed Income 7.51%	Large Cap Equity -1.01%	High Yield 0.37%	U.S. Fixed Income -1.25%	Global ex-U.S. Fixed Income 1.62%	U.S. Fixed Income 0.33%	Emerging Market Equity 0.17%	High Yield 3.62%
Global ex-U.S. Fixed Income -6.02%	U.S. Fixed Income 2.65%	High Yield 7.50%	Dev ex-U.S. Equity -14.09%	U.S. Fixed Income 8.72%	High Yield 7.11%	Global ex-U.S. Fixed Income -1.03%	U.S. Fixed Income -1.44%	Emerging Market Equity -1.51%	High Yield 1.09%	High Yield 0.30%	Dev ex-U.S. Equity -1.02%	U.S. Fixed Income -1.60%
Emerging Market Equity -14.92%	Global ex-U.S. Fixed Income 1.49%	U.S. Fixed Income 3.54%	Emerging Market Equity -14.57%	Global ex-U.S. Fixed Income 5.09%	Real Estate -9.04%	Dev ex-U.S. Equity -1.07%	Global ex-U.S. Fixed Income -1.94%	Global ex-U.S. Fixed Income -2.42%	U.S. Fixed Income 0.79%	Small Cap Equity 0.21%	Global ex-U.S. Fixed Income -2.02%	Global ex-U.S. Fixed Income -4.42%

Sources: ● Bloomberg Barclays Aggregate ● Bloomberg Barclays Corp High Yield ● Bloomberg Barclays Global Aggregate ex US ● FTSE EPRA Nareit Developed ● MSCI World ex USA ● MSCI Emerging Markets ● Russell 2000 ● S&P 500

Continued Surge in Global Equity Markets in 2Q21

Small cap leads in both U.S. and global ex-U.S. markets

Global equity continued to surge in 2Q

- Year-over-year returns from June are eye-popping:
  - S&P 500: +41%
  - MSCI World ex-USA: +34%
  - Emerging Markets: +41%
  - U.S. Small Cap: +62% (!)
- The initial recovery was concentrated in a few stocks (FAANG) and U.S. mega cap.
- Market rotation to small cap and value with the flip from a "COVID trade" to a "GDP growth trade" in November, with the announcement of vaccines
- Economic recovery now looking very strong in 2021, into 2022. Fed projects GDP growth of 7.0% in 2021, although initial GDP estimate for 2Q is 6.5% and 1Q was revised down to 6.3%.
- Initial distribution challenges and resistance to vaccination have stalled the achievement of widespread inoculation in the U.S. Restricted availability of the vaccine outside the U.S. means inoculation rates have been held back in countries around the globe.

Returns for Periods ended 6/30/21

	1 Quarter	1 Year	5 Years	10 Years	25 Years
U.S. Equity					
Russell 3000	8.24	44.16	17.89	14.70	9.87
S&P 500	8.55	40.79	17.65	14.84	9.76
Russell 2000	4.29	62.03	16.47	12.34	9.33
Global ex-U.S. Equity					
MSCI World ex USA	5.65	33.60	10.36	5.70	5.37
MSCI Emerging Markets	5.05	40.90	13.03	4.29	--
MSCI ACWI ex USA Small Cap	6.35	47.04	11.97	7.02	6.60
Fixed Income					
Bloomberg Barclays Aggregate	1.83	-0.33	3.03	3.39	5.14
90-day T-Bill	0.00	0.09	1.17	0.63	2.17
Bloomberg Barclays Long Gov/Credit	6.44	-1.86	5.45	7.30	7.48
Bloomberg Barclays Global Agg ex-US	0.92	4.60	1.63	0.99	3.79
Real Estate					
NCREIF Property	1.72	5.42	5.74	8.59	9.04
FTSE Nareit Equity	12.02	38.02	6.31	9.41	10.23
Alternatives					
CS Hedge Fund	3.02	16.60	5.63	4.24	7.05
Cambridge Private Equity*	9.48	54.21	18.83	15.07	15.52
Bloomberg Commodity	13.30	45.61	2.40	-4.44	1.31
Gold Spot Price	3.26	-1.61	6.05	1.66	6.33
Inflation - CPI-U	2.57	5.39	2.43	1.87	2.22

*Cambridge PE data through 03/31/21

Sources: Bloomberg, Bloomberg Barclays, Callan, Cambridge, Credit Suisse, FTSE Russell, MSCI, NCREIF, S&P Dow Jones Indices

U.S. Equity Performance: 2Q21

Rotation in market leadership

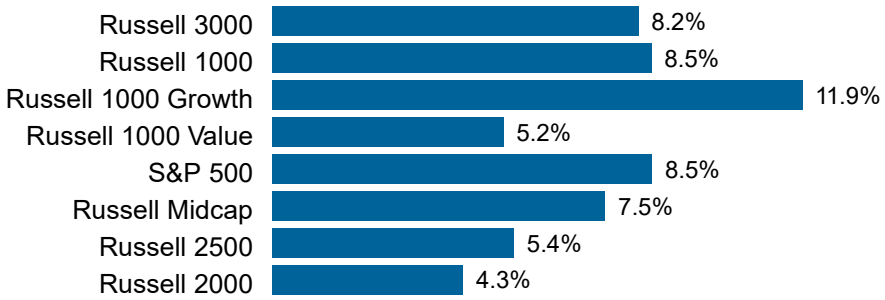
Markets keep setting all-time highs

- The S&P 500 Index continued to reach record highs in 2Q21.
  - *The 12-month rebound following the market low in March 2020 exceeded 75% for the S&P 500, which surpasses the 12-month GFC and Dot-Com Bubble rebounds.*
  - *Since March 2020 market low, the S&P is up 96.1%, with all sectors posting gains over 45%; Energy +140.6%*
  - *All sectors posted positive returns except for Utilities. 2Q21 top sectors were Technology and Energy.*

Market leadership has changed in 2Q21

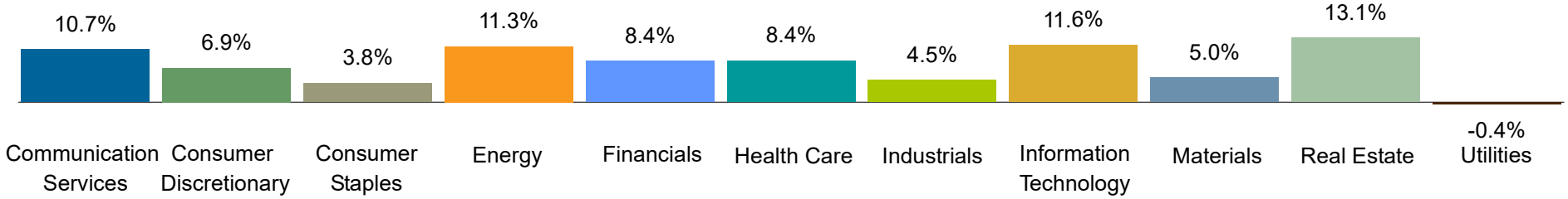
- Generally, growth outperformed value during the quarter as investors contemplated a "transitory" inflationary environment. The only exception was in small caps, where the Russell 2000 Growth underperformed the Russell 2000 Value. Continued outperformance of meme stocks helped small value.
- Larger cap stocks outperformed smaller cap stocks, reversing the recent trend of small cap outperformance.

U.S. Equity: Quarterly Returns



U.S. Equity: One-Year Returns

Industry Sector Quarterly Performance (S&P 500)



Sources: FTSE Russell, S&P Dow Jones Indices

Global ex-U.S. Equity Performance: 2Q21

Strong growth despite pockets of COVID-19 outbreaks

- Government stimulus and a continued "return to normal" spurred positive sentiment.
- Risk assets lost some steam amid concerns around the Delta variant.
- Small cap was largely in-line with large, except within emerging markets where smaller companies benefited from rebounds within industrials and basic materials.
- Despite return dispersions within regions, developed and emerging markets performed similarly over the quarter.

Market shifts away from cyclicals

- Expectations remain positive, but cooled from previous quarters, causing cyclical stocks to lag.
- Factor performance showed a preference for quality and growth, a divergence from last quarter.

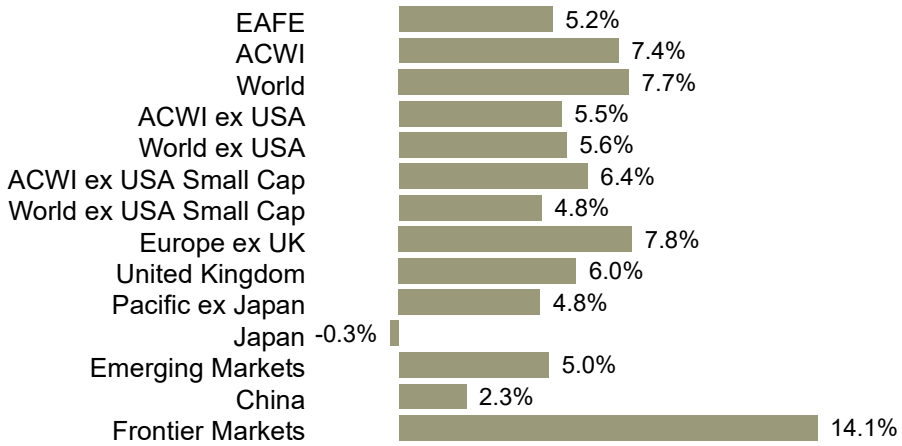
U.S. dollar vs. other currencies

- The U.S. dollar was mixed versus other currencies and did not contribute meaningfully to global ex-U.S. results.

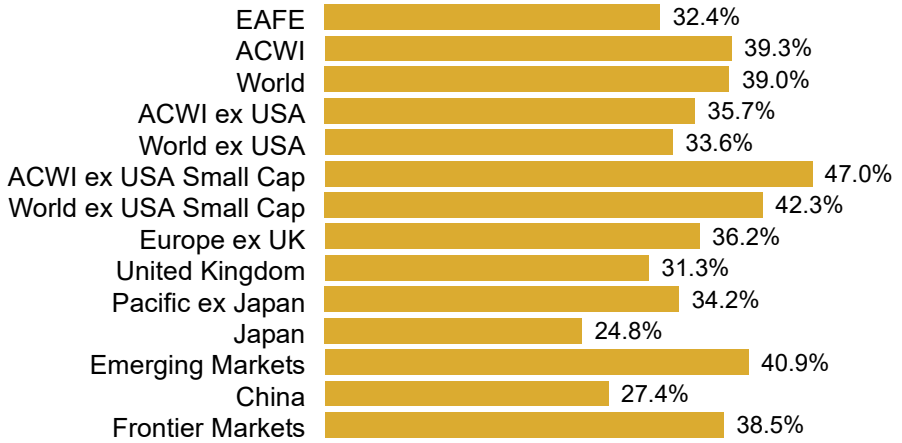
Growth vs. value

- Growth overturned value, except in emerging markets, where commodity-rich countries rallied.

Global Equity: Quarterly Returns



Global Equity: One-Year Returns



Source: MSCI

U.S. Fixed Income Performance: 2Q21

U.S. Treasury yield curve flattens

- The 10-year U.S. Treasury yield closed 2Q21 at 1.45%, a decline of 29 bps from 1Q21.
- The short-end of the curve remained anchored, though a hawkish tone from the Fed's June meeting rallied rates on the long end.
- TIPS outperformed nominal U.S. Treasuries given strong relative performance in April and May.

Bloomberg Barclays Aggregate rallies

- The Bloomberg Barclays US Aggregate Bond Index added 1.8%, with spread sectors outperforming treasuries.
- Demand for corporate credit remained strong, with spreads tightening 11 bps over the quarter, to 80 bps.

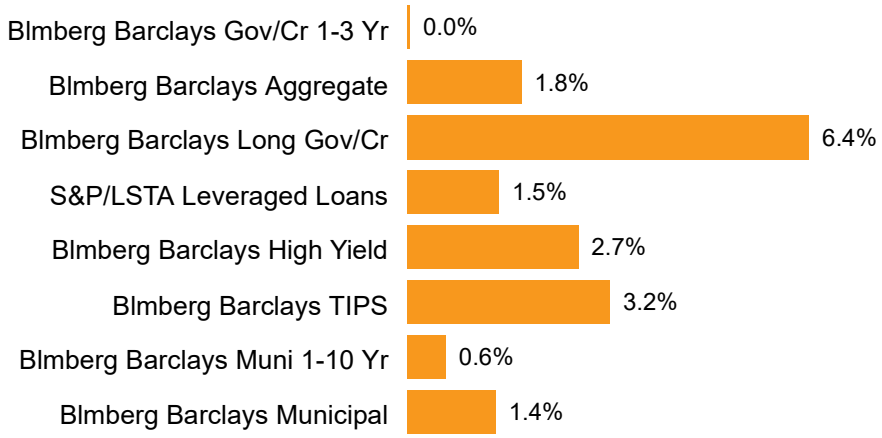
High yield continues its rally on lowered default expectations

- High yield (HY) bonds outperformed investment grade (IG) in 2Q adjusted for duration, but underperformed IG in absolute terms.
- Leveraged loans returned 1.5% for the quarter, driven by favorable supply/demand dynamics.

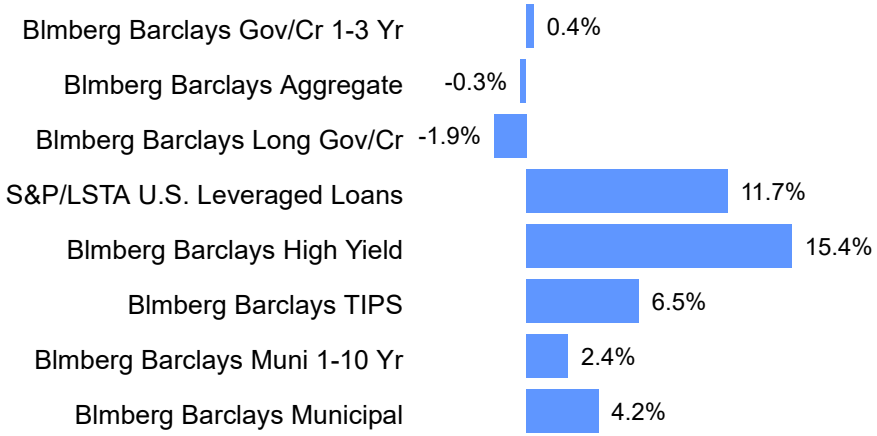
Munis outperform Treasuries as economies re-open

- Municipals topped Treasuries, as municipal yields rose less than Treasury yields.
- The municipal market was supported by the American Rescue Act.

U.S. Fixed Income: Quarterly Returns



U.S. Fixed Income: One-Year Returns



Source: Bloomberg Barclays

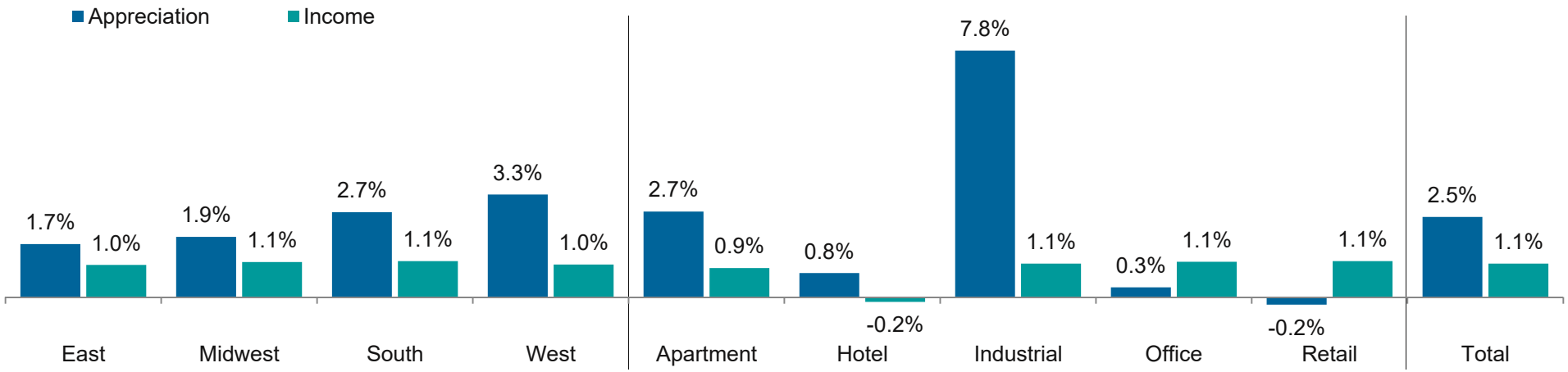
U.S. Private Real Estate Market Trends

Results

- Recovery continues as ODCE posts strongest return in 10 years; Industrial remains the best performer.
- Income remains positive except in Hotel sector.
- Appraisers beginning to price in recovery due to strong fundamentals within Industrial and Multifamily
- Return dispersion by manager within the ODCE Index due to composition of underlying portfolios
- Niche sectors self-storage and life sciences continue to be accretive.

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	3.7%	7.1%	4.6%	5.6%	8.6%
Income	0.8%	3.0%	3.1%	3.3%	3.8%
Appreciation	2.9%	4.0%	1.4%	2.3%	4.8%
NCREIF Property Index	3.6%	7.4%	5.5%	6.1%	8.8%
Income	1.1%	4.2%	4.4%	4.5%	5.0%
Appreciation	2.5%	3.1%	1.1%	1.6%	3.7%

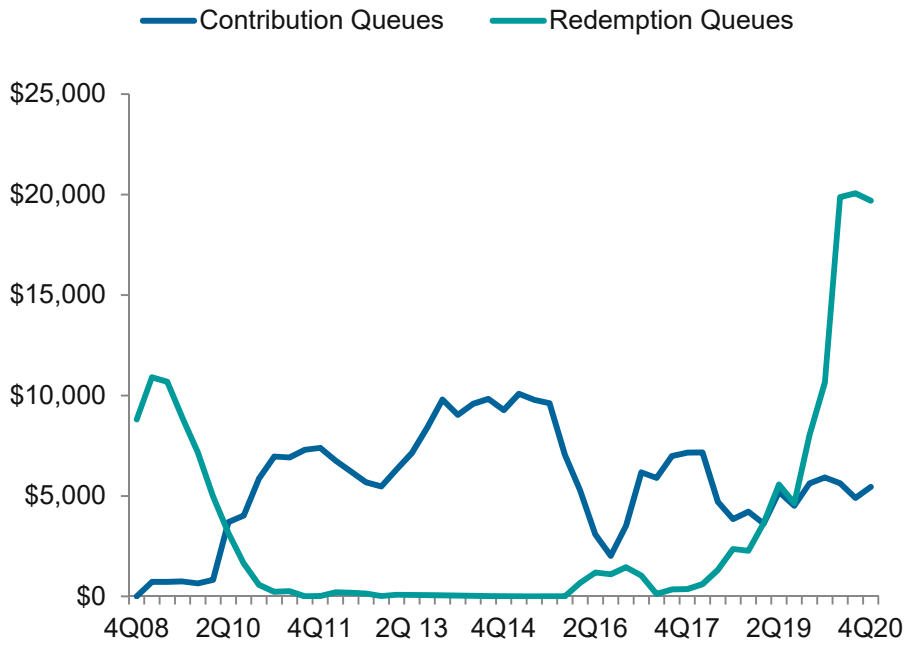
NCREIF Property Index Returns by Region and Property Type



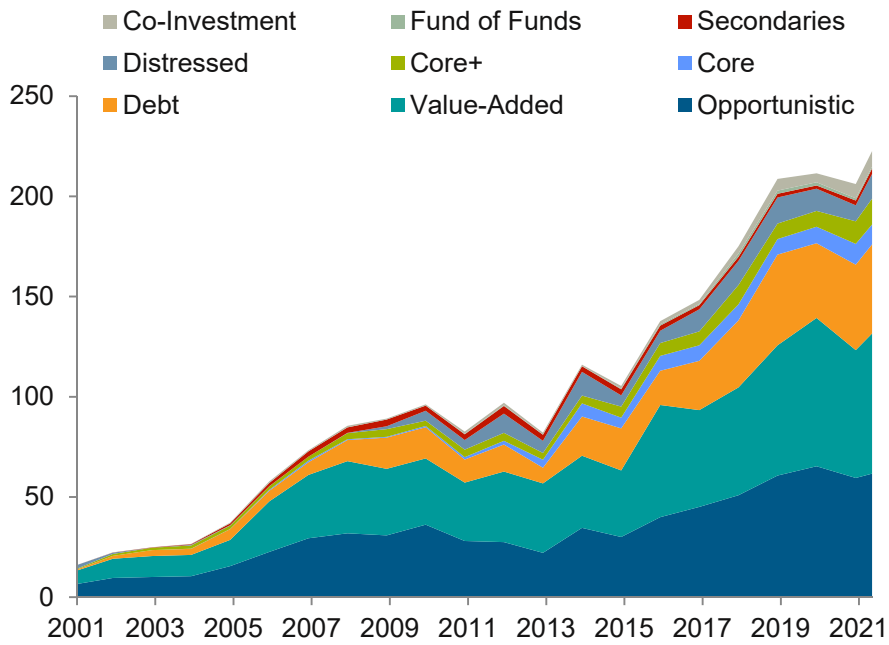
Source: NCREIF

U.S. Private Real Estate Market Trends

Core Fund Contribution/Redemption Queues ($bn)



Dry Powder Available for CRE investment in North America ($bn)



- U.S. core open end funds have investment queues of roughly $5 billion and exit queues of $20 billion.
- >$200 billion of capital waiting to be deployed in North America
- Majority of dry powder capital in opportunistic, value-add, and debt funds

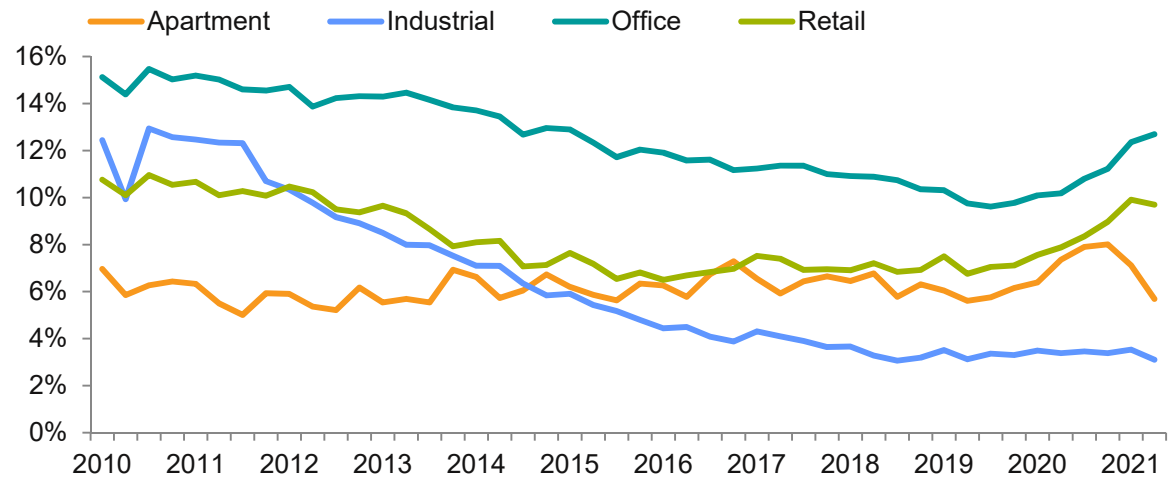
Sources: NCREIF, Preqin

U.S. Private Real Estate Market Trends

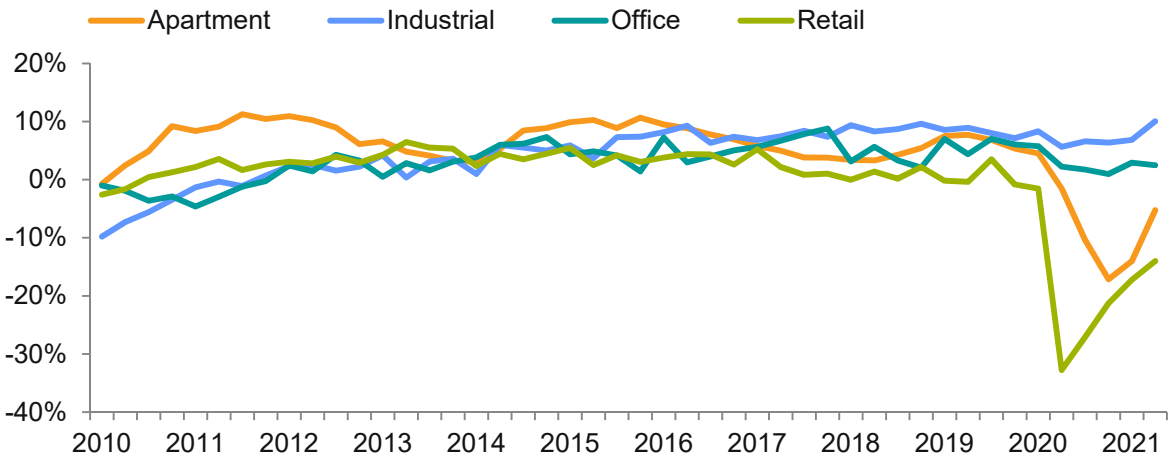
U.S. real estate fundamentals

- Vacancy rates continue to compress in Industrial and Multifamily as demand continues.
- Net operating income remains negative for Office and Retail but recovery continues; tenants are poised to return to work and pent-up demand is evident through foot traffic in retail centers.
- 2Q21 rent collections showed relatively stable income throughout the quarter in the Industrial, Apartment, and Office sectors; Retail sector remains challenged, with regional malls impacted most heavily.
- Class A/B urban apartments were relatively strong, followed by Industrial and Office.
- Demand outpaces supply as new construction of preleased Industrial and Multifamily is occurring.

Vacancy by Property Type



Rolling 4-Quarter NOI Growth by Property Type



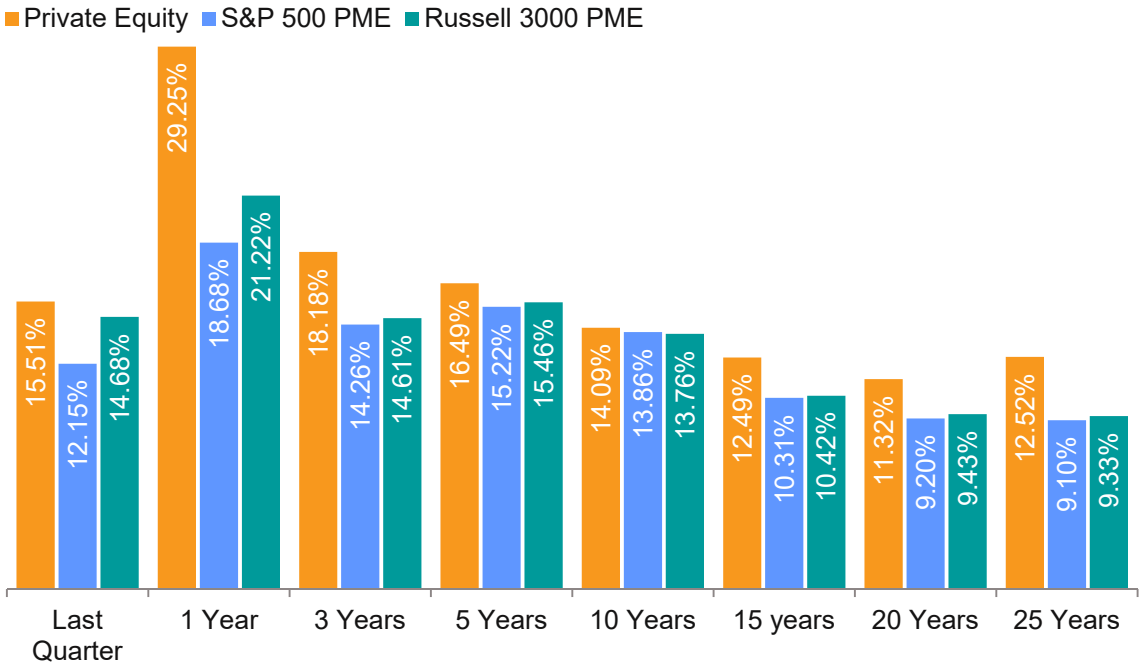
Source: NCREIF

Private Equity Performance

Big gains in 2020, outpacing public equity

- Private equity 4Q20 gains ahead of those of public equity
- Private equity performance positive for 2020, notably outperforming public equity
- Private equity ahead of public equity across all longer-term time horizons, although only marginally over the last 10 years

Net IRRs as of 12/31/20



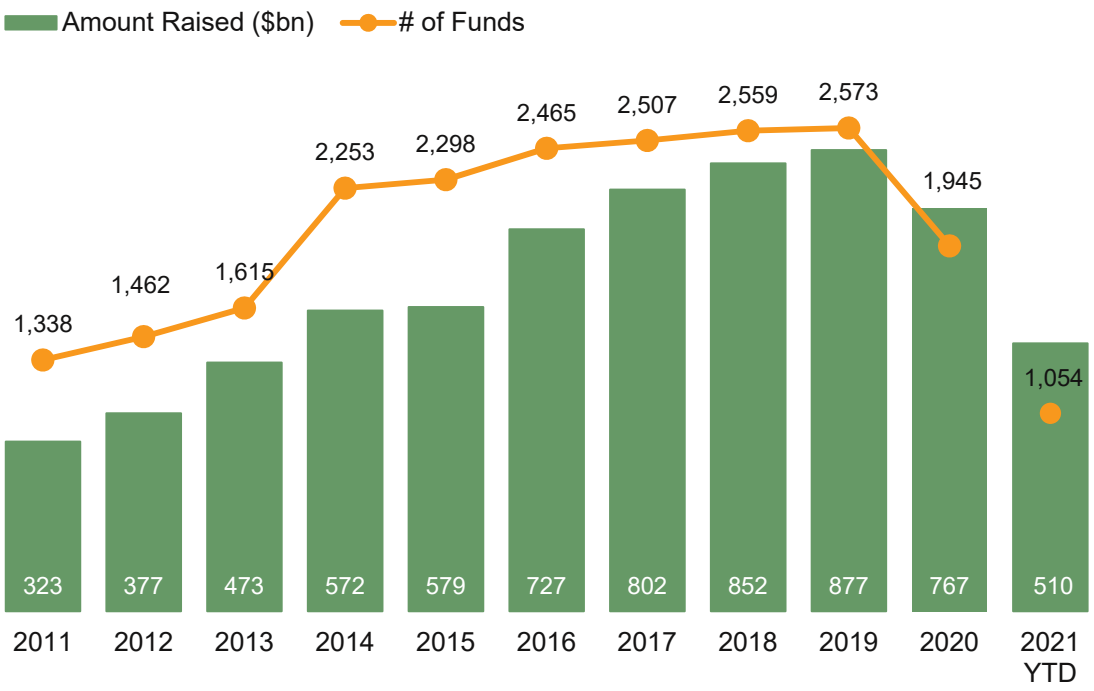
Source: Refinitiv/Cambridge

Private Equity Global Fundraising

Rebound in 2021

- Fundraising for 2020 at 87% of 2019 levels
- Many fundraises pushed out to 2021 due to worries over investor appetite and inability of funds to deploy capital during the onset of the pandemic
- Fundraising reached new high in 1H21, exceeding 1H20 by 20% and 1H19 by 48%.

Annual Fundraising



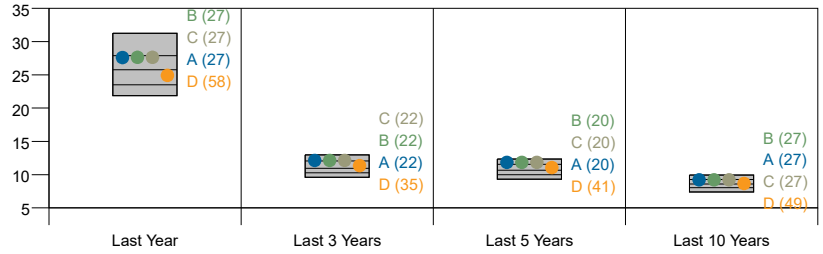
Source: PitchBook, data through 6/30/21; includes private equity and private debt

Callan

Pension Plan

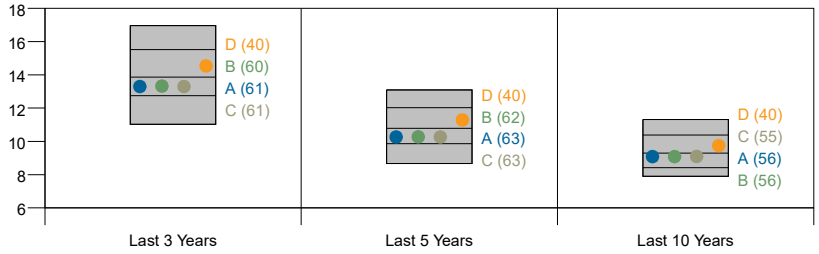
PERS, TRS, and JRS Performance Dashboard – June 30, 2021

Returns vs Callan Public Fund Sponsor Database



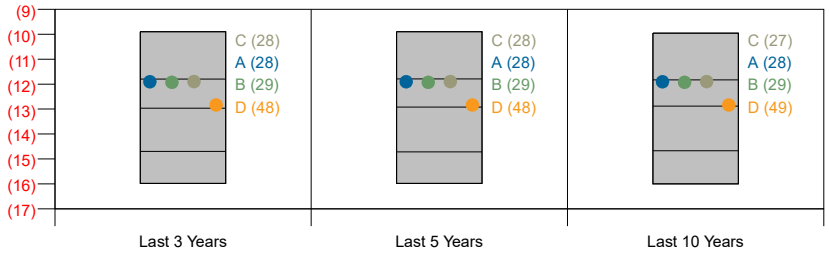
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		31.25	12.99	12.34	9.96
25th Percentile		27.90	12.07	11.57	9.28
Median		25.78	10.95	10.67	8.59
75th Percentile		23.52	10.29	10.00	8.05
90th Percentile		21.86	9.61	9.32	7.42
Member Count		209	208	207	195
Employees' Total Plan	A	27.62	12.13	11.86	9.22
Teachers' Total Plan	B	27.65	12.13	11.87	9.24
Judicial Total Plan	C	27.64	12.14	11.86	9.22
Policy Target	D	24.95	11.37	11.09	8.67

Standard Deviation vs Callan Public Fund Sponsor Database



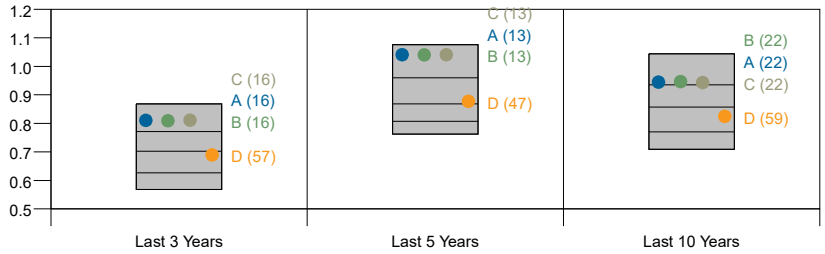
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		16.97	13.10	11.31
25th Percentile		15.52	12.03	10.39
Median		13.87	10.78	9.30
75th Percentile		12.75	9.87	8.42
90th Percentile		11.03	8.68	7.90
Member Count		208	207	195
Employees' Total Plan	A	13.31	10.27	9.09
Teachers' Total Plan	B	13.33	10.28	9.09
Judicial Total Plan	C	13.31	10.26	9.10
Policy Target	D	14.54	11.30	9.75

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.89)	(9.89)	(9.95)
25th Percentile		(11.79)	(11.78)	(11.82)
Median		(12.96)	(12.92)	(12.88)
75th Percentile		(14.70)	(14.71)	(14.66)
90th Percentile		(15.97)	(15.97)	(15.99)
Member Count		208	207	195
Employees' Total Plan	A	(11.90)	(11.90)	(11.90)
Teachers' Total Plan	B	(11.92)	(11.92)	(11.92)
Judicial Total Plan	C	(11.89)	(11.89)	(11.89)
Policy Target	D	(12.83)	(12.83)	(12.83)

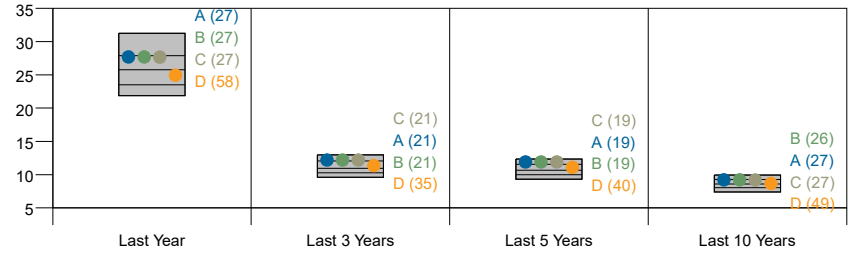
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.87	1.08	1.04
25th Percentile		0.77	0.96	0.94
Median		0.70	0.87	0.86
75th Percentile		0.63	0.81	0.77
90th Percentile		0.57	0.76	0.71
Member Count		208	207	195
Employees' Total Plan	A	0.81	1.04	0.94
Teachers' Total Plan	B	0.81	1.04	0.95
Judicial Total Plan	C	0.81	1.04	0.94
Policy Target	D	0.69	0.88	0.83

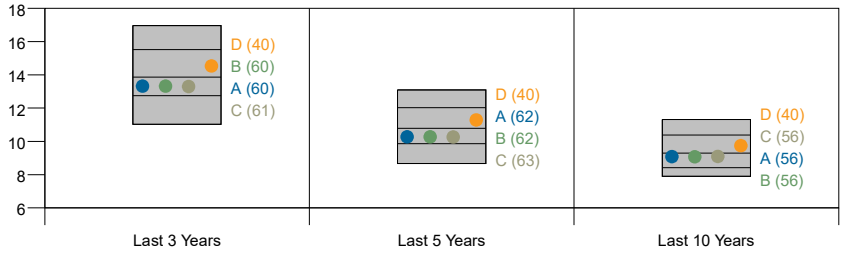
Health Care Plans Performance Dashboard – June 30, 2021

Returns vs Callan Public Fund Sponsor Database



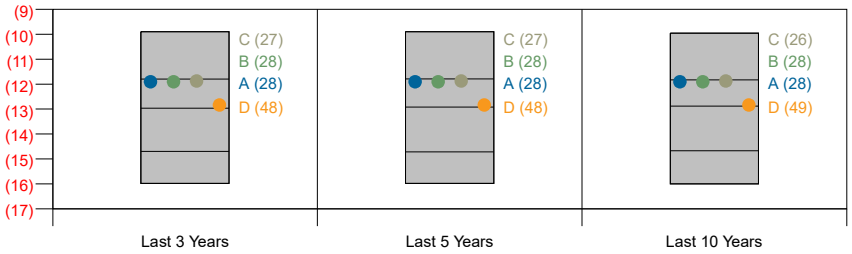
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		31.25	12.99	12.34	9.96
25th Percentile		27.90	12.07	11.57	9.28
Median		25.78	10.95	10.67	8.59
75th Percentile		23.52	10.29	10.00	8.05
90th Percentile		21.86	9.61	9.32	7.42
Member Count		209	208	207	195
PERS Health Plan	A	27.71	12.20	11.91	9.22
TRS Health Plan	B	27.70	12.20	11.91	9.24
JRS Health Plan	C	27.69	12.21	11.92	9.21
Policy Target	D	24.97	11.37	11.09	8.68

Standard Deviation vs Callan Public Fund Sponsor Database



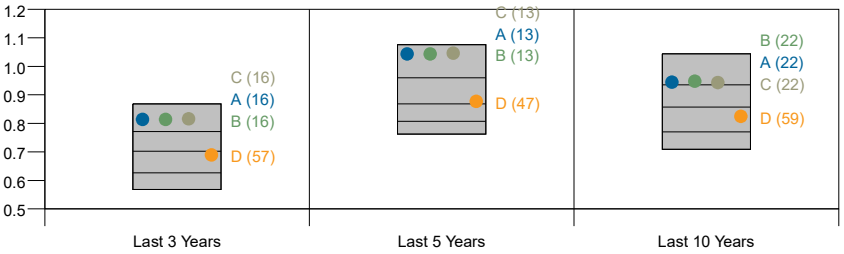
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		16.97	13.10	11.31
25th Percentile		15.52	12.03	10.39
Median		13.87	10.78	9.30
75th Percentile		12.75	9.87	8.42
90th Percentile		11.03	8.68	7.90
Member Count		208	207	195
PERS Health Plan	A	13.33	10.28	9.10
TRS Health Plan	B	13.33	10.28	9.08
JRS Health Plan	C	13.31	10.26	9.10
Policy Target	D	14.54	11.30	9.75

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.89)	(9.89)	(9.95)
25th Percentile		(11.79)	(11.78)	(11.82)
Median		(12.96)	(12.92)	(12.88)
75th Percentile		(14.70)	(14.71)	(14.66)
90th Percentile		(15.97)	(15.97)	(15.99)
Member Count		208	207	195
PERS Health Plan	A	(11.90)	(11.90)	(11.90)
TRS Health Plan	B	(11.90)	(11.90)	(11.90)
JRS Health Plan	C	(11.87)	(11.87)	(11.87)
Policy Target	D	(12.83)	(12.83)	(12.83)

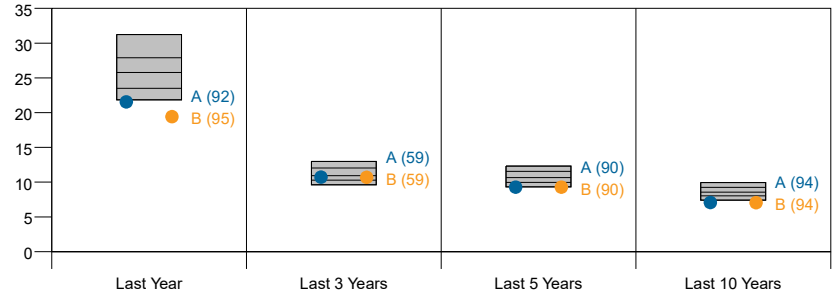
Sharpe Ratio vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.87	1.08	1.04
25th Percentile		0.77	0.96	0.94
Median		0.70	0.87	0.86
75th Percentile		0.63	0.81	0.77
90th Percentile		0.57	0.76	0.71
Member Count		208	207	195
PERS Health Plan	A	0.81	1.04	0.94
TRS Health Plan	B	0.81	1.04	0.95
JRS Health Plan	C	0.82	1.05	0.94
Policy Target	D	0.69	0.88	0.83

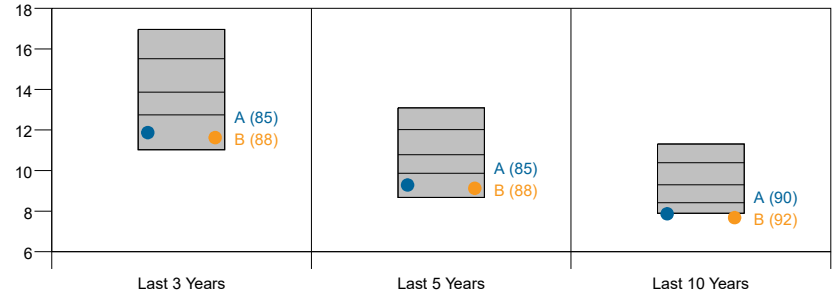
Military Plan Performance Dashboard – June 30, 2021

Returns vs Callan Public Fund Sponsor Database



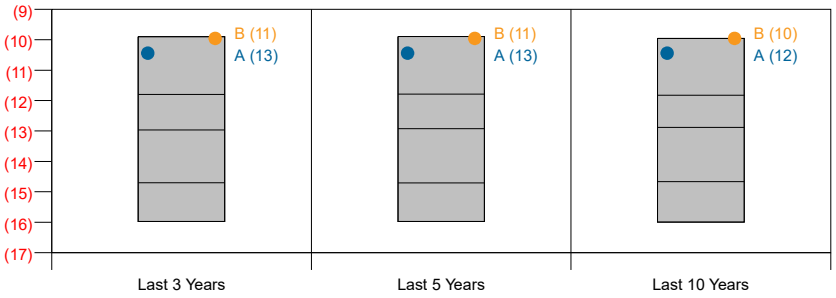
		Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		31.25	12.99	12.34	9.96
25th Percentile		27.90	12.07	11.57	9.28
Median		25.78	10.95	10.67	8.59
75th Percentile		23.52	10.29	10.00	8.05
90th Percentile		21.86	9.61	9.32	7.42
Member Count		209	208	207	195
Military Total Plan	A	21.56	10.74	9.28	7.10
Military Policy Target	B	19.43	10.72	9.28	7.07

Standard Deviation vs Callan Public Fund Sponsor Database



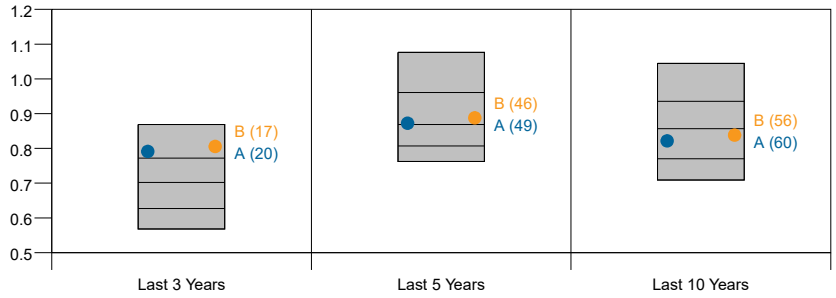
		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		16.97	13.10	11.31
25th Percentile		15.52	12.03	10.39
Median		13.87	10.78	9.30
75th Percentile		12.75	9.87	8.42
90th Percentile		11.03	8.68	7.90
Member Count		208	207	195
Military Total Plan	A	11.87	9.29	7.87
Military Policy Target	B	11.63	9.13	7.68

Maximum Drawdown vs Callan Public Fund Sponsor Database



		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		(9.89)	(9.89)	(9.95)
25th Percentile		(11.79)	(11.78)	(11.82)
Median		(12.96)	(12.92)	(12.88)
75th Percentile		(14.70)	(14.71)	(14.66)
90th Percentile		(15.97)	(15.97)	(15.99)
Member Count		208	207	195
Military Total Plan	A	(10.44)	(10.44)	(10.44)
Military Policy Target	B	(9.95)	(9.95)	(9.95)

Sharpe Ratio vs Callan Public Fund Sponsor Database

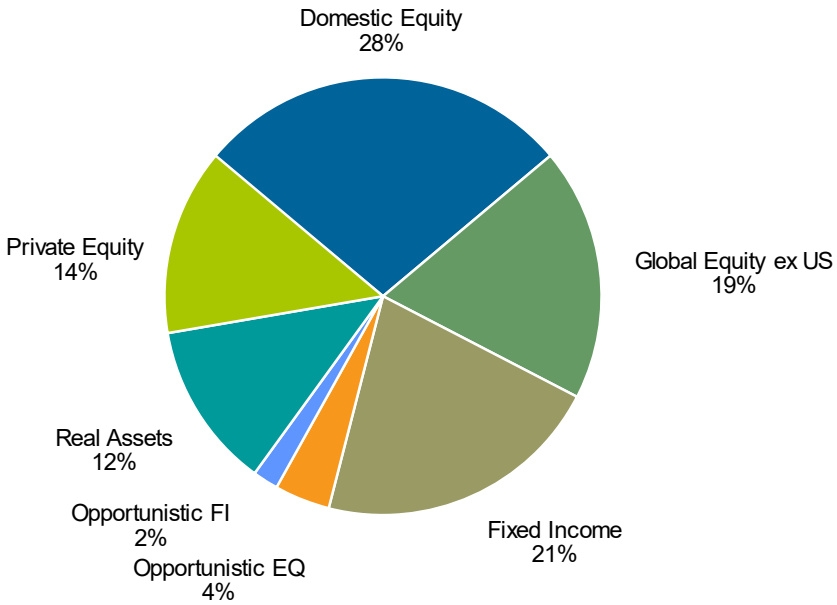


		Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile		0.87	1.08	1.04
25th Percentile		0.77	0.96	0.94
Median		0.70	0.87	0.86
75th Percentile		0.63	0.81	0.77
90th Percentile		0.57	0.76	0.71
Member Count		208	207	195
Military Total Plan	A	0.79	0.87	0.82
Military Policy Target	B	0.81	0.89	0.84

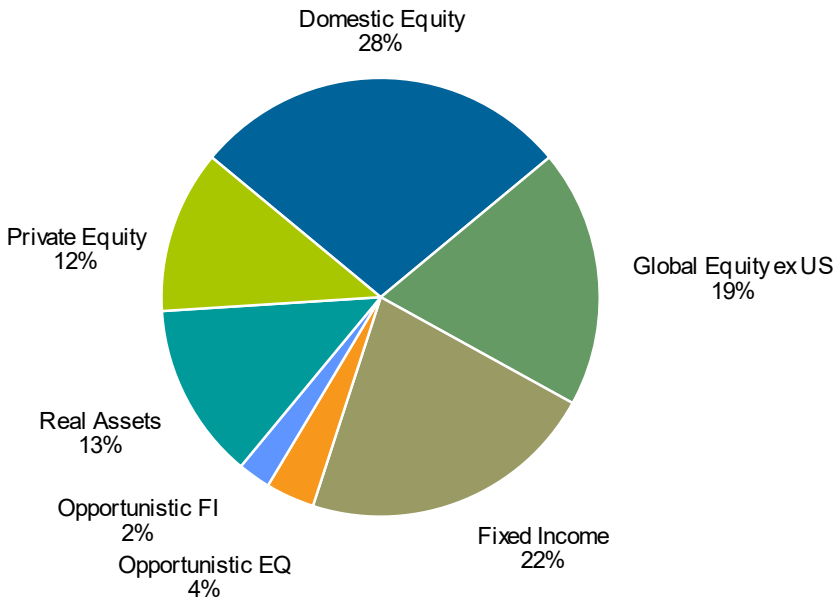
Asset Allocation – Public Employees' Retirement System

Quarter Ending June 30, 2021

Actual Asset Allocation



Target Asset Allocation



Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Domestic Equity	3,265,330	27.9%	28.0%	(0.1%)	(10,052)
Global Equity ex US	2,181,877	18.7%	19.0%	(0.3%)	(40,704)
Fixed Income	2,504,521	21.4%	22.0%	(0.6%)	(68,994)
Opportunistic EQ	475,459	4.1%	3.6%	0.5%	54,338
Opportunistic FI	220,604	1.9%	2.4%	(0.5%)	(60,143)
Real Assets	1,441,149	12.3%	13.0%	(0.7%)	(79,564)
Private Equity	1,608,853	13.8%	12.0%	1.8%	205,118
Total	11,697,795	100.0%	100.0%		

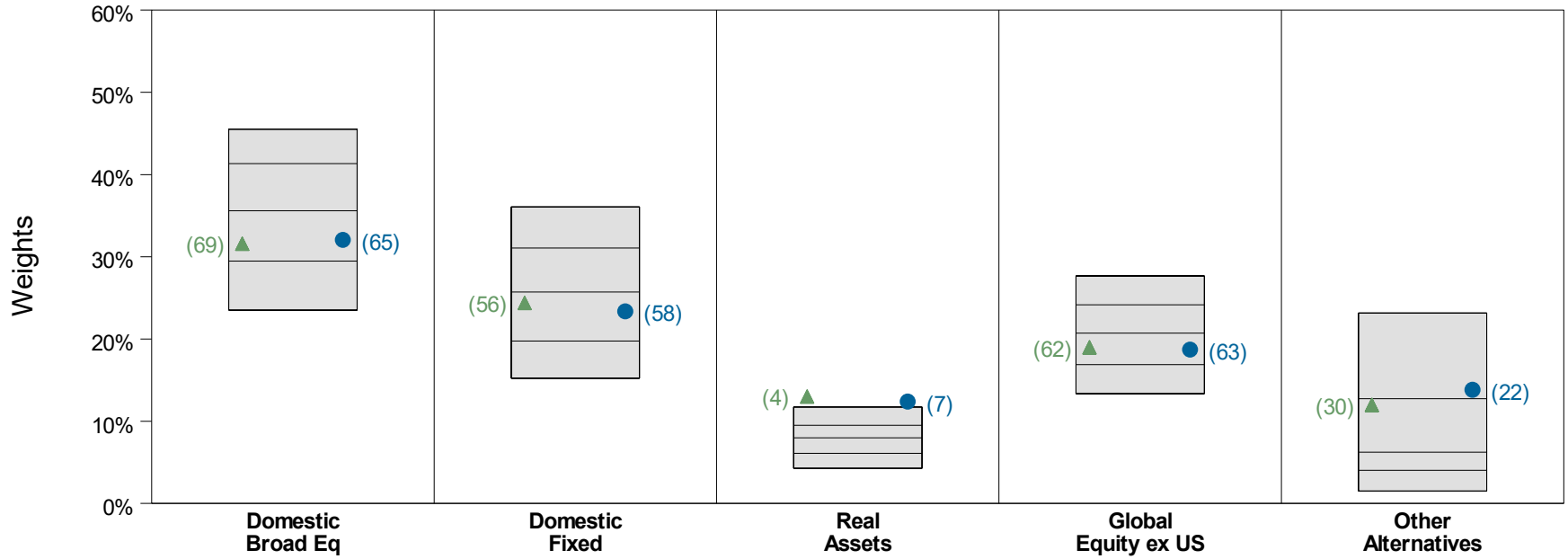
PERS is used as illustrative throughout the presentation.

The other plans exhibit similar modest and understandable variations from strategic target allocations.

Asset Allocation vs. Public Funds (PERS)

Callan Public Fund Database

Asset Class Weights vs Callan Public Fund Sponsor Database



	Domestic Broad Eq	Domestic Fixed	Real Assets	Global Equity ex US	Other Alternatives
10th Percentile	45.52	36.08	11.73	27.69	23.17
25th Percentile	41.33	31.07	9.50	24.16	12.74
Median	35.60	25.71	7.99	20.73	6.23
75th Percentile	29.48	19.75	6.10	16.89	4.03
90th Percentile	23.51	15.22	4.28	13.35	1.53
Fund ●	31.98	23.30	12.32	18.65	13.75
Target ▲	31.60	24.40	13.00	19.00	12.00

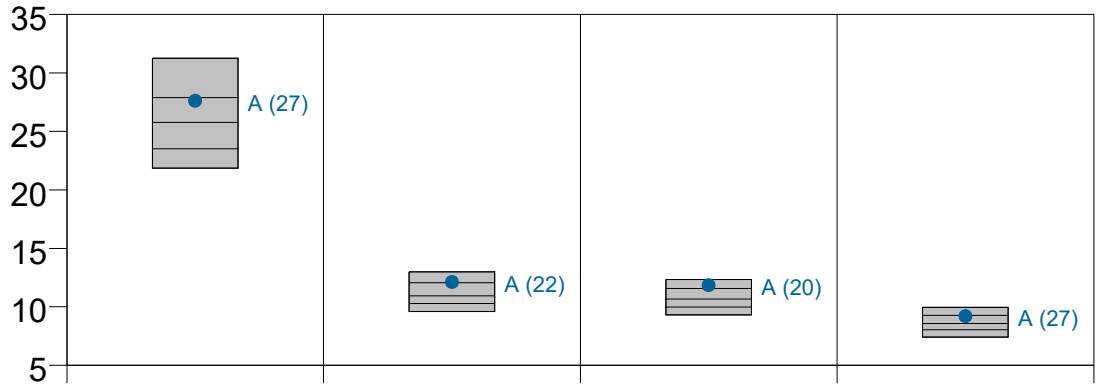
- Asset class allocations are in line with targets after the recent asset allocation update and associated rebalancing.
- Weightings to real assets and alternatives are relatively high in comparison to other public funds.

Notes: Real Assets includes Private Real Estate, REITs, Farmland, Timber, Energy, and Infrastructure. Other Alternatives represents private equity.

Total Fund Return vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Returns
for Periods Ended June 30, 2021
Group: Callan Public Fund Sponsor Database



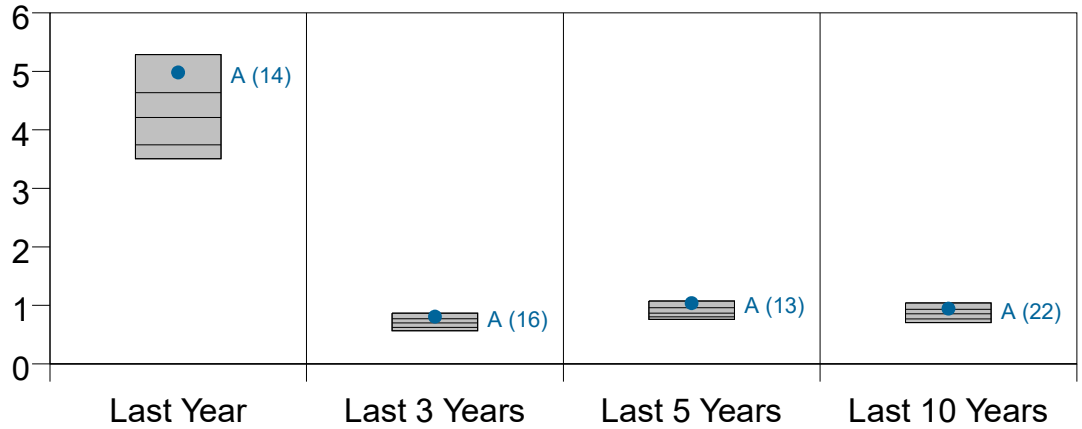
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	31.25	12.99	12.34	9.96
25th Percentile	27.90	12.07	11.57	9.28
Median	25.78	10.95	10.67	8.59
75th Percentile	23.52	10.29	10.00	8.05
90th Percentile	21.86	9.61	9.32	7.42
Member Count	209	208	207	195
PERS - Total Fund ● A	27.62	12.13	11.86	9.22

- Despite the recent change to the asset allocation, longer-term performance reflects ARMB's prior orientation toward capital growth as opposed to income generation.
- Performance was above the Public Funds median for the one-, three-, five-, and ten-year periods.

Total Fund Sharpe Ratio Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Sharpe Ratio
for Periods Ended June 30, 2021
Group: Callan Public Fund Sponsor Database



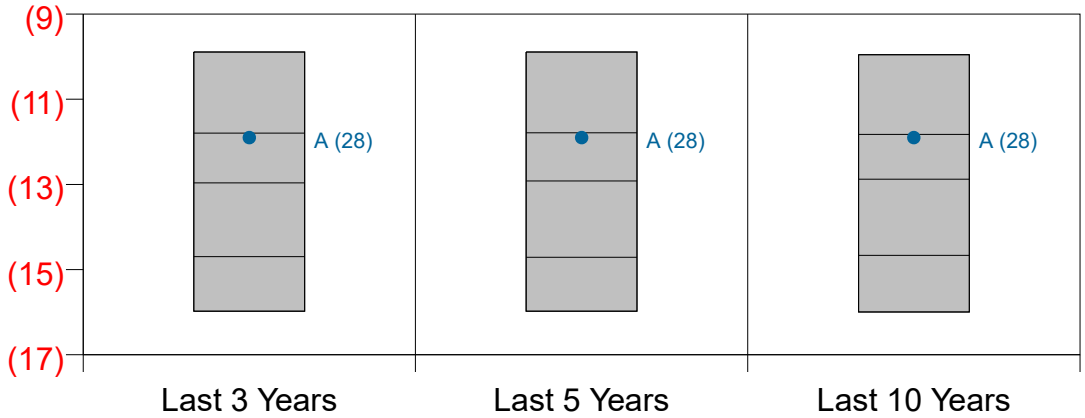
	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	5.29	0.87	1.08	1.04
25th Percentile	4.64	0.77	0.96	0.94
Median	4.21	0.70	0.87	0.86
75th Percentile	3.75	0.63	0.81	0.77
90th Percentile	3.51	0.57	0.76	0.71
Member Count	209	208	207	195
PERS - Total Fund ● A	4.98	0.81	1.04	0.94

- “Sharpe ratio” is a risk-adjusted measure of excess return above the risk-free rate.
- ARMB’s risk-adjusted return (Sharpe ratio) was above the Public Funds median for the one-, three-, five-, and 10-year periods.

Total Maximum Drawdown Rankings vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Maximum Drawdown
for Periods Ended June 30, 2021
Group: Callan Public Fund Sponsor Database



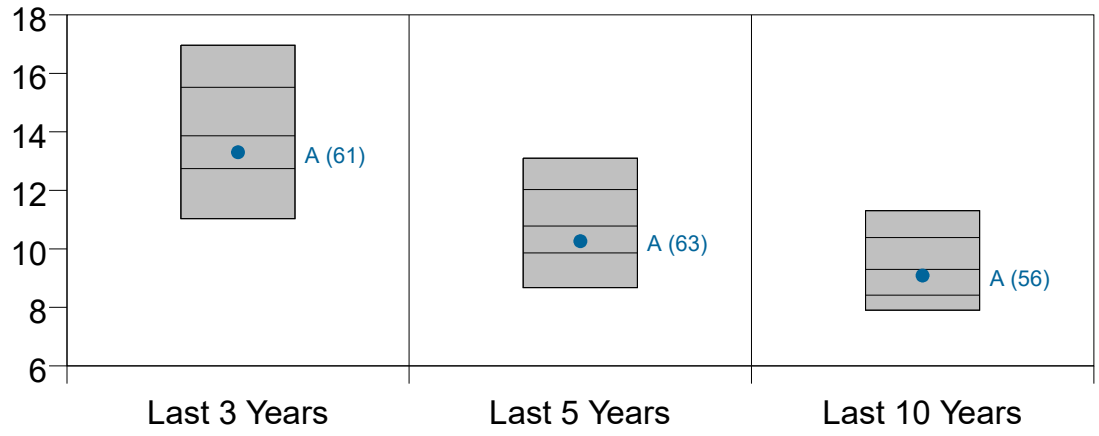
	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(9.89)	(9.89)	(9.95)
25th Percentile	(11.79)	(11.78)	(11.82)
Median	(12.96)	(12.92)	(12.88)
75th Percentile	(14.70)	(14.71)	(14.66)
90th Percentile	(15.97)	(15.97)	(15.99)
Member Count	208	207	195
PERS - Total Fund ● A	(11.90)	(11.90)	(11.90)

- "Maximum drawdown" is a measure of the largest loss from peak to trough in a given period.
- Lower rankings reflect larger drawdowns (i.e. bigger losses). ARMB's drawdown rankings for all periods have reflected better than average drawdowns (i.e. lower losses) and have improved over time.
- The drawdown experienced in the first quarter of 2020 is the largest of the last 10 years.

Standard Deviation Ranking vs Public Funds (PERS)

Callan Public Fund Database

Gross of Fee Standard Deviation
for Periods Ended June 30, 2021
Group: Callan Public Fund Sponsor Database



	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	16.97	13.10	11.31
25th Percentile	15.52	12.03	10.39
Median	13.87	10.78	9.30
75th Percentile	12.75	9.87	8.42
90th Percentile	11.03	8.68	7.90
Member Count	208	207	195
PERS - Total Fund ● A	13.31	10.27	9.09

- “Standard deviation” measures variability of returns. It is one measurement of investment risk.
- Less standard deviation results in lower rankings. A lower ranking of standard deviation suggests lower variability.
- ARMB’s portfolio diversification has resulted in volatility that is lower than median compared to peers.

PERS Performance Attribution – 2nd Quarter 2021 & Trailing Year

Relative Attribution Effects for Quarter ended June 30, 2021

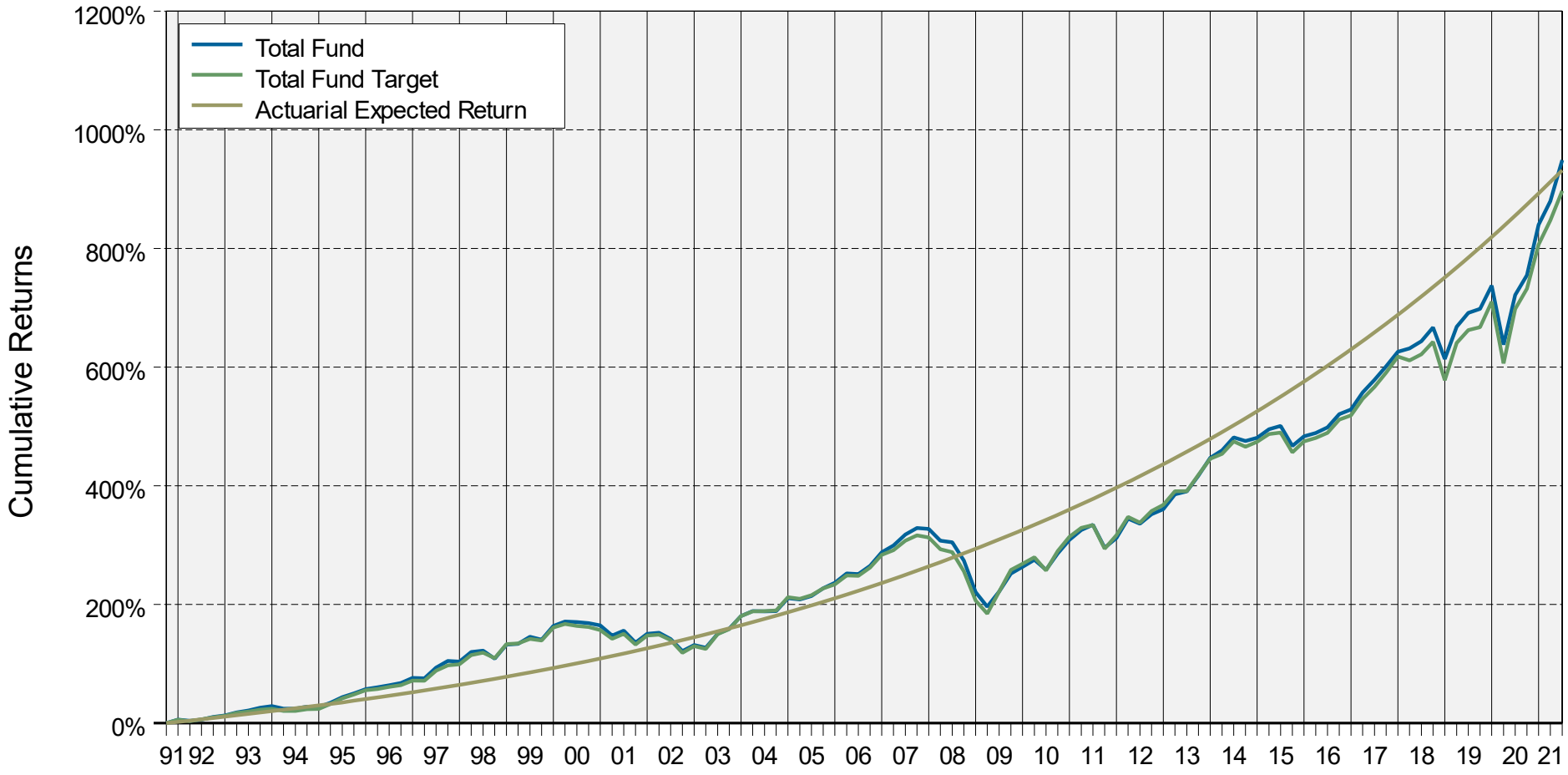
Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	28%	28%	7.79%	8.24%	(0.13%)	(0.00%)	(0.13%)
Fixed-Income	22%	22%	2.35%	1.74%	0.14%	(0.01%)	0.13%
Opportunistic	6%	6%	7.03%	5.04%	0.12%	0.00%	0.12%
Real Assets	13%	13%	4.38%	2.23%	0.27%	0.01%	0.28%
Global Equity ex US	19%	19%	5.86%	5.60%	0.05%	(0.00%)	0.05%
Private Equity	13%	12%	17.94%	7.45%	1.32%	0.01%	1.33%
Total			**7.02% =**	**5.24% +**	**1.77% +**	**0.01%**	**1.78%**

One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	28%	28%	42.69%	44.16%	(0.38%)	(0.01%)	(0.39%)
Fixed-Income	22%	22%	2.20%	(0.31%)	0.65%	(0.07%)	0.58%
Opportunistic	6%	6%	23.86%	23.20%	0.04%	(0.01%)	0.03%
Real Assets	13%	13%	9.86%	4.62%	0.75%	(0.01%)	0.74%
Global Equity ex US	19%	19%	38.54%	37.18%	0.24%	(0.01%)	0.23%
Private Equity	12%	12%	50.67%	36.80%	1.51%	(0.06%)	1.46%
Total			**27.62% =**	**24.95% +**	**2.84% +**	**(0.16%)**	**2.67%**

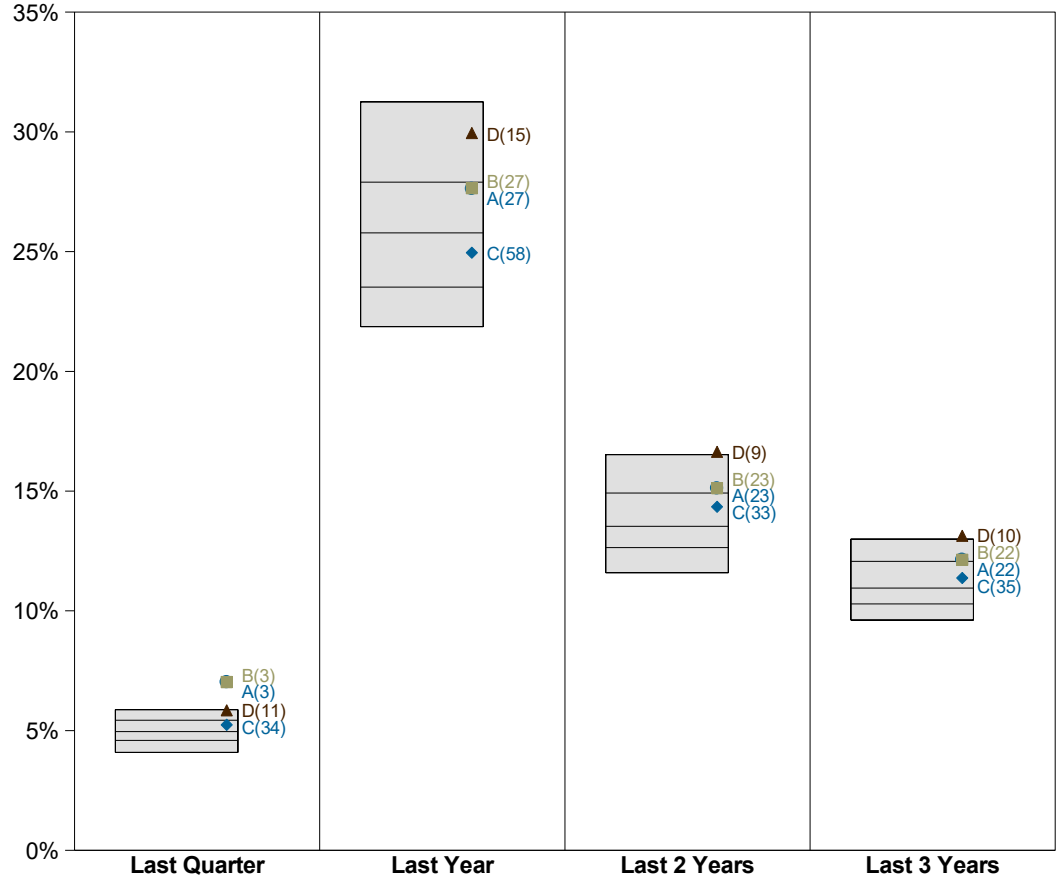
PERS Long-Term Total Fund Performance as of 06/30/201

Cumulative Returns Actual vs Target



- Each Fund has two targets: the asset allocation policy return and the actuarial return.
- Total Fund returns continue to closely track the strategic allocation target.
- Market correction setbacks in 3Q15, 4Q18, and 1Q20 have hindered the Total Fund's progress toward closing the gap versus the actuarial return following the Global Financial Crisis of 2008/2009.

Annualized Total Fund Returns as of 06/30/21

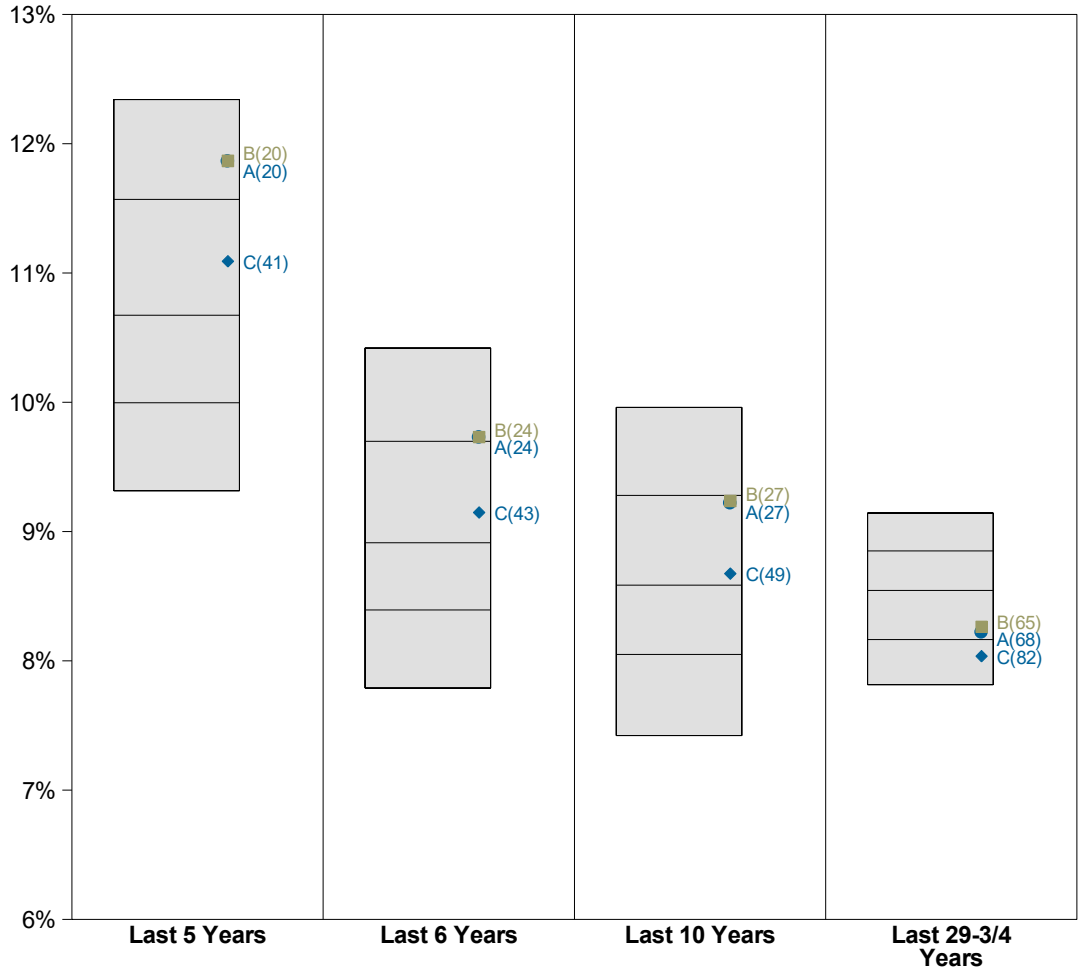


	Last Quarter	Last Year	Last 2 Years	Last 3 Years
10th Percentile	5.87	31.25	16.52	12.99
25th Percentile	5.43	27.90	14.92	12.07
Median	4.96	25.78	13.53	10.95
75th Percentile	4.59	23.52	12.64	10.29
90th Percentile	4.08	21.86	11.59	9.61
PERS Total Plan ● A	7.02	27.62	15.11	12.13
TRS Total Plan ■ B	7.02	27.65	15.12	12.13
Target Index ◆ C	5.24	24.95	14.34	11.37
Public Market Proxy ▲ D	5.84	29.95	16.64	13.14

- PERS and TRS have outperformed their target for the last quarter, one-year, two-year and three-year periods.

The Public Market Proxy consists of 45% Russell 3000 Index, 30% MSCI ACWI ex US IMI (Net), and 25% Bloomberg Aggregate Index.

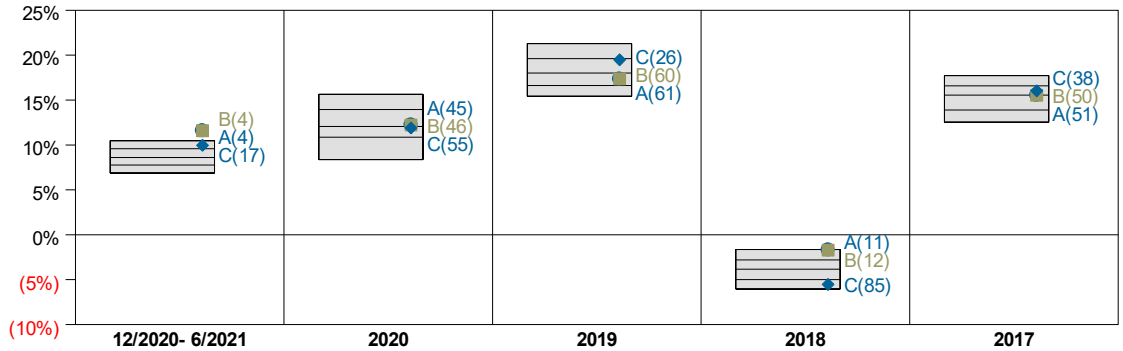
Longer-Term Total Fund Returns as of 06/30/21



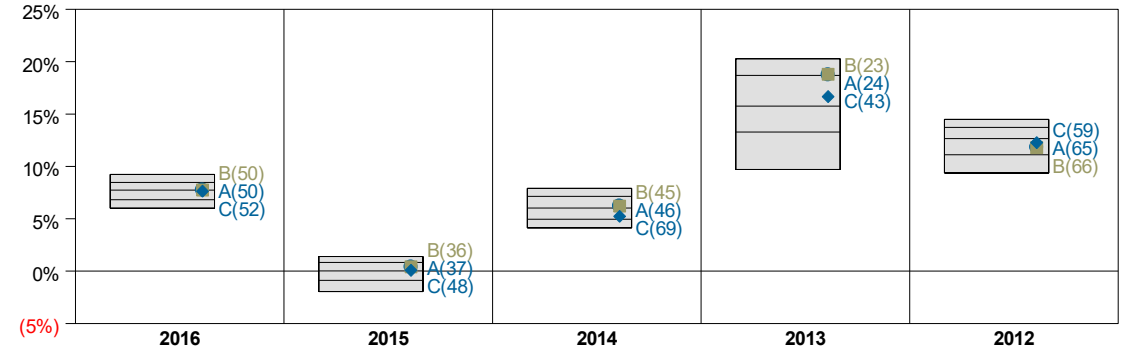
	Last 5 Years	Last 6 Years	Last 10 Years	Last 29-3/4 Years
10th Percentile	12.34	10.42	9.96	9.14
25th Percentile	11.57	9.70	9.28	8.85
Median	10.67	8.91	8.59	8.54
75th Percentile	10.00	8.39	8.05	8.16
90th Percentile	9.32	7.79	7.42	7.82
PERS Total Plan ● A	11.86	9.73	9.22	8.22
TRS Total Plan ■ B	11.87	9.73	9.24	8.26
Target Index ◆ C	11.09	9.15	8.67	8.04

- Five-, six-, and ten-year performance is above target and median.
- 29 year and 3 quarter return for PERS beat the target by 18 basis points.

Calendar Period Total Fund Performance



	12/2020- 6/2021	2020	2019	2018	2017
10th Percentile	10.48	15.64	21.29	(1.64)	17.73
25th Percentile	9.59	13.95	19.61	(2.79)	16.59
Median	8.61	12.06	18.01	(3.83)	15.56
75th Percentile	7.77	10.86	16.61	(4.99)	13.89
90th Percentile	6.89	8.37	15.43	(6.05)	12.54
PERS Total Plan ● A	11.58	12.23	17.34	(1.70)	15.52
TRS Total Plan ■ B	11.59	12.21	17.36	(1.70)	15.54
Target Index ◆ C	9.96	11.89	19.49	(5.53)	16.03

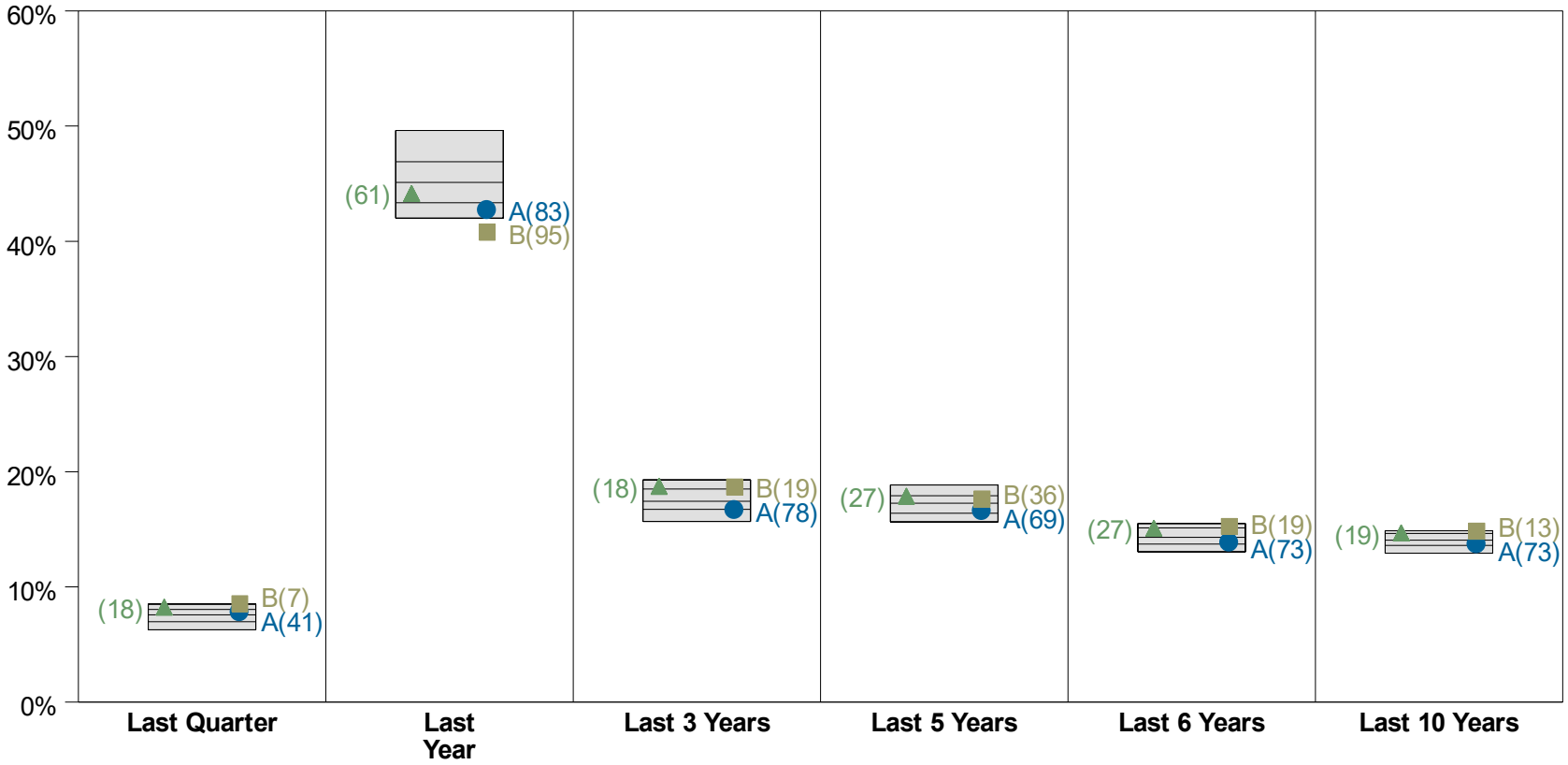


	2016	2015	2014	2013	2012
10th Percentile	9.23	1.40	7.90	20.27	14.49
25th Percentile	8.46	0.84	7.14	18.69	13.73
Median	7.74	0.02	6.03	15.76	12.66
75th Percentile	6.82	(0.88)	4.96	13.28	11.11
90th Percentile	6.01	(1.95)	4.13	9.71	9.38
PERS Total Plan ● A	7.74	0.40	6.22	18.74	11.81
TRS Total Plan ■ B	7.74	0.41	6.22	18.79	11.79
Target Index ◆ C	7.64	0.08	5.24	16.66	12.26

- PERS ranks at or above median in seven and TRS ranks at or above median in eight of the 10 periods shown.
- Peer group range of returns during 2016, 2015, and 2014 were very tight.
- Wide range of peer group returns during calendar 2013 due to varying fixed-income allocations within the Public Fund universe.

Total Domestic Equity through 06/30/21

Performance vs Public Fund - Domestic Equity (Gross)



		Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		8.51	49.63	19.29	18.85	15.49	14.89
25th Percentile		8.05	46.90	18.50	17.91	15.13	14.64
Median		7.57	45.12	17.43	17.27	14.29	14.06
75th Percentile		6.98	43.35	16.74	16.40	13.72	13.61
90th Percentile		6.28	42.02	15.69	15.64	13.04	12.93
Domestic Equity Pool	● A	7.79	42.69	16.65	16.58	13.83	13.69
Standard & Poor's 500	■ B	8.55	40.79	18.67	17.65	15.25	14.84
Russell 3000 Index	▲	8.24	44.16	18.73	17.89	15.10	14.70

Domestic Equity Component Returns

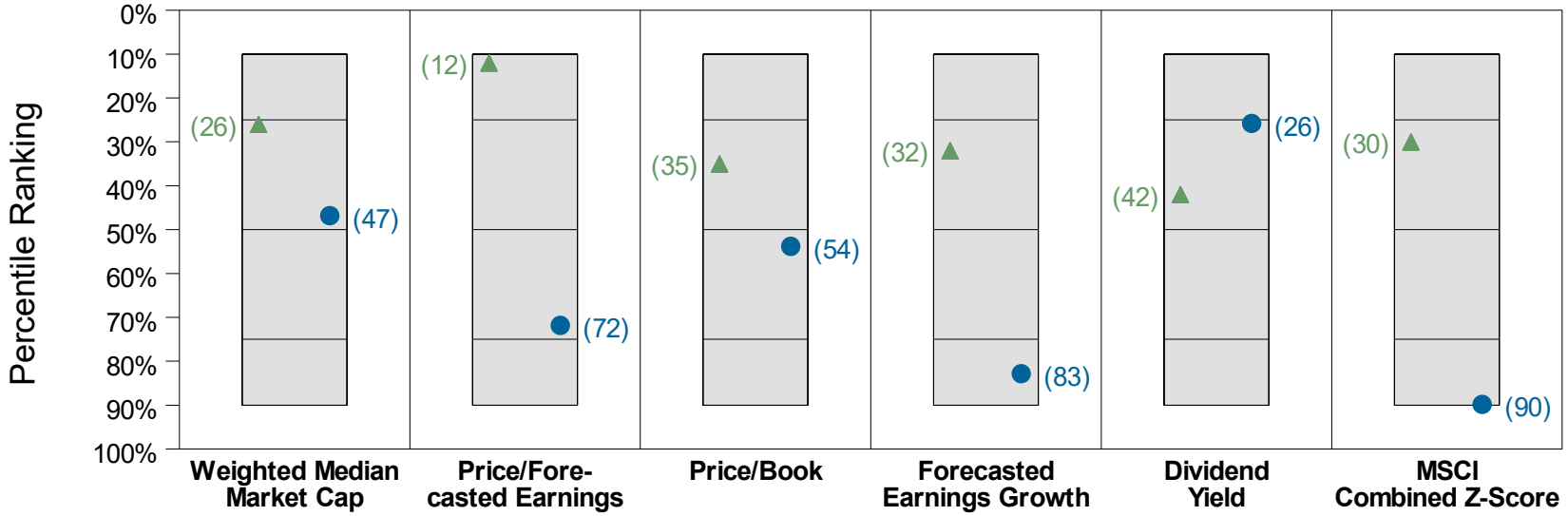
Returns for Periods Ended June 30, 2021

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Total Dom Equity Pool	7.79%	42.69%	16.65%	16.58%	13.69%
Russell 3000 Index	8.24%	44.16%	18.73%	17.89%	14.70%
Large Cap Managers	8.05%	40.52%	17.22%	16.73%	14.13%
Russell 1000 Index	8.54%	43.07%	19.16%	17.99%	14.90%
Small Cap Managers	4.26%	66.71%	13.35%	16.74%	12.69%
Russell 2000 Index	4.29%	62.03%	13.52%	16.47%	12.34%

- The large cap composite trailed its benchmark (the Russell 1000 Index) over all periods shown in the table.
- The small cap composite has outperformed its benchmark (the Russell 2000 Index) over the last one-, five-, and ten year periods but lags for the last quarter, and three year time period.

Domestic Equity Portfolio Characteristics

Portfolio Characteristics Percentile Rankings
Rankings Against Public Fund - Domestic Equity
as of June 30, 2021

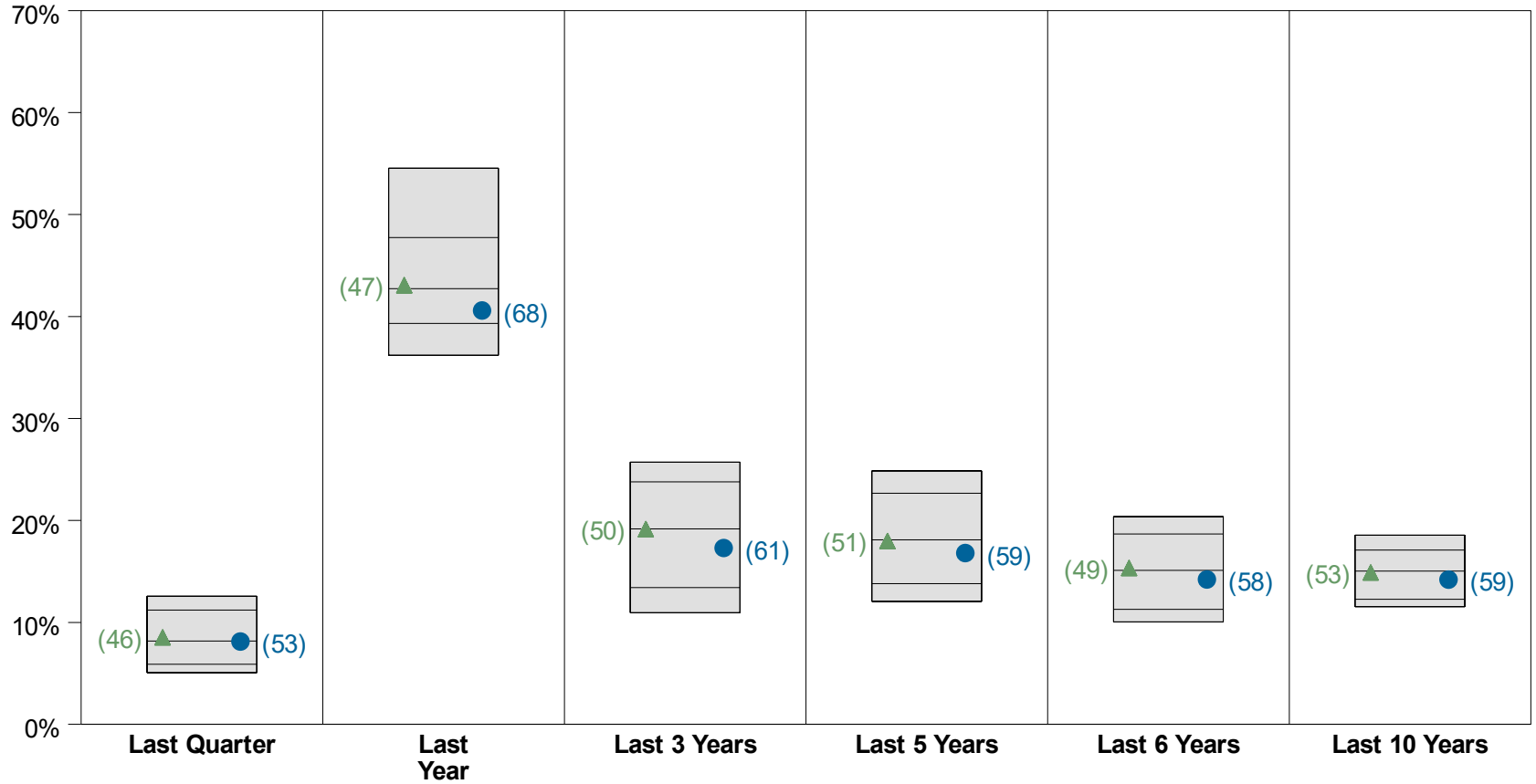


	Weighted Median Market Cap	Price/Fore-casted Earnings	Price/Book	Forecasted Earnings Growth	Dividend Yield	MSCI Combined Z-Score
10th Percentile	193.89	22.97	4.38	20.09	1.37	0.18
25th Percentile	134.74	22.13	4.31	19.34	1.35	0.04
Median	76.57	21.53	3.80	19.10	1.25	(0.02)
75th Percentile	64.38	20.25	3.41	18.48	1.13	(0.05)
90th Percentile	42.28	19.21	3.23	17.48	1.03	(0.10)
Domestic Equity Pool ●	85.85	20.55	3.73	17.78	1.35	(0.12)
Russell 3000 Index ▲	128.18	22.71	4.08	19.18	1.28	0.01

- ARMB's overall domestic equity portfolio's market capitalization is smaller than 47% of public funds (first column).
- Overall, ARMB's domestic equity portfolio tilts decidedly "value" versus peers (last column on right).
  - "MSCI Combined Z-Score" measures Growth and Value characteristics of individual stocks within managers' portfolios.
  - A low Z-Score rank (i.e.– the dot appears towards the top of the floating bar) indicates a Growth bias.
  - A high Z-Score rank (i.e. – the dot appears towards the bottom of the floating bar) indicates a Value bias.

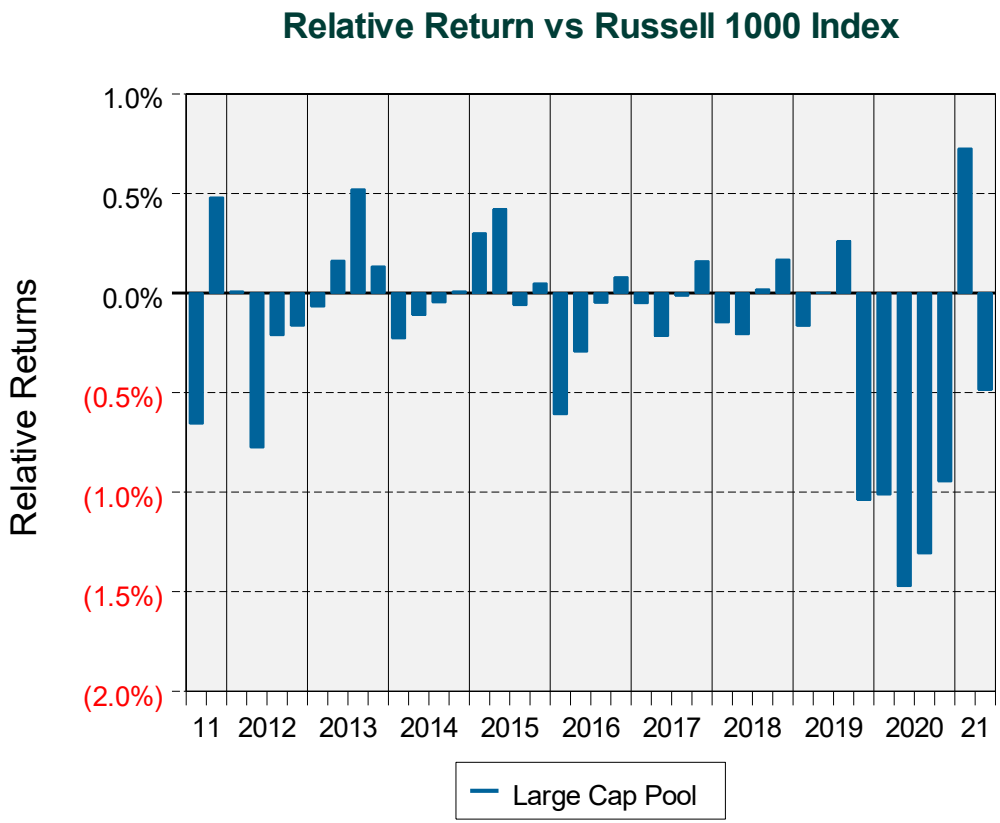
Large Cap Domestic Equity through 06/30/21

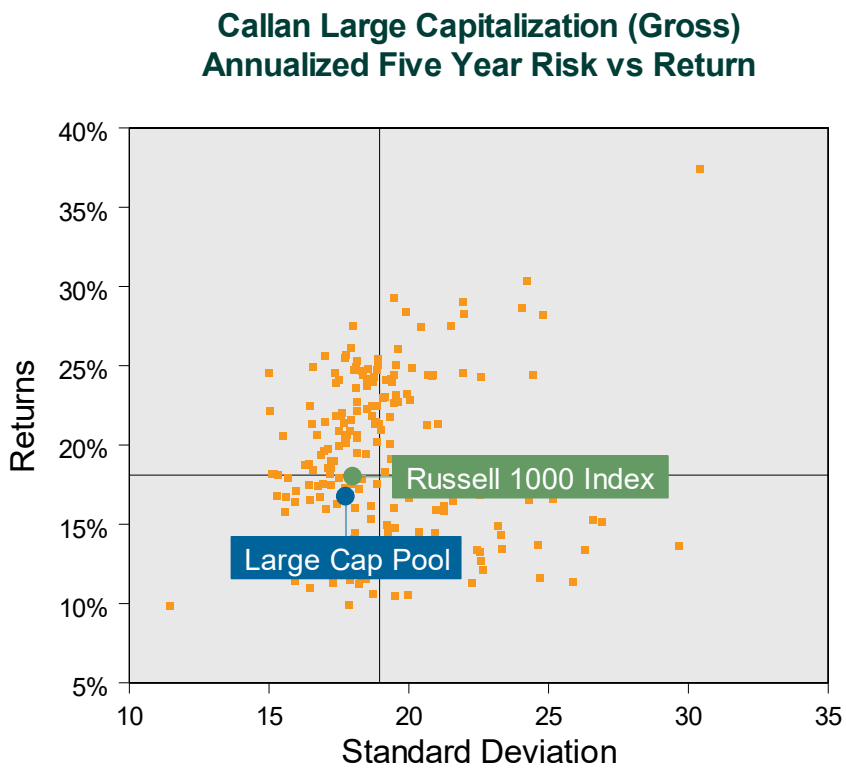
Performance vs Callan Large Capitalization (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	12.58	54.55	25.72	24.86	20.38	18.56
25th Percentile	11.21	47.74	23.77	22.68	18.67	17.11
Median	8.18	42.72	19.16	18.11	15.11	15.04
75th Percentile	5.91	39.32	13.42	13.81	11.29	12.28
90th Percentile	5.07	36.20	10.96	12.05	10.05	11.54
Large Cap Pool ●	8.05	40.52	17.22	16.73	14.14	14.13
Russell 1000 Index ▲	8.54	43.07	19.16	17.99	15.34	14.90

Large Cap Domestic Equity as of 06/30/21

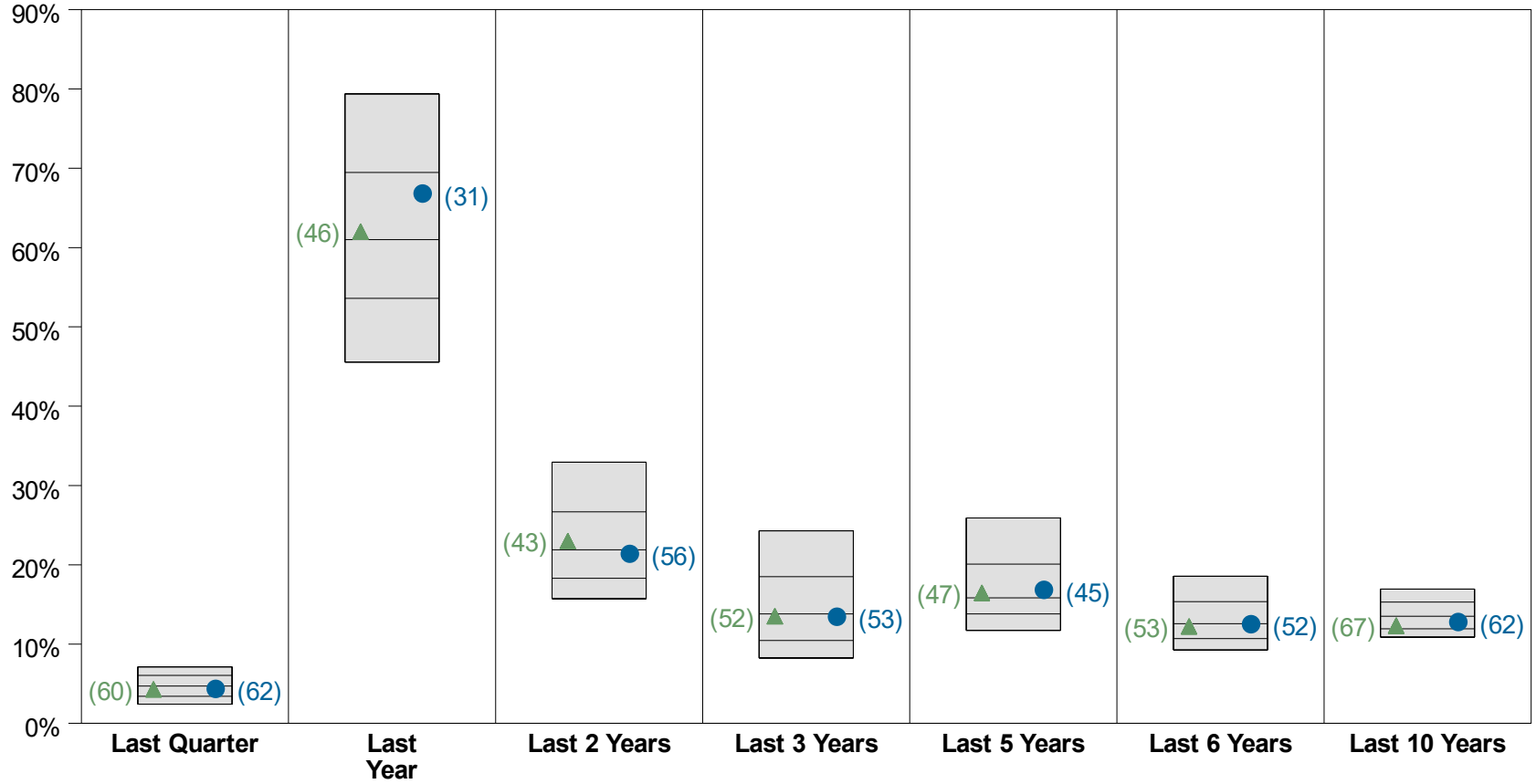




- Large Cap Domestic Equity returns underperformed the Russell 1000 index by 49bps in the second quarter of 2021.
- Long-term performance exhibits market-like returns with similar risk.
- Underperformance vs. the Russell 1000 Index in 4Q19 through 4Q20 was driven by Scientific Beta, which trailed the broad benchmark by between 2% and 4% in each of those quarters.
- Passive implementation also detracted as the S&P 900 Index trailed the Russell 1000 Index by 1.1% in 2Q20, 0.8% in 3Q20, and 0.9% in 4Q20.

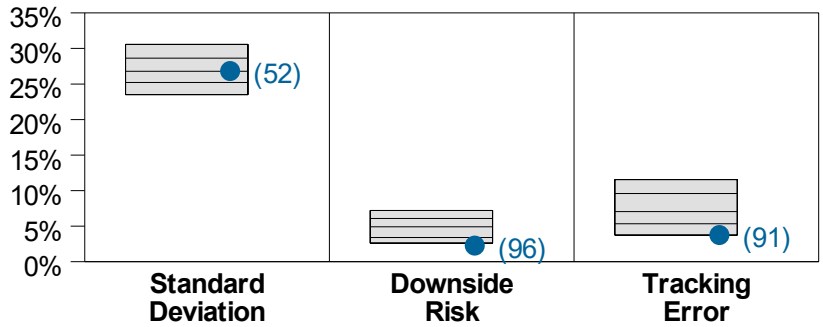
Small Cap Domestic Equity through 06/30/21

Performance vs Callan Small Capitalization (Gross)



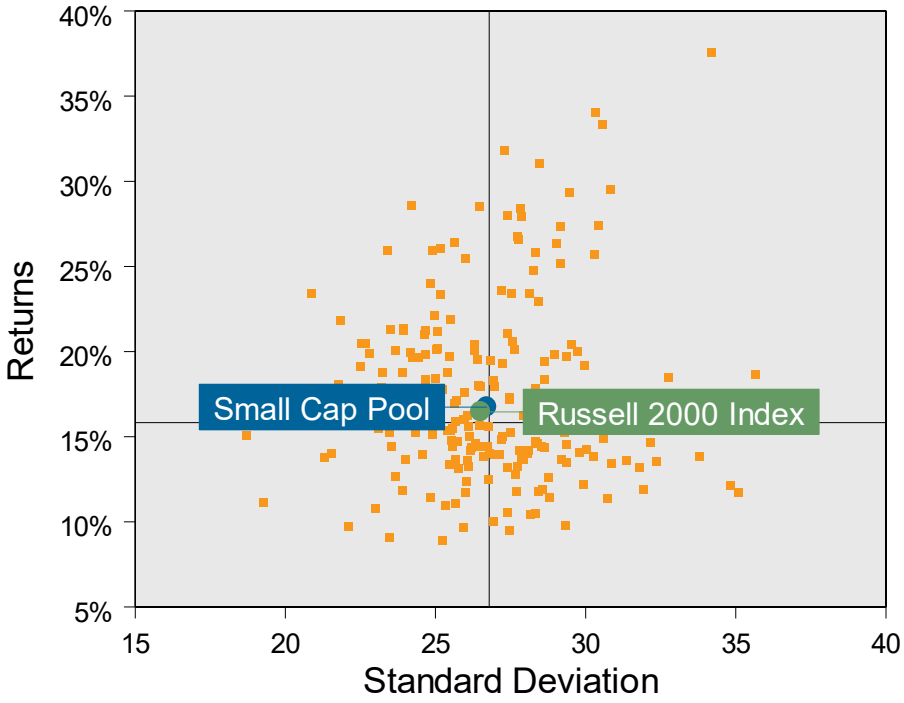
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	7.14	79.38	32.94	24.28	25.90	18.55	16.93
25th Percentile	6.06	69.47	26.68	18.51	20.09	15.34	15.30
Median	4.70	60.99	21.89	13.82	15.83	12.58	13.52
75th Percentile	3.41	53.61	18.31	10.44	13.82	10.69	11.94
90th Percentile	2.43	45.54	15.71	8.24	11.73	9.26	10.89
Small Cap Pool ●	4.26	66.71	21.29	13.35	16.74	12.41	12.69
Russell 2000 Index ▲	4.29	62.03	23.00	13.52	16.47	12.23	12.34

Small Cap Domestic Equity through 06/30/21



	Standard Deviation	Downside Risk	Tracking Error
10th Percentile	30.60	7.23	11.56
25th Percentile	28.65	6.09	9.58
Median	26.79	4.94	7.04
75th Percentile	25.22	3.42	5.35
90th Percentile	23.52	2.64	3.74
Small Cap Equity Pool ●	26.71	2.17	3.65

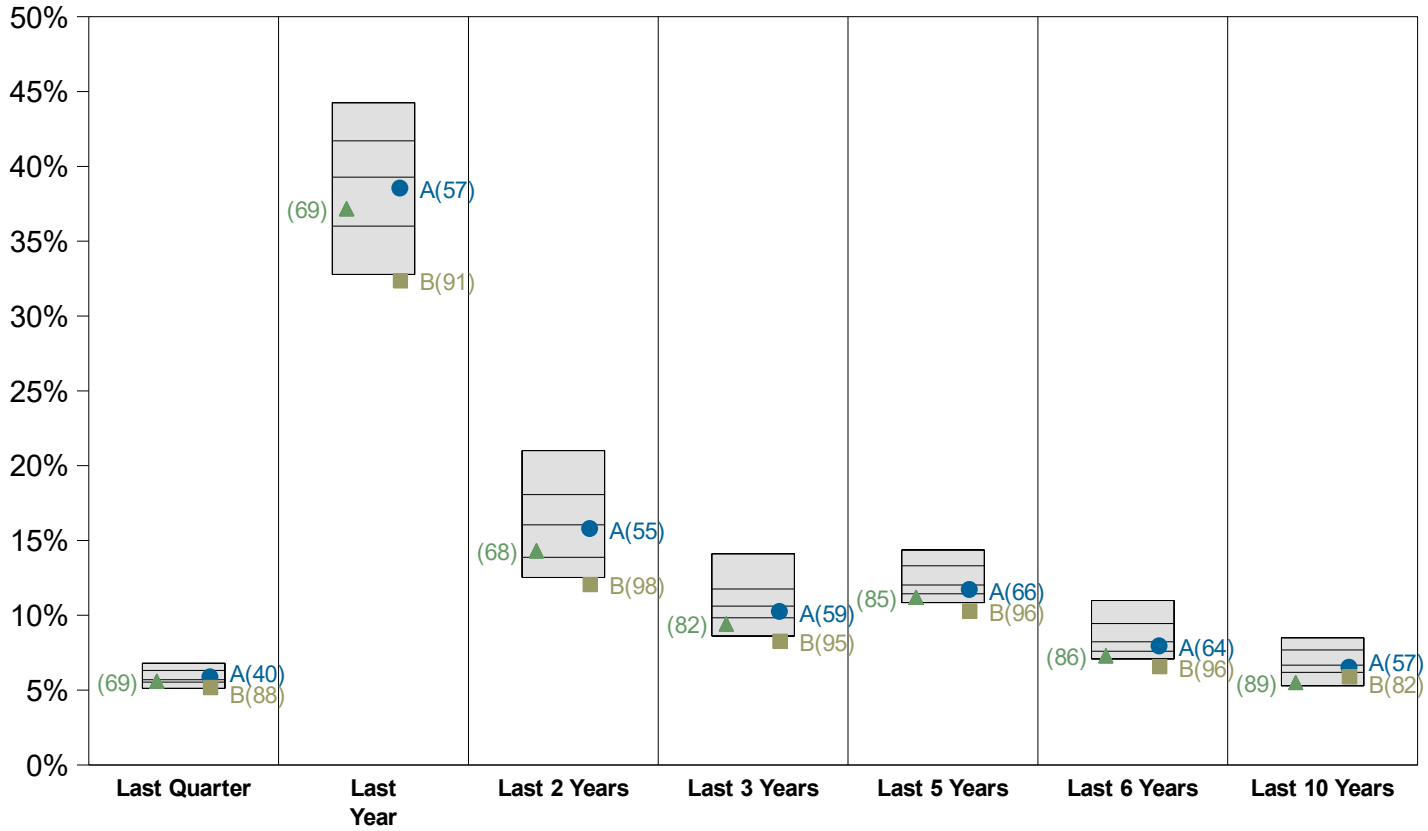
Callan Small Capitalization (Gross)
Annualized Five Year Risk vs Return



- The five-year risk statistics of standard deviation, downside risk, and tracking error compare favorably versus the peer group of small cap managers.

Global Equity ex-US through 06/30/21

Performance vs Public Fund - International Equity (Gross)

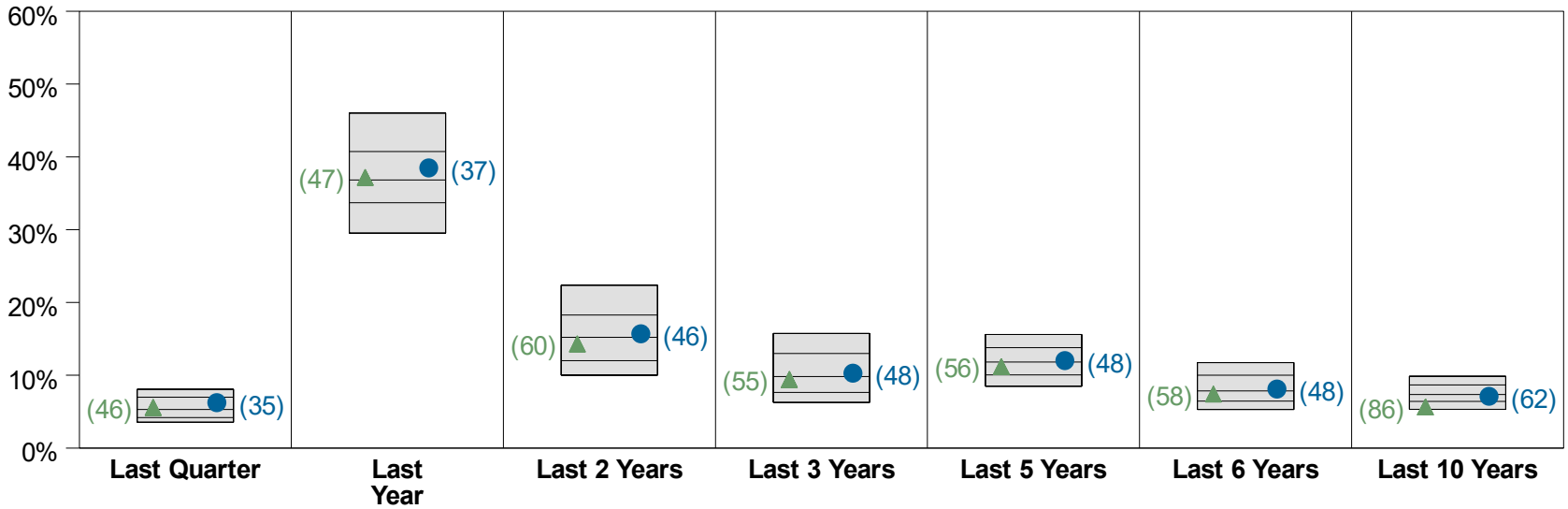


		Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile		6.80	44.24	21.01	14.12	14.37	10.98	8.49
25th Percentile		6.31	41.71	18.06	11.76	13.31	9.45	7.68
Median		5.70	39.29	16.05	10.62	12.03	8.22	6.67
75th Percentile		5.53	36.01	13.88	9.84	11.44	7.60	6.19
90th Percentile		5.12	32.77	12.53	8.61	10.85	7.08	5.29
Global Equity ex-US	● A	5.84	38.51	15.76	10.22	11.69	7.91	6.49
MSCI EAFE Index	■ B	5.17	32.35	12.05	8.27	10.28	6.57	5.89
Int'l Equity Target	▲	5.60	37.18	14.32	9.43	11.20	7.30	5.51

The Int'l Equity Target currently consists of MSCI ACWI ex U.S. IMI.

International Equity ex Emerging Markets through 06/30/21

Performance vs Callan Non-US Equity (Gross)



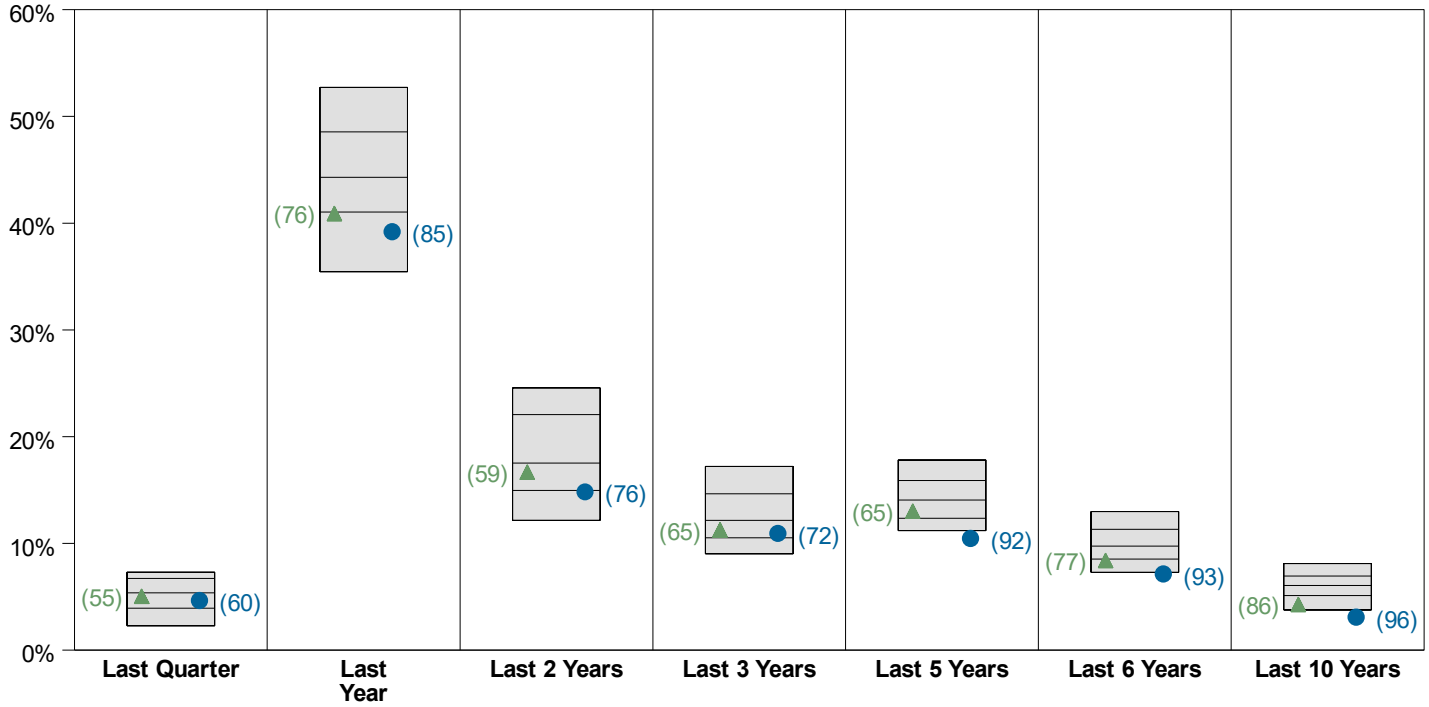
	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	8.10	46.03	22.38	15.76	15.60	11.74	9.87
25th Percentile	6.99	40.73	18.30	12.99	13.79	10.00	8.67
Median	5.31	36.81	15.21	9.83	11.81	7.85	7.36
75th Percentile	4.21	33.69	11.99	7.65	10.05	6.46	6.43
90th Percentile	3.56	29.53	9.99	6.26	8.49	5.31	5.34
Int'l Equity Pool (ex Emerging. Mkt) ●	6.14	38.38	15.61	10.18	11.93	8.01	7.01
MSCI ACWI ex US IMI ▲	5.60	37.18	14.32	9.43	11.20	7.42	5.65

International Equity ex Emerging Markets through 06/30/21

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Int'l Equity Pool (ex Emerging Market)	**6.14%**	**38.38%**	**10.18%**	**11.93%**	**7.01%**
Arrowstreet ACWI ex -US	6.62%	50.27%	15.98%	15.48%	-
Baillie Gifford ACWI ex US	6.73%	41.91%	17.33%	16.52%	-
Brandes Investment	6.26%	45.69%	5.97%	9.03%	6.08%
Capital Guardian	6.97%	38.27%	15.82%	17.17%	9.48%
L&G Sci Beta Dev ex US	6.34%	34.57%	-	-	-
SSgA World ex US IMI	5.49%	34.86%	-	-	-
MSCI EAFE Index	5.17%	32.35%	8.27%	10.28%	5.89%
MSCI ACWI ex-US IMI Index	5.60%	37.18%	9.43%	11.20%	5.65%

Emerging Markets through 06/30/21

Performance vs Callan Emerging Broad (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	7.31	52.71	24.57	17.22	17.82	12.97	8.12
25th Percentile	6.72	48.55	22.05	14.65	15.89	11.32	6.94
Median	5.38	44.29	17.53	12.16	14.06	9.75	6.06
75th Percentile	3.93	41.04	14.97	10.52	12.35	8.53	5.13
90th Percentile	2.29	35.45	12.16	9.01	11.21	7.29	3.75
Emerging Markets Pool ●	4.58	39.14	14.76	10.87	10.40	7.07	3.04
MSCI EM ▲	5.05	40.90	16.67	11.28	13.03	8.40	4.29

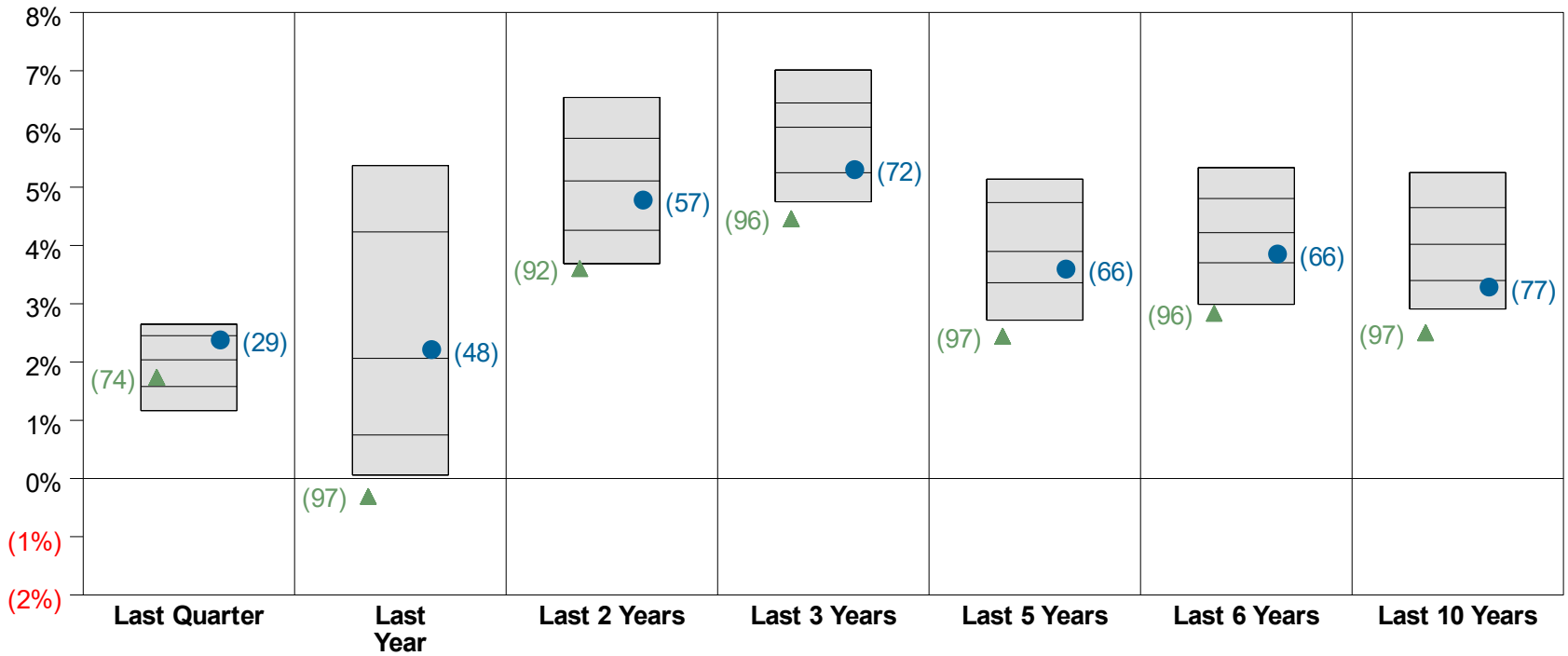
- After underperforming by 3.76% in 2Q17, 1.38% in 3Q17, 1.68% in 4Q17, 4.03% in 2Q18, 1.87% in 1Q19, 1.41% in 4Q19, 0.94% in 1Q21, and 0.47% in 2Q21 the Emerging Markets Pool lags the benchmark and ranks in the bottom quartile over periods of one year and longer.
- DRZ and Lazard were liquidated and L&G Scientific Beta was funded in 4Q19, leaving only passive and smart beta approaches within the emerging markets equity space.

Emerging Markets Pool through 06/30/21

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Emerging Markets Pool	**4.58%**	**39.14%**	**10.87%**	**10.40%**	**3.04%**
SSgA Emerging Markets	5.03%	40.38%	-	-	-
L&G SciBeta EM	3.52%	36.14%	-	-	-
MSCI EM	5.05%	40.90%	11.28%	13.03%	4.29%

Total Fixed Income as of 06/30/21

Performance vs Public Fund - Domestic Fixed (Gross)



	Last Quarter	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 6 Years	Last 10 Years
10th Percentile	2.65	5.37	6.54	7.01	5.14	5.34	5.25
25th Percentile	2.45	4.23	5.84	6.45	4.74	4.81	4.65
Median	2.04	2.06	5.11	6.03	3.90	4.22	4.02
75th Percentile	1.58	0.75	4.26	5.25	3.36	3.70	3.40
90th Percentile	1.17	0.06	3.69	4.75	2.72	2.99	2.91
Total Fixed Income Pool ●	2.37	2.20	4.77	5.29	3.58	3.84	3.27
Fixed Income Target ▲	1.74	(0.31)	3.60	4.46	2.44	2.84	2.50

- The Total Fixed Income Pool portfolio outperformed the Fixed Income Target in all time periods shown.
- The transition from intermediate Treasury to Aggregate mandates was completed during the fourth quarter of 2019.

Total Fixed Income through 06/30/21

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Fixed Income	**2.37%**	**2.20%**	**5.29%**	**3.58%**	**3.27%**
Fixed Income Target	1.74%	(0.31%)	4.46%	2.44%	2.50%
Blmbg Treasury Intmdt	0.62%	(1.18%)	3.96%	1.93%	2.16%
ARMB US Aggregate	1.95%	(0.19%)	-	-	-
Opportunistic Fixed Income	**3.02%**	**9.48%**	**5.86%**	**6.11%**	**6.27%**
FIAM Tactical Bond	2.66%	7.74%	7.60%	6.12%	-
Blmbg Aggregate	1.83%	(0.33%)	5.34%	3.03%	3.39%
FIAM REHI	3.77%	19.66%	4.77%	4.73%	-
Blmbg:Universal CMBS xAaa	3.14%	14.06%	6.64%	5.07%	5.20%
Alternative Fixed Income	**4.80%**	**9.36%**	**-**	**-**	**-**
Crestline (Blue Glacier)	5.21%	6.80%	5.79%	7.23%	6.36%
Prisma Capital (Polar Bear)	2.24%	11.90%	2.58%	3.42%	3.08%
Crestline Specialty Lending Fund	1.71%	33.08%	16.05%	14.80%	-
Crestline Specialty Lndg Fd II	4.35%	33.37%	12.23%	-	-
HFRI Fund of Funds Index	2.89%	18.32%	6.33%	6.13%	3.86%
T-Bills + 5%	1.23%	5.09%	6.34%	6.17%	5.63%

Opportunistic through 06/30/21

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Opportunistic (T)	**6.98%**	**23.43%**	**10.20%**	**-**	**-**
Alternative Equity Strategies	**11.12%**	**35.23%**	**18.13%**	**14.83%**	**10.92%**
McKinley Healthcare Transformation	11.12%	35.23%	-	-	-
Russell 1000 Index	8.54%	43.07%	19.16%	17.99%	14.90%
Other Opportunities	**(4.30%)**	**(4.84%)**	**(1.73%)**	**0.06%**	**-**
Project Pearl	(12.22%)	(13.83%)	-	-	-
Schroders Insurance Linked	1.99%	1.23%	(1.53%)	(1.11%)	-
T-Bills + 6%	1.47%	6.09%	7.34%	7.17%	6.63%
Tactical Allocation Strategies	**5.57%**	**28.34%**	**-**	**-**	**-**
PineBridge	4.97%	30.89%	-	-	-
Pine Bridge Benchmark	3.64%	20.98%	7.36%	7.39%	4.07%
Fidelity Signals	6.16%	25.95%	-	-	-
Fidelity Signals Benchmark	5.02%	23.07%	11.06%	10.11%	7.53%
Alternative Beta	**8.59%**	**1.52%**	**(4.27%)**	**(3.15%)**	**-**
Man Group Alternative Risk Premia	8.59%	1.52%	(1.85%)	-	-
T-Bills + 5%	1.23%	5.09%	6.34%	6.17%	5.63%

Real Assets through 06/30/21

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Real Assets	**4.40%**	**9.92%**	**6.03%**	**6.33%**	**7.35%**
Real Assets Target (1)	5.19%	16.98%	6.66%	5.99%	7.73%
Real Estate	5.14%	16.00%	8.26%	7.73%	9.72%
Real Estate Target (2)	4.44%	9.75%	6.34%	6.47%	9.06%
Private Real Estate	2.95%	9.97%	6.93%	7.53%	9.60%
NCREIF NFI-ODCE Val Wt Nt	3.68%	7.09%	4.60%	5.62%	8.60%
NCREIF Total Index	3.59%	7.37%	5.50%	6.13%	8.79%
ARMB REIT	11.97%	32.49%	11.86%	7.95%	10.16%
NAREIT Equity Index	12.03%	32.80%	11.97%	8.10%	10.29%
Total Farmland	0.92%	7.07%	4.82%	4.79%	7.73%
UBS Agrivest	0.92%	7.49%	5.31%	5.22%	8.61%
ARMB Farmland Target (3)	2.00%	6.54%	5.24%	5.44%	8.59%
Total Timber	1.92%	5.72%	3.13%	2.93%	4.89%
Timberland Investment Resources	1.92%	5.02%	3.12%	2.95%	4.51%
NCREIF Timberland Index	1.70%	3.10%	2.12%	2.65%	4.66%
Total Energy Funds	5.85%	11.42%	(4.10%)	3.36%	(1.91%)
CPI + 5%	4.02%	11.12%	7.67%	7.52%	6.82%
Total Infrastructure	5.65%	13.94%	10.26%	10.61%	-
JPM Infrastructure	1.09%	7.42%	6.87%	7.73%	-
IFM Infrastructure	6.70%	15.47%	12.58%	13.40%	-
CPI + 4%	3.79%	10.12%	6.67%	6.52%	5.82%
Global Infrastructure Idx	2.33%	23.15%	5.60%	6.21%	6.18%

(1) As of 10/01/2019, Real Assets Target is 37.5% NFI-ODCE Value Weight Net Index, 10% FTSE NAREIT All Equity Index, 25% NCREIF Farmland Index, 10% NCREIF Timberland Index, 17.5% CPI+4.

(2) ARMB Custom Real Estate Target is 90% NCREIF Property Index and 10% FTSE NAREIT All Equity REIT Index.

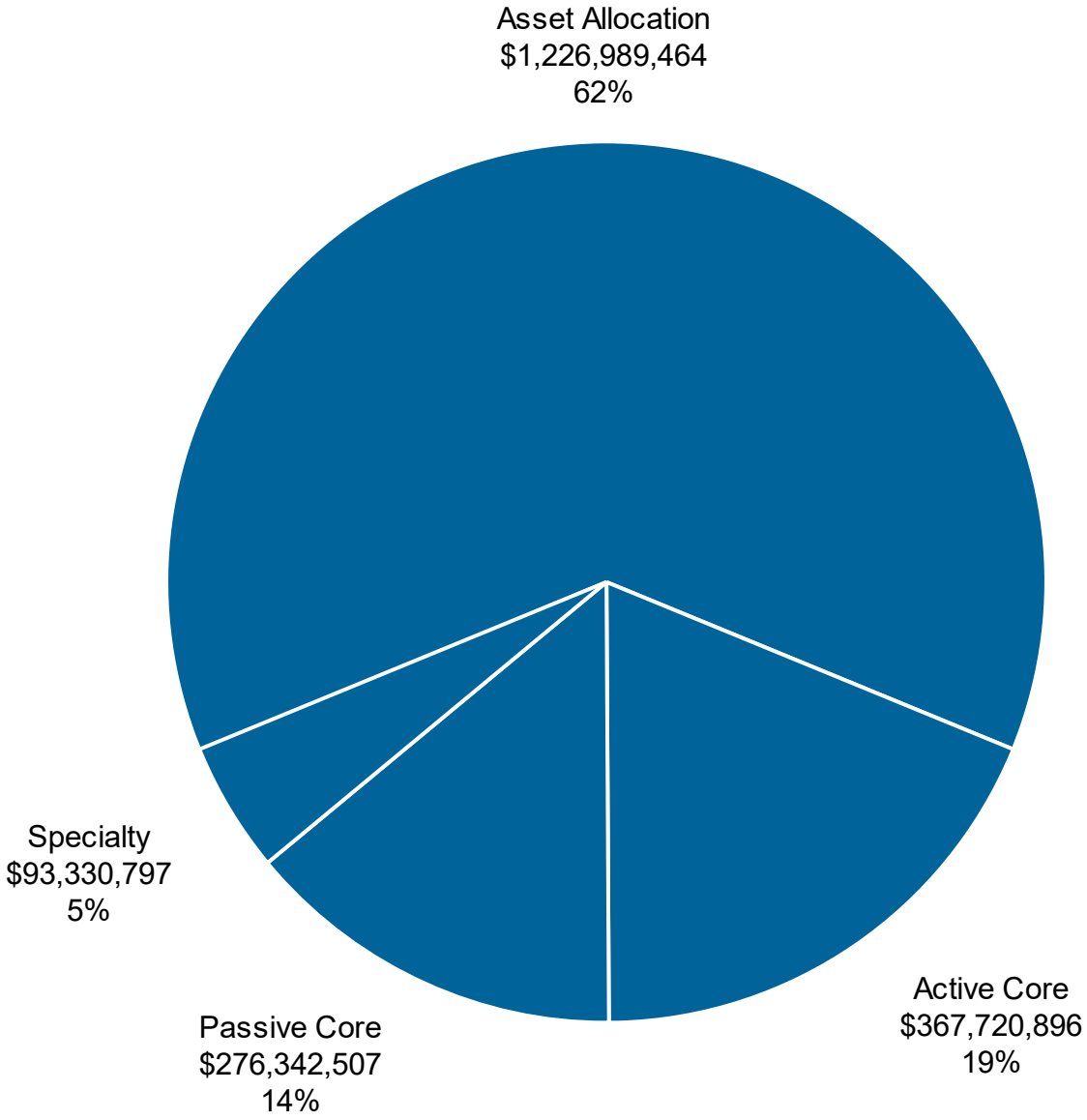
(3) ARMB Custom Farmland Target is leased-only properties in the NCREIF Farmland Index reweighted to reflect 90% row crops and 10% permanent crops until 1/1/08 and 80% row crops and 20% permanent crops thereafter .

Farmland and Timber data supplied by the manager and may vary from State Street returns due to timing variations.

Participant-Directed Plans

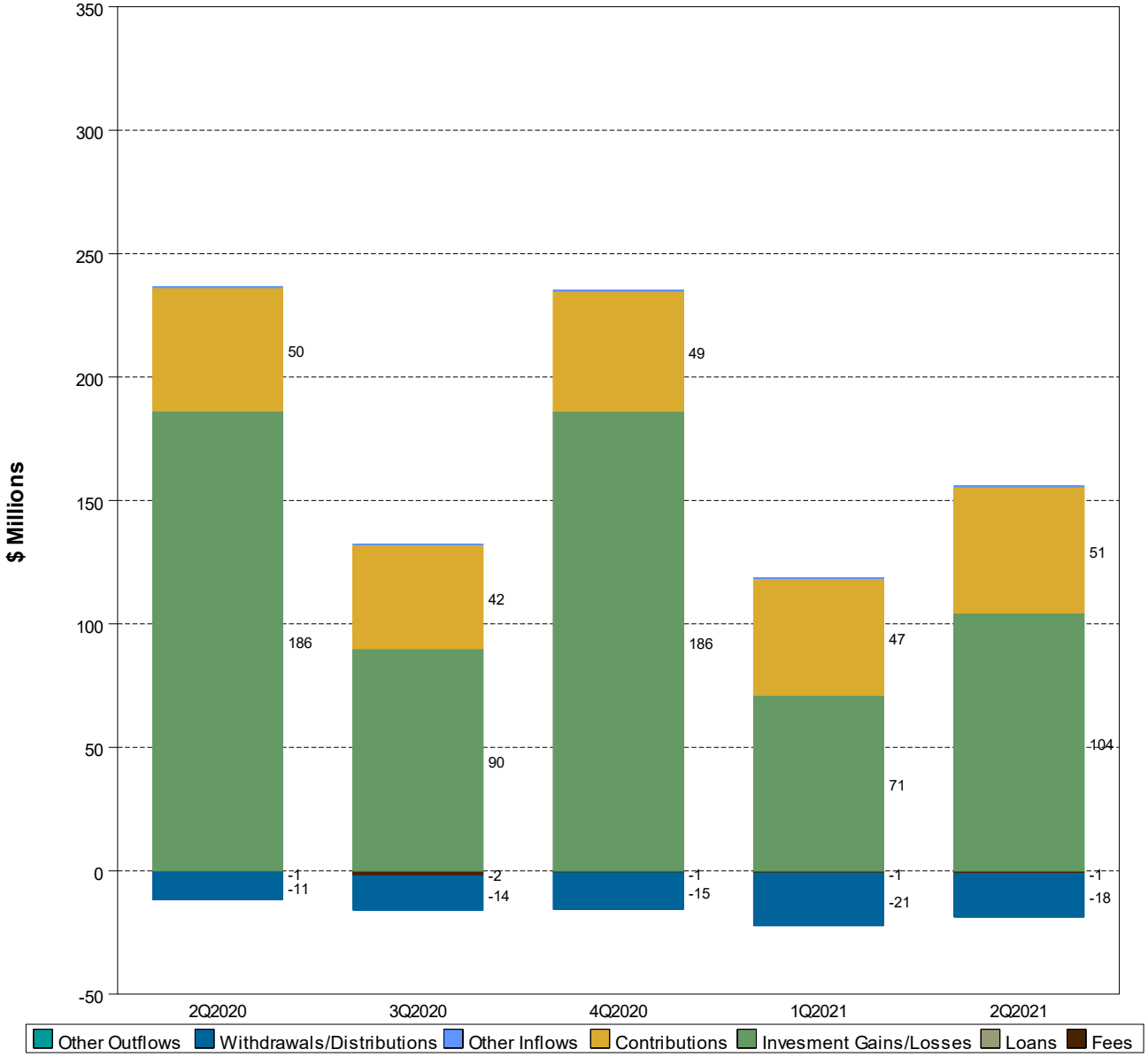
PERS DC Plan

June 30, 2021



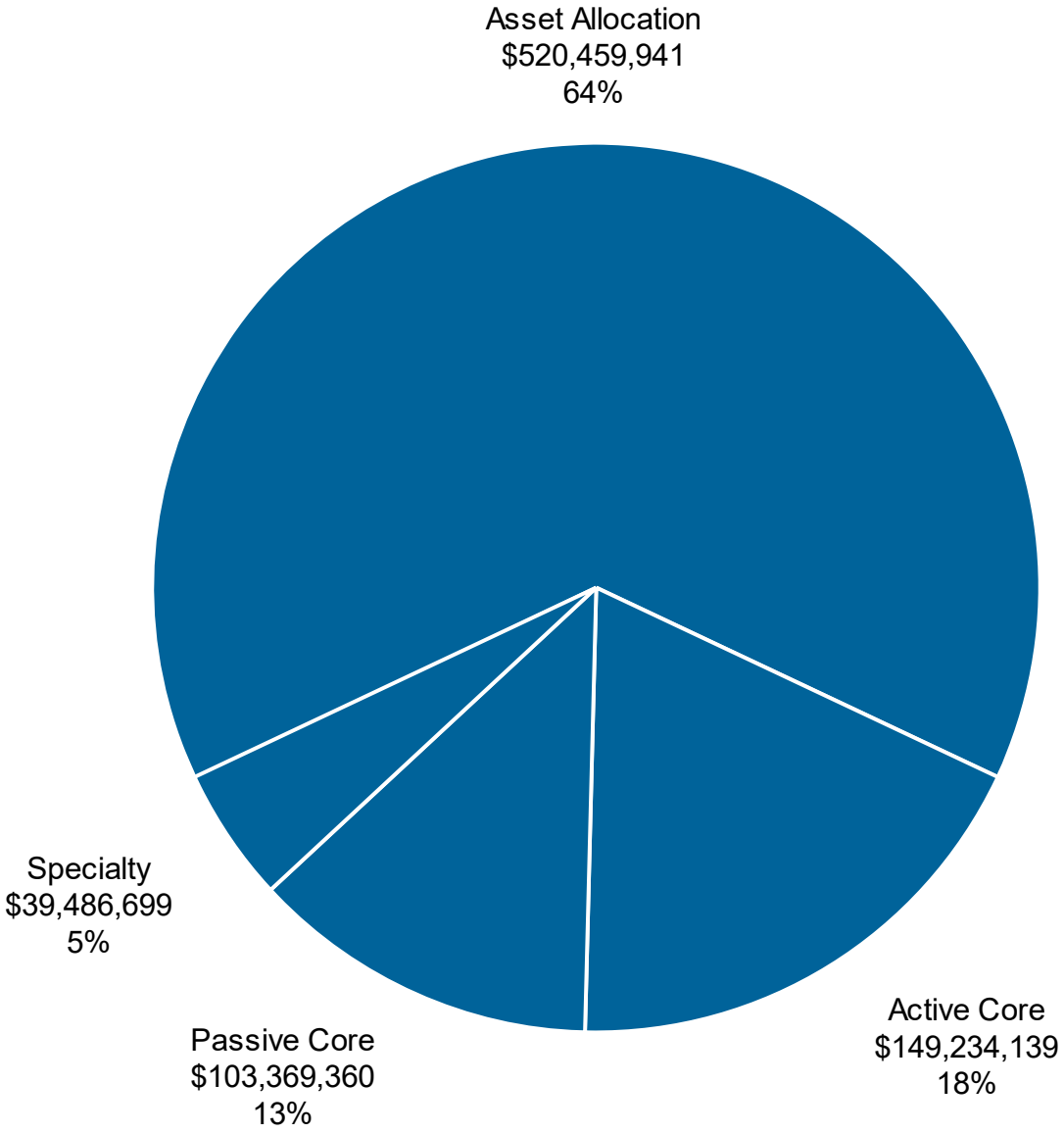
PERS DC Plan: Asset Changes

June 30, 2021



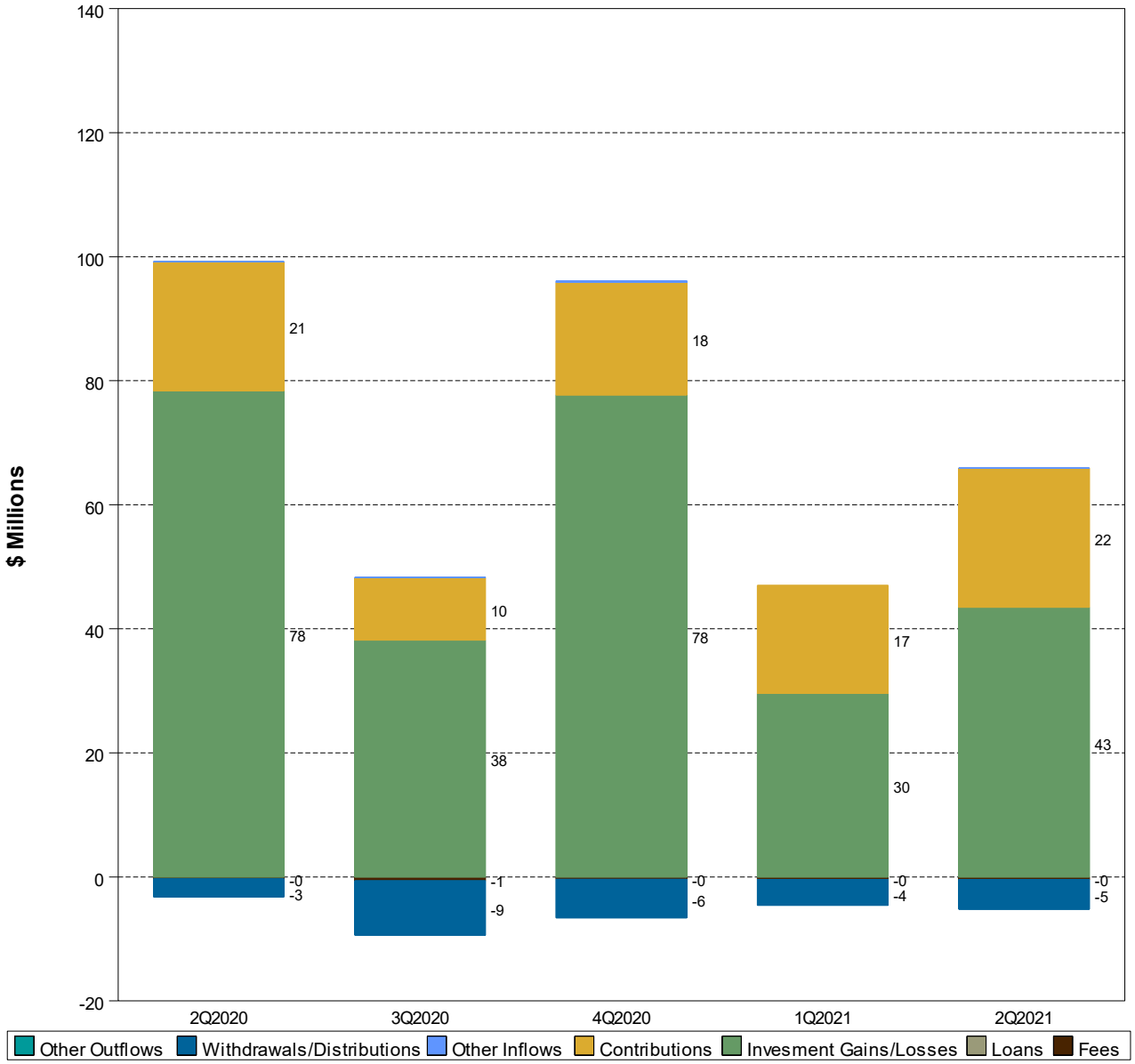
TRS DC Plan

June 30, 2021



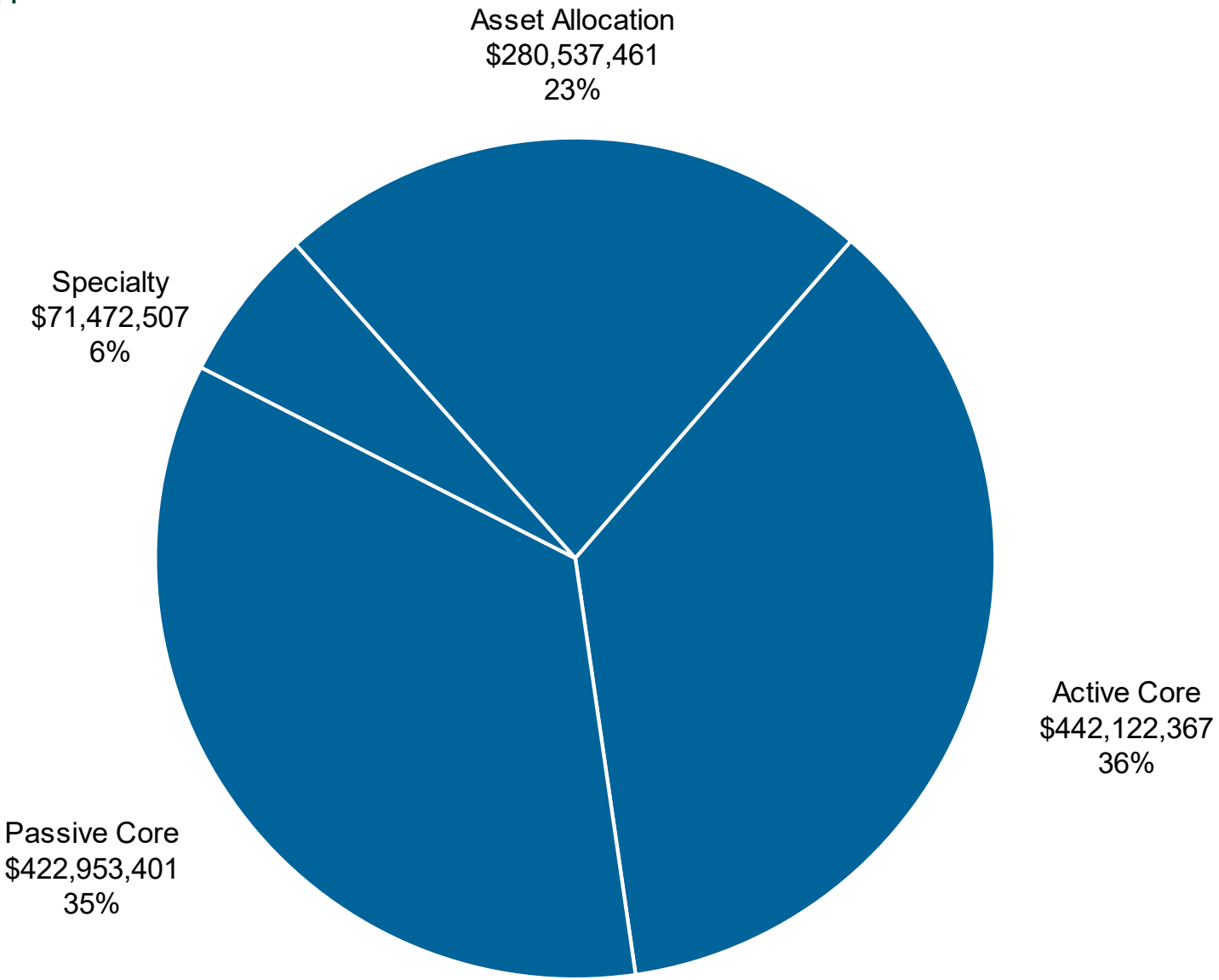
TRS DC Plan: Asset Changes

June 30, 2021



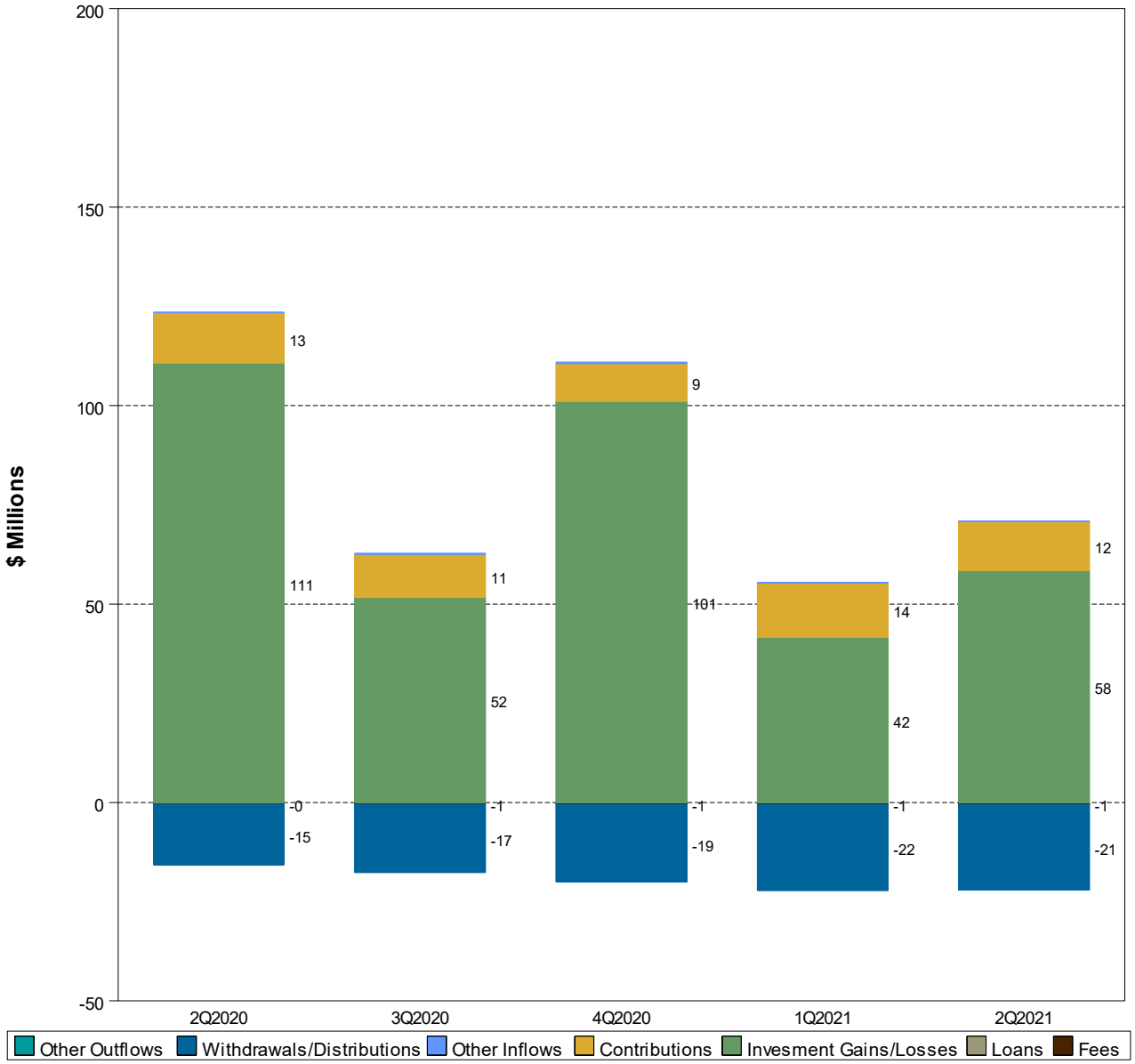
Deferred Comp Plan

June 30, 2021



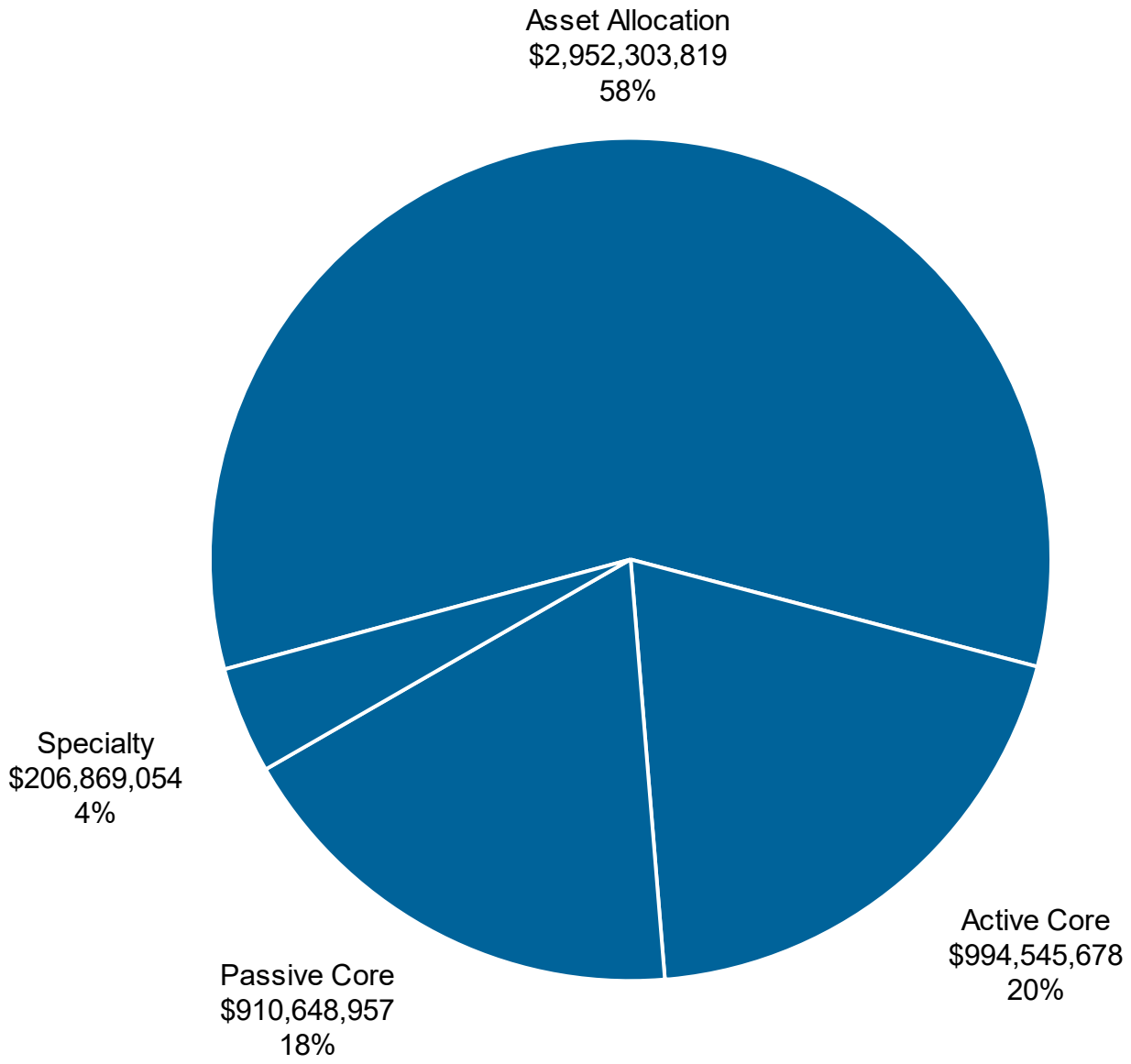
Deferred Comp Plan: Asset Changes

June 30, 2021



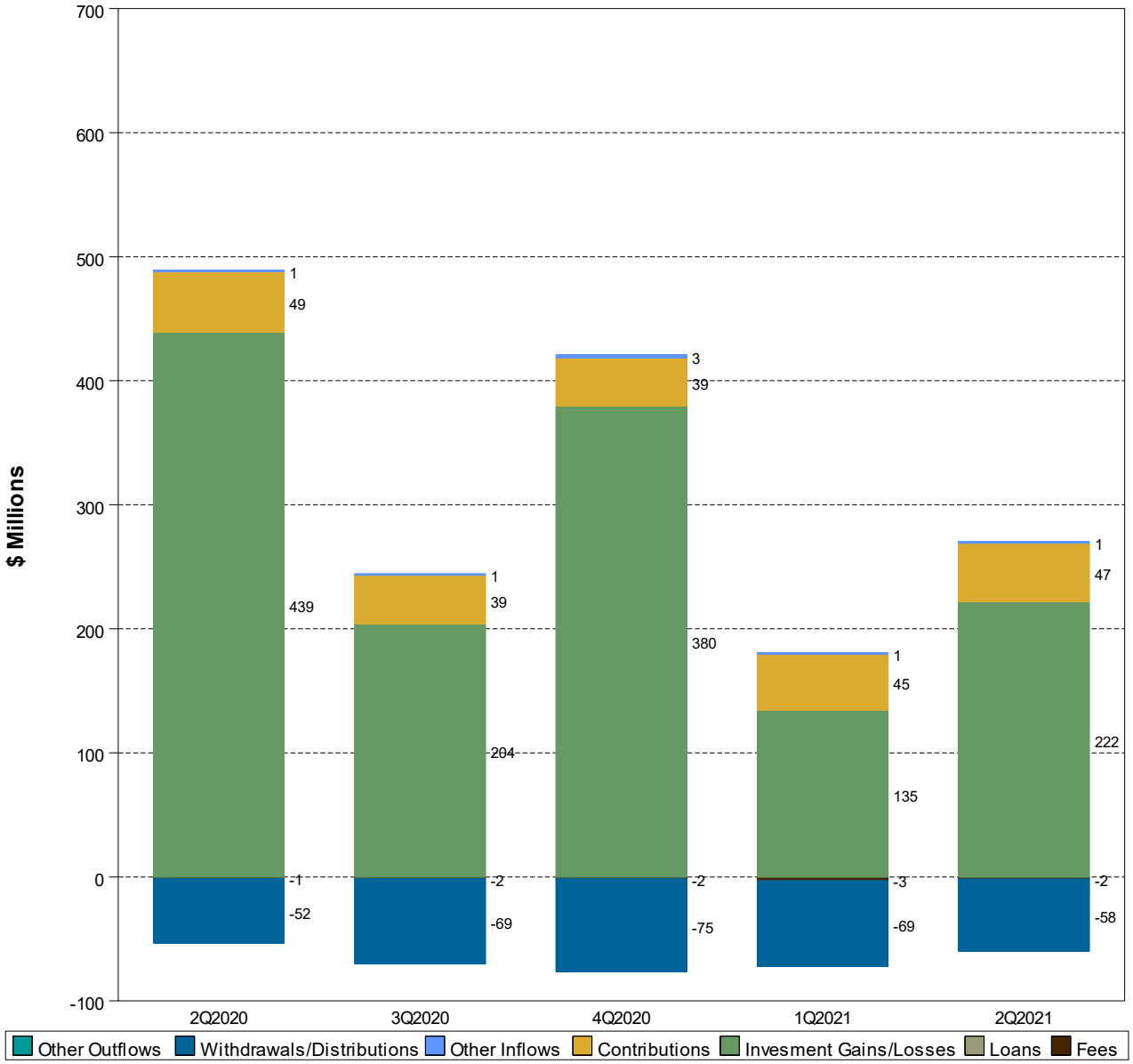
SBS Fund

June 30, 2021



SBS Fund: Asset Changes

June 30, 2021



Individual Account Option Performance: 06/30/21

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Asset Allocation										
Alaska Balanced Trust	**3.1** 56	**13.4** 53	**8.6** 21	**7.3** 26	**5.9** 19	**6.3** 70		**-0.2** 38	**0.3** 100	**1.0** 3
CAI MA Tgt Alloc Cons MFs										
Passive Target	3.3 47	13.5 51	8.6 21	7.4 24	5.9 19	6.5 68				1.0 3
Alaska Long-Term Balanced	**4.7** 49	**23.6** 52	**11.5** 33	**10.5** 33	**8.0** 32	**10.7** 60		**-0.7** 56	**0.3** 100	**0.9** 22
CAI MA Tgt Alloc Mod MFs										
Passive Target	4.8 44	23.8 50	11.6 31	10.7 32	8.1 29	10.9 59				0.9 21
Target 2010 Trust	**3.2** 93	**15.2** 40	**8.6** 69	**7.9** 47	**6.1** 45	**7.3** 51		**-0.5** 72	**0.3** 100	**0.9** 30
CAI Tgt Date 2010										
Custom Index	3.4 85	15.4 31	8.7 49	8.0 44	6.2 43	7.5 48				0.9 31
Target 2015 Trust	**3.6** 81	**17.7** 45	**9.5** 38	**9.0** 26	**6.9** 29	**8.4** 41		**-0.2** 34	**0.3** 100	**0.9** 22
CAI Tgt Date 2015										
Custom Index	3.8 72	17.9 43	9.6 37	9.0 24	6.9 29	8.6 39				0.9 30
Target 2020 Trust	**4.2** 52	**21.4** 25	**10.7** 21	**10.3** 17	**7.8** 15	**10.1** 26		**-0.3** 20	**0.3** 100	**0.9** 21
CAI Tgt Date 2020										
Custom Index	4.4 44	21.6 24	10.7 21	10.3 16	7.8 15	10.3 24				0.9 25
Target 2025 Trust	**4.8** 41	**25.3** 16	**11.9** 10	**11.5** 9	**8.6** 8	**11.7** 19		**-0.3** 17	**0.3** 100	**0.9** 13
CAI Tgt Date 2025										
Custom Index	5.0 22	25.5 14	11.9 10	11.6 8	8.6 8	11.9 15				0.9 15
Target 2030 Trust	**5.4** 38	**28.7** 19	**12.8** 15	**12.5** 15	**9.3** 9	**13.1** 26		**-0.5** 27	**0.3** 100	**0.9** 15
CAI Tgt Date 2030										
Custom Index	5.6 16	29.0 16	12.9 11	12.6 12	9.3 9	13.3 24				0.9 15
Target 2035 Trust	**5.9** 45	**31.8** 27	**13.7** 16	**13.4** 18	**9.9** 14	**14.4** 44		**-0.5** 24	**0.3** 100	**0.9** 9
CAI Tgt Date 2035										
Custom Index	6.0 31	32.0 25	13.7 16	13.5 16	9.9 13	14.5 41				0.8 9
Target 2040 Trust	**6.2** 45	**34.5** 37	**14.3** 18	**14.1** 16	**10.3** 13	**15.3** 55		**-0.5** 28	**0.3** 100	**0.8** 7
CAI Tgt Date 2040										
Custom Index	6.4 32	34.6 34	14.4 18	14.3 14	10.4 12	15.5 50				0.8 7
Target 2045 Trust	**6.6** 44	**36.7** 46	**14.9** 14	**14.5** 15	**10.6** 11	**16.1** 61		**-0.6** 25	**0.3** 99	**0.8** 8
CAI Tgt Date 2045										
Custom Index	6.7 28	36.9 42	15.0 13	14.7 14	10.7 10	16.3 60				0.8 8

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Individual Account Option Performance: 06/30/21

Balanced & Target Date Funds

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Target 2050 Trust	**6.6** 51	**36.8** 58	**14.9** 18	**14.5** 18	**10.6** 13	**16.1** 75		**-0.6** 43	**0.3** 99	**0.8** 8
CAI Tgt Date 2050 Custom Index	6.8 31	37.0 54	15.0 15	14.7 15	10.7 10	16.3 73				0.8 8
Target 2055 Trust	**6.6** 59	**36.8** 69	**14.9** 18	**14.5** 21	**10.6** 18	**16.1** 80		**-0.6** 50	**0.3** 100	**0.8** 8
CAI Tgt Date 2055 Custom Index	6.8 33	37.0 66	15.0 17	14.7 20	10.7 17	16.3 75				0.8 8
Target 2060 Trust	**6.6** 62	**36.7** 68	**14.8** 27	**14.4** 27		**16.1** 79		**-0.9** 84	**0.3** 100	**0.8** 13
CAI Tgt Date 2060 Custom Index	6.8 37	37.0 64	15.0 21	14.7 24		16.3 73				0.8 9
Target 2065 Trust	**6.5** 69	**36.6** 58								
CAI Tgt Date 2065 Custom Index	6.8 35	37.0 57								

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Other Options: 06/30/21

Passive Strategies

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Index Funds										
SSgA S&P 500 Index Fund (i)	**8.5** 28	**40.8** 12	**18.7** 15	**17.6** 12	**14.1** 15	**17.3** 51		**-0.6** 11	**0.0** 82	**1.0** 11
Callan S&P 500 Index MFs										
S&P 500 Index	8.5 9	40.8 9	18.7 9	17.6 11	14.1 10	17.3 34				1.0 11
SSgA Russell 3000 Index Fund (i)	**8.2** 51	**44.1** 28	**18.7** 48	**17.9** 47	**13.9** 46	**18.4** 58		**-0.8** 75	**0.0** 100	**0.9** 51
CAI Mut Fd: Large Cap Broad Style (Net)										
Russell 3000 Index	8.2 51	44.2 28	18.7 48	17.9 47	14.0 46	18.4 57				0.9 51
SSgA World Equity ex-US Index Fund (i)	**5.6** 49	**35.6** 53	**9.6** 43	**11.1** 43	**5.5** 50	**18.3** 68		**0.1** 41	**0.9** 99	**0.5** 39
CAI MF: Non-U.S. Equity Style										
MSCI ACWI x U.S. Index (Net)	5.5 50	35.7 53	9.4 44	11.1 43	5.3 52	18.0 77				0.6 38
BlackRock Passive US Bd Index Fund (i)	**1.8** 72	**-0.4** 99								
Callan Core Bond MFs										
Blmbg Aggregate	1.8 72	-0.3 99	5.3 90	3.0 93	3.3 79	3.6 80				0.5 90

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

(i) – Indexed scoring method used. Green: manager & index ranking differ by less than +/- 10 percentiles; Yellow: manager and index ranking differ by +/- 20 percentiles; Red: manager & index ranking differ by more than 20 percentiles.

Other Options: 06/30/21

Active Equity, Stable Value, and Money Market

Investment Manager	Last Quarter Return	Last Year Return	3 Year Return	5 Year Return	7 Year Return	5 Year Risk	5 Year Risk Quadrant	5 Year Excess Rtn Ratio	3 Year Tracking Error	5 Year Sharpe Ratio
Active and Other Funds										
BlackRrock Strategic Completion Fd	**8.0** 42	**25.0** 58								
Callan Real Assets MFs										
Strategic Completion Custom Index	8.0 42	25.2 56								
Northern Trust ESG Fund	**8.9** 45	**40.7** 59								
Callan Lg Cap Broad MF										
MSCI USA ESG	8.9 44	41.0 56	19.9 44	17.9 47	13.7 48	16.4 92				1.0 40
International Equity Fund	**6.2** 36	**42.4** 16	**11.4** 35	**11.5** 40		**19.4** 44		**0.1** 36	**3.3** 83	**0.5** 41
CAI Mut Fd: Non-U.S. Equity Style										
MSCI ACWI ex US Index	5.5 50	35.7 53	9.4 44	11.1 43	5.3 52	18.0 77				0.6 38
T. Rowe Price Small Cap	**5.3** 35	**54.5** 51	**19.7** 28	**19.8** 36	**14.4** 37	**22.8** 93		**0.6** 24	**6.9** 84	**0.8** 23
CAI Mut Fd: Sm Cap Broad Style										
Russell 2000 Index	4.3 57	62.0 30	13.5 58	16.5 51	11.4 54	26.5 47				0.6 56
T. Rowe Price Stable Value	**0.5** 4	**2.2** 3	**2.4** 1	**2.4** 1	**2.4** 1	**0.1** 93		**3.4** 5	**0.4** 17	**12.3** 2
Callan Stable Value CT										
FTSE 3 Mo T-Bill	0.0 99	0.1 99	1.3 97	1.1 98	0.8 100	0.4 1				-0.1 97
SSgA Inst Treasury Money Market	**0.0** 100	**0.0** 75	**1.2** 10	**1.0** 8	**0.7** 11	**0.4** 9		**-3.2** 24	**0.0** 95	**-0.4** 8
Callan Money Market Funds										
FTSE 3 Mo T-Bill	0.0 11	0.1 5	1.3 2	1.1 2	0.8 2	0.4 4				-0.1 2

Returns:
- above median
- third quartile
- fourth quartile

Risk:
- below median
- second quartile
- first quartile

Risk Quadrant:

Excess Return Ratio:
- above median
- third quartile
- fourth quartile

Tracking Error:
- below median
- second quartile
- first quartile

Sharpe Ratio:
- above median
- third quartile
- fourth quartile

Callan

Callan Update

Callan Institute Events

Upcoming conferences, workshops, and webinars

Callan College

Intro to Investments - Learn the Fundamentals

This course is for institutional investors, including trustees and staff members of nonprofits, and public and corporate funds. This session familiarizes trustees and staff with basic investment theory, terminology, and practices.

Join our next virtual sessions (2-3 hour sessions over 3 days)**:**

Aug. 17, 2021 – Aug. 19, 2021
Oct. 26, 2021 – Oct. 28, 2021

Join our next LIVE session in Chicago (1.5-day session)**:**

Oct. 6, 2021 – Oct. 7, 2021

Alternative Investments

Alternative investments like private equity, hedge funds, and real estate can play a key role in any portfolio. You will learn about the importance of allocations to alternatives, and how to consider integrating, evaluating, and monitoring them.

Join our next virtual session (2-3 hour sessions over 2 days)**:**
Oct. 19, 2021 – Oct. 20, 2021

Fall Regional Workshops

Join us in person!

Our regional workshops will be covering ESG topics this Fall. Watch your email for further details and an invitation.

November 2, 2021, in Atlanta

St. Regis Hotel
Eighty-Eight West Paces Ferry Road, Atlanta, GA 30305

November 5, 2021, in San Francisco

Palace Hotel
2 New Montgomery St, San Francisco, CA 94105

Agenda

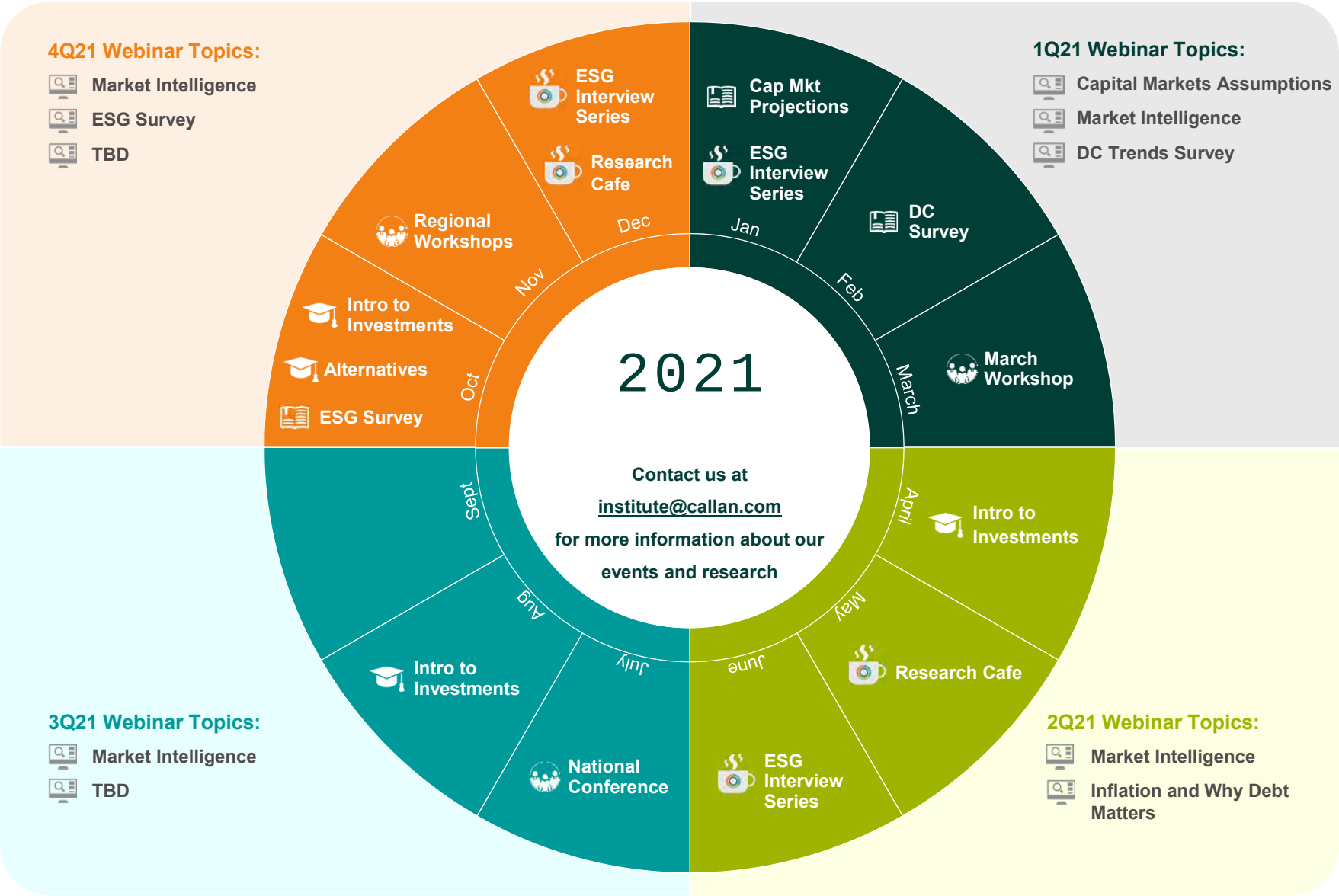
8:30am - Breakfast
9:30am - Workshop

Webinars

Research Café: Property Technology
Aug. 30, 2021 – 9:30am (PT)

Market Intelligence
Oct. 15, 2021 – 9:30am (PT)

Content Calendar – Callan Institute



Callan College | Conference/Workshop | Publication | Webinar | Research Cafe

Callan Updates

Firm updates by the numbers, as of June 30, 2021

Total Associates: ~200

Ownership
- 100% employees
- Broadly distributed across 99 shareholders

Leadership Changes
- No changes to leadership this quarter

Total General and Fund Sponsor Consultants: more than 55

Total Specialty and Research Consultants: more than 60

Total CFA/CAIA/FRMs: more than 55

Total Fund Sponsor Clients: more than 400

AUA: more than $3 trillion

"With Callan at the forefront of ESG research and education, we are thrilled to be part of this working group of our peers to bring further transparency and insights to the rapidly changing ESG landscape. There is growing interest from institutional investors to incorporate financially material ESG factors into their investment processes, and we believe the move toward more ESG incorporation is consistent with a long-term investment approach."

-— Tom Shingler, leader of Callan's ESG team, on the formation of the Investment Consultants Sustainability Working Group – US.

Disclaimers

This report is for informational purposes only and should not be construed as legal or tax advice on any matter. Any decision you make on the basis of this content is your sole responsibility. You should consult with legal and tax advisers before applying any of this information to your particular situation.

This report may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact.

Reference to or inclusion in this report of any product, service or entity should not be construed as a recommendation, approval, affiliation or endorsement of such product, service or entity by Callan.

Past performance is no guarantee of future results.

The statements made herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties such that actual results may differ materially from these statements. There is no obligation to update or alter any forward-looking statement, whether as a result of new information, future events or otherwise. Undue reliance should not be placed on forward-looking statements.

ALASKA RETIREMENT MANAGEMENT BOARD

Risk Management

September 2021

Shane Carson, CAIA, CFA
State Investment Officer

Key Board Decisions

Determine Investment Objective

- Fund's Purpose
- Governance – who makes which decisions?

Determine Asset Allocation

- Strategic
- Tactical

Oversee Implementation

- Manager Structure – number and types of manager allocations.
- Manager Selection

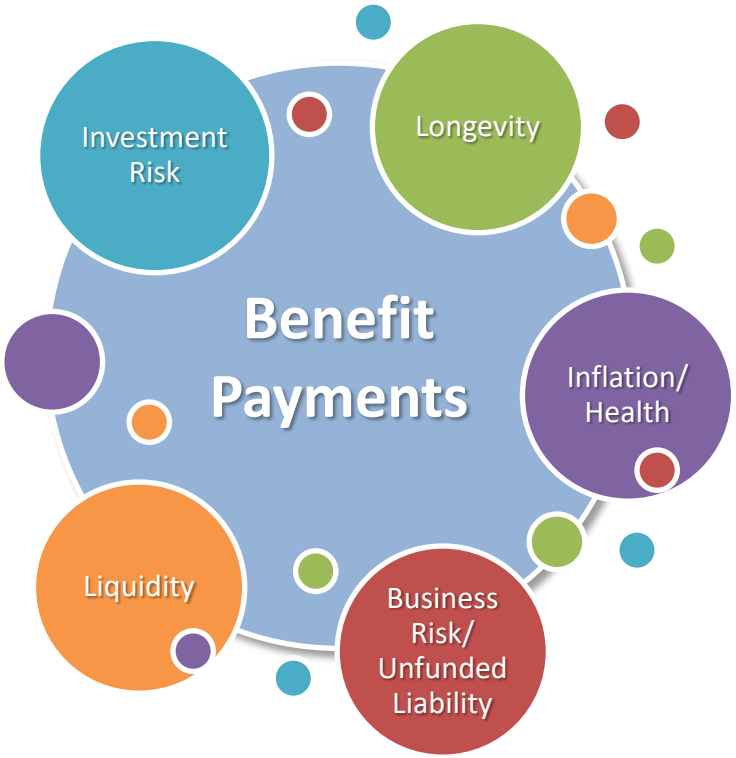
Monitor Results

- Are the fund, asset classes and mandates performing as expected?
- Are they achieving objectives?

Risk and the Retirement System?

What does risk mean to the ARMB?

- At its most comprehensive, risk is anything that could impact the objectives of the retirement systems.
- The defined benefit systems' primary objective is to pay all benefits when they are due.
- Risk encompasses both assets and liabilities.
- Defined benefit systems are designed to be able to take risks – pooling market, longevity, and other risks across time and a broad pool of participants.
- Setting and monitoring investment risks is one of the primary roles of the ARMB.



Risk Monitoring Tool: truView

- The ARMB is using truView for portfolio risk analytics. truView is State Street Global Exchange's risk measurement platform.
- truView analytics are run every six months and the current results are as of June 30, 2021.
- We use truView to help answer the following questions:
  - Is the portfolio risk positioned according to the ARMB's asset allocation?
  - What is the probability and magnitude of potential losses?
  - Is the ARMB taking more or less risk than the strategic benchmark by asset class?
  - Are specific investment mandates or managers adding to or reducing risk?
  - Does the ARMB have unexpected risk exposures or concentration?
  - How would the ARMB's current portfolio perform in historic market events or scenarios?

Volatility Decomposition

- Total portfolio volatility is dominated by public equities at 63%.
- Public and private equities contribute 81% of total volatility.
- Little change in overall volatility from December.
- Portfolio volatility in June is 12.6%. A slight decrease from December's report but still not outside of expectations.

Volatility Decomposition 6/30/2021

	Market Value (Millions)	Allocation (%)	Volatility[1] (% per annum)	Volatility Contribution (% of Total Vol)
Broad Domestic Equity	9,298	27.9%	17.9%	39.1%
Global Equity Ex-US	6,132	18.4%	16.6%	24.0%
Real Assets	4,128	12.4%	14.7%	12.1%
Broad Fixed Income	7,192	21.6%	2.6%	0.6%
Private Equity	4,562	13.7%	16.6%	18.0%
Opportunistic	1,977	5.9%	13.3%	6.2%
TOTAL	**33,290**	**100.0%**	**12.6%**	**100.0%**

Volatility Decomposition 12/31/2020

	Market Value (Millions)	Allocation (%)	Volatility[1] (% per annum)	Volatility Contribution (% of Total Vol)
Broad Domestic Equity	8,501	28.1%	17.9%	38.4%
Global Equity Ex-US	5,888	19.5%	16.7%	24.8%
Real Assets	3,753	12.4%	15.1%	12.2%
Broad Fixed Income	6,574	21.8%	2.4%	2.4%
Private Equity	3,654	12.1%	17.0%	15.7%
Opportunistic	1,840	6.1%	13.9%	6.5%
TOTAL	**30,208**	**100.0%**	**12.9%**	**100.0%**

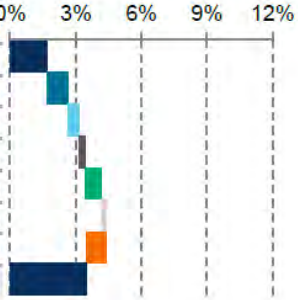
Volatility at the asset class level is calculated using parametric Value-at-Risk at 84th percentile, expressed as a percentage of the market value of each asset class.

Asset Class Risk & Diversification

- The monthly value-at-risk is 3.5%.
- Broad Domestic Equity and Global Equity Ex-US contributed 57.4% of the VaR for 6/30/2021, down from approximately 58.2% at 12/31/2020.
- Overall, the asset class specific contributions were little changed from December.

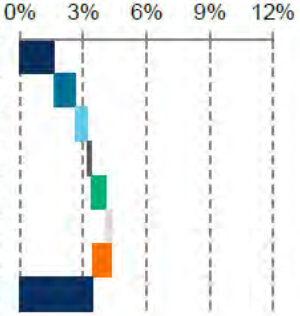
Asset Class Risk & Diversification 6/30/2021

	Allocation (%)	Value-at-Risk[1] Contribution (% of Total VaR)	Value-at-Risk[1] (% of Total MV)
Broad Domestic Equity	27.9%	34.3%	1.7%
Global Equity Ex-US	18.4%	23.1%	1.0%
Real Assets	12.4%	12.6%	0.5%
Broad Fixed Income	21.6%	4.9%	0.3%
Private Equity	13.7%	19.9%	0.7%
Opportunistic	5.9%	5.2%	0.2%
Diversification Benefit	-	-	-0.9%
TOTAL	**100.0%**	**100.0%**	**3.5%**



Asset Class Risk & Diversification 12/31/2020

	Allocation (%)	Value-at-Risk[1] Contribution (% of Total VaR)	Value-at-Risk[1] (% of Total MV)
Broad Domestic Equity	28.1%	33.9%	1.6%
Global Equity Ex-US	19.5%	24.3%	1.0%
Real Assets	12.4%	13.0%	0.6%
Broad Fixed Income	21.8%	5.2%	0.2%
Private Equity	12.1%	17.7%	0.7%
Opportunistic	6.1%	5.9%	0.3%
Diversification Benefit	-	-	-0.8%
TOTAL	**100.0%**	**100.0%**	**3.5%**



Equity Beta

- Equity Betas are within expectations for 6/30/2021.
- ARMB's Domestic and Global ex-US portfolios should closely parallel their respective benchmarks.
- Slight increase in total equity beta in the 6/30/2021 report.

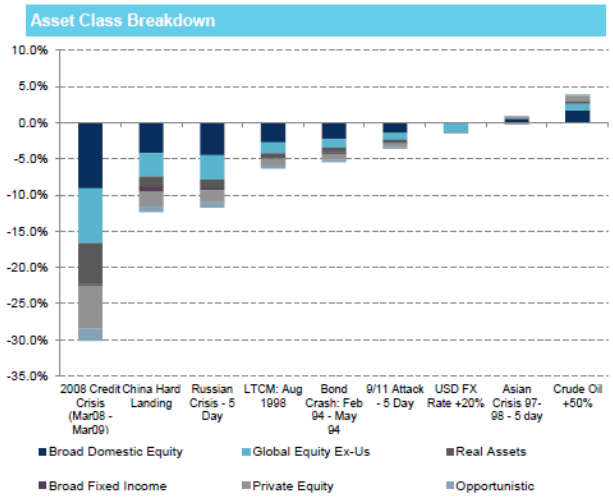
Sub Asset Class Beta Analysis

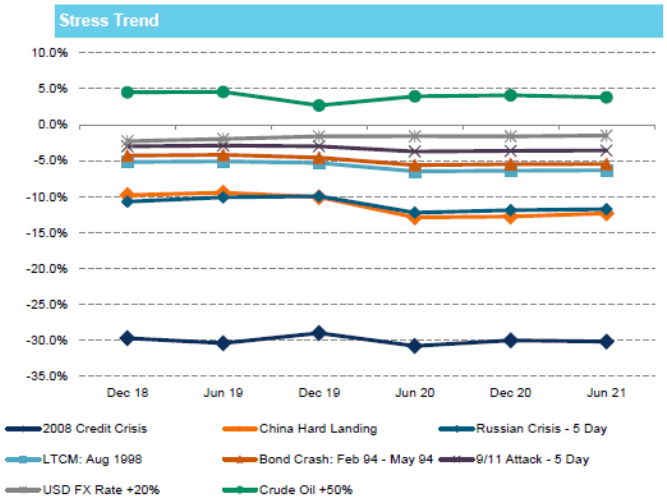
Asset Class / [Benchmark]	Market Value (Millions)	Allocation (%)	Beta[1] 1Y to the Benchmark	Beta[1] 5Y to the Benchmark
Broad Domestic Equity / [Russell 3000]	**9,298**	**60.3%**	**1.01**	**1.00**
Large Cap Pool (AYQK)	8,565	55.5%	0.99	0.98
Small Cap Pool (AYQC)	733	4.7%	1.18	1.33
Global Equity Ex-Us / [MSCI ACWI Ex US IMI]	**6,132**	**39.7%**	**0.89**	**0.98**
Emerging Markets Pool (AYSC)	1,087	7.0%	0.82	0.94
IE Large Cap Pool (AYRC)	5,045	32.7%	0.91	0.98
TOTAL Equity / [MSCI ACWI]	**15,430**	**100.0%**	**1.04**	**1.04**

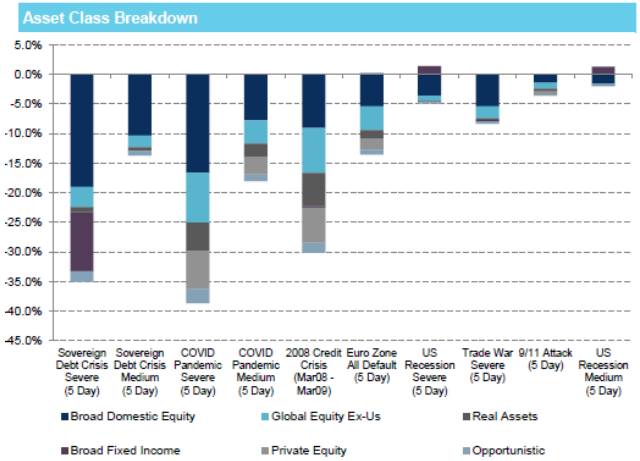
1. Beta is the regression coefficient generated by a linear regression of the percent return time series of position on an explanatory time series. This explanatory time series is often composed of the returns from a broader market index, the Benchmarks of each of the Equity Asset Classes.

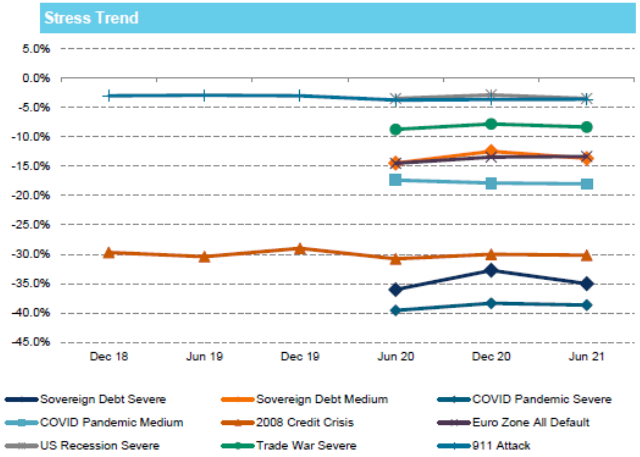
Stress Tests

- Stress tests reveal no significant change in expected outcomes.







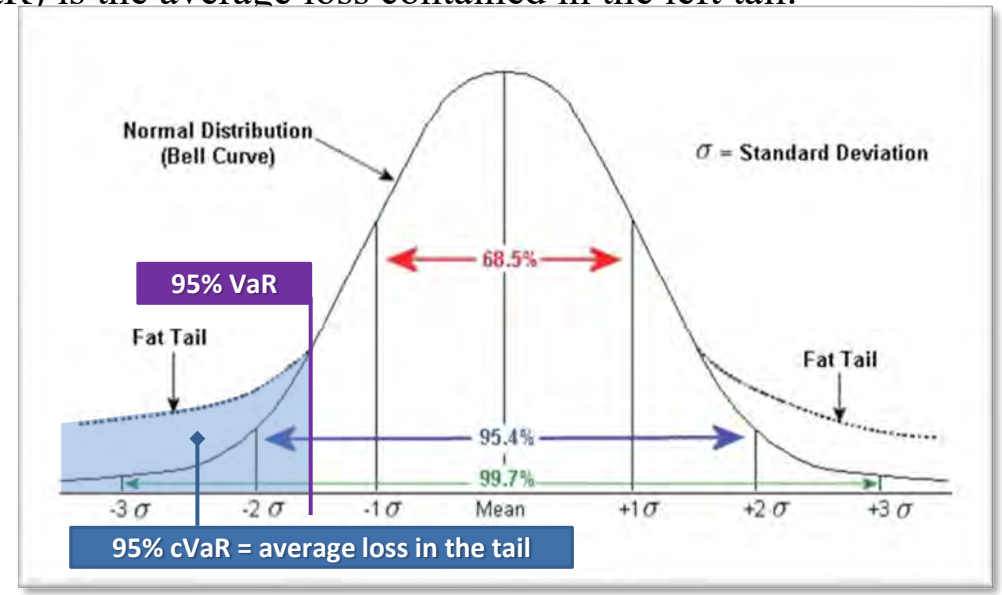


Summary

- Overall, risk metrics are within expectations.
- Public equity allocation is the largest driver of portfolio volatility and value-at-risk as expected.
  - Private Equity's contribution to risk increased due to an increase in the allocation to the asset class.
- TruView models several historical and predictive scenarios.
  - ARMB's portfolio sensitivity to the stress tests has been little changed over time indicating there are no sudden or unexpected exposures to assets that are sensitive to the scenarios provided.

What is Value-at-Risk?

- Value-at-risk (VaR)
  - A commonly used measure of potential loss.
  - VaR represents a return threshold over a given time horizon whereby worse outcomes are only expected with some small and specific probability.
  - VaR can be estimated parametrically using the mean and standard deviation, but this ignores fat tails (kurtosis, skewness).
  - VaR also can be estimated using historic market information, which includes past fat tails – this is the approach truView takes.
- Expected shortfall (conditional VaR or cVaR) is the average loss contained in the left tail.
- Why are VaR and cVaR important?
  - They quantify the risk of loss for the portfolio.
  - Differences between historical and parametric-based VaR calculations suggest impact of fat tails.



J.P. Morgan Asset Management Global Real Assets

Mandate: **JPMCB Strategic Property Fund – Open-End Commingled Real Estate Fund** **Hired: 1998**

Firm Information

J.P. Morgan Investment Management Inc. (JPMIM) is the primary U.S. investment advisory branch of J.P. Morgan Asset Management (JPMAM), which is the marketing name for the asset management businesses of JPMorgan Chase & Co. (JPMC), a publicly traded company, and its affiliates worldwide. JPMIM is wholly-owned by JPMorgan Asset Management Holdings Inc. which is a subsidiary of JPMC. JPMIM was incorporated in Delaware on February 7, 1984.

J.P. Morgan Real Estate Americas employs over 170 professionals, serves 900+ institutional clients from six offices and is headquartered in New York, New York. As of 6/30/2021, J.P. Morgan Real Estate Americas total assets under management were $64.0 billion.

Key Executives:
Kimberly Adams, Portfolio Manager
Susan M. Kolasa, Portfolio Manager
Steve Zaun, Portfolio Manager
Jeff Shields, *Executive Director, Client Advisor*
Tom Klugherz, Executive Director, Investment Specialist

Investment Approach

J.P. Morgan Asset Management - Global Real Assets follows a disciplined investment process that focuses on adding value throughout the acquisition, ownership and disposition of an asset.

Investment decisions are based upon a variety of factors, including, without limitation, a fulsome macro and micro research analysis and a quantitative financial analysis. Such factors suggest the performance viability of the proposed investment and its compatibility with a client's investment strategy and objectives. Prior to making an investment, J.P. Morgan requires the approval of an Investment Committee, whose review includes consideration of the following factors: cash flow and debt assumptions; return models; property history; location analysis; investment proposal; transaction structure (equity/debt); investment strengths and weaknesses; tenant analysis; replacement cost analysis; research assessment; comparable sales and lease analysis; and investment recommendation.

Strategic Property Fund's research- and data-based portfolio construction process leverages the information advantage created by the fund's in-depth real estate expertise, market presence, on-the-ground teams, and the firm-wide research capabilities.

Benchmark: NCREIF ODCE

Total ARMB Mandate

Assets Under Management:
6/30/21: $159,514,776

Concerns: None

6/30/2021 Performance

	Last Quarter	1-Year	3-Years Annualized	6-Years Annualized	15-Years Annualized	23.5-Years Annualized
Manager (Gross)	2.90%	6.56%	4.68%	6.80%	6.59%	8.96%
Fee	0.24%	0.93%	0.97%	0.96%	0.93%	0.93%
Manager (Net)	2.66%	5.61%	3.71%	5.84%	5.66%	8.03%
Benchmark (Net)	3.67%	7.09%	4.60%	6.47%	5.34%	7.50%

Alaska Retirement Management Board

J.P. Morgan Asset Management

Strategic Property Fund (SPF) | September 23, 2021

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ALTs by J.P.Morgan Asset Management

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Presenters

Steven Zaun, Managing Director, is a Portfolio Manager for Strategic Property Fund, J.P. Morgan Asset Management's flagship core real estate fund. He is involved in all aspects of managing the portfolio's investments and strategy. Previously, Steve was Head of the West Coast Office/Industrial Asset Management team and responsible for all aspects of office and industrial Asset Management, including property management, leasing and development for J.P. Morgan Asset Management - Real Estate Americas. Steven joined the Asset Management team in 2000, initially based out of the New York office. In 2004, he relocated to Los Angeles to help establish the West Coast Asset Management presence. Since that time, Steven has worked on many of the platform's highest profile Office and Industrial assets in the West region. Steven obtained a B.A. in Finance from Boston College and is a CFA charterholder.

Jeff Shields, Executive Director, is a Client Advisor at J.P. Morgan Asset Management advising institutional investors on strategic and tactical investment opportunities, challenges and solutions. He joined the firm in 2013 from Watershed Asset Management, a credit hedge fund manager, where he led the investor relations effort since 2009. Prior to joining Watershed, Jeff was a principal at Hall Capital Partners focusing on marketing the firm's co-mingled alternative investment funds to private and institutional investors. He joined Hall Capital Partners in 2005 from U.S Trust Company where he was a member of the endowment and foundation group and responsible for the administration and investments for planned gift management programs and multi-asset class mandates. Before joining U.S. Trust in 2000, Jeff worked in the community foundation field at the Council on Foundations, The San Francisco Foundation, and the Peninsula Community Foundation. He is currently a board member of the Dechomai Foundation which was founded in 2003 to assist charitable organizations to receive, manage, liquidate and grant proceeds from non-cash donations. Jeff graduated from the University of Maryland with a Bachelor of Arts degree.

Tom Klugherz, Executive Director, is an Investment Specialist at J.P. Morgan Asset Management –Real Estate Americas, based in San Francisco. Tom is responsible for capital raising and advising clients for the Real Estate Americas investment platform. Previously, Tom was a member of the Portfolio and Client services Unit for Real Estate US at UBS, a business which forms part of the Real Estate & Private Markets within UBS Asset Management. Tom has 31 years of experience working in various capacities as a fiduciary for some of the nation's largest pension plans and institutions. His prior experience includes acquisitions, asset management, portfolio management and day-to-day operations of several investment managers including GE Capital Investment Advisors and SSR Realty Advisors. During his career, Tom has been directly involved in sourcing, underwriting and managing more than USD 10 billion of institutional grade investments across the United States. Tom has worked directly with existing and prospective separate account and fund clients to analyze their portfolios and formulate investment strategies. He holds the FINRA Series 7, 63, 24 and 3 licenses.

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Investment Review

Table of contents

Page

I. Real Estate Americas Platform Overview 4

II. Investment Summary and Performance 9

III. Strategic Property Fund 11

IV. Appendix 25

- U.S Real Estate Market Outlook
- SPF Sector Slides 37
  - Office 38
  - Industrial 41
  - Retail 47
  - Residential 50
- Environment, Social and Governance (“ESG”) Overview 54
- REA Diversity, Equity & Inclusion Overview 58
- Supplemental Exhibits 61
- GIPS Report 68
- Biographies of Key Professionals 70
- Important Risks and Disclaimers 75

Real Estate Americas Platform Overview

J.P. Morgan Real Estate Americas:
The largest manager of core real estate in open-end funds

$64bn
Gross Asset Value of real estate investments[2]

50yrs
History of managing core real estate strategies

No.1
Manager of core real assets in open-end funds[1]

$49bn
Gross Asset Value across all core offerings[2]

170+
Professionals in the United States

900+
Institutional and high net worth clients globally

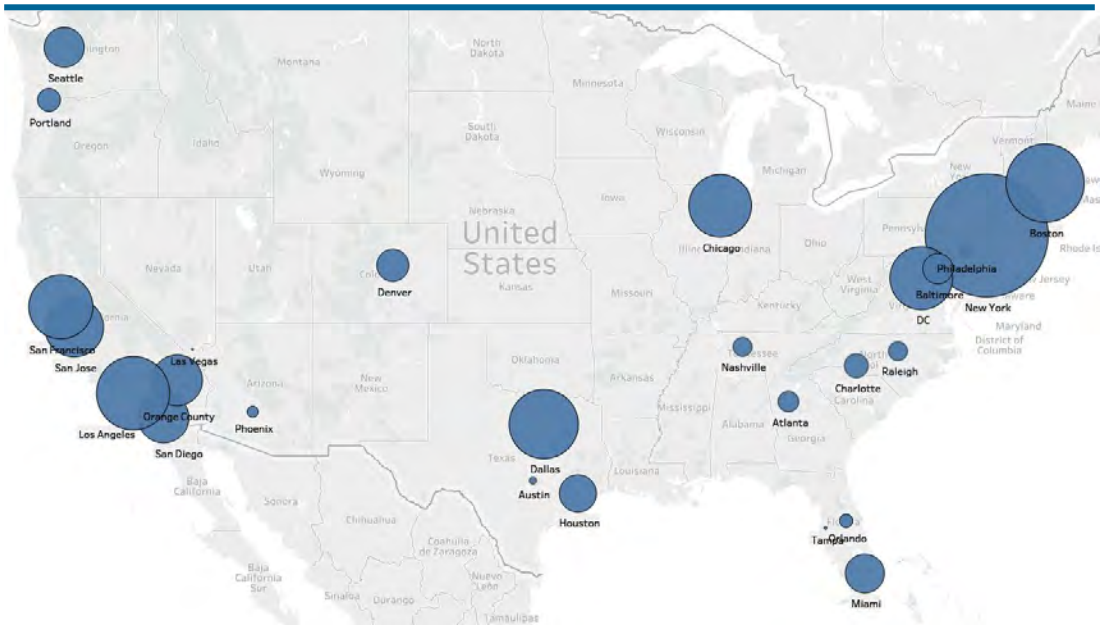
$4bn
Annual acquisition activity over the past year

Data as of June 30, 2021, unless otherwise noted. There can be no assurance that the past performance or success of the business will serve as an indicator of such future performance or success.
[1]Source: J.P. Morgan Asset Management. [1]Pensions & Investments (P&I) as of October 2020. [2]Final AUM as of March 31, 2021.

Depth of Real Estate Americas platform creates differentiated information advantage

$64 billion in AUM translates into….

Total market exposure (FMV)



- ***Over 170 professionals*** in 6 offices across the country
- Investment teams ***specialized by market***
- ***Sector strategists*** providing deep expertise in each sector
- Dedicated ***Development and Engineering team*** of 6 individuals to oversee development projects
- Average annual transaction volume of ***$11.8bn per year***[2]
- ***$8.5bn in deals sourced*** in 2020 alone; ***closed on ~$4bn***
- Access to ***extensive proprietary and non-proprietary, real-time*** daily data used to ***drive investment decisions***

39	362	129m	41k	3,000+
Markets	*Investments*	*Square Feet of commercial GLA*[3]	*Residential units*	*Tenants across 20 NAICS*

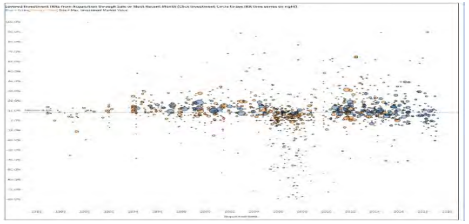
Source: J.P. Morgan Asset Management as of June 30, 2021.
Final AUM as of March 31, 2021. [2]Over the last 5 years. [3]Data preliminary as of June 30, 2021

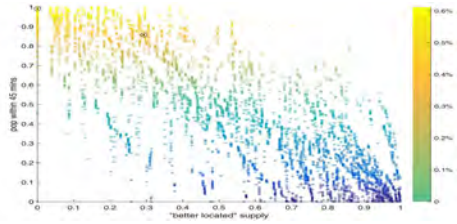
Diverse, experienced specialists support portfolio manager

- Team-based approach
- Multi-disciplinary investment process
- Deep functional expertise with a cross real asset perspective
- No single perspective; no tunnel vision
- Experienced and stable team
  - 26 years average industry experience
  - 19 years average JPM experience
- Over 170 professionals supporting Real Estate Americas Platform

For discussion purposes only.
Source: J.P. Morgan Asset Management. As of June 30, 2021

Disciplined and integrated investment process fostering innovation





Top-down research

Analyze market conditions and trends

Acquisitions
Buy right

Asset Management
Maximize value

Dispositions
Sell right

Bottom-up investment philosophy

Market transaction intelligence
Acquisition, leasing, financing, sales

Single family rentals

Multifamily garden development

High-flow through truck terminal

For illustrative and discussion purposes only.

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Investment Summary and Performance

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Alaska Retirement Management Board
Investment summary as of June 30, 2021

Invested capital	Market value
Strategic Property Fund	$159,514,776

Account Performance (%)	Income	Appreciation	Total	ODCE
Three months[1]	0.9	2.1	2.9	3.9
One year	3.4	3.3	6.8	8.0
Three years	3.7	1.1	4.8	5.5
Five years	3.9	2.1	6.0	6.6
Ten years	4.5	4.8	9.4	9.6
Fifteen years	4.9	1.6	6.6	6.3
Twenty years	5.5	2.5	8.1	7.6
Twenty-five years	6.1	2.9	9.2	8.8
Since inception (7/1/84)	6.6	1.7	8.3	7.3

[1]non-annualized returns.

Past performance is not a guarantee of comparable future results. Total return assumes the reinvestment of income. Performance results are gross of investment management fees. The deduction of an advisory fee reduces an investor's return. Actual account performance will vary depending on individual portfolio security selection and the applicable fee schedule.

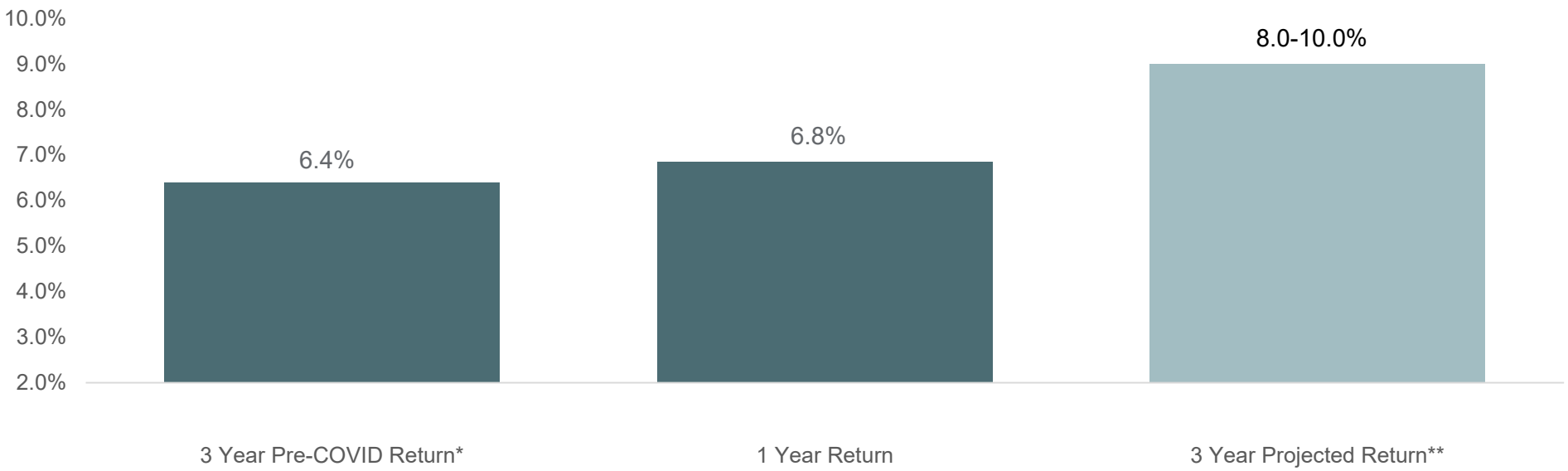
Strategic Property Fund

The market leading U.S. core real estate investment strategy

Differentiated assets	▪ Irreplaceable collection of **high quality assets** in **major growth markets** ▪ **Outsized Net Operating Income** from dominant assets with superior rent growth trajectories ▪ **Strong asset** and **geographic selection** driving full cycle outperformance
Size and scale	▪ **Development pipeline** facilitates **next generation** of **functional assets** in growing submarkets ▪ Programmatic joint ventures create **competitive entry points** in extended sectors ▪ Fortress balance sheet with **proven liquidity track record** through several economic cycles
Information Advantage	▪ Proprietary understanding of **real time fundamentals** through vast relationships ▪ **Data driven analytics** enhances thoroughness of investment and valuation process ▪ Enhanced investment edge provided by **broader capabilities of JPMorgan Chase & Co.**
ESG and Diversity, Equity & Inclusion	▪ **Sustainability objectives** fully integrated **into every investment decision** ▪ **Average GRESB score of 85** significantly outpaces peers ▪ Target 10-year **reduction of energy and emissions by 25%** and **water and waste by 15%** ▪ Managed by tenured **Women-led team**

It should not be assumed that Fund positioning in the future will be profitable or will equal past performance.

SPF Total Return



- Robust development pipeline: 12M SF of industrial currently under construction
- Expedited recovery in the hardest hit sectors: urban multi-family, retail
- Asset selection: SPF office holdings generating alpha via NOI growth
- Capital markets search for yield: attractive relative spreads for retail and office

As of June 30, 2021. Total return assumes the reinvestment of income. Performance results are gross of investment management fees. *3 Year Pre-COVID Return is the 3 year period ending 1Q 2020. **The target returns are for illustrative purposes only and are subject to significant limitations. An investor should not expect to achieve actual returns similar to the target returns shown above. Because of the inherent limitations of the target returns, potential investors should not rely on them when making a decision on whether or not to invest in the strategy. Please see the complete Target Return disclosure at the conclusion of the presentation for more information on the risks and limitation of target returns.

The performance shown above is not the actual performance of any private placement investment vehicle. Performance is that of a predecessor fund that was managed in a similar manner by the portfolio manager. Past performance is not a reliable indicator of current and future results.

Portfolio Allocation: Fund objectives advance through COVID

Geographic Exposure[1]

	SPF 4Q15	SPF 2Q21	ODCE 2Q21
West	41.8%	53.5%	44.2%
East	31.0%	23.5%	29.1%
Central	5.2%	4.8%	7.8%
South	22.0%	18.1%	18.9%

Sector Exposure[1]

	SPF 4Q15	SPF 2Q21	ODCE 2Q21
Office	48.3%	31.7%	30.0%
Residential	20.0%	23.2%	25.6%
Retail	24.0%	21.6%	13.1%
Industrial	7.7%	22.1%	26.2%
Land/Other	0.0%	1.4%	5.6%

Recent Portfolio Activity

1. Added $360M in industrial development commitments YTD; 12M SF under construction
2. Single Family Rental program expanding: Key markets include Nashville, Atlanta, Charlotte, Salt Lake City, Phoenix
3. Profitably divested over $3B in office sales since COVID; $450M currently under contract
4. Approximately $500M in retail assets sold or under contract YTD above current carry

[1]Net of debt. As of June 30, 2021 unless otherwise noted. Diversification does not guarantee investment returns and does not eliminate the risk of loss. Other for SPF represents land. Diversification does not guarantee investment returns and does not eliminate the risk of loss. Provided for update and reporting purposes only, not to be construed as investment advice.

SPF uniquely positioned for recovery

Superior asset selection[1]

Sector	Three Year Returns	
	SPF	Peer Set
Office	5.8%	4.3%
Industrial	14.5%	14.9%
Residential	5.4%	4.6%
Retail	-1.7%	-2.6%

Robust development pipeline in competitive sectors

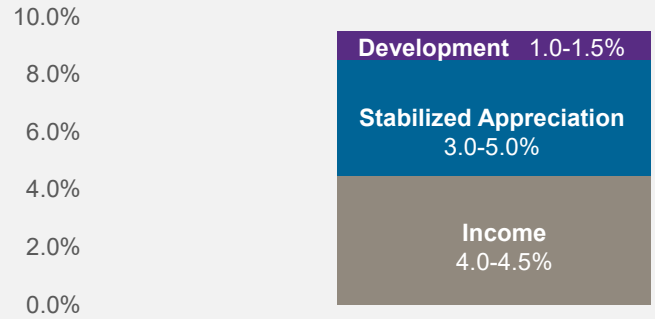
	Development Pipeline	Total Development Costs
Industrial	12M SF	$1.74B
Single family rental	1,300 homes	$398.1M
Residential	4,200 units	$2.17B

Favorable valuation entry point

Peak to trough depreciation

Attractive go-forward returns[2]

3 year projected return of 8.0-10.0%



As of June 30, 2021. [1]Performance is unlevered and peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF.

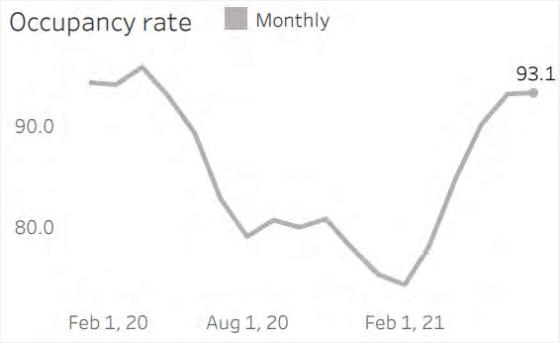
[2]The target returns are for illustrative purposes only and are subject to significant limitations. An investor should not expect to achieve actual returns similar to the target returns shown above. Because of the inherent limitations of the target returns, potential investors should not rely on them when making a decision on whether or not to invest in the strategy. Please see the complete Target Return disclosure at the conclusion of the presentation for more information on the risks and limitation of target returns.

Market evidence points to an inflection point: Core real estate's recovery has begun

Evidence of urban revitalization

- Tenants now touring space for new large office requirements, particularly in the Bay Area, LA, and Boston
- Apartment renters are moving back into cities

Occupancy throughout Covid-19 have rebounded - recovering 25% since February 2021 at Strata (Mission Bay, SF)



A new era of retailers- stores are opening and space is leasing

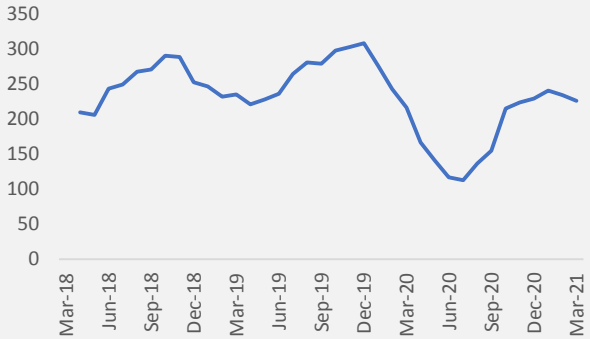
- Retailers maintained conviction to dominant retail in 2020 – 34 new store openings at Valley Fair Mall
- SPF retail occupancy decreased only 1% in 2020
- Junior anchored vacant boxes backfilled in West coast infill markets ahead of budget
- Sharp uptick in traffic; higher sales per trip

Traffic count at River Oaks (Houston open-air luxury retail) higher than at any point since COVID began

Transaction market has returned for well-leased assets

- Suburban multi-family assets sold at record low cap rates
- Liquidity returning to neighborhood retail, even for large format assets
- Trades well supported by deep financing markets

Commercial RE transaction volume ($B)



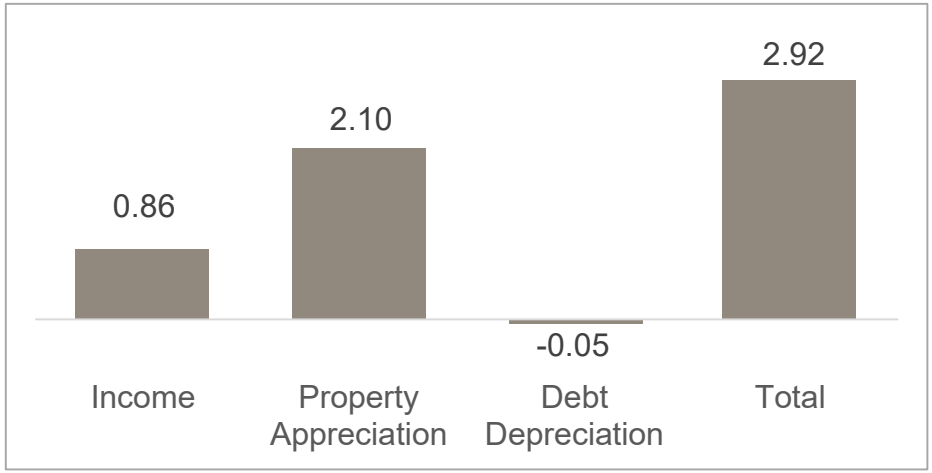
Left chart: Source for occupancy chart is JPMAM from 1/1/20 – 6/30/21; Center chart: Source for traffic count is Creditnell from 3/1/20-6/30/21; Right chart: Source for transaction volume in Real Capital Analytics from 3/31/18-5/31/21

For illustrative purposes only.

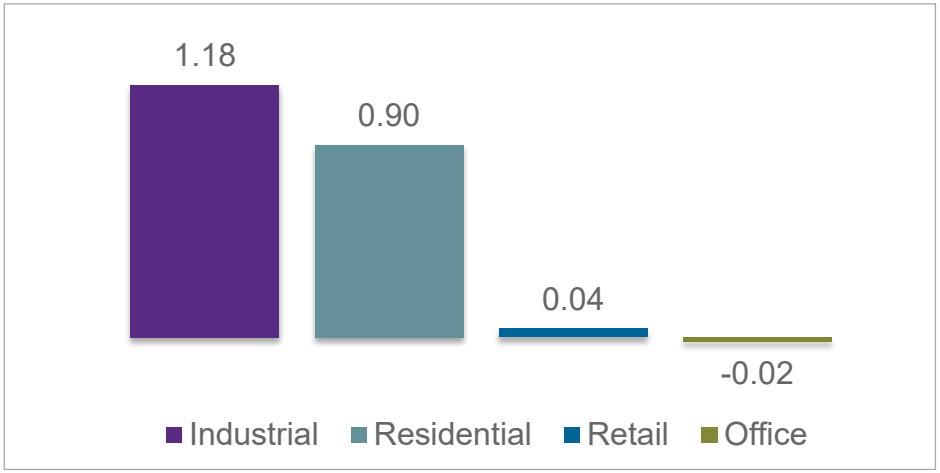
ALTs by J.P.Morgan Asset Management

Q2 2021 performance snapshot

Gross Returns (%)



Property Appreciation by Sector (%)



Top Contributors and Detractors (bps)

Industrial

- Greater LA Industrials
- Toyota Campus
- Vineyard Industrial I
- Black Creek Build to Core

Residential

- Suburban
- Urban

Retail

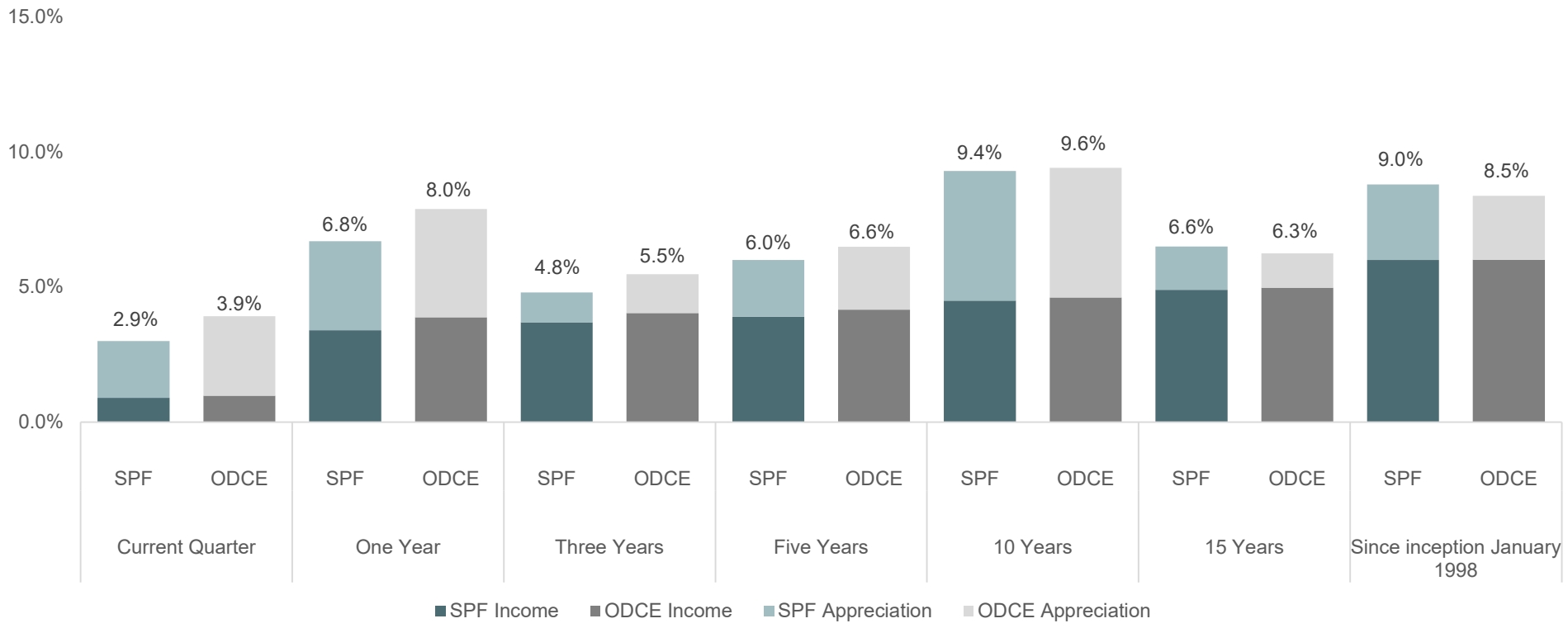
- DSRG
- Edens
- Valley Fair Mall

Office

- 2000 Avenue of the Stars
- 1345 Avenue of the Americas
- 200 Fifth Avenue

Data as of June 30, 2021. Returns represent combined PHC level return. Totals may not sum due to rounding. Source: JPMAM. **Past performance is not a reliable indicator of current and future results.** Total return assumes the reinvestment of income. Performance results are gross of investment management fees. The deduction of an advisory fee reduces an investor's return. Actual account performance will vary depending on individual portfolio security selection and the applicable fee schedule. Largest contributors and detractors are based on absolute value. Provided for update and reporting purposes only, not to be construed as investment advice.

Performance



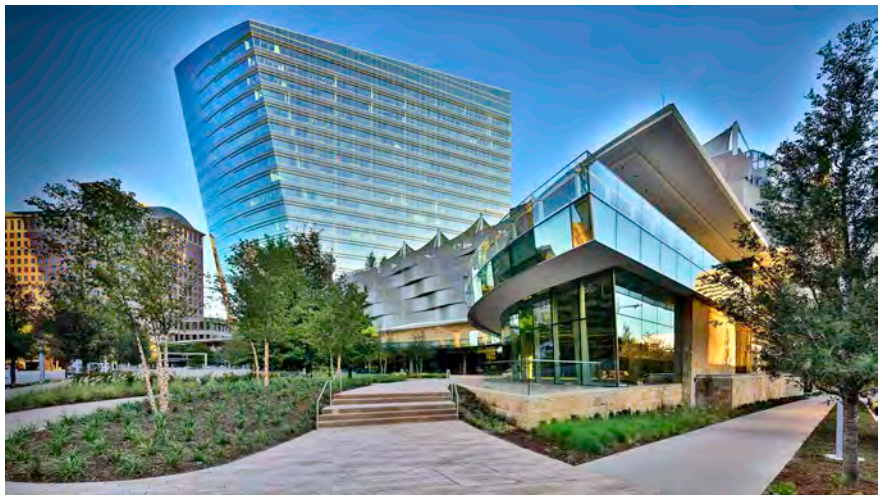
Returns as of June 30, 2021. Returns for periods less than one year are not annualized.

Total returns net of fees for SPF were: 2Q21: 2.7%; YTD: 4.3%; One year: 5.8%; Three years: 3.8%; Five years: 5.0%; 10 years: 8.4%; Fifteen years: 5.6% Since inception: 7.9%. Net returns are based on the highest applicable fee rate for this strategy. Total returns net of fees for ODCE were: Qtr.: 3.7%; YTD: 5.7%; One year: 7.1%; Three years: 4.6%; Five years: 5.6%; 10 years: 8.6%; Fifteen years: 5.3% Since inception (January 1998): 7.5%.

The performance shown above is not the actual performance of any private placement investment vehicle. Performance is that of a predecessor fund that was managed in a similar manner by the portfolio manager. Past performance is not a reliable indicator of current and future results. Important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, can be provided upon request. Total return assumes the reinvestment of income. Performance results are gross of investment management fees. Net returns are based on the highest applicable fee rate for this strategy. The deduction of an advisory fee reduces an investor's return. Actual account performance will vary depending on individual portfolio security selection and the applicable fee schedule.

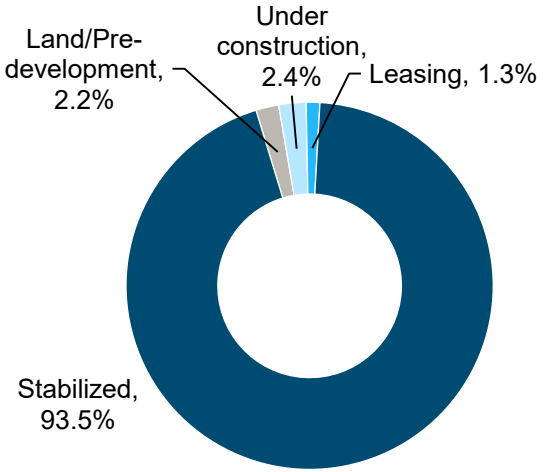
Balance sheet

Details (USD, millions)	
Gross Asset Value	39,606.4
Net Asset Value	29,860.7
Cash	2.3%
LTV	24.5%
Contribution Queue	472.3[1]
Line of credit capacity	1,045.1



McKinney & Olive, Dallas, TX

SPF Lifecycle[2]



Development Details	
Apartment Units	~4,200
Single Family Rental	1,300 homes
Industrial Development	12M SF

Data as of June 30, 2021 unless otherwise noted. It should not be assumed that Fund positioning in the future will be profitable or will equal past performance. [1]As of August 24, 2021. [2]As of March 31, 2021 and based on gross asset value (GAV). **See important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, on the private placement risk disclosure page in the appendix.**

Office

Sector Overview

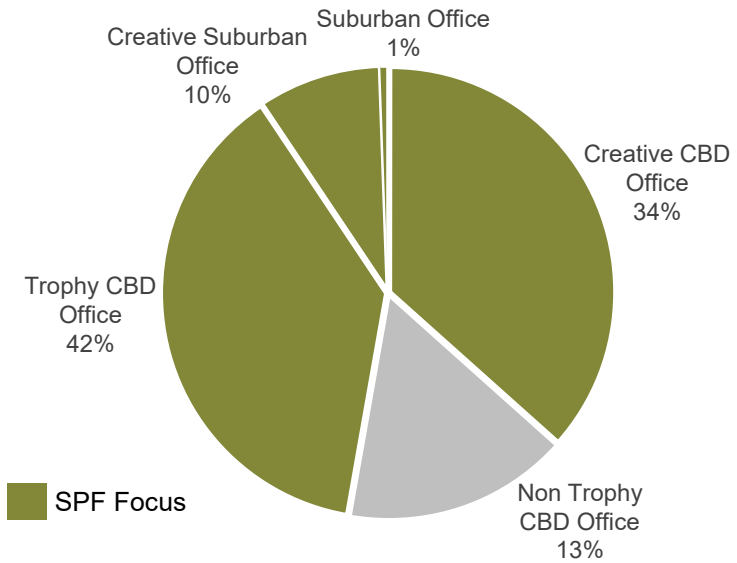
	YE 2019	2Q 2021	2021 Rollover
% Leased	94%	92%	4.1%

Returns	SPF[1]	Peer Set[1]
1 Year	4.4%	3.0%
3 Year	5.8%	4.3%
5 Year	6.1%	5.2%

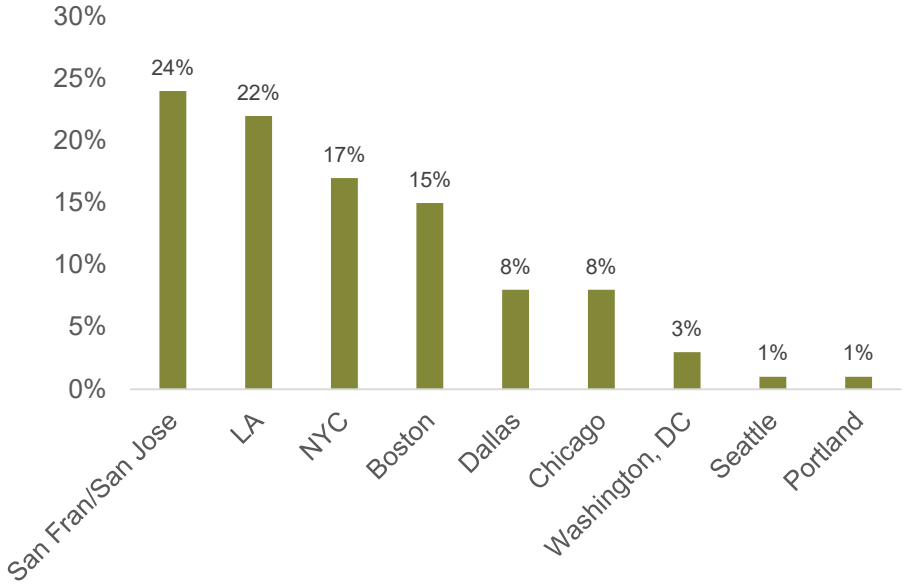
Historical Allocation

	4Q 2015	4Q 2019	2Q 2021
SPF	48.3%	36.8%	31.7%
ODCE	38.0%	33.4%	30.0%

Office Portfolio by Subsector[2]



Office Portfolio by MSA[2]



Information as of June 30, 2021 unless otherwise noted. [1]Performance is unlevered and Peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF. [2]Based on % of NAV. Occupancy represents percentage leased and based on square feet. Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. Provided for update and reporting purposes only, not to be construed as investment advice.

Industrial

Sector Overview

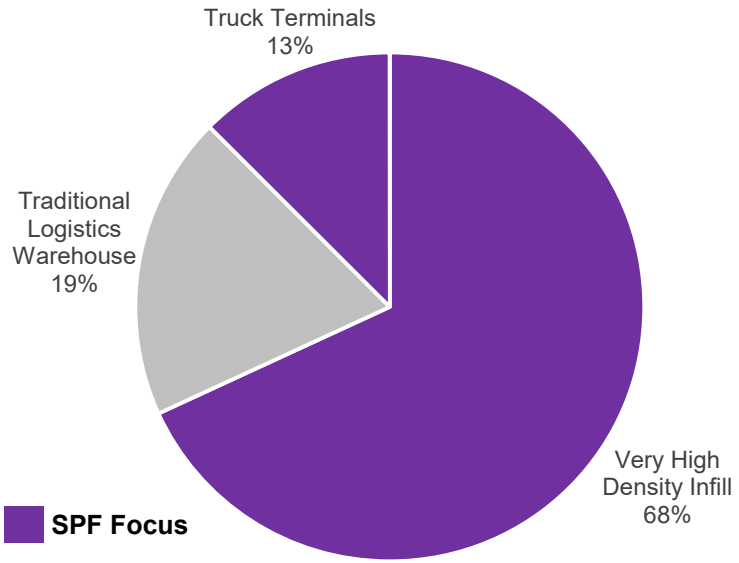
	YE 2019	2Q 2021	2021 Rollover
% Leased	95%	97%	2.3%

Returns	SPF[1]	Peer Set[1]
1 Year	19.7%	20.5%
3 Year	14.5%	14.9%
5 Year	13.7%	14.1%

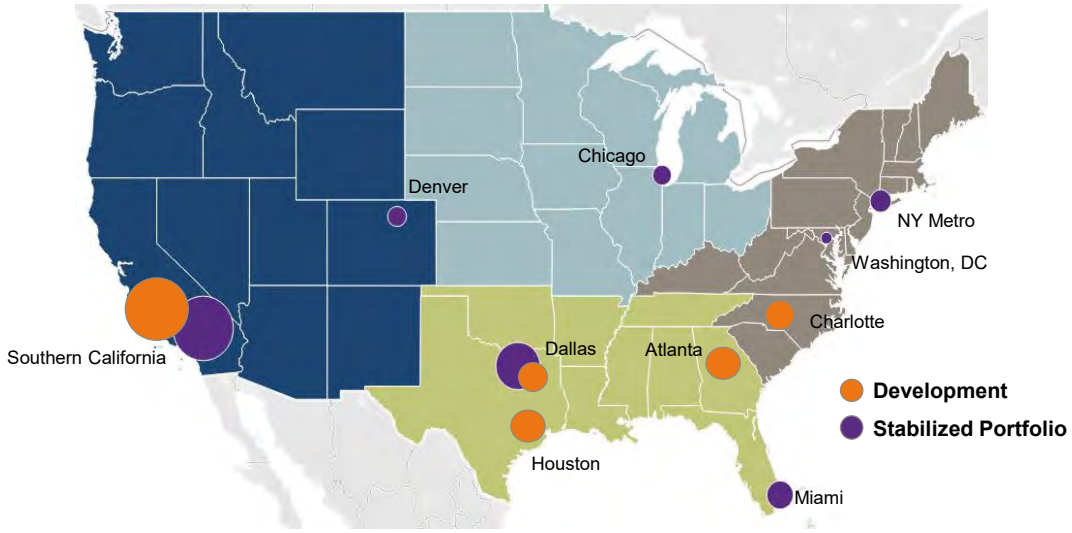
2021 Observations

- Rents in Southern California rose 20%-40% YTD
- Replacement cost continues to increase - land, steel
- Increase of new entrants - development

Industrial Portfolio by Subsector



Industrial Portfolio: high barrier infill markets



Information as of June 30, 2021 unless otherwise noted. [1]Performance is unlevered and Peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF. Occupancy represents percentage leased and based on square feet. Results shown are not meant to be representative of actual investment results. Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.
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ALTs by J.P.Morgan Asset Management

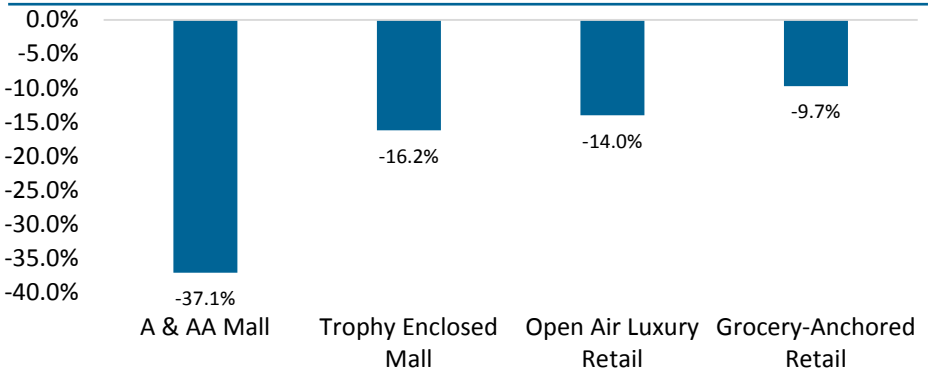
Retail

Sector Overview

	YE 2019	2Q 2021	2021 Rollover
% Leased	94%	91%	6.1%

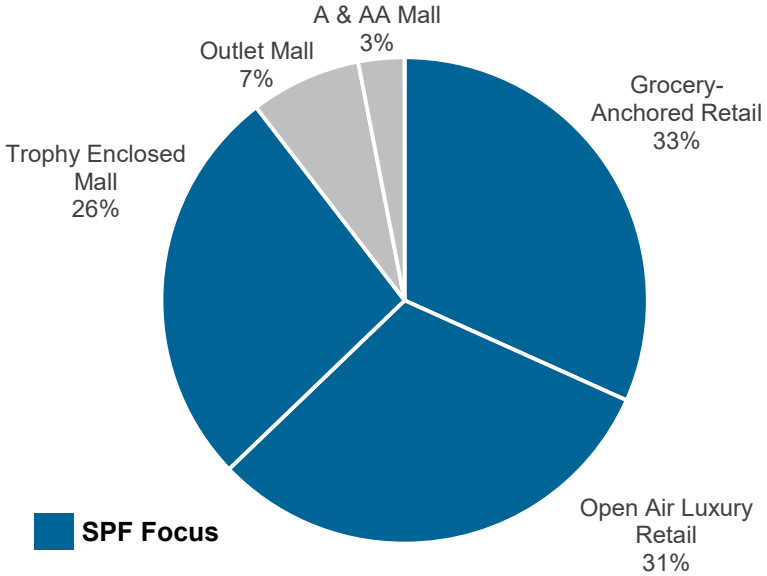
Returns	SPF[1]	Peer Set[1]
1 Year	1.0%	-1.1%
3 Year	-1.7%	-2.6%
5 Year	1.2%	0.6%

Peak to Trough declines by subsector



University Towne Center, La Jolla, CA

Retail Portfolio by Subsector



Information as of June 30, 2021 unless otherwise noted. [1]Performance is unlevered and Peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF. Occupancy represents percentage leased and based on square feet; excludes development at Valley Fair Mall. Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. Provided for update and reporting purposes only, not to be construed as investment advice.

Residential

Sector Overview

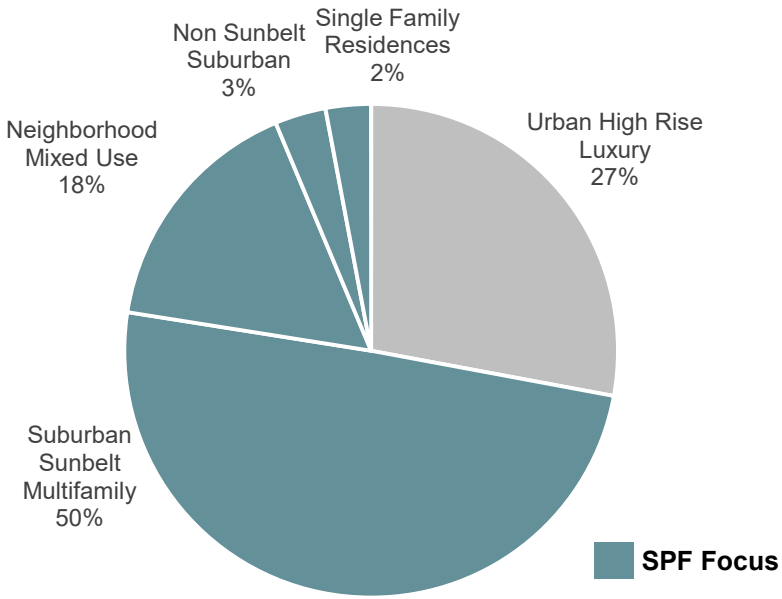
	YE 2019	2Q 2021
% Leased	94%	94%

Returns	SPF[1]	Peer Set[1]
1 Year	6.4%	5.9%
3 Year	5.4%	4.6%
5 Year	5.6%	5.2%

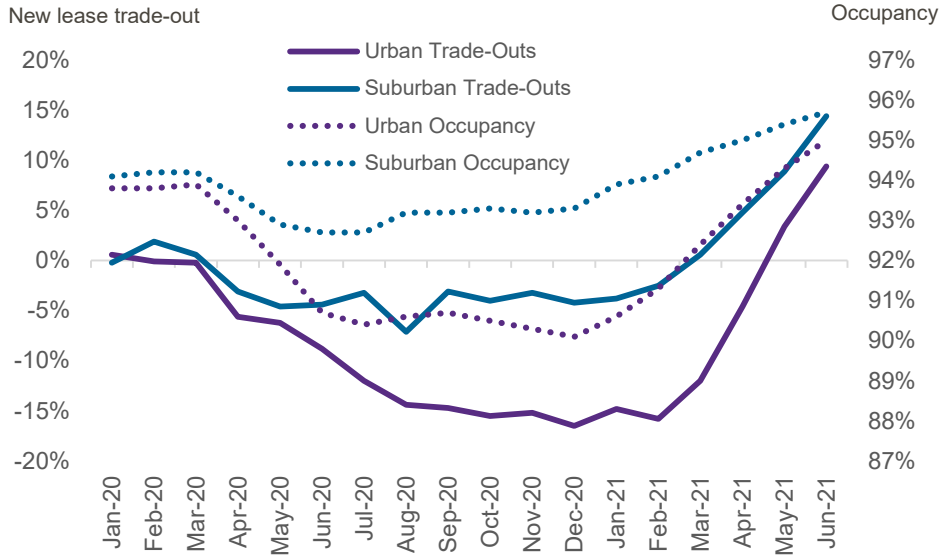
2021 Observations

- Urban luxury occupancies almost fully recovered
- Concessions largely eliminated
- Stabilization quicker than anticipated

Residential Portfolio by Subsector



New lease trade-outs



Information as of June 30, 2021 unless otherwise noted. [1]Performance is unlevered and Peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF. Occupancy represents percentage leased and based on square feet. Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. Provided for update and reporting purposes only, not to be construed as investment advice.

ALTs by J.P.Morgan Asset Management

The future of SPF

Asset selection and execution driven performance

- Differentiated assets
- High growth markets

Increased development pipeline

- Continued commitment to single family rentals and industrial joint ventures
- Grow multi-family exposure via development in Sunbelt markets

Extended sectors

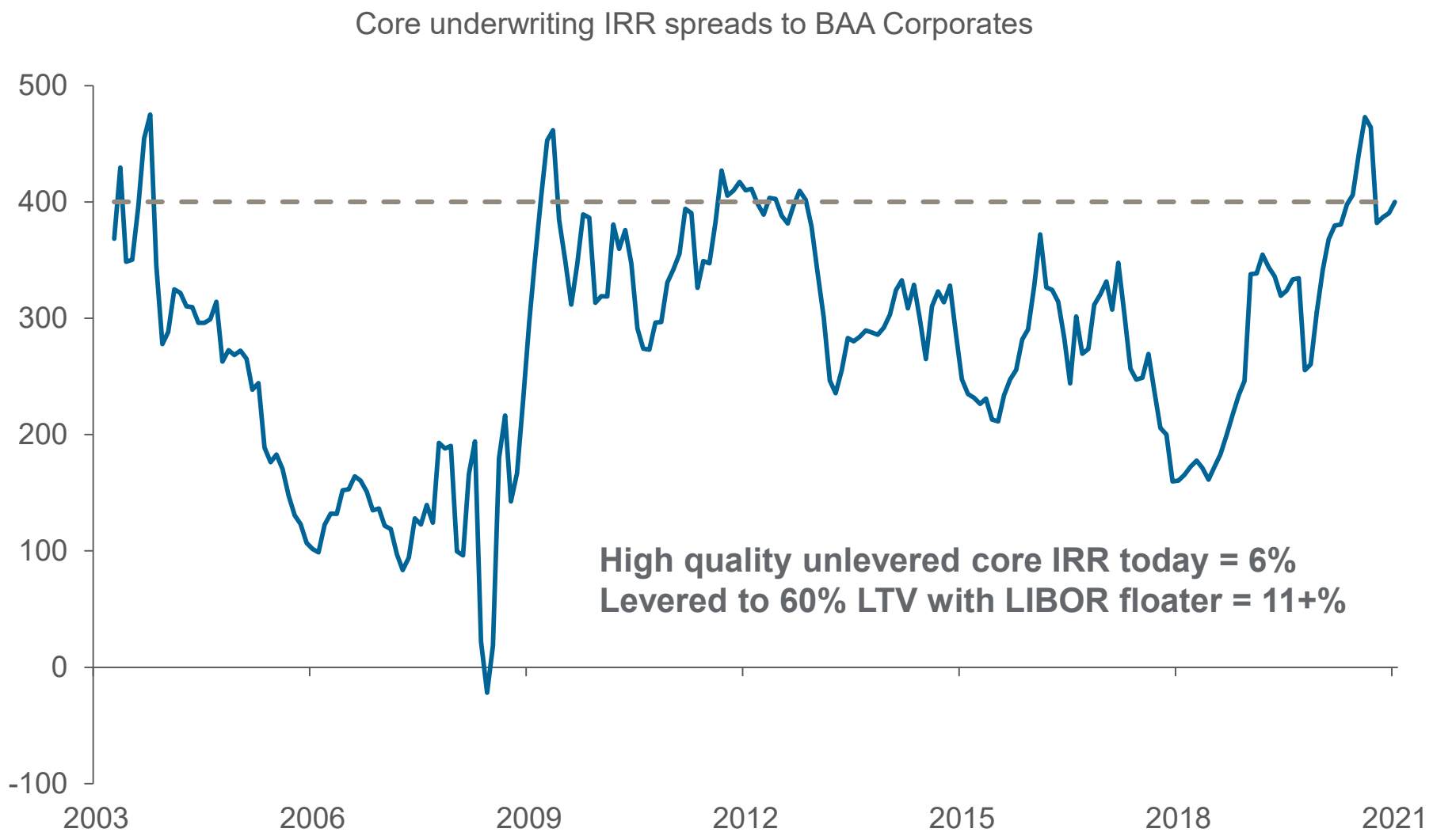
- Single family rentals
- Lab
- Truck terminals
- Self storage, medical office, outdoor storage

Century Plaza Towers, Los Angeles, CA

Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.

Appendix - U.S. Real Estate Market Outlook

Direct real estate is relatively cheap and debt highly accretive



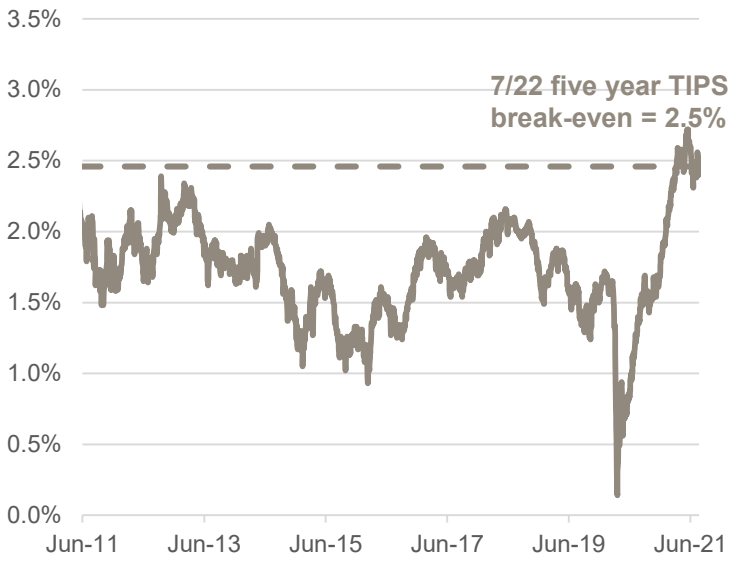
Source: Moody's and JPMAM. As of June 30, 2021.

ALTs by J.P.Morgan Asset Management

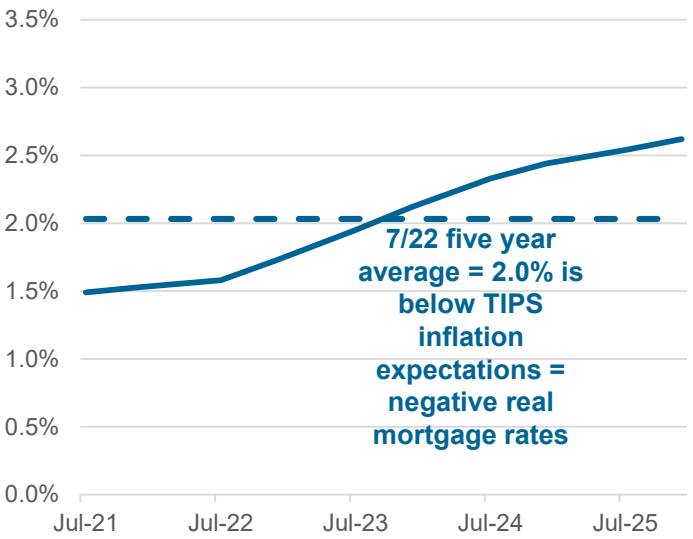
Rising inflationary expectations and low floating mortgage rates are a recipe for healthy or even frothy private real estate market appreciation

Market implies properties could be levered at *negative real interest rates* over the next five years just as cash flow growth should accelerate

Inflation expectations implied by five year TIPS



LIBOR forward curve + today's mortgage spread (140 bps)



Source: Federal Reserve Board, Chatham Financial (LIBOR), JPMAM (mortgage spread – estimate for 60% LTV mortgage on income-producing property). As of June 30, 2021 (left) and July 22, 2021 (right).

Changing sector leadership makes sector-fund allocations more complicated

Sector outperformers can switch to being underperformers within a quarter or two even when performance is measured over three years

Relative within-period performance looking back over three years.
Green = three-year lookback outperformance
Red = three-year lookback underperformance

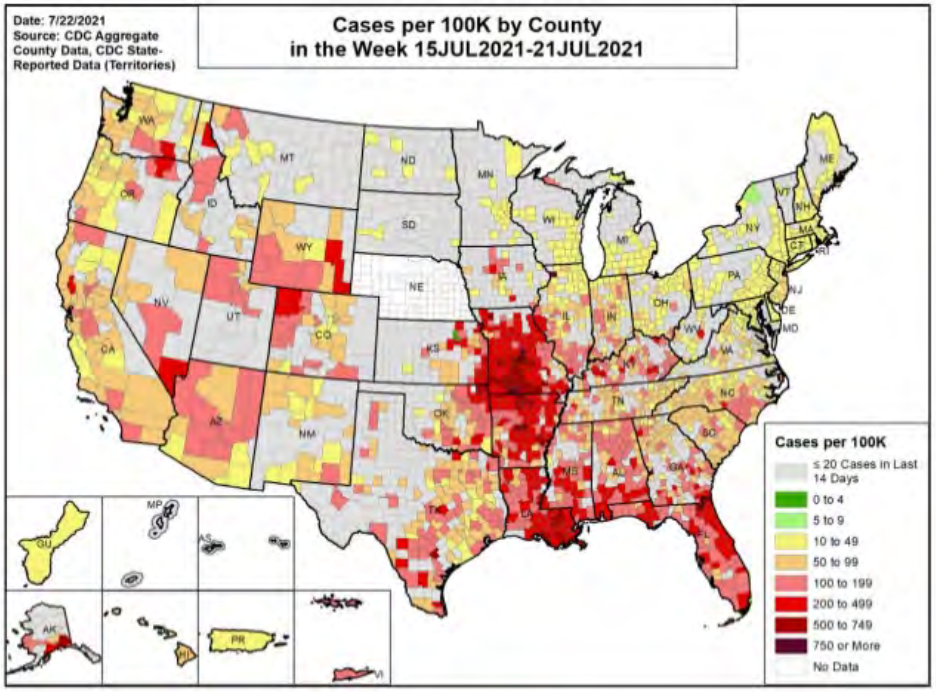
Sources: ODCE. As of June 30, 2021.

ALTs by J.P.Morgan Asset Management

Delta variant could complicate back to office/school plans

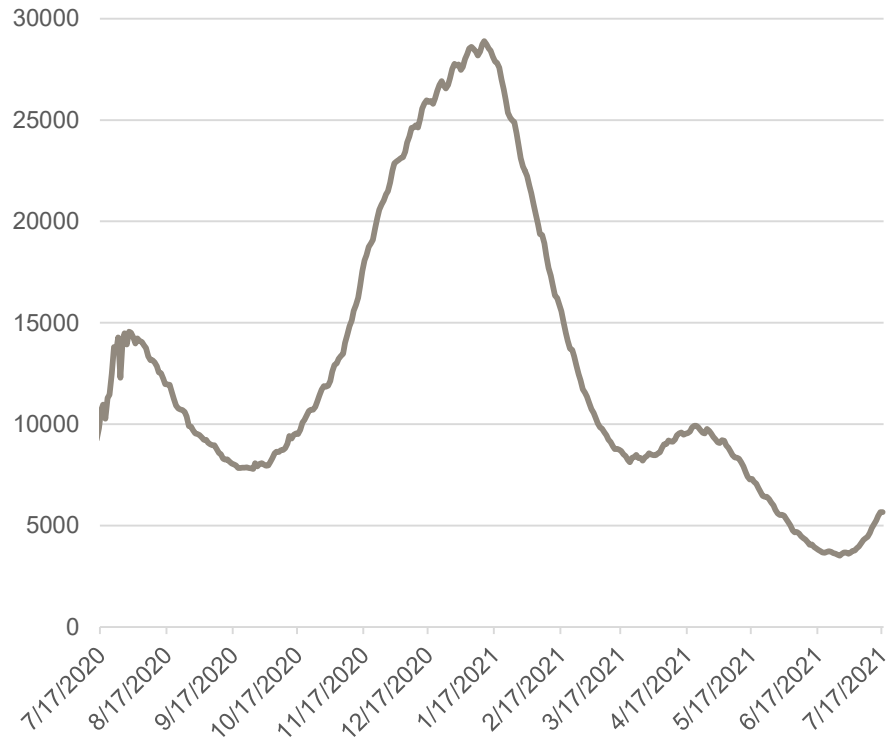
Models are showing little consensus how long and how serious spike will be but UK experience shows very low mortality for vaccinated patients

Infections



AL state-level case and mortality data were back distributed on 7/19/2021

ICU patients



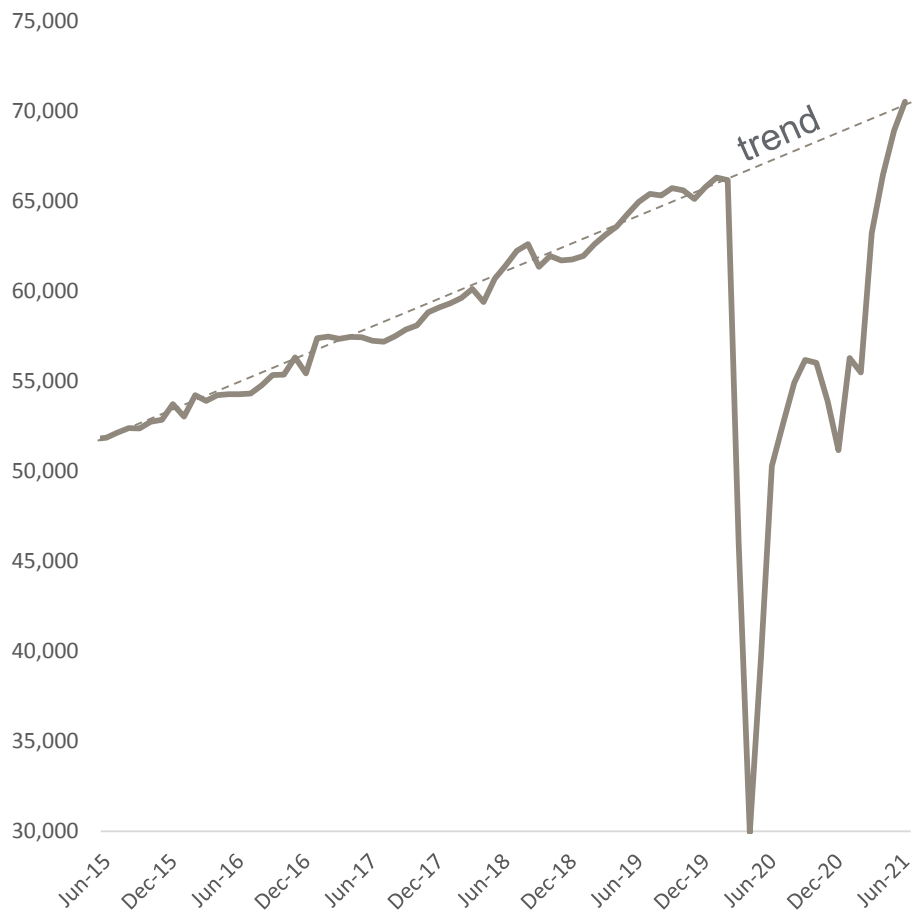
Sources: U.S. Department of Health & Human Services. As of July 17, 2021.

ALTs by J.P.Morgan Asset Management

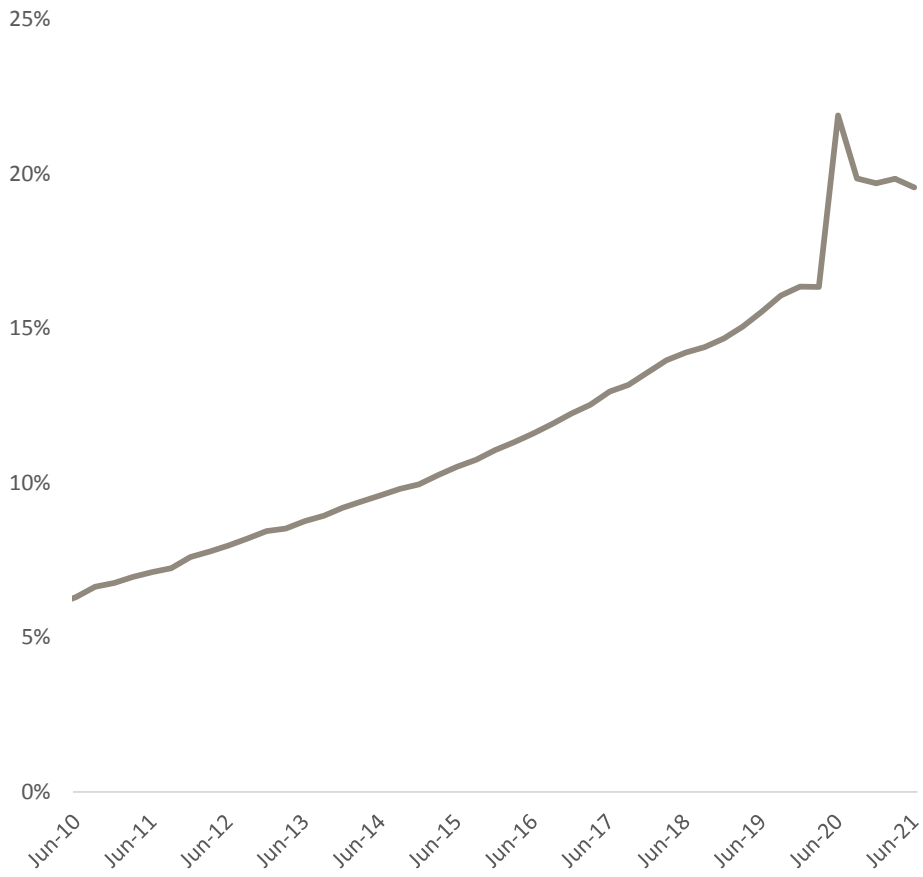
Retail: Restaurant spike is underway and COVID permanent impact on online sales share may run 3%-4% of core sales

The US has more than 6 restaurants & bars for every 10 stores. Revival in dining out is key driver to outdoor format recovery and price rebound

Food Services and Drinking Places (Restaurant) Sales



Internet Sales as a % of Core Retail Sales



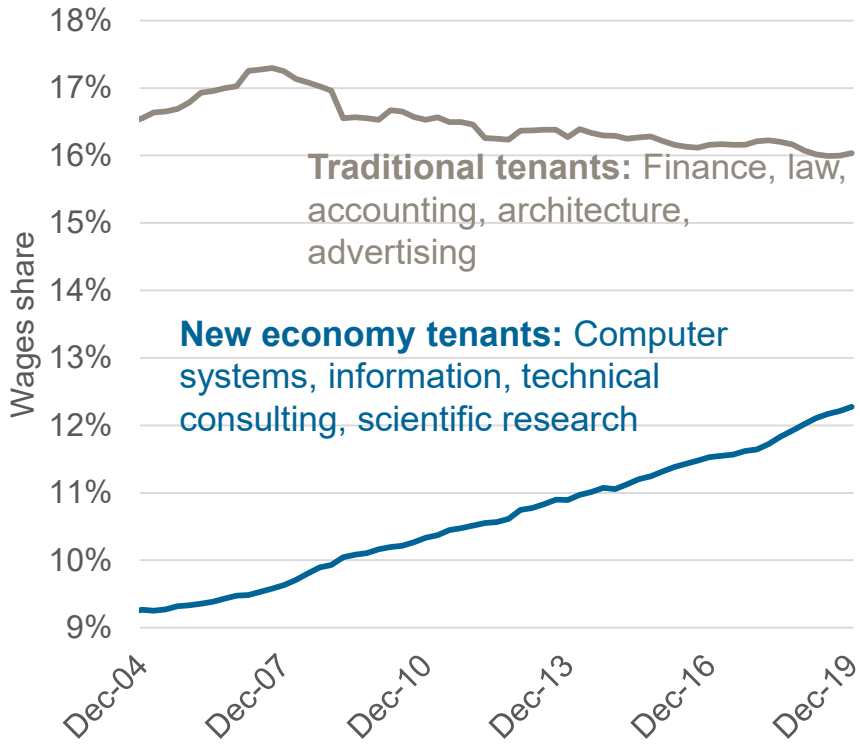
Source: Census Bureau. As of June 30, 2021.

ALTs by J.P.Morgan Asset Management

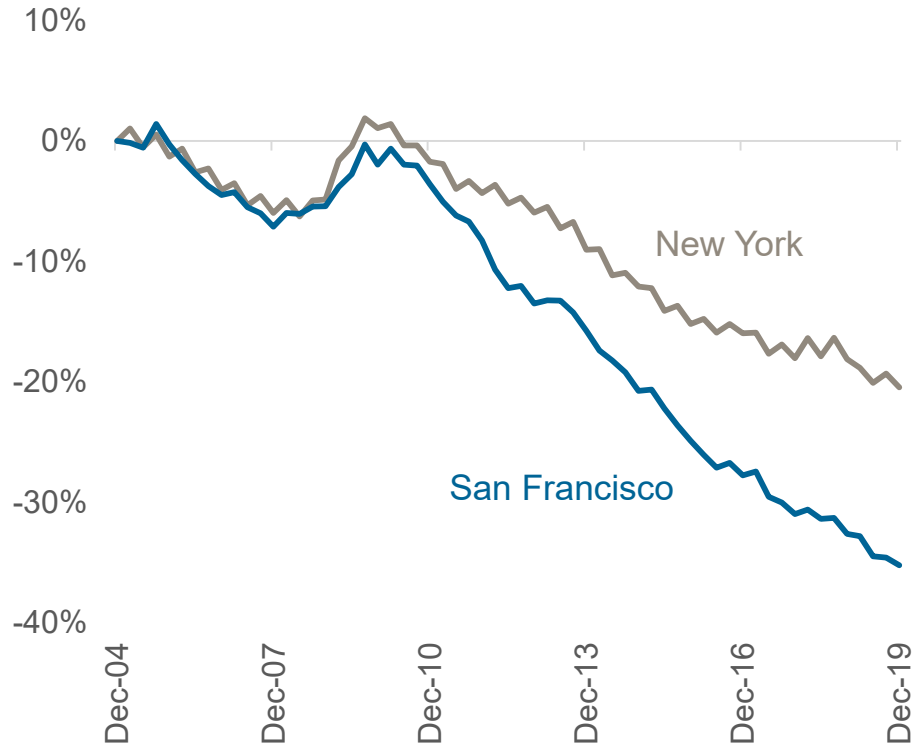
Office in transition: Office has faced disruptions for many years

Work-from-home trend joins other changes affecting office space use

Growing share of "new economy" occupiers



Change in space per office worker



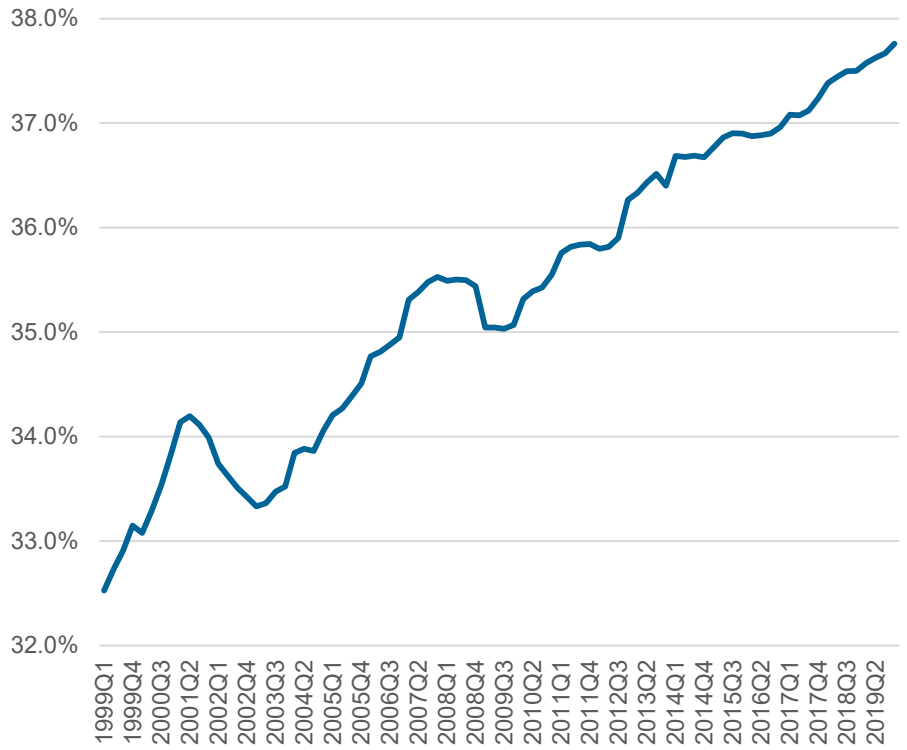
Source: Bureau of Labor Statistics, CoStar. As of December 31, 2019.

ALTs by J.P.Morgan Asset Management

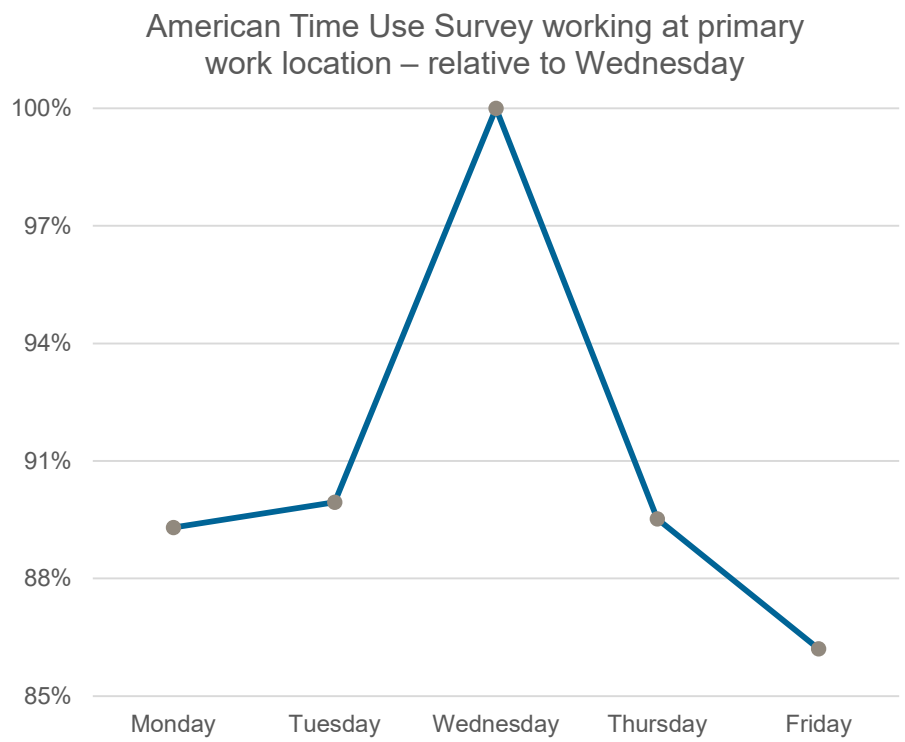
Long term office stabilizers: Office-based work is a rising share of the economy and hybrid work is complicated

Magnitude of work-from-home impact is tough to predict

Share of all US private sector wages in office-using jobs



Tenants need to lease for peak occupancy days

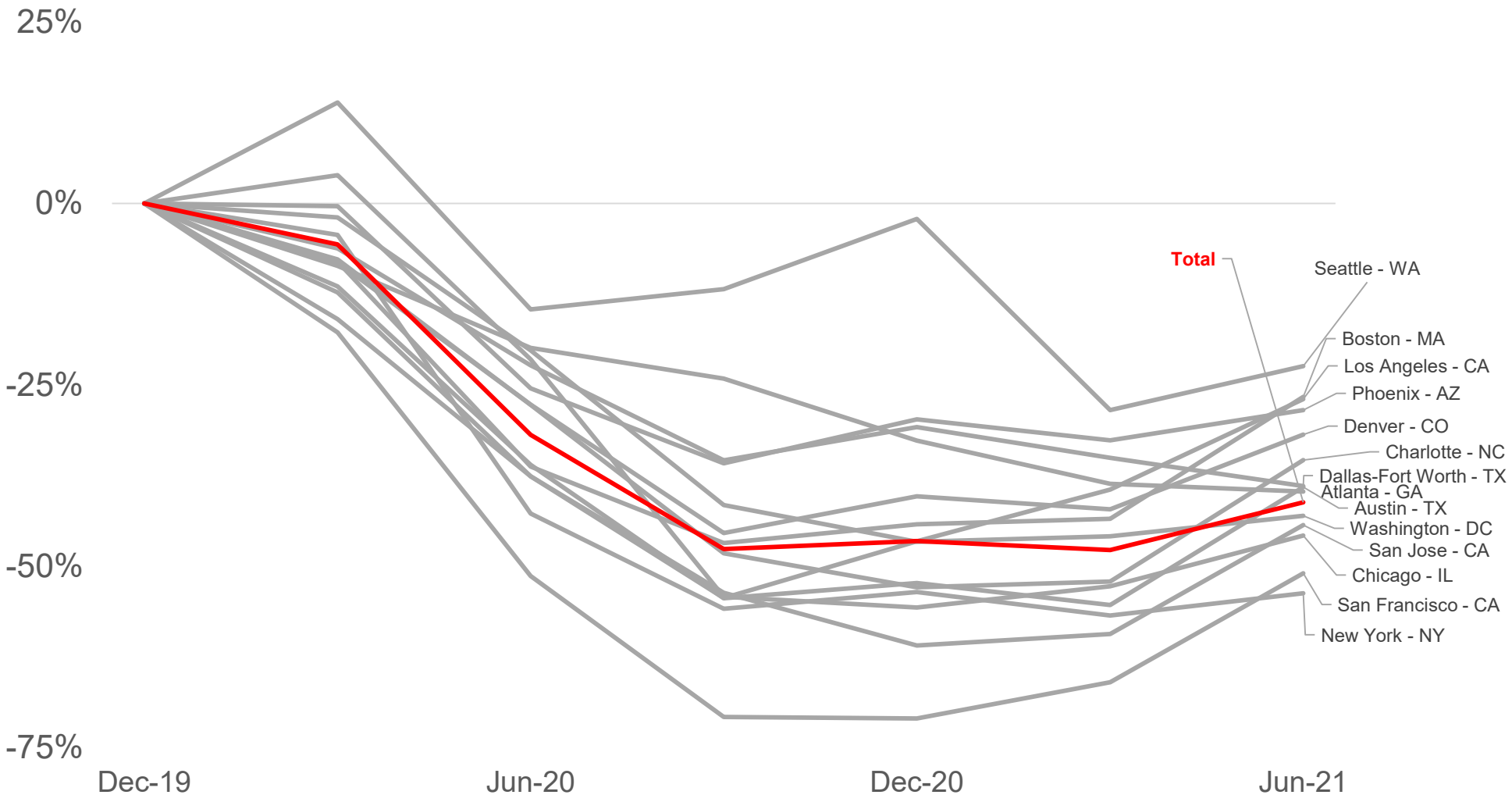


Source: Bureau of Labor Statistics; As of December 31, 2019, BEA

ALTs by J.P.Morgan Asset Management

Office leasing rebound is varied and incremental so far

Return-to-work culture varies widely. We expect more clarity after delta variant passes in Q4



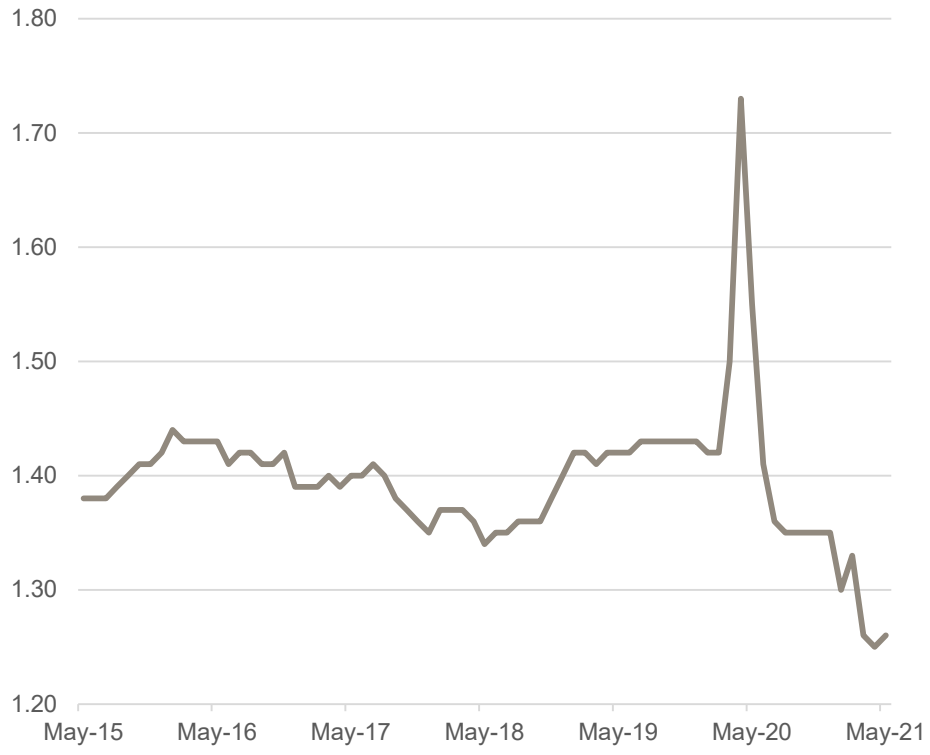
Source: CoStar. As of June 30, 2021.

ALTs by J.P.Morgan Asset Management

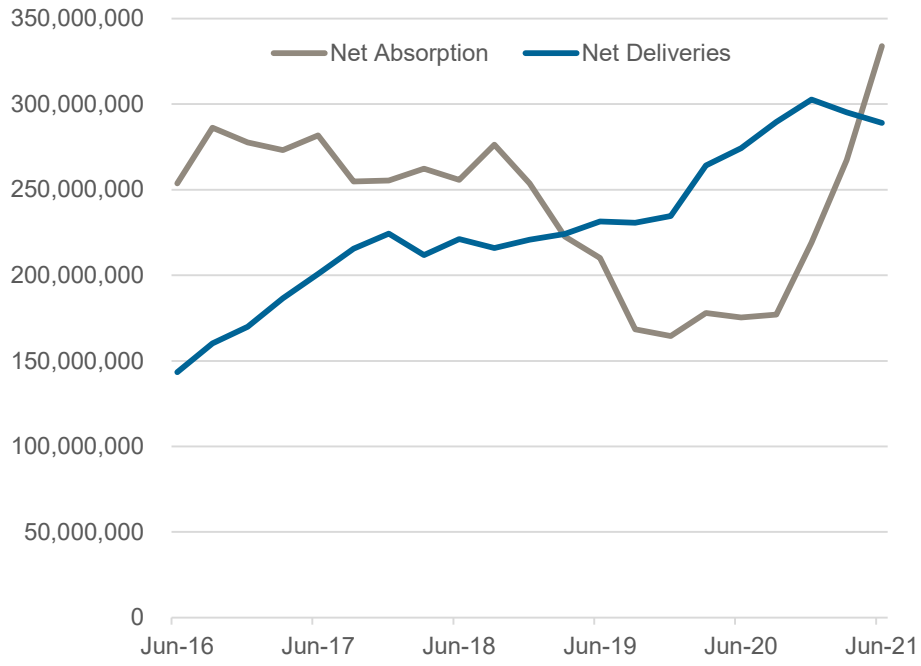
Distributors need to rebuild inventories picked clean by still-flush consumers -- boosting warehouse demand

Strong overall consumption growth and continued online market share gains should result in healthy rent growth over next 12-24 months.

Inventory to sales ratio



US Warehouse performance



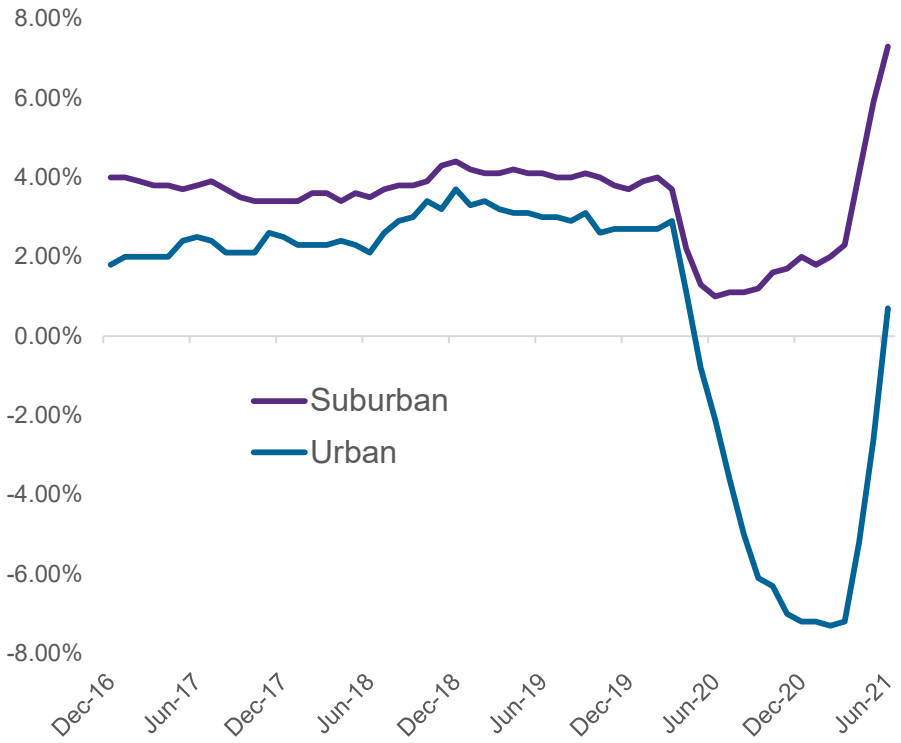
Sources: BEA, CoStar. As of May 31, 2021 (left) and June 30, 2021 (right).

ALTs by J.P.Morgan Asset Management

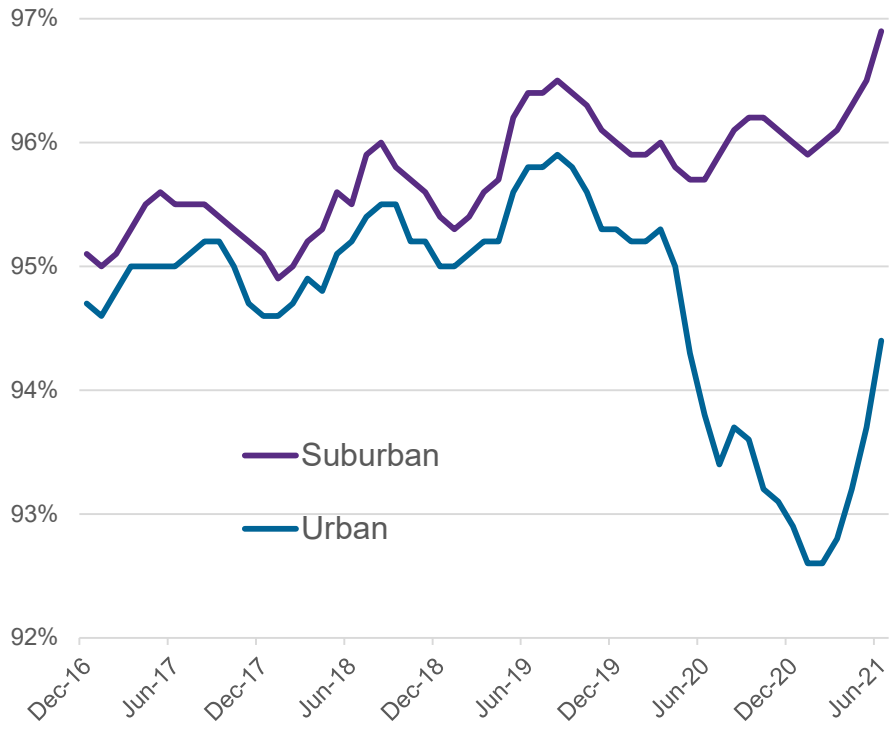
Suburban apartment rents are spiking while urban residential rebound picks up steam

Suburban relative performance might be related to rising acceptance of longer commutes due to WFH expectations

Rent growth vs. a year earlier



Occupancy



Source: Axiometrics. As of June 30, 2021.

ALTs by J.P.Morgan Asset Management

Disruptions create opportunities

- Positive environment for core and core+ real estate as NOI growth expectations rise and funding rates stay low
- Office rebound may wait for delta variant to pass through
  - Infotech/biotech/medical office share grows while finance/law drag becomes less important
  - Flexible leasing environment will increasingly favor landlords
  - Continued infotech dispersion to smaller markets but less so for biotech
- Outperformance in outdoor retail formats should continue
  - Sharp post-COVID improvement in services (restaurants, health clubs, theatres)
  - Few openings of new apparel concepts
- Strong warehouse tenant demand growth should continue for one to two years
  - Accelerating rural supply growth suggests tilt more towards supply constrained last mile still makes sense
- Renters hasten their transition to suburban multifamily and single-family rentals
  - Partial work from home allows for longer commutes and need for more room
- Sunbelt growth markets remain good long-term bets (e.g., Austin, Nashville and Raleigh)

Source: JPMorgan, as of June 30, 2021. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.

Appendix – SPF Sector Slides

Office

Office

Sector Overview

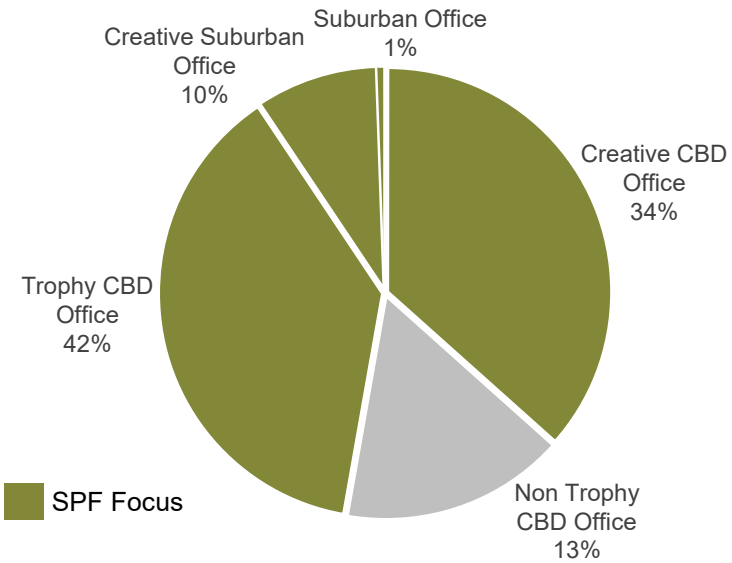
	YE 2019	2Q 2021	2021 Rollover
% Leased	94%	92%	4.1%

Returns	SPF[1]	Peer Set[1]
1 Year	4.4%	3.0%
3 Year	5.8%	4.3%
5 Year	6.1%	5.2%

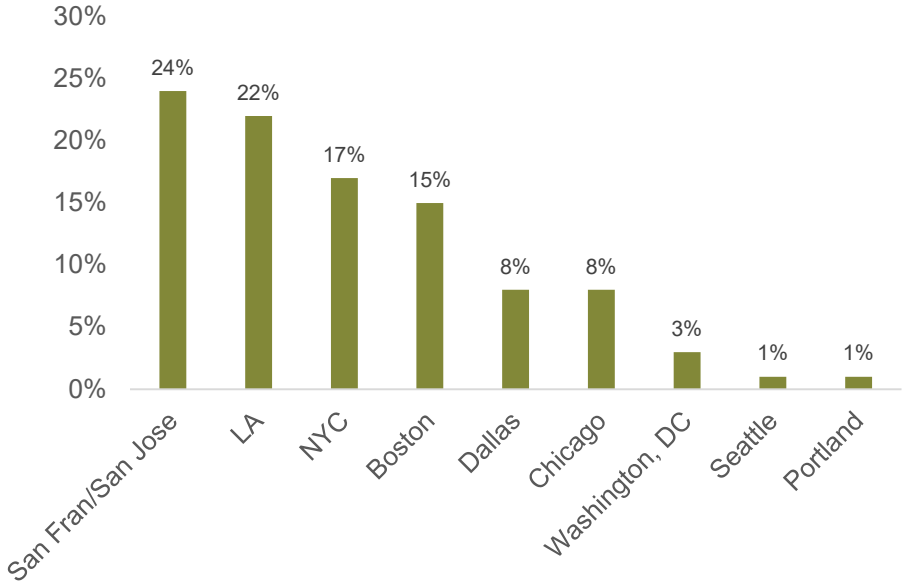
Historical Allocation

	4Q 2015	4Q 2019	2Q 2021
SPF	48.3%	36.8%	31.7%
ODCE	38.0%	33.4%	30.0%

Office Portfolio by Subsector[2]



Office Portfolio by MSA[2]



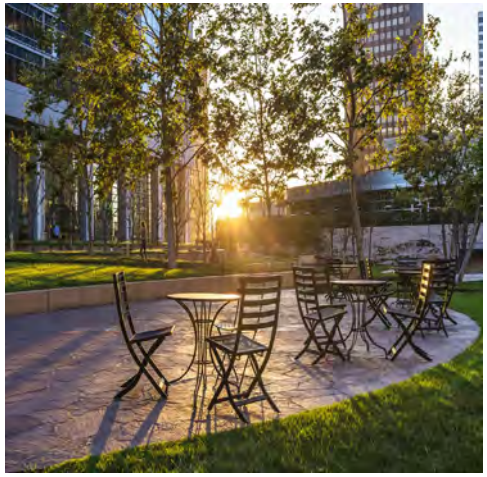
Information as of June 30, 2021 unless otherwise noted. [1]Performance is unlevered and Peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF. [2]Based on % of NAV. Occupancy represents percentage leased and based on square feet. Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. Provided for update and reporting purposes only, not to be construed as investment advice.

Century Park, Los Angeles, CA

ASSET OVERVIEW

Property Type	Class-A Office
Initial Investment Year	1997
Ownership	Joint Venture
Size	~3.1M SF
NAV (USD)	$1.19B

- Centrally located in a highly supply-constrained, commercial and residential community
- Highly amenitized asset, including 4 banks, 7 restaurants, 2 cafés, 2 sundry shops, 15K SF tenant-only gym, tenant lounge, conference facilities, among many other daily needs services
- As of 2Q21, Century Plaza Towers was 95% leased and 2000 Avenue of the Stars was 99% leased
- Since the start of the pandemic, Century Park has signed 563,742 SF of leases across 24 transactions
- Current pipeline of leases is approximately 249,023 SF across 16 transactions



As of June 30, 2021. This example is included solely for its aesthetic appeal. This example represents one of the investments of the Fund. However, you should not assume that these types of investments will be available to or, if available, will be selected for investment by the Fund in the future. The above example does not constitute investment advice or recommendations. It is not a solicitation or an offer to purchase or sell any investment. **Past performance is not a reliable indicator of current and future results. See important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, on the private placement risk disclosure page in the appendix.** Any investment mentioned throughout presentation are shown for illustrative purposes. A full list of SPF holdings are included in appendix.

Industrial

Industrial

Sector Overview

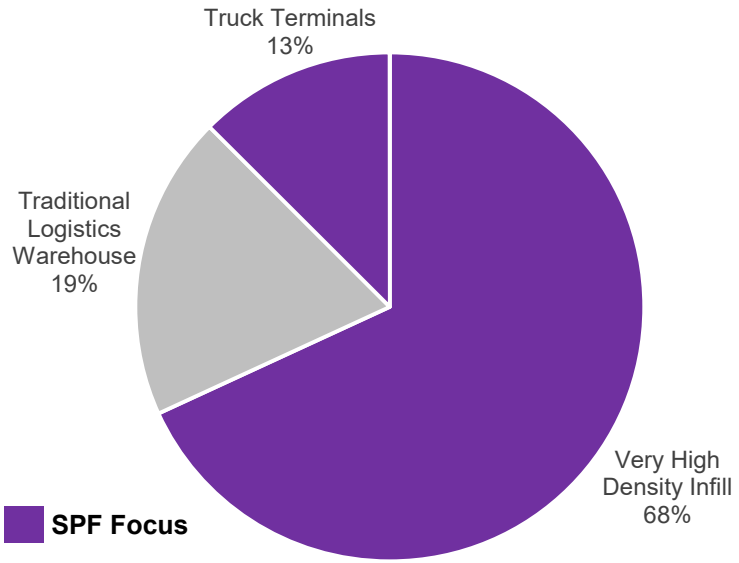
	YE 2019	2Q 2021	2021 Rollover
% Leased	95%	97%	2.3%

Returns	SPF[1]	Peer Set[1]
1 Year	19.7%	20.5%
3 Year	14.5%	14.9%
5 Year	13.7%	14.1%

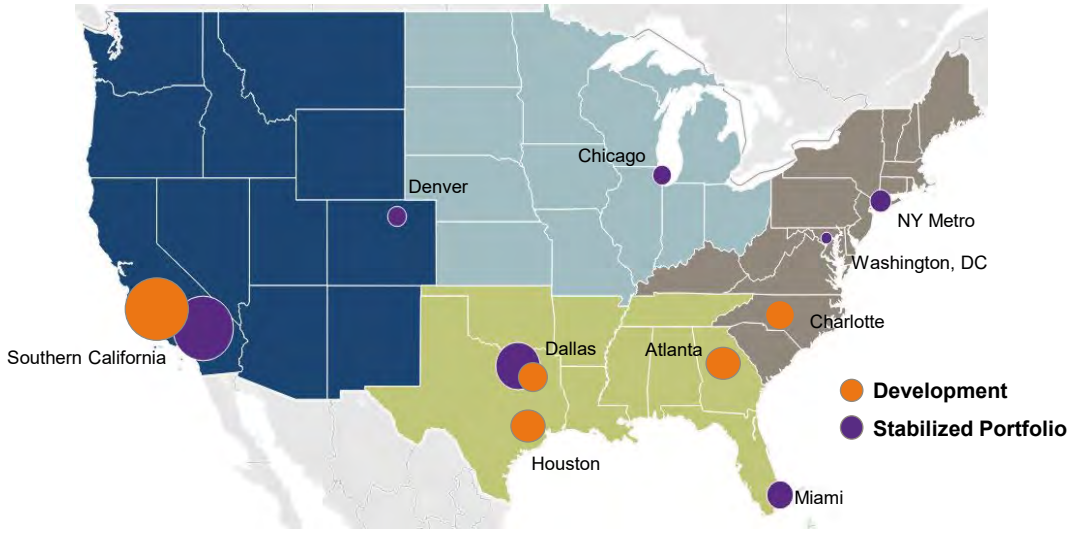
2021 Observations

- Rents in Southern California rose 20%-40% YTD
- Replacement cost continues to increase - land, steel
- Increase of new entrants - development

Industrial Portfolio by Subsector



Industrial Portfolio: high barrier infill markets



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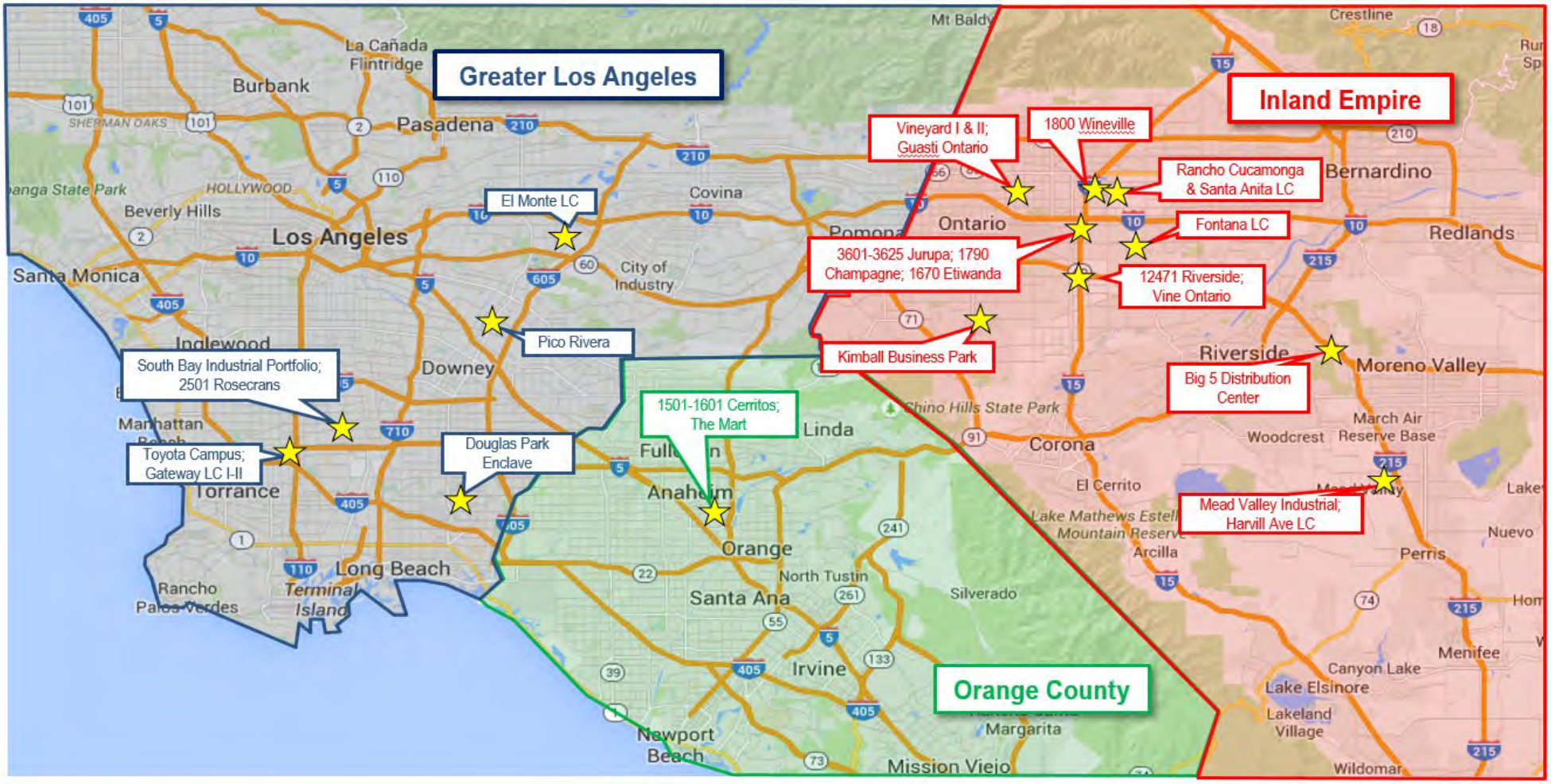
ALTs by J.P.Morgan Asset Management

SPF SoCal Industrial



- Vacancy rates in SoCal are below 2% and expected to stay there
- Land values in the Inland Empire have more than doubled over the past 12 months
- Inland Empire rents are up 40% year to date and rents in LA/OC are up 20% YTD; we expect to see strong rent growth for the balance of the year

Source: JPMAM. For illustrative purposes only. Any securities mentioned throughout the presentation are shown for illustrative purposes only and should not be interpreted as recommendations to buy or sell. A full list of SPF holdings are included in the appendix. Provided for update and reporting purposes only, not to be construed as investment advice.

ALTs by J.P.Morgan Asset Management

Industrial portfolio – Allocation timeline

Jul 2015
Vineyard Industrial I and II

Apr 2016
Pico Rivera

Apr 2016
Sares Regis
Thousand Oaks

Sept 2016
Kimball Business
Park

Sept 2016
South Florida
Logistics Center

Aug 2017
Moreno Commerce

Oct 2017
Toyota Campus

Jul 2018
RealTerm Industrial

Nov 2018
Black Creek Venture

Jan/Feb 2019
- Sam Houston Distribution Center
- Maywood Park

October 2020
Douglas Park
Enclave

Dec 2020
CenterPoint Truck
Terminal Portfolio

Feb 2021
Mead Valley

June 2021
Vine Ontario

Leverage partnerships for growth and pipeline:

Sares Regis Partnership:

- Partners since 1996
- Best in class regional operator
- Proven track record with local municipalities
- Focus on infill industrial in southern California
- Over 6.5mm SF of industrial with Sares Regis since 2015

Black Creek Venture:

- Access build-to-core pipeline with best-in-class operator
- Goal is to scale the investment to $1 billion+ over time
- Scalable and geographically diversified with a focus on infill
- SPF's size was an advantage in securing the opportunity
- Market joint venture fee structure

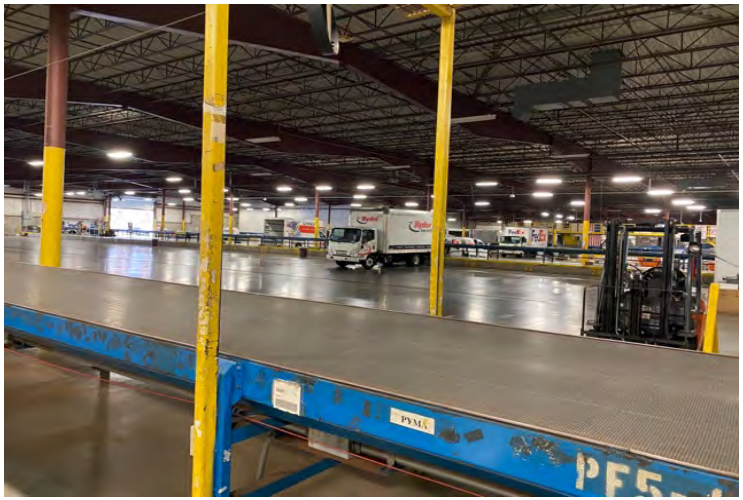
All case studies are shown for illustrative purposes only and should not be relied upon as advice or interpreted as a recommendation. Results shown are not meant to be representative of actual investment results. **See important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, on the private placement risk disclosure page(s).** Any investment mentioned throughout the presentation are shown for illustrative purposes. A full list of SPF holdings are included in the appendix.

CenterPoint Truck Terminal

ASSET OVERVIEW

Property type	Industrial/Truck terminals
Investment date	December 2020
Ownership	50%
Size	1.8 M SF
Net equity	$145 M

- 54 asset nationwide portfolio of truck terminals totaling 718 acres, 2,090 doors and 1.8M SF of total building size. Low coverage (6.5% on average).
- 50%/50% Joint Venture with SPF's existing partner, RealTerm
- SPF investment: $154M
- Occupancy 97%
- Year 1 cap rate: 4.8%
- Cap on Market rents: 6.2%



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RealTerm Portfolio

ASSET OVERVIEW

Property Type	Class A Industrial
Investment Date	July 2018
Ownership	Joint Venture
Size	2,188,172 SF
NAV	USD 568.4 million

- RealTerm is a portfolio of high flow-through truck terminal, secure storage and final-mile logistics facilities comprised of 54 locations, 2.1 million rentable square feet (RSF) and 799 acres.
- 28 submarkets across 20 states with the highest concentrations in Northern New Jersey, Chicago, Inland Empire, Laredo and Los Angeles that is currently 91.6% leased.
- Truck terminal facilities are a critical piece of the supply chain network and are designed to move, rather than store freight.
- The Fund is looking to add additional outdoor storage and terminal assets to the existing RealTerm Portfolio.

As of 3Q 2020, unless otherwise noted. All case studies are shown for illustrative purposes only and should not be relied upon as advice or interpreted as a recommendation. Results shown are not meant to be representative of actual investment results. Any securities mentioned throughout the presentation are shown for illustrative purposes only and should not be interpreted as recommendations to buy or sell. **See important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, on the private placement risk disclosure page(s).** Provided for update and reporting purposes only, not to be construed as investment advice.

Retail

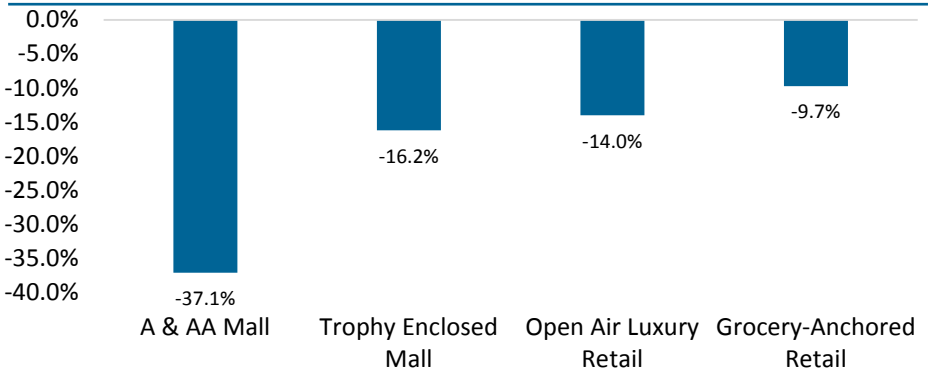
Retail

Sector Overview

	YE 2019	2Q 2021	2021 Rollover
% Leased	94%	91%	6.1%

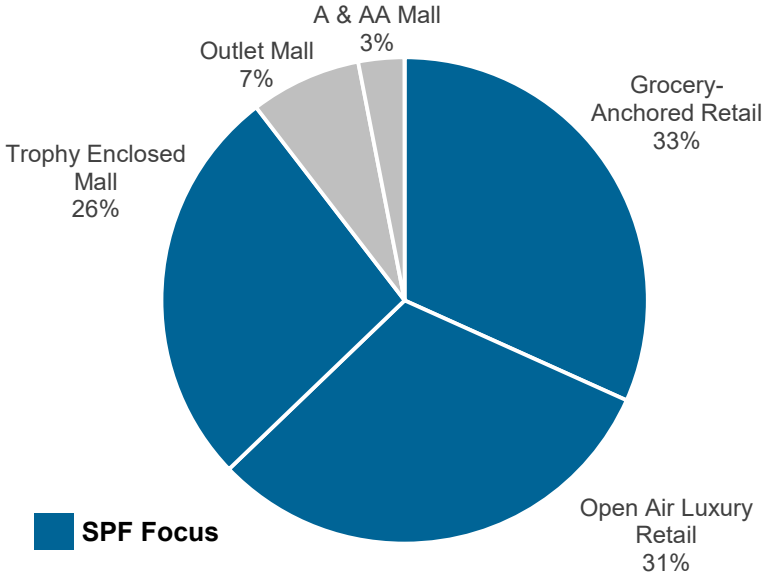
Returns	SPF[1]	Peer Set[1]
1 Year	1.0%	-1.1%
3 Year	-1.7%	-2.6%
5 Year	1.2%	0.6%

Peak to Trough declines by subsector



University Towne Center, La Jolla, CA

Retail Portfolio by Subsector



Information as of June 30, 2021 unless otherwise noted. [1]Performance is unlevered and Peer set for unlevered performance is MSCI/PREA US ACOE ex-SPF. Occupancy represents percentage leased and based on square feet; excludes development at Valley Fair Mall. Forecasts, projections and other forward looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. Provided for update and reporting purposes only, not to be construed as investment advice.

River Oaks, Houston, TX

ASSET OVERVIEW

Property Type	Open Air Luxury Retail
Investment Date	June 2016
Ownership	100%
Size	304,584 SF
NAV (USD)	$363.1M

- Strong sales growth: Gross sales in May of 2021 were 60% higher than gross sales in May of 2019
- Luxury, jewelry and restaurants are leading in sales growth
  - Cartier (+97.8%), Hermes (+26.0%) and Van Cleef (+160.6%) over 2019
  - Restaurants up over 75% of 2019 levels
- Continued traffic increases: 16% higher today than spring of 2021, and overall traffic better than 2019, despite the muted theater and gym traffic
- Leasing momentum: New leasing activity (executed leases and LOIs) will bring the center to 89% leased in the coming quarters

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Residential

Residential

Sector Overview

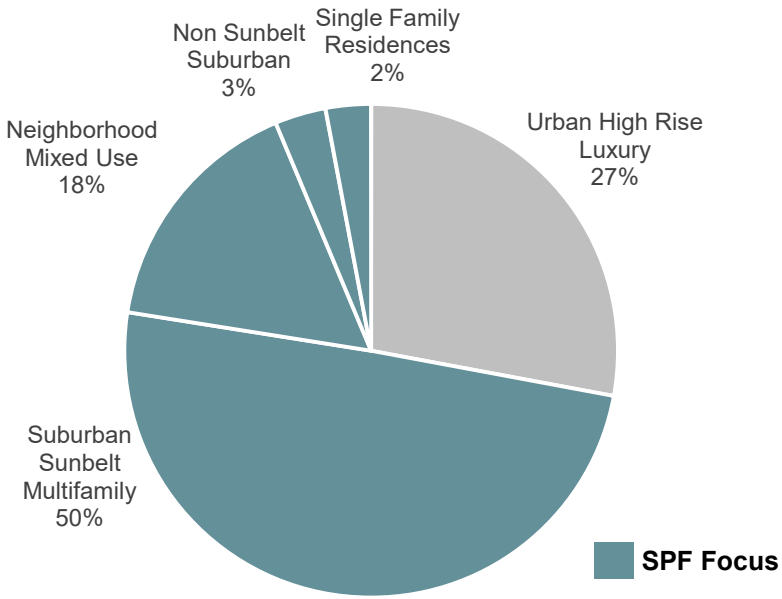
	YE 2019	2Q 2021
% Leased	94%	94%

Returns	SPF[1]	Peer Set[1]
1 Year	6.4%	5.9%
3 Year	5.4%	4.6%
5 Year	5.6%	5.2%

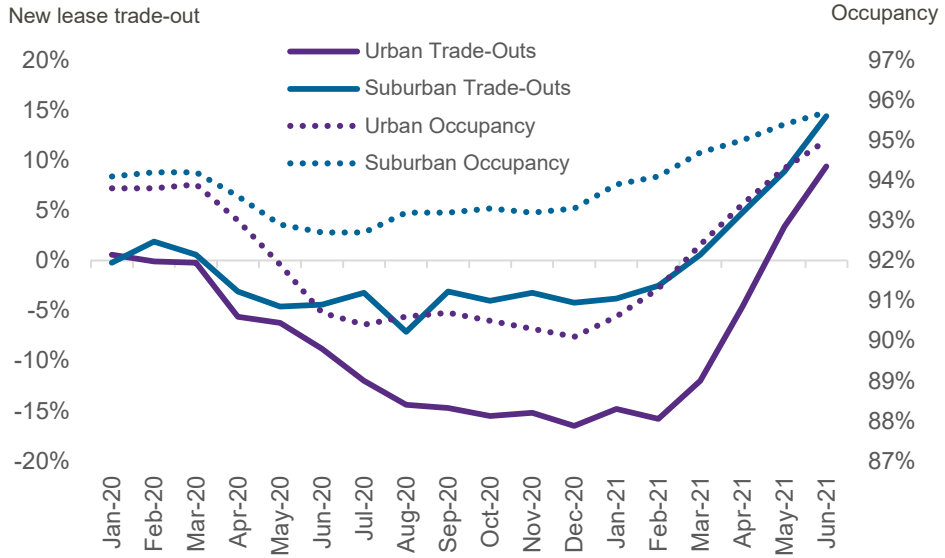
2021 Observations

- Urban luxury occupancies almost fully recovered
- Concessions largely eliminated
- Stabilization quicker than anticipated

Residential Portfolio by Subsector



New lease trade-outs



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ALTs by J.P.Morgan Asset Management

Broadstone Olivine, Littleton, CO

ASSET OVERVIEW

Property Type	Residential
Investment Date	April 2019
Ownership	Joint Venture
Size	326 units
NAV	$78.5M

- One of the first mid-rise projects in the area that offers luxury finishes and urban amenities
- The project is built on excess land in the Bowles Crossing Shopping center, which provides immediate access to many desirable retail amenities, such as a Trader Joe's and an upscale fitness concept, VASA, as well as dining options
- The Property is next to Raccoon Creek Golf Course and is walking distance to Clement Park, a large regional park which includes a 1.4-mile running loop and 60-acre lake
- The project is scheduled to deliver in four phases with 87 of 326 units delivered in July 2021 and final completion slated for 4Q 2021.

As of June 30, 2021. All case studies are shown for illustrative purposes only and should not be relied upon as advice or interpreted as a recommendation. Results shown are not meant to be representative of actual investment results. **The performance shown above is not the actual performance of any private placement investment vehicle. Performance is that of a predecessor fund that was managed in a similar manner by the portfolio manager. Past performance is not a reliable indicator of current and future results. See important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, on the private placement risk disclosure page(s).** Any investment mentioned throughout the presentation are shown for illustrative purposes. A full list of SPF holdings are included in the appendix.

Single family rental demand has been explosive

American Homes 4 Rent

Property type	Single family residences (rental)
First closing date	May 2020
SPF initial investment	USD 202.5 million

- Programmatic joint venture including approximately 2,500 single family rental homes located primarily in the Southeast and Sunbelt
- Increases exposure to the residential sector with the aim of generating outsized yield and stronger rent growth relative to apartment construction
- To date, the venture has closed on 16 sites totaling ~1,300 homes
- Rationale:
  - Demographic tailwinds: Millennials are aging into family formation age; migration to suburbs due to desire for more space and better schools
  - Impediments to homeownership: personal balance sheet impairment, tighter lending standards, record home prices and limited inventory
  - Advantages to renting: despite tax law changes, renting remains cheaper than owning in many high growth markets

Kingdom Crest, Nashville, TN

Royal Firs/Braun's Addition, Seattle, WA

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Appendix – Environment, Social and Governance (“ESG”) Overview

ESG Integration: Global Real Estate ("GRE")

We strive to act in the highest fiduciary interest of our clients by maintaining institutional quality assets, improving property level operating performance, and maximizing value. We view sustainability as synonymous with good asset management.

ESG fully integrated into the investment and asset management processes across GRE

Due Diligence	■ Undertake acquisition/underwriting ESG assessments to identify risks and opportunities for new investments ■ Assess and evaluate alignment of ESG interests with prospective partners (JVs, property managers, suppliers) ■ Incorporate the output of these initiatives into acquisition investment committee memos and decision-making
Active Asset Management	■ Measure and track resource usage within our control against reduction targets, and identify areas for improvement ■ Provide ESG and satisfaction surveys to all tenants to identify areas to improve tenant engagement and experience ■ Integrate the output of these initiatives into annual asset business plans and budgets
Governance & Transparency	■ Guide and manage the accountability of our sustainability efforts through our regional ESG Taskforces ■ Pursue energy ratings, green building and health/wellness certifications where feasible to demonstrate achievements ■ Disclose ESG performance through annual UNPRI and GRESB Assessments, Sustainability Reports, etc.

ESG in action: Strategic Property Fund examples

McKinney & Olive, Dallas

- Class A+ office
- Prestigious LEED® v4 for Building Operations & Maintenance: Existing Buildings Gold certification.
- ENERGY STAR certified with a score of 90.
- We reduced outdoor water use at the property by 68% by having on-site native and adaptive vegetation, as well as high efficiency irrigation system with weather-based electronic controls and pressure compensating drip system.

Polo Lakes Apartments, Wellington, FL

- Earned IREM Certified Sustainable Property certification in 2019.
- We offset this multifamily asset's carbon footprint by purchasing 221,000 kWh of Renewable Energy Certificates (RECs), equivalent to a 75% of the property's annual electricity use.
- As a result of purchasing these RECs, there will be an annual reduction of 156 metrics tons of CO2, which is equivalent to 26.4 homes' electricity use for one year.

Century Park, Los Angeles

- Two Class A+, LEED O+M: Existing Building Gold certified office properties.
- 11,000+ windows installed with Sun Control Window Films with heat rejection qualities and neutral light appearances
- Project cost offset by a rebate from LA Department of Water and Power. Resulted in a 61% rejection of heat load and reduced HVAC electrical consumption by 30%, equivalent to saving 1.9 million kWh and $303,930 annually.

These examples are included solely to illustrate the investment process and strategies which have been utilized by the manager. It should not be assumed that investments in the portfolio including the examples above have been profitable. Please note that these investments are not necessarily representative of future investments that the manager will make. There can be no guarantee of future success.

Investing on the basis of sustainability/ESG criteria involves qualitative and subjective analysis. There is no guarantee that the determinations made by the adviser will align with the beliefs or values of a particular investor. Specific assets/companies are not excluded from portfolios explicitly on the basis of ESG criteria. Sustainability issues are identified and quantified as part of our investment due diligence process, not only as a pre-requisite for responsible investing, but also as a tool to help mitigate potential risks.

ESG+R Program Summary

Commitment to Sustainability

J.P. Morgan Asset Management – Real Estate Americas believes that continuous improvement of our assets with respect to environment, social, and governance (ESG+R) policies will ultimately improve the environment in which those assets exist and, more importantly, enhance their competitiveness and asset value.

We integrate ESG+R into every investment decision and have fully integrated these sustainability objectives into our overall business strategy. Sustainability issues are identified and quantified as part of our real estate asset investment due diligence process, not only as a prerequisite for responsible investing, but also as a tool to identify and mitigate potential risks.

Our ESG+R Objectives for Real Estate Americas are summarized as follows:

ENVIRONMENTAL

Conserving Resources

- Reduce, measure, and report building energy, emissions, water, and waste within our control
- Measure and improve performance to reduction targets
- Evaluate and implement low-cost property enhancements and capital improvements
- Evaluate and pursue energy ratings and green building certifications, where possible

SOCIAL

Regularly engaging with our identified stakeholders:

- Investors
- Joint venture partners
- Employees
- Property managers
- Tenants
- Community
- Suppliers

GOVERNANCE

Leadership & Transparency

- Continuously integrate ESG+R throughout the investment process
- Disclose ESG+R strategy and performance to enhance transparency
- Lead the industry by example and guide best practices and outcomes

RESILIENCE

Mitigate climate-change related risk

- Identify and measure physical risks
- Assess and develop mitigation strategies at high-risk assets
- Analyze climate-related transition risks and opportunities

UN PRI and GRESB ratings are not reliable indicators of current and/or future results or performance of the underlying assets. *Investing on the basis of sustainability/ESG criteria involves qualitative and subjective analysis. There is no guarantee that the determinations made by the adviser will align with the beliefs or values of a particular investor. Specific assets/companies are not excluded from portfolios explicitly on the basis of ESG criteria. Sustainability issues are identified and quantified as part of our investment due diligence process, not only as a pre-requisite for responsible investing, but also as a tool to help mitigate potential risks.* Our ESG program is aligned with INREV, GRESB, GRI and UN PRI. Data provided herein has been reviewed by LORD Green Strategies and represents a snapshot of current performance.

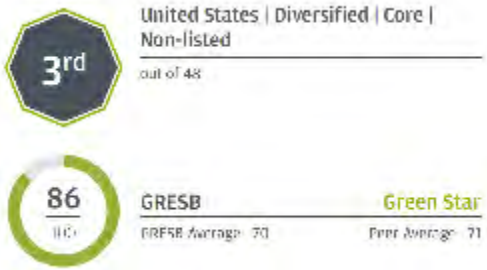
ESG+R Performance

PRI – Direct Property

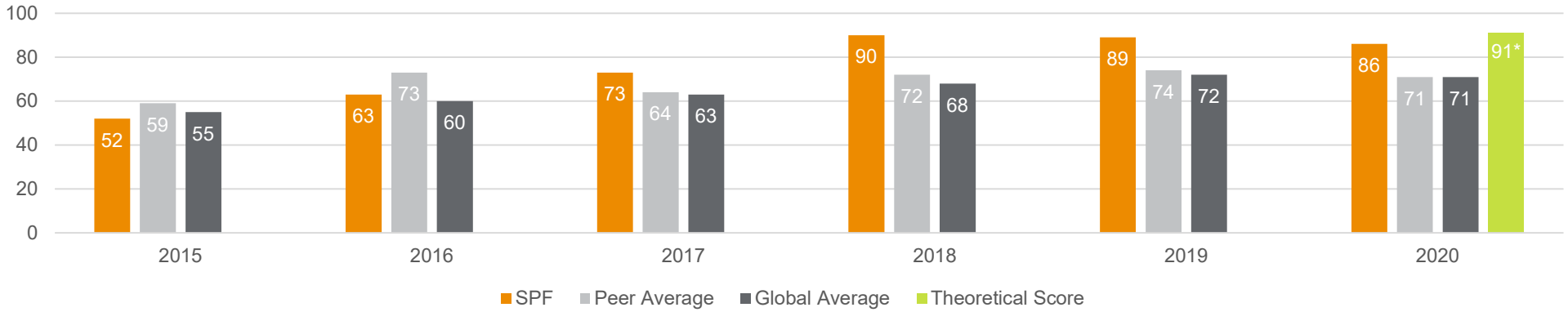
JPMAM participated in the 2020 United Nations Principles for Responsible Investment, and direct property once again outranked peers with a score of A compared to a peer average of B.

GRESB

J.P. Morgan U.S. Core (assets of SPF) has participated in the annual GRESB Assessment since its inception. In 2020, J.P. Morgan U.S. Core ranked 3rd of 48 diversified core funds in the United States, achieving 5 out of 5 Green Stars for the third consecutive year, placing in the top 20% of over 1,200 participants globally. The Fund achieved an overall score of 86, with the management portion of the assessment receiving nearly all possible points. With its high score and ranking year-over-year in an increasingly competitive arena, J.P. Morgan U.S. Core continues to be recognized as a leader in ESG across the globe. The Fund team submitted to the 2021 GRESB Assessment in July and results will be released in Q4 2021.



GRESB Perfomance History



* Due to the numerous changes made to the GRESB Real Estate Benchmark in 2020, GRESB released Theoretical Scores calculated using the 2019 Assessment structure. Using the 2019 Assessment structure, the Fund would have received a 91, a two point increase in the score compared to 2019.The Fund was part of the US Diversified Office/Retail Peer Group in 2015 and 2016. Since 2017, the Fund has been part of the US Diversified Peer Group

UN PRI and GRESB ratings are not reliable indicators of current and/or future results or performance of the underlying assets. ESG considerations are one aspect of our decision making process. We continue to only make investments that we believe will be return-enhancing and accretive to our clients' portfolios. Our ESG program is aligned with INREV, GRESB, GRI and UN PRI. Data provided herein has been reviewed by LORD Green Strategies and represents a snapshot of current performance.

Appendix – REA Diversity, Equity & Inclusion Overview

Commitment to Diversity, Equity and Inclusion: Real Estate Americas

74%

of Real Estate Americas AUM is managed by Women

40%

of the Real Estate Americas Management Committee are Women

Female Portfolio Managers

KIM ADAMS	NANCY BROWN	ALICE CAO	CANDACE CHAO	SUE KOLASA
PORTFOLIO MANAGER	PORTFOLIO MANAGER	PORTFOLIO MANAGER	PORTFOLIO MANAGER	PORTFOLIO MANAGER

Female Senior Team Leaders

ALLINA BOOHOFF	CASSANDRA CLARK	ANN COLE	JULIE NEGRON	RUCHI PATHELA
ASSET MANAGEMENT	DEBT CAPITAL MARKETS	CLIENT STRATEGY	DIRECTOR OF FINANCE	DIRECTOR OF VALUATIONS

DEI Initiatives & Activity

- REA team members serve on the **Alternatives Diversity & Inclusion Committee**, focusing on Recruitment, Engagement & Retention, and Leadership & Talent.
  - Facilitating an open dialogue on DEI and sharing best practices.
  - Hosting learning circles on diverse movies, books, podcasts.
  - Partnering with recruiting team on a Hiring Manager Playbook.
  - Taking D&I leadership positions in industry groups.
  - Planning Day of Service, Coffee Connect, Mentoring “buddy” program.
  - Creating executive sponsorship for career development for diverse talent.
- **Annual training for employees** to actively focus on inclusive teams and overcoming unconscious bias.
- Real Estate Americas is proud to be a founding donor and major sponsor of the **SEO/PREA Real Estate Track Program**, dedicated to increasing diverse employment in the real estate industry and closing the achievement gap by providing Black, Hispanic and Native American undergrads training, internships and access to real estate careers. REA has hosted SEO internships since 2018.
- REA has consistently participated in the **J.P. Morgan Military Pathways Program** since its inception to hire, develop and retain veteran talent.
- REA team members are active participants in JPMC’s **Business Resource Groups**, fostering leadership and networking opportunities and advancing the firm’s commitment to diversity and community involvement.

Sources: J.P. Morgan Asset Management. *based on gross assets under management for Real Estate Americas as of December 31, 2020.

Real Estate Americas – Diversity, Equity & Inclusion (DEI) Strategy

Real Estate Americas is committed to fostering diverse, equitable and inclusive environments within our spheres of influence. Our DEI strategy has Workforce, Workplace and Marketplace as its pillars – with Accountability as the foundation.

WORKFORCE

- Attract diverse talent and focus on being the best company for all backgrounds by casting a wide net when recruiting and hiring great people
- Employ inclusive recruitment, on-boarding, retention and advancement policies and practices with measurable diversity objectives
- Encourage voluntary self-identification to aid in the measuring, tracking and reporting of our DEI initiatives

WORKPLACE

- Foster an inclusive environment for all employees
- Support and increase internal mobility for women and other under-represented groups
- Facilitate an open dialogue on DEI and share best practices
- Require annual training for all employees to actively focus on overcoming unconscious bias

MARKETPLACE

- Utilize qualified suppliers and third-party property managers operated by historically under-represented groups, leveraging JPM's Supplier Diversity Network
- Assess DEI alignment in JV Partnerships
- Align annual asset business plans with DEI objectives where applicable
- Encourage employee volunteer and community engagement activities
- Adhere to Real Estate Americas' Responsible Contractor Guidelines

"People are our most important asset. Maintaining a diverse and inclusive workplace where everyone can thrive is not only the smart thing to do – it's the right thing to do." – Jamie Dimon, Chairman & CEO, JPMorgan Chase & Co.

ACCOUNTABILITY

- Establish, and monitor progress on, measurable DEI initiatives by incorporating into year-end performance evaluations
- Continually confirm our on-going commitment to fostering a diverse and inclusive work environment by requiring all employees to read and sign JPMorgan's Code of Conduct annually

Appendix – Supplemental Exhibits

J.P. Morgan Asset Management – Real Estate Americas

Head of Real Estate Americas
Mike Kelly, MD – *32 years experience*

Director of Research and Data Science
Dave Esrig, MD
29 years experience

Aric Chang, ED

Luigi Cerreta, ED

Michael Gordon, ED

19 years average experience

Chief Investment Officer
Doug Schwartz, MD
27 years experience

Region Heads

Northeast:
Gerard Norcia, MD
Eric Wald, ED

Southeast:
Allina Boohoff, MD
Rob Niedzwiecki, ED

Central:
Andrew Ruffo, ED
Caitlin Simon, MD

West:
Morgan Lingle, MD

Mezzanine Debt:
Candace Chao, MD

Sector Strategists

Industrial: Nick Firth, ED
Multifamily: Brett Kahn, ED
Office: Erik Grabowski, ED
Retail: Adria Savarese, ED

16 years average experience

Head of Separate Accts & Portfolio Strategy
Brian Nottage, MD
23 years experience

Separate Accounts:

Alice Cao, MD

Wayne Comer, MD

Eric Johnson, MD

Preston Meyer, MD

26 years average experience

Portfolio Analytics
Samantha King, ED
18 years experience

Funds Portfolio Management

Strategic Property Fund
Kim Adams, MD, Senior PM
Susan Kolasa, MD, PM
Steve Zaun, MD, PM

Income & Growth Fund
Nancy Brown, MD, PM

Special Situation Property Fund
Craig Theirl, MD, PM

U.S. Real Estate Mezzanine Debt Fund
Candace Chao, MD, PM
Whit Wilcox, MD, PM

26 years average experience

REA Chief Operating Officer
Josh Weintraub, ED
18 years experience

Debt Capital Markets
Cassandra Clark, MD
19 years experience

Head of Asset Management
Mark Bonapace, MD
28 years experience

Development & Engineering
Jim Kennedy, MD
31 years experience

Global Head of Client Strategy
Ann Cole, MD - *32 yrs exp.*

Americas:
Melissa Anezinis, ED
Rebekah Brown, ED
Tom Klugherz, ED
Larry Ostow, MD
Steven Weddle, MD

Asia Pacific:
Seungmin Oh, ED

Europe:
Marie-Claire Bolton, ED

Defined Contribution:
Jani Venter, ED

20 years average experience

Functional Partners

Finance
Al Dort, MD
30 years experience

DC Trading
Barney Fahey, MD
39 years experience

Valuations
Ruchi Pathela, ED
23 years experience

Global Product Development
Steve Greenspan, MD
36 years experience

Alternative Investment Strategy & Solutions
Pulkit Sharma, MD
15 years experience

Client Relations
Ravi Sharma, MD
24 years experience

June 2021. There can be no assurance that professionals currently employed by JPMAM will continue to be employed by JPMAM or that past performance or success of any professional serves as an indicator of professional's future performance or success.

Investment committee

Institutionalized process employed across the platform: collaborative, streamlined, efficient, and thorough

Voting members: unanimous vote required to approve all acquisitions and dispositions

Chief Investment Officer	■ Provides investment experience and ensures consistency of process and policy ■ Underwriting responsibility
Portfolio Manager	■ Represents the interests of the Fund ■ Responsible for adherence to Fund investment strategy and maintaining portfolio diversification
Head of Asset Management	■ Assures consistency of asset management policies across regions and sectors ■ Responsible for providing a further reasonableness check on underwriting from an asset management perspective
Real Estate Research ***Senior Member***	■ Provides macro perspective ■ Advises on economic and demographic trends, risks/opportunities and portfolio strategies

Participating members: provide expertise in respective areas to aid in decision making

- Head of Real Estate Americas
- Development and Engineering
- Financial
- Head of Portfolio Strategy
- Global Head of Client Strategy
- Sector Strategist
- Director of Valuations
- Debt Capital Markets

For illustrative purposes only
June 2021

Valuation Process

Independent third-party valuation review and approval – Every asset – Every quarter

- Quarterly Valuations
  - Every asset is appraised annually by a third-party appraisal firm
  - In quarters when a third-party appraisal firm does not value an asset, the third-party appraisal management firm, Situs RERC ("RERC") appraises each office, industrial and retail asset
  - For multifamily assets, RERC recommends assets that should be reviewed for a potential interim quarterly valuation and if JPM and RERC agree, JPM produces an interim quarterly valuation that is reviewed and approved by RERC
- Review of Appraisals
  - All third-party appraisals are reviewed and approved by Asset Management, Valuations, and RERC
  - Asset Management reviews all appraisals for factual information, and all three groups review all appraisals for accuracy of leasing conditions and market data
  - Director of Valuations or senior member of Valuations Team reviews valuations for reasonableness of assumptions and final value as well as consistency of pricing parameters within geographic region and property type
- Quarterly Audit
  - PricewaterhouseCoopers performs a quarterly audit review of all appraisals

Select third-party appraisal firms:

- Breakpoint Advisors
- Capright
- CBRE
- Colliers International
- Cushman & Wakefield
- KTR Real Estate Advisors
- National Valuation Consultants
- National Property Valuation Advisors
- The Weitzman Group
- Welsh Chester Galiney Matone

Strategic Property Fund: Fee schedule effective January 1, 2021

Tiered Fee Structure Based on NAV of Investor's Shares		Percentage (per annum)
Clients < USD100 million	First USD25 million	1.00%
	Next USD25 million	0.95%
	Next USD50 million	0.85%
Clients ≥ USD100 million	First USD100 million	0.88%
	Next USD150 million	0.75%
	Next USD250 million	0.70%
	Next USD200 million	0.50%
	> USD700 million	0.35%
Fee on Cash	Cash > 5%	0.15%

- The fee will only be 0.15% with respect to the market value of cash and cash equivalents in SPF in excess of a 5.0% reserve position for cash and cash equivalents
- No acquisition, disposition or incentive fees
- Fees shall be computed and billed on a calendar quarter basis, in arrears

Product Design: Risk Management Elements

Fund guidelines	Strategic Property Fund
Leverage Limit:	
Portfolio	35%
Asset Specific	65%
Cash Min - Max	1% - 5%
Asset Type Sector Concentration + / - vs. NFI-ODCE[1]	15%
Geographic Sector Concentration + / - vs. NFI-ODCE[1]	15%
Development Property - Non Income Producing Max[2]	15%
JV Single-Partner Largest Concentration[3]	10%
Single Largest Asset Concentration[3]	5%
Annual Gross Turnover (rolling four quarters)[4]	5% - 20%
Annual Sales Turnover (rolling four quarters)[5]	5% - 20%

[1]Based on Fund's net asset value (NAV) - direct real estate only, including Land [2]Based on Fund's gross asset value (GAV) - direct real estate only, including Land. 5% for new development and up to a total 15% including re-development opportunities. [3]Based on the Fund's net asset value (NAV) [4]Represents, as a percentage of the Fund's quarterly average gross asset value, the total gross acquisitions, gross sales proceeds and capital expenditures over a rolling 12 month period [5]Represents, as a percentage of the Fund's quarterly average gross asset value, total gross sales proceeds over a rolling 12 month period

*The Guidelines set forth herein are not firm restrictions but may fluctuate from time to time due to market conditions, Contributions, repurchases/withdrawals and other factors beyond JPMC's control. Additional information is available upon request. For purposes of applying the investment guidelines set forth herein, the "Fund" includes the value of the "Retained Legacy Investments" in the Fund's gross asset values. As a result, the guideline target percentages for the Other FIVs will vary from those of the overall Fund. Additionally, with respect to Other FIV Investors, the Fund's investments and leverage may vary from these Guidelines initially and for some time following the Fund's launch as the Fund expands its investor and investment base.

**Benchmark information/disclaimer: NFI-ODCE is the Open End Diversified Core Equity Index, a capitalization-weighted, gross of fee, time-weighted return index with an inception date of December 31, 1977. For more information, see https://www.ncreif.org/data-products/funds/. Reference to the NFI-ODCE is solely for comparison purposes. It is not possible to invest directly in an index. Exposure to an asset class represented by an index is available through investable instruments based on that index. Past performance of an index is not an indication or guarantee of future results and the Fund's investments will not necessarily provide the same results.

Strategic Property Fund: Key Terms

Fund Summary		
Fund	■	Strategic Property Fund (the "Fund" or "SPF")
Fund Structure	■	The Fund is currently comprised of five (5) Fund investor Vehicles (FIVs), each designed for a specific type of investor: (i) FIV 1 (the existing bank comming led investment fund, originally launched in January 1998 and designed for US qualified retirement plans); FIV2 (a Delaware LP, designed for foundations, endowments and US taxable investors), (iii) FIV 3 (a Luxembourg SCSp, designed for Section 892 investors); (iv) FIV4 (a Luxembourg SCSp, designed for Section 897(I) investor) and (v) FIV5 (a Luxembourg SCSp, designed for non-Section 892/897(I) investors).
Fund Inception	■	January 1998
Minimum Commitment	■	USD10 million
Gross Asset Value	■	USD 39.6 billion as of June 30, 2021
Net Asset Value	■	USD 29.9 billion as of June 30, 2021
Currency	■	SPF is a USD denominated fund
Strategy	■	An open-end core fund seeking to produce a compelling risk adjusted return with the majority of return deriving from income and the balance from appreciation. The Fund invests in core real estate projects in the United States, which consist of high quality stabilized assets in the four major property types: office, industrial, retail and residential
Fund Structure	■	Open-end, perpetual life
Target Return	■	The Fund seeks to outperform the NFI-ODCE Value Weighted Index through asset, geographic and sector selection and active asset management.
Geographic Concentration	■	+/- 15% vs. NFI-ODCE
Asset Type Sector Concentration	■	+/- 15% vs. NFI-ODCE[2,3]
Leverage Guideline	■	Portfolio – 35% / Asset Specific – 65%
Management Fee[4]	■	Client NAV < USD100 million: 1.00% per annum ("p.a.") (first USD25m), 0.95% (next USD25m), 0.85% (next USD50m)
	■	Client NAV ≥ USD100m: 0.88% p.a.(first USD100m), 0.75% (next USD150m), 0.70% (next USD250m), 0.50% (next USD200m)
	■	Client NAV > USD700m: 0.35%
	■	Cash > 5%: 0.15% p.a.
Contributions	■	Subscriptions are accepted monthly and placed into a queue. The Fund may, but is not obligated to, call capital on a monthly basis subject to cash needs of the portfolio and contribution queues.
Repurchases/ Redemptions	■	Participants may request to withdraw from the Fund once per quarter subject to available cash, as determined by the Trustee. A written redemption request is required to be submitted and accepted not less than 30 days prior to the last day of the calendar quarter. To the extent requests exceed available cash, distributions are considered pro-rata, based on participant's interest in the Fund.

[1]The target returns are for illustrative purposes only and are subject to significant limitations. An investor should not expect to achieve actual returns similar to the target returns shown above. Because of the inherent limitations of the target returns, potential investors should not rely on them when making a decision on whether or not to invest in the strategy. Please see the complete Target Return disclosure at the conclusion of the presentation for more information on the risks and limitation of target returns. *[2]Based on Fund's net asset value (NAV) - direct real estate only, excluding land. [3]NFI-ODCE diversification excludes hotel and other allocation. [4] Fee schedule effective January 1, 2021.* **See important disclosures, including with respect to certain existing investments of SPF in which investors in FIVs 2-5 will not participate, and the impact to the FIVs of differing levels of expenses and taxes inherent in their investment structures, on the private placement risk disclosure page in the appendix.**

Appendix –GIPS report

GIPS® Report: Strategic Property Composite
December 31, 2018

Year	Income (%)	Capital (%)	Composite Gross of Fees Return %	Composite Net of Fees Return %	Benchmark Return %	Number of Accounts	Internal Dispersion	Composite Assets ($Millions)	External Appraisal % of Composite Assets	Firm Assets ($ Billions)
2018	3.93	3.97	8.04	6.96	8.35	<6	n/a	33,424	97.2%	1,230
2017	4.20	2.89	7.20	6.14	7.62	<6	n/a	31,895	94.0%	1,165
2016	4.44	3.79	8.38	7.31	8.77	<6	n/a	30,515	94.7%	1,068
2015	4.87	9.93	15.24	14.10	15.02	<6	n/a	28,717	99.4%	834
2014	5.18	5.70	11.14	10.04	12.50	<6	n/a	24,176	99.1%	845
2013	5.25	10.16	15.90	14.76	13.94	<6	n/a	21,151	96.5%	775
2012	5.26	6.54	12.12	11.02	10.94	<6	n/a	18,515	91.2%	701
2011	5.47	9.98	15.96	14.82	15.99	<6	n/a	15,495	98.5%	657
2010	6.61	7.11	14.15	13.03	16.36	<6	n/a	12,632	90.6%	621
2009	6.13	-30.92	-26.55	-27.30	-29.76	<6	n/a	9,661	93.6%	617

Firm Definition: J.P. Morgan Investment Management Inc. (JPMIM or the Firm) consists of the assets of institutional clients invested in US managed products including 1) the Fixed Income and Cash assets formerly part of Chase Asset Management and MDSass&Chase Partners, 2) the New York institutional investment division of JPMorgan Chase Bank, N.A., formerly Morgan Guaranty Trust Company of New York, 3) the institutional investment assets of JPMorgan Investment Advisors, Inc. (JPMIA), formerly known as Banc One Investment Advisors Corporation (BOIA), the advisor to institutional assets directly managed by JPMIA or sub-advised by an affiliate institution, and 4) the institutional assets of Bear Stearns Asset Management Inc. The Firm also includes Separately Managed Accounts over which JPMIM has full and sole discretion. JPMIM is marketed under JPMorgan Asset Management.

Compliance Statement: J.P. Morgan Investment Management Inc. claims compliance with the Global Investment Performance Standards (GIPS®) and has prepared and presented this report in compliance with the GIPS standards. J.P. Morgan Investment Management Inc. has been independently verified for the period 2001-2018. The verification report is available upon request. Verification assesses whether (1) the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis and (2) the firm's policies and procedures are designed to calculate and present performance in compliance with the GIPS standards. Verification does not ensure the accuracy of any specific composite presentation.

Composite Description: The composite includes all discretionary accounts, including pooled funds that are directly invested according to JPMCB's Strategic Property Strategy. The strategy is an actively managed diversified core and seeks to generate an income-driven rate of return. It aims to outperform the NCREIF Fund Index – Open End Diversified Core Equity (NFI-ODCE) through asset, geographic and sector selection. The Strategy invests in high-quality stabilized assets with dominant competitive characteristics in markets with attractive demographics throughout the United States. The composite was created in December 2000.

Fee Schedule: Both gross and net returns reflect the reinvestment of income, deduction of transaction costs, and are net of withholding taxes where applicable and include the effect of leverage. All returns are expressed in U.S. dollars. Gross returns do not reflect the deduction of investment advisory fees or any other expenses that may be incurred in the management of the account. As of December 31, 2018, the standard annual fee schedule is as follows: For investors with Fund NAV below $100 million: 1.00% of the participant's pro-rata share of the net asset value of JPMCB Strategic Property Fund, except that the fee will only be 0.15% with respect to the market value of cash and cash equivalents in SPF in excess of a 5% reserve position for cash and cash equivalents. For investors that maintain Fund NAV of $100 million or more: 0.92% of the participant's pro-rata share of the net asset value of JPMCB Strategic Property Fund on the first $100 million of NAV, 0.85% per annum on the next $150 million of NAV, 0.80% per annum on the next $250 million of NAV, and 0.75% on amounts of NAV thereafter; except that the fee will only be 0.15% with respect to the market value of cash and cash equivalents in strategy in excess of a 5.0% reserve position for cash and cash equivalents. Actual advisory fees charged and actual account minimum size may vary by account due to various conditions described in Part IIA of Form ADV. Prior to 2018, the fee was deducted quarterly.

Benchmark Description: Effective July 01, 2013, the Composite has changed its benchmark from the NCREIF Property Index (NPI) to the NCREIF Fund Index – Open End Diversified Core Equity (NFI-ODCE). As a capitalization-weighted index of U.S. open-end core direct real estate funds with returns based on changes in the published market value of net assets of its constituents, the NFI-ODCE provides a more meaningful peer-to-peer comparison than the NPI, a market-value weighted index of unleveraged property returns for the investment-grade U.S. real estate market. Released in 2005, the NFI-ODCE was not available for use as a benchmark at the Composite's inception January 1, 1998. The decision to switch the Fund's benchmark to the NFI-ODCE as the index is now more widely used in the industry as a gauge of performance of the overall institutional-quality U.S. real estate marketplace.

Use of Derivatives: 'The Strategy maintains a degree of leverage through the use of long term, fixed rate debt and floating rate debt that matches the investment strategy for each asset. The Strategy has the ability to enter into interest rate swaps, caps or other such hedging transactions to protect (hedge) against interest rate fluctuations.

Calculation Methodology: Income and Capital Returns are expressed gross of management fees and may not equal to the total Composite return due to the compounding effect of linking sub-period returns. Performance reporting is based on valuations after accounting for all capital adjustments.

Composite Valuation: For periods prior to 1 January 2011, assets were externally appraised by an independent appraiser at least every 36 months. Beginning 1 January 2011, assets are externally appraised annually. When market circumstances dictate, the Firm may increase the frequency of external appraisals. Since inception, all real estate assets have undergone a monthly internal valuation to account for capital adjustments. Internal property valuations are determined by applying market discount rates to future projections of gross cash flows and capitalized terminal values over the expected holding period for each asset. The percentage of composite assets valued using an external valuation is shown for each annual period. The total composite assets under management represent net asset values. Real estate asset valuations are determined by applying market discount rates to future projections of gross cash flows and capitalized terminal values over the expected holding period for each asset. To the extent leverage (debt) is used, the debt is valued separately from the real estate. Property mortgages, notes, and loans are marked to market using prevailing interest rates for comparable property loans if the terms of existing loans preclude the immediate repayment of such loans. Due to the nature of real estate investments, valuations are based upon subjective unobservable inputs.

Internal Dispersion: The internal dispersion of annual returns is measured by the asset-weighted standard deviation of gross account returns included in the composite for the full year. For periods with less than 6 accounts included for the entire year, internal dispersion is not presented (n/a) as it is not considered meaningful.

Description of Discretion: The Firm has responsibility for sourcing, valuing, and managing the acquisition and disposition of assets.

Composite Listing: A list of composite descriptions and policies for valuing portfolios, calculating performance, and preparing compliant presentations are available upon request.

Past and Future Performance: Past performance is no guarantee of future results. As with any investment vehicle, there is always the potential for gains as well as the possibility of losses.

Publication Date: 03/24/2020

Appendix – Biographies of key professionals

J.P. Morgan Asset Management – Real Estate Americas

Mike Kelly, *Managing Director*, is Head of Real Estate Americas at J.P. Morgan Asset Management and leads the 250 person group that manages more than $65 billion of assets across a range of Core, Mid-risk and Opportunistic strategies on behalf of institutional, sovereign and high net worth investors. Previously, Mike was Head of Portfolio Management, Real Estate Americas, and was responsible for oversight of the portfolio managers for U.S. real estate funds and separate accounts. Mike chairs the Real Estate Americas Management Committee and is a member of the USRE Oversight Committee. An employee since 2009, Mike also serves on the Board of Directors for two of Real Estate Americas' entity level investments. Before joining the firm, he was a director and head of Real Estate Conduit and Workouts for Citigroup Global Markets. Previously, Michael was a vice president and originator in the Large Loan CMBS Group and assisted with management of Goldman Sachs Commercial Mortgage Capital. Earlier in his career, he was a managing director and co-head of Commercial Mortgage Origination at New York Life Investment Management. He started in the industry in 1989. Mike earned a B.S. in business management from Springfield College and an M.S. in real estate from New York University and holds Series 3, 7 and 63 licenses.

Douglas A. Schwartz, *Managing Director*, is Chief Investment Officer, Real Estate Americas at J.P. Morgan Asset Management, responsible for all transactions and asset management on the platform. Doug is a voting member of the Investment Committee and sits on the America's Management Committee as well as the Risk and Oversight Committee. He is also a member of the Board of Directors of Carr Properties. Previously, Doug was portfolio manager of JPMCB Special Situation Property Fund, an open-end, value added real estate fund. Prior to this role, he was head of real estate acquisitions for the West Coast with responsibility for sourcing, underwriting and closing office, industrial, retail and multi-family transactions for all of J.P. Morgan's U.S. real estate funds. His 23 years in the industry have included roles in transactions, asset management, development management, research, risk management, and capital-raising. Prior to joining the firm in 2004, he held real estate investment roles with Lowe Enterprises, Bristol Group and Sedway & Associates. Doug earned his B.A. in mathematics from the University of Pennsylvania and an M.B.A. from the University of California, Los Angeles. Doug is a ULI IOPC chair.

Ann Cole, *Managing Director*, is Global Head of Real Estate Client Strategy for J.P. Morgan Asset Management and leads a global team of investment specialists focused on advising clients on real estate strategies and execution across regions, risk levels, equity, debt and defined contribution. Ann sits on the Real Estate Americas Management Committee as well as the Real Estate Americas Oversight Committee. Previously, Ann was Co-Portfolio Manager for J.P. Morgan's flagship U.S. core real estate strategy, Strategic Property Fund. Since joining J.P. Morgan Asset Management in 1989, Ann has held various positions in our Real Estate Asset Management team including Sector Head of our office/industrial East and West Regions. Ann has extensive real estate experience with the acquisition, asset management, development and disposition of institutional quality real estate. Ann also served as a Client Portfolio Manager on the Marketing and Client Strategy team, where she advised clients on real estate investment strategies. Ann has a B.B.A. in accounting from Pace University. Ann holds the Series 3, 7 and 63 licenses.

Dave Esrig, CFA, *Managing Director*, is J.P. Morgan Asset Management's Director of Research and Data Science for Real Estate Americas. Dave is also a member of the Real Estate Americas Management Committee and voting member of the Infrastructure Investments Committee. An employee since 1997, Dave and his team forecast local economic and property performance used in real estate acquisitions and dispositions underwriting. He or a member of his team accounts for one of four unanimous votes required for all property acquisitions and dispositions. Additionally, the research team develops new investment strategies for existing as well as new funds. Dave designed, founded and launched JPMAM's industry-leading suite of defined contribution direct property funds. He also leads the Real Estate Americas' effort to generate investment insights from the firm's proprietary data. Dave holds a B.A. from the University of Virginia and an M.A. in economics from the University of Pennsylvania.

J.P. Morgan Asset Management – Real Estate Americas

Kimberly A. Adams, *Managing Director*, is the Senior Portfolio Manager for J.P. Morgan's flagship U.S. core real estate strategy, Strategic Property Fund. She is responsible for managing all aspects of the portfolio's investments and strategy. Kim joined the Strategic Property Fund portfolio management team in July 2012. She is a member of the Investment Committee and US RE Management Committee. Since joining J.P. Morgan Asset Management – Real Estate Americas in 2003, Kim has served in various investment roles including Sector Head for office/industrial asset management in the Central region, senior asset manager in the retail and East/South region, and as an acquisitions officer in the Midwest. Earlier in her career, Kim worked for Prudential Real Estate Investors and LaSalle Investment Management. Kim received a B.A. in economics from Northwestern University and an M.B.A. from the Kellogg Graduate School of Management. She serves as a council member for the Urban Land Institute, and a member of PREA.

Sue Kolasa, CFA, *Managing Director*, is a Portfolio Manager for Strategic Property Fund, J.P. Morgan Asset Management's flagship core real estate fund. She is involved in all aspects of managing the portfolio's investments and strategy. She is a member of the Real Estate Americas Management Committee. An employee since 2000, Sue brings a deep knowledge of portfolio construction due to her nine years leading portfolio analytics for open-end real estate funds. Sue was Head of Real Estate Americas' retirement business with responsibility for JPMorgan's private real estate strategies for defined contribution programs, portfolios she designed and oversaw since inception. Sue serves on the board of the IPD PREA U.S. Property Fund Index, a group that establishes and monitors a suite of open-end fund indices. Sue received a B.B.A. in accounting from the College of William and Mary and holds Series 7 and 63 licenses. She is a CFA charterholder.

Steven Zaun, **CFA**, *Managing Director*, is a Portfolio Manager for Strategic Property Fund, J.P. Morgan Asset Management's flagship core real estate fund. He is involved in all aspects of managing the portfolio's investments and strategy. Previously, Steve was Head of the West Coast Office/Industrial Asset Management team and responsible for all aspects of office and industrial Asset Management, including property management, leasing and development for J.P. Morgan Asset Management - Real Estate Americas. Steven joined the Asset Management team in 2000, initially based out of the New York office. In 2004, he relocated to Los Angeles to help establish the West Coast Asset Management presence. Since that time, Steven has worked on many of the platform's highest profile Office and Industrial assets in the West region. Steven obtained a B.A. in Finance from Boston College and is a CFA charterholder.

Craig A. Theirl, Managing Director, is Portfolio Manager of JPMCB Special Situation Property Fund, an open-end, value added real estate fund managed by J.P. Morgan Asset Management. Previously, Craig was the head of the South-Midwest region acquisitions team with responsibility for sourcing, underwriting and closing transactions across property types for all of J.P. Morgan's U.S. real estate funds. Craig was also an acquisitions officer involved in the origination and structuring of real estate investment transactions in the Northeast, with a focus on properties in New England. Prior to joining the firm in 2000, he worked in the real estate consulting practice of PricewaterhouseCoopers in New York. Craig holds a B.B.A. in real estate and urban land economics from the University of Wisconsin-Madison.

J.P. Morgan Asset Management – Real Estate Americas

Mark Bonapace, *Managing Director*, is the head of Asset Management for the JPMorgan Real Estate Group, responsible for the management, leasing and ongoing development of the real estate assets. An employee since 1990, Mark has held several positions within the group. Prior to his role as head of Asset Management, Mark was the sector head for Office/Industrial East/South within the Real Estate Group. Mark has also been the Office/Industrial sector head for the Central region and was a Senior Asset Manager for our Retail portfolio. Mark previously worked at Deloitte & Touche for four years. He holds a B.S. in accounting from the University of Delaware and an M.B.A. in finance from New York University's Stern School of Business. Mark is also a Certified Public Accountant and an active member of the Urban Land Institute.

Brian Nottage, PhD, CFA, *Managing Director*, is Head of Portfolio Strategy and Separate Accounts for J.P. Morgan Asset Management's Real Estate Americas group. In this Portfolio Strategy role, he oversees fund strategy, positioning and analytics for both the comingled funds and separately managed accounts. He has direct management responsibilities for the separate account portfolio management team, and he leads the co-investments program. He is also the lead portfolio manager for REA's Opportunity Zone Fund Series. Before joining the firm in 2005, he was a vice president and econometrician at GMAC Commercial Mortgage, where he helped develop market commercial mortgage risk products. Prior to that, Brian was a director at Moody's Economy.com, where he provided U.S. macro, industry and regional economic analysis. Brian holds a Ph.D. in economics from Florida State University and is a CFA charter holder.

James F. Kennedy, *Managing Director*, is the head of the Development & Engineering Group, Global Real Estate, at J.P. Morgan Asset Management. An employee since 2004, he is responsible for engineering and environmental due diligence, development oversight and general engineering support. Jim is involved with the various real estate and infrastructure funds internationally, and provides leadership in the group's sustainability initiatives. Prior to joining J.P. Morgan Jim served in various roles across the development, construction and business consulting fields. His experience ranges across asset types, including office, industrial, retail, multi-family, hospitality and large-scale civil infrastructure. Jim received a B.B.A. in finance from the University of Massachusetts at Amherst and an M.S. in civil and environmental engineering from the Massachusetts Institute of Technology. He is a member of the American Society of Civil Engineers, National Association of Real Estate Investment Managers, Urban Land Institute and International Council of Shopping Centers. Jim is a USGBC-LEED Accredited Professional.

Steve Greenspan, *Managing Director*, is the Global Director of Product Development for J.P. Morgan Asset Management -- Global Alternatives. Steve plays an integral role in the design, structuring, marketing, launch and operation of our global real estate and broader alternatives products and strategies. A J.P. Morgan employee since 1996, Steve has broad experience in structuring open-and closed-end funds, separate accounts and other investment vehicles designed to meet the complex commercial, legal, and regulatory needs of JPMAM's global client base. He sits on the boards and investment committees of various Alternatives funds, as well as on the board of Security Capital Research and Management Incorporated. He previously served as a vice president/assistant general counsel in JPMAM's Legal Department, and as a practicing attorney in the real estate and corporate departments at a large Wall Street law firm. Steven holds a B.P.S. from the University at Buffalo and a J.D. from Brooklyn Law School.

J.P. Morgan Asset Management – Real Estate Americas

Joshua Weintraub, *Managing Director*, is the Chief Operating Officer of the Real Estate Americas business. Previously, Josh had been the Head of Finance & Business Management for the North America Institutional (NAI), Global Insurance Solutions (GIS) and Americas Retirement distribution channels. Josh had also been the Head of Finance and Business Management for AWM Intelligent Digital Solutions (IDS), primarily focused on building the IDS Data Science team. Additionally, Josh was a Senior Manager of the Asset Management Strategy team. Josh joined JPMorgan in 2014. Prior to JPMorgan, Josh spent five years with McKinsey & Company in the New York office leading business development and strategy projects for banking and financial services firms. Josh also spent several years as a Sanctions Investigator with the U.S. Treasury Department, Office of Foreign Assets Control (OFAC). Josh earned an MBA from Duke University's Fuqua School of Business and a BA in Government/Political Science from Georgetown University. Josh is also a CFA charter holder and a member of the CFA Society New York.

Alfred W. Dort, *Managing Director*, is head of the Global Real Estate Financial Group at J.P. Morgan Asset Management. An employee since 1997, he manages a team of professionals that provide dedicated support to the real estate and transportation teams in New York, Los Angeles, London, Luxembourg, Mumbai, Hong Kong and Singapore. His responsibilities include all aspects of financial management, tax, reporting and analysis for all of the platforms open- and closed-end funds and separate accounts. He serves on the boards of directors of several real estate funds and is a non-voting member of the Real Estate Americas Investment Committee. Prior to joining the firm, Alfred spent several years with PricewaterhouseCoopers LLP, providing consulting and accounting services to real estate industry clients. He earned a B.S. in accountancy from Villanova University and is a Certified Public Accountant. He is currently a member of the American Institute of Certified Public Accountants and the New York State Society of Certified Public Accountants.

Cassandra Clark, *Managing Director*, heads the Real Estate Americas Debt Capital Markets Group at J.P. Morgan Asset Management. An employee of J.P. Morgan since 2002, she is responsible for debt procurement and mezzanine loan valuation for the domestic platform. During her time in Real Estate Americas, she has closed over USD12Bn of transactions. Prior to joining the group, Cassandra was a Vice President within J.P. Morgan's Commercial Bank focusing on Investor Real Estate loan origination for the bank's high new worth clients. Cassandra began her career as a credit analyst in the Commercial Bank's Asset Based Lending Group. Cassandra serves on the Boards of Alpha Sigma Nu, the honor society of Jesuit institutions of higher education, and Choices in Childbirth. Cassandra graduated magna cum laude with a B.A. in Economics and Psychology from the College of the Holy Cross.

Ruchi Pathela, *Executive Director*, is the Director of Valuations at J.P. Morgan Asset Management - Global Real Assets. Active in the real estate industry since 1998, Ruchi has experience in valuations, acquisitions, asset/portfolio management, underwriting, and private equity. Prior to joining J.P. Morgan in 2017, she was a Director at Altus Group where she oversaw the appraisal management client relationship on-site at J.P. Morgan for four years. She is a respected veteran in the industry with diverse experience, and has held positions at RREEF/Deutsche Bank Real Estate, Bear Stearns, and PricewaterhouseCoopers. Ruchi earned an M.S. in Real Estate Development from Columbia University and a B.S. in Architecture from The Georgia Institute of Technology. She carries the Counselor of Real Estate (CRE) and Fellow of the Royal Institution of Chartered Surveyors (FRICS) designations.

Appendix – Important Risk and Disclaimers

Investment Risk Disclosure

Target Returns:

The target returns discussed herein have been established as of the date of this presentation. The target returns have been established by each investment professional based on its assumptions and calculations using data available to it and available investment opportunities and is subject to the risks set forth herein and set forth more fully in the applicable Fund's Memorandum. A more detailed explanation along with the data supporting the target returns is on file with the applicable investment professional and is available for inspection upon request. The target returns are for illustration/discussion purposes only and are subject to significant limitations. An investor should not expect to achieve actual returns similar to the target returns shown above. The target returns are the financial professional's estimate based on the professionals assumptions, as well as past and current market conditions, which are subject to change. Each financial professional has the discretion to change the target returns for the Fund at any time. Because of the inherent limitations of the target returns, potential investors should not rely on them when making a decision on whether or not to invest in any Fund. The target returns cannot account for the impact that economic and market factors have on the implementation of an actual investment program. Unlike actual performance, the target returns do not reflect actual trading, liquidity constraints, fees, expenses, and other factors that could impact the future returns of a Fund. Any financial professional's ability to achieve the target returns is subject to risk factors over which such professional may have no or limited control. No representation is made that a Fund will achieve the target return or its investment objective. Actual returns could be higher or lower than the target returns. The data supporting the Target Return is on file with J.P. Morgan Asset Management and is available for inspection upon request.

Property Fund risk:

Past performance of property funds are not indicative of the performance of the property market as a whole and the value of real property will generally be a matter of a valuer's opinion rather than fact. The value of a property may be significantly diminished in the event of a downturn in the property market. Property investments are subject to many factors including adverse changes in economic conditions, adverse local market conditions and risks associated with the acquisition, financing and ownership and operation and disposal of real property. Property funds may impose limits on the number of redemptions and may provide for deferrals or suspension in particular circumstances for a given period of time.

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Past performance of real estate funds are not indicative of the performance of the real estate market as a whole and the value of real property generally will be a matter of a valuer's opinion rather than fact. The value of a property may be significantly diminished in the event of a downturn in the real estate market. Real estate investments are subject to many factors including adverse changes in economic conditions, adverse local market conditions and risks associated with the acquisition, financing and ownership and operation and disposal or lack of liquidity of real property. Since the Fund anticipates a significant portion of its income will come, directly or indirectly, from rental income from real estate, the Fund's financial position thus will depend indirectly on the success of the businesses operated by the tenants of the Fund's properties. The Fund may impose limits on the number of redemptions and may provide for deferrals or suspension in particular circumstances for a given period of time.

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The net asset value per unit of each fund investor vehicle is expected to differ because each fund investor vehicle is likely to incur or otherwise be subject to different levels of expenses and taxes through its investment structure. The taxes and expenses of a fund investor vehicle may be greater than those of SPF, which, accordingly, may result in lower returns to investors of any such fund investor vehicle.

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UBS Farmland Investors, LLC

Mandate: Farmland **Hired:** 2004

Firm Information

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As of 6/30/21, UBS Farmland, LLC's total assets under management were $2.0 billion.

Key Executives:
Darren Rabenou, Head of Food & Agriculture and Head of ESG Investment Strategies
Jim McCandless, Head of Real Estate Farmland
Daniel E. Murray, Director

Investment Approach

UBS Farmland Investors, LLC investment decision-making is team-oriented. Regional managers work with the portfolio manager and investment committee in the decision-making process. Regional managers source and screen new investment opportunities in consultation with the portfolio manager and members of the investment committee to ensure that the investments meet the established guidelines and standards. Approval and commitment of capital must be cleared by the regional manager, portfolio manager and investment committee.

Inputs to the process include comparable sales and rent data; rainfall and growing season statistics; irrigation sources and water costs; drainage systems; crop yield history; soil types and topography; crop marketing and/or contracts; buildings and improvements; conservation plans; mineral exploration/production activity; economic analysis – returns/projections; phase I environment site assessment; and legal (access, encroachment, etc).

Benchmark: Leased only properties in NCREIF Farmland Index weighted 80% row and 20% permanent crop.

Total ARMB Mandate

Assets Under Management:
6/30/21: $900,100,543

Concerns: None

6/30/2021 Performance

	Last Quarter	1-Year	3-Years Annualized	6-Years Annualized	16.5-Years Annualized
Manager (gross)	0.92%	7.49%	5.31%	5.56%	9.16%
Fee	0.16%	0.73%	0.80%	0.85%	0.87%
Manager (net)	0.76%	6.76%	4.51%	4.71%	8.29%
Benchmark	0.92%	6.54%	5.24%	5.60%	10.54%

UBS

For limited distribution to institutional and professional investors only

Midnight Sun

UBS Asset Management, Real Estate & Private Markets

Food & Agriculture

Alaska Retirement Management Board

Jim McCandless
Dan Murray

September 23, 2021

Table of contents

Section 1	**Midnight Sun**	3
Section 2	**Farmland Investment Characteristics**	11
Section 3	**Biographies**	23
Section 4	**Appendix**	26

General risk disclosure

- Certain sections of this presentation that relate to future prospects are forward looking statements and are subject to certain risks and uncertainties that could cause actual results to differ materially. This material is designed to support an in-person presentation, is not intended to be read in isolation, and does not provide a full explanation of all the topics that are presented and discussed.
- An investment in farmland will involve significant risks and there are no assurances against loss of principal resulting from farmland investments or that the portfolio's objectives will be attained.
- **This is not a recommendation. Investors must have the sophistication to independently evaluate investment risks and to exercise independent judgment in deciding to invest in farmland funds.** Investors must also have the financial ability and willingness to accept and bear the risks, including, among other things:
  - **Risk of illiquidity.** Farmland is an illiquid investment. There can be no assurance that there will be a ready market for each property at the time it may be necessary to dispose of the same;
  - **Risks of investing in farmland.** These risks include adverse changes in economic conditions (local, national, international), persistent changes in weather, and environmental issues;
  - **Limitations on the transfer of fund units.** There is no public market for interests in any of our funds and no such market is expected to develop in the future; and
  - **Legal & Taxation.** Investors should consult their own legal and tax advisers for potential US and/or local country legal or tax implications on any investment.
- Investors should evaluate all risk and uncertainties before making any investment decision. Risks are detailed in the Fund's offering memorandum.

Section 1

Midnight Sun

UBS Farmland Investors LLC

UBS Farmland Investors LLC
10 State House Square
15th floor
Hartford, CT 06103-3604
860-616 9200

James B. McCandless
Managing Director
Portfolio Manager
Head of Real Estate Farmland

Daniel E. Murray
Director

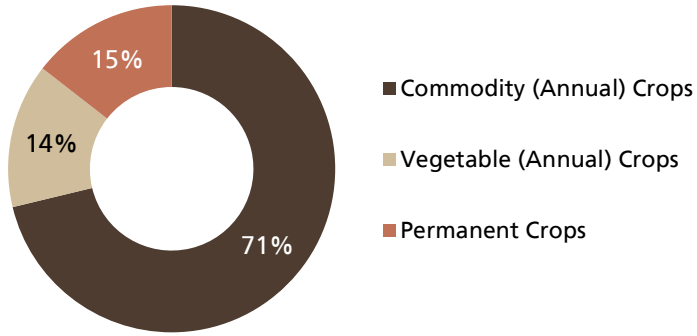
- UBS Farmland Investors LLC is the farmland investment business within UBS Asset Management, Real Estate & Private Markets
- UBS Farmland Investors LLC began investing for US tax-exempt investors in 1991 through its predecessor and has been a major contributor to the NCREIF Farmland Index since its inception in that same year
- Our seasoned regional officers are responsible for the sourcing, acquiring, managing and selling of properties in their regions subject to investment committee approval

Midnight Sun portfolio

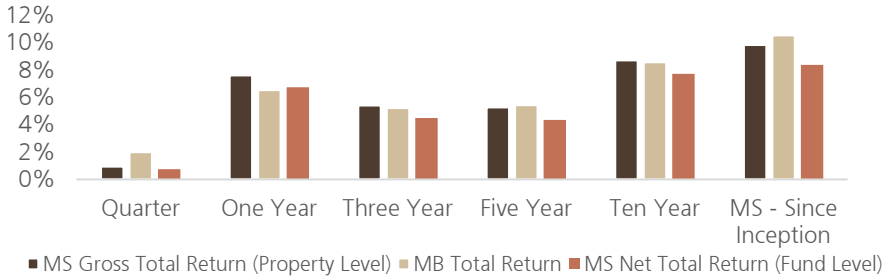
- Midnight Sun was launched October 7, 2004
- Portfolio summary:
  - USD 908.3 million in gross asset value
  - Farmland value USD 895.5 million; Cost USD 644.7 million
  - 144,967 acres (227 square miles) in fifteen states
  - 88 investments growing over 25 major crops
- One-year gross property level return was 7.61%, with since inception gross return of 9.84%
- Cash Distributions: USD 206 million Since Inception

Data as of June 30, 2021
Source: UBS Asset Management, Real Estate & Private Markets, Food & Agriculture

Portfolio distribution by crop type

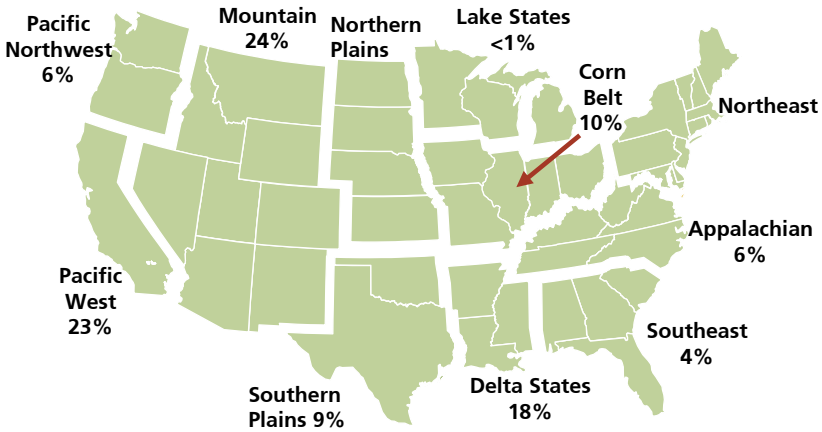


MS Account Annualized Performance



Source: UBS Asset Management, Real Estate & Private Markets, Food & Agriculture. Past performance is not indicative of future results. Inception date for portfolio calculations is 4/1/05 at the client's request.
Northern Ag properties are included as of 10/1/20.
Midnight Sun Benchmark (MB) is a custom benchmark defined by the client.
MS Gross Total Return and MB are property level returns calculated using the NCREIF Farmland Index return formula which does not include fees.
MS Net Total Return is a time-weighted fund level calculation that includes cash and reinvestment of income and is net of fees and other fund level expenses.

Portfolio distribution by geographic region



Midnight Sun portfolio

Recent Portfolio Activity - FY 2021

Capital Improvement Projects – the equivalent of 0.54% of the Midnight Sun portfolio's market value was used for capital expenditures in FY 2021. This is slightly below the annual fiscal year average of 0.59% average Since Inception.

Significant Capital Projects:

- **MSI#67 Minidoka Farm:** Replaced majority hand & wheel line irrigation system with pivot irrigation. Obtained 5.9% rent increase (7.4% return on capital cost)
- **MSI#66 Wapato Orchard:** Two separate Cosmic Crisp planting projects with planting started in 2020 and 2022 (expected)
- **MSI#22 Gaver Ranch:** Final capital expenditures related to the culvert project
- **NAP#3 Portage 73:** Replacement of fully depreciated pivots. Increased irrigated area by 6 acres
- **MSI#17 Phipps Road Orchard:** Pink Lady & Cosmic Crisp grafting project started in 2019
- **MSI#70 Tieton Orchards:** Grafting Cosmic Crisp to Gala rootstock started in 2018

NAP#3 Portage 73: New pivot with swing arm that increased irrigated area by 6 acres

MSI#66 Wapato Orchard: 2020 Cosmic Crisp trees growing into the trellis system

Data as of June 30, 2021

Source: UBS Asset Management, Real Estate & Private Markets, Food & Agriculture

Midnight Sun portfolio

Recent Portfolio Activity - FY 2021

Acquisitions: None

Dispositions:

- **NAP#13 Colquitt Omega:** Sold for USD 2,100,000; Sale price was 4.5% over book and appraised value. Sale occurred on March 3, 2021.

Northern Agriculture Takeover:

- 24 Farms, $289m in market value as of transfer date on October 1, 2020
- **Significant Capital Projects:**
    - **NAP#3 Portage 73:** Replacement of fully depreciated pivots. Increased irrigated area by 6 acres
    - **NAP#29 Kern Kraft:** Removal of almond trees damaged by windstorm in 2019
    - **NAP#25 Freemont 700N:** Completion of previously approved potato cellar and irrigation upgrades

NAP#30 Kern Sebastian Vineyard – Table grapes growing in the summer

NAP#31 Suwannee 152 – Sweet corn growing under pivot irrigation

Data as of June 30, 2021

Source: UBS Asset Management, Real Estate & Private Markets, Food & Agriculture

Sustainability, a priority

Reduce environmental impact while maximizing total returns

Our portfolios, including Midnight Sun, are enrolled in the newly developed ESG standards for farmland portfolios titled: "Leading Harvest Farmland Management Standard"

Leading Harvest is a comprehensive set of 13 Principals, 13 Objectives, 33 Performance Measures and 77 Indictors that address economic, environmental, social and governance issues associated with managing farmland sustainably.

Includes measures covering sustainable farming practices, conservation of soil and water, maintenance of biodiversity, use of regional agricultural best management practices and the wellbeing of farm labor and local communities, among others.

Portfolios will be audited for compliance by an independent auditor.

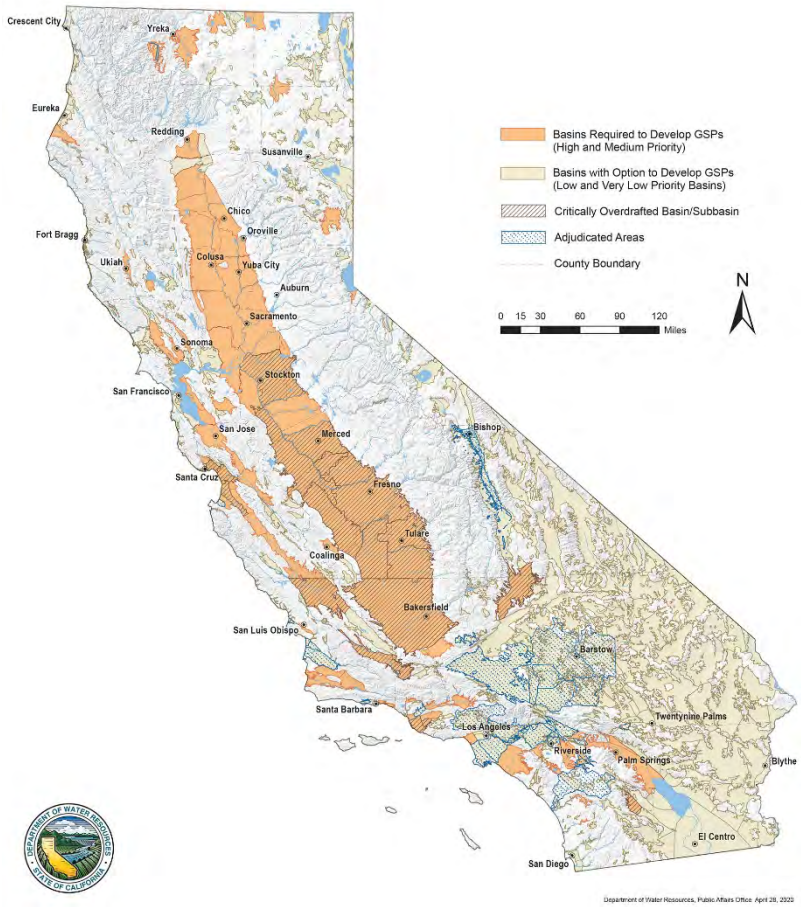
MSI#73 Kerman Raising Vineyard, **Fresno County, CA**
Raisins drying on the vine

Notes:
As of June 2020. Source: UBS Asset Management, Real Estate & Private Markets (REPM) . Our corporate sustainability mission consists of delivering superior risk-adjusted investment performance by integrating sustainability considerations into our investment processes; implementing sustainable practices through innovation and the sharing of best practices; and addressing environmental impacts while enhancing property operations and values. As such, sustainability plays an important role in corporate-, fund- and property-level decisions. The product described herein aligns to Article 6 of Regulation (EU) 2019/2088.

Climate Risk: Water Rights

Sustainable Groundwater Management Act (SGMA)

Current SGMA Basin Prioritization Map



SGMA Risks to the Midnight Sun Portfolio

- Due to priority status (High & Medium), much of California's agricultural regions are located in groundwater basins that are required to develop Groundwater Sustainability Plans (GSP) and begin implementing them in 2022.
- Reductions in groundwater pumping limits will be decided at the local level and result in a wide variety of impacts ranging from no impact to required fallowing.
- **Midnight Sun's SGMA Risk (Percents are measured by farm market value):**
  - 40% of Midnight Sun's California portfolio has extremely low SMGA Risk:
    - 28% is located in an Exchange Contractor District with reliable, affordable, and plentiful water deliveries due to the high priority water rights associated with these districts.
    - 12% receives recycled tertiary wastewater from local municipalities
  - 27% of Midnight Sun's California portfolio,is located in the Salinas Valley and relies on groundwater via on-site irrigation wells. The wells are located near the Salinas river and, in our view, are more at risk of reduced flows of the Salinas River than SGMA.
  - 28% of Midnight Sun's California portfolio is located in the lower San Joaquin Valley (Kern & Tulare Counties). All 3 orchards and the 1 table grape vineyard have more than 1 source of water ranging from on-site wells, supplemental surface water supplies, and/or water sharing agreements with neighboring farms
  - 4% of Midnight Sun's California portfolio is not located in an irrigation district and is solely reliant on on-site wells to provide all irrigation needs.

Climate Risk: Wildfires & Smoke

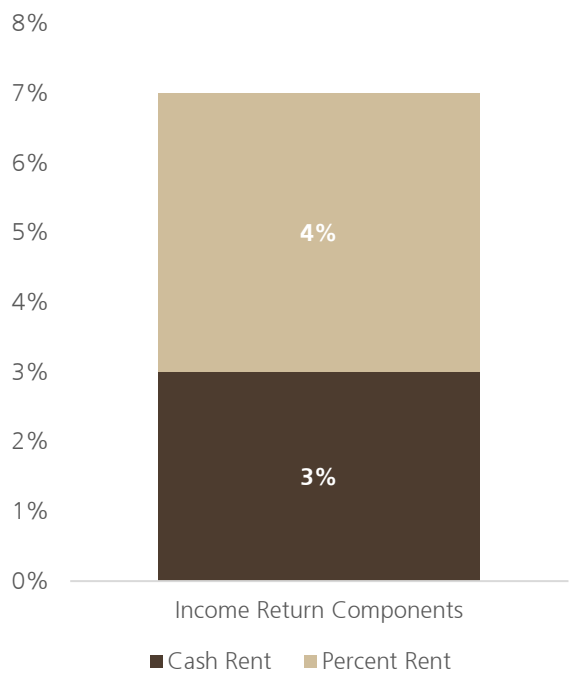
Lease structures provide income stability, mitigate risk, and preserve upside potential

Wildfire & Smoke Risks to the Midnight Sun Portfolio

- In recent years, California wildfires have increased in size, scope, and monetary damages compared to historical norms.
- While Midnight Sun farms have very low risk to wildfires themselves, the smoke produced from the 2020 wildfires was absorbed by many unharvested wine grapes rendering them worthless through a condition known as Smoke Taint.
- MSI#69 Sales Ranch was directly affected by Smoke Taint in 2020. We still collected the cash rent portion of the lease despite a near-total crop loss.
- If we directly operated, that vineyard would have returned a negative income return due to the operating losses
- This structure is designed to protect the investor from the increased risk of permanent crop and, in part, explains the superior risk-adjusted returns of farmland portfolios with leased permanent crops compared to directly operated permanent crops

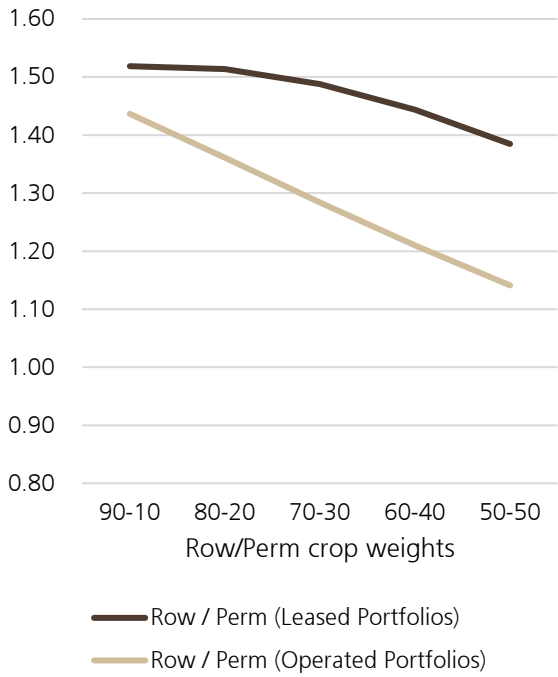
Midnight Sun Permanent Crop Lease Structure

Projected Underwriting Income Returns



Leased Perm Crop vs Operated Perm Crop

*Sharpe Ratio**



* Sharpe ratio is a common investment performance tool that measures an investment's excess return above the risk-free rate relative to the volatility of the investment's excess return. In other words, it shows the reward received per unit of risk assumed. A higher Sharpe ratio indicates a superior investment on a risk adjusted basis.

Source: UBS Asset Management, Real Estate & Private Markets, Research & Strategy research based on data obtained from NCREIF Property Index and Core Farmland Index as of December 31, 2020.

Section 2

Farmland Investment Characteristics

US farmland investment universe

- The investment universe of US farmland is significant at USD 2.7 trillion in value
- A diversity of crops are grown across the US
- A significant proportion of commodity crops are grown in the Corn Belt, Delta States and Southern Plains
- The Pacific West is an important and diverse agricultural region with both annual and permanent cropland

MSI#56 Monarch Orchard, Kern & Tulare Counties, CA
Pistachios approaching harvest

Photo of rice courtesy of USDA NRCS.
Source: USDA as of August 2021 (2020 value)

Competitive advantages of US agriculture

Source: ESRI

Geography:

- Largest cropland mass in the world located in latitudes favorable to crop production
- Midway between major export markets of Europe, Asia, Mexico and Canada

Infrastructure:

- Mississippi, Ohio, Columbia Rivers
- Rails, highways
- Port facilities - New Orleans, Portland, Houston, Los Angeles, Baltimore

Technology & capital:

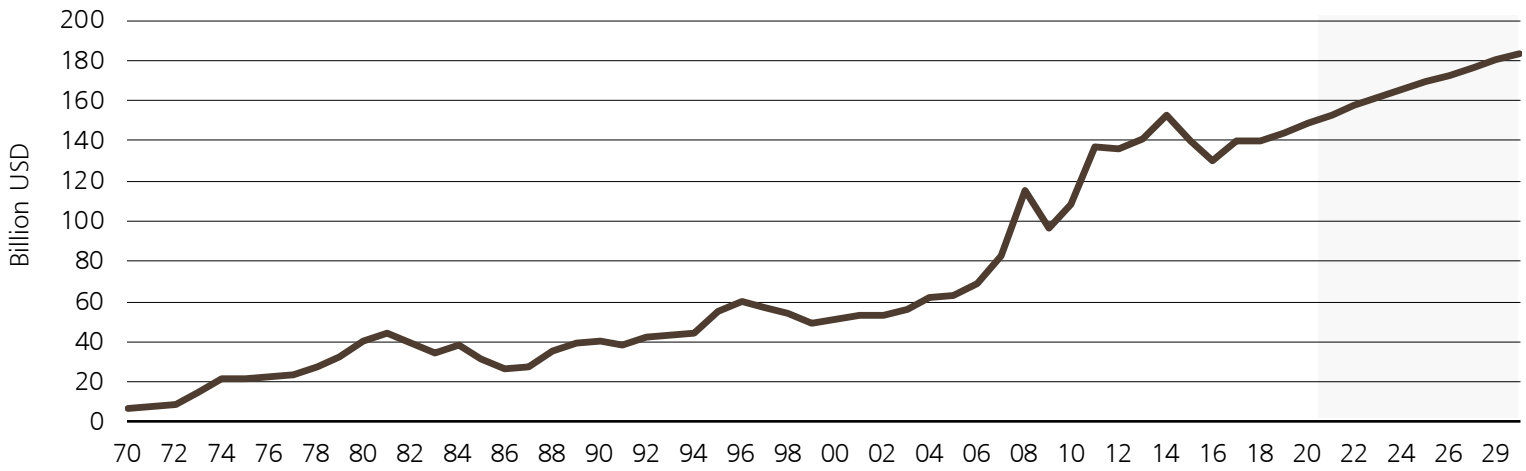
- Biotechnology, mechanical, conservation
- Land grant colleges, agricultural extension programs
- Innovative farmers with strong management skills
- Well-capitalized farm economy

Dominant global export market share:

- Increasing global demand from improving income in developing countries and alternative fuels (ethanol and biodiesel)
- US is most efficient and reliable producer
- Depth and diversity of US exports is unmatched by any other country or region in the world

Expanding global demand for farm commodities

US agricultural exports

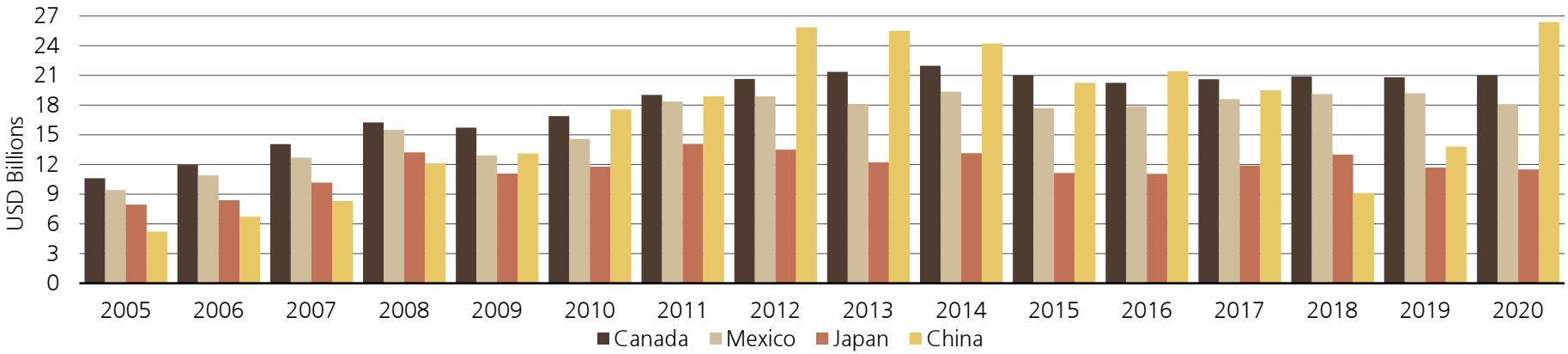


Source: USDA as of February 2020. 2018 to 2029 are forecasted by the USDA.
Data is based on fiscal year.

- GDP growth around the globe is creating additional demand for commodities in general
- Improving incomes in developing countries are having a major impact on the demand for farm commodities
- The US is the most dependable exporter of farm commodities in the global market

US agricultural exports

US agricultural exports, four largest buyers
2005-2020

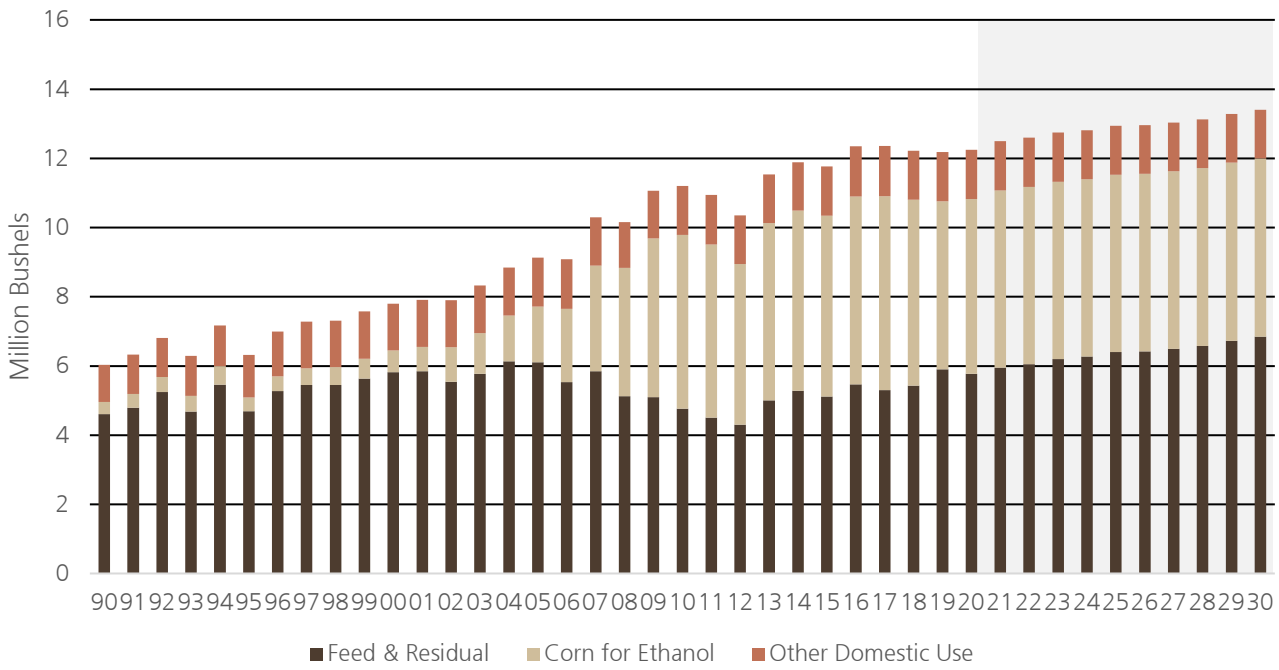


Source: USDA/Economic Research Service as of December 2020.

- Emerging and developing economies are a source of rising demand for US agricultural products
- As incomes rise, lifestyles change. For example, people consume more protein in their diet (more meat requires more livestock feed). They also become more mobile and burn more fuel (more fuel increases ethanol demand).
- China is a prime example. Sixteen years ago they were a small buyer and, despite temporary trade tensions, China remains a prominent export market and imported a record amount of US agricultural goods in 2020.

Additional demand from alternative fuels

United States Domestic Corn Use

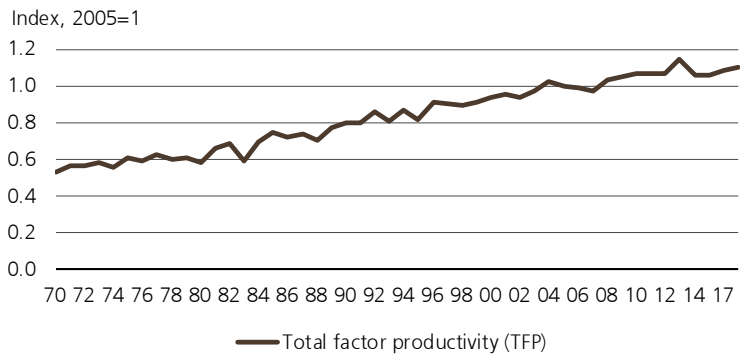


Source: USDA as of February 2020, 2021 through 2030 are forecasted by the USDA

- Alternative fuels in the US has accelerated the demand for corn while feed and other uses have also continued to grow
- Increasing demand for corn has resulted in improved supply/demand fundamentals for other row crops as well as corn acreage expanded

Productivity of US agriculture

US agriculture total factor productivity
1970 - 2017



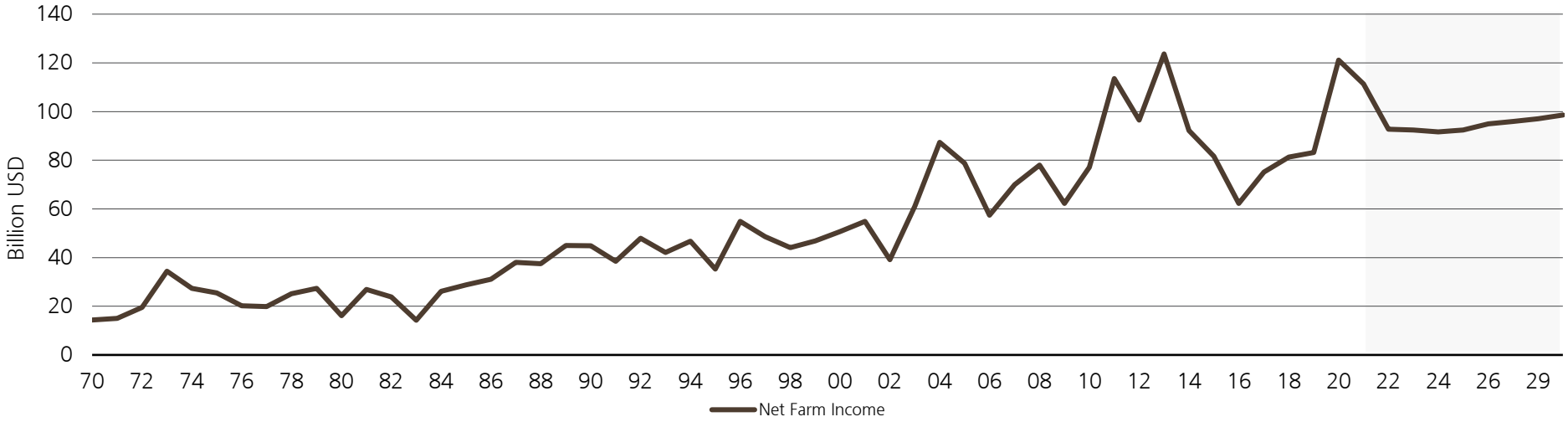
Source: USDA, Economic Research Service, Productivity in the United States as of January 2020. USDA, Economic Research Service uses Total Factor Productivity (TFP) which measures changes in the efficiency with which all inputs are transformed into outputs.

- Increased productivity is one of the main contributors to economic growth in US agriculture
- Productivity has nearly doubled since 1970
- Increased productivity contributed to, and supports, higher farmland values

MSI#59 Pacific Ranch, Ventura County, CA
Pole tomatoes ready for harvest

US farm income

Net Farm Income
1970 – 2029

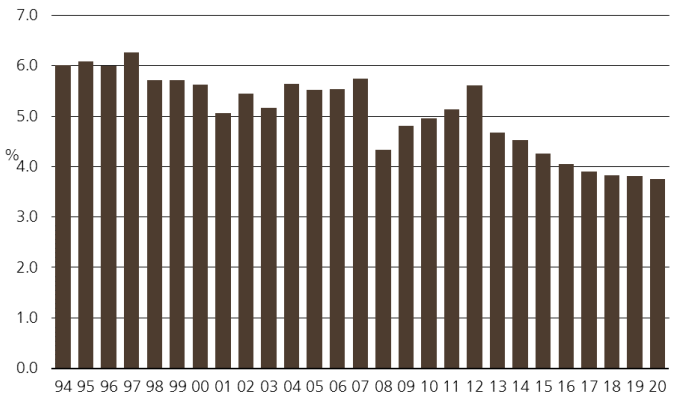


Source: USDA as of February 2021. 2020 to 2029 are forecasted by the USDA.

- From 2013 to 2016, a sharp decline in commodity prices reduced net farm income by 50%. Since then Net Farm Income has rebounded to near record highs despite multiple challenges such as trade wars and the COVID-19 pandemic.
- The USDA forecast to 2029 is relatively flat after 2021
- Farmland rents and values are in the process of levelling off

US farmland income returns

Core farmland income returns



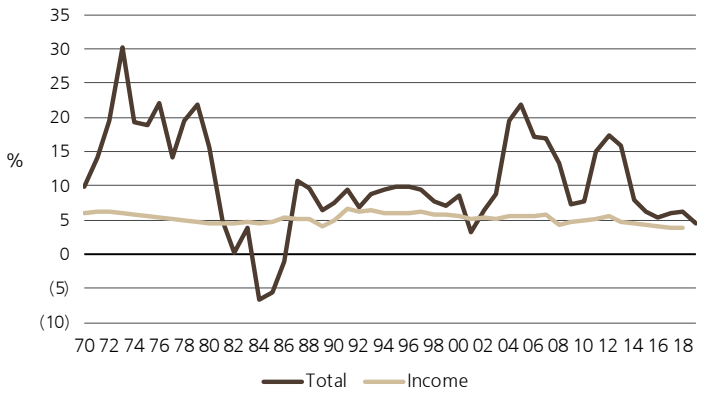
Source: NCREIF as of December 31, 2020. Past performance is not an indication of future results and the possibility of loss does exist. The Core Farmland Index does not include fund-level management or other fees or fund-level expenses, is not available for investment and is for illustrative purposes only.

- Farmland investments that are leased to local operators tend to provide a steady flow of income
- Core farmland income returns have averaged 5.00% over the past 25 years
- Capital expenses have averaged 0.74%

MSI#71 Bassinger Grove, Okeechobee County, FL
Valencia oranges ripening on the tree

US farmland returns

US farmland returns



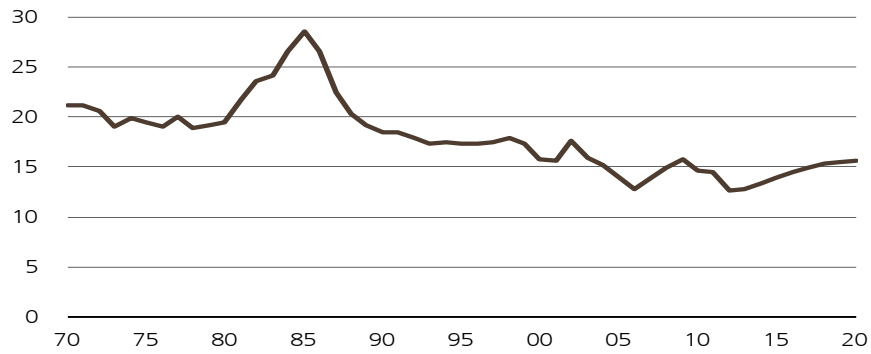
Source: Ibbotson Associates (1970-1990) and the Core Farmland Index (1991-2019) as of December 31, 2019. Past performance is not an indication of future results and the possibility of loss does exist. The Core Farmland Index does not include fund-level management or other fees or fund-level expenses, is not available for investment and is for illustrative purposes only.

- Farmland has provided positive returns in 45 out of 49 years:
  - Consistent 5%-6% income returns
  - 10.36% annual total return over the 1970-2019 time period
- A period of high inflation and low (even negative) real interest rates encouraged leveraged acquisition of farmland in the late 1970s
- Lower farm income has moderated the gains in farmland values recently

NAP#28 Camden Currituck, Camden County, NC
Recently emerged chipping potatoes in the spring time

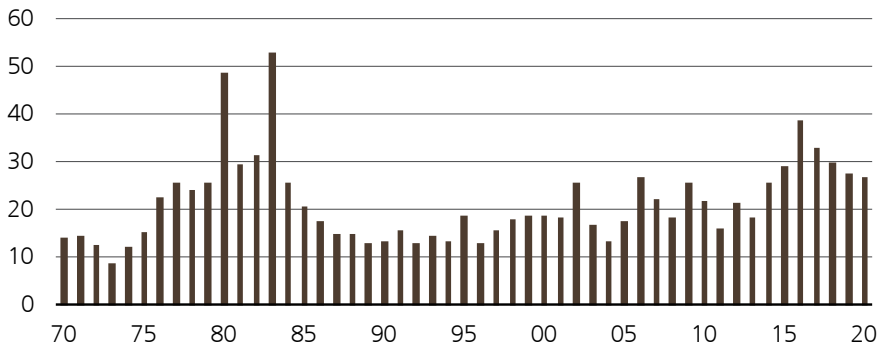
US farm sector financial indicators

Farm debt/equity ratio



Source: USDA/Economic Research Service as of February 20, 2020. 2019 and 2020 are forecasted. Ratio represents total farm debt divided by equity in land, buildings, equipment, crops and livestock.

Price/earnings ratio



Source: USDA/Economic Research Service as of February 20, 2020. 2019 and 2020 are forecasted. Ratio represents land and building value divided by net farm income.

- Farm debt/equity ratios have drifted slightly higher as land values have leveled off and debt levels increased slightly.
- Farm price/earnings ratios have increased largely due to the drop in Net Farm Income.
- Low debt/equity ratios suggest that solid farm sector debt levels remain low.

MSI#60 Carneros Hills Vineyard, Napa County, CA
Chardonnay grapes maturing on vine in early autumn

US farmland returns in perspective

Annual returns 1970-2020

	Mean		Standard deviation		Correlations				
	Nominal (%)	**Real (%)**	**Nominal (%)**	**Sharpe Ratio**	**CPI**	**Bonds**	**Stocks**	**Commercial real estate**	**Farmland (CFI)**
CPI	3.9	-	3.0	N/A	1.00				
Bonds	7.3	3.5	6.5	0.42	(0.12)	1.00			
Stocks	10.2	6.4	17.1	0.33	(0.09)	0.26	1.00		
Commercial Real Estate	8.9	5.1	6.8	0.64	0.29	(0.13)	0.09	1.00	
Farmland (CFI)	**10.1**	**6.1**	**7.4**	**0.78**	**0.44**	**(0.45)**	**(0.11)**	**0.21**	**1.00**

Source: UBS Asset Management, Real Estate & Private Markets, Research & Strategy research based on data obtained from the Bureau of Labor Statistics, Morningstar, the Bar-Cap Aggregate Bond Index, EAFE International Stock Index, S&P 500 Stock Index, IA SBBI US Small Stock Index, NAREIT, NCREIF Property Index and Core Farmland Index as of December 31, 2020. Source of CPI: Bureau of Labor Statistics. CPI is the Consumer Price Index, an inflationary indicator of the standard of living in the US. It is also referred to as the "cost of living" index. Means are annualized returns consistent with methodology used by NCREIF and are as of December 2020. Standard Deviation and Correlations are based on December ending annual returns. Past performance is not an indication of future results and the possibility of loss does exist. The Core Farmland Index does not include fund-level management or other fees or fund-level expenses, is not available for investment and is for illustrative purposes only.

- Strong total returns over this 50-year period
- Low total return variability with stable income component
- Historically strong hedge against inflation
- Diversification benefits for a traditional stock and bond portfolio

Section 3

Biographies

UBS Farmland Investors LLC biographies

Investment committee

- **James B. McCandless,** Managing Director, Head of Real Estate Farmland, and President/Chief Executive Officer of UBS Farmland Investors LLC. Mr. McCandless is one of the founders of AgriVest. He has over 47 years of experience financing and investing in agricultural real estate. His career includes positions with Bank of America, Connecticut Mutual Life Insurance Company and Bell Investment Company. Mr. McCandless' duties with these institutions focused exclusively on financing and equity investment in agricultural real estate. His experience covers a broad range of property types in the primary farming regions of the United States. Mr. McCandless received his bachelor's degree in Animal Science and Business Administration from Oklahoma State University. He is an affiliated member of the American Society of Farm Managers and Rural Appraisers, a member of the Pension Real Estate Association and the National Council of Real Estate Investment Fiduciaries.
- **Daniel E. Murray,** Director for UBS Farmland Investors, LLC. Mr. Murray is responsible for the Administration of UBS Farmland Investors LLC's asset management activities, property and portfolio performance measurement, as well as evaluation and analysis of property acquisitions and sales. He has over 10 years of experience in agricultural investment work. Prior to joining the firm in 2019, Mr. Murray held positions in Farmland Investment firms, Commodity Trading firms and a Dairy Research Center. He has undergraduate degrees in Animal Science as well as Applied Economics and Management from Cornell University and an MBA in Finance from Rensselaer Polytechnic Institute. He is a Level II CFA candidate.
- **Charles W. Bryan, Jr.,** ARA, Director of UBS Farmland Investors LLC. Mr. Bryan is responsible for managing assets in the Northwest region and is based in Nampa, Idaho. He has been actively involved in agricultural real estate for over 35 years, primarily in the Northwest. Prior to joining the staff of UBS Farmland Investors LLC in 2005, he was a lending officer with Farm Credit Services in Idaho. Mr. Bryan has extensive farmland appraisal experience having also served as a Senior Appraiser and an Engineer Appraiser with Farm Credit Services. He received his bachelor's degree in Geology from Boise State University. He holds the designation "Accredited Rural Appraiser" awarded by the American Society of Farm Managers and Rural Appraisers.
- **Cullum Jefferies,** Director of UBS Farmland Investors LLC. Mr. Jefferies is responsible for managing assets in Texas, Arkansas, Louisiana, Mississippi and Florida. He has over 20 years of experience in real estate investment management. Prior to joining the staff of UBS Farmland Investors LLC in 2009, Mr. Jefferies was with GE Real Estate where he handled acquisitions, asset management, and valuations. He received his bachelor's degree in agribusiness and master's degree of land economics and real estate from Texas A & M University. He owns a farm with his parents in West Central Texas

UBS Farmland Investors LLC biographies

Investment committee

- **Erik C. Roget,** ARA, RPRA, AFM, Director of UBS Farmland Investors LLC. Mr. Roget is responsible for managing assets in California and Arizona and is based in Lodi, CA. He has been actively involved in California and Western US agricultural real estate for over 38 years. Prior to joining the staff of UBS Farmland Investors LLC in 2010, he was Regional Vice President, Western Region, with Rabo Agri-Finance, an affiliate of Rabobank NA. Mr. Roget has extensive farmland appraisal and management experience having also served with Equitable Agri-Business Inc., Correia-Xavier Appraisals and the Federal Land Bank. He received his Bachelor's Degree in Agri-business from California State University-Fresno. He holds the designation "Accredited Rural Appraiser", "Accredited Farm Manager" and "Real Property Review Appraiser" awarded by the American Society of Farm Managers and Rural Appraisers. He holds a CA Certified General Appraiser's license. He and his wife own a farm in Madera County, CA.
- **Brian C. Duke**, AFM, Director of UBS Farmland Investors LLC. Mr. Duke is responsible for managing assets in Illinois, Indiana, Colorado, Wisconsin and Georgia. He has 29 years of experience in the acquisition and management of farmland investments in the Central and Western United States. Prior to joining the staff of UBS Farmland Investors in 2014, Mr. Duke was with The Northern Trust Company for 18 years. He was most recently serving as the Director of Agricultural Services, responsible for the management of over 200 agricultural properties in 27 states. Prior to joining Northern Trust he was the Assistant Manager of L. J. Duke Farms in Indiana. He received his Bachelor's Degree in Agricultural Economics from Purdue University. He holds the designation "Accredited Farm Manager" awarded by the American Society of Farm Managers and Rural Appraisers. He is also a Board Member of The Chicago Farmers organization.
- **Barbara A. Missal**, Director of UBS Farmland Investors LLC. Ms. Missal is responsible for the management of the UBS Farmland Investors data warehouse, special projects, portfolio reporting, and assisting asset and portfolio management. She has over 30 years of experience with financial reporting and analysis in the real estate industry. Prior to joining the staff of UBS Farmland Investors in 2016, Ms. Missal was with UBS Realty Investors for 25 years. She was most recently a business analyst responsible for defining user requirements, system testing and ongoing user support for various software applications and was previously an accountant responsible for fund and property accounting. Prior to joining UBS Realty Investors, she was an auditor and Certified Public Accountant with Coopers & Lybrand. She received her Bachelor's Degree in Accounting from the University of Connecticut.

Section 3

Appendix

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MSI#70 Tieton Orchards, Yakima Count, WA (Cover Photo)
Sweetheart cherries ready to be picked

Timberland Investment Resources, LLC

Relevant Mandates: **Timberland** **Hired:** **2008**

Firm Information

Timberland Investment Resources, LLC (TIR) is a Timberland Investment Management Organization. TIR is 100% owned by the equity partners of the firm, who also serve as Managing Directors.

As of 6/30/21, the firm's total assets under management were $1.87 billion.

Key Executives:
Mark Seaman, President and CIO
Tom Johnson, Managing Director, Client Service and Business Development
Chung-Hong Fu, Managing Director, Economic Research
Chris Mathis, Managing Director, Real Estate

Investment Approach

TIR's investment philosophy emphasizes active timber and land management, which requires that TIR perform not only the investment management but also many property management functions in-house. TIR is able to reduce operating expenses because of the high level of management conducted with direct employees of TIR. The account management and property management decision making functions are also performed in-house by TIR Partners and staff.

TIR believes that much of the return potential for a timberland portfolio, particularly a southern pine portfolio, is contained in the biological growth of the timber. In order to maximize the growth and thus, return potential, TIR conducts rigorous economic and biometric research, coupled with effective implementation of intensive, stand level management plans through TIR's own foresters deployed in the field. TIR's forest biometrician and economist perform research to benefit client portfolios. The same rigorous economic and biometric analysis used to develop the acquisition strategy is applied to the disposition strategy, recognizing that in some cases, properties acquired as timberland may transition to Higher-and-Better-Use properties (e.g., recreation, conservation, etc.) over the investment term.

Benchmark: NCREIF Timberland Index.

Total ARMB Mandate

Assets Under Management:
6/30/21 $366,935,894

Concerns: None.

6/30/2021 Performance

	Last Quarter	1-Year	3-Years Annualized	6-Years Annualized	12.5-Years Annualized
Manager Gross	1.92%	5.02%	3.12%	2.79%	4.59%
Fee	0.16%	0.72%	0.80%	0.83%	0.76%
Manager Net	1.76%	4.30%	2.32%	1.96%	3.83%
Benchmark	1.70%	3.10%	2.12%	2.78%	3.42%

TIMBERLAND
INVESTMENT RESOURCES LLC

Growing value for our clients every day

Alaska Retirement Management Board (ARMB)
Timberland Investment Portfolio Review

Agenda

01 Introductions

02 Firm Overview

03 Timber Basics

04 Role of Timberland in a Portfolio

05 Market Overview

06 ARMB Portfolio Overview

07 Risks and Emerging Opportunities

08 Biographies

Firm Overview

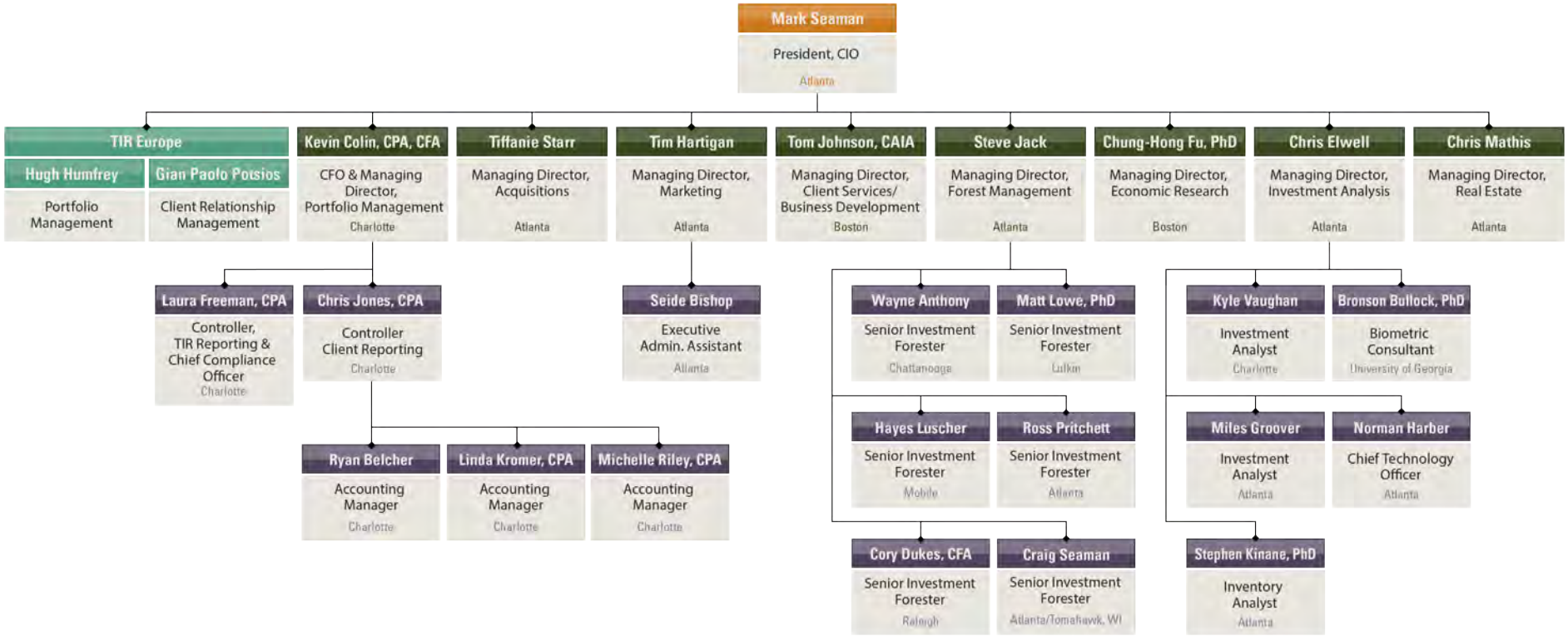
Timberland Investment Resources, LLC

- Established in 2003 by former head of Wachovia's timberland investment management business
- Manage more than $1.87 billion in assets under management through nine separate accounts, six commingled funds, and one club account (135 individual investors in total)
- All forest operations independently certified under the Sustainable Forestry Initiative (SFI) and firm is a signatory to UN-sponsored Principles for Responsible Investment
- 100% employee-owned firm
- Senior management team averages more than 25 years of experience
- Six U.S. offices with headquarters in Atlanta, Georgia and a London-based affiliate, TIR- Europe

What Distinguishes Timberland Investment Resources, LLC

TIR	Benefits to Client
Stable ownership and senior team	***Reliability***
100% owned by the Managing Directors	***Alignment of interests***
Mid-market focus ($10-$75 million investment)	***Specialization and expertise***
Stand-level investment management	***Biological alpha***
TIR is a value manager that exploits inefficiencies in acquiring, managing, and selling timberland properties	***Investment alpha***

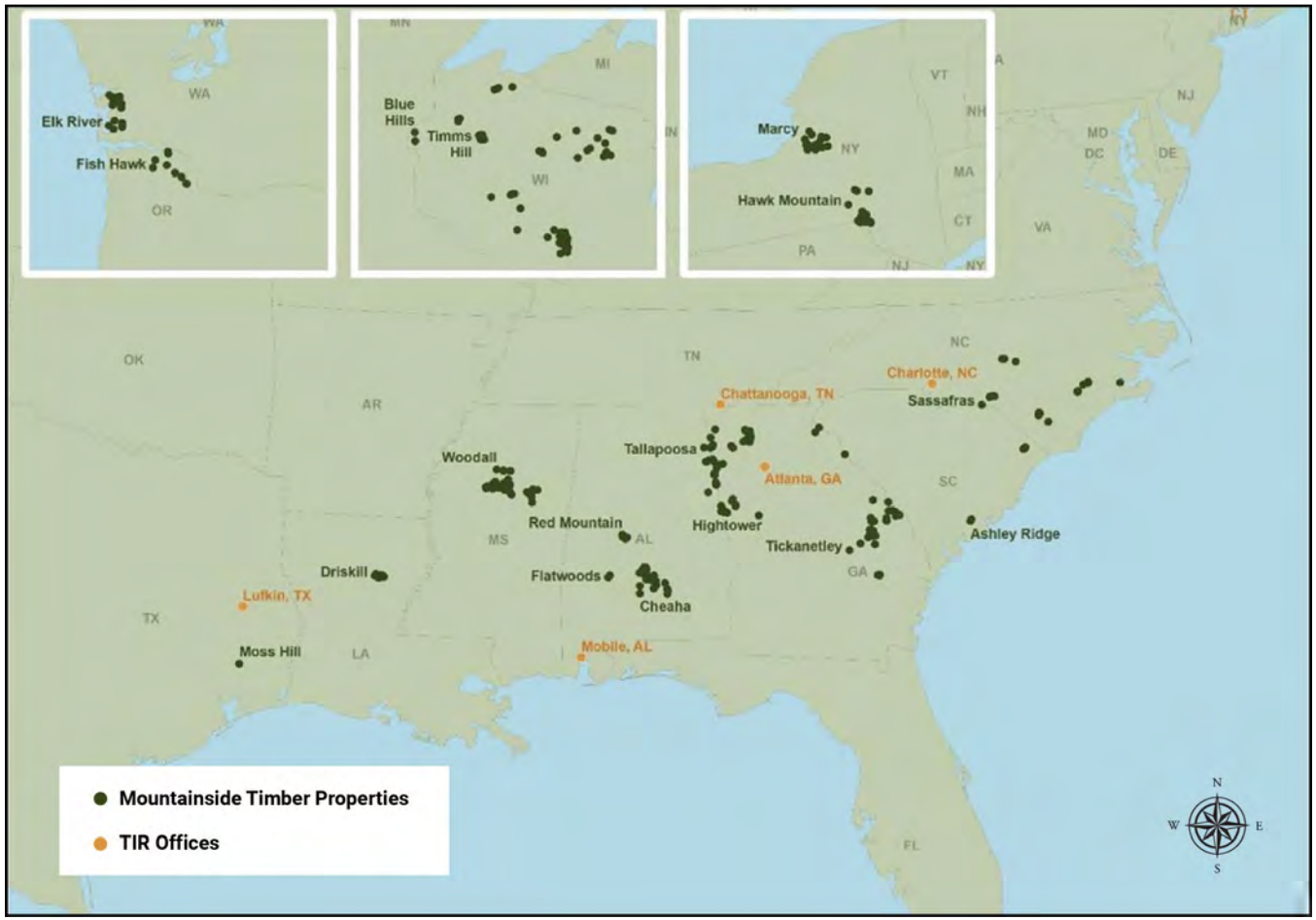
TIR Organization Structure (includes TIR-Europe)



Mountainside Timber

Mountainside Timber – Assets Location Map

Mountainside Timber, LLC Properties: 160,560 acres



Mountainside Timber, LLC

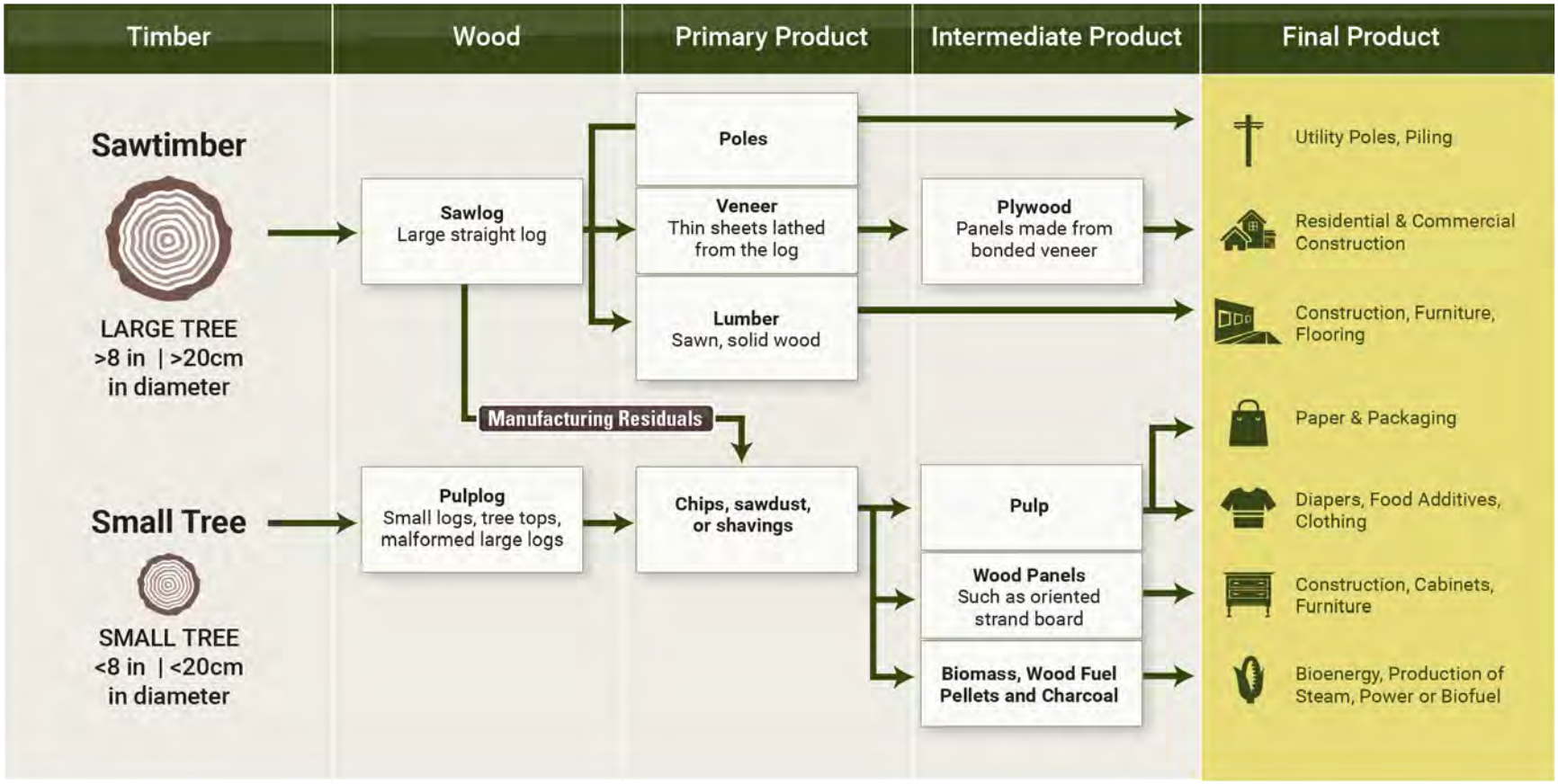
- Formed in 2008 with a capital commitment of $100 million.
- Capital commitment increased over time to $244 million.
- In 2020, assets from Hancock Timber Resource Group (Salmon Timber) were consolidated into Mountainside. The market value of the assets was approximately $100 million at the time of the conversion and included three properties in Alabama, Oregon, and Washington.
- Prior to the consolidation, fees were renegotiated to reflect the increase in scale of assets under management.
- Total market value of the Mountainside assets were $357.1 million as of 6/30/2021.
- The portfolio is unleveraged and is compared to the NCREIF Timberland Index and net-of-fee total return between public equities and fixed income over rolling six-year periods.
- To provide a sense of scale, the properties represent 250 square miles, and if all the trees in Mountainside were harvested and loaded on trucks, they would stretch end-to-end across the width of the State of Alaska.

Timber Basics

Timber Basic – Two Timber Types – Diverse End-Use Products

Timber Basics – Main Products Produced from Timber

Flow diagram that shows how the main economic products of a timber harvest, sawtimber and pulpwood, become value-added products.



Role of Timberland in a Pension Portfolio

Timberland in a Pension Portfolio

Traditional Rationale

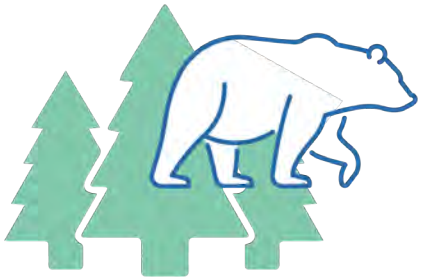
- Return
- Diversification
- Inflation Hedge
- Capital Preservation
- Yield

Increasing Focus on Timberland for ESG and Impact Mandates

- Forests provide clean air, clean water, wildlife habitat
- Forest operations and related manufacturing yield well-paying rural jobs
- Forests absorb and store carbon helping to mitigate climate change

CLEAN AIR

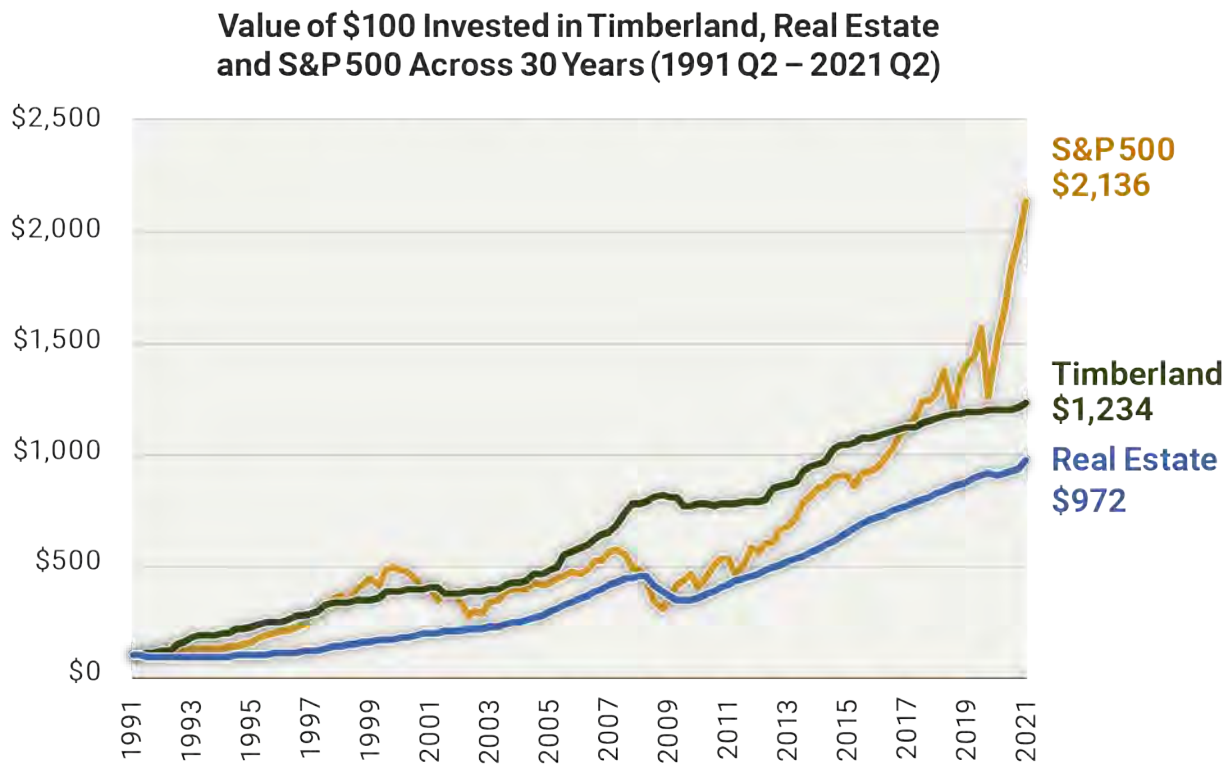
CLEAN WATER



WILDLIFE HABITAT

Return

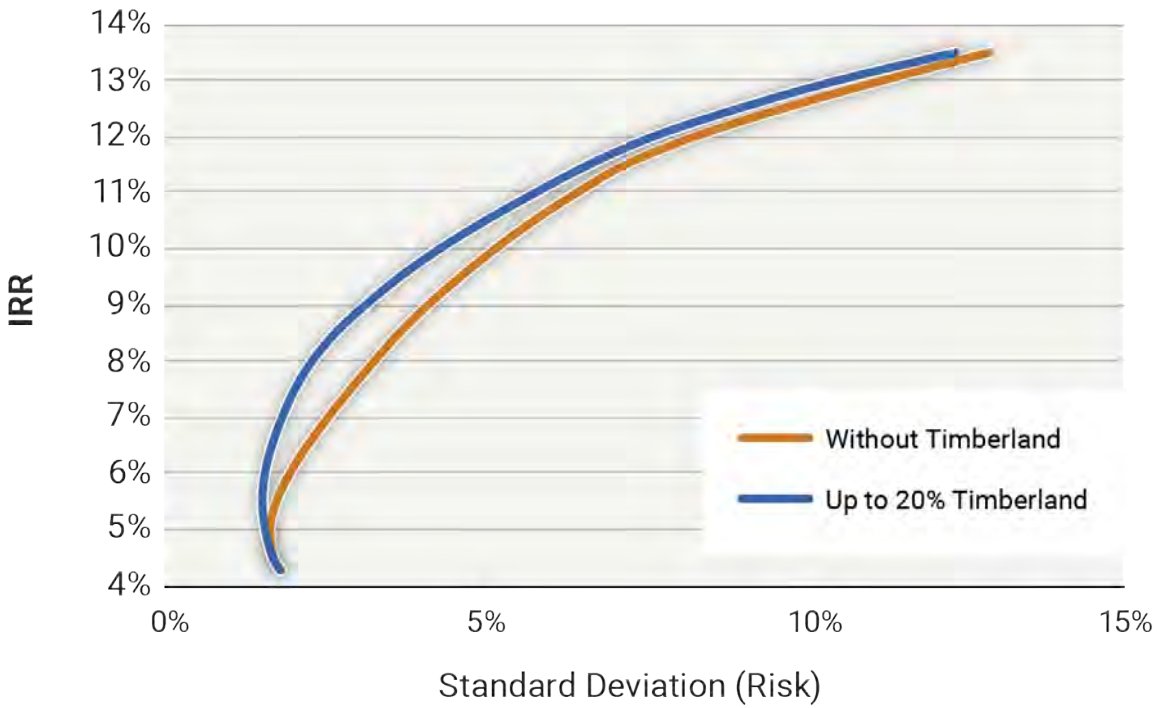
Despite a decade of recovering from our asset class' "Black Swan" event, timberland provides attractive long-term return characteristics.



Source: NCREIF, Standard and Poor's.

Risk

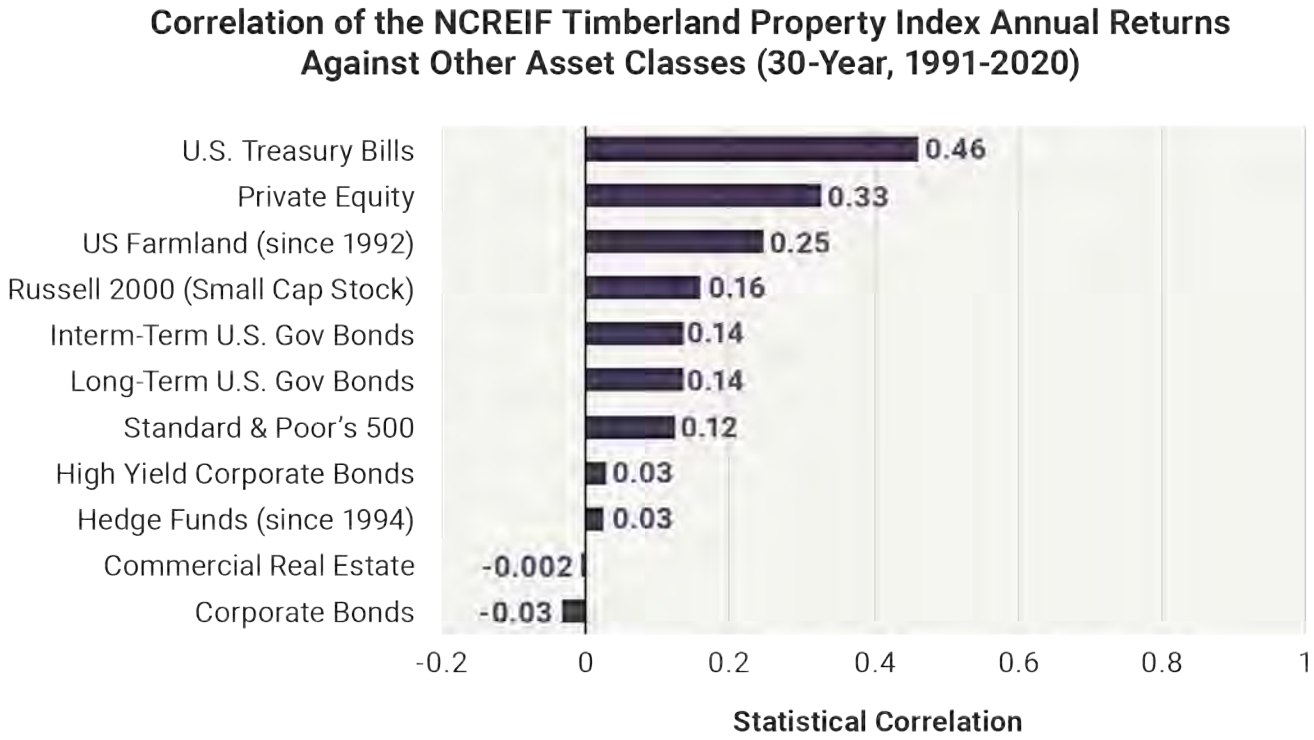
Adding timberland to a typical pension plan portfolio can reduce risk for a given target return.



Source: TIR Research

Diversification

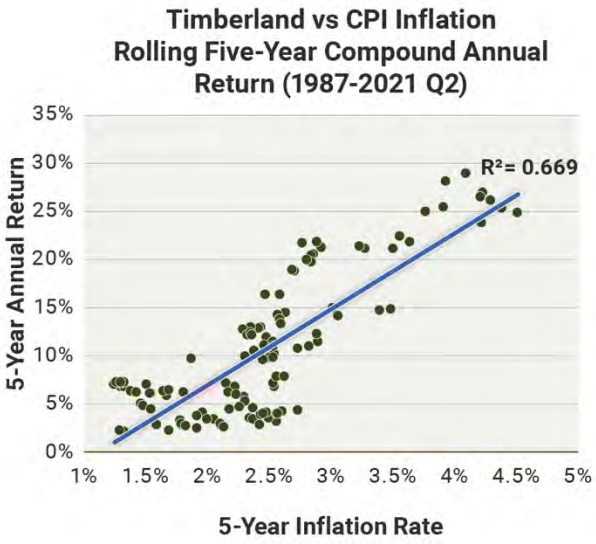
Timberland's biological growth properties provide a risk and return characteristic that adds to the diversification of any real assets portfolio.

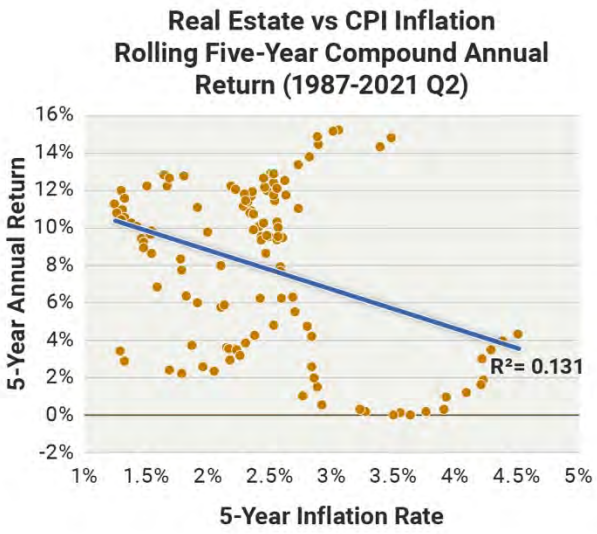


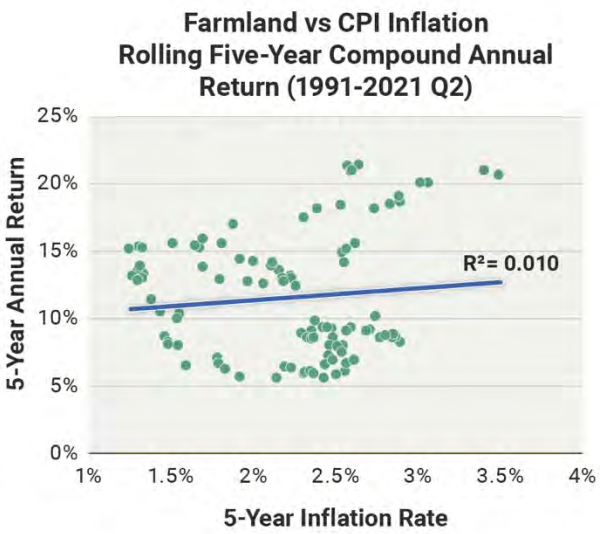
Sources: Ibbotson, Cambridge Associates, NCREIF

Inflation Hedge

Timberland has been consistently shown to have strong inflation hedging properties relative to other real assets.





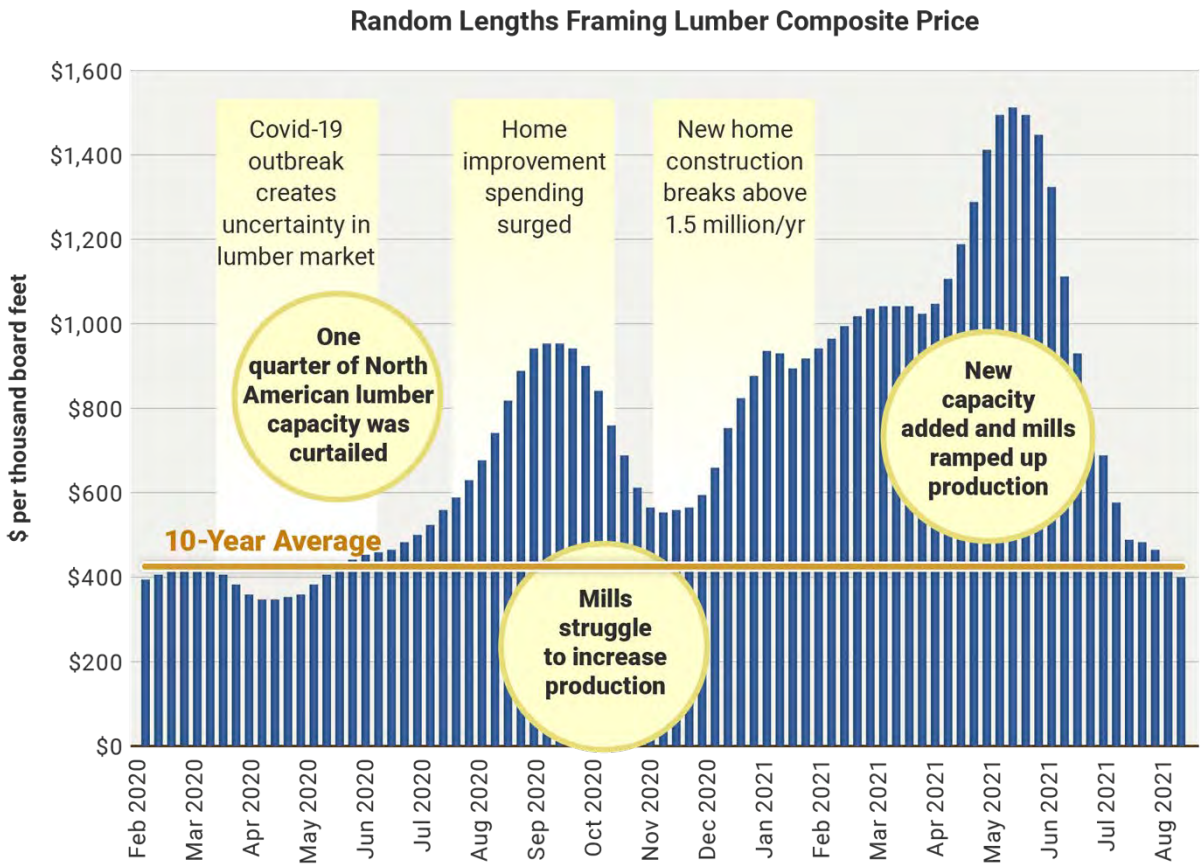


The charts above plot rolling five-year total annualized return against the observed five-year inflation rate over the same period from 1991 through 2021q2. Timberland returns are measured by the NCREIF Timberland Property Index, real estate by the NCREIF National Property Index, and farmland by the NCREIF Farmland Index. Inflation is measured by the United States Consumer Price Index.

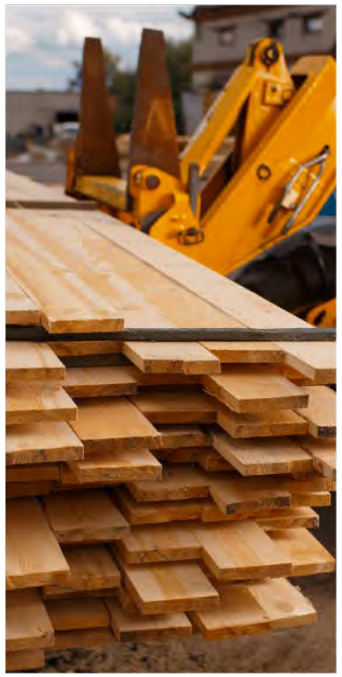
TIMBER AND ECONOMIC PROJECTIONS

An Extraordinary Year for Lumber Markets

Sawmills failed to anticipate the quick rebound in lumber use amid the Covid-19 lockdown. By the second quarter of 2021, lumber producers were able to catch up to demand.



Source: Random Lengths



Housing Sector Growth is Driving Lumber Demand

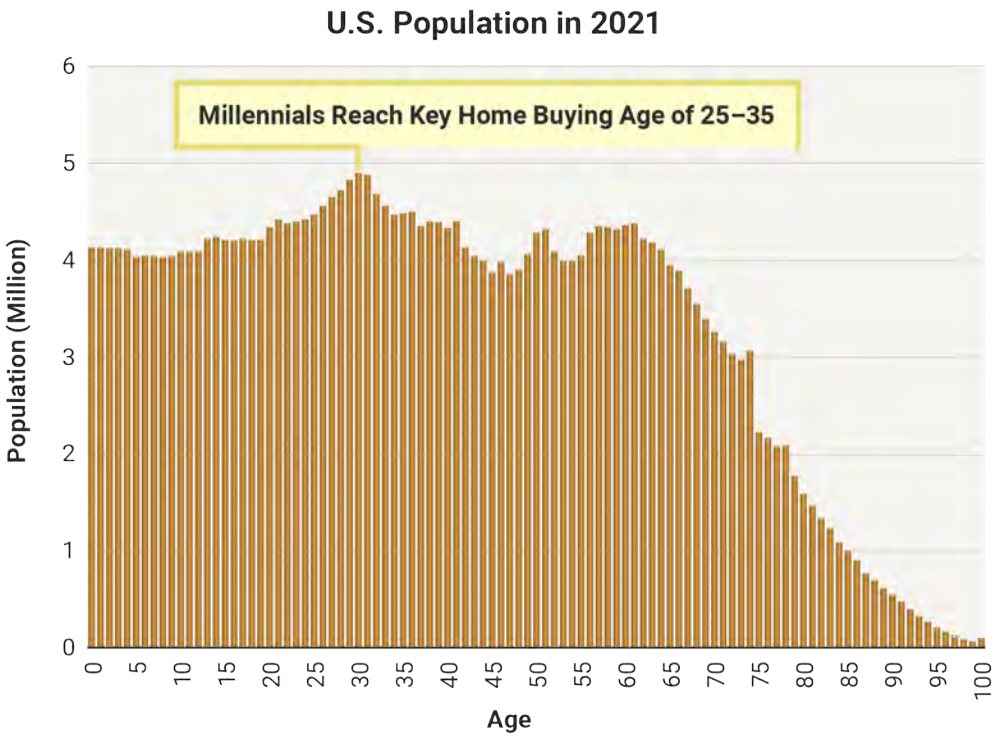
Both new home construction and home improvement spending have risen above historical levels and are expected to remain durable through the economic recovery.

Sources: US Commerce Department, Forest Economic Advisors
Freddie Mac: "One of the Most Important Challenges Our Industry Will Face: The Significant Shortage of Starter Homes" (April 15, 2021)

Adjusted for inflation by CPI to current $

Demographics and Aging Housing Stock

Millennials, the largest generation in history, are entering the key 25–35-year demographic where they will purchase their first home. Also, a decade of low home construction has caused the average age of the U.S. home to reach 42 years old, which will help drive spending on home repair and remodeling.

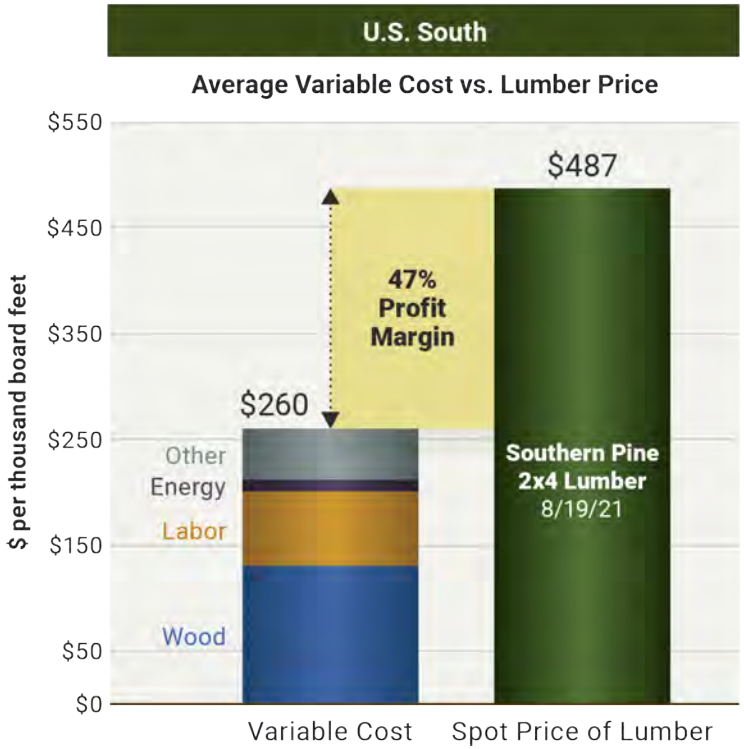


Source: U.S. Census Bureau

Source: U.S. Census Bureau, *2019 American Housing Survey*

Southern Mills Operate at High Margins

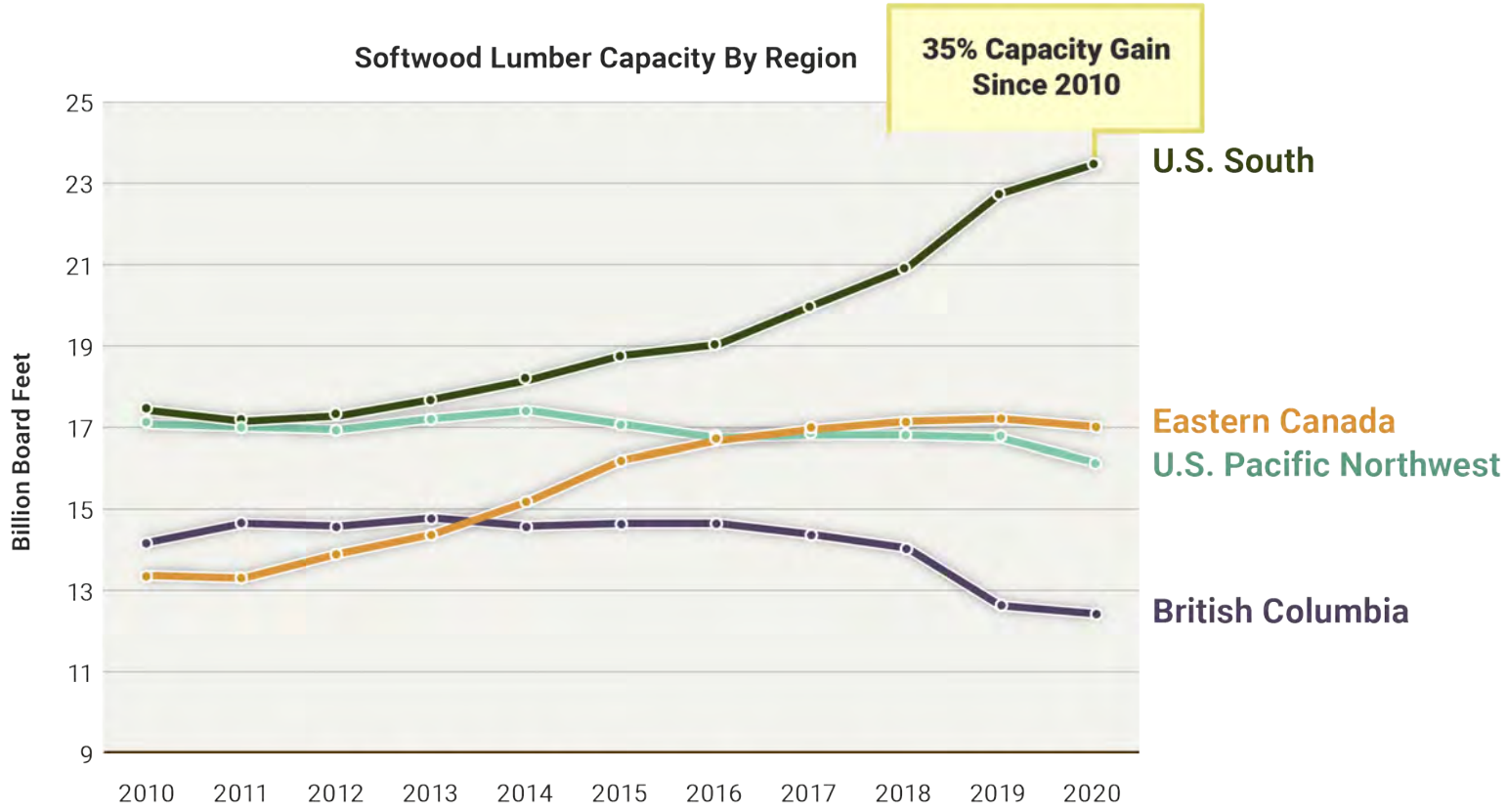
Southern sawmills on average carry a 23 percent cost advantage over mills in the Pacific Northwest. This makes them better able to remain profitable in the face of volatile lumber markets.



Variable cost reported by Forest Economic Advisors for 2021
Spot lumber price by Random Lengths

Competitive Advantage Attracted Mill Investment

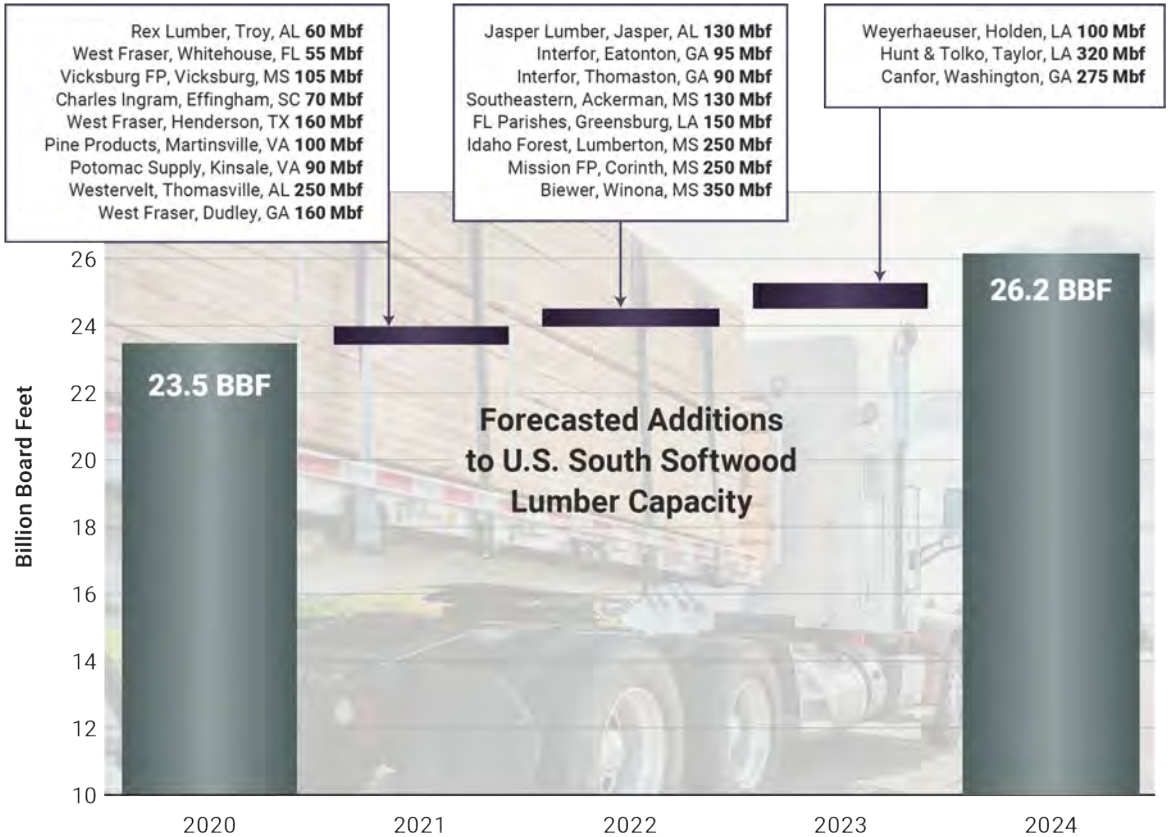
In anticipation of a recovery of the U.S. housing market, more than $4 billion in capital investments flowed into the U.S. South following the Global Financial Crisis, making the region the leading producer of lumber in North America.



Source: Forest Economic Advisors

The South Continues to Attract Fresh Investment

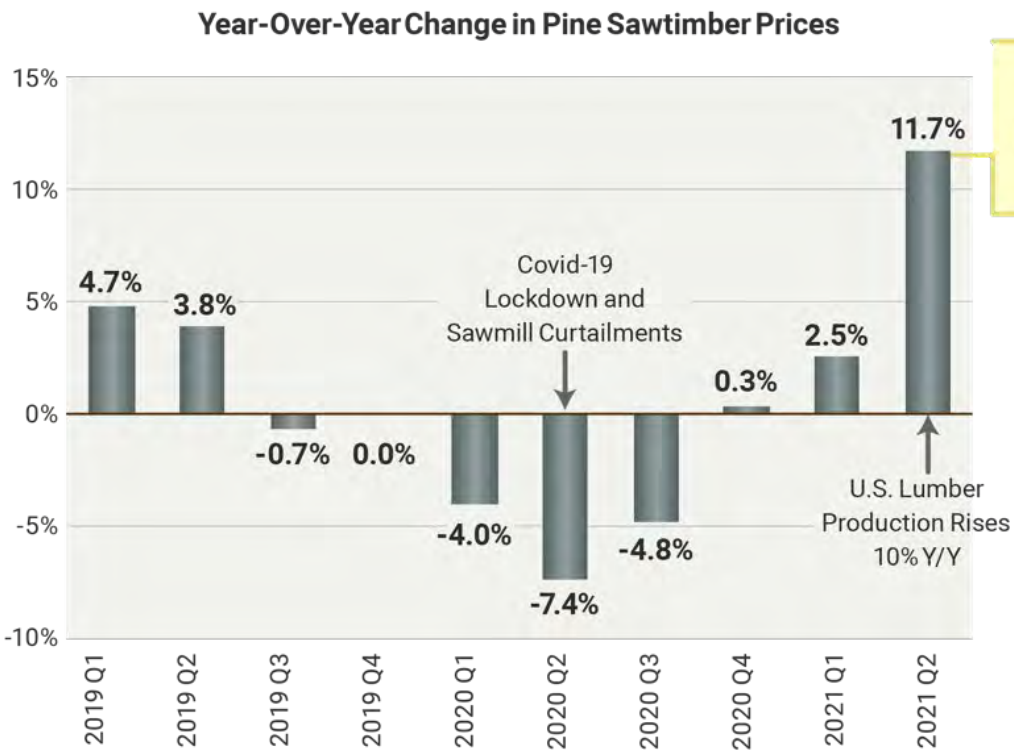
Given the cost advantage afforded to the U.S. South, lumber producers continue to make capital investments in the region. An additional 2.7 BBF, or 12 percent, of lumber capacity is expected to be added by 2024.



Sources: Forisk Consulting

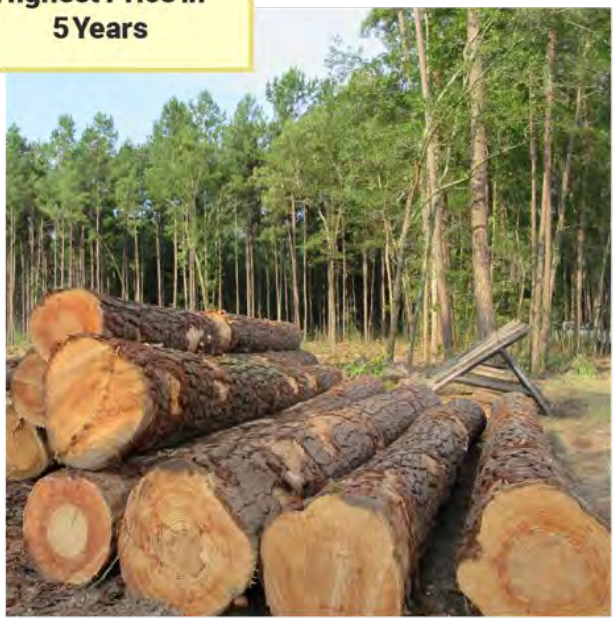
Southern Sawtimber Markets Are Responding

There is a lag effect, but the rising production of lumber has begun to lift pine sawtimber in many parts of the U.S. South.



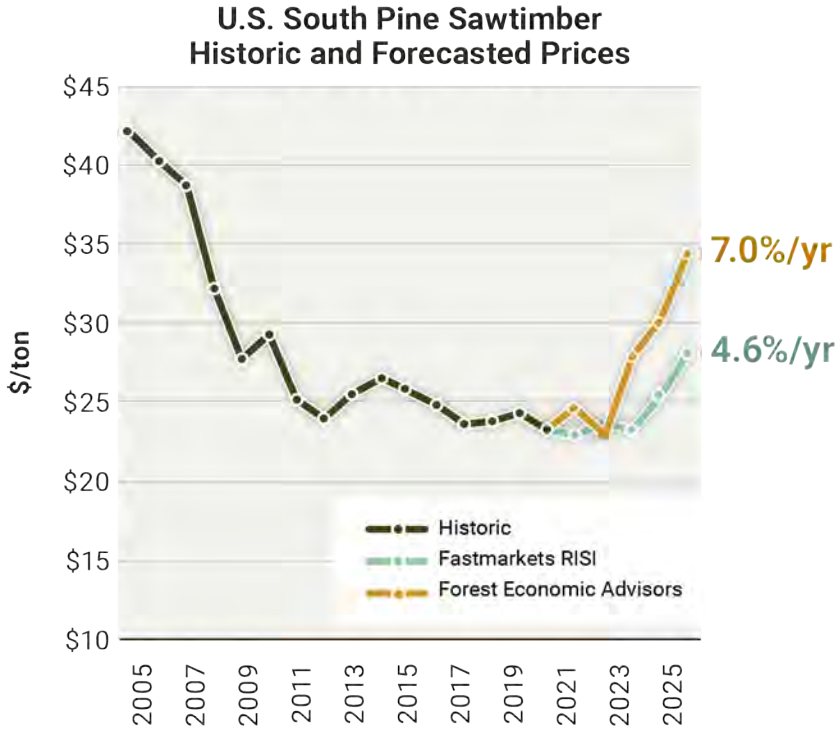
Source: Timber Mart-South

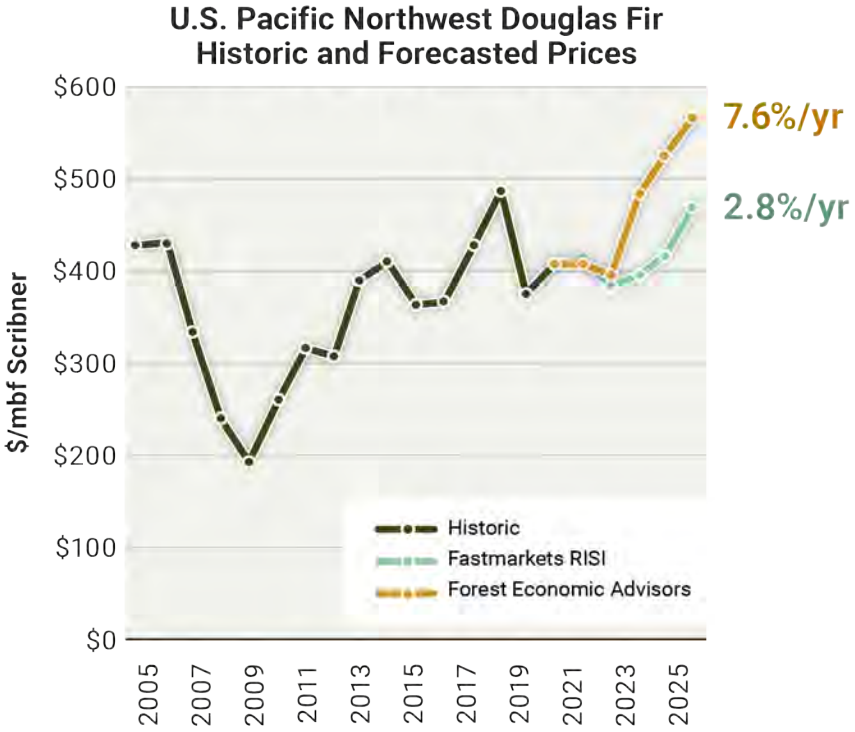
$25.41/ton Highest Price in 5 Years



Pricing Momentum is Expected to Continue

Third-party forecasters project sawtimber prices in the both the Pacific Northwest and the South to rise in the mid-single digits as rising lumber output puts pressure on wood inventory





Source: TimberMart-South (historic); Fastmarkets RISI and Forest Economic Advisors (forecast)

ARMB Portfolio Overview

Diversification - Geographically

The Mountainside Timber portfolio encompasses properties (160,560 acres) located in 11 states across all of the major timber producing regions of the U.S. – making it one of the largest and most diverse collections of working forest assets owned by an institutional investment organization.

Diversification - Species and Product Classes

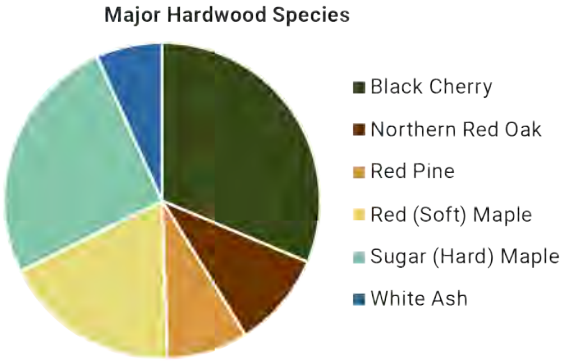
Mountainside also has broad diversification across species, product classes (e.g., pulpwood, chip-n-saw, and sawtimber) and overall age-class distribution.

- Relatively even age-class distribution for softwood and broad hardwood diversification.
- Geographical distribution is roughly comparable to NCREIF with some strategic tilts.

Mountainside Timber, LLC - Portfolio Diversification - 6/30/21

Region	Portfolio Acres	% of Portfolio
South	105,496	66%
Lake States	23,774	15%
Northwest	13,783	9%
Northeast	17,507	11%

Mountainside Portfolio Diversification by Timber Type



Diversification - Relative to the Benchmark

Mountainside is in line with the NCREIF Index for the South – is overweighted in the Northeast and Lake states – and is underweighted in the Pacific Northwest.

Mountainside Timber, LLC - Regional Diversification Compared to Benchmark- 6/30/21

Region	NCREIF		Mountainside	
	Asset Market Value	Asset Weighting	Asset Market Value	Asset Weighting
Lake States	$971,206,810	4.24%	$25,907,225	7.25%
Northeast	$1,034,773,002	4.51%	$40,737,353	11.41%
South	$15,111,186,509	65.91%	$230,335,329	64.50%
Northwest	$5,811,159,819	25.34%	$60,140,875	16.84%
Total Timberland	**$22,928,326,140**	**100.00%**	**$357,120,783**	**100.00%**

Performance Summary

- On a gross basis, Mountainside has outperformed the NCREIF (National) benchmark by 126 basis points since inception and is very similar to the Bloomberg Barclays Aggregate Index while trailing the Russell 3000. The outperformance of Mountainside over the NCREIF (National) Index has widened over the last year.

Mountainside Timber, LLC - Portfolio Returns - 06/30/2021

Time-Weighted Returns	Mountainside (Gross)	Mountainside (Net)	NCREIF (South)[2]	NCREIF (National)[2]	Regionally Allocated[3]	Agg[4]	Russell 3000
Current Quarter	1.92%	1.76%	1.25%	1.70%	1.77%	1.83%	7.73%
Trailing 12 Months	5.03%	4.31%	2.44%	3.10%	3.17%	-0.33%	42.01%
Trailing 3 Years	3.12%	2.32%	2.32%	2.12%	2.09%	5.35%	16.77%
Trailing 5 Years	2.93%	2.13%	2.32%	2.65%	2.45%	3.03%	15.82%
Trailing 6 Years	2.77%	1.96%	2.46%	2.78%	2.49%	3.52%	12.92%
Trailing 10 Years	4.59%	3.75%	3.65%	4.66%	4.19%	3.39%	12.18%
Since Inception[1]	4.67%	3.83%	2.50%	3.41%	3.10%	3.93%	13.25%

(1) Since inception represents the company contribution return for the fund. This supports comparison with the NCREIF since inception calculation.

(2) NCREIF Property Indices are reported gross of fees and without the impact of leverage. Mountainside is unleveraged and returns are also reported gross of fees. Net Mountainside returns are located in the performance history table with the financial statement.

(3) This benchmark is for internal use. It is the NCREIF South, Lakes States, Pacific Northwest, and Northeast geographic returns weighted by the MV of Mountainside's assets in those regions.

(4) Agg is the Bloomberg Barclays US Aggregate Bond Index

Yields

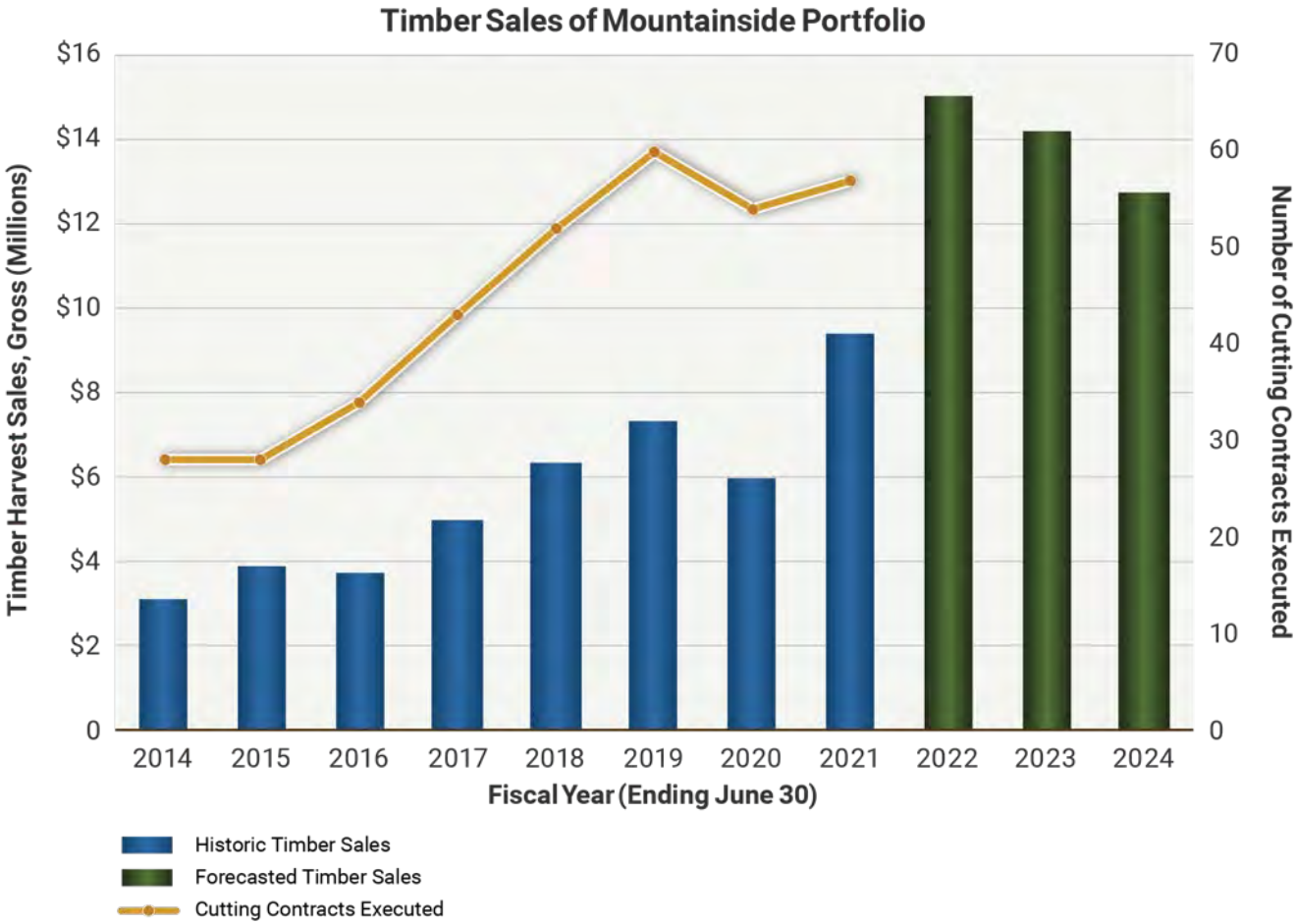
- Yields have averaged 4.48% since 2013.
- The yield is projected to be materially higher in 2021 relative to 2020 because of:
  - Timber price improvements resulting from increased demand due to housing starts.
  - Increased retail land sales in a market that has been "on fire."

Mountainside Timber, LLC - Distribution & Yield - 6/30/21

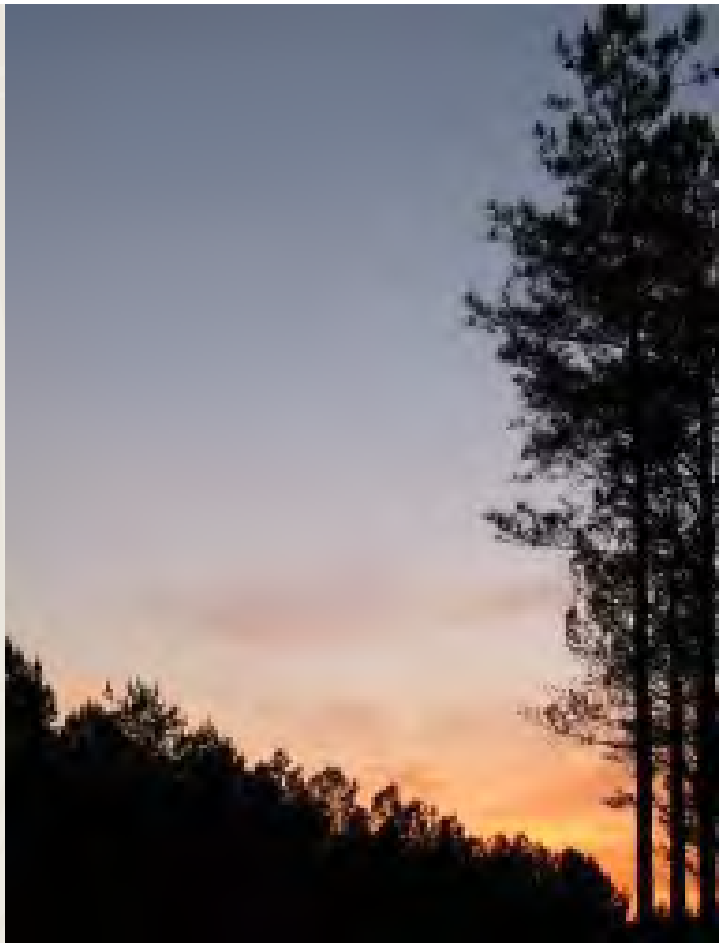
Calendar Year	Cash Distribution	Beg Year NAV	Cash Yield
2013	$6,000,000	$171,453,496	3.50%
2014	$7,500,000	$189,008,917	3.97%
2015	$14,000,000	$269,945,189	5.19%
2016	$13,300,000	$276,684,112	4.81%
2017	$18,400,000	$276,813,308	6.65%
2018	$22,800,000	$285,655,074	7.98%
2019	$4,200,000	$268,275,894	1.57%
2020	$5,900,000	$268,695,726	2.20%
2021 YTD	$6,000,000	$359,610,786	1.67%
Total Cash Distribution	**$98,100,000**	**Avg Annual Yld***	**4.48%**

Yield – Return of capital, capital gains, and ordinary income
* Calculated based upon full calendar years 2013-2020

Increased Harvests Tied to Increased Opportunistic Sales



Performance Summary



- Timber markets are improving due to increased demand from the housing sector (new home starts and repairs and renovations) and the ongoing economic recovery.
- Interest in rural forested land for recreation, conservation and personal investment has been increasing throughout the pandemic and is driving demand for retail-sized parcels – a trend that shows no signs of abating.
- We should continue to see strengthening of markets, especially in the U.S. South, along with higher timber yields.

Risks and Emerging Opportunities

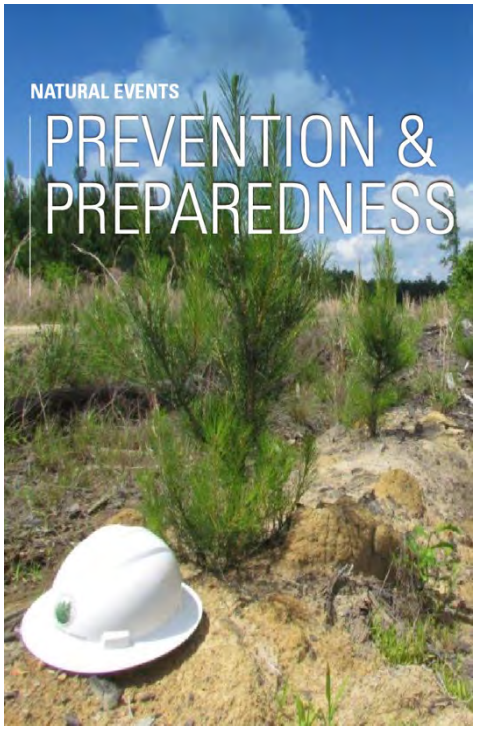
Risks

Systemic Risks

- Market Risk
- Regulatory and Policy Risks
- Physical Risks
  - The “Big Three” - Fire, Wind, Insects

Risk Mitigation

- Market - Diversification
- Regulatory, Legal, and Policy Risks – Active engagement with policy makers through the National Alliance of Forest Owners (NAFO)
- Physical Risks - Mitigation
  - Advanced Genetics and Breeding
  - Active Forest Management
    - Healthy trees are more resistant to threats
    - Plowing fire lanes and road maintenance
  - Early Detection and Response Time



Physical Risks are Low – The average annual losses for Mountainside have been 3 basis points over the past 5 years (2016-2020)

Emerging Opportunities

Carbon

- Significant focus in the media
- Increasing option value for landowners
- Marketplace has grown significantly to about $2 billion annually – but it is still relatively new and evolving rapidly
- Mountainside Timber's forest assets currently store 13.8 million metric tons of carbon – *equivalent to the amount of carbon emitted by 3 million passenger cars each year*

Solar Opportunities

- Solar energy has also seen significant growth (with half of all new projects being launched in the U.S. Southeast)
- TIR has spent several years working to enhance opportunities with solar developers that focus on sourcing rural lands for large-scale projects
- Solar opportunities provide enhanced economics for landowners (at least 3X+ values relative to traditional timberland valuations)

Recreation and Conservation Values

- With 250 square miles of land, demographic influences and land value uses change over time pushing values into other higher and better uses such as recreation values (~25% premiums) and conservation values (~30% premiums)
- COVID has accelerated demand especially for recreational properties

Thank you for your business!

Biographies

Mark T. Seaman, President and Chief Investment Officer

seaman@tirllc.com | 404-848-2000

Mark directs all business and investment strategy and operations for TIR and also serves as the firm's chief investment officer, directing portfolio strategy and management. He has more than 30 years of senior management experience in the timberland investment arena and he founded TIR in 2003. Mark was previously executive managing director of Wachovia's timberland investment business. During his tenure with Wachovia, he grew the company's timberland assets under management from $60 million to almost $1.4 billion and directed all phases of its timberland investment business. His responsibilities entailed developing and managing the company's core investment strategy, which entailed establishing its investment discipline and building its portfolio management, accounting, reporting, compliance, marketing, sales and product development functions.

In addition to helping to launch and expand two, highly successful timberland investment management organizations (TIMOs), Mark also has been directly involved in the development of more than 15 separate account and 6 commingled fund programs on behalf of numerous institutional investment clients.
These efforts have included directing more than 150 acquisitions encompassing more than 1.85 million acres in 12 states and managing more than 180 dispositions involving more than $400 million in assets. Because of his success in this regard, Mark is widely recognized among TIMO senior executives for his disciplined investment approach and his capacity to make and manage investments that are supportive of clients' unique risk and return objectives.

Mark is a graduate of Virginia Polytechnic Institute and State University where he received a BS degree in forest management. He also is a Registered Forester, a Certified Forester and a member of Society of American Foresters.

Tom E. Johnson, Managing Director, Client Service and Business Development

johnson@tirllc.com | 617-264-4769

Tom is responsible for all client relationship management and he directs the firm's domestic and international business development efforts. He was a founding member of TIR and plays key roles in shaping its strategic direction and overseeing the implementation of its core investment strategy on behalf of clients. This includes participating in all buy-hold-sell decisions and establishing operational parameters and priorities for the management of the company's business and portfolios.

Tom began his career at Wachovia where he spent ten years managing significant client relationships in the institutional investment and corporate trust markets. In that capacity, he served as the bank's West Coast territory manager, which entailed directing all business development and client relationship management activities in support of its retirement and charitable fund clients. Prior to joining Wachovia, Tom was a principal consultant at PricewaterhouseCoopers Management Consulting. In that role, he was an industry advisor to global investment management firms, managing major projects that influenced the implementation of clients' business operations and marketing functions.

In addition to his years of experience in the institutional investment arena, Tom is a forester who grew up in a saw-milling family in North Carolina. This background gives him a unique perspective on the timberland asset class - enabling him to provide valuable counsel to TIR with regard to the firm's strategic direction and to consistently reflect and represent the needs and interests of its clients.

Tom is a graduate of Appalachian State University where he earned a BSBA in finance. He earned his MBA and MS in forest resources, with honors, at the University of Georgia and is a member of the Phi Kappa Phi honor society. He holds the designation of Chartered Alternative Investment Analyst (CAIA^{SM}) and also has completed Level I of the Chartered Financial Analysts' exam.

Chung-Hong Fu, Managing Director, Economic Research and Analysis

fu@tirllc.com | 404-848-2000

Hong oversees all economic and market analysis and forecasting for TIR and plays a key role in the development and Implementation of the firm's investment strategy. He was a founding member of TIR and was instrumental in establishing the firm's research-driven investment ethic.

Hong began his career at Temple-Inland Forest Products Corporation where he served as a resource utilization specialist and business analyst. In these roles, he provided economic and research analysis services that were used by senior executives within the company to make strategic decisions across a range of issues, including asset securitization, acquisitions and resource and business optimization. Prior to joining TIR in 2003, Hong served as senior investment analyst with Global Forest Partners where he performed global timber acquisition analysis, created a variety of decision support models and directed currency risk management analysis.

Hong is recognized in the timberland investment arena for his measured and comprehensive analysis of the trends and events that drive investment performance and that influence the long-term risk and return profile of the timberland asset class. He writes extensively on these and related issues and is frequently consulted by market participants and analysts, including the news media, for his unique and well-informed perspectives.

Hong is a graduate of Northwestern University where he received a BS in biology. He also earned an MS in environmental management at Duke University and an MBA at Columbia University. He received his Ph.D. in forest economics at North Carolina State University.

Christopher T. Mathis, JD, Managing Director, Real Estate

mathis@tirllc.com | 404-736-3486

Chris oversees TIR's asset monetization efforts on behalf of clients by developing and executing land sale strategies that are designed to optimize the long-term investment performance of clients' portfolios. In addition, he plays a key role in the land acquisition analysis process.

Chris has a broad range of experience in timberland finance, law and operations in the forest products industry. He previously held a variety of senior leadership positions at Temple-Inland, including: Vice President of Treasury and Investor Relations; Vice President of Strategic Resource Planning; and, Senior Corporate Attorney. During his tenure at Temple-Inland, Chris led the sale of 1.55 million acres of the company's high quality timberland assets for $2.4 billion in a tax-deferred manner. Chris also managed Temple-Inland's treasury and investor relations departments through the financial crisis and the sale of the company to International Paper in February 2012 for $4.3 billion. In addition, he served on the company's pension investment committee that managed the company's defined benefit plan assets of $1.3 billion. Just prior to joining TIR, Chris headed the Mathis Property Group, where he consulted with a family-office to evaluate opportunities to invest in timberland and other real estate asset classes.

Chris is a Texas native and holds a Bachelor of Business Administration, Master of Business Administration, and Doctor of Jurisprudence from Texas Tech University. He also completed the Stanford University Executive Program at the Stanford Graduate School of Business.

Important Notice

These materials (the “Materials”) and the information contained herein are being provided to Alaska Retirement Management Board (“you” or the “recipient”) to provide information regarding Timberland Investment Resources, LLC (“TIR”) and the timberland portfolio that TIR manages on behalf of the recipient (the “Portfolio”). The Recipient should not construe the contents of the Materials as legal, tax, accounting, investment or other advice. The Recipient should make its own inquiries and consult its advisors as to legal, tax, financial, and other relevant matters concerning any investment, including the Portfolio. The indicative terms and other information included in the Materials are incomplete, subject to change and are provided for discussion purposes only.

The Materials are not an offer to sell a security nor the solicitation of an offer to buy a security and no offer or solicitation should be implied by the delivery of the Materials. The Materials and related information about the Portfolio cannot be used in conjunction with the marketing of any product or security in any jurisdiction, and the Materials may not be distributed in any jurisdiction except in accordance with legal requirements applicable in such jurisdiction. Recipients should not rely on the Materials in making any future investment decision. Statements contained in the Materials are based on current expectations, estimates, targets, projections, opinions and beliefs of TIR. Such statements involve known and unknown risks, uncertainties and other factors. These and other forward-looking statements contained in the Materials are speculative in nature, involve a number of assumptions which may not prove to be valid, and may be changed without notice. “Forward-looking statements” can be identified by the use of forward-looking terminology such as “may,” “will,” “seek,” “should,” “expect,” “anticipate,” “project,” “estimate,” “intend,” “continue,” “target,” “plan” or “believe” or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, actual events or results or the actual performance of the Portfolio may differ materially from those reflected or contemplated in such forward-looking statements. No reliance may be placed for any purpose whatsoever on the information, representations or opinions contained in the Materials, and no liability is accepted for any such information, representations or opinions, nor does TIR or any other person, to the maximum extent permitted by law, accept any responsibility or liability whatsoever for any direct or indirect loss howsoever arising from the use of the Materials.

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Performance Information. In considering any target or projected performance information contained herein, the Recipient should bear in mind that such information is not necessarily indicative of future results. While the targeted or projected returns are based on assumptions regarding estimates of underlying cash flows, current business plans, timing, financing terms and residual values for the investments which TIR believes are reasonable, there can be no assurance that such results will actually be realized or that capital contributed by the Recipient will be returned. Such assumptions are made solely for purposes of underwriting or valuing investments and are not for purposes of projecting returns on such investments, the eventual realization value of such investments or the Portfolio’s overall performance. Actual gross and net returns for the Portfolio may vary significantly from any targeted or projected returns set forth herein and will depend on, among other factors, future operating results, the availability and terms of financing, 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 targeted or projected returns are based.

Information regarding expected market returns and market outlooks is based on research, analysis, and opinions of certain members of TIR. These opinions are speculative in nature, may not come to pass, and are not intended to predict the future of any specific investment. Certain factual economic and market information contained herein has been obtained from published sources prepared by other parties and has not been independently verified by TIR. While such sources are believed to be reliable, TIR does not assume any responsibility for the accuracy or completeness of such information.

Past performance is not indicative of future results. In considering the operating history contained herein, recipients should bear in mind that such operating history is not necessarily indicative of future results, and there can be no assurance or guarantee that TIR or the Portfolio will achieve comparable results in the future.

Images contained herein are for illustrative purposes only.

TIMBERLAND
INVESTMENT RESOURCES LLC

Growing value for our clients every day

Thank You

IFM Investors

Mandate: **IFM Global Infrastructure Fund** **Hired:** **2015**

Firm Information

IFM Investors, established in 1995, is a global fund manager owned by 23 Australian pension funds.

IFM has a global team of more than 570 staff, including more than 100 investment professionals on the infrastructure team in offices across the globe.

As of 6/30/2021, the firm's total assets under management were approximately $128.5 billion across infrastructure (equity), debt, listed equities, and private equity asset classes. As of 6/30/2021, the net asset value of the IFM Global Infrastructure Fund ("the Fund") was $33.9 billion.

Key Executives:
Kyle Mangini, Head of Infrastructure - Global
Julio Garcia, Head of Infrastructure – North America
Christian Seymour, Head of Infrastructure – Europe
Michael Hanna, Head of Infrastructure - Australia

Investment Approach

IFM Investors believes a professionally managed portfolio of infrastructure assets can provide long-term institutional investors with significant benefits: portfolio diversification, participation in economic growth, protection from inflation, asset-level earnings resilience, and portfolio risk management. Infrastructure assets can also help investors to match their long-term liabilities with long-term investments.

IFM seeks to construct and maintain a portfolio which consist of long-term, core infrastructure assets. Core infrastructure assets typically have monopoly-like characteristics, strong market positions, a reliable regulatory environment, high barriers to entry, limited demand-elasticity, exposure to inflation and economic growth, and long lives.

The Fund utilizes an open-end structure that suits the long-lived nature of the assets and provides investors with vintage year diversification, embedded growth opportunities with strategic partners, and the alignment of long-term liabilities with long-lived infrastructure investments.

The Fund's foreign currency exposure is hedged, to the extent that it is reasonably practicable and prudent, against currency movements.

Target Portfolio Return: 8-12% per annum, net of fees

Total ARMB Mandate

Assets Under Management:
6/30/21: $609,586,655

Concerns: None

6/30/2021 Performance

	Last Quarter	1-Year	3-Years Annualized	6-Years Annualized	6.25-Years Annualized
Manager Gross	6.70%	15.47%	12.58%	12.73%	12.40%
Fee	.21%	.82%	.74%	.76%	.72%
Manager Net	6.49%	14.65%	11.84%	11.97%	11.68%
CPI+4%	3.49%	9.39%	6.54%	6.19%	6.27%

IFM Investors

IFM Global Infrastructure Fund

Alaska Retirement Management Board

Important Disclosures

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Past performance does not guarantee future results. The value of investments and the income derived from investments will fluctuate and can go down as well as up. A loss of principal may occur.

This material may contain information provided by third parties for general reference or interest. While such third party sources are believed to be reliable, IFM Investors does not assume any responsibility for the accuracy or completeness of such information.

This material does not constitute investment, legal, accounting, regulatory, taxation or other advice and it does not take into account your investment objectives or legal, accounting, regulatory, taxation or financial situation or particular needs. You are solely responsible for forming your own opinions and conclusions on such matters and for making your own independent assessment of the information in this material.

Risks of IFM Investors' investment programs typically include: assets of IFM Investors funds may have limited liquidity; distributions are uncertain, a return on your investment is not guaranteed and you may lose all or a substantial amount of your investment; unfavorable economic conditions in the markets in which IFM Investors funds operate could adversely affect your investment; assets acquired with leverage have risks including loss of value and limits on flexibility needed if there are changes in the business or industry.

Liquidity- An investment in the Partnership provides limited liquidity since withdrawal rights are not unqualified and Interests may not be transferred without the prior written consent of the General Partner, which generally may be withheld in its absolute discretion. Although the portfolio investments may generate some current income, they are expected to be generally illiquid.

Valuation- Most of the portfolio investments will be highly illiquid, and will most likely not be publicly traded or readily marketable.

Economic conditions- Interest rates, general levels of economic activity, the price of securities and participation by other investors in the financial markets may affect the value of portfolio investments made by the Master Fund or considered for prospective investment.

Leverage- Portfolio investments may include businesses whose capital structures may have significant leverage.

Economic conditions- Interest rates, general levels of economic activity, the price of securities and participation by other investors in the financial markets may affect the value of portfolio investments made by the Master Fund or considered for prospective investment.

An infrastructure investment is subject to certain risks including but not limited to: the burdens of ownership of infrastructure; local, national and international economic conditions; the supply and demand for services from and access to infrastructure; the financial condition of users and suppliers of infrastructure assets; changes in interest rates and the availability of funds which may render the purchase, sale or refinancing of infrastructure assets difficult or impractical; changes in environmental and planning laws and regulations, and other governmental rules; environmental claims arising in respect of infrastructure acquired with undisclosed or unknown environmental problems or as to which inadequate reserves have been established; changes in energy prices; changes in fiscal and monetary policies; negative economic developments that depress travel; uninsured casualties; force majeure acts, terrorist events, under insured or uninsurable losses; and other factors beyond reasonable control. Please consult the constituent documents for more information on risks specific to infrastructure investing. An investment in any of these investment programs should be made only after careful review of the risk factors described in the related offering documents.

This material is confidential and should not be distributed or provided to any other person without the written consent of IFM Investors.

Presenters

Julio Garcia

Head of Infrastructure, North America

IFM Investors

Julio is responsible for IFM's infrastructure business in North America and manages the infrastructure team in the US.

Julio joined IFM Investors in January 2008 in Melbourne, Australia, and relocated to New York in 2014. Julio's experience includes senior roles in deal sourcing, investment evaluation, transaction execution, asset management, investment banking and strategy. Julio has led several major infrastructure investments and has been a director on the boards of various infrastructure companies, including the Port of Brisbane, NSW Ports, Ecogen Energy, Northern Territory Airports and Wyuna Water. Prior to joining IFM Investors, Julio held positions with Viant Capital, Bank of America, Robertson Stephens and Gemini Consulting.

Julio holds a Master's Degree in Business Administration from the Stanford University Graduate School of Business, and a Bachelor of Arts (Public Policy) degree from Stanford University.

David Altshuler

Head of North America, Global Relationship Group

IFM Investors

David is an Executive Director, Head of North America's Global Relationship Group at IFM Investors, where he is responsible for product development for the firm.

David has more than 18 years of equity and debt investment experience in infrastructure, energy, and natural resources sectors. Prior to joining IFM Investors, David was the founding partner of StepStone Infrastructure and Real Assets, where he was responsible for constructing and managing portfolios of funds and co-investments for institutions globally. David spent the first part of his career at Nuveen Investments, where he was a member of the infrastructure financing team.

David holds a PhD (University of Chicago).

Contents

Section	Topic	Page
1	IFM Investors Firm Overview	4
2	IFM Global Infrastructure Fund	7
3	LP Performance	13
4	Asset Management and Responsible Investment	15

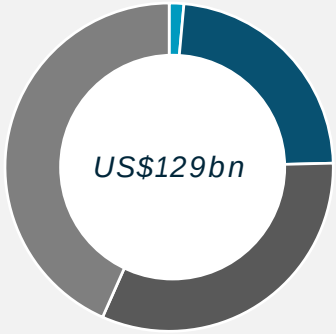
IFM Investors Firm Overview

Firm Overview

IFM Investors is a truly aligned global fund manager investing across multiple asset classes

Established & owned by 23 pension funds

US$129 billion across four asset classes[1]



- Infrastructure Equity **$55.9bn**
- Debt Investments **$37.9bn**
- Listed Equities **$34.0bn**
- Private Equity **$0.4bn**

10 global locations

New York | Berlin | Melbourne | Hong Kong | Amsterdam

London | Zurich | Sydney | Seoul | Tokyo

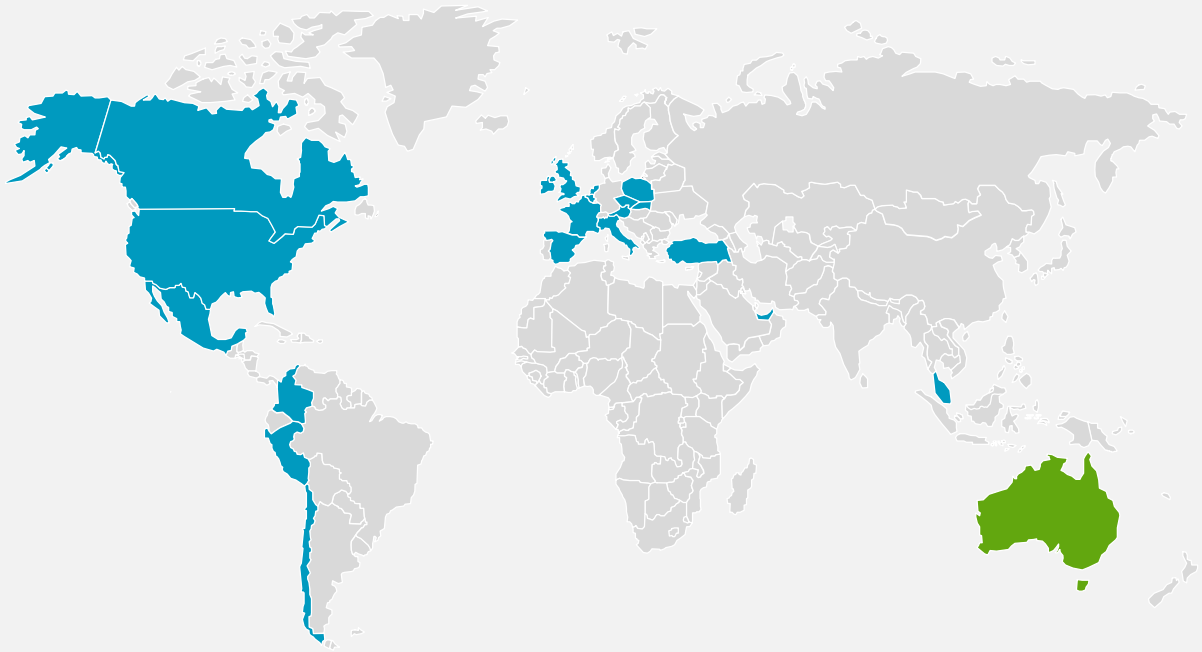
A distinct ownership model, focusing on the prosperity of our investors

(1) As at 30 June 2021. US $129bn represents the FUM of investments and undrawn investor commitments. Differences may be due to rounding.

Infrastructure Equity

With a track record over two decades, IFM Investors is an established infrastructure equity manager with global scale

US$ 56 BN	Funds Under Management
2	Open-end infrastructure equity fund
26	Years investing in infrastructure
100+	Infrastructure investment professionals
80+	Transactions since 1995
33	Portfolio Companies



Global Infrastructure Fund (GIF)
Incepted in December 2004
18 Portfolio Companies

Australia Infrastructure Fund (AIF)
Incepted in August 1995
15 Portfolio Companies

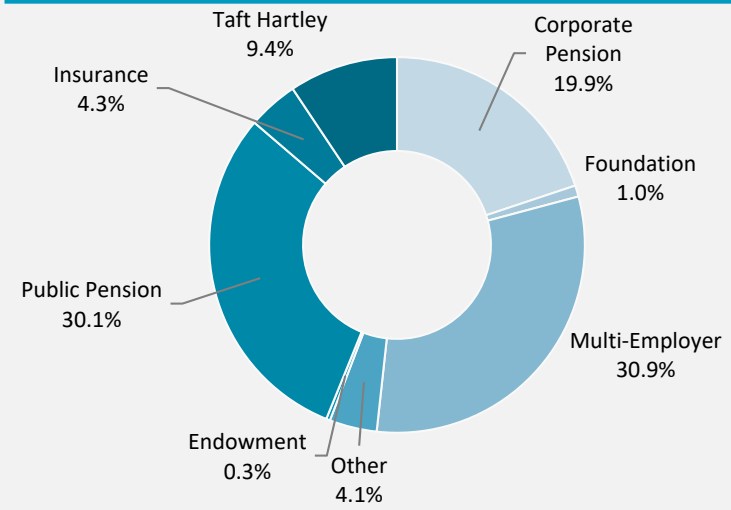
All figures as at 30 June 2021. Differences may be due to rounding.

GIF Investor Base

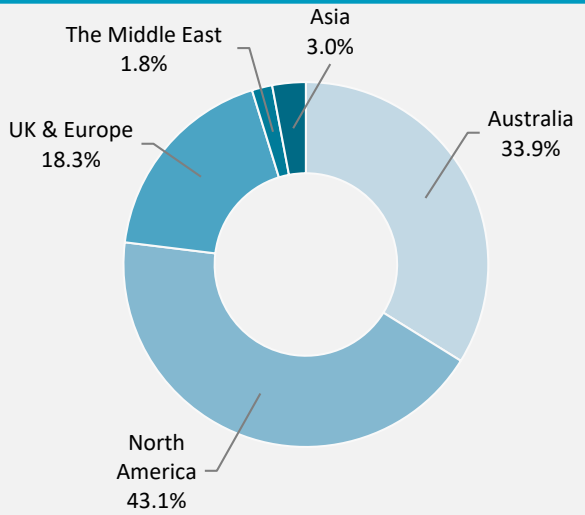
IFM Investors manages infrastructure investments for long-term institutional investors globally, with impacts on our investors' 30 million+ members and retirees.

Serving 487 investors

FUM by Investor Type (1)



FUM by Investor Region



As at 30 June 2021.
(1) FUM represents total NAV of the IFM Global Infrastructure Master Fund plus all undrawn investor commitments and cash available for investment in USD. Differences due to rounding. Past returns are not indicative of future performance.

IFM Global Infrastructure Fund

Targeted Investments

IFM GIF seeks to invest in essential infrastructure assets primarily in OECD countries

We target assets with distinct characteristics:

01 Strong market positions/ High barriers to entry

02 Long asset/ concession life

03 Inflation protection

04 Benefit from regional/global economic growth

05 Stable and predictable revenues

06 Stable regulatory environment

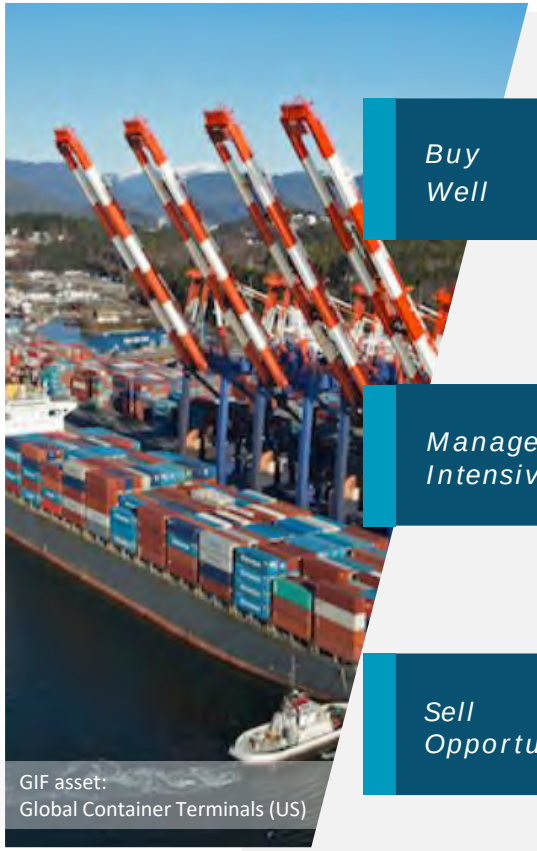
07 Targeting investment-grade financing

Target sectors

Transportation | *Utilities* | *Energy*

Investment Strategy

IFM GIF is focused on building and managing a diversified portfolio of essential infrastructure assets to deliver stable long-term returns



GIF asset:
Global Container Terminals (US)

Key building blocks of our investment strategy include specific goals through the investment cycle:

Buy Well

- A long-term partner aligned with government entities and strategics
- Opportunities sourced through 100+ dedicated specialists and senior advisors, extended sourcing network through portfolio companies' industry relationships
- Current portfolio is a platform for bolt on acquisitions and capital reinvestment

Manage Intensively

- Strong governance and active board representation
- Integrated Asset Management Specialist team driving global knowledge sharing and best practice
- Prudent and conservative approach towards leverage
- ESG principles embedded in investment decision and asset management

Sell Opportunistically

- Create value with a long-term return focus
- Sell to capture one-off market opportunities
- Partial divestments to rebalance portfolio and partner with strategic sponsors

IFM Global Infrastructure Fund (GIF)

IFM GIF's strategy is to manage a diversified portfolio of global infrastructure investments with *a net target return of 8-12% p.a. over the long term* [1]

Total Investment Value: $34.2 bn

Number of portfolio companies: 18

Weighted average leverage: 36.4%

Net Return	1-Year	3-Year	5-Year	7-Year	10-Year	Since Inception
GIF Net Return[2]	**16.3%**	**11.4%**	**13.0%**	**12.4%**	**10.8%**	**9.2%**
US LP Net Return[3]	**14.6%**	**11.7%**	**12.5%**	**n.a.**	**n.a.**	**12.3%**

6.3% p.a. net cash yield since inception [4]

GIF's total return seeks a significant contribution from cash yield over the medium to long term.

Past returns are not indicative of future performance. All figures as at June 30, 2021.

1. There is no guarantee that target returns will be realized. Actual returns may vary materially from target and past returns as a result of changes in the portfolio composition, such as acquisitions, divestments or material changes in business plan forecasts for individual assets. Returns are reported on an annualized basis.
2. The IFM Global Infrastructure Fund ("Master Fund") has been investing in core infrastructure assets globally ex-Australia since December 1, 2004 (including investments made through predecessor vehicles). The return series shown above is time-weighted, reported on an annualized basis, and reflects the aggregated performance of each asset's respective local currency performance at the Master Fund level, weighted by the USD proportionate equity value of each asset. In order to show net returns for the Master Fund return series, the highest Class A management and performance fees structure has been applied on a pro-forma basis. The Master Fund return series does not reflect the impact and costs of hedging and other expenses charged to the fund, which will further reduce returns. No representation is being made that the Master Fund return series reflects the returns of any feeder fund or the returns of an actual investor in the fund. Actual net feeder performance is available upon request. This information is provided for illustrative purposes only. Investment decisions should not be made solely based on the returns series shown above. Past performance is not indicative of future performance.
3. IFM Global Infrastructure (US) L.P. Class A is a hedged product for eligible US investors seeking access to core infrastructure located in globally developed economies ex-Australia. Returns are time-weighted as of June 30, 2021 net of taxes and fees, denominated in USD. Fund was incepted June 2016. Returns are reported on an annualized basis.
4. Cash yield for the IFM Global Infrastructure Master Fund represents aggregate feeder cash yield to investors on a NAV basis net of management and performance fees. Since inception cash yield is calculated as of the Fund's first distribution to investors on June 1, 2012. Returns are reported on an annualized basis.

Global Infrastructure Team

Kyle Mangini

Global Head of Infrastructure

Julio Garcia

Head of North America

Christian Seymour

Head of Europe

Michael Hanna

Head of Australia

10
years average tenure at IFM Investors(1)

20+
Languages Spoken

21
years average industry experience(1)

300+
support staff across Legal, Tax & Ops

100+
Professionals

85 *Investment Team*

Infrastructure specialists

- Origination and agile transactional capability
- Deal team continues to be responsible for asset management, ensuring alignment and continuity
- Deep sector knowledge

17 *Asset Management Specialists*

Support investment team for value creation across portfolio

- Managing key asset risks
- Enhancing asset performance
- Leveraging portfolio's scale to generate synergies

5 *Portfolio Management*

Improving efficiency of portfolio

- Portfolio insight
- Determining optimal asset allocations
- FX, structuring and liquidity management

Diverse Skill Set

- **IB/ Capital Markets**
- **Operations**
- **Regulation/ Government / Legal**
- **Project Management**
- **HR/Labour Relations**

(1) Representative of employees who are Director and above in title.

Portfolio Evolution

Buy and manage strategy with opportunistic exits

Since 2015, we've executed 18 acquisitions and follow-ons, representing US$20bn+ (1)

	2015	2016	2017	2018	2019	2021
18 New Acquisitions *c. $18bn*	Indiana Toll Road (US) Conmex (US)		VTTI (Global) & Follow-on OHL Mexico (Mexico) M6toll (UK) Mersin Port (Turkey)	FCC Aqualia (Spain, Czech Republic) GCT Terminals (US and Canada) Impala Terminal (Peru, Spain & Mexico) Aleatica (Global)	DCT Gdańsk (Poland) Buckeye Partners (US)	Enwave Energy Corporation (Canada)
5 Follow-ons/ Expansion *c. $2bn*		Vienna Airport (Austria)	Conmex (Mexico) Freeport Notes 2 (US)	Indiana Toll Road (US) VTTI (Global)		
Divestitures		Essential Power, Full (US) Indiana Toll Road, Partial (US)	Freeport Notes, Full (US) Duquesne Light, Full (US)	Conmex, Partial (Mexico) 50Hertz, Full (Germany) Freeport Notes 2 (US)	VTTI, Partial (Global)	Indiana Toll Road, Partial (US)

Main Reasons for divesture

- Portfolio Diversification
- Strategic Considerations
- Opportunistic Exit

(1) Investments made since 2015 have been included. This is not a representation of all investments completed since the inception of the Global Infrastructure Fund.
It should not be assumed that the investments shown herein will be profitable or that investments made in the future will be profitable or will equal the performance of the investments shown herein.
A complete list of historical investments in the portfolio is available upon request.

IFM Global Infrastructure Fund

Diversified portfolio of investments

18 portfolio companies across 20+ countries[1]

Americas

Colonial Pipeline
US, 2007
The largest refined product pipeline system in U.S.

Global Container Terminals
US & Canada, 2018
Portfolio of container terminals in Vancouver and NY/NJ

Buckeye Partners, L.P.
US, 2019
Energy midstream company with over 130 years of operating history

Freeport LNG
US, 2014
Natural gas liquefaction and export facility

Indiana Toll Road
US, 2015
157-mile toll road in the State of Indiana

enwave
Canada, 2021
Fully integrated district energy business – cooling & heating

Global

aqualia
Spain and Global, 2018
One of the world's largest private water groups

vtti
Global, 2017
Portfolio of energy midstream marine terminals across five continents

ALEATICA
Americas, Italy & Spain, 2015
Portfolio of transportation infrastructure concessions with 20 assets

impala
Global, 2018
Portfolio of essential base metals terminals

Europe

arqiva
UK, 2004
Broadcast & wireless communication infrastructure

Veolia Energia Polska
Poland, 2006
District heating and cogeneration plants

Anglian Water Group
UK, 2006
4th largest water supply and sewerage company in England

MIP
Turkey, 2017
Turkey's largest import/export port

MAG
UK, 2013
One of the top three airport operators in the UK

VIE Vienna International Airport
Austria, 2014
The primary airport in Austria and a gateway to Eastern Europe

M6toll
UK, 2017
A 43km, dual three-lane tolled motorway

DCT.GDANSK.SA
Poland, 2019
The largest container port in Poland and the Baltic Sea

As at 30 June 2021. Portfolio holdings shown are as of the date noted, may not represent all of the portfolio's current holdings, and are not representative of future investments.
Note: Year indicates initial acquisition year. Certain assets have subsequent transactions (follow-on investments or partial divestments).

(1) Country exposures outlined here reflect material asset exposures (based on contribution to total EBITDA) across our portfolio companies. GIF has assets located in 45 countries, of which 21 countries account for 98%+ of the portfolio

Looking Through GIF

The assets in GIF's portfolio provide essential services to the global economy

40,000+
Operating employees

20+
Countries represented in the portfolio[1]

US $1bn
Average deal size

7 airports

- Located across 5 countries

9 port facilities

- Located across 6 countries, including US and Canada

1,200 broadcast towers

- 1,750 mobile towers [2]
- >200 corporate customers

130+ storage terminals

- 200 mm barrels and 6+mm metric tons of capacity
- Across 20+ countries

17 toll roads

- Located across 8 countries
- 1,300+km in length

11,500 miles of pipeline

- Largest US refined products pipeline
- Flagship LNG export facility in Houston

400+ water concessions

- Located across 20+ countries
- >30 mm customers
- Regulated water in the UK & Czech Republic

As at 30 June 2021 unless otherwise indicated

(1) Country exposures outlined here reflect material asset exposures (based on contribution to total EBITDA) across our portfolio companies. GIF has assets located in 45 countries, of which 21 countries account for 98%+ of the portfolio.

(2) Including mobile towers under Master Sale and Servicing Agreement with Cellnex.

Performance

Alaska Retirement Management Board

IFM GIF US LP (Class B) Account Activity	Date	Amount (USD)
Initial Commitment	January 2, 2014	$200,000,000
Drawdown	May 13, 2015	$200,000,000
Additional Commitment	September 30, 2015	$50,000,000
Total Distributions Since Inception (Class B)	May 31, 2016	$3,089,338
Ending Capital Balance	May 31, 2016	$219,559,388
Net TWR Since Inception (%p.a.)	**May 31, 2016**	**9.28%**

IFM GIF US LP (Class A) Account Activity	Date	Amount (USD)
Switch from Class B	June 1, 2016	$219,559,388
Partial Drawdown	February 15, 2017	$25,000,000
Partial Drawdown	April 19, 2017	$25,000,000
Additional Commitment	October 3, 2016	$50,000,000
Drawdown	November 1, 2017	$50,000,000
Additional Commitment	March 9, 2018	$52,789,278
Partial Drawdown	July 1, 2019	$13,197,320
Partial Drawdown	October 23, 2019	$39,591,959
Total Distributions Since Inception (Class A)	July 31, 2021	$139,396,202
Ending Capital Balance	July 31, 2021	$584,311,515
Net TWR Since Inception (%p.a.)	**July 31, 2021**	**12.17%**

Notes:

1. Investor has chosen to receive distributions in CASH via wire.
2. Combined Partnership Net TWR Since Inception: 11.67%. Return calculated by annualizing the monthly returns since inception for the time in Class B and Class A. Returns are net of fees and are as of 31 July 2021.

Past performance is no guarantee of future results. Returns are shown net of all fees and all costs incurred by the investment programs, but before withholding taxes and other costs that are incumbent on clients. Nothing contained herein should be deemed to be a prediction or projection of future performance of any investment.

CONTACTS:

David Altshuler
Executive Director, Head of Global Relationship Group, North America
Registered Representative
Phone: +1 212 784 2266
Email: david.altshuler@ifminvestors.com

ifm investors

One purpose. Shared prosperity.

IFM (US) Securities, LLC

Member: FINRA/SIPC

IFM-31AUGUST2021-1817780

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Blockchain Presentation

Alaska Retirement Management Board

SEPTEMBER 2021

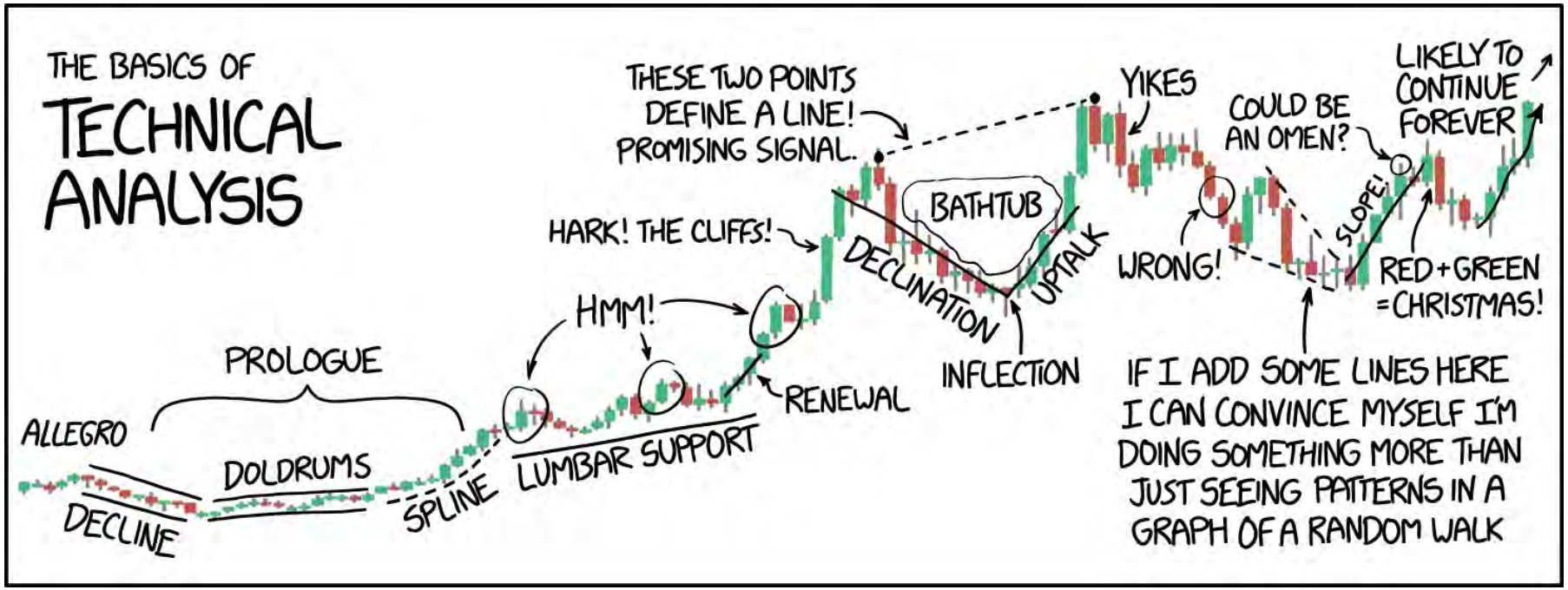
PATHWAY®
CAPITAL MANAGEMENT
1991 30 YEARS 2021

"Cryptocurrencies basically have no value and they don't produce anything. They don't reproduce, they can't mail you a check, they can't do anything, and what you hope is that somebody else comes along and pays you more money for them later on."

—WARREN BUFFETT

"[Bitcoin] is a remarkable cryptographic achievement... The ability to create something which is not duplicable in the digital world has enormous value...Lots of people will build businesses on top of that."

—ERIC SCHMIDT



Digital Money Takes Many Forms

- Many forms of digital money have existed dating back to at least the mid-1990s, but each required a central authority to **issue new currency** and/or **facilitate transactions**.

ONLINE MONEY TRANSFER

PayPal 1999

venmo 2009

Square 2010

EXCHANGE CURRENCIES

e-gold 1996

Liberty Reserve 2006

CORPORATE CURRENCIES

2004 World of Warcraft

2017 Fortnite

bitcoin 2009

- *Bitcoin* is a peer-to-peer, distributed digital ledger of transactions.
- Cryptography is used to allow third parties to audit transactions (“mining”) while keeping transactions pseudonymous.
- No central authority or double-spending.

What Is a Blockchain?

- A blockchain is like a spreadsheet duplicated thousands of times across a network of computers that can be added to but not edited.
- **Blocks** are like packages that contain verified data, and as new blocks are created, they are added to the end of chain to update the database.
- Blockchain records are public and verifiable, and because no centralized version exists, there is no trusted central authority or single point of attack for hackers.

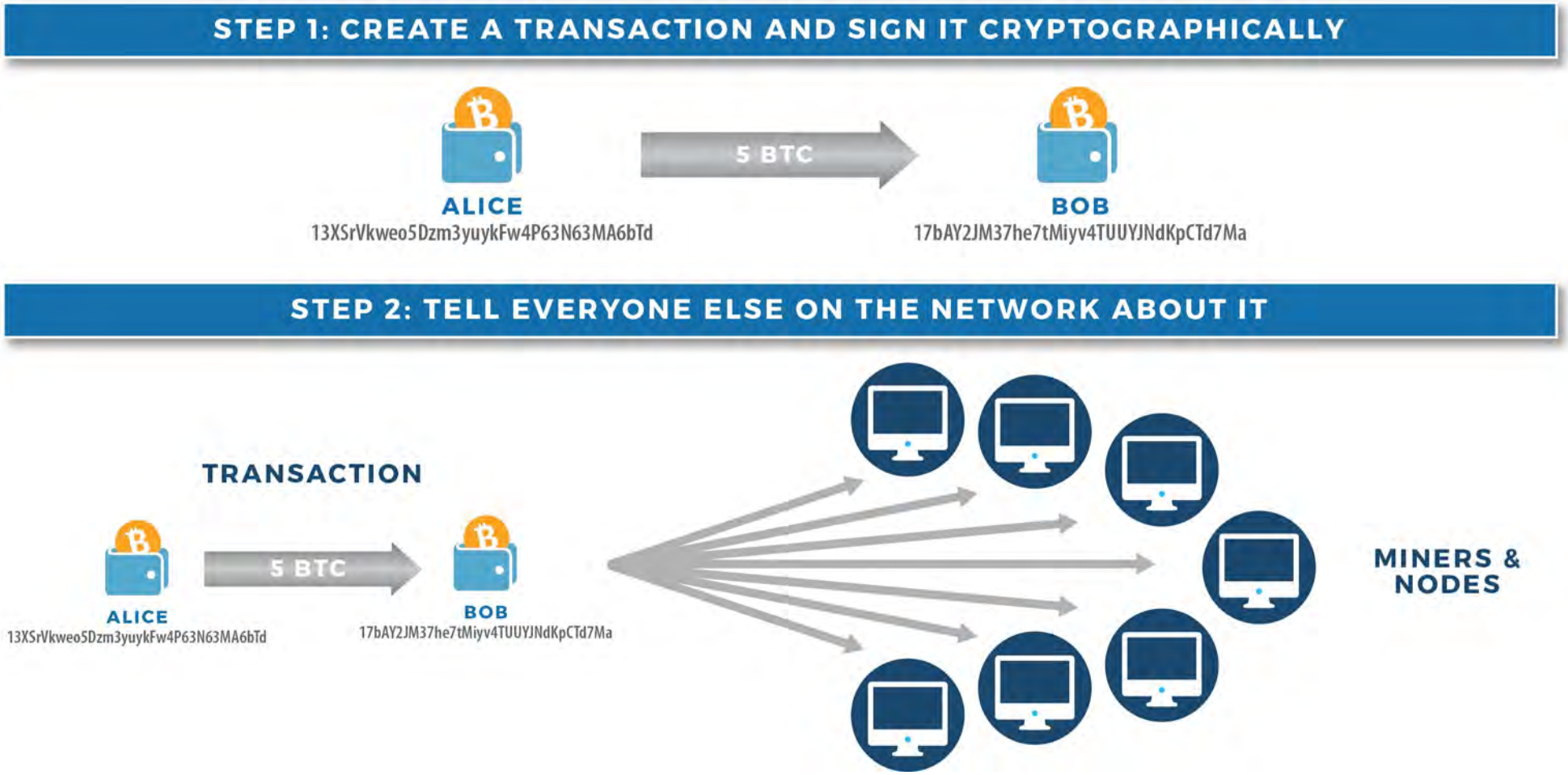
CENTRALIZED

DECENTRALIZED

DISTRIBUTED LEDGERS

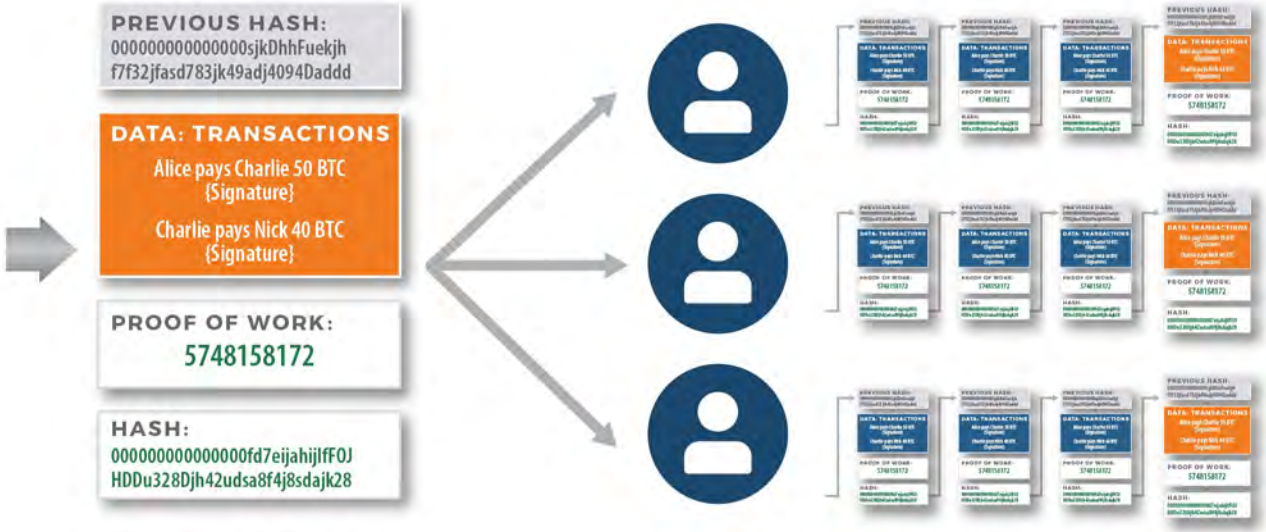
How Does a Transaction Work?

Alice has Bitcoin and wants to send some to Bob.



The Purpose of Mining

- Collect unverified transactions and combine them into a ”block.”
- Process the block by solving complex algorithms using high-powered computers and, in exchange, receive newly minted Bitcoin for providing the power to run the network.
- Eliminates the possibility of ”double spending” in the case of Bitcoin.
- Miners disseminate the new block to the entire network, increasing the size of the existing blockchain.



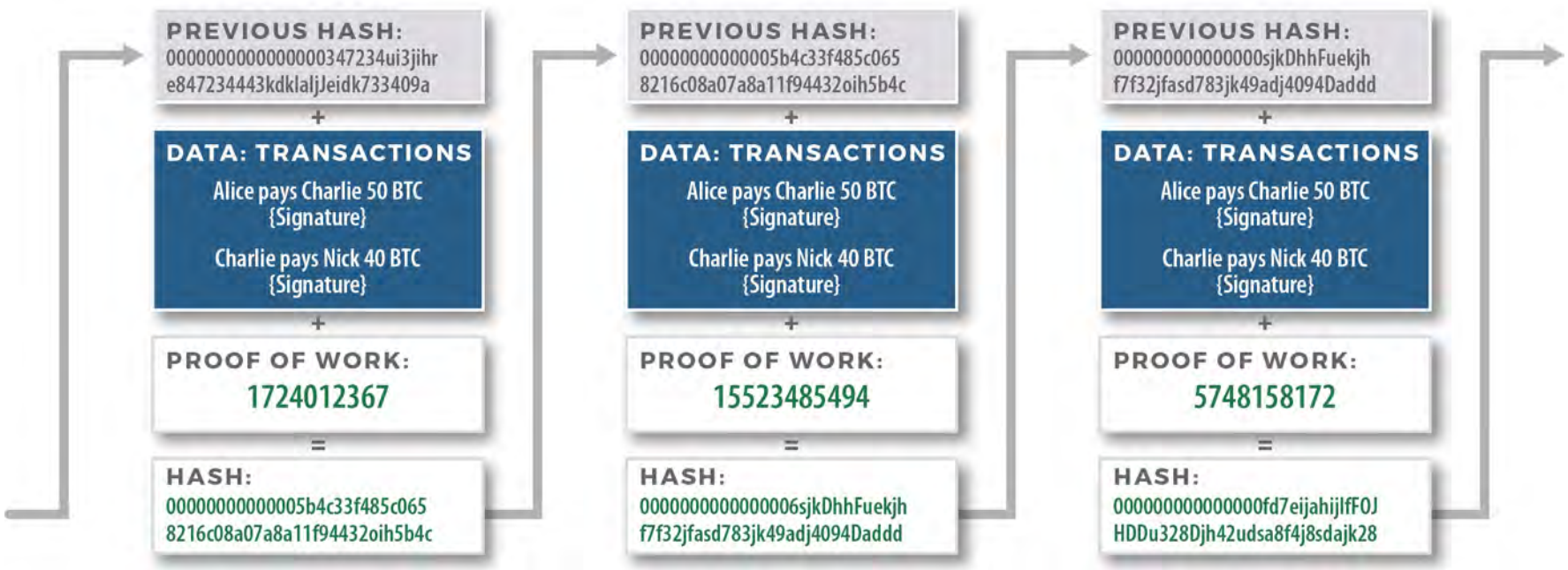
MINER

NEW BLOCK

BITCOIN NETWORK NODES

Bitcoin: A Distributed Digital Ledger

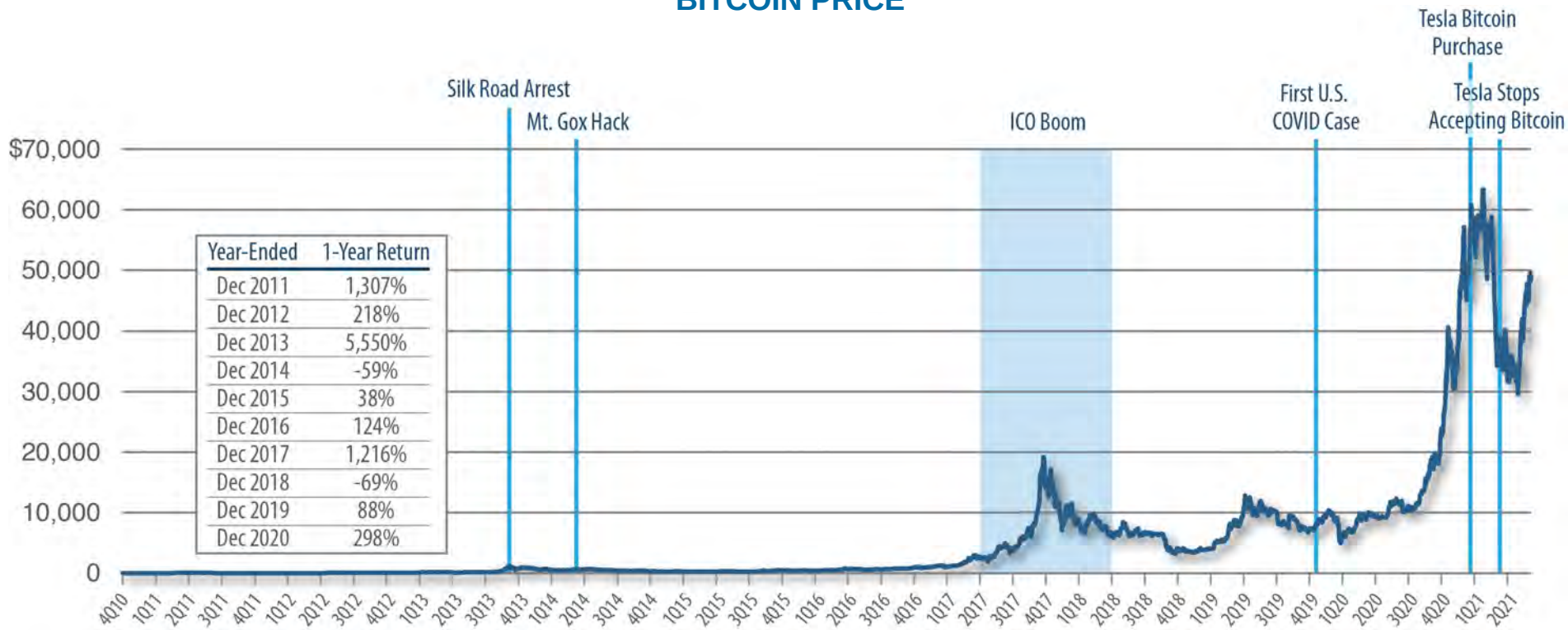
- Each Bitcoin “block” includes transactions, a hash that proves its algorithm has been solved, and importantly, **the hash of the block that came before it.**
  - If one person changes data in an old block, all subsequent blocks on that chain would be invalid and discarded by the network.
- Computers solving the algorithm are called “miners.” The first miner to successfully add the next block to the blockchain receives newly minted Bitcoin as a reward.



Investors Drawn by Spectacular Returns

- **$100** invested in Bitcoin in December 2010 would be worth ~**$16 million** today.
- Over the past year, the value of a Bitcoin has increased by more than 4x.
- However, there have been multiple sustained periods of decline for the currency.

BITCOIN PRICE



Year-Ended	1-Year Return
Dec 2011	1,307%
Dec 2012	218%
Dec 2013	5,550%
Dec 2014	-59%
Dec 2015	38%
Dec 2016	124%
Dec 2017	1,216%
Dec 2018	-69%
Dec 2019	88%
Dec 2020	298%

Institutional Interest—Direct and Indirect

COMPANIES

MicroStrategy
TESLA
Square
VISA

INVESTMENT MANAGERS

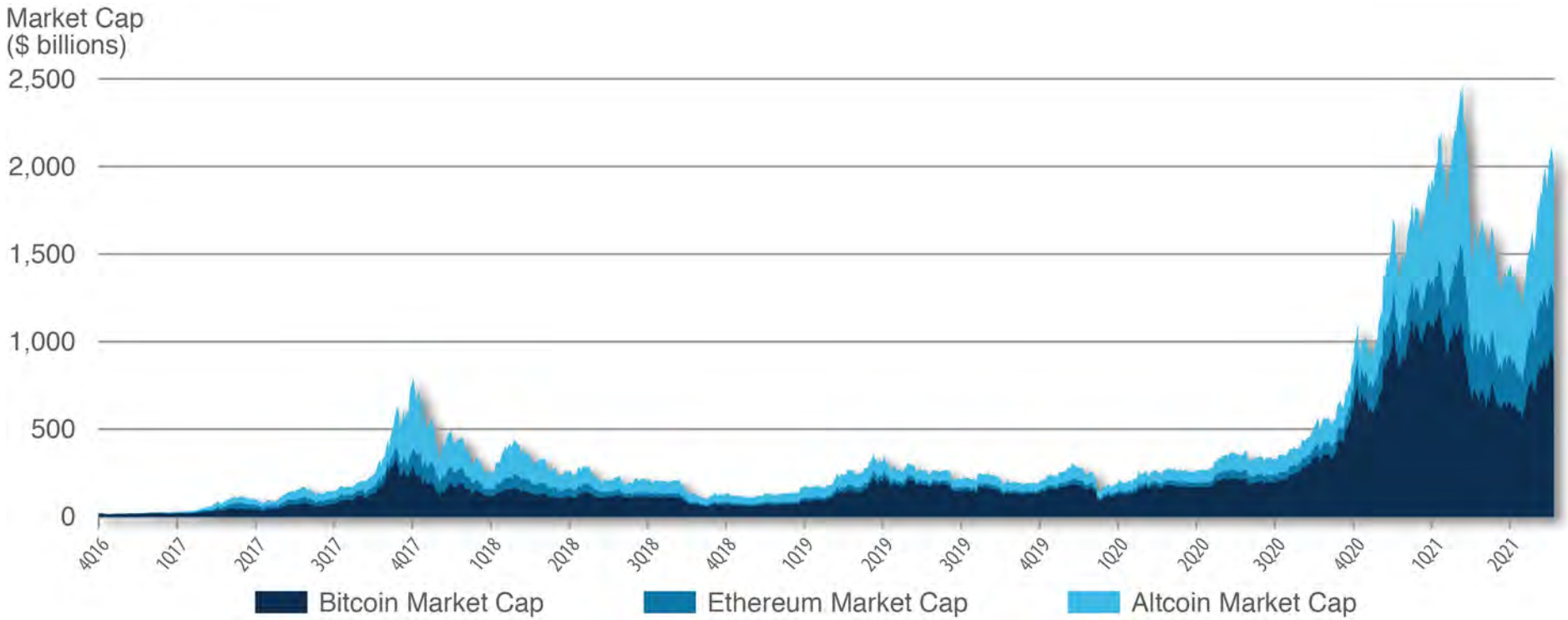
RUFFER
GRAYSCALE
fortress ASSET MANAGEMENT
GALAXY DIGITAL
PANTERA

PENSIONS & INSURANCE COMPANIES

KiwiSaver Poua he Oranga
CalPERS
MassMutual
NJDPB NJ Division of Pensions & Benefits

- Fidelity Investments last year found that 27% of financial institutions across the United States said they own cryptocurrencies or derivatives.
  - Despite a high participation rate, the dollar amounts invested by institutions are generally de minimis, although there is a small set of outliers.
  - Public information remains limited; a handful of high-profile announcements have attracted outsized coverage.

Total Cryptocurrency Market Cap Is ~~$0.5 trillion~~ ~~$1.5 trillion~~ ~~$2.5 trillion~~ ~~$1.3 trillion~~ $2.0 trillion



- Bitcoin has historically been the dominant asset, but it fell below 50% in May 2021 and has since remained below 50% (45%) as a result of other cryptocurrencies exploding in the past several years.

Rapid Fire News Cycle: August 23/24/25, 2021

Neuberger Berman Wins SEC Approval to Invest 5% Commodities Fund in Bitcoin Futures

Citigroup Sets to Begin Trading Bitcoin Futures for Institutional Clients

MicroStrategy Adds Up 3,907 BTC Units to Bring Total Assets to 108,992 Units

El Salvador Standing by to Rollout 200 ATMs for Converting Bitcoin to Cash

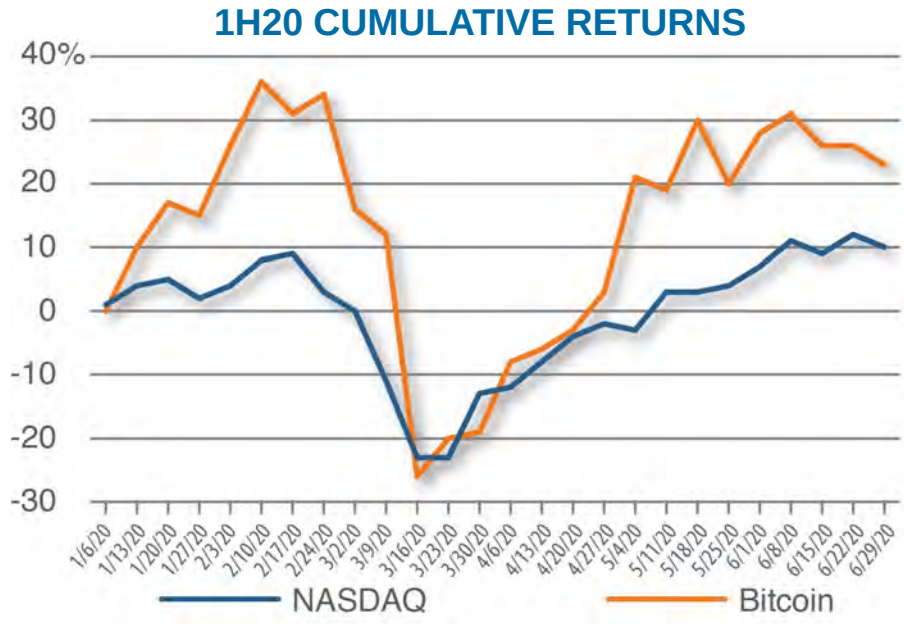
Visa Steps into NFT Craze with CryptoPunk Purchase of $150,000

Hacker Turns Hero? All Stolen Funds from the Poly Network Have now Returned

Practical Considerations

Correlations–Historically considered to be largely uncorrelated to the broader market, Bitcoin became positively correlated with several major asset types in 2020.

Custody–Many technical and security challenges associated with holding cryptocurrency assets.



ESG

- Estimates of Bitcoin's annual energy consumption are staggering and growing.
- Partial or complete anonymity has resulted in use in illicit activities.

Regulatory

- Uncertain landscape for various crypto assets and their associated applications.
- Central bank digital currencies (CBDCs) may prove to have serious domestic and foreign policy implications.

Investing in the Crypto Universe through Multiple Avenues

DIRECT INVESTMENT

INDIRECT INVESTMENT

INVESTING DIRECTLY INTO TOKENS

coinbase, GEMINI, Ledger

INVESTING THROUGH A CUSTODIAN/TRUST

Fidelity INVESTMENTS, GRAYSCALE, coinbase Custody

CRYPTOCURRENCY HEDGE FUNDS

DACM, BAM BLOCK ASSET MANAGEMENT, alpha sigma capital

TRADITIONAL VC INVESTMENT

USV, ANDREESSEN HOROWITZ, PANTERA, DIGITAL CURRENCY GROUP

PUBLICLY TRADED COMPANIES

Robinhood, MARATHON DIGITAL HOLDINGS, NVIDIA

Venture Capital Involvement

- Since the beginning of 2021, 452 crypto asset- and blockchain-related startups have already received a record $16.3 billion in funding—an increase of $12.1 billion compared with total calendar-year 2020 fundraising activity.
- 7 of the 10 largest fundraisings ever held have occurred over the past 13 months; these collectively represent $6.8 billion in funding and signal an increase in blockchain interest.

2021 FUNDRAISING ACTIVITY

Company	Description	Funding Date	Stage	Amount Raised ($MM)	Post-Money Valuation ($MM)	Notable Investor(s)
robinhood	Brokerage	Jan-21	Convertible Note, Series H	**3,400**	NA	Sequoia, IVP, Index, NEA, a16z
FTX	Trading Platform	Jul-21	Series B	**900**	18,000	Insight, Lightspeed, Sequoia, Thoma Bravo
Revolut	Banking	Jul-21	Series E	**800**	33,000	Tiger Global, SoftBank
Ledger	Custody Hardware	Jun-21	Series C	**380**	1,500	FirstMark Capital, Draper Associates
BlockFi	Banking	Mar-21	Series D	**350**	3,000	Breyer Capital, Bain Ventures, Tiger Global
Dapper	NFT & Gaming	Mar-21	Venture Round	**350**	2,478	a16z, Coatue, USV
Fireblocks	Custody Service	Jul-21	Series D	**310**	2,000	Coatue, Sequoia, Spark Capital
BLOCKCHAIN	Blockchain Explorer & Exchange	Mar-21	Series C	**300**	5,200	Lightspeed Venture Partners
PAXOS	Brokerage	Apr-21	Series D	**300**	2,400	Oak HC/FT, PayPal Ventures
Bullish	Trading Platform	May-21	Venture Round	**300**	NA	Block.one, Founders Fund, Galaxy Digital Partners

SOURCE: PitchBook Data, Inc.
NOTES: Fundraising activity represents venture capital-related activity and does not include pending, or rumored transactions.
NA=Not applicable.

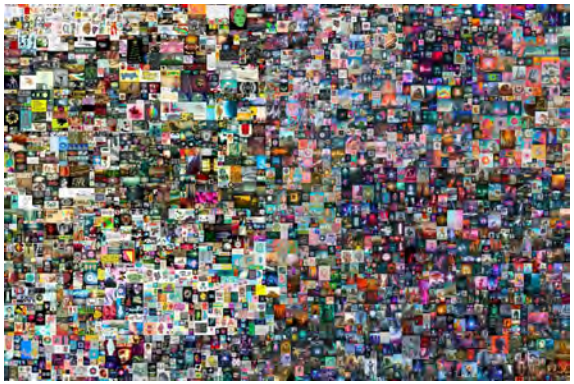
Blockchain ≠ Bitcoin

- As of August 2021, there are thousands of crypto assets/tokens ("altcoins") that employ blockchain technology to address a variety of different use cases.

SMART CONTRACTS	Ethereum	Cardano	Solana	Stellar
DE-FI	Uniswap	Wrapped Bitcoin	Aave	Maker
STABLECOINS	Tether	USDC	Binance USD	DAI
NFTS	Flow	CryptoPunks	Mana	OpenSea
OTHER	Doge	Filecoin	Monero	Polygon

Non-Fungible Tokens (NFTs)

Somebody just paid $1.3 million for a picture of a rock —CNBC, August 23, 2021



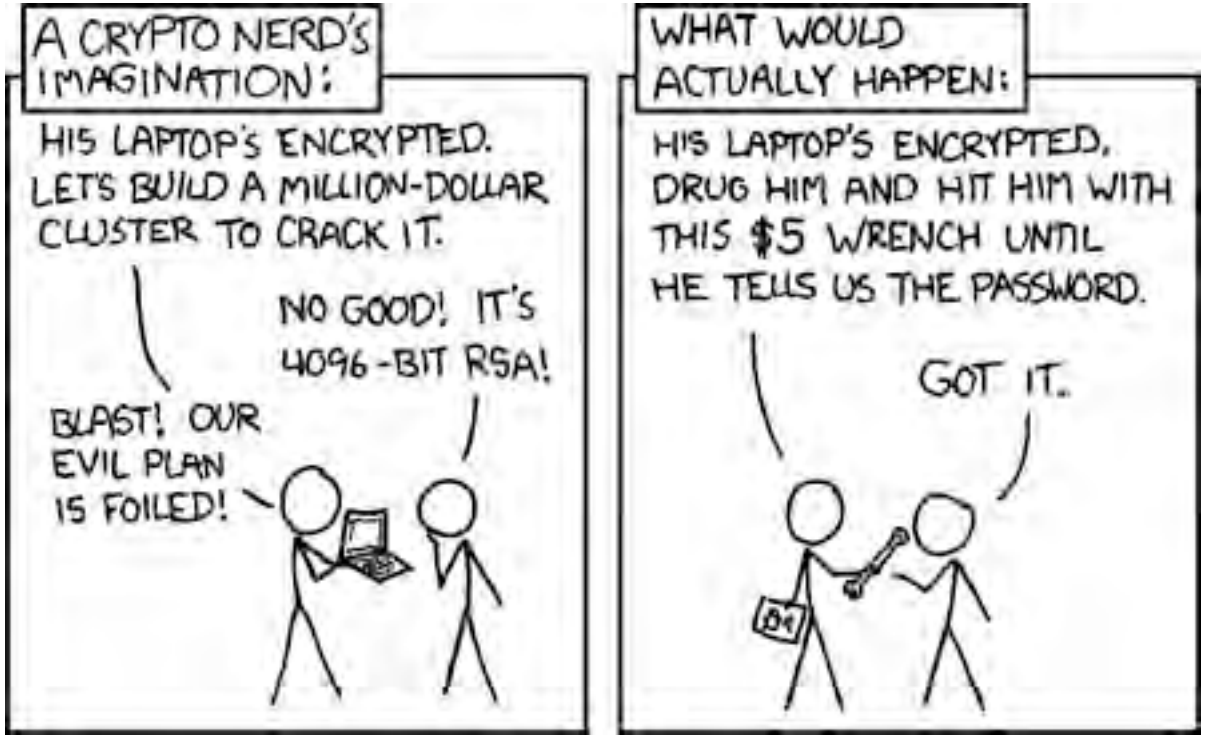
Beeple sold an NFT for $69 million—The Verge, March 11, 2021

“Disaster girl” makes $500,000 in NFT sale of her viral meme—Axios, April 29, 2021

Who Spends $140,000 on a CryptoKitty? —*The New York Times,* May 18, 2018

NBA Top Shot: $230 million spent trading video highlights—CNBC, February 28, 2021

Q&A Time



pathwayresearch@pathwaycapital.com

Abbott Capital Management, LLC

Mandate: **Private Equity** **Hired:** **1998**

Firm Information

Abbott is a leading independent investment management firm founded in 1986. Abbott focuses exclusively on private equity by making primary commitments, secondaries, and co-investments for both Abbott sponsored commingled funds, and separate account clients in professionally managed venture capital, growth equity, buyout, and special situations funds. Since inception, Abbott has committed more than $22 billion to more than 550 private equity investments on behalf of its clients, and currently manages over $12 billion in assets.

Abbott is registered as an investment advisor with the SEC in the United States and its UK subsidiary is authorized and regulated by the FCA. The firm has offices in New York and London.

As of 9/01/21, Abbott has 60 employees, including 18 investment professionals.

Key Executives:
Jonathan Roth, Co-President
Leonard Pangburn, Co-President
Matthew Smith, Managing Director

Investment Approach

Abbott employs a collaborative approach to investing and managing portfolios. This team approach ensures that investment discussions benefit from the broad range of backgrounds and experiences of the members of the investment team, as well as from the investment management disciplines the firm has developed over the last three decades of managing private equity assets.

Abbott's investment process is multi-stepped and disciplined. Investment decisions are made through an iterative process of review, analysis, and further review designed to meet the standards of Abbott's investment team. Fundamentally, Abbott evaluates general partners based on its views of:

The quality of the team, including:
- Proven ability to work cohesively
- Past investment success
- Individual and joint reputations, including for acting with integrity and honesty

The quality of the prior track record, including:
- Absolute and relative performance
- Relevance to the current strategy
- Repeatability
- Involvement of present team members in that record

The team's ability to be successful in the future, given:
- Strategy
- Experience
- Motivation

Benchmark: 1/3 S&P 500, 1/3 Russell 2000, 1/3 MSCI EAFE +200 basis points and the Cambridge vintage year peer comparison.

Total ARMB Mandate

Assets Under Management: (3/31/21)
Market Value: $1.8 billion

Concerns: None

Performance

The since inception internal rate of return (IRR) for ARMB's Abbott portfolio is 11.8% through 3/31/21, which compares favorably against the public market equivalent return of ARMB's blended benchmark (1/3 S&P 500, 1/3 Russell 2000, 1/3 MSCI EAFE) of 7.4%.

ARMB's portfolio managed by Abbott has outperformed the Cambridge median over all vintage years with three vintage years in the top quartile and 16 in the second quartile when compared against the Cambridge database for vintage years 1999-2017.

ABBOTT CAPITAL

Alaska Retirement Management Board Portfolio Review

September 24, 2021

ABBOTT CAPITAL MANAGEMENT, LLC | 1290 AVENUE OF THE AMERICAS, NEW YORK, NY 10104 | +1 212 757 2700

Presenter Introduction

Jonathan D. Roth – Managing Director, Co-President

Mr. Roth has more than 29 years of private equity investment experience and is responsible for the overall management of the firm. He also works closely with clients to develop and implement private equity investment programs. Mr. Roth reviews investment opportunities, with specific emphasis on the analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Roth also serves on several partnership advisory boards. Prior to joining Abbott in 1992, Mr. Roth was an Associate at Elmrock Partners and a Financial Analyst with Amoco Corporation. Prior to obtaining his M.B.A., he worked for Chemical Bank as a corporate lending officer. Mr. Roth received his A.B. in Economics from Cornell University and his M.B.A. from The Fuqua School of Business at Duke University.

Leonard C. Pangburn – Managing Director, Co-President

Mr. Pangburn has more than 15 years of private equity investment experience. He reviews investment opportunities, with specific emphasis on analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Pangburn also serves on several partnership advisory boards. Prior to joining Abbott Capital in 2005, Mr. Pangburn was a supervisor of global operations at International Fund Services in New York, where he managed and reconciled all aspects of the global security database. Mr. Pangburn received his B.S. in Finance from Bentley University and his M.B.A. from New York University.

Dillon Booth – Senior Analyst, Client Relations

Mr. Booth supports Abbott Capital's client service and business development activities. Prior to joining Abbott Capital in 2017, Mr. Booth was an Investor Relations Associate at EnTrust Global. Mr. Booth received his B.A. in Communications and Political Science from Denison University.

Agenda

Section	Title
I.	Abbott Capital Overview
II.	Private Equity Market Update & Current Industry Topics
III.	ARMB Portfolio Review
IV.	Appendix

I. Abbott Capital Overview

Abbott Capital Management, LLC

1986
Abbott Founded

$12B+
Assets Under Management[1]

$22B+
Aggregate Commitments Since Inception

9,700+
Funds in Database

$1B+
Capital Deployed Annually[2]

120+
Advisory Board Seats[1]

2015
Abbott becomes PRI signatory

Heritage

- Pioneer in customized private equity solutions
- High-conviction, performance driven portfolio construction
- Independently owned with a 35+ year track record focused exclusively on private equity
- Offices in New York and London

Team

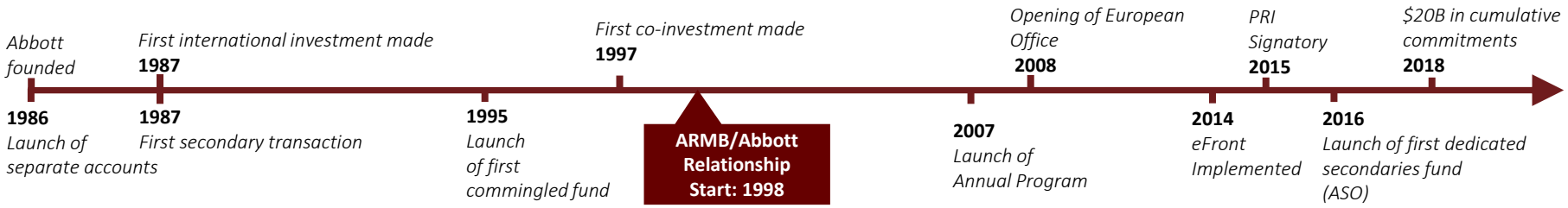
- Highly integrated and collegiate culture, 50+ professionals dedicated to private equity
- Cycle tested; Managing Directors with deep private equity investment experience
- Relationship and information advantages across the private equity ecosystem

Private Markets Solutions

Separately Managed Accounts	▪ Portfolios tailored to meet specific investment goals and objectives ▪ Customized reporting and administrative support ▪ Ability to access emerging, diverse, and sector-focused managers
Global, Customizable Commingled Portfolios	▪ Access to multiple investment strategies, secondaries, and co-investments ▪ Simplified administration and reporting
Opportunistic Strategies	▪ Secondaries, with a focus on smaller, less competitive transactions ▪ Co-investments sourced through Abbott's GP network/relationships
Operation/Administration Support	▪ Customized data management, transaction facilitation, and reporting ▪ Fund administration ▪ Distributed stock liquidation management; data analytics and benchmarking

[1]As of 12/31/2020. AUM herein is defined as (unfunded commitments + NAV) and includes non-discretionary assets for which Abbott does not provide continuous and regular supervisory or management services but provides ongoing investment monitoring, valuation, and reporting functions. Approximately $674M of the AUM represents assets Abbott manages but does not advise. [2]Annual average for the three year period ending 12/31/2020. **Past performance is not a guide to future results and is not indicative of expected realized returns.** See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and performance, and calculation of both AUM and RAUM.

Building Private Equity Portfolios for Institutional Investors



Representative Investor Relationships[1]

Public Pension Funds	Corporate Pension Funds & Insurance Companies	Endowments & Foundations
Alaska Retirement Management Board	Baxter International	Bradley University
Army & Air Force Exchange Service	Belk Pension Plan Trust	Community Investment Group
Baltimore Employees' Retirement System	BMW Pension Plan	Evangelical Covenant Church
British Coal Staff Superannuation Trust	Hess Corporation	Gates Family Foundation
City of Aurora General Employees' Retirement System	Michigan Catastrophic Claims Association	Grupo Guayacán
City of Milwaukee Employes' Retirement System	Portico Benefit Services	HFSF Grants Management, Inc.
Illinois Municipal Retirement Fund	Reuters Pension Fund Trustees Limited	M.J. Murdock Charitable Trust
Kern County Employees' Retirement Association	Reynolds American Inc.	NY Community Trust
Marin County Employees' Retirement Association	Severn Trent PIF Trustees, Ltd.	Polk Bros. Foundation
Nebraska Investment Council	The Trustees of BOCM PAULS Pension Scheme	The Greater Cincinnati Foundation
New York State Teachers' Retirement System	Triple – S Propiedad, Inc.	The Texas A&M University System
Orange County Employees Retirement System		
Sacramento County Employees' Retirement System		
Utah Retirement System		
Ventura County Employees' Retirement Association		
Wyoming Retirement System		

30+ years of building private equity portfolios for sophisticated, long-term investors around the world

[1]Represents up to the 10 largest investors by category that have committed to any Annual Program Fund, plus any Abbott Fund organized since 2007, plus each actively investing separately managed discretionary client account as of December 31, 2019, in each category. Excludes investors imposing confidentiality restrictions on use of their name or whose relationship with Abbott commenced after this date. References to any specific investor or client should not be construed as an endorsement of Abbott by any such investor.

Abbott's Private Equity-Focused Organization

Investments

Jonathan Roth
Managing Director,
Co-President (1992)

Len Pangburn
Managing Director,
Co-President[1] (2005)

Timothy Maloney
Managing Director
(2004)

Meredith Rerisi
Managing Director
(1998)

Matthew Smith
Managing Director
(2000)

Young Lee
Managing Director
(2007)

Jobst Klemme*
Managing Director
(2015)

Jennie Benza
Principal

Wolf Witt
Principal

Arianna Merrill
Vice President

Brian Susetka
Vice President

Jonathan Tubiana
Vice President

Moritz Turck*
Vice President

Lance Zhou
Vice President

Declan Feeley
Associate

Sean Bacon
Analyst

Kate Holzer
Analyst

Taylor McGinnis
Analyst

Client Relations and Business Development

Ryan Green
Director

Kristin Kunert
Vice President

Valentine Whittaker
Vice President

Operations, Finance, Legal & Compliance

Lauren Massey
Managing Director,
Chief Admin. Officer
(1995)

Paolo Parziale
Managing Director,
Chief Financial Officer
(2002)

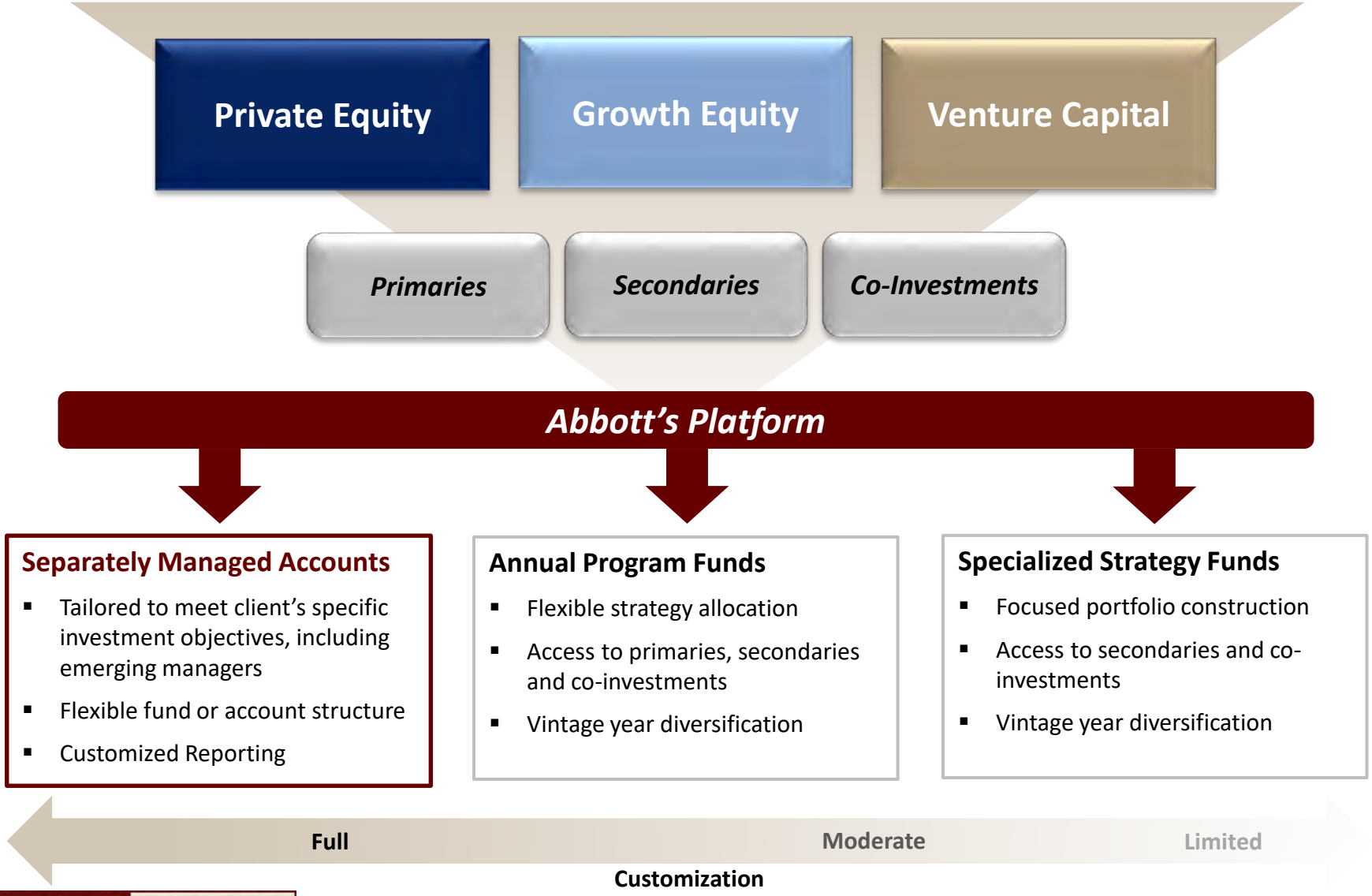
Mary Hornby
Managing Director,
General Counsel
(2004)

Monique Horton
Chief Compliance
Officer

Abbott's Managing Directors have on average more than 22 years experience and 18 years working at Abbott

[1]Effective 10/1/2021. (Year Managing Director joined Abbott) *Abbott Europe

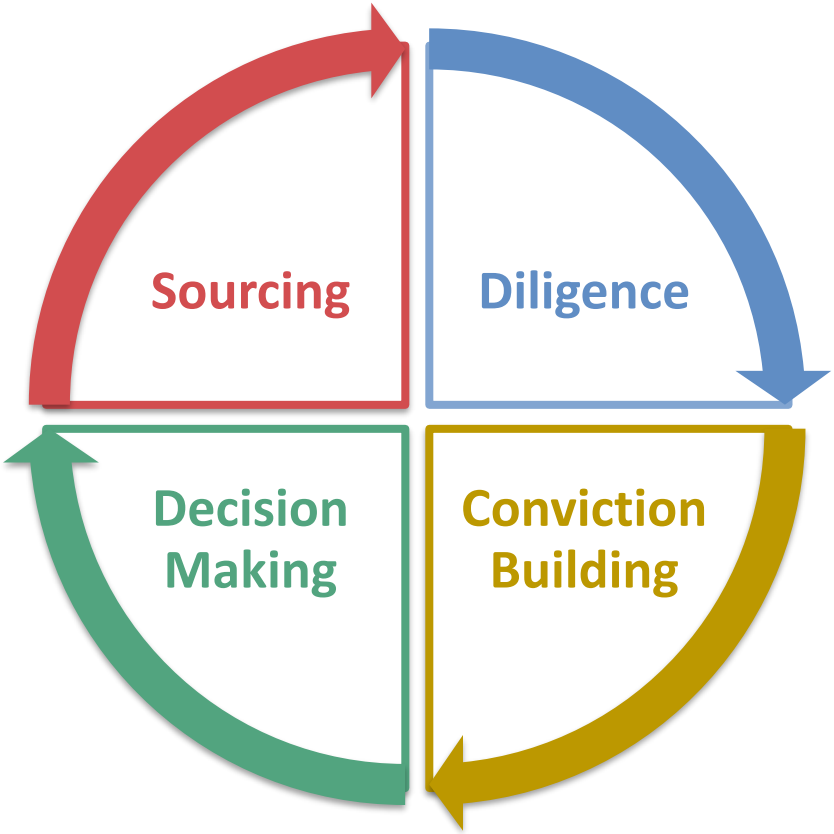
Global Private Equity Solutions



Investment Due Diligence

Sourcing:
Seek High-Quality GPs/Investments

- Proactive research/outreach
- Open door policy
- Historic relationships
- Customized tracking systems
- "Groups to track"



Diligence:
Assess Manager Performance & Skill

- Quantitative and qualitative analysis and attribution
- Conduct GP diligence and prepare/review diligence reports
- Conduct reference calls
- Develop Abbott view of risk adjusted return potential

Decision Making:
Assess Future Performance Potential

- Special skills, expertise, sourcing
- Culture; strong disciplines
- Weighted voting system
- Legal review

Conviction Building:
Debate Fund Merits

- Full team discussion
- Peer group analysis
- Potential rewards vs. risks
- Alignment and governance

Entire investment staff perspective is considered throughout iterative due-diligence process

Although the foregoing describes the typical areas reviewed by Abbott when monitoring an investment, not every monitoring item occurs nor is every factor considered by Abbott in each instance it evaluates an investment.

Abbott's Risk Management Program

Portfolio Construction

- **Abbott's Portfolio Construction Committee ("PCC")** is responsible for tracking and guiding the implementation of the individual portfolio construction and diversification guidelines in place for each actively investing fund or account, which includes:
  - ✓ Evaluating suitability of investments for each portfolio based on size, sector, stage, geography, and vintage year
  - ✓ Sizing and pacing of commitments
  - ✓ Overseeing the allocation process

Operational Due Diligence and Monitoring

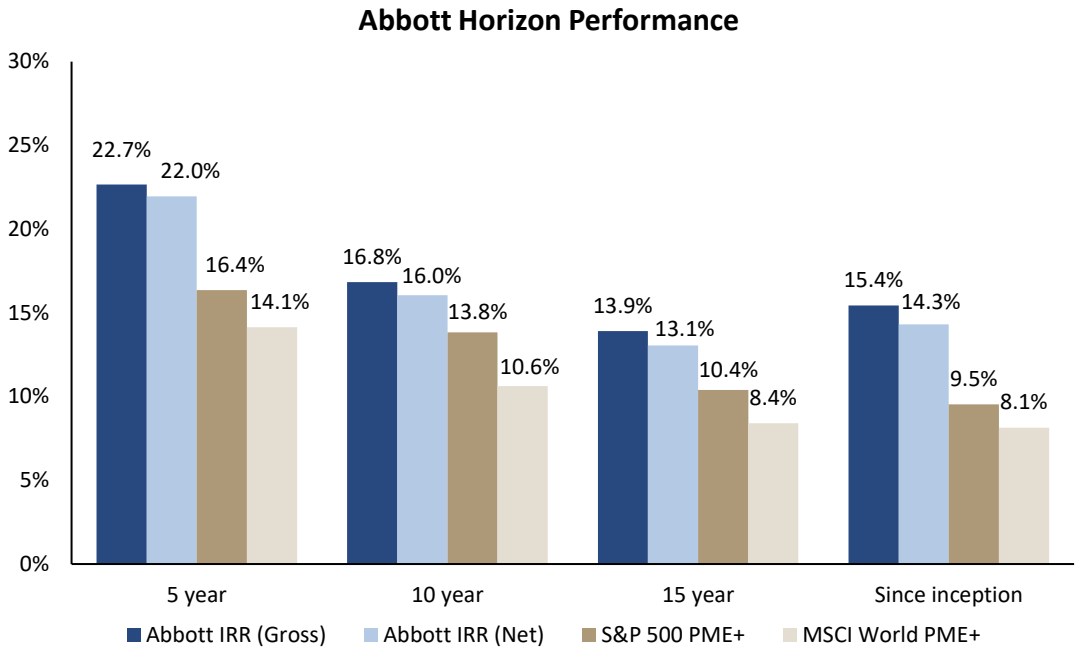
- **Operational due diligence and monitoring** of each investment is conducted by multiple members of the Investment and Operations teams, and covers:
  - ✓ Initial and ongoing contact with fund management teams
  - ✓ Monitor valuation practices
  - ✓ Reconcile investment activity and performance
  - ✓ Participation in annual meetings and LPACs

Abbott's Performance Across Market Cycles

As of 3/31/2021

Abbott Horizon Performance by Vintage Year

VY	IRR (%)	TVPI (x)	VY	IRR (%)	TVPI (x)
1987	23.6%	4.2x	2003	25.9%	2.2x
1988	24.8%	3.2x	2004	11.2%	1.7x
1989	24.3%	2.7x	2005	9.4%	1.6x
1990	22.0%	2.2x	2006	7.9%	1.6x
1991	15.2%	2.1x	2007	11.3%	1.8x
1992	36.1%	2.9x	2008	13.1%	1.8x
1993	44.0%	4.4x	2009	13.7%	1.9x
1994	32.6%	2.9x	2010	16.6%	2.1x
1995	45.8%	3.2x	2011	19.2%	2.2x
1996	16.1%	1.8x	2012	19.0%	2.2x
1997	22.4%	2.0x	2013	16.7%	1.8x
1998	8.2%	1.4x	2014	29.2%	2.6x
1999	0.2%	1.0x	2015	21.3%	2.0x
2000	8.2%	1.5x	2016	21.9%	1.7x
2001	24.1%	2.1x	2017	38.7%	1.8x
2002	16.8%	2.5x			



Performance Highlights (From 1987 – 2017)

- Abbott has **consistently outperformed** public market equivalents over several market cycles
- Abbott has generated **double digit IRRs** in **26 out of 31** vintage years

Judgment and careful selection have generated attractive returns over the long-term for each vintage year

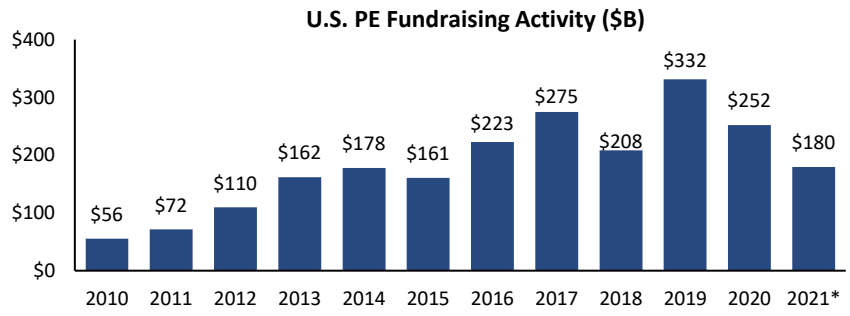
Past performance is not a guide to future results and is not indicative of expected realized returns. Net performance is not available by vintage year. The indices listed have not been selected to represent benchmarks for the portfolio, but rather allow for comparison of the portfolio's performance to that of a widely recognized index. See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and impact of fees on performance, and additional information on PME (+).

II. Private Equity Market Update & Current Industry Topics

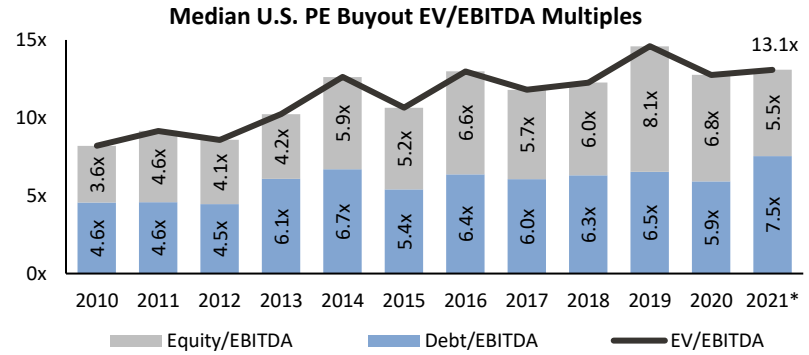
1H 2021 Private Equity Market Update

U.S. Private Equity

- Strong appetite for PE - Fundraising activity at peak levels
  - Investors searching for yield in the current low interest rate environment

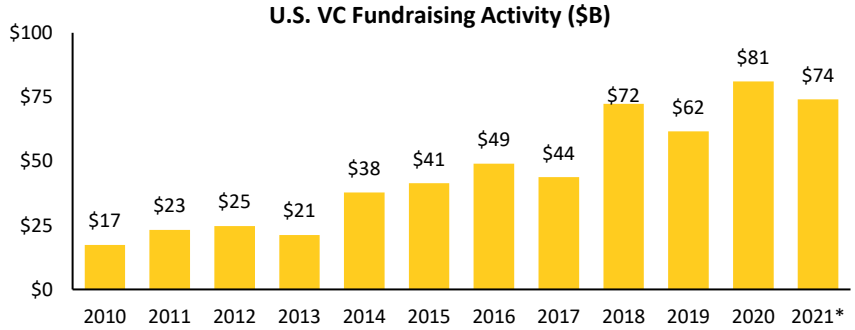


- Purchase price entry multiples remain elevated
  - High level of exit activity, and sellers taking advantage of high prices

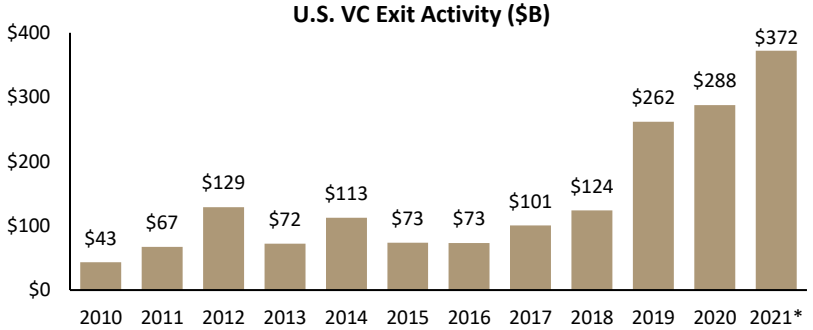


U.S. Venture Capital

- Strong appetite for VC - Fundraising record-setting pace for 2021
  - Late stage, pre-IPO, rounds continue to attract $$$ from non-traditional investors (hedge funds, mutual funds, etc.)



- Accelerating increase in exit activity
  - SPACs becoming less prevalent



*1H 2021. With respect to private equity information, material sourced through: PitchBook's Q2 2021 US PE Breakdown. With respect to venture capital information, material sourced through: Q2 2021 PitchBook-NVCA Venture Monitor, Q2 2021 PitchBook-NVCA Venture Monitor. The views expressed are Abbott's opinion as of Q2 2021 and are subject to change without notice. There is no assurance that any trends depicted or described will continue. Data provided is as of June 30, 2021.

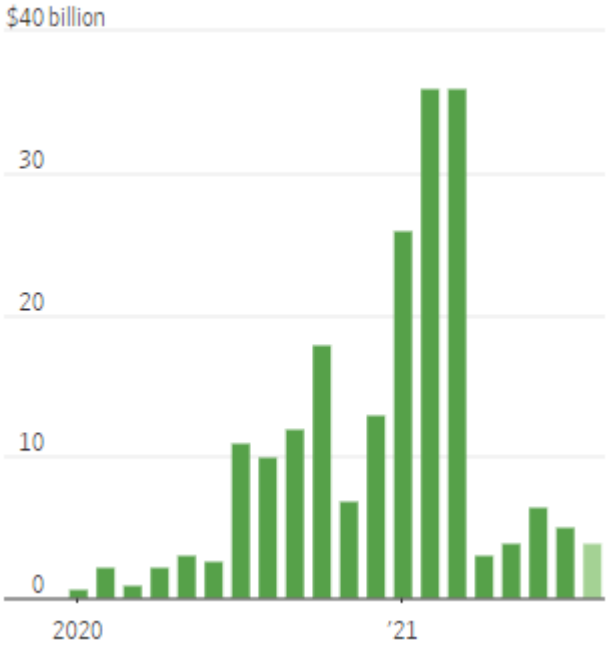
“SPACs” (Special Purpose Acquisition Companies)

SPACs… The bloom is off the rose

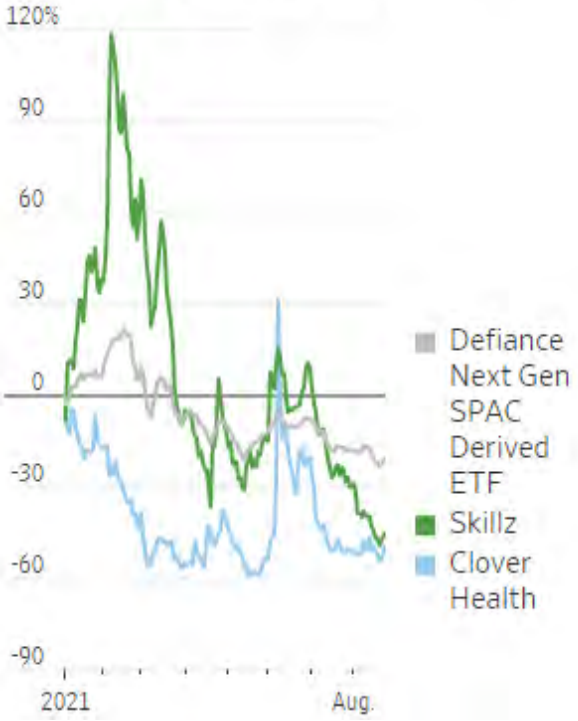
BuzzFeed Clashed With NBCUniversal as It Pursued SPAC Deal

Chief Executive Jonah Peretti of BuzzFeed signed off on terms that could put more pressure on the company if its shares don’t rise. He is confident investors will be pleased with the results.

Monthly amount raised by SPACs



2021 performance of companies that went public through SPACs and ETF



Source: WSJ, BuzzFeed Clashed with NBCUniversal as It Pursued SPAC Deal; August 18, 2021. There is no assurance that any trends depicted or described will continue.

Current PE Industry Topic - “SPVs” (Special Purpose Vehicles)

SPVs have become just as popular as SUVs

SPVs in Private Equity

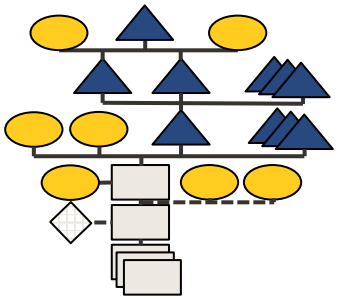
- LP/GP Led Secondary transactions
  - End of fund life options
- Continuation Funds
- Single Asset SPVs

SPV Limited Partner Considerations

- Focus and attention of General Partners
- Valuation of underlying assets/portfolio companies
- SPV Terms:
  - GP/LP alignment

Just as Popular:

Much More Complicated:



When considering SPVs, one size does NOT fit all!

The views expressed are Abbott’s opinion as of Q2 2021 and are subject to change without notice. There is no assurance that any trends depicted or described will continue.

Preparing For The Next Cycle… When Tailwinds Turn To Headwinds

It is the farmer who faithfully plants seeds in the Spring, who reaps a harvest in the Autumn
- B.C. Forbes, Founder of Forbes Magazine

- Steady annual commitment pacing is critical to a long-term successful private equity portfolio
  - Dollar cost averaging across cycles: vintage year diversification
  - Diversification by – strategy, manager style (growth vs. value), industry, geography

- Monitor exposure to venture capital and growth equity strategies

The views expressed are Abbott's opinion as of Q2 2021 and are subject to change without notice. There is no assurance that any trends depicted or described will continue.

III. ARMB Portfolio Review

Alaska Retirement Management Board

ARMB Active and Liquidated Portfolio Snapshot

As of 3/31/2021

Alaska Retirement Management Board	Commitment	Amount Paid-in	Distributions / Realizations	Valuation[1]	Total Value	TVPI	IRR
Active Portfolio Funds:							
Venture Capital & Growth Equity	$837,057,500	$757,754,484	$777,901,961	$834,566,723	$1,612,468,684	2.1x	12.1%
Buyouts and Special Situations	$1,739,928,890	$1,389,116,949	$1,428,535,340	$923,205,559	$2,351,740,899	1.7x	15.2%
Secondary Purchases	$32,236,143	$30,779,489	$36,164,139	$22,728,140	$58,892,279	1.9x	20.9%
Co-Investments	$28,040,125	$26,019,651	$244,337	$41,884,997	$42,129,334	1.6x	35.1%
Total Active Portfolio Funds	**$2,637,262,658**	**$2,203,670,573**	**$2,242,845,777**	**$1,822,385,420**	**$4,065,231,197**	**1.8x**	**13.7%**
Liquidated Portfolio Funds:							
Venture Capital & Growth Equity	$144,597,219	$139,899,364	$203,256,629	$0	$203,256,629	1.5x	6.5%
Buyouts and Special Situations	$431,379,625	$424,623,169	$677,026,168	$0	$677,026,168	1.6x	9.7%
Secondary Purchases	$10,189,447	$9,739,528	$22,031,543	$0	$22,031,543	2.3x	26.1%
Total Liquidated Portfolio Funds	**$586,166,291**	**$574,262,061**	**$902,314,340**	**$0**	**$902,314,340**	**1.6x**	**9.1%**
Distributed Stock Activity and Other Income (Active and Liquidated Portfolio):							
Distributed Stock			($18,277,624)	$4,640,377	($13,637,248)		
Other Income			$82,149	$0	$82,149		
Total Distributed Stock Activity and Other Income			**($18,195,476)**	**$4,640,377**	**($13,555,099)**		
Total ARMB Portfolio	**$3,223,428,949**	**$2,777,932,634**	**$3,126,964,641**	**$1,827,025,797**	**$4,953,990,438**	**1.8x**	**11.8%**

[1]Valuation for a portfolio fund investment is net of any management fees, carried interest, and other expenses of the portfolio fund. Net asset values reported in non-U.S. currencies are translated at the relevant exchange rate at the close of business on the report date. Active and Liquidated Portfolio IRR and TVPI are shown gross of investment management fees charged by Abbott, and gross of gains and losses realized upon the sale of distributed stock, including brokerage and other related commissions. Total ARMB Portfolio IRR and TVPI are shown gross of investment management fees charged by Abbott and are net of gains and losses realized upon the sale of distributed stock, including brokerage and other related commissions. **Past performance is not a guide to future results and is not indicative of expected realized returns.** See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for additional disclosures on risk and performance.

ARMB Active Portfolio Snapshot

Preliminary as of 6/30/2021

Portfolio Summary

Total Portfolio Fund & Co-Investment Commitments	$2,714.1 million
Primary Investments	$2,639.3 million
Secondary Transactions	$32.2 million
Co-Investments	$42.6 million
Number of Portfolio Fund Investments (Primary/Secondary Transactions/Co-Investments)	213 / 19 / 9

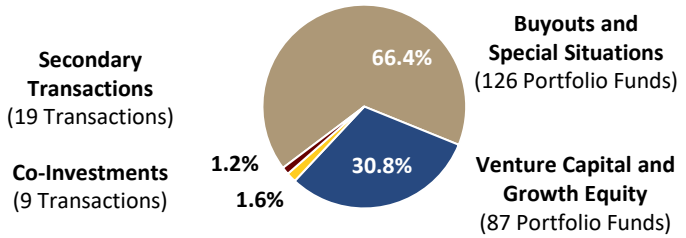
Portfolio Fund Metrics

Amount Paid-In	$2,260.8 million
As a % of Commitments	*83.3%*
Amount Distributed	$2,345.2 million
As a % of Amount Contributed	*103.7%*
Latest Valuation	$1,869.2 million
Pooled IRR	13.7%
Multiple (TVPI)	1.9x

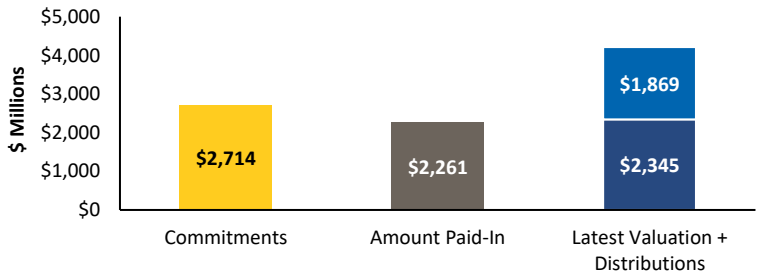
Portfolio Company Metrics | As of 3/31/2021

Underlying portfolio companies	2,550
Underlying portfolio company investments	2,963
Average age of portfolio companies	4.5 years
Percent of Investments valued above cost	62.0%
Percent of Investments valued at cost	14.9%
Percent of Investments valued below cost	23.1%

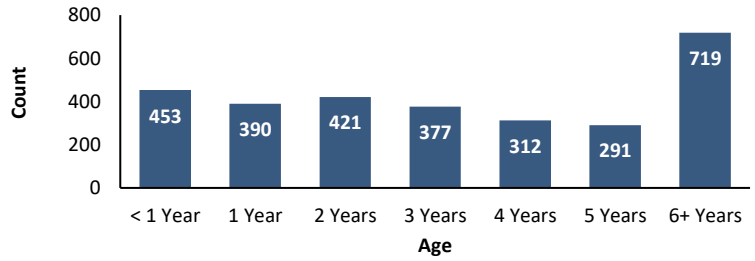
Strategy Diversification | By Amount Committed



Portfolio Fund Metrics



Portfolio Company Age | As of 3/31/2021

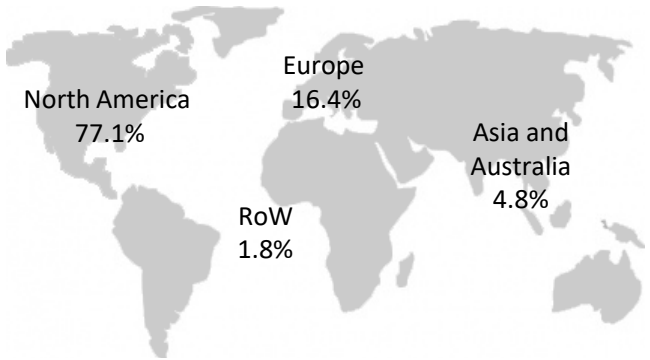


Valuation is based on the most recent available net asset value provided by the general partner or managing entity of the portfolio fund as of August 25, 2021, including allocations of unrealized gains and losses on the underlying portfolio company investments. If the most recent available net asset value is as of a date other than the report date, the valuation is adjusted by net cash flows, other than contributions identified by the general partner or managing entity as contributions for management fees and/or other expenses, from the date of the most recent available net asset value through the report date. Distributions exclude gains and losses realized on the sale of distributed stock, including brokerage and other related commissions. IRR and Multiple are provided at the portfolio fund level and are gross of Abbott fees as well as gains and losses realized on the sale of distributed stock. Diversification will not guarantee profitability or protection against loss. **Past performance is not a guide to future results and is not indicative of expected realized returns.** See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and performance.

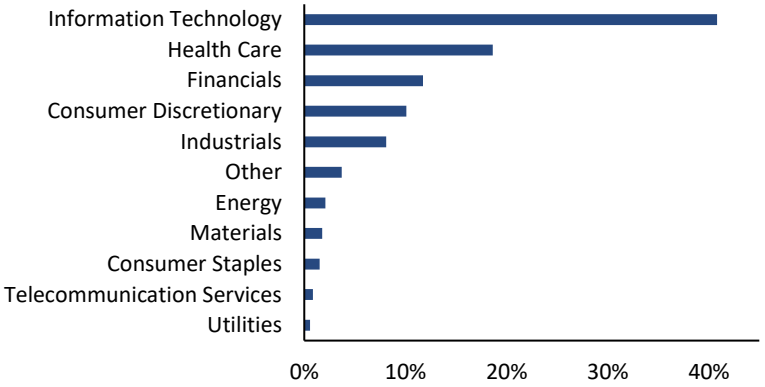
ARMB Portfolio Company Diversification

As of 3/31/2021

Geographic Diversification by Value



Industry Diversification by Value

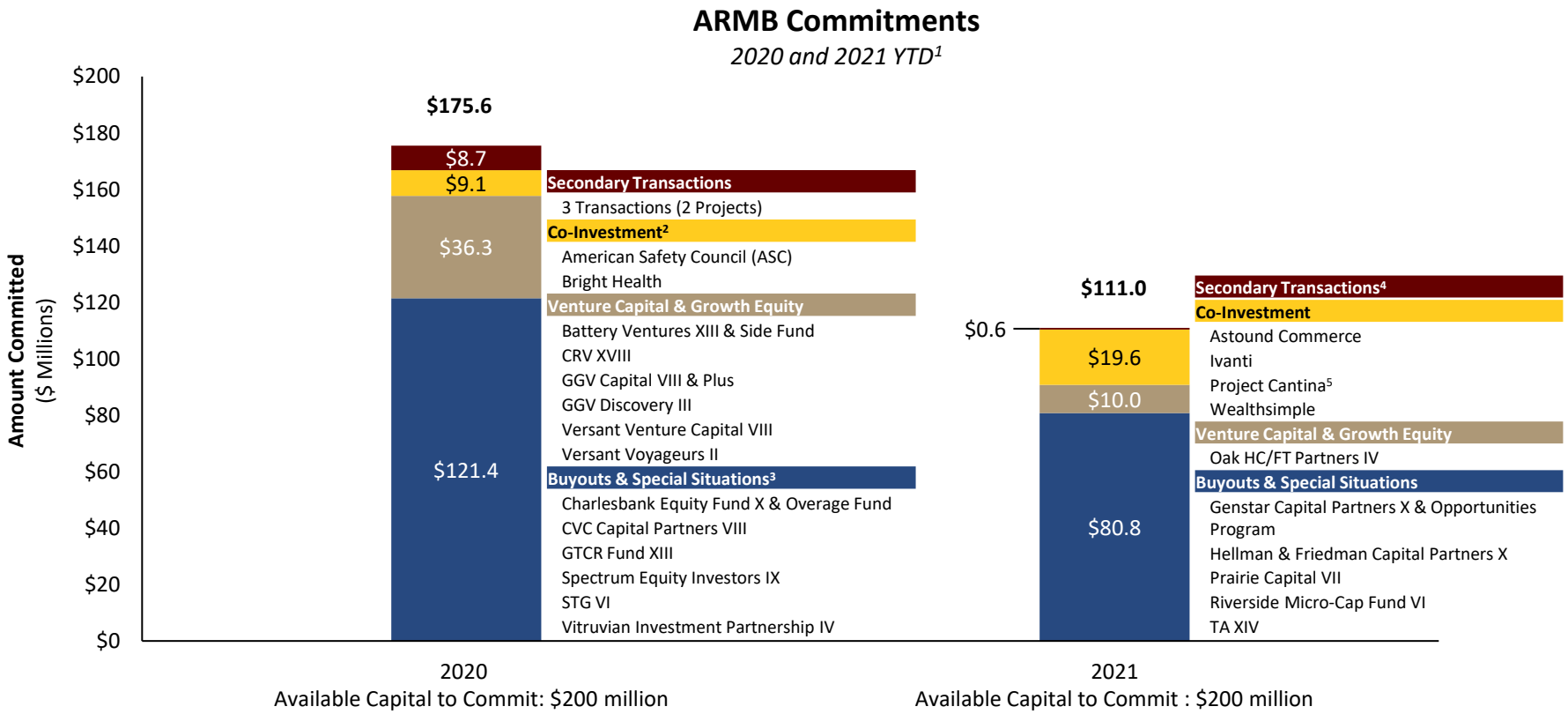


Top Ten Portfolio Companies By Proportionate Value

Company Name	Portfolio Fund Name
GoodRx[1]	Spectrum Equity Investors VII
Village Practice Management Company, LLC	Oak HC/FT Partners
Bright Health Inc.	New Enterprise Associates 15; New Enterprise Associates 16
Maravai Life Sciences[1]	GTCR Fund XI
DataBricks, Inc.	New Enterprise Associates 14; Battery Ventures XI; Battery Ventures XI Side Fund
Lucid Software	Spectrum Equity Investors VII
ZoomInfo Technologies, Inc.[1]	TA XI; TA Subordinated Debt Fund III; Great Hill Equity Partners VI
Robinhood Markets, Inc.	New Enterprise Associates 15
Tuya Inc.[1]	New Enterprise Associates 14
Sotera Health[1]	GTCR Fund XI; Warburg Pincus Private Equity XI
Total Top Ten Portfolio Companies	**$238.0 million**

[1]Denotes publicly traded company. Proportionate Value is calculated based on the portfolio's share of the total capital committed by all investors of the relevant portfolio fund. Diversification will not guarantee profitability or protection against loss.

ARMB 2020 and 2021 YTD Commitment Activity



2021 Targeted Commitments: $200mm

- Buyouts & Special Situations: $20mm per fund
- Venture Capital & Growth Equity: $10mm per fund

Maintain a cautious approach to VCGE due to existing exposure and unrealized portfolio appreciation

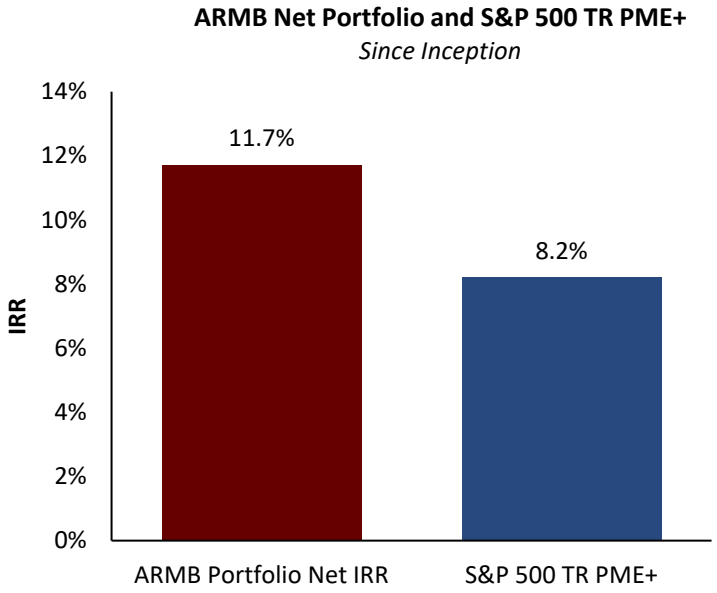
[1]2021 YTD commitments are shown through August 27, 2021. [2]Includes $15,529 add-on commitment to Recorded Future (Project RF). [3]Includes $200,000 additional commitment to Welsh, Carson, Anderson & Stowe relating to an approved amendment. [4]Includes $644,417 commitment to continuation fund Samson Brunello 1 (Project Samson) formed by Hellman & Friedman. [5]Commitment has not closed as of 8/27/2021. Certain funds may be denominated in EUR. Amounts committed in a currency other than USD have been converted to USD using the applicable exchange rate on the date of closing. Numbers may not sum due to rounding.

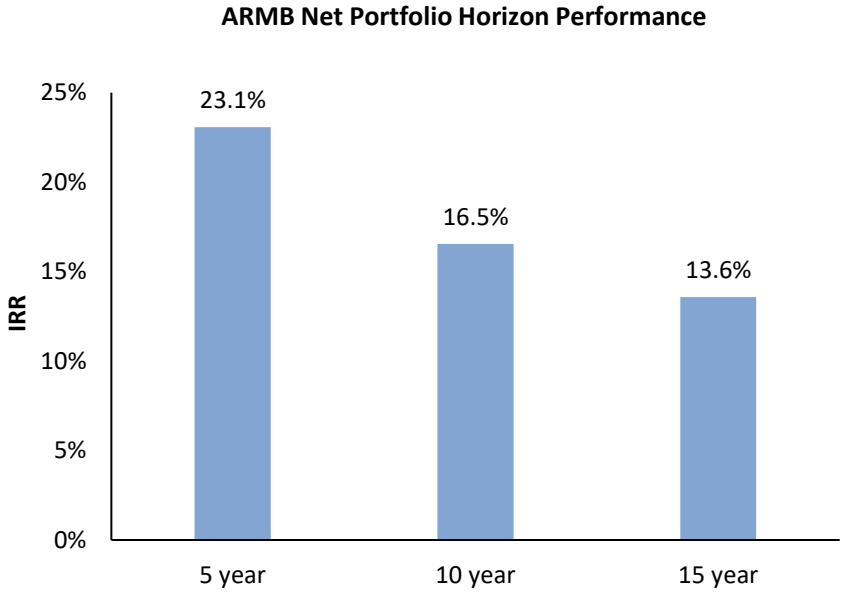
ARMB Net Performance

As of 3/31/2021

Pooled IRR & Public Market Equivalent+

- ARMB's since inception net IRR is 11.7%
- Based on a PME+ analysis, ARMB's since inception net IRR has outperformed the S&P 500 Total Return Index ("S&P 500 TR") by 345 bps





Net IRR is shown net of investment management fees charged by Abbott and gross of gains and losses realized upon the sale of distributed stock, including brokerage and other related commissions. The S&P 500 TR has not been selected to represent a benchmark for ARMB, but rather allow for comparison of ARMB's performance to that of a widely recognized index. No assurances can be given that cash flows will continue at this pace in the future, or that the Portfolio will make any further distributions. **Past performance is not a guide to future results and is not indicative of expected realized returns.** See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and performance.

ARMB 2021 Portfolio Fund Cash Flows

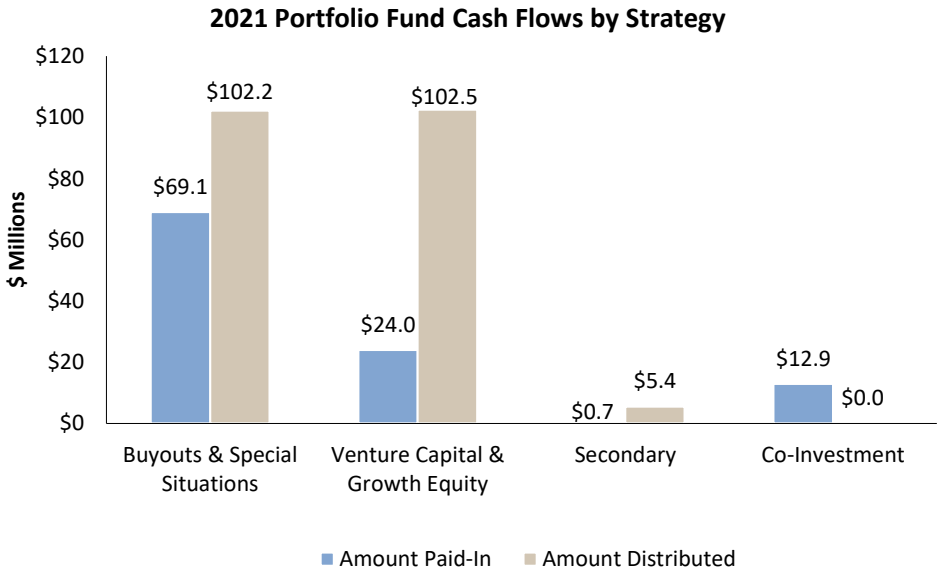
As of 6/30/2021

2021 Capital Calls and Distributions
by Portfolio Fund Vintage Year

Vintage Year	Amount Paid-In	Distributions	Net Cash Flows
1999	$0	$281,403	$281,403
2000	$0	$163,558	$163,558
2001	$0	$346,632	$346,632
2003	$0	$111,540	$111,540
2004	$0	$243,234	$243,234
2005	($4,235)	$529,978	$525,743
2006	$0	$3,987,630	$3,987,630
2007	$0	$8,855,807	$8,855,807
2008	$0	$11,796,879	$11,796,879
2009	$0	$6,360,467	$6,360,467
2010	($18,598)	$6,655,973	$6,637,375
2011	($26,412)	$4,960,364	$4,933,952
2012	($113,291)	$14,838,732	$14,725,441
2013	($92,650)	$4,691,207	$4,598,557
2014	($40,394)	$37,785,331	$37,744,937
2015	($1,972,548)	$29,607,194	$27,634,646
2016	($7,770,734)	$28,620,367	$20,849,633
2017	($9,017,422)	$3,855,742	($5,161,680)
2018	($15,471,353)	$27,908,436	$12,437,083
2019	($33,885,428)	$10,114,520	($23,770,907)
2020	($20,573,383)	$7,960,748	($12,612,635)
2021	($17,703,010)	$531,707	($17,171,303)
Total	**($106,689,459)**	**$210,207,451**	**$103,517,992**

2021 Capital Calls and Distributions
by Portfolio Fund Strategy

Strategy	Amount Paid-In	Distributions	Net Cash Flows
Buyouts & Special Situations	($69,064,046)	$102,230,901	$33,166,855
Venture Capital and Growth Equity	($24,000,140)	$102,529,146	$78,529,007
Secondary	($691,611)	$5,447,403	$4,755,792
Co-Investment	($12,933,662)	$0	($12,933,662)
Total	**($106,689,459)**	**$210,207,451**	**$103,517,992**



Past performance is not a guide to future results and is not indicative of expected realized returns. Abbott defines VY as the year the fund made its initial capital call. Distributions exclude gains and losses realized on the sale of distributed stock, including brokerage and other related commissions. Diversification will not guarantee profitability or protection against loss. No assurances can be given that cash flows will continue at this pace in the future, or that the Fund will make any further distributions. See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and performance.

ARMB Portfolio Fund Cash Flows

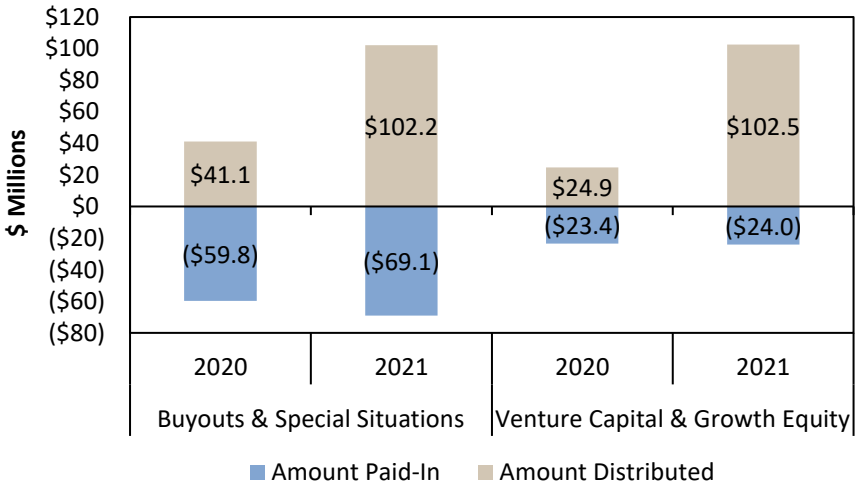
As of 6/30/2021

Portfolio Fund Cash Flows

- Capital calls have remained relatively stable over the past five years (2016 – 2020) with an average of $187mm called annually
- Distributions totaled $210.2mm through 1H 2021, nearly a 3x increase over 1H 2020
- The largest contributor to distribution activity was venture capital and growth equity funds

Primary Fund Cashflows by Strategy[1]

1H 2020 & 1H 2021



Distributions by Strategy ($ Millions)

1H 2020 & 1H 2021

Strategy	2020	2021	YoY Change
VC & GE	$24.9	$102.5	$77.7
BO	$15.7	$59.5	$43.8
SS	$25.5	$42.7	$17.3
Secondaries	$5.1	$5.4	$0.4
Co-Investments	$0.0	$0.0	$0.0
Total	**$71.1**	**$210.2**	**$139.1**

No assurances can be given that cash flows will continue at this pace in the future, or that the Portfolio will make any further distributions. Totals may not sum due to rounding. **Past performance is not a guide to future results and is not indicative of expected realized returns.** See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and performance.

ARMB Summary and Outlook

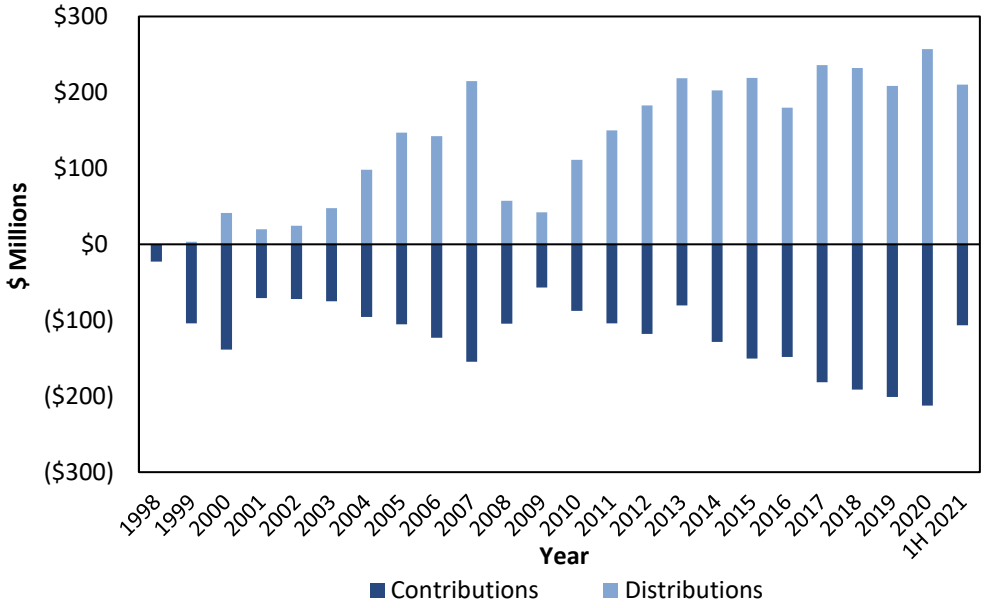
As of 6/30/2021

Summary

- Total contributions and distributions through 1H 2021 were $107mm and $210mm, respectively, compared to $87mm and $71mm in 1H 2020
- Record level of distribution activity in 1H 2021; on pace for an all-time annual record
- Seasoned portfolio should continue to generate cash from mature vintage years
- Steady commitment pace allows for dollar cost averaging, and maintenance of vintage year and prudent strategy diversification

Annual ARMB Portfolio Cash Flows

Inception to 1H 2021



Top 10 ARMB Portfolio Distributors

1H 2021

Partnership	Strategy
Advent International GPE VIII-B	BO
JMI Equity Fund VIII	VC & GE
M/C Venture Partners VII	VC & GE
Madison Dearborn Capital Partners VI	SS
Oak HC/FT Partners	VC & GE
Spectrum Equity Investors VII	VC & GE
Spectrum Equity Investors VIII	VC & GE
TA XI	VC & GE
The Resolute Fund IV	BO
U.S. Venture Partners X	VC & GE

1H 2021 Top 10 Distributors ($ Millions)	**$83.0**
1H 2021 Total Distributions ($ Millions)	**$210.2**

Distributions exclude gains and losses realized on the sale of distributed stock, including brokerage and other related commissions. No assurances can be given that cash flows will continue at this pace in the future or that the Abbotts will make any further distributions. **Past performance is not a guide to future results and is not indicative of expected realized returns.** See Important Information pages at the back of this document and Abbott's Form ADV Part 2A for disclosures on risk and performance.

Q&A

IV. Appendix

Team Biographies

Important Information

Team Biographies

Managing Directors

Jonathan D. Roth – Managing Director, Co-President

Mr. Roth has more than 29 years of private equity investment experience and is responsible for the overall management of the firm. He also works closely with clients to develop and implement private equity investment programs. Mr. Roth reviews investment opportunities, with specific emphasis on the analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Roth also serves on several partnership advisory boards. Prior to joining Abbott in 1992, Mr. Roth was an Associate at Elmrock Partners and a Financial Analyst with Amoco Corporation. Prior to obtaining his M.B.A., he worked for Chemical Bank as a corporate lending officer. Mr. Roth received his A.B. in Economics from Cornell University and his M.B.A. from The Fuqua School of Business at Duke University.

Leonard C. Pangburn – Managing Director, Co-President

Mr. Pangburn has more than 15 years of private equity investment experience. He reviews investment opportunities, with specific emphasis on analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Pangburn also serves on several partnership advisory boards. Prior to joining Abbott Capital in 2005, Mr. Pangburn was a supervisor of global operations at International Fund Services in New York, where he managed and reconciled all aspects of the global security database. Mr. Pangburn received his B.S. in Finance from Bentley University and his M.B.A. from New York University.

Timothy W. Maloney, CPA – Managing Director

Mr. Maloney has more than 20 years of private equity investment experience. He reviews investment opportunities, with specific emphasis on analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Maloney also serves on several partnership advisory boards. Prior to joining Abbott in 2004, Mr. Maloney was an associate at Frye-Louis Capital Management in Chicago, working on screening and due diligence for venture capital, buyouts and special situations partnerships. Mr. Maloney also worked as a senior analyst at General American Transportation Corporation and at Hewitt Associates as a pension consultant. Mr. Maloney received his B.S. in Accounting from DePaul University, his M.B.A. in Finance from New York University and his C.P.A. from the State of Illinois.

Meredith L. Rerisi – Managing Director

Ms. Rerisi has more than 20 years of private equity investment experience. She reviews investment opportunities, with specific emphasis on analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Ms. Rerisi also serves on several partnership advisory boards. Ms. Rerisi originally joined Abbott in 1998 and returned in the fall of 2002, following receipt of her M.B.A. Prior to joining Abbott, Ms. Rerisi was an equity analyst at American High Growth Equities Corporation. Ms. Rerisi received her B.S. in Applied Economics and Business Management from Cornell University and her M.B.A. from The Fuqua School of Business at Duke University.

Team Biographies

Managing Directors

Matthew M. Smith – Managing Director

Mr. Smith has more than 20 years of private equity investment experience. He is responsible for reviewing investment opportunities with specific emphasis on analysis and due diligence for prospective investments and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Smith, as Abbott's ESG Officer, is responsible for building upon the strong foundation Abbott has set in adopting the UN Principles for Responsible Investment and integrating ESG considerations into Abbott's investment process. Mr. Smith also serves on several partnership advisory boards. Prior to joining Abbott in 2000, he was a financial examiner at the Federal Reserve Bank of New York. He also worked for First Trust Washington and Bank of America as a trust officer. Mr. Smith received his A.B. in History and his M.B.A. in Finance from Georgetown University.

Young Lee, CFA – Managing Director

Mr. Lee has more than 16 years of private equity investment experience. He reviews investment opportunities, with specific emphasis on analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Mr. Lee also serves on several partnership advisory boards. Prior to joining Abbott in 2007, Mr. Lee was an associate at The Henry J. Kaiser Family Foundation in Menlo Park, sourcing and leading due diligence on prospective private equity and hedge fund investments. Mr. Lee also worked as a product manager in the Online Business Services Division at Silicon Valley Bank and co-founded a company that matched university-based start-ups with angel investors. Mr. Lee received his B.A. in Economics from Stanford University, his M.B.A. from Columbia University and is a CFA® charterholder.

Jobst Klemme – Managing Director

Mr. Klemme has more than 21 years of private equity investment experience. He reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Mr. Klemme also serves on several partnership advisory boards. Mr. Klemme manages Abbott Capital (Europe), Ltd, Abbott's subsidiary which is authorized and regulated by the UK Financial Conduct Authority and located in London. Mr. Klemme worked for Bethmann Bank AG as Director in its Private Equity Solutions group. Prior to working at Bethmann Bank, he worked at Credit Suisse as Vice President, also in its Private Equity Solutions group. Mr. Klemme received his M.B.A from ESCP Europe and his Bachelor of Arts in Business Administration from Georg-August University Goettingen.

Team Biographies

Managing Directors

Lauren M. Massey, CPA – Managing Director, Chief Administrative Officer

Ms. Massey has more than 29 years of private equity experience. She oversees the firm's fund investment recordkeeping activities, separate account reporting and the calculation of various performance analytics. Prior to joining Abbott in 1995, Ms. Massey was an Audit Manager in the Financial Services Division of Ernst & Young, where she had an asset management industry focus and was responsible for audit planning and management. Ms. Massey received her B.S. in Accounting from the State University of New York at Binghamton, her M.B.A. in Finance and Marketing from New York University, and her C.P.A. from the State of New York.

Paolo Parziale, CPA – Managing Director, Chief Financial Officer

Mr. Parziale has more than 21 years of private equity experience. He oversees the financial accounting and administration of all fund products, including the preparation of all fund financial reports and tax filings as well as Abbott's corporate accounting function. Prior to joining Abbott in 2002, Mr. Parziale was an Audit Senior at Ernst & Young, where he worked on audits of investment management firms and various types of commingled funds. Mr. Parziale received his B.S. in Accounting from St. John's University, his M.B.A. in Finance from New York University and his C.P.A. from the State of New York.

Mary T. Hornby – Managing Director, General Counsel

Ms. Hornby has more than 24 years of private equity experience. She assists the investment team in the review, legal analysis and negotiation of underlying fund investments and directs all legal aspects relating to the formation and maintenance of Abbott's pooled investment funds. In addition, Ms. Hornby assists in the legal aspects of daily operations, including client relationships and contracts, regulatory compliance and internal corporate structuring matters. Prior to joining Abbott in 2004, Ms. Hornby was Counsel and a member of the Private Equity Group at Testa, Hurwitz & Thibeault, LLP, representing investment advisers, funds of funds, public pension plans and other limited partner investors, as well as general partner groups, in all aspects of private equity fund formation. Ms. Hornby received her B.A., magna cum laude, from Boston College and her J.D. from Boston College Law School. She is a member of the Bar of the Commonwealth of Massachusetts.

Compliance

Monique Horton – Chief Compliance Officer

Ms. Horton is responsible for Abbott Capital's compliance program. Prior to joining Abbott Capital in 2019, Ms. Horton worked at Invesco Private Capital, Inc., ACA Compliance Group, and Royalty Pharma. Ms. Horton received her B.A. in Government from Cornell University.

Team Biographies

Investments

Jennie Benza – Principal

Ms. Benza has more than 12 years of private equity investment experience. She reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments, and is engaged in the negotiation of business and legal issues, ongoing monitoring of investments and profit realization from distributed securities. Ms. Benza also serves on several partnership advisory boards. Prior to joining Abbott in 2016, Ms. Benza was a Vice President with aPriori Capital Partners (DLJ Merchant Banking Partners). She also worked at Thomas H. Lee Partners and Merrill Lynch as a member of the M&A group. Ms. Benza received her B.S. in Finance & Accounting from New York University and her M.B.A. from the Harvard Business School.

Wolf Witt – Principal

Mr. Witt reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments, with a particular focus on secondary transactions. Prior to joining Abbott in 2018, Mr. Witt was a Director at Zurich Alternative Asset Management ("ZAAM"), the in-house unit managing the alternative investments of Zurich Insurance Group. At ZAAM, Mr. Witt was part of the global private equity team responsible for primary fund investments, co-investments, and secondary investments. Prior to that, Mr. Witt worked at the economic consulting unit of Oliver Wyman (NERA) in the Frankfurt and New York offices. Mr. Witt received his M.A. from the University of St. Gallen (Switzerland). He also studied at HEC Business School (France) and received his M.S. from the CEMS program. Mr. Witt is a CFA charterholder.

Team Biographies

Investments

Arianna Merrill – Vice President

Ms. Merrill reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Prior to joining Abbott Capital in 2018, Ms. Merrill worked at Partners Group where she made investments in private equity funds as well as co-investments, and Top Tier Capital Partners where she focused on investing in venture capital funds. Ms. Merrill received her B.A. in Economics and Political Science from Connecticut College and her M.B.A. from Cornell University.

Brian Susetka – Vice President

Mr. Susetka reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Before joining the investment team in 2014, Mr. Susetka worked on Abbott's operations team for three years. Prior to joining Abbott Capital in 2010, Mr. Susetka worked in financial reporting at AllianceBernstein, where he assisted with the creation and development of custom client reports. Mr. Susetka received his B.S. in Business from the Kelley School of Business at Indiana University.

Jonathan Tubiana – Vice President

Mr. Tubiana reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Prior to joining Abbott Capital in 2009, Mr. Tubiana was an Associate in the European investment team of Altius Associates where he was involved in European due diligence, portfolio analysis, and research activities. Mr. Tubiana received a Master of Science in Management from Grenoble Ecole de Management (France) and his M.B.A. from New York University.

Moritz Turck – Vice President

Mr. Turck reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Mr. Turck operates out of Abbott's subsidiary in London, Abbott Capital (Europe), Ltd. Abbott Capital (Europe), Ltd., is authorized and regulated by the UK Financial Conduct Authority Before joining the investment team in 2017, Mr. Turck was a Senior Associate on the Global Investment Team of Pavilion Alternatives, where he was responsible for evaluating and reviewing private equity managers across the EMEA region, and particularly in Western and Northern Europe. Mr. Turck received his M.S. in Accounting and Finance from Kings College London and his B.A. in Management Studies with French from the University of Nottingham.

Lance Zhou – Vice President

Mr. Zhou reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments, with a particular focus on secondary transactions. Prior to re-joining Abbott in 2019, Mr. Zhou was an Investment Director at Schroder Adveq Management, the private equity arm of Schroders. At Schroder Adveq, Mr. Zhou was part of the global private equity team where he was responsible for leading North American secondary investments. Before joining Schroder Adveq, Mr. Zhou worked at Abbott where he was initially on the fund administration team before migrating to investment management. Mr. Zhou started his career as a Financial Analyst at Citigroup. Mr. Zhou received his B.S. in Business Administration from State University of New York at Geneseo and earned his M.B.A from Columbia Business School. Mr. Zhou is a CAIA charterholder.

Team Biographies

Investments

Declan Feeley – Investment Associate
Mr. Feeley reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Before joining the investment team in 2017, Mr. Feeley worked at Maltese Capital Management. Mr. Feeley received his B.B.A. in Finance from the University of Notre Dame.

Sean Bacon – Investment Analyst
Mr. Bacon reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Before joining Abbott, Mr. Bacon worked as an Analyst at Dyal Capital Partners. Mr. Bacon received his B.S. in Business Administration from Boston University – Questrom School of Business.

Kate Holzer – Investment Analyst
Ms. Holzer reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Before joining Abbott, Ms. Holzer worked as an Investment Banking Summer Analyst at Raymond James. Ms. Holzer received her B.S. in Economics with Financial Applications from Southern Methodist University.

Taylor McGinnis, CPA – Investment Analyst
Ms. McGinnis reviews investment opportunities with specific emphasis on analysis and due diligence for prospective investments. Before joining Abbott, Ms. McGinnis worked as an Assurance Associate at PricewaterhouseCoopers. Ms. McGinnis received her M.F.M. in Financial Management and her B.B.A. in Accounting and Business from Texas A&M University, and her C.P.A. from the State of Texas.

Team Biographies

Client Relations & Business Development

Ryan Green – Director

Mr. Green manages and leads Abbott's fundraising and the development of customized private equity solutions. Prior to joining Abbott Capital in 2017, Mr. Green was a Director at LGT Capital Partners, working closely with institutions, consultants, family offices and distribution partners. Mr. Green held a similar role as a member of the institutional sales team at Commonfund and during his tenure at Seasons Capital Management. Before joining Seasons Capital, Mr. Green was a Vice President within the institutional sales desk at DoubleRock. Mr. Green was the co-founder to TrainerLink Inc., a technology start-up and received his B.S. from Rutgers University.

Kristin Kunert – Vice President

Ms. Kunert assists in all marketing, client services, and business development activities. Prior to joining Abbott Capital in 2017, Ms. Kunert was an Investor Relations associate at Wilshire Private Markets, a business unit of Wilshire Associates. Ms. Kunert received her B.A. in English Literature from the State University of New York at Buffalo, M.A. in English Literature from the University of Pittsburgh, and her M.B.A. from the SC Johnson Graduate School of Management at Cornell University.

Valentine Whittaker – Vice President

Mr. Whittaker assists in all marketing, client services, and business development activities. Prior to joining Abbott Capital in 2020, Mr. Whittaker was an Alternatives Director at Schroder Adveq, responsible for fundraising and institutional client service. Mr. Whittaker was a member of the sales team at Capital Dynamics and Brookfield Asset Management. He was a Communications Specialist at Vontobel Asset Management and started his career at JPMorgan Asset Management where he had a variety of investment management roles. Mr. Whittaker received his B.S. in Management from SUNY Old Westbury.

Important Information

Past performance is not a guide to future results and is not indicative of expected realized returns. This material contains confidential and trade secret information regarding Abbott Capital Management, LLC ("Abbott"), its affiliates, funds sponsored by Abbott (the "Abbott Funds") and Abbott's managed account clients (collectively along with the Abbott Funds, the "Abbott Clients") as well as underlying portfolio funds held by the Abbott Clients and portfolio companies held by these funds. This material and the information contained in this material may not be reproduced or distributed to persons other than the recipient or its advisors, but solely to the extent such advisors are bound by a duty of confidentiality.

This material is for informational purposes only and is not an offer or a solicitation to subscribe to any fund and does not constitute investment, legal, regulatory, business, tax, financial, accounting or other advice or a recommendation regarding any securities of Abbott, of any fund or vehicle managed by Abbott, or of any other issuer of securities. Interests in the Abbott Funds have not been and will not be registered under the U.S. Securities Act of 1933, as amended, any U.S. State securities laws or the laws of any non-US Jurisdiction. None of the Abbott Funds are registered as an Investment Company under the U.S. Investment Company Act of 1940, as amended nor is it expected that they will be in the future. Interests in the Abbott Funds, and information provided herein, have not been approved or disapproved by the U.S. Securities and Exchange Commission ("SEC") or by any securities regulatory authority of any U.S. State or non-U.S. jurisdiction and neither the SEC nor any such authority has passed upon the accuracy or adequacy of this communication or the merits of Abbott or any Abbott Fund, nor is it intended that the SEC or any such authority will do so. Investment in the Abbott Funds may not be suitable for all investors; investors should carefully consider risks and other information and consult their professional advisers regarding suitability, legal, tax and economic consequences of an investment. Abbott's registration as an investment adviser under the Investment Advisers Act of 1940, as amended to date, does not imply any certain level of skill or training.

Private equity investments are highly illiquid and are not suitable for all investors. All investments are subject to risk of loss, including the loss of principal. Private Equity performance is volatile and the value of investment(s) will fluctuate. Additional risks include, among others, those associated with the use of leverage, illiquidity and restrictions on transferability and resale of private equity investments, dependence on the performance and judgment of underlying portfolio investment managers over which Abbott has no control, Abbott's ability to access suitable investment opportunities sufficient to satisfy each client's investment objectives, and the speculative nature of private equity investments in general. Diversification will not guarantee profitability or protection against loss. There is no assurance that any Abbott Client's objective will be attained.

The views and information provided are as of August 31, 2021 unless otherwise indicated and are subject to frequent change, update, revision, verification and amendment, materially or otherwise, without notice, as market or other conditions change. There can be no assurance that terms and trends described herein will continue or that forecasts are accurate. Certain statements contained herein are statements of future expectations or forward-looking statements that are based on Abbott's views and assumptions as of the date hereof and involve known and unknown risks and uncertainties (including those discussed below and in **Abbott's** Form ADV Part 2A, available on the **SEC's** website at www.adviserinfo.sec.gov) that could cause actual results, performance or events to differ materially and adversely from what has been expressed or implied in such statements. Forward-looking statements may be identified by context or words such as "may, will, should, expects, plans, intends, anticipates, believes, estimates, predicts, potential or continue" and other similar expressions. Neither Abbott, its affiliates, nor any of Abbott's or its affiliates' respective advisers, members, directors, officers, partners, agents, representatives or employees or any other person (collectively "Abbott Entities") is under any obligation to update or keep current the information contained in this document.

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Coronavirus Outbreak Risks. The recent global outbreak of the 2019 novel coronavirus ("COVID-19"), together with resulting voluntary and U.S. federal and state and non-U.S. governmental actions, including, without limitation, mandatory business closures, public gathering limitations, restrictions on travel and quarantines, has meaningfully disrupted the global economy and markets. Although the long-term economic fallout of COVID-19 is difficult to predict, it has and is expected to continue to have ongoing material adverse effects across many, if not all, aspects of the regional, national and global economies. In particular, the COVID-19 outbreak has already, and will continue to, adversely affect many private equity investments and many of the industries in which private equity managers operate. The ability to operate effectively, including the ability of personnel or service providers and other contractors to function, communicate and travel to the extent necessary to carry out investment strategies and objectives and business, has been, and will continue to be, impaired. Markets are experiencing very high levels of volatility and generally stressed conditions. Businesses across the United States and the world, and across most sectors, are experiencing significant challenges to their revenues and business, which could make it difficult for businesses to continue as a going concern. Unemployment is likely to rise significantly and reduced revenues may reduce profits or lead to losses. Many governments--federal, state, local, and non-United States--have imposed limitations on businesses and intervened in markets in an effort to ensure they continue to function. It is unclear how long these conditions will continue and, the longer these conditions continue, the risk of a long term adverse effect increases. The extent of COVID-19's impact will depend on many factors, including the ultimate duration and scope of the public health emergency and the restrictive countermeasures being undertaken, as well as the effectiveness of other governmental, legislative and financial and monetary policy interventions designed to mitigate the crisis and address its negative externalities, all of which are evolving rapidly and may have unpredictable results. Even if and as the spread of the COVID-19 virus itself is substantially contained and economies are able to "re-open", it will be difficult to assess what the longer-term impacts of an extended period of unprecedented economic dislocation and disruption will be on future macro-and micro- economic developments, the health of certain industries and businesses, and commercial and consumer behavior.

Important Information

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Market Performance and Indices: Market indices, benchmarks or other measures of relative market performance are provided for information only and do not imply that an Abbott Client will achieve, or should expect, similar returns, volatility or results, or that these are appropriate benchmarks to be used for comparison. The market volatility, liquidity and other characteristics of private equity investments are materially different from publicly-traded securities and the composition of these indices does not reflect the manner in which any Abbott Client portfolio is constructed with respect to expected or actual returns, portfolio guidelines/restrictions, investment strategies/sectors, or volatility, all of which change. Index returns will generally reflect the reinvestment of dividends, if any, but do not reflect the deduction of any fees or expenses which would reduce returns. An investor cannot invest directly in the indices.

With respect to publicly-traded securities, Abbott generally calculates or provides performance using the following indices:

- S&P 500: Annualized time-weighted total returns of the S&P 500 (represents the 500 most widely-held large cap US stocks on the NYSE or NASDAQ) includes the reinvestment of dividends and income.

Where indicated, returns are calculated as a Public Market Equivalent (PME or PME+) as described in "A Private Investment Benchmark", a 1996 white paper by Austin M. Long III and Craig J. Nickels, and PME+ as described in "Private Equity Benchmarking with PME+", an article published in the Venture Capital Journal (August 2003) by Christophe Rouvinez of Capital Dynamics. PME analysis/return is calculated without adjustment for management fee and carried interest paid to Abbott. PME is an internal rate of return calculated as if investor cash flows were used to purchase and sell shares of a public market index. PME+ scales distributions by a constant proportion such that the net remaining investment in the index equals the actual net asset value at the measurement date. PME+ is provided because if a portfolio significantly outperforms the public market index due to a high level of distributions, the net remaining investment in the index may be in a short position. A PME+ return calculation permits the net remaining investment in the index to equal the net asset value of the private equity portfolio at the measurement date. Any PME (or PME+) analysis is based on illiquid and unrealized values which will vary considerably over the life of an investment, thus making this type of comparison more relevant with respect to mature funds (i.e., where net asset value is a small fraction of total distributions). Horizon PMEs are calculated using actual daily cash flows of each portfolio investment; Abbott Fund PMEs are calculated using cash flows between the relevant Abbott Fund and its limited partners.

Abbott and Portfolio Investment Performance Information:
Internal Rate of Return (IRR) represents the annualized internal rate of return over the relevant period using Latest Valuation.
Latest Valuation refers to the fair value of net assets as of the report date.
Total Value equals Distributions plus Latest Valuation.
TVPI represents the Total Value over Contributions.
DPI represents Distributions over Contributions.

A Net IRR or a net multiple is net of underlying portfolio fund investment fees and expenses, net of fees paid (or pro forma fees paid) to Abbott as the investment adviser, and net of allocations of carried interest to Abbott, if any.

A Gross IRR or a gross multiple, and unless otherwise noted, any composite level or individual portfolio investment return, is net of underlying portfolio investment fees and expenses, but NOT net of fees paid, or allocations of carried interest made, to Abbott as the investment adviser, account level expenses and adjustments resulting from gains and losses realized upon the sale of distributed stock. Actual returns to an individual investor or client would be further reduced for any such fees and expenses not accounted for in the performance calculations.

AUM will not reflect Abbott's reported RAUM due to the inclusion of non-discretionary assets for which Abbott does not provide continuous and regular supervisory or management services and the inclusion of liabilities.

Since Inception refers to an Abbott inception date of March 31, 1987.

Expenses, management fees and performance fees/carried interest paid by existing or past Abbott Clients may not be comparable to the expenses, management fees and performance fees/carried interest that another or future Abbott Client will pay in respect of its investments and such amounts may be lower or higher than amounts actually paid with respect to investors in prior or subsequent Abbott Funds or paid by discretionary separate account clients. Results portrayed may reflect the reinvestment of realized proceeds and other earnings by the Abbott Funds and the underlying portfolio investments. Exchange rate fluctuations may affect returns. Interim performance data may not accurately reflect the actual current or expected future performance of an Abbott Client. Performance data should not be used to compare returns among private equity funds due to, among other factors, differences in vintage year, investment strategy, investment size, etc. The performance herein has not been calculated, reviewed, verified or in any way sanctioned or approved by the general partners of the portfolio funds. There can be no assurance that any Abbott Client, its portfolio investments and underlying portfolio companies, or the private and public equity and debt markets in general, will perform, or continue to perform, similarly to prior periods, funds, investments, or accounts. It should not be assumed that any fund organized, or investment made, in the future will ultimately be profitable or will equal the performance of the funds, investments, or accounts listed in this material.

Important Information

Unrealized valuations depend upon assumptions that may be reasonable under the circumstances and at the time made, but actual realized returns on unrealized investments will depend upon, 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 used for the valuations incorporated herein. Actual realized returns on unrealized investments may differ materially and adversely from the returns indicated herein.

The hypothetical and pro forma information herein is for illustrative purposes only and is not indicative of any future performance as it is hypothetical and does not reflect the actual results achieved by Abbott or any of its client accounts or investors. There is no assurance that this information accurately represents the performance that an investor would have achieved had it invested in any included transaction or any Abbott portfolio or that an investor will be able to make any profit or be able to avoid incurring any substantial losses.

Certain Abbott Funds, such as ASO, use a subscription line of credit. Performance may be favorably impacted when the Abbott Fund uses this line of credit to facilitate portfolio investments, or to pay expenses, because it defers the calling of capital from investors. Since IRR generally is calculated as of the date the Abbott Fund's capital is called, rather than at the earlier time of funding the portfolio investment or payment of the expense, the use of a subscription line of credit could have a favorable impact on performance returns. If a subscription line had not been used, the Net LP IRR may have been materially different due to the increased time an investor's capital was at risk.

Abbott Composites: Unless otherwise noted, the Abbott composites below include all relevant portfolio investments made by Abbott on behalf of its discretionary client accounts (including the Abbott Funds) being managed as of the date indicated or through liquidation. Not all composites may appear within this material. Composite performance is unaudited and does not represent the actual return of any Abbott Client. Composite returns are NOT net of account level expenses and adjustments resulting from the gains and losses realized upon the sale of distributed stock. Actual returns to an individual investor or client would be reduced for any such fees and expenses not accounted for in these performance calculations.

- Abbott Horizon Performance: Pooled returns for all portfolio investments, shown gross and net of Abbott's management fees and carried interest (if any).
- Individual Strategy Performance: Unless otherwise noted, pooled returns by strategy for primary fund investments only. Returns are shown gross of Abbott's management fees and carried interest (if any). The application of an annual pro-forma management fee of 0.72% on each portfolio fund in the composite would result in an estimated average impact per strategy of 2.3% to IRR and 0.12X to TVPI. The pro-forma management fee applied is the equivalent of a 1.0% annual management fee on individual portfolio fund commitments, adjusted to reflect the typical phase-in and phase-down of the management fee over a 15-year period, or if earlier, through such time as the investment was liquidated or sold.

STATE OF ALASKA
DEPARTMENT OF REVENUE

ALASKA RETIREMENT MANAGEMENT BOARD

Real Assets
Fiscal Year 2022 Annual Investment Plan

September 2021

Steve Sikes, CFA, CPA
Manager of Opportunistic Strategies & Real Assets

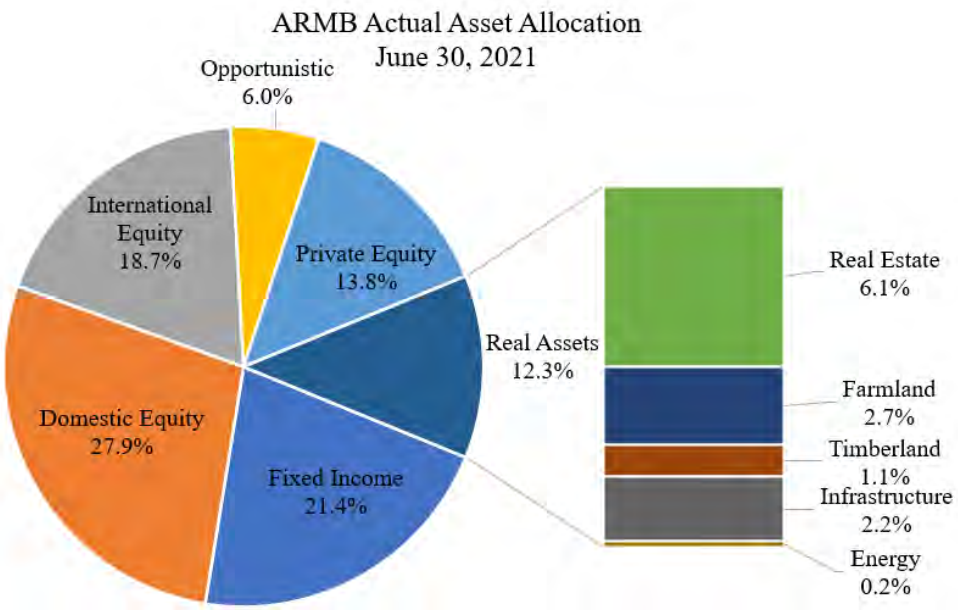
Alaska Retirement Management Board

Real Assets Portfolio

Portfolio Role: Diversify the portfolio while providing attractive total returns, inflation protection, and income.

Strategy: Seek to establish exposure to real assets through both public and private assets primarily in core investments.

Return Expectations: Long-term performance expectations for real assets are to have net-of-fee performance between public equities and fixed income over rolling 6-year periods.



Real Assets represented $4.1 billion of ARMB's $33.2 billion of total defined benefit assets as of June 30, 2021. Callan Real Assets values are used.

Benchmark: At the asset class level, a custom benchmark of 35% NFI-ODCE, 15% FTSE NAREIT Equity Index, 25% NCREIF Farmland Index, 10% NCREIF Timberland Index, 15% CPI+4 is employed.

Structure: The Real Assets portfolio is primarily a collection of private, illiquid assets requiring long-term holding periods and an investment in publicly traded REITs.

Alaska Retirement Management Board

Fiscal Year 2022 ARMB Asset Allocation

- What are we trying to achieve? Callan's FY22 Capital Market Assumptions:

Customized ARMB Capital Market Projections – PERS & TRS Target

ARMB Asset Allocation Model 2021-2030

		PROJECTED RETURN		PROJECTED RISK	
Asset Class	**Target Weight**	**1-Year Arithmetic**	**10-Year Geometric Return**	**Annualized Standard Deviation**	**Projected Yield**
Public Equities	**47.0%**				
Broad US Equity	28.0%	8.00%	6.60%	17.95%	1.95%
Global Ex-US Equity	19.0%	8.70%	6.80%	20.70%	2.80%
Fixed Income	**22.0%**				
ARMB Fixed Income	22.0%	1.75%	1.70%	3.55%	2.43%
Opportunistic	**6.0%**				
Opportunistic	6.0%	5.45%	5.00%	10.60%	2.20%
Private Equity	**12.0%**				
Private Equity	12.0%	11.50%	8.00%	27.80%	0.00%
Real Assets	**13.0%**	**6.80%**	**6.10%**	**13.10%**	**4.35%**
Real Estate	4.88%	6.60%	5.75%	14.10%	4.40%
Timber	1.30%	6.45%	5.50%	14.95%	3.70%
Farmland	3.25%	6.60%	5.60%	15.10%	4.25%
Private Infrastructure	2.28%	7.00%	6.00%	15.45%	4.60%
REITs	1.30%	8.15%	6.20%	20.70%	4.65%
Cash Equivalents	**0.0%**				
Cash Equivalents	0.0%	1.00%	1.00%	0.90%	1.00%
Inflation			2.00%	1.50%	
Total Fund	**100.0%**	**6.90%**	**6.15%**	**13.56%**	**2.32%**

Projection set customized to reflect specific ARMB strategies:

- Real assets, opportunistic and fixed income

Source: Callan, LLC June 2021 ARMB presentation

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Actual vs. Target Weights

as of June 30, 2021	**Actual**	**Target**	**Difference**
Core Real Estate	34.5%	35%	-0.5%
Non-Core Real Estate	2.5%	0%	2.5%
REITs	13.1%	15%	-1.9%
Farmland	21.7%	25%	-3.3%
Timberland	8.9%	up to 10%	-1.1%
Infrastructure	17.9%	15%	2.9%
Energy	1.5%	0%	1.5%
Total Real Assets	12.5%	13.0%	-0.5%

- Long-term sector target allocations are developed with Callan, ARMB's Real Assets consultant. The asset class sector target weights remain unchanged since 2019.
- As of June 30, the Real Assets portfolio was largely in-line with targets. Underweight in REITs is partially offset against exposure to non-core real estate.
- At the plan level, Real Asset allocation difference with target is accommodated by adjusting investments in fixed income and equity based on a 60/40 allocation.

Alaska Retirement Management Board

Fiscal Year 2022 ARMB Asset Allocation

- ARMB increased the Real Assets target allocation to 14% from 13% as part of its FY22 asset allocation.

*$ millions, June 30 Callan Real Assets Report, adjusted****							
ARMB Real Assets	**Target Allocation**	**NAV $ Target**	**NAV $ Actual**	**Target - Actual**	**Investment Action**	**Projected NAV $**	**Projected Allocation**
Core	35%	1,665	1,289	376	400	1,689	35.9%
Non-Core	0%	-	103	(103)	-	103	2.2%
REITS	15%	714	541	173	-	541	11.5%
Farmland	25%	1,189	900	289	300	1,200	25.5%
Timberland *	up to 10%	367	367	-	-	367	7.8%
Infrastructure	15%	714	742	(29)	-	742	15.8%
Energy	0%	-	62	(62)	-	62	1.3%
Total	**100%**	**4,648**	**4,004**	**644**	**700**	**4,704**	**100%**
Real Assets FY22 Target	14%						
Total Plan Assets ($ millions) **	33,200						
* Current timberland portfolio size of 8.8% is used as target.							
** Current Plan Assets as of June 2021							
*** Core reduced by $140 million to reflect UBS distribution in Aug, 2021							

- The additional investment requirement is also being driven by the very strong 1-year asset growth at the plan level with a return of 27.6% and assets growing by $6.65 billion during the 12-months ending June 30, 2021.

- Based on June 30, 2021 total plan asset levels, ARMB needs to invest approximately $700 million in Real Assets to achieve a 14% target level.

- A 10% correction in overall plan assets could reduce Real Asset investment needs which suggests an investment implementation over time is prudent given uncertainty around monetary policy and the pandemic combined with very strong plan Fiscal Year 2021 returns.

Alaska Retirement Management Board

ARMB Performance vs. Benchmarks

- The Real Assets portfolio returned 11.14% net in Fiscal Year 2021 which outperformed the target return of 8.95%.
- Most sectors performed within expectations with REITs producing exceptional performance over the short and long-term. Non-core real estate returns underperformed on 1-year basis but longer-term results are favorable.
- Performance has met objectives of providing diversification and returns between public equities and fixed income.

as of June 30, 2021 (net of fees)	Qtr	1yr	6yr	10yr
Core	2.93%	9.73%	7.35%	8.73%
NCREIF ODCE	3.68%	7.09%	6.47%	8.60%
Non-Core	1.30%	3.95%	8.52%	9.36%
NCREIF ODCE +1.5%	4.02%	8.59%	7.97%	10.10%
REIT	11.97%	32.49%	10.42%	10.16%
FTSE NAREIT All Equity	12.03%	32.80%	10.54%	10.29%
Farmland	0.76%	6.34%	4.29%	6.86%
NCREIF Farmland (80/20 Blend)	2.00%	6.54%	4.71%	7.74%
Timberland	1.76%	5.00%	1.83%	4.16%
NCREIF Timberland	1.70%	3.10%	2.78%	4.66%
Infrastructure (Private)	5.44%	13.06%	10.34%	
CPI+4%	3.49%	9.39%	6.19%	
ARMB Real Assets	3.87%	11.14%	5.67%	7.26%
ARMB Real Assets Target	3.73%	8.95%	5.94%	7.42%
Russell 3000	8.24%	44.16%	15.10%	14.70%
Bloomberg Barclays Aggregate	1.83%	-0.33%	3.52%	3.39%

Source: Callan Real Assets Quarterly Report June 30, 2021

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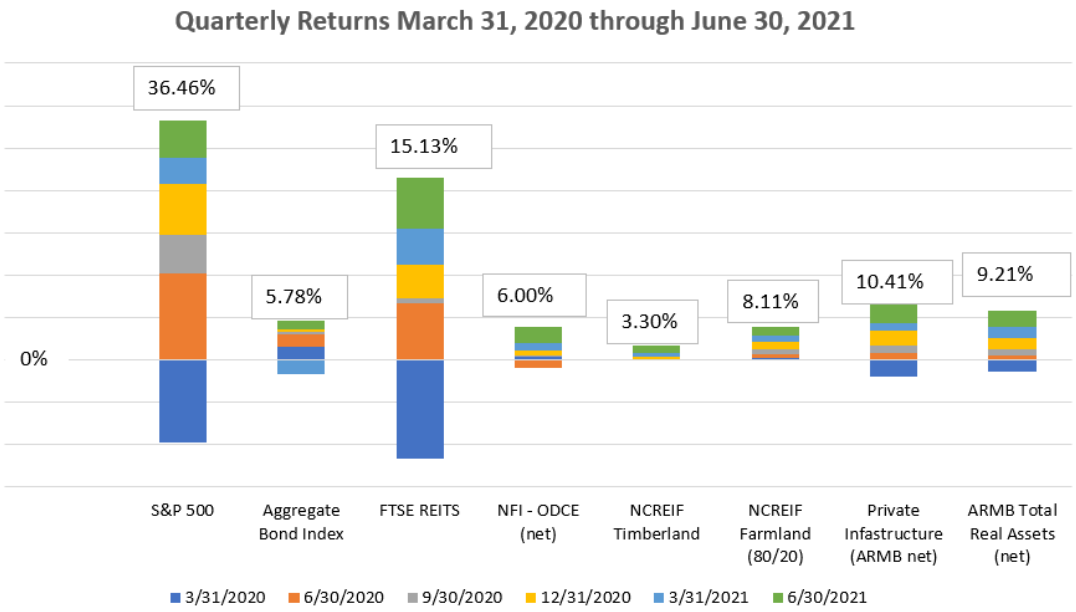
COVID Look Back

- Real Asset sector returns have been positive over the full pandemic period. Total ARMB Real Asset net returns were 9.21% over the 6-quarter period ending June 30, 2021.
- Consistent with historical behavior, REITs had much higher volatility than private investment components.
- Farmland and Timberland NCREIF returns were positive with relatively small quarterly write-downs early on in real estate and infrastructure.



Quarter Ending	3/31/2020	6/30/2020	9/30/2020	12/31/2020	3/31/2021	6/30/2021	6 Qtr Cumulative
S&P 500	-19.60%	20.54%	8.93%	12.15%	6.18%	8.55%	36.46%
Aggregate Bond Index	3.15%	2.90%	0.62%	0.67%	-3.37%	1.83%	5.78%
FTSE REITS	-23.44%	13.25%	1.19%	8.15%	8.32%	12.03%	15.13%
NFI - ODCE (net)	0.75%	-1.75%	0.27%	1.10%	1.89%	3.68%	6.00%
NCREIF Timberland	0.11%	0.08%	0.04%	0.58%	0.76%	1.70%	3.30%
NCREIF Farmland (80/20)	0.55%	0.92%	1.13%	1.77%	1.49%	2.00%	8.11%
Private Infastructure (ARMB net)	-3.85%	1.57%	1.80%	3.62%	1.65%	5.44%	10.41%
ARMB Total Real Assets (net)	-2.74%	1.13%	1.50%	2.44%	2.81%	3.87%	9.21%

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Fiscal Year 2021 Accomplishments

- Invested an additional $100 million in the BlackRock Core US Real Estate Fund and an additional $125 million in REITs.
- $50 million re-up commitments each were made to non-core real estate managers KKR Real Estate Partners Americas III and Almanac Realty Securities IX.
- UBS placed $140 million of mortgage debt on three existing real estate properties. Proceeds have been reinvested based on ARMB's overall asset allocation.
- Cancelled redemption request to JPM Strategic Property Fund due to change in market conditions and desire to maintain exposure with manager in good standing.
- While no acquisitions were made during Fiscal Year 2021, Sentinel continued to work on deploying $125 million of allocation into the real estate separate account.
- Renegotiated contracts with all separate account managers to achieve lower fees.
- Consolidated timberland separate accounts into one account managed by Timberland Investment Resources, LLC.
- Consolidated farmland separate accounts into one account managed by UBS Farmland LLC.

Alaska Retirement Management Board

Real Estate Portfolio

- Two core separate account managers make investments on a discretionary basis within the parameters defined by ARMB's guidelines and annual investment plan up to approved allocations. These investments represent 38% of the real estate portfolio and are currently composed of 15 assets within the apartment, industrial, office, and retail sectors across the U.S. ARMB owns 100% interest in these assets.

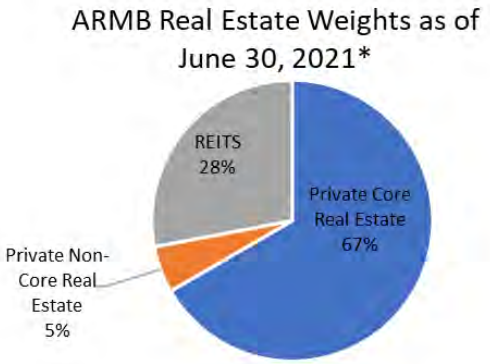
- Three core open-end commingled funds make investments on a discretionary basis according to each fund's strategy. These funds represent 28% of the real estate portfolio and offer well diversified exposure across asset types, markets, and size. ARMB owns units in these funds along with other institutional investors.

- Fund investments with three non-core commingled fund managers represent the majority of non-core real estate strategies. Non-core funds represent 5% of the real estate portfolio.

- The remaining 28% of the real estate portfolio is a passive publicly traded REIT stock portfolio invested internally by staff.

Real Estate Portfolio
June 30, 2020 *

- Net Asset Value: $1.9 billion
- Number of Assets: 15 + commingled fund interests
- Core Structure: 2 separate accounts, 3 open-end funds
- Non-Core Structure: 14 commingled funds
- U.S. Domestic REITs – FTSE NAREIT All Equity



* Values adjusted for $140 million financing in UBS portfolio in August 2021

Alaska Retirement Management Board

Real Estate – Outlook

- Industrial and apartment sectors are expected to continue to benefit from positive trends in logistics and housing demand. Retail and office have higher uncertainty from the pandemic and e-commerce trends.
- ARMB's portfolio has benefitted from being overweight apartment and industrial.

NPI total returns have bifurcated

Calendar Year							
2014	2015	2016	2017	2018	2019	2020	2021Q2 (TTM)
Ind 13.4%	Ret 15.3%	Ind 12.3%	Ind 13.1%	Ind 14.3%	Ind 13.4%	Ind 11.8%	Ind 23.0%
Ret 13.1%	Ind 14.9%	Ret 9.0%	Apt 6.2%	Off 6.9%	Off 6.6%	Apt 1.8%	Apt 7.0%
Off 11.5%	Off 12.5%	Apt 7.3%	Ret 5.9%	Apt 6.1%	Apt 5.5%	Off 1.6%	Off 3.2%
Apt 10.3%	Apt 12.0%	Off 6.2%	Off 5.8%	Ret 2.2%	Ret 1.9%	Ret -7.5%	Retail -1.3%

Source: BlackRock

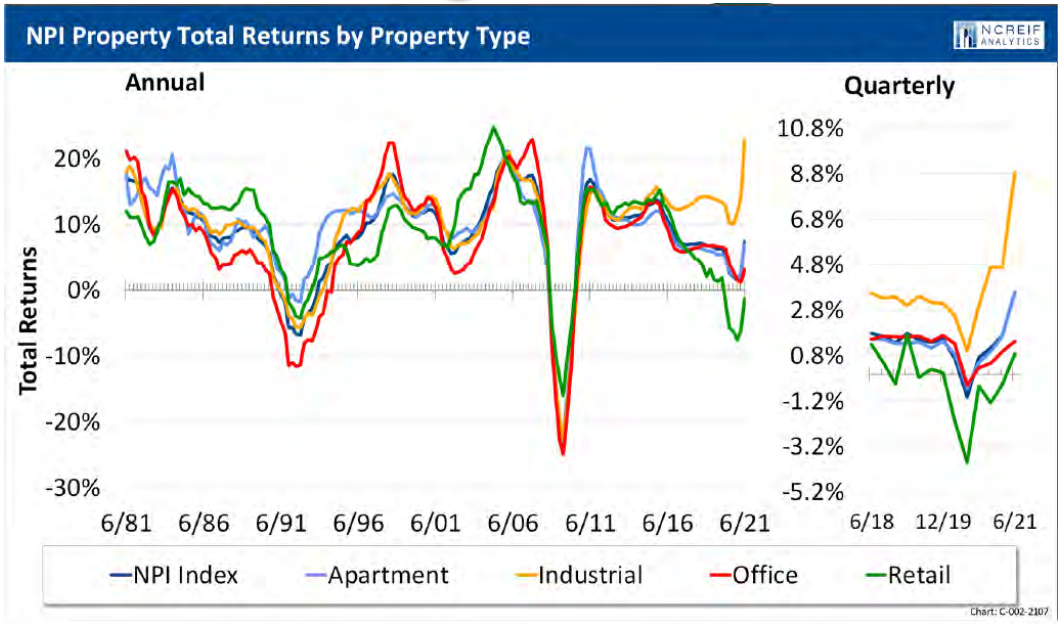
Forecasts project continuation (2021-2023)

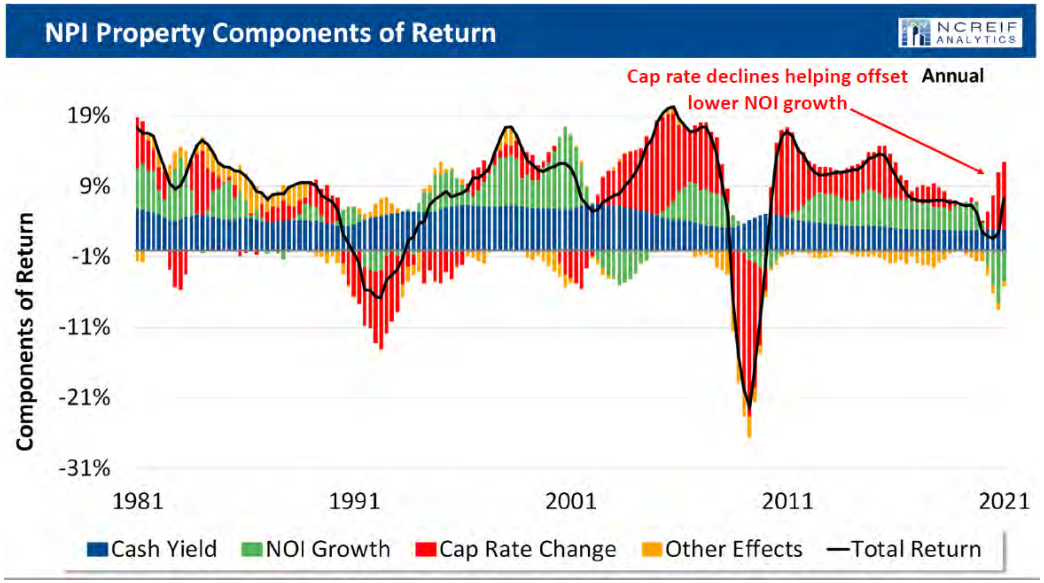
Sector	Current Cap Rate		Dividend Pay-Out Ratio		Dividend Yield		NOI Growth		Cap Rate Shift Effect		Total Return	Exit Cap Rate
Industrial	4.4	x	68.4	=	3.0	+	4.8	+	2.1	=	9.9	4.2
Apartment	3.9	X	74.8	=	3.1	+	6.6	+	-2.9	=	6.9	4.2
Office	4.5	X	57.7	=	3.0	+	1.7	+	-1.3	=	3.4	4.7
Retail	4.2	X	70.0	=	3.3	+	2.4	+	-4.4	=	1.3	4.9
NPI	4.3	X	66.6	=	3.1	+	3.7	+	-1.6	=	5.3	4.5

Alaska Retirement Management Board

Real Estate – Performance

- Core real estate returns as provided by the NCREIF Property Index have been negatively impacted by the pandemic but nowhere near GFC magnitude.
- Recent performance has turned up across property types with industrial and apartments outperforming office and retail.
- Returns have been driven by capitalization rate declines as net operating income growth has been negatively impacted by the pandemic. Real time data suggests income growth is now recovering.





Source: NCREIF

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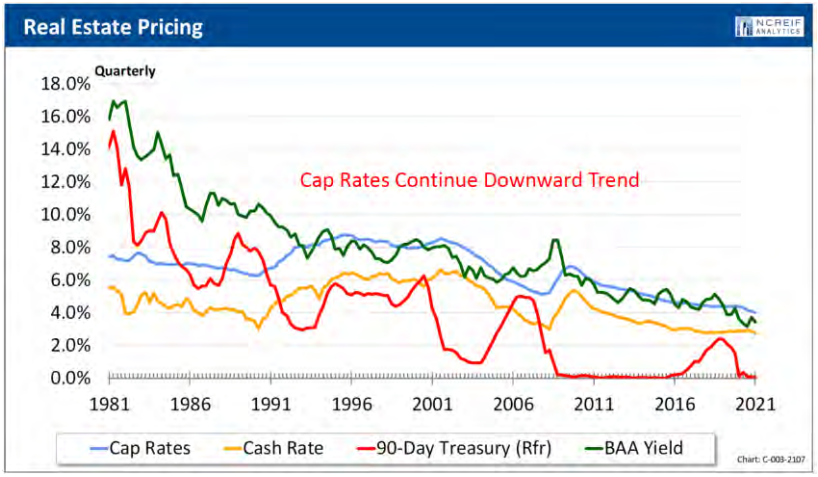
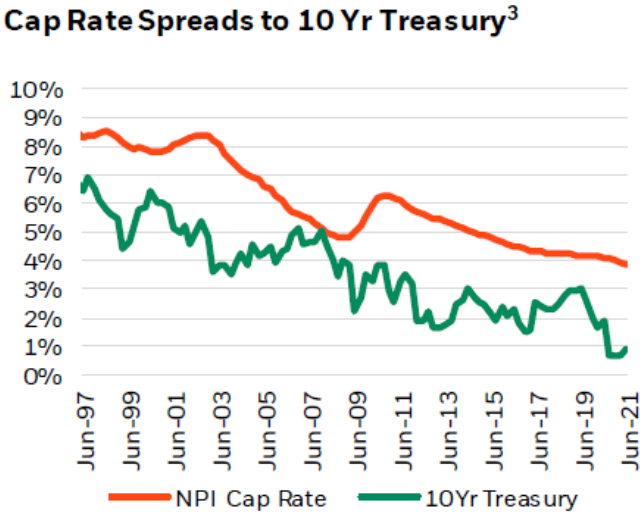
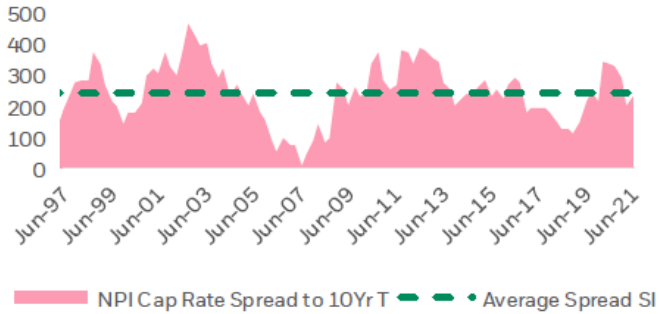
Real Estate – Performance

- Declining interest rate markets have supported real estate pricing as stable income streams have become more valuable.
- Current real estate capitalization rates approximate average spreads to 10-year Treasuries and maintain historical consistency with BAA corporate bond levels.
- Real estate capitalization rates were lower than bonds in the 1980's due to expectations real estate income growth would offset higher inflation.



Source: NCREIF





[2] Source: Real Capital Analytics as of June 2021.

[3] Source: NCREIF, Bloomberg; as of June 2021.

Source: BlackRock

Alaska Retirement Management Board

Real Estate – Strategy

- Continue primary focus on income producing core real estate to achieve results between stocks and bonds through core separate accounts and open-end funds.
- Be diversified. Uncertainties abound, particularly in office and retail. Portfolio growth in the UBS and Sentinel separate accounts will improve diversification.
- Portfolio is expected to continue to be overweight to apartment and industrial assets going forward.
- ARMB has been able to achieve relatively attractive fee levels compared to the NCREIF ODCE open-end fund market with a weighted portfolio fee that is approximately 50% of the NCREIF ODCE Index level. Continue to leverage these economics.
- ARMB also has an attractive fee level on its REIT portfolio which is internally managed by equity team.

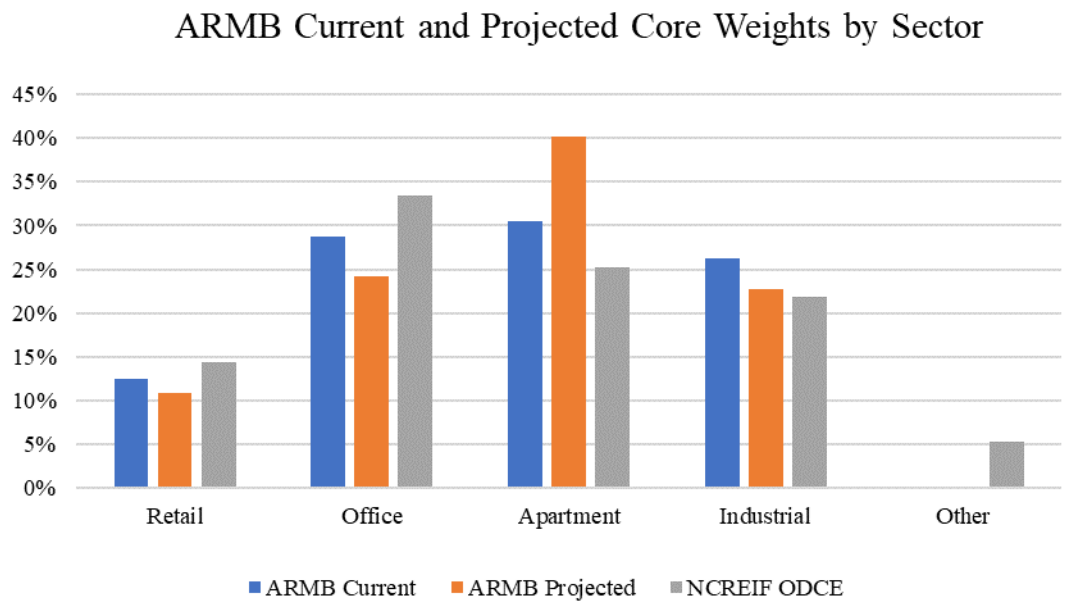
	ARMB NAV		1 Year		5 year		10 year	
as of June 30, 2021	*$millions*	*Core Weight*	Income	Total	Income	Total	Income	Total
UBS Separate Account (net)	527	42%	4.11%	11.63%	4.28%	8.38%	4.71%	11.59%
Sentinal Separate Account (net)	188	15%	4.80%	13.03%	4.77%	8.13%	4.90%	10.20%
BlackRock Core Property Fund (net)	348	27%	3.18%	7.24%	3.64%	6.95%	3.86%	9.23%
JPM Strategic Property Fund (net)	161	13%	2.39%	5.61%	2.93%	5.00%	3.68%	8.44%
UBS Trumbull Property Fund (net)	42	3%	3.05%	1.13%	3.48%	1.86%	3.74%	5.75%
NCREIF ODCE Value Wt (net)				7.09%		6.57%		8.60%

Source: Callan and BlackRock (1,5,10yr BlackRock numbers reflect general fund returns and not ARMB results)
UBS NAV adjusted for $140million financing that occurred in July 2021

Alaska Retirement Management Board

Real Estate – Strategy

- Projection of ARMB core real estate portfolio assuming additional investments to meet target allocation:



- Separate accounts are expected to focus additional investment primarily on multi-family due to positive housing dynamics, expected rent growth, and relatively low capital expenditure reinvestment requirements.

- Projections include assumptions about core open-end sector exposures.

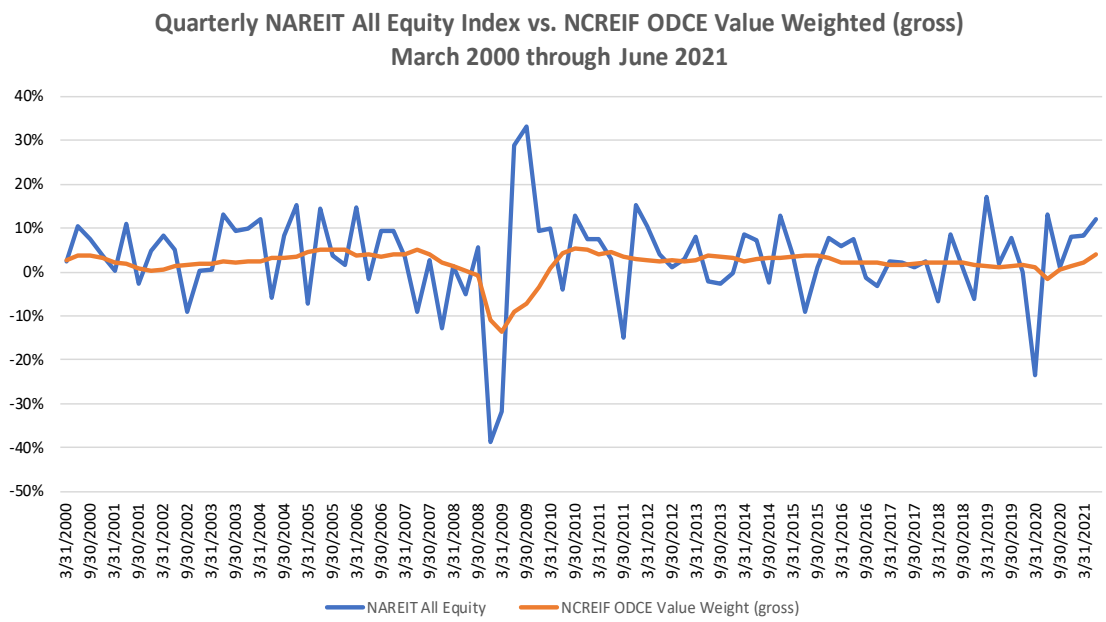
Alaska Retirement Management Board

Real Estate Portfolio – REITs

- REITs are a significant part of the ARMB Real Estate portfolio with a target weight of 15%.
- The FTSE NAREIT All Equity Index offers ARMB liquidity, diversification, and attractive returns in the Real Assets portfolio.
- Relative performance has been attractive compared to the NCREIF ODCE Index but at a much higher volatility level and drawdown risk. As long-term holders, we view REITs as attractive exposure for the Real Assets portfolio with volatility providing rebalancing opportunity.

March 2000 - June 2021 quarterly returns	FTSA NAREIT All Equity	NCREIF-ODCE
Annualized Return	11.5%	7.9%
Annualized Volatility	20.6%	6.2%
Sharpe Ratio	0.48	1.00

FTSE NAREIT All Equity REITS Index	# of Companies	Weights
Infrastructure REITS	4	17.2%
Industrial	13	11.5%
Apartments	15	10.8%
Data Centers	5	9.4%
Health Care	17	8.9%
Office	20	7.3%
Self Storage	5	6.4%
Free Standing	10	4.3%
Specialty	10	4.1%
Shopping Centers	18	4.0%
Diversified	15	3.4%
Regional Malls	2	3.1%
Manufactured Homes	3	2.6%
Lodging/Resorts	13	2.5%
Single Family Homes	2	2.4%
Timber REITS	4	2.4%
TOTAL	**156**	**100%**
Traditional REIT Sectors		36.7%



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Real Estate Portfolio – Fiscal Year 2022 Plan

Core

- Portfolio allocation need is $400 million to achieve 35% target. Plan is to incrementally add investments over time. Reaching allocation is expected to take at least 12 months and possibly longer.

- Increase UBS separate account allocation by $140 million to reinvest financing proceeds in order to grow and diversify that core portfolio. UBS is targeting apartment properties within a multi-property type discretionary mandate.

- $125 million was allocated to Sentinel Real Estate in 2020 to grow ARMB's separate account apartment portfolio. Sentinel will also be looking to implement a financing strategy. A total of 4 – 6 additional property investments are expected bringing total portfolio to 7 – 9 properties.

- Commit additional $135 million to core open-end funds. Consider existing and new funds.

- Explore transitioning JPM SPF position to non-qualified eligible structure to permit health care plan participation.

- Adjust REIT exposure as needed recognizing REIT target, non-core weight, and overall Real Assets allocation. Evaluate and take action during quarterly ARMB rebalancing process.

Non-Core

- Existing strategies provide alpha opportunities to portfolio. Consider new strategies selectively.

REITs

- Maintain investment in passive diversified approach.

Alaska Retirement Management Board

Farmland Portfolio

- Investment manager makes investments on a discretionary basis within the parameters defined by the ARMB's guidelines and annual investment plan up to approved allocations.

- Portfolio is composed of U.S. farmland. Strategy is a leased-based approach targeting both row crops and permanent crops. ARMB owns 100% of the assets. Portfolio is currently 100% leased.

- The farmland portfolio target benchmark is the NCREIF Farmland Index reweighted to reflect 80% row crops and 20% permanent crops.

Farmland Portfolio
June 30, 2021

- Total Net Asset Value: $900.1 million
- Number of Assets: 88
- Total acres: 144,967
- Number of states where investments are located: 15
- Row/Permanent Crop Distribution by MV: 85%/15%

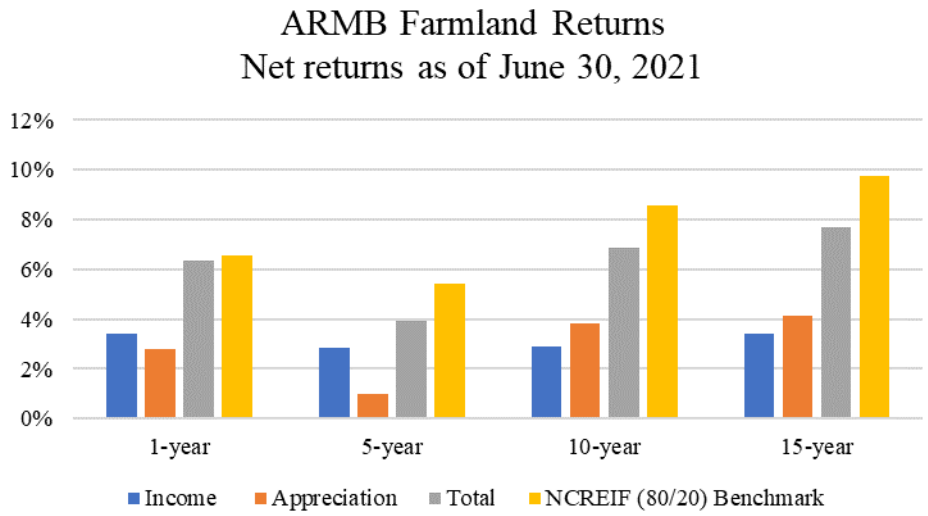
Strawberries, California

Wine Grapes, California

Alaska Retirement Management Board

Farmland Portfolio – Performance

- Historical returns have met objectives with attractive mix of income and appreciation.
- Returns have diminished over time as U.S. Treasury rates have declined.
- Portfolio is U.S.-based and well diversified by crop type and region.
- No leverage is used in portfolio construction.
- Longer-term underperformance compared to the benchmark is due to an underweight to permanent crops. UBS will be looking to add permanent crops with the additional allocation.



Midnight Sun portfolio diversification matrix as of June 30, 2021

(percent by market value)

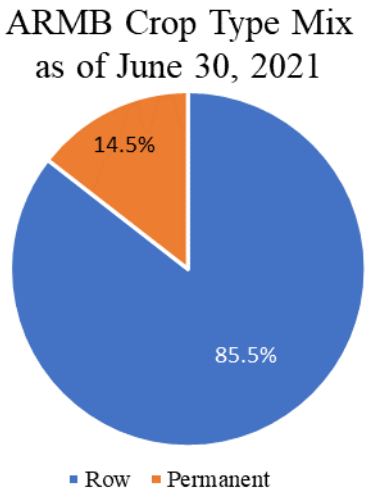
Crops	Mountain	Pacific West	Delta	Corn Belt	Southern Plains	Pacific Northwest	Appalachian	Southeast	Lake States	Total
Corn	6.56		3.48	6.42	4.41		2.20	0.66	0.05	23.77
Permanent		9.96				2.07		2.46		14.48
Vegetables	5.20	6.29			1.08	0.59	0.89		0.24	14.29
Soybeans	0.13		7.05	3.98	0.18		2.20		0.05	13.59
Wheat	5.58		0.25		0.89	1.91	0.10			8.77
Cotton		1.93	4.29		0.86		0.15	0.10		7.32
Other	1.51	1.56		0.03	0.60	0.65				4.34
Sugar crops	2.75	0.27			0.46					3.48
Range & hay	1.19	1.84			0.11					3.15
Rice			2.61							2.61
Feed grains	0.68				0.80	0.49				1.97
Berries		1.56								1.56
Peanuts								0.65		0.65
Total	23.60	23.41	17.68	10.43	9.39	5.71	5.58	3.86	0.34	100.00

Source: UBS Asset Management, Real Estate & Private Markets, Food & Agriculture
*Rounding differences may occur

Alaska Retirement Management Board

Farmland Portfolio – Fiscal Year 2022 Plan

- Portfolio allocation need is $300 million to achieve 25% target. Plan is to incrementally add to the allocation over time as capital is deployed and market conditions allow.
- Existing $100 million allocation to UBS was recently activated in the UBS rotation.
- Staff will work with UBS to manage additional allocation commitment with investment pace.
- No additional board action is required. CIO has discretion to add allocation as needed.
- Continue leased-based strategy targeting 80% permanent crops and 20% row crops.



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Timberland – Portfolio

- Investments are made on a discretionary basis within the parameters defined by ARMB's guidelines and annual investment plan up to approved allocations.
- ARMB allocation is fully invested at current size.
- Portfolios are composed of U.S. timberland. ARMB owns 100% of the assets.
- ARMB portfolio is diversified and well positioned to benefit from building product demand with 65% of portfolio in the U.S. South.
- No leverage is used in portfolio construction.

Timberland Portfolio
June 30, 2021

- Total Net Asset Value: $366.9 million
- Number of Assets: 17
- Total acres: 160,575
- Number of States where investments are located: 11

Source: Timberland Investment Resources, LLC

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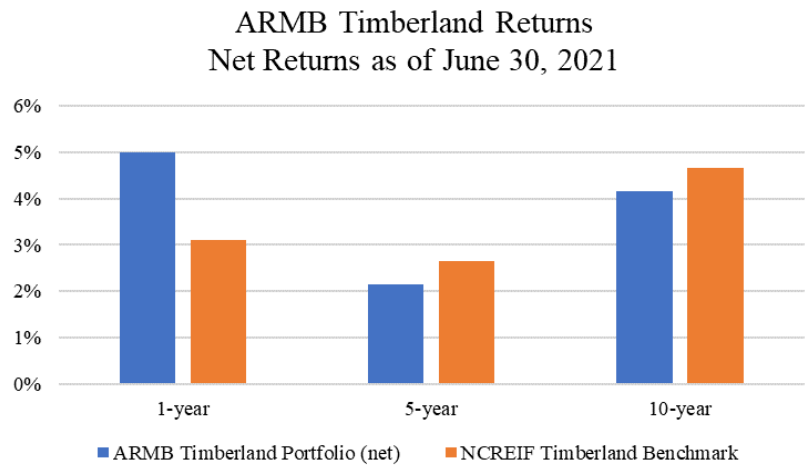
Timberland Portfolio – Performance and Fiscal Year 2022 Plan

- Sector returns have not met original 5% real return expectations, but current market trends are positive, and sector is still considered attractive within the context of a diversified Real Assets portfolio. Valuations imply net IRR of 8%.
- Timberland returns have been frustrated primarily by lack of growth in sawtimber prices. Price is expected to improve from strong mill growth in the U.S. South. A meaningful part of ARMB portfolio will be transitioning to higher value sawtimber in the coming years.
- Strategy is to stay the course with current portfolio as it provides inflation hedge and higher return opportunities through retail land sales and other higher and better use opportunities.
- How carbon offset markets will develop is uncertain but is possibly an undervalued option in the portfolio which is not factored into current return expectations.



Alaska Retirement Management Board

Infrastructure Portfolio

- ARMB is invested in two open-end private investment funds, sponsored by J.P. Morgan and Industry Funds Management (IFM).
- Investments are focused on essential core public infrastructure that are both regulated and unregulated. Assets include regulated water, regulated electricity, airports, pipelines, toll roads and ports. Target return is 8 – 12% net with a high cash yield.
- Portfolio is well diversified with a mix of GDP sensitive assets and regulated or contractually based assets which often include inflation pass-through features.
- ARMB infrastructure portfolio mix is 18% JPM and 82% IFM. While both funds are attractive investments, this mix has produced beneficial results so far with greater exposure to GDP sensitive assets and better cost economics for ARMB.
- COVID has had a negative impact on the operations of some assets such as airports and ports but the diversification of the portfolios has proved resilient thus far. Ports have recovered but airports are still struggling to recover pre-COVID operational levels.

Infrastructure Portfolio Profile
June 30, 2021

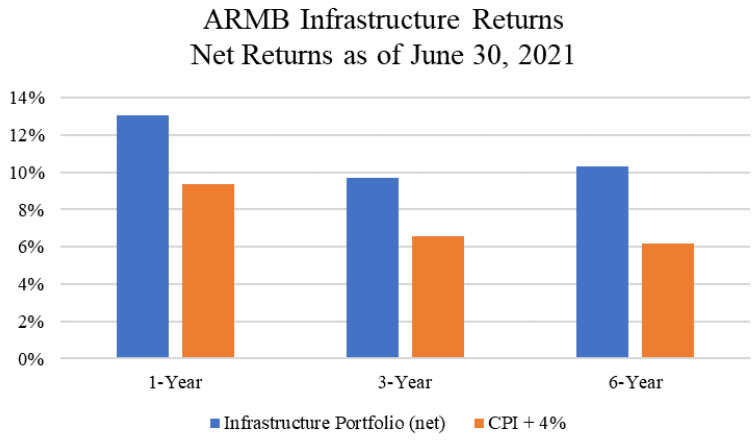
- Total Net Asset Value: $742.1 million
- Number of Company Investments in Funds: 36
- Total Combined Fund NAV (all investors): $52.1 billion

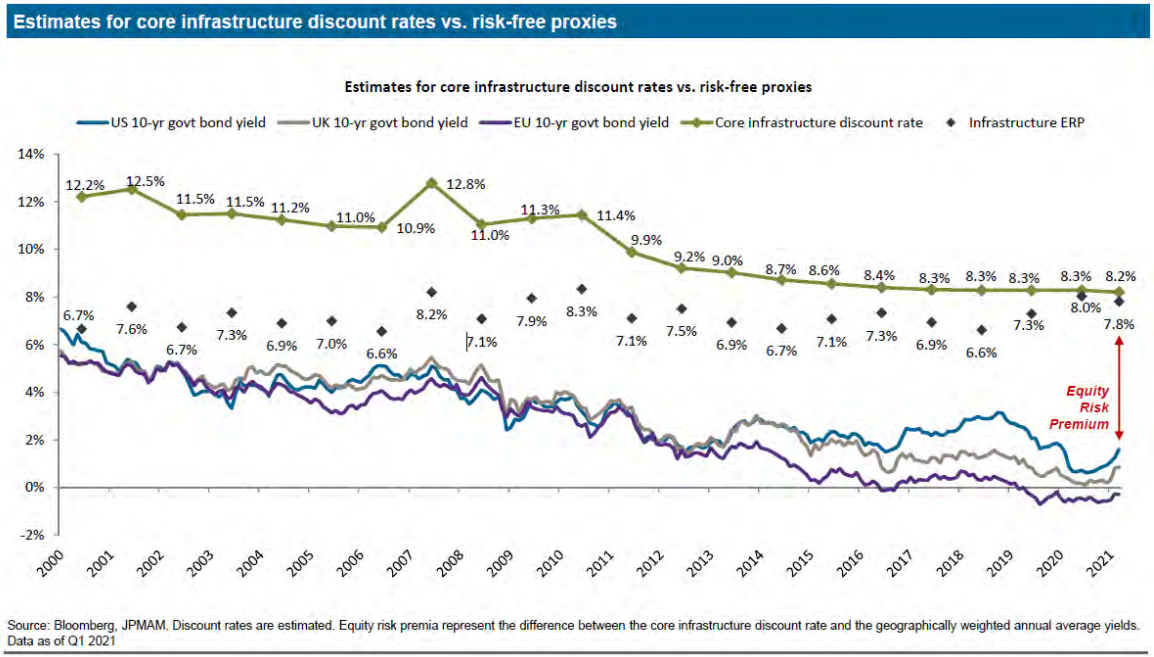
Indiana Toll road held in IFM Fund

Alaska Retirement Management Board

Infrastructure Portfolio – Performance and Fiscal Year 2022 Plan

- ARMB portfolio performance has been good. Both funds have benefitted from focus on cash yield and growth opportunities within existing companies in the portfolio.
- Current portfolio discount rates are attractive compared to risk free rates. They have not compressed like other asset sectors. The current weighted average discount rate for assets in the portfolios is approximately 10%.
- Both IFM and JPM have large current entry queues from investors.
- No portfolio changes are recommended for Fiscal Year 2022.
- Expect separate Energy portfolio will continue to wind down.





Source: JPMorgan Asset Management

Alaska Retirement Management Board

Real Assets – Fiscal Year 2022 Recommendation Summary

Real Estate	Invest $400 million in core real estate over time to meet allocation requirements: • $125 million allocation to Sentinel already authorized. • Allocate additional $140 million to UBS separate account to reinvest financing proceeds. • Increase investments in core open-end funds by $135 million. Explore non-qualified structure for existing JPM Strategic Property Fund investment. Continue to consider non-core investments on a selective basis. Adjust REIT position as needed during quarterly rebalancing process.
Farmland	Invest $300 million in farmland over time to meet allocation requirements. CIO discretion will be used to pace allocation increases incrementally.
Timberland	No changes recommended.
Infrastructure	No changes recommended.

Callan

September 2021

Real Assets Strategic Plan Review

Avery Robinson, CAIA
Co-Head Real Assets Consulting

Jonathan Gould, CAIA
Senior Vice President

Callan

The Role of Real Assets, Revisited

Real Asset Investing Strengths and Considerations

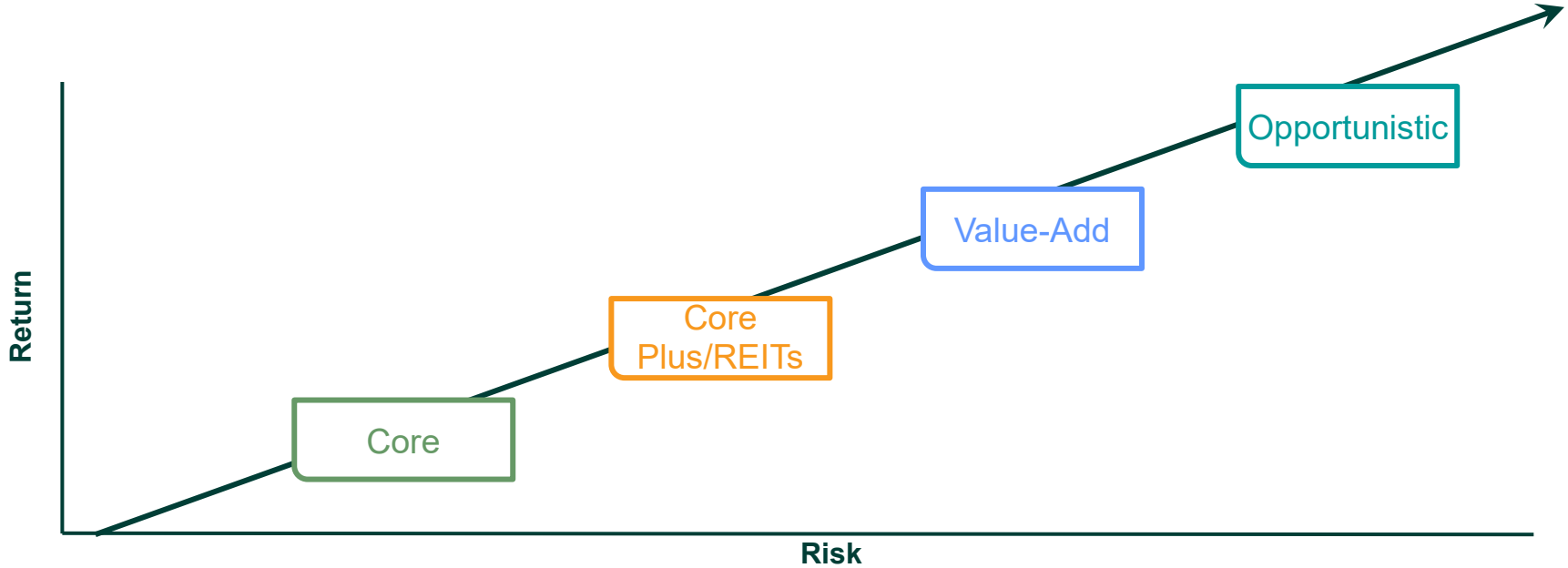
Strengths

- Competitive Returns
- Diversification benefits when added to portfolios of stocks and bonds
- Low correlations with stocks and bonds
- Strong income component
- Inefficiency creates return opportunities
- Inflation protection characteristics

Considerations

- Real Assets are cyclical in nature
- Private Markets
  - Not valued daily
  - Illiquid
  - Management intensive/implementation risks
  - High fees compared to mainstream asset classes
  - Lack of investable indices; benchmarking issues
- Public real estate
  - Volatility
  - Lower diversification benefits than private real assets

Private Real Assets Strategies – Relative Risk/Return



	Core		Non-Core	
	Core	Core Plus / REITs	Value-Add	Opportunistic
Net Return estimate	Up to 8%	8-10%	10-12%	13%+
Asset	Stable asset, Highly leased	Stable, plus moderate upside	Enhancement of existing asset, Material improvement, releasing	Development of a new asset, Significant capital improvement
Expected Income vs Appreciation Return	>75% from Income	65% Income / 35% Appreciation	50%/50%	>65% from Appreciation

Callan

Real Assets Market Overview and Performance Review

Real Estate Market Update – COVID-19

- Prior to the COVID-19 pandemic, the overall real estate market was relatively healthy from a fundamental standpoint, albeit there were indications of the market being late in the cycle. Positive indicators included strong occupancy, upward rent growth and steady transaction volumes. However, moderating total returns and the flattening of property value appreciation, particularly in the retail sector, was cause for some cautiousness.

- While the long-term impacts of the pandemic on real estate will continue to play out over time, it is clear that all property types have been impacted by the crisis, whether positively or negatively and to varying degrees.
  - Across the four main property types, the industrial sector has emerged as a clear winner, with tenant demand at an all-time high due to the growth of e-commerce as well as supply chain disruptions caused by the pandemic.
  - Apartments have generally been resilient, despite early concerns about rent collections, concessions, and declining market rents. Apartment performance varies significantly by market, dictated primarily by pandemic-driven migration trends.
  - Uncertainty remains in the office sector, with varying opinions on the long-term impacts of the pandemic on demand for office space and tenant preferences.
  - Pre-pandemic challenges in the retail sector have been accelerated by COVID-19, although there is significant dispersion between performance of discretionary retail and necessity-based, grocery-anchored retail centers.

- Although the transactions market has begun to rebound since the initial stages of the pandemic, the level of distressed, opportunistic acquisition opportunities has been limited relative to the amount of capital that was raised by opportunistic fund managers seeking to take advantage of the dislocation.

U.S. Private Real Estate Market Trends

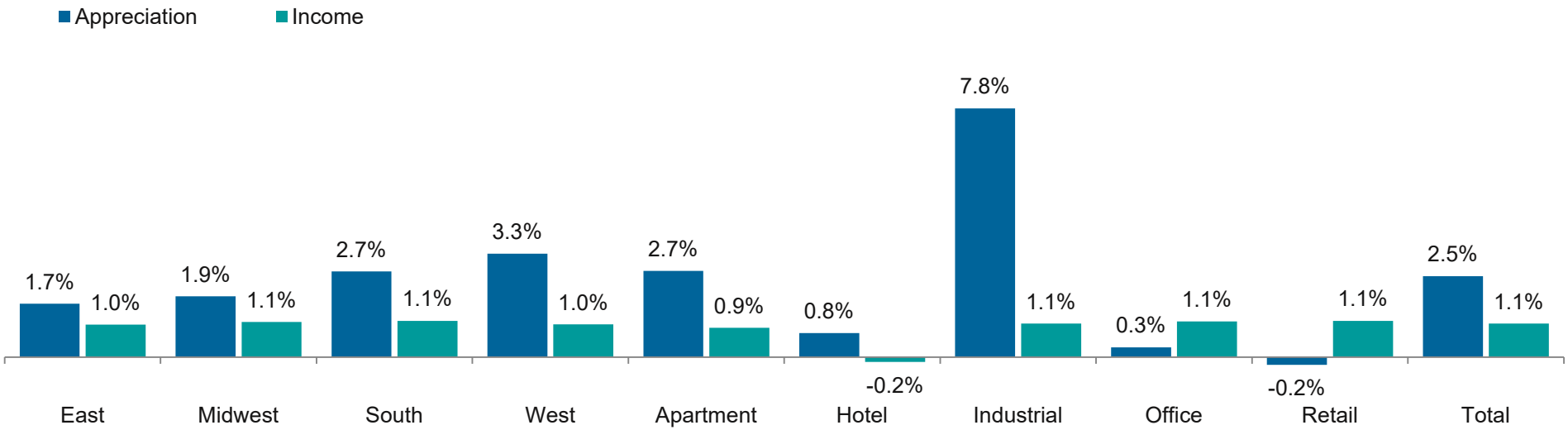
Market Performance through 2Q 2021

Results

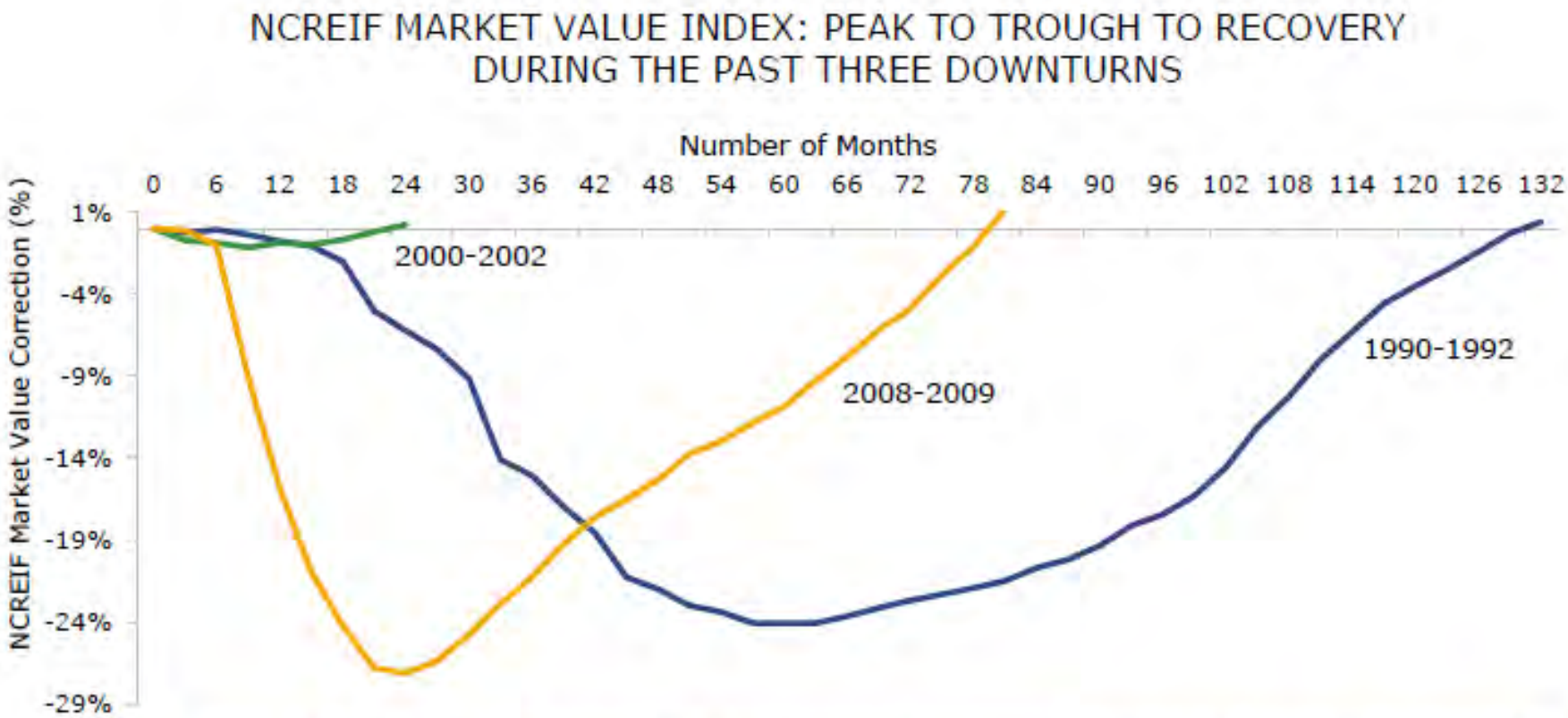
- Recovery continues as ODCE posts strongest return in 10 years; Industrial remains the best performer.
- Income remains positive except in Hotel sector.
- Appraisers beginning to price in recovery due to strong fundamentals within Industrial and Multifamily.
- Return dispersion by manager within the ODCE Index due to composition of underlying portfolios
- Exposure to niche sectors; self-storage & life sciences continue to be accretive

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	3.7%	7.1%	4.6%	5.6%	8.6%
Income	0.8%	3.0%	3.1%	3.3%	3.8%
Appreciation	2.9%	4.0%	1.4%	2.3%	4.8%
NCREIF Property Index	3.6%	7.4%	5.5%	6.1%	8.8%
Income	1.1%	4.2%	4.4%	4.5%	5.0%
Appreciation	2.5%	3.1%	1.1%	1.6%	3.7%

NCREIF Property Index Trailing One-Year Returns by Region and Property Type as of June 30, 2021



Peak to Trough Recovery During Past Downturns



NCREIF Downturn	MVI Decline	Peak to Trough (Quarters)	Trough to Recovery (Quarters)
1990-1992	-24.1%	19	25
2000-2002	-1.2%	3	5
2008-2009	-27.1%	8	19

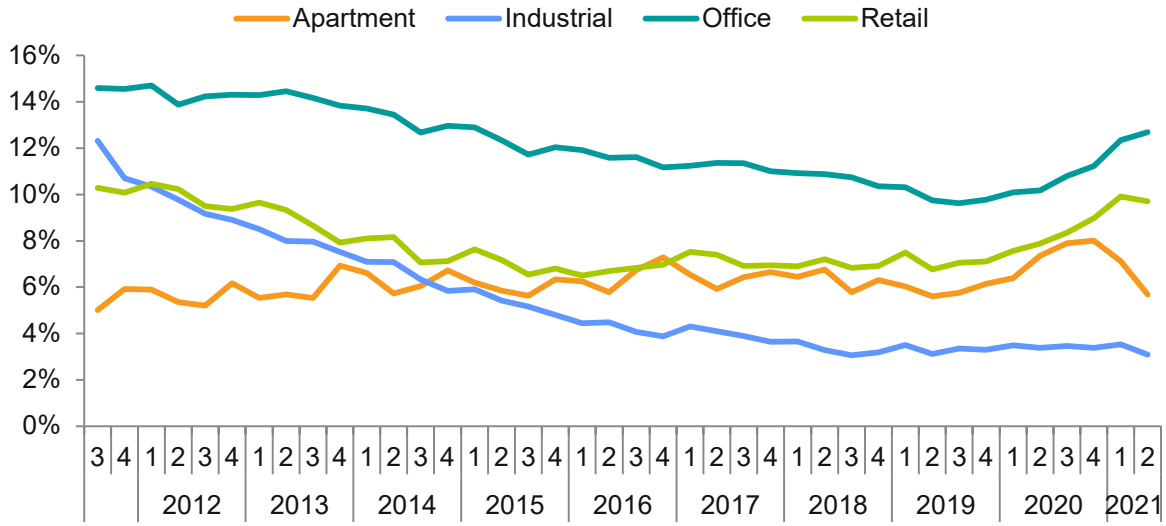
Source: NCREIF, Clarion Partners

U.S. Private Real Estate Market Trends

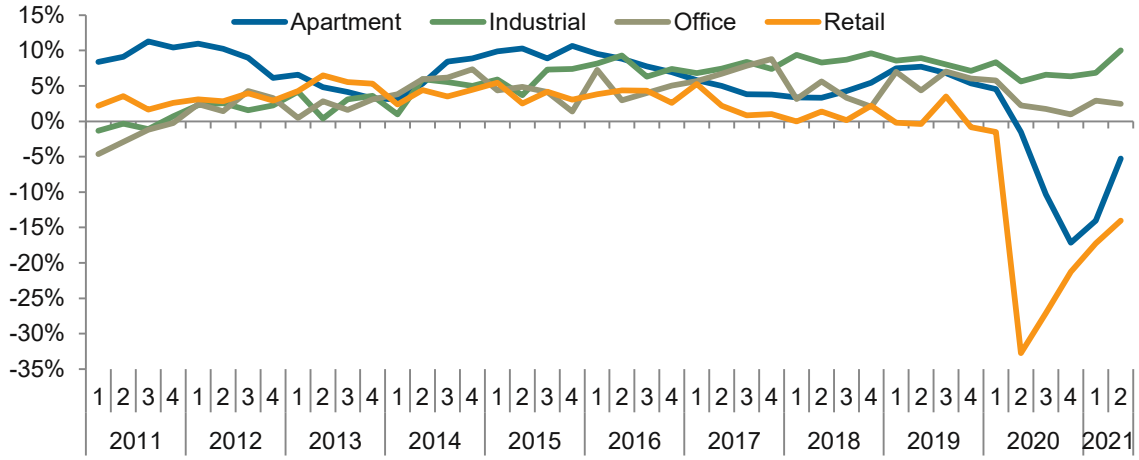
U.S. real estate fundamentals

- Vacancy rates continue to compress in Industrial and Multifamily as demand continues.
- Net operating income remains negative for Office and Retail but the recovery continues. Tenants are poised to return to work and pent up demand is evident through foot traffic in retail centers.
- 2Q21 rent collections showed relatively stable income throughout the quarter in the Industrial, Apartment, and Office sectors. The Retail sector remains challenged, with regional malls impacted most heavily.
- Class A/B urban apartments were relatively strong, followed by Industrial and Office.
- Demand outpaces supply as new construction of preleased industrial and multifamily is occurring.

Vacancy by Property Type



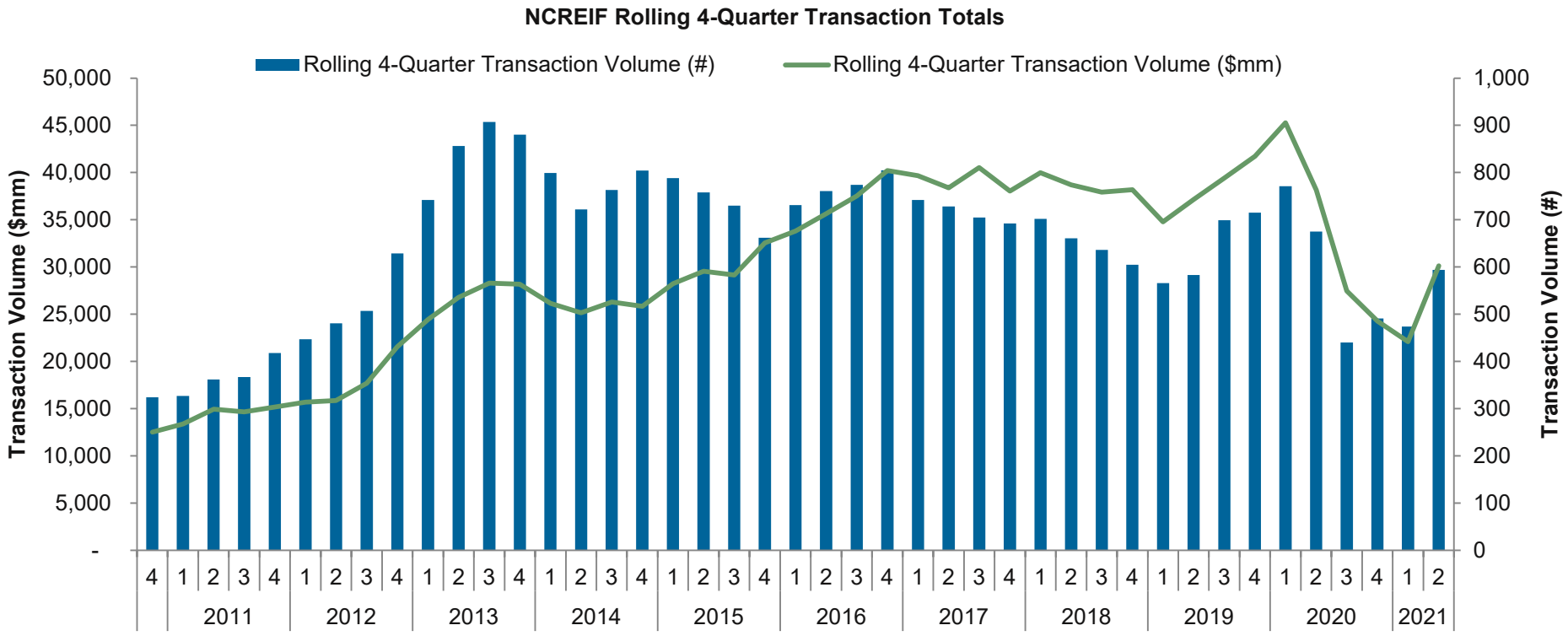
Rolling 4-Quarter NOI Growth by Property Type



Source: NCREIF

U.S. Private Real Estate Market

Pricing and transaction volumes are increasing in 2Q21



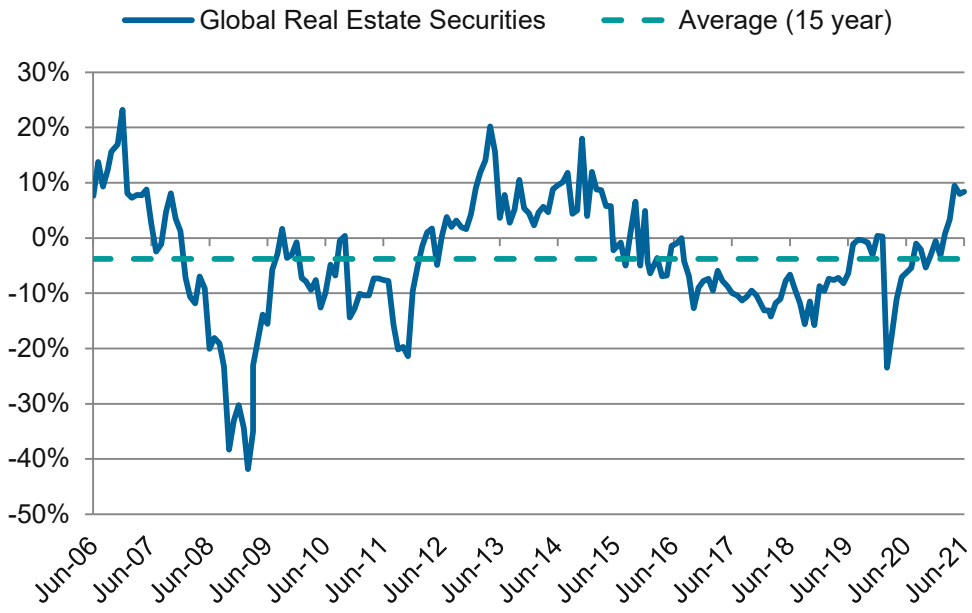
- Transaction volume increased quarter over quarter led by multifamily and industrial assets with strong-credit tenants, which are trading at higher values than pre-COVID-19 levels.
- Callan believes the pandemic is causing a re-pricing of risk across property types. Property types with more reliable cash flows are experiencing cap rate compression; due to the demand for logistics facilities coupled with the housing shortage.

Source: NCREIF

Global REIT Market Trends

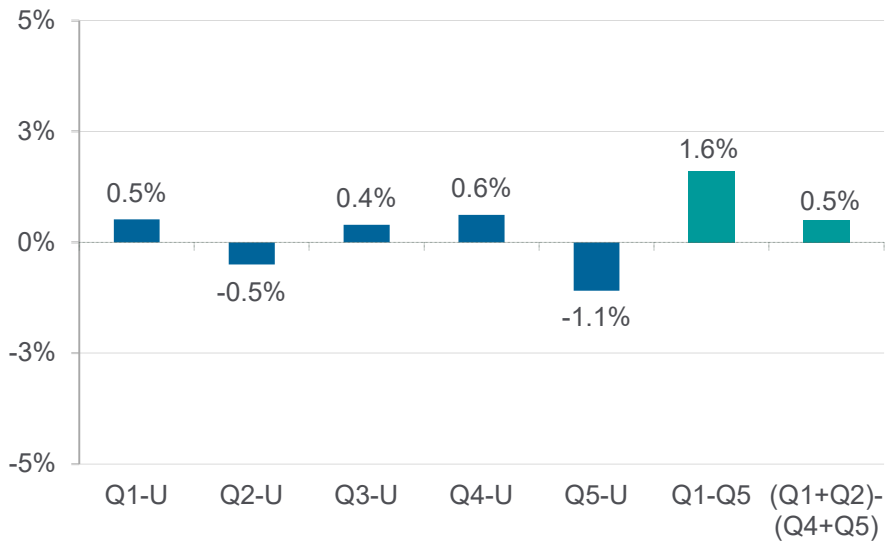
Stronger gains than equities, both in the U.S. and globally

Global Real Estate Securities Price to NAV



Total Return by Debt to Total Capital

Note: Q1 = Lowest Leverage, Q5 = Highest Leverage, U=Universe Mean



Global REITs outpacing the broader equity market recovery

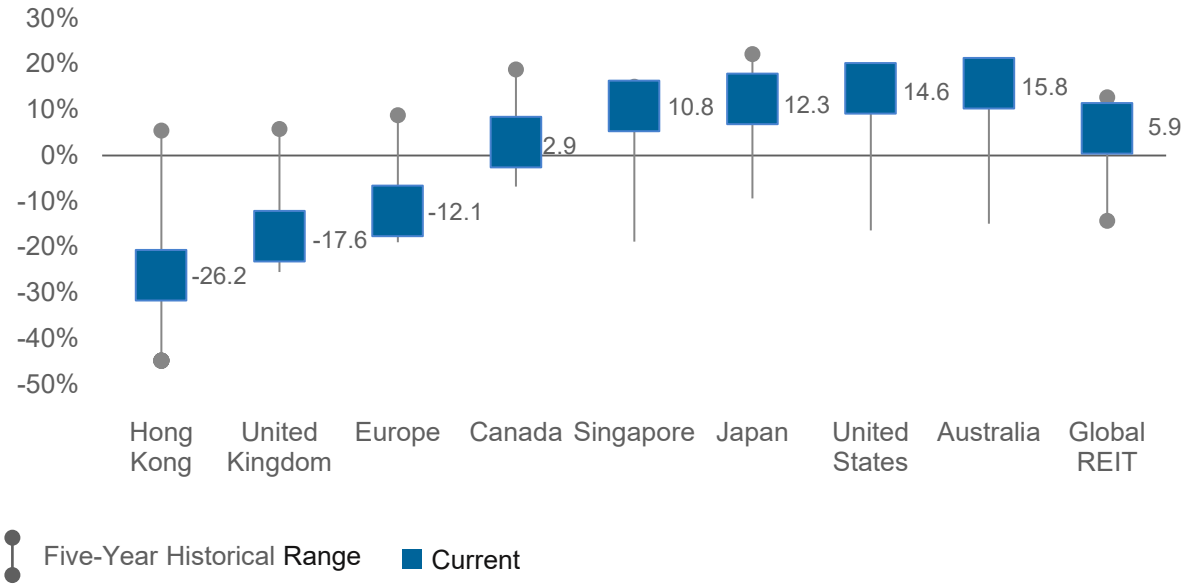
- Global REITs outperformed in 2Q21, gaining 9.2% compared to 7.7% for global equities (MSCI World).
- U.S. REITs rose 12.0% in 2Q21, beating the S&P 500 Index, which gained 8.5%.

Sources: Principal Global Investors, UBS, FactSet, IBESS 2Q21

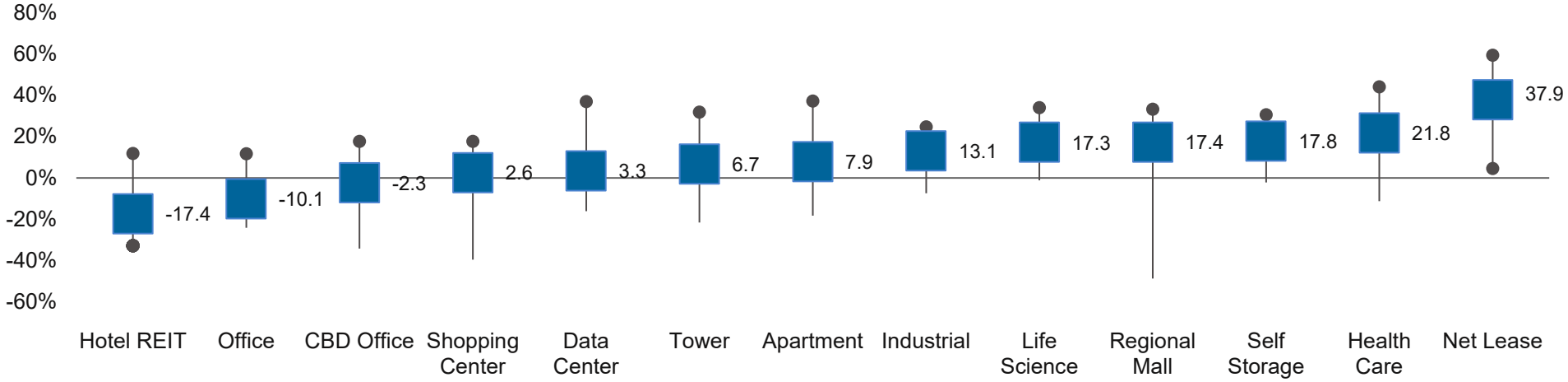
Global REIT Market Trends

- Globally, REITs are trading above NAV with the exception of those in Hong Kong, the United Kingdom, and Continental Europe.
- Property sectors are mixed, between trading at a discount or premium.
- Ongoing volatility in REIT share prices offers opportunities to purchase mispriced securities, individual assets from REIT owners, and discounted debt, as well as lend to companies and/or execute take-privates of public companies.

Price to NAV by Region



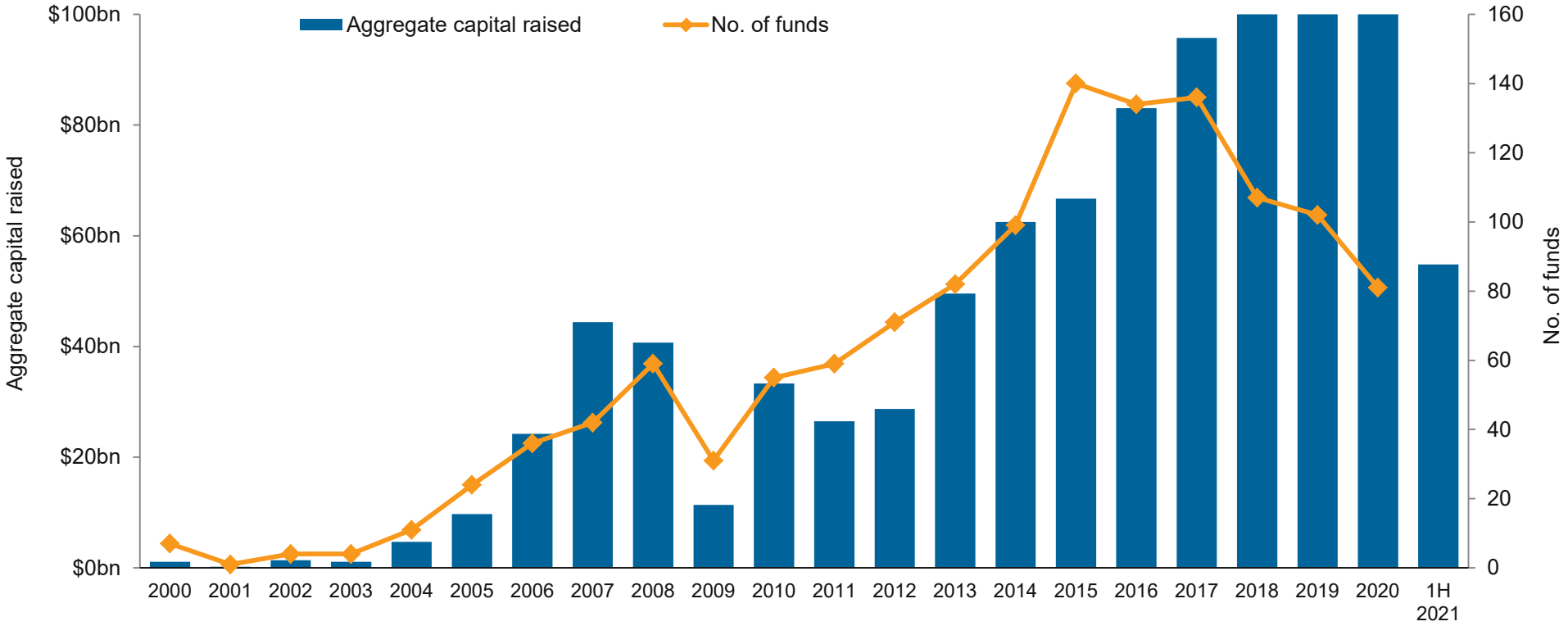
Price to NAV by Sector



Source: Cohen & Steers
Note: Five-year historical range 5/15/16 to 5/15/21

Infrastructure Fundraising Momentum Continues

Mega-funds continue to dominate fundraising



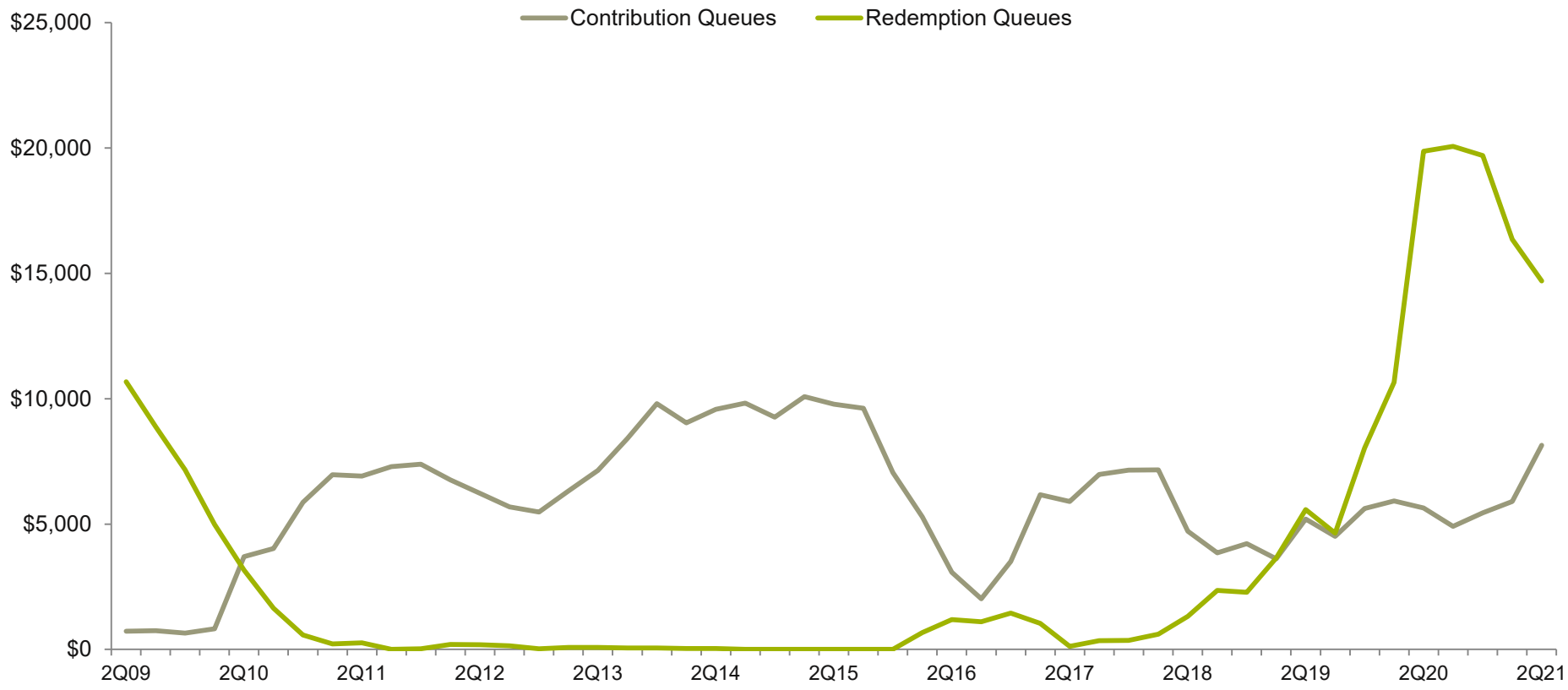
- Fundraising continues to be strong for the mega-funds, which are targeting a fund size in excess of $5 billion.
- The closed-end fund market continues to expand, with infrastructure debt, emerging markets and sector-specific strategies (e.g., communications and renewables).
- The open-end fund market is increasing, with several new strategies coming to market in 2020/2021.
- In 2020 assets with guaranteed/contracted revenue or more inelastic demand patterns (e.g., renewables, telecoms, and utilities) fared better than assets with GDP/demand-based revenue (e.g. airports, seaports, midstream-related).

Source: Preqin and Callan research

Entry and Exit Queues

- One way to gauge demand is by the amount of capital flowing into core open-end funds.
- Investor appetite for core real estate is re-gaining steam as contribution queues pick up.
- Redemption queues have come down from their 3Q 2020 peaks, coinciding with the transaction markets normalizing. While approximately half of funds have a queue, a few underperforming managers represent a large proportion of the redemption queues.

Core Fund Contribution/Redemption Queues ($mm)



Real Estate Indicators: Too Hot to Touch or Cool Enough to Handle?

Quartile Results

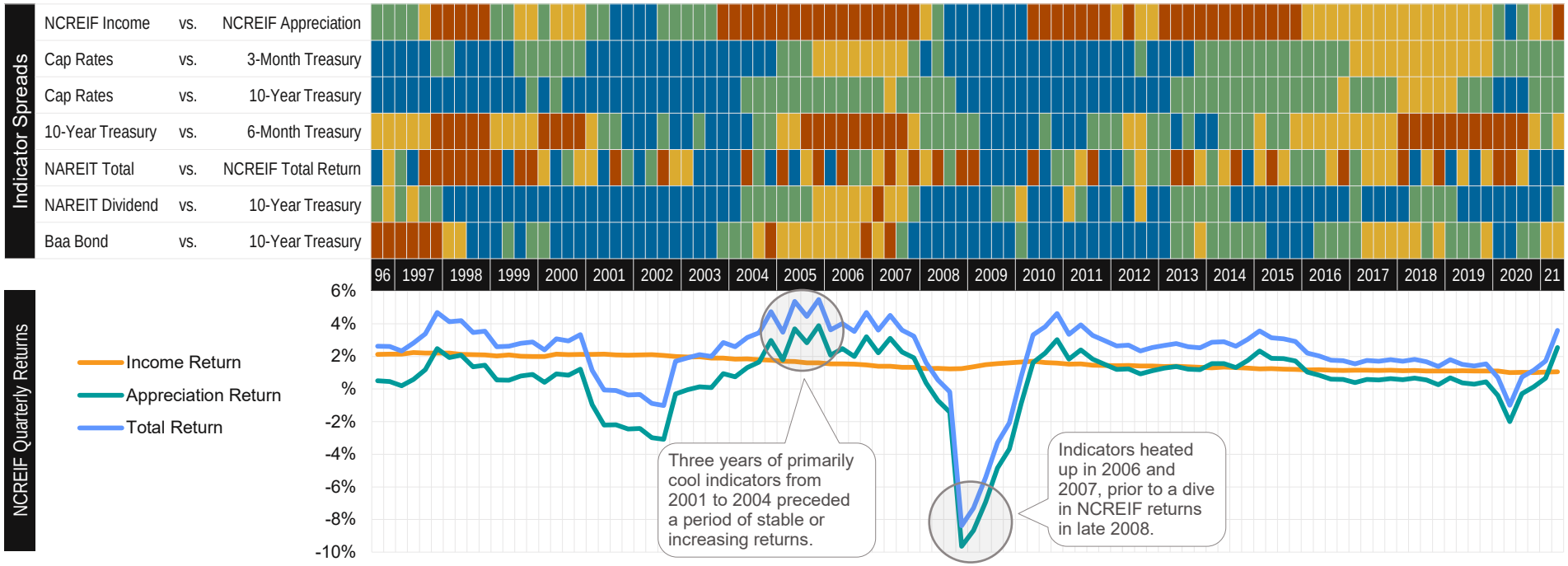
as of June 30, 2021

Wide Spread: blue blocks signal quarters when spreads were the widest (top quartile)

2nd Quartile: green blocks define quarters when spreads were less wide

3rd Quartile: yellow blocks mark quarters when spreads narrowed

Narrow Spread: red blocks are periods when spreads were narrowest or inverted (fourth quartile)

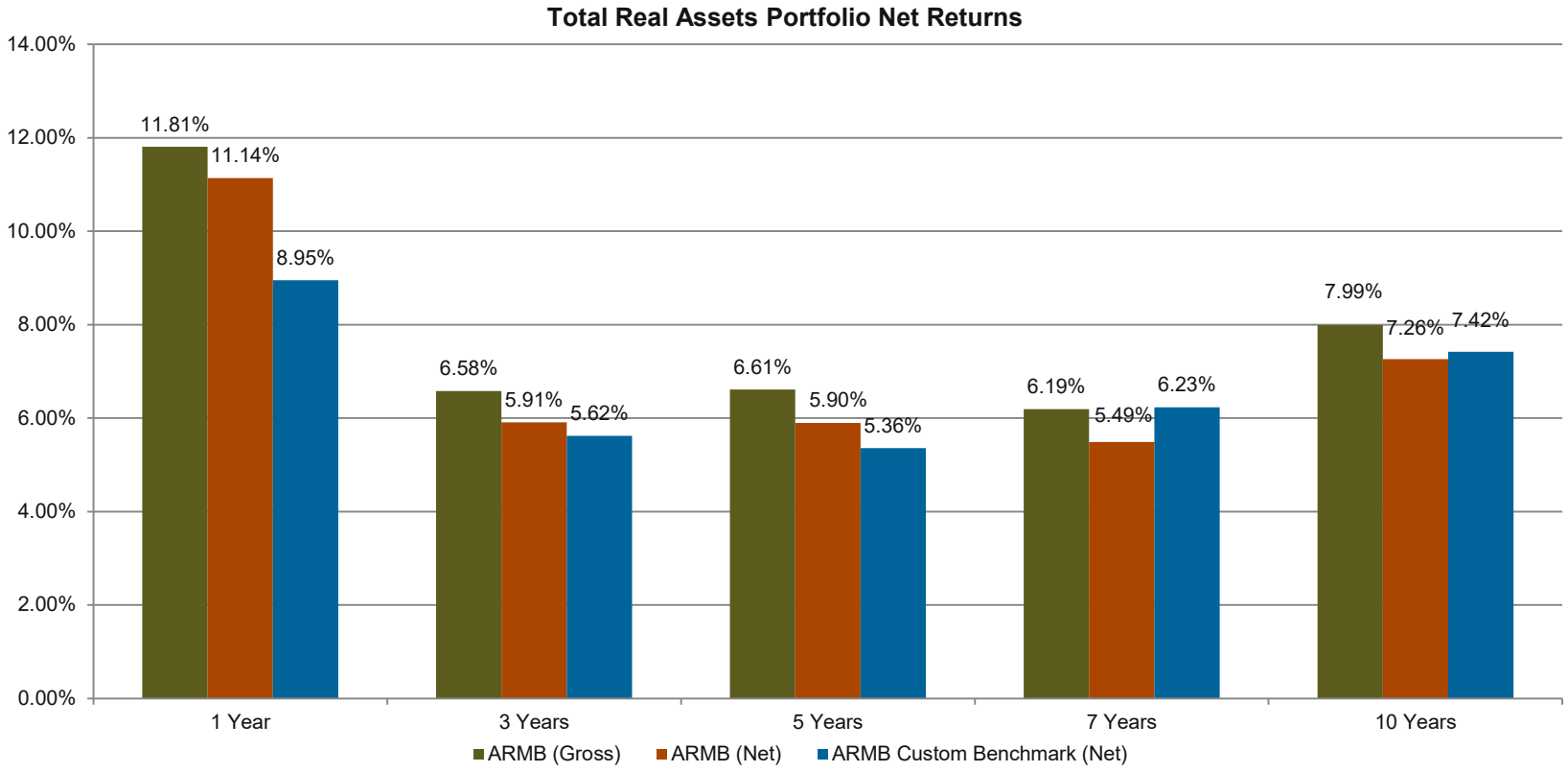


The seven indicator spreads reveal multiple instances when wide spreads (cool indicators) preceded stable or increasing performance, and narrow spreads (hot indicators) were more prevalent before declining market periods.

ARMB Real Assets Portfolio Performance

ARMB Real Assets Portfolio Returns

For Period Ended June 30, 2021

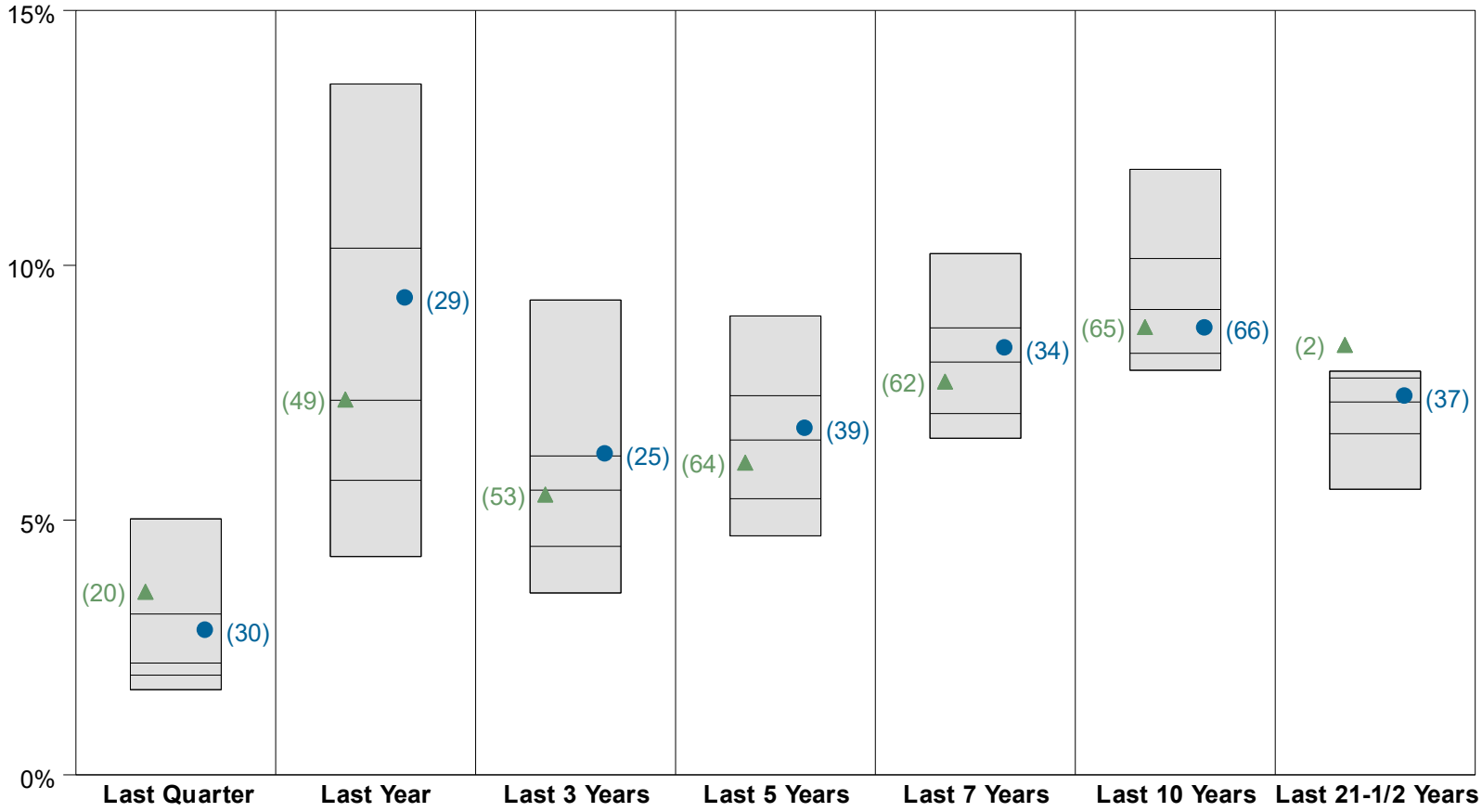


Sub-Sector Returns	1 Year	3 Years	5 Years	7 Years	10 Years
Real Estate*	13.94%	7.23%	6.83%	8.47%	8.88%
Real Assets (ex. Real Estate)	8.53%	4.77%	5.13%	3.15%	6.20%
Total Real Assets Portfolio	**11.14%**	**5.91%**	**5.90%**	**5.49%**	**7.26%**

* Includes public REITs

ARMB Real Assets Portfolio Returns – Private Real Estate

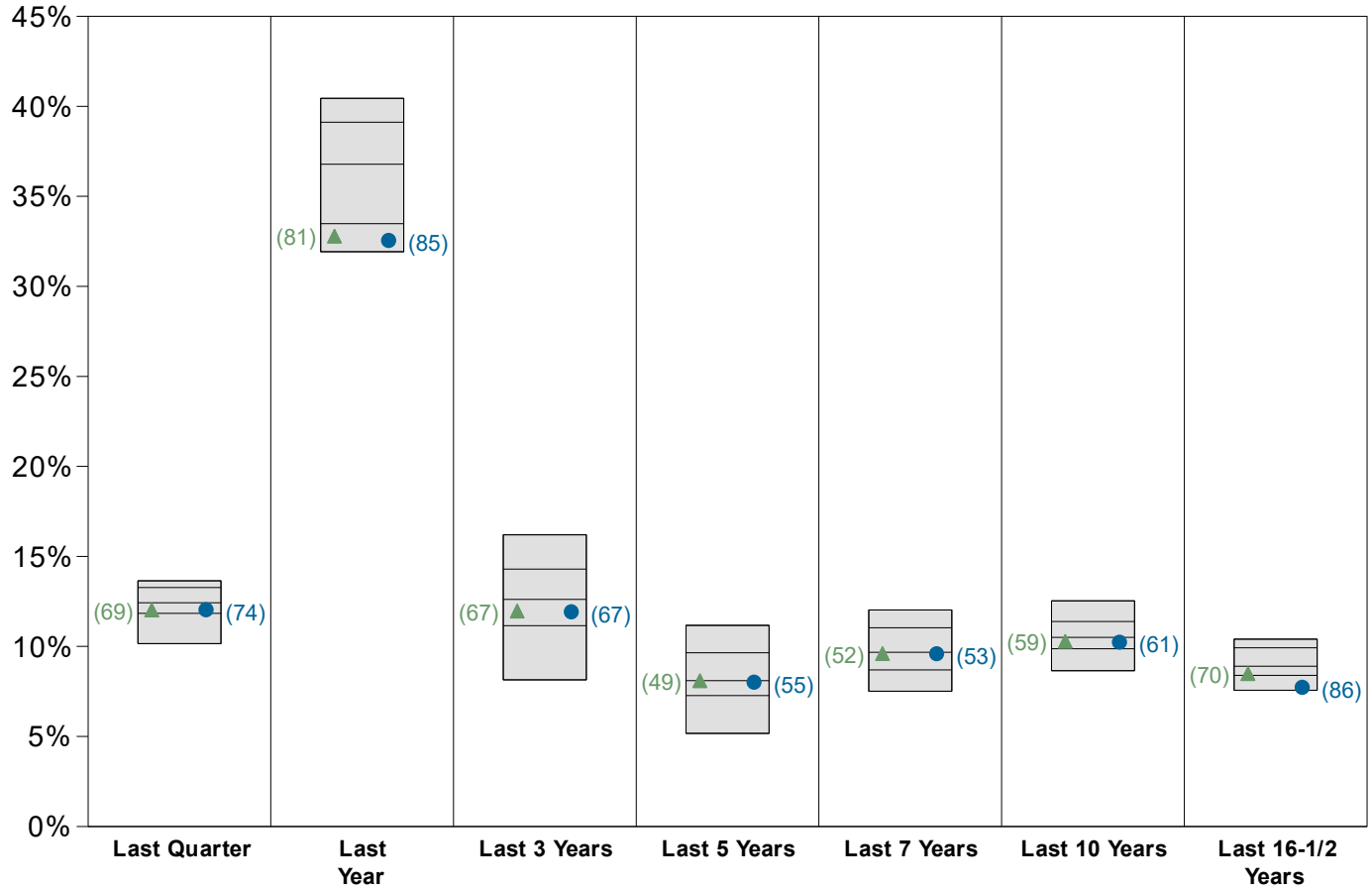
Performance vs Callan Total Domestic Real Estate DB



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 21-1/2 Years
10th Percentile	5.03	13.56	9.32	9.01	10.23	11.88	7.92
25th Percentile	3.16	10.34	6.26	7.44	8.77	10.13	7.79
Median	2.20	7.35	5.59	6.57	8.10	9.13	7.32
75th Percentile	1.96	5.78	4.49	5.42	7.09	8.27	6.69
90th Percentile	1.67	4.29	3.57	4.69	6.61	7.94	5.61
Private Real Estate Portfolio ●	2.82	9.34	6.28	6.79	8.36	8.75	7.42
NCREIF Total Index ▲	3.59	7.37	5.50	6.13	7.72	8.79	8.44

ARMB Real Assets Portfolio Returns – Public Real Estate

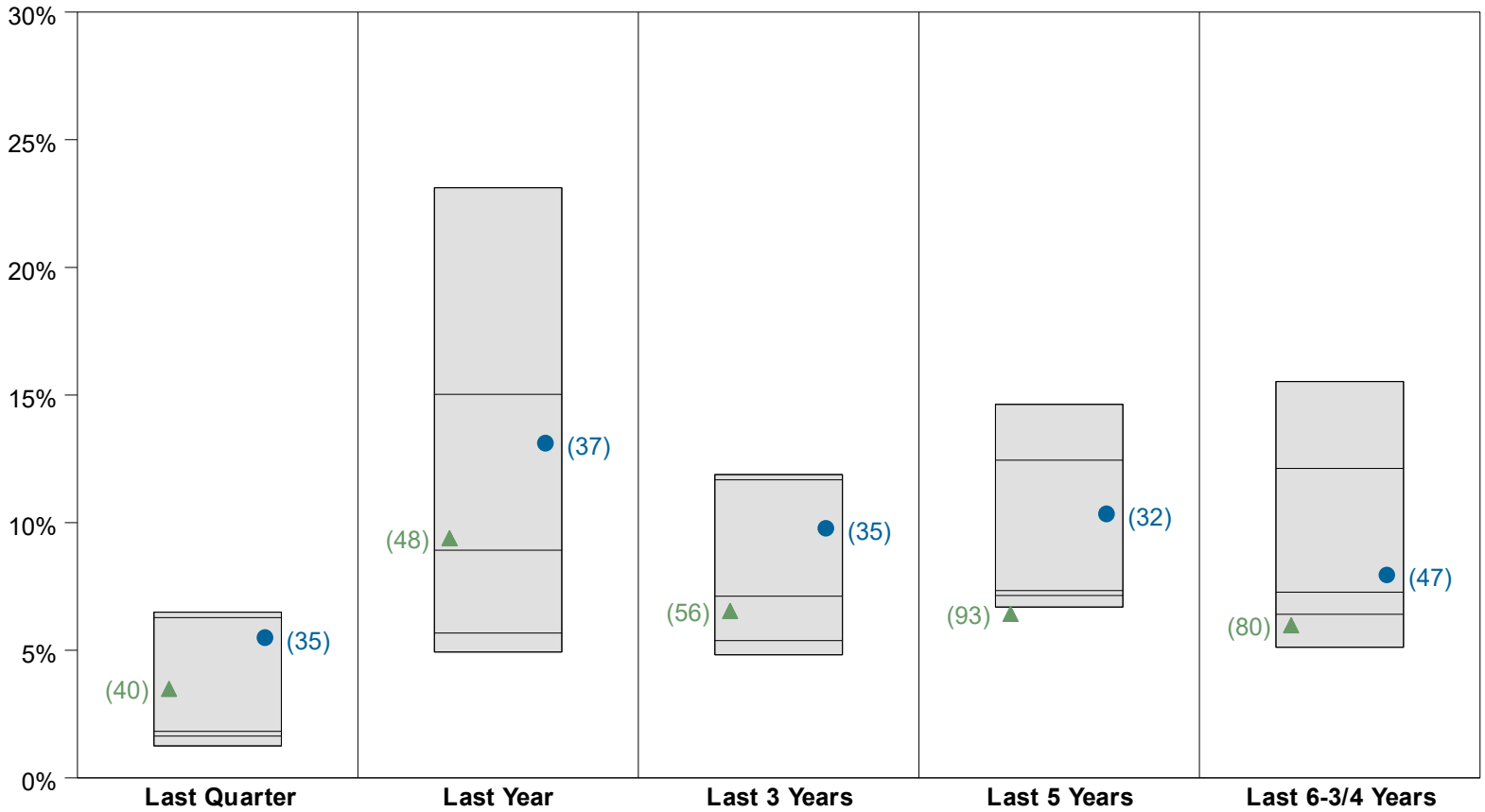
Performance vs Callan Real Estate REIT (Gross)



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 16-1/2 Years
10th Percentile	13.64	40.44	16.20	11.17	12.02	12.53	10.40
25th Percentile	13.27	39.12	14.29	9.65	11.04	11.39	9.92
Median	12.43	36.78	12.62	8.10	9.67	10.50	8.90
75th Percentile	11.84	33.48	11.15	7.27	8.69	9.87	8.39
90th Percentile	10.16	31.92	8.14	5.17	7.51	8.65	7.56
ARMB REIT ●	11.97	32.49	11.86	7.95	9.53	10.16	7.66
FTSE NAREIT All Eq Index ▲	12.03	32.80	11.97	8.10	9.61	10.29	8.49

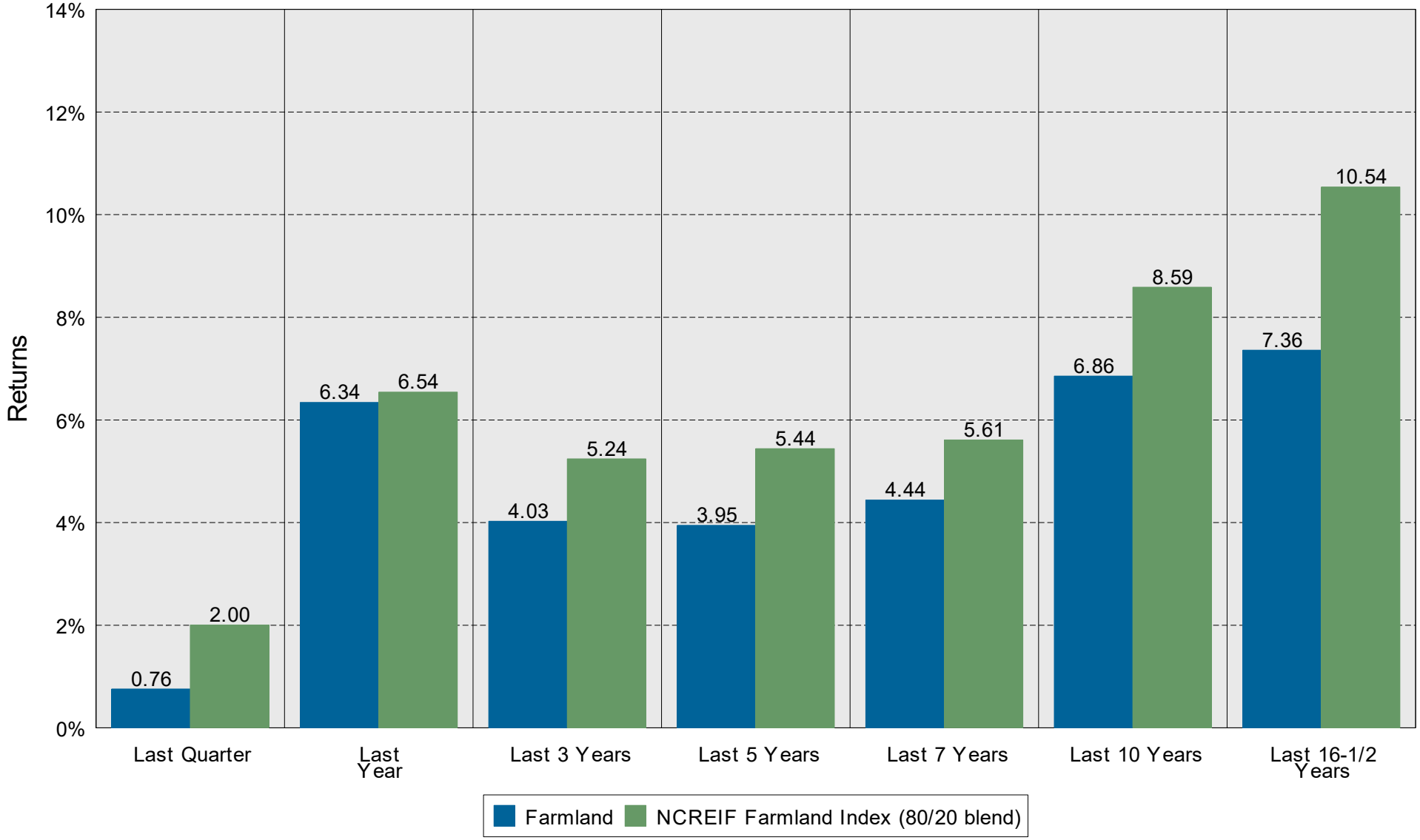
ARMB Real Assets Portfolio Returns – Infrastructure

Performance vs Callan Real Estate Pvt Infrastructure (Net)



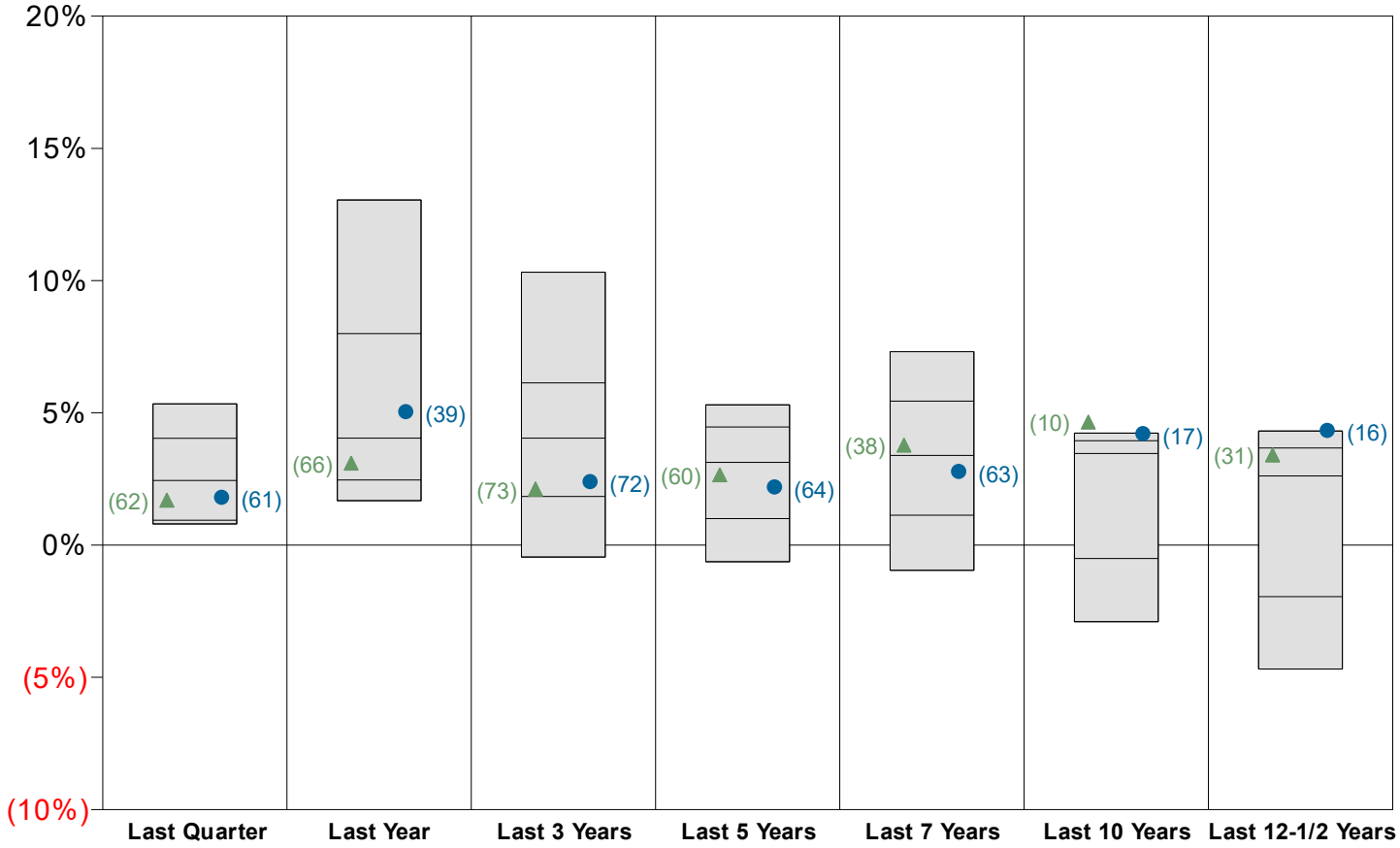
	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 6-3/4 Years
10th Percentile	6.49	23.12	11.88	14.63	15.53
25th Percentile	6.28	15.03	11.68	12.45	12.12
Median	1.83	8.92	7.12	7.34	7.28
75th Percentile	1.64	5.68	5.38	7.14	6.41
90th Percentile	1.26	4.93	4.82	6.70	5.12
Private Infrastructure ●	5.44	13.06	9.72	10.29	7.90
CPIU + 4% ▲	3.49	9.39	6.54	6.43	5.98

ARMB Real Assets Portfolio Returns – Farmland



ARMB Real Assets Portfolio Returns – Timber

Performance vs Callan Real Estate Timber



	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 12-1/2 Years
10th Percentile	5.34	13.05	10.32	5.30	7.31	4.23	4.31
25th Percentile	4.04	8.00	6.13	4.47	5.44	3.94	3.67
Median	2.44	4.04	4.05	3.13	3.39	3.46	2.61
75th Percentile	0.94	2.46	1.84	1.00	1.13	(0.51)	(1.95)
90th Percentile	0.80	1.68	(0.46)	(0.63)	(0.95)	(2.90)	(4.69)
Timber ●	1.76	5.00	2.35	2.15	2.74	4.16	4.29
NCREIF Timberland Index ▲	1.70	3.10	2.12	2.65	3.78	4.66	3.41

Callan

ARMB Real Assets Strategic Plan Review

Objective of the Real Assets Strategic Plan

The goal of this exercise is to identify the optimal mix of real assets that help achieve the role of real assets while taking into account practicality and implementation constraints

Role of Real Assets Restated

Objective:

The Alaska Retirement Management Board (ARMB) will invest in real estate with the goals of portfolio diversification and attaining the optimum return on the portfolio, consistent with the assumption of prudent risk and safety of principal.

Based on Callan's analysis of the ARMB total portfolio, including characteristics such as the size of the program, liquidity and yield needs, we believe this objective is consistent with the role the entire real assets portfolio should play within the context of the broader portfolio.

Return Expectations:

Over rolling six- year periods, the ARMB real estate investment portfolio is expected to generate a net-of-fee total return between public equities and fixed-income.

Based on Callan's long-term capital markets return forecast for the components of the real assets program, we believe the return expectations for the portfolio are reasonable and obtainable

ARMB Asset Allocation Target

ARMB AssetMax Model Considerations

- The below target mix was adopted in 2019 as the result of an asset allocation study.
- The model was revisited in 2020 and again in 2021, which resulted in a recommendation to maintain the allocation targets.

Portfolio Component	Allocation Target
Real Estate	35%
REITs	15%
Farmland	25%
Timber	0-10%
Infrastructure	15%
Totals	100%

10 Yr. Geometric Mean Return*	6.15%
Projected Standard Deviation*	13.30%

* Based on true Real Assets target sub-allocations shown above. Overall Risk/Return projections differ slightly from projections shown in ARMB's 2021 Strategic Asset Allocation from June 2021, which showed a 10-year geometric mean return of 6.10% and volatility of 13.10%. In order to reflect existing positions in the Real Assets portfolio, the 2021 Strategic Asset Allocation utilized an intermediate benchmark for Real Assets that is comprised of 37.5% Real Estate, 17.5% Infrastructure, 25% Farmland, 10% Timber and 10% REITs.

2020 Strategic Plan & Accomplishments

The following is a summary of action items implemented over the prior year.

Category	Action	Status
Core Real Estate Portfolio	Provide separate account managers the ability to utilize debt within their portfolios (30% limit at the account-level).	The ability for ARMB to utilize leverage on its core real estate separate accounts was approved at the September 2020 ARMB Board Meeting. UBS has implemented leverage on two assets, while Sentinel plans to identify assets for long-term leverage in the second half of 2021
Non-Core Real Estate	Consider re-up opportunities with existing non-core fund series that have performed well for ARMB in the past and are coming to market with continuation funds in the same strategy.	During 4Q2020 and 1Q2021, ARMB and Callan evaluated re-up opportunities with KKR Real Estate Partners III and Almanac Real Estate Securities IX, both of which ARMB has invested in prior funds in the series. Both opportunities were approved.
Farmland	In June 2020 it was recommended and approved to consolidate the two Farmland separate accounts into one. Additionally it was determined that UBS Agrivest is suitable to invest in both row and permanent crops.	During the fourth quarter of 2020, the two Farmland separate accounts were consolidated under the management of UBS Agrivest, with Hancock being removed. The consolidated account continues to target 80% row crop and 20% permanent crop
Timber	In June 2020 it was recommended and approved to consolidate the two Timber separate accounts into one.	During the fourth quarter of 2020, the two Timber separate accounts were consolidated under the management of Timberland Investment Resources, with Hancock being removed.
Infrastructure Portfolio	Review infrastructure portfolio structure. Consider activating cash dividend option for both IFM and JPMorgan; use these distributions to rebalance and fund other components of the real assets program as necessary (i.e. REITs).	It was determined to maintain exposure in both funds given their complementary characteristics. ARMB staff will look to rebalance the positions overtime to improve diversification. The IFM cash dividend option was activated, while the JPM dividend will be reinvested to increase exposure and provide greater balance between the two funds.
REIT Portfolio	Strategically increase REIT exposure as capital is returned from other components that are above their targets.	ARMB's real assets portfolio increased its REIT allocation from 8.3% of the portfolio as of June 30, 2020 to 13.5% at June 30, 2021

ARMB Real Assets Allocation

	Target Weight	Exposure ($million)	Current Weight	Variance	Percent of Overall Portfolio
Core Real Estate*	35.00%	$1,289	32.2%	-2.8%	3.9%
Farmland	25.00%	$900	22.5%	-2.5%	2.7%
Private Infrastructure	15.00%	$742	18.5%	+3.5%	2.2%
Timber	10.00%	$367	9.2%	-0.8%	1.1%
REITs	15.00%	$541	13.5%	-1.5%	1.6%
Energy	-	$62	1.6%	+1.6%	0.2%
Non-Core Real Estate	-	$103	2.6%	+2.6%	0.3%
Total Real Assets	14.00%	$4,005	100.0%		12.1%
Total Fund		**$33,200**			

*Core Real Estate reduced by $140 million to account for Account refinancing in UBS account subsequent to quarter-end

Implementation Considerations:

- The Real Assets target was increased from 13% to 14% over the past year, which combined with the strong performance of the equity markets has resulted in the Real Assets portfolio becoming underweight to the target allocation by -1.9%.
- Energy and non-core real estate have been eliminated from the target allocation. The energy and non-core real estate allocations are entirely in illiquid, closed-end funds, and as such will take a few years to fully wind down. As the positions burn off, distributed proceeds should continue to be reinvested in other asset classes to which the plan is underweight, particularly REITs.
  - Non-core real estate was also eliminated from the target allocation in 2019; however, re-ups with existing managers and selective new strategies may be considered
- The underweight to REITs was narrowed over the past year from a -6.7% underweight at June 30, 2020 to -1.5% at June 30, 2021.
- ARMB is modestly overweight to private infrastructure (+3.5%). The dividend reinvestment option for the portfolio's larger infrastructure position, IFM, was toggled off in 2020, which limits the ability for the position to grow. A partial-redemption for rebalancing purposes is not necessary at this time, as . Should a partial redemption be made, increasing the allocation at a later date would prove challenging given the high contribution queues seen in the current infrastructure lineup.
- The portfolio has a modest underweight to Farmland. ARMB currently has $100 million committed to the UBS Farmland position, with an additional $200 million up for consideration. The $100 million commitment is expected to be called over the next 12 to 18 months. Capital deployment in Farmland can be lumpy and take several years to fully fund.

2021 Strategic Plan Recommendation

Callan Recommends the following strategic initiatives for ARMB's Real Assets portfolio for Fiscal Year 2022:

- Continue implementation of strategic plan, with no change to the target sub-allocations of the real assets program, as follows:
  - Real Estate: 35%
  - Farmland: 25%
  - REITs: 15%
  - Private Infrastructure: 15%
  - Timber: 10%, with a range from 0% – 10%
- While not a strategic imperative, ARMB staff and Callan to continue to evaluate and consider opportunities in non-core real estate, including re-ups with existing managers/fund series, as well as selectively in new opportunities.
  - No specified allocation target should be set in order to avoid forced deployment of capital to adhere with a pacing model
  - New non-core opportunities may be evaluated on a select and strategic basis
  - New strategies and re-ups should fit the objectives of the ARMB Real Assets portfolio and be viewed as an investment in the series, not an individual fund
- Evaluate opportunity set of open-end fund options to fill the under-allocation to core real estate, including:
  - Existing Core Funds – J.P. Morgan Strategic Property Fund & BlackRock U.S. Core Property Fund
  - Additional options in the NCREIF Open-End Diversified Core Equity ("ODCE") universe
  - Exploration of non-ODCE core and core plus funds, including single sector funds, funds targeting higher levels of non-core real estate, and funds specializing in non-traditional property types such as Student Housing, Senior Housing, Self-Storage, Medical Office / Life Sciences, Single Family Residential, etc.

Disclaimers

This report is for informational purposes only and should not be construed as legal or tax advice on any matter. Any decision you make on the basis of this content is your sole responsibility. You should consult with legal and tax advisers before applying any of this information to your particular situation.

This report may consist of statements of opinion, which are made as of the date they are expressed and are not statements of fact.

Reference to or inclusion in this report of any product, service or entity should not be construed as a recommendation, approval, affiliation or endorsement of such product, service or entity by Callan.

Past performance is no guarantee of future results.

The statements made herein may include forward-looking statements regarding future results. The forward-looking statements herein: (i) are best estimations consistent with the information available as of the date hereof and (ii) involve known and unknown risks and uncertainties such that actual results may differ materially from these statements. There is no obligation to update or alter any forward-looking statement, whether as a result of new information, future events or otherwise. Undue reliance should not be placed on forward-looking statements.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: Fiscal Year 2022 Real Assets Annual Investment Plan

ACTION: X

DATE: September 23-24, 2021

INFORMATION: _____

BACKGROUND

Staff prepares an Annual Real Assets Investment Plan to review performance, structure, objectives, and strategy of the portfolio. The plan establishes the Board-approved plan for the portfolio for the upcoming fiscal year.

STATUS

Staff, with the assistance of Callan, has developed the Real Assets Annual Investment Plan for Fiscal Year 2022. The Real Assets Annual Investment Plan includes a presentation of the Fiscal Year 2022 investment strategy.

For Fiscal Year 2022 the plan is to make additional investments in core real estate and farmland as determined by ARMB's overall asset allocation and the sector weights within the Real Assets asset class. Recommendations for the Real Assets Fiscal Year 2022 Investment Plan are as follows:

Real Estate	Invest $400 million in core real estate over time to meet allocation requirements: • $125 million allocation to Sentinel already authorized. • Allocate additional $140 million to UBS separate account to reinvest financing proceeds. • Increase investments in core open-end funds by $135 million. Explore non-qualified structure for existing JPM Strategic Property Fund investment. Continue to consider non-core investments on a selective basis. Adjust REIT position as needed during quarterly rebalancing process.
Farmland	Invest $300 million in farmland over time to meet allocation requirements. CIO discretion will be used to pace allocation increases incrementally.
Timberland	No changes recommended.
Infrastructure	No changes recommended.

RECOMMENDATIONS

The ARMB approve Resolution 2021-11 which adopts the Real Assets Annual Investment Plan for Fiscal Year 2022.

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to Real Assets Annual Investment Plan

Resolution 2021-11

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, the Board contracts an independent consultant to provide experience and expertise in asset allocation and other investment matters to come before the Board; and

WHEREAS, the Board has established an asset allocation for the funds that considers earnings and liabilities on a current as well as a future basis; and

WHEREAS, the Board has authorized investments in Real Assets for the Public Employees' Retirement System, Teachers' Retirement System, and Judicial Retirement System, including investments for those systems in the State of Alaska Retirement and Benefits Plans Trust; and

WHEREAS, the Board will establish and on an annual basis review an investment plan for Real Assets asset class.

NOW THEREFORE BE IT RESOLVED THAT THE ALASKA RETIREMENT MANAGEMENT BOARD adopt the Real Assets Annual Investment Plan for Fiscal Year 2022, attached hereto and made a part hereof.

DATED at Juneau, Alaska this 24th day of September, 2021.

Chair

ATTEST: Gayle Harbo

Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: History of PERS / TRS Employer Contribution Rates

ACTION: _____

DATE: September 24, 2021

INFORMATION: X

Below is a history of employer contribution rates adopted by the Alaska Retirement Management Board for Fiscal Years 2014 through 2022, as well as the proposed FY 2023 contribution rates.

ARM BOARD ADOPTED RATES													
		FY14 (a)	FY15 (a)	FY15 (b)	FY16	FY17	FY18	FY19 (c)	FY20	FY21	FY22	PROPOSED FY23 (1)	PROPOSED FY23 (2)
Public Employees' Retirement System (PERS)													
	Total Employer Contribution Rate	35.68%	44.03%	31.90%	27.19%	26.14%	25.01%	27.58%	28.62%	30.85%	30.11%	27.63%	24.89%
	- DB Employer Contribution Rate	32.31%	39.85%	27.72%	22.58%	21.78%	20.38%	22.64%	23.18%	24.93%	24.01%	21.22%	18.48%
	- DCR Employer Contribution Rate	3.37%	4.18%	4.18%	4.61%	4.36%	4.63%	4.94%	5.44%	5.92%	6.10%	6.41%	6.41%
	DCR - Retiree Medical Plan	0.48%	1.66%	1.66%	1.68%	1.18%	1.03%	0.94%	1.32%	1.27%	1.07%	1.10%	1.10%
	DCR - OD&D - All Others	0.20%	0.22%	0.22%	0.22%	0.17%	0.16%	0.26%	0.26%	0.31%	0.31%	0.30%	0.30%
	DCR - OD&D - P/F	1.14%	1.06%	1.06%	1.05%	0.49%	0.43%	0.76%	0.72%	0.70%	0.68%	0.68%	0.68%
Teachers' Retirement System (TRS)													
	Total Employer Contribution Rate	53.62%	70.75%	48.69%	29.27%	28.02%	26.78%	28.90%	30.47%	30.47%	31.85%	27.34%	22.37%
	- DB Employer Contribution Rate	50.10%	66.31%	44.25%	24.48%	23.40%	21.75%	23.56%	24.62%	24.34%	25.49%	20.62%	15.65%
	- DCR Employer Contribution Rate	3.52%	4.44%	4.44%	4.79%	4.62%	5.03%	5.34%	5.85%	6.13%	6.36%	6.72%	6.72%
	DCR - Retiree Medical Plan	0.47%	2.04%	2.04%	2.04%	1.05%	0.91%	0.79%	1.09%	0.93%	0.83%	0.87%	0.87%
	DCR - OD&D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%

(a) As noted in the June 30, 2012 actuarial valuation reports, "The Board changed the amortization method used for funding from the level percentage of payroll method to the level dollar method in June 2012, effective June 30, 2012."

(b) During the FY 2014 legislative session, HB 385 enacted certain changes into law. In AS 37.10.220(a), item (a)(8)(B) was amended to define that "an appropriate contribution rate for liquidating the past service liability of the defined benefit retirement plan under AS 14.25.009 - 14.25.220 or the past service liability of the defined benefit retirement plan under AS 39.35.095 - 39.35.680 must be determined by a level percent of pay method based on amortization of the past service liability for a closed term of 25 years;"
The PERS DB and TRS DB Employer Contribution Rates for FY 2015 were updated to the level percentage of pay methodology from the previously determined rates that were prepared using the level dollar methodology, and have been done so going forward.

(c) Beginning in Fiscal Year 2019, employer contribution rates for plans which have no past service liability as determined by the actuarial valuation process will not reflect a contribution rate for liquidating past service liability under AS 37.10.220(a)(8)(B).

(1) Proposed FY23 rates are based on Buck letter dated August 25, 2021 with liabilities rolled forward two years and assets rolled forward one year and smoothed.

(2) Proposed FY23 rates are based on Buck letter dated September 16, 2021 with liabilities rolled forward two years and assets rolled forward one year with AVA reset to MVA as of June 30, 2021 and 5-year smoothing thereafter.

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: FY 23 PERS Retiree Major Medical and Occupational Death & Disability

ACTION: X

DATE: September 24, 2021

INFORMATION: _____

BACKGROUND:

The Alaska Retirement Management Board (Board) establishes rates for the Public Employees' Retirement System (PERS) Defined Contribution Retirement Plan for the following plans: 1) Retiree Major Medical Insurance and 2) Occupational Death & Disability under the following two sections in Alaska Statute:

Retiree Major Medical Insurance
AS 39.35.750 (b) requires that "An employer shall also contribute an amount equal to a percentage, as adopted by the board, of each member's compensation from July 1 to the following June 30 to pay for retiree major medical insurance."

Occupational Death & Disability
AS 39.35.750 (e) requires that "An employer shall make annual contributions to the plan in an amount determined by the board to be actuarially required to fully fund the cost of providing occupational disability and occupational death benefits under AS 39.35.890 and 39.35.892. The contribution required under this subsection for peace officers and fire fighters and the contribution required under this subsection for other employees shall be separately calculated based on the actuarially calculated costs for each group of employees."

STATUS:

The Division of Retirement & Benefits' actuary, Buck, has completed the actuarial valuation of the PERS Defined Contribution Retirement Plan as of June 30, 2020. The valuation has been reviewed by the Board's actuary, Gabriel, Roeder, Smith & Co. (GRS) and then certified and accepted by the Board.

According to the PERS Defined Contribution Retirement Plan actuarial valuation report, and confirmed by GRS, the Fiscal Year 2023 actuarially determined contribution rates attributable to employers for the Retiree Major Medical Insurance should be 1.10 percent; for the peace officer/firefighter Occupational Death & Disability benefit should be 0.68 percent; and for "all other" Occupational Death & Disability benefit should be 0.30 percent.

The Actuarial Committee met September 22, 2021, and passed a motion recommending that the Board adopt Resolutions 2021-05 and 2021-06

RECOMMENDATION:

That the Alaska Retirement Management Board set Fiscal Year 2023 PERS Defined Contribution Retirement Retiree Major Medical Insurance and Occupational Death & Disability Benefit rates as set out in the following resolutions:

1. Resolution 2021-05: Public Employees' Defined Contribution Retirement Plan Retiree Major Medical Insurance Rate

2. Resolution 2021-06: Public Employees' Defined Contribution Retirement Plan Occupational Death & Disability Benefit Rates

BUCK

State of Alaska

Public Employees' Retirement System Defined Contribution Retirement Plan

For Occupational Death and Disability and Retiree Medical Benefits

Actuarial Valuation Report

As of June 30, 2020

May 2021

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the PERS report) created an actuarial gain of approximately $7,863,000. This gain included an update to the medical and prescription drug relative value factors (described in Section 4.1) this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed, which resulted in an actuarial loss of approximately $7,485,000.

5. **Changes in Methods Since the Prior Valuation**

   There were no changes in actuarial methods since the prior valuation.

6. **Changes in Assumptions Since the Prior Valuation**

   Healthcare claim costs are updated annually as described in Section 4.2. The medical and prescription drug relative value factors were updated this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed. The amounts included in Normal Cost for administrative expenses were updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. **Changes in Benefit Provisions Since the Prior Valuation**

   There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occupational Death & Disability	FY 2022	FY 2023
Peace Officer/Firefighter		
a. Employer Normal Cost Rate	0.68%	0.68%
b. Past Service Cost Rate	(0.18)%	(0.19)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.68%	0.68%
Others		
a. Employer Normal Cost Rate	0.31%	0.30%
b. Past Service Cost Rate	(0.14)%	(0.16)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.31%	0.30%

Retiree Medical	FY 2022	FY 2023
a. Employer Normal Cost Rate	1.02%	1.05%
b. Past Service Cost Rate	0.05%	0.05%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.07%	1.10%

Total	FY 2022	FY 2023
Peace Officer/Firefighter		
a. Employer Normal Cost Rate	1.70%	1.73%
b. Past Service Cost Rate	0.05%	0.05%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.75%	1.78%
Others		
a. Employer Normal Cost Rate	1.33%	1.35%
b. Past Service Cost Rate	0.05%	0.05%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	1.38%	1.40%

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to the Fiscal Year 2023 Employer Contribution Rate
For Public Employees' Defined Contribution Retirement Plan
Retiree Major Medical Insurance Rate

Resolution 2021-05

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, AS 37.10.220 requires the Board to coordinate with the retirement system administrator to conduct an annual actuarial valuation of each retirement system to determine system assets, accrued liabilities and funding ratios; and

WHEREAS, AS 39.35.750(b) requires the Board to approve an amount equal to a percentage of each member's compensation from July 1 to the following June 30 to pay for retiree major medical insurance; and

WHEREAS, the June 30, 2020 PERS Defined Contribution actuarial valuation report determines that the actuarially determined contribution rate for retiree major medical insurance is 1.10 percent, composed of the normal cost rate of 1.05 percent and past service rate of 0.05 percent;

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD, the Fiscal Year 2023 employer contribution rate for the retiree major medical insurance for the Public Employees' Defined Contribution Retirement Plan is set at 1.10 percent.

DATED at Juneau, Alaska this 24th day of September, 2021.

Chair

ATTEST:

Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to the Fiscal Year 2023 Employer Contribution Rate
For Public Employees' Defined Contribution Retirement Plan
Occupational Death & Disability Benefit Rates

Resolution 2021-06

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, AS 37.10.220 requires the Board to coordinate with the retirement system administrator to conduct an annual actuarial valuation of each retirement system to determine system assets, accrued liabilities and funding ratios; and

WHEREAS, AS 39.35.750(e) requires the Board to determine an actuarially sound amount required to fully fund the cost of providing occupational disability and occupational death benefits under AS 39.35.890 and 39.35.892, and that such contribution for peace officers and fire fighters, and the contribution for other employees shall be calculated separately; and

WHEREAS, the June 30, 2020 PERS Defined Contribution actuarial valuation report determines that the actuarially determined contribution rate for peace officer / firefighter occupational death & disability is 0.68 percent, which is the normal cost rate, and the actuarially determined contribution rate for "all other" is 0.30 percent, which is the normal cost rate; and

WHEREAS, there is no past service liability as determined by the annual actuarial valuation of the PERS Defined Contribution occupational death & disability, so no contribution rate for liquidating past service liability is appropriate under AS 37.10.220(a)(8)(B);

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD, the Fiscal Year 2023 employer contribution rate for public employees' occupational death and disability benefit rate is set at 0.68 percent for peace officers / fire fighters, and at 0.30 percent for all other Public Employees' Defined Contribution Retirement Plan employees.

DATED at Juneau, Alaska this 24th day of September, 2021.

Chair

ATTEST:

Gayle Harbo

Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT: FY 23 TRS Retiree Major Medical and Occupational Death & Disability

ACTION: X

DATE: September 24, 2021

INFORMATION: _____

BACKGROUND:

The Alaska Retirement Management Board (Board) establishes rates for the Teachers' Retirement System (TRS) Defined Contribution Retirement Plans for the following plans: 1) Retiree Major Medical Insurance and 2) Occupational Death & Disability under the following two sections in Alaska Statute:

Retiree Major Medical Insurance
AS 14.25.350 (b) requires that "An employer shall also contribute an amount equal to a percentage, as approved by the board, of each member's compensation from July 1 to the following June 30 to pay for retiree major medical insurance."

Occupational Death & Disability
AS 14.25.350 (e) requires that "An employer shall make annual contributions to a trust account in the plan, applied as a percentage of each member's compensation from July 1 to the following June 30, in an amount determined by the board to be actuarially required to fully fund the cost of providing occupational disability and occupational death benefits under AS 14.25.310 - 14.25.590."

STATUS:

The Division of Retirement & Benefits' actuary, Buck, has completed the actuarial valuation of the TRS Defined Contribution Retirement Plan as of June 30, 2020. The valuation has been reviewed by the Board's actuary, Gabriel, Roeder, Smith & Co. (GRS) and then certified and accepted by the Board.

According to the TRS Defined Contribution Retirement Plan actuarial valuation report, and confirmed by GRS, the Fiscal Year 2023 actuarially determined contribution rate attributable to employers for the Retiree Major Medical Insurance should be 0.87 percent and for the Occupational Death & Disability Benefit should be 0.08 percent.

The Actuarial Committee met September 22, 2021, and passed a motion recommending that the Board adopt Resolutions 2021-08 and 2021-09.

RECOMMENDATION:

That the Alaska Retirement Management Board set Fiscal Year 2023 TRS Defined Contribution Retirement Plan Retiree Major Medical Insurance and Occupational Death & Disability Benefit rates as set out in the following resolutions:

1. Resolution 2021-08: Teachers' Defined Contribution Retirement Plan Retiree Major Medical Insurance Rate

2. Resolution 2021-09: Teachers' Defined Contribution Retirement Plan Occupational Death & Disability Benefit Rate

BUCK

State of Alaska

Teachers' Retirement System Defined Contribution Retirement Plan

For Occupational Death and Disability and Retiree Medical Benefits

Actuarial Valuation Report

As of June 30, 2020

May 2021

The recent claims experience described in Section 4.2 of this report (Section 5.2 of the TRS report) created an actuarial gain of approximately $2,162,000. This gain included an update to the medical and prescription drug relative value factors (described in Section 4.1) this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed, which resulted in an actuarial loss of approximately $2,153,000.

5. **Changes in Methods Since the Prior Valuation**

   There were no changes in actuarial methods since the prior valuation.

6. **Changes in Assumptions Since the Prior Valuation**

   Healthcare claim costs are updated annually as described in Section 4.2. The medical and prescription drug relative value factors were updated this year. In addition, the 0.2% annual trend rate adjustment factor between the DB and DCR plans was removed. The amount included in Normal Cost for administrative expenses for retiree medical was updated based on the last two years of actual administrative expenses paid from plan assets. There were no other changes in actuarial assumptions since the prior valuation.

7. **Changes in Benefit Provisions Since the Prior Valuation**

   There have been no changes in benefit provisions valued since the prior valuation.

Comparative Summary of Contribution Rates

Occupational Death & Disability	FY 2022	FY 2023
a. Employer Normal Cost Rate	0.08%	0.08%
b. Past Service Cost Rate	(0.09)%	(0.10)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.08%	0.08%

Retiree Medical	FY 2022	FY 2023
a. Employer Normal Cost Rate	0.83%	0.87%
b. Past Service Cost Rate	(0.15)%	(0.14)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.83%	0.87%

Total	FY 2022	FY 2023
a. Employer Normal Cost Rate	0.91%	0.95%
b. Past Service Cost Rate	(0.24)%	(0.24)%
c. Total Employer Contribution Rate, (a) + (b), not less than (a)	0.91%	0.95%

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to the Fiscal Year 2023 Employer Contribution Rate For
Teachers' Defined Contribution Retirement Plan
Retiree Major Medical Insurance Rate

Resolution 2021-08

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, AS 37.10.220 requires the Board to coordinate with the retirement system administrator to conduct an annual actuarial valuation of each retirement system to determine system assets, accrued liabilities and funding ratios; and

WHEREAS, AS 14.25.350(b) requires the Board to approve an amount equal to a percentage of each member's compensation from July 1 to the following June 30 to pay for retiree major medical insurance; and

WHEREAS, the June 30, 2020 TRS Defined Contribution actuarial valuation report determines that the actuarially determined contribution rate for retiree major medical insurance is 0.87 percent, which is the normal cost rate; and

WHEREAS, there is no past service liability as determined by the annual actuarial valuation of the TRS Defined Contribution retiree major medical insurance, so no contribution rate for liquidating past service liability is appropriate under AS 37.10.220(a)(8)(B);

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD, the Fiscal Year 2023 employer contribution rate for the retiree major medical insurance for the Teachers' Defined Contribution Retirement Plan is set at 0.87 percent.

DATED at Juneau, Alaska this 24th day of September, 2021.

Chair

ATTEST:

Dayle Harbo

Secretary

State of Alaska
ALASKA RETIREMENT MANAGEMENT BOARD
Relating to the Fiscal Year 2023 Employer Contribution Rate For
Teachers' Defined Contribution Retirement Plan Occupational
Death & Disability Benefit Rate

Resolution 2021-09

WHEREAS, the Alaska Retirement Management Board (Board) was established by law to serve as trustee to the assets of the State's retirement systems; and

WHEREAS, under AS 37.10.210-220, the Board is to establish and determine the investment objectives and policy for each of the funds entrusted to it; and

WHEREAS, AS 37.10.071 and AS 37.10.210-220 require the Board to apply the prudent investor rule and exercise the fiduciary duty in the sole financial best interest of the funds entrusted to it and treat beneficiaries thereof with impartiality; and

WHEREAS, AS 37.10.220 requires the Board to coordinate with the retirement system administrator to conduct an annual actuarial valuation of each retirement system to determine system assets, accrued liabilities and funding ratios; and

WHEREAS, AS 14.25.350 (e) requires the Board to determine an actuarially sound amount required to fully fund the cost of providing occupational disability and occupational death benefits under AS 14.25.310 – 14.25.590; and

WHEREAS, the June 30, 2020 TRS Defined Contribution actuarial valuation report determines that the actuarially determined contribution rate for occupational death & disability is 0.08 percent, which is the normal cost rate; and

WHEREAS, there is no past service liability as determined by the annual actuarial valuation of the TRS Defined Contribution occupational death & disability, so no contribution rate for liquidating past service liability is appropriate under AS 37.10.220(a)(8)(B);

NOW THEREFORE, BE IT RESOLVED BY THE ALASKA RETIREMENT MANAGEMENT BOARD, the Fiscal Year 2023 employer contribution rate for teachers' occupational death and disability benefit rate is set at 0.08 percent for all Teachers' Defined Contribution Retirement Plan employees.

DATED at Juneau, Alaska this 24th day of September, 2021.

Chair

ATTEST:

Secretary

ALASKA RETIREMENT MANAGEMENT BOARD

SUBJECT:	FY 23 JRS Employer Contribution Rate	ACTION:	
DATE:	September 24, 2021	INFORMATION:	X

BACKGROUND:

AS 22.25.046 states in part that:

(a) The state court system shall contribute to the judicial retirement system at the rate established by the commissioner of administration. The contribution rate shall be based on the results of an actuarial valuation of the judicial retirement system. The results of the actuarial valuation shall be based on actuarial methods and assumptions adopted by the commissioner of administration.

(b) The contribution rate shall be a percentage which, when applied to the covered compensation of all active members of the judicial retirement system, will generate sufficient money to support, along with contributions from members, the benefits of the judicial retirement system.

(c) Employer contributions shall be separately computed for benefits provided by AS 22.25.090 and shall be deposited in the Alaska retiree health care trust established under AS 39.30.097(a)."

STATUS:

The Division of Retirement & Benefits' (Division's) actuary, Buck, has completed the actuarial valuation of the Alaska Judicial Retirement System (JRS) as of June 30, 2020. The actuarial valuation has been reviewed by the Alaska Retirement Management Board's (Board's) actuary, Gabriel, Roeder, Smith & Co. (GRS) and then certified and accepted by the Board.

According to page 4 of the JRS actuarial valuation as of June 30, 2020, the recommended Fiscal Year 2023 employer contribution rate is 70.08 percent based on the following table:

	Pension	Post-employment Health Care	Total
Normal Cost Rate	38.85%	6.49%	45.34%
Past Service Cost Rate	24.74%	-8.24%	24.74%
Total Employer Contribution Rate	63.59%	6.49%	70.08%

The Alaska Legislature has established operating budget language that explicitly addresses JRS past service costs separate from the normal costs. Normal costs as a percentage are charged to the Alaska Court System's operating budget and past service cost in dollars is funded separately in retirement section language like PERS and TRS.

The computed JRS Past Service Contribution amount is $3,255,000 as shown on page 2 of the Buck letter dated August 25, 2021. The contribution amount should be reflected in the operating budget language section and should be deposited in the JRS pension benefit trust during FY 2023.

BUCK

State of Alaska

Judicial Retirement System

Actuarial Valuation Report
As of June 30, 2020

May 2021

Comparative Summary of Contribution Rates

Pension	FY 2021	FY 2023
a. Normal Cost Rate Net of Member Contributions	42.04%	38.85%
b. Past Service Cost Rate	35.78%	24.74%
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)	77.82%	63.59%

Healthcare	FY 2021	FY 2023
a. Normal Cost Rate	6.12%	6.49%
b. Past Service Cost Rate	(6.45)%	(8.24)%
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)	6.12%	6.49%

Total	FY 2021	FY 2023
a. Normal Cost Rate Net of Member Contributions	48.16%	45.34%
b. Past Service Cost Rate	35.78%	24.74%
c. Total Employer/State Contribution Rate, (a) + (b), not less than (a)	83.94%	70.08%

The contribution rates for FY22 based on a roll-forward valuation as of June 30, 2019 were 70.97% (pension), 6.28% (healthcare), and 77.25% (total). These FY22 contribution rates reflect the change in the salary and pensioner benefit increase assumptions to 0% for FY19 and FY20 that were implemented for the June 30, 2019 roll-forward valuation.

Summary of Actuarial Accrued Liability Gain/(Loss) and Other Changes

The following table summarizes the sources of change in the total Employer/State contribution rates as of June 30, 2018, June 30, 2019, and June 30, 2020:

	Pension	Healthcare	Total
1. Total Employer/State Contribution Rate as of June 30, 2018	77.82%	6.12%	83.94%
2. Change during FY19[1]	(6.85)%	0.16%	(6.69)%
3. Total Employer/State Contribution Rate as of June 30, 2019 from Roll-Forward Valuation	70.97%	6.28%	77.25%
4. Change due to:			
a. Investment Experience	1.38%	0.24%	1.62%
b. Demographic Experience, Health Claims Experience, and New Entrants[2]	6.22%	(0.20)%	6.02%
c. State Appropriation	(2.46)%	0.00%	(2.46)%
d. Actual vs Expected Contributions	(0.74)%	(0.40)%	(1.14)%
e. Assumption Changes	(11.78)%	0.57%	(11.21)%
f. Total Change, (a) + (b) + (c) + (d) + (e)	(7.38)%	0.21%	(7.17)%
5. Total Employer/State Contribution Rate as of June 30, 2020, (3) + (4)(f)	63.59%	6.49%	70.08%

[1] Net effect of FY19 experience and assumption changes implemented effective June 30, 2019.
[2] Includes changes in future healthcare claims costs.

State of Alaska
Summary of FY23 Contributions - With and Without Reset of AVA to MVA as of June 30, 2021

Without Reset of AVA to MVA[1]

	PERS						TRS	
	Non-State Employers		State as an Employer		All Employers			
	Percent of Total Payroll	Estimated Dollar Amount	Percent of Total Payroll	Estimated Dollar Amount		Estimated Dollar Amount	Percent of Total Payroll	Estimated Dollar Amount
Employer Contributions								
DB Pension Plan								
1. Normal Cost	2.37%		2.37%				2.24%	
2. Past Service Cost	10.38%		16.01%				0.88%	
3. Total: (1) + (2)	12.75%	$ 155,071,000	18.38%	$ 218,507,000		$ 373,578,000	3.12%	$ 23,550,000
DB Healthcare Plan								
4. Normal Cost	2.84%		2.84%				2.72%	
5. Past Service Cost	0.00%		0.00%				0.00%	
6. Total: (4) + (5)	2.84%	34,541,000	2.84%	33,763,000		68,304,000	2.72%	20,531,000
7. DCR Plan	6.41%	77,961,000	6.41%	76,204,000		154,165,000	6.72%	50,723,000
8. Total: (3) + (6) + (7)	22.00%	$ 267,573,000	27.63%	$ 328,474,000		$ 596,047,000	12.56%	$ 94,804,000
Additional State Contributions to DB								
9. DB Pension Plan	5.63%	$ 68,475,000	0.00%	$ 0		$ 68,475,000	14.78%	$ 111,560,000
10. DB Healthcare Plan	0.00%	0	0.00%	0		0	0.00%	0
11. Total: (9) + (10)	5.63%	$ 68,475,000	0.00%	$ 0		$ 68,475,000	14.78%	$ 111,560,000
Total DB								
12. DB Pension Plan: (3) + (9)	18.38%	$ 223,546,000	18.38%	$ 218,507,000		$ 442,053,000	17.90%	$ 135,110,000
13. DB Healthcare Plan: (6) + (10)	2.84%	34,541,000	2.84%	33,763,000		68,304,000	2.72%	20,531,000
14. Total: (12) + (13)	21.22%	$ 258,087,000	21.22%	$ 252,270,000		$ 510,357,000	20.62%	$ 155,641,000
Total DB and DCR: (7) + (14)	27.63%	$ 336,048,000	27.63%	$ 328,474,000		$ 664,522,000	27.34%	$ 206,364,000

With Reset of AVA to MVA[2]

	PERS						TRS	
	Non-State Employers		State as an Employer		All Employers			
	Percent of Total Payroll	Estimated Dollar Amount	Percent of Total Payroll	Estimated Dollar Amount		Estimated Dollar Amount	Percent of Total Payroll	Estimated Dollar Amount
Employer Contributions								
DB Pension Plan								
1. Normal Cost	2.37%		2.37%				2.24%	
2. Past Service Cost	10.38%		13.27%				0.88%	
3. Total: (1) + (2)	12.75%	$ 155,071,000	15.64%	$ 185,933,000		$ 341,004,000	3.12%	$ 23,550,000
DB Healthcare Plan								
4. Normal Cost	2.84%		2.84%				2.72%	
5. Past Service Cost	0.00%		0.00%				0.00%	
6. Total: (4) + (5)	2.84%	34,541,000	2.84%	33,763,000		68,304,000	2.72%	20,531,000
7. DCR Plan	6.41%	77,961,000	6.41%	76,204,000		154,165,000	6.72%	50,723,000
8. Total: (3) + (6) + (7)	22.00%	$ 267,573,000	24.89%	$ 295,900,000		$ 563,473,000	12.56%	$ 94,804,000
Additional State Contributions to DB								
9. DB Pension Plan	2.89%	$ 35,150,000	0.00%	$ 0		$ 35,150,000	9.81%	$ 74,046,000
10. DB Healthcare Plan	0.00%	0	0.00%	0		0	0.00%	0
11. Total: (9) + (10)	2.89%	$ 35,150,000	0.00%	$ 0		$ 35,150,000	9.81%	$ 74,046,000
Total DB								
12. DB Pension Plan: (3) + (9)	15.64%	$ 190,221,000	15.64%	$ 185,933,000		$ 376,154,000	12.93%	$ 97,596,000
13. DB Healthcare Plan: (6) + (10)	2.84%	34,541,000	2.84%	33,763,000		68,304,000	2.72%	20,531,000
14. Total: (12) + (13)	18.48%	$ 224,762,000	18.48%	$ 219,696,000		$ 444,458,000	15.65%	$ 118,127,000
Total DB and DCR: (7) + (14)	24.89%	$ 302,723,000	24.89%	$ 295,900,000		$ 598,623,000	22.37%	$ 168,850,000

[1] Please see letter dated August 25, 2021 for additional details.
[2] Please see letter dated September 16, 2021 for additional details.

BUCK

State of Alaska Retirement Systems

Presentation to ARMB Actuarial Committee

Development of FY23 Additional State Contribution - TRS

September 22, 2021

Background

Background

- AS 14.25.070(a): Each employer contributes 12.56% of total base salaries

- DB and DCR salaries are based on the 6/30/20 data provided to us; future salaries are estimated based on the salary increase assumptions used in the valuation

($000's)	FY21 Payroll	FY23 Projected Payroll
TRS DB	349,236	291,514
TRS DCR	391,854	463,287
TRS DB/DCR	741,090	754,801

Background (cont'd)

- The actuarial valuations produce the two components of the Actuarially Determined Contribution
  - Normal Cost (the cost of active members' benefit accruals in the upcoming year)
  - 25-year layered amortizations of the unfunded liability

- Once these amounts are determined by the valuations, we project them to FY23
  - DB – Step 1
  - DCR – Steps 2-4

- In Step 5, the FY23 projected amounts are converted to a % of FY23 total pay

- In Step 6, the FY23 DB and DCR contribution rates from Step 5 are combined to calculate the FY23 Additional State Contribution

Summary of Steps

Summary of Steps

- **Step 1*:** Calculate Projected FY23 DB Contribution Amounts (2-year roll-forward from 6/30/20)
- **Step 2*:** Calculate FY21 DCR Contribution Amounts as of 6/30/20
- **Step 3:** Convert DCR Contribution Amounts (Step 2) to % of FY21 DCR Pay
- **Step 4:** Calculate Projected FY23 DCR Contribution Amounts
- **Step 5:** Convert FY23 DB & DCR Contribution Amounts (Steps 1 & 4) to % of FY23 Total Pay
- **Step 6:** Calculate FY23 Additional State Contribution

* the outputs of the 6/30/20 actuarial valuations are used in Steps 1 and 2

Step 1

Calculate Projected FY23 DB Contribution Amounts

Step 1: Calculate Projected FY23 DB Contribution Amounts ($000's)

Total Projected FY23 Contribution Amount = Normal Cost + 25-Year Layered Amortizations (cannot be less than Normal Cost)

WITHOUT RESET OF AVA TO MVA	Pension	Healthcare	Total
1) Normal Cost - Total	42,117	20,531	62,648
2) Less: Employee Contributions (excl. indebtedness)	(25,210)	0	(25,210)
3) Normal Cost - Employer	16,907	20,531	37,438
4) 25-year Layered Amortizations	118,203	(59,870)	118,203
5) DB Total Contribution Amount [3 + 4, not less than 3]	135,110	20,531	155,641

WITH RESET OF AVA TO MVA	Pension	Healthcare	Total
1) Normal Cost - Total	42,117	20,531	62,648
2) Less: Employee Contributions (excl. indebtedness)	(25,210)	0	(25,210)
3) Normal Cost - Employer	16,907	20,531	37,438
4) 25-year Layered Amortizations	80,689	(80,528)	80,689
5) DB Total Contribution Amount [3 + 4, not less than 3]	97,596	20,531	118,127

Step 2

Calculate FY21 DCR Contribution Amounts as of 6/30/20

Step 2: Calculate FY21 DCR Contribution Amounts as of 6/30/20 ($000's)

Total FY21 Contribution Amount = Normal Cost + 25-Year Layered Amortizations (cannot be less than Normal Cost)

	ODD	Healthcare	Total
1) Normal Cost	312	3,396	3,708
2) 25-year Layered Amortizations	(376)	(533)	(909)
3) DCR Contribution Amount [1 + 2, not less than 1]	312	3,396	3,708

Step 3

Convert DCR Contribution Amounts to % of FY21 DCR Pay

Step 3: Convert DCR Contribution Amounts (Step 2) to % of FY21 DCR Pay ($000's)

FY23 DCR Contribution Rate = Contribution Amount / FY21 DCR Pay

	ODD	Healthcare	Total
1) 6/30/20 DCR Contribution Amount (from Step 2)	312	3,396	3,708
2) FY21 DCR Pay (from Slide 3)	391,854	391,854	391,854
3) FY23 DCR Contribution Rate (% of DCR pay)* [1 / 2]	0.08%	0.87%	0.95%

* FY23 DCR contribution rate is based on FY21 contribution amount and DCR payroll without adjustment

Step 4

Calculate Projected FY23 DCR Contribution Amounts

Step 4: Calculate Projected FY23 DCR Contribution Amounts ($000's)

FY23 Contribution Amount = FY23 Contribution Rate x FY23 DCR Pay

		ODD	Healthcare	DC Match*	HRA*	Total
1)	FY23 DCR Contribution Rate (from Step 3)	0.08%	0.87%	7.00%	3.00%	10.95%
2)	FY23 DCR Pay (from Slide 3)	463,287	463,287	463,287	463,287	463,287
3)	FY23 DCR Total Contribution Amount [1 x 2]	371	4,031	32,430	13,899	50,731

* fixed contribution rates

Step 5

Convert FY23 DB & DCR Contribution Amounts to % of FY23 Total Pay

Step 5: Convert FY23 DB & DCR Contribution Amounts (Steps 1 & 4) to % of FY23 Total Pay ($000's)

FY23 Contribution Rate = FY23 Contribution Amount x FY23 Total Pay

WITHOUT RESET OF AVA to MVA	DB			DCR
	Pension	Healthcare	Total	
1) FY23 Contribution Amount (from Steps 1 & 4)	135,110	20,531	155,641	50,731
2) FY23 Total Pay (from Slide 3)	754,801	754,801	754,801	754,801
3) FY23 Contribution Rate (% of total pay) [1 / 2]	17.90%	2.72%	20.62%	6.72%

WITH RESET OF AVA to MVA	DB			DCR
	Pension	Healthcare	Total	
1) FY23 Contribution Amount (from Steps 1 & 4)	97,596	20,531	118,127	50,731
2) FY23 Total Pay (from Slide 3)	754,801	754,801	754,801	754,801
3) FY23 Contribution Rate (% of total pay) [1 / 2]	12.93%	2.72%	15.65%	6.72%

Step 6

Calculate FY23 Additional State Contribution

Step 6: Calculate FY23 Additional State Contribution ($000's)

WITHOUT RESET OF AVA TO MVA		Total
1)	FY23 DB Contribution Rate (from Step 5)	20.62%
2)	FY23 DCR Contribution Rate (from Step 5)	6.72%
3)	FY23 DB/DCR Contribution Rate [1 + 2]	27.34%
4)	Statutory Employer Contribution Rate	12.56%
5)	FY23 Additional State Contribution Rate [3 – 4]	14.78%
6)	FY23 Total Pay (from Slide 3)	754,801
7)	FY23 Additional State Contribution [5 x 6]	**111,560**

WITH RESET OF AVA TO MVA		Total
1)	FY23 DB Contribution Rate (from Step 5)	15.65%
2)	FY23 DCR Contribution Rate (from Step 5)	6.72%
3)	FY23 DB/DCR Contribution Rate [1 + 2]	22.37%
4)	Statutory Employer Contribution Rate	12.56%
5)	FY23 Additional State Contribution Rate [3 – 4]	9.81%
6)	FY23 Total Pay (from Slide 3)	754,801
7)	FY23 Additional State Contribution [5 x 6]	**74,046**

Actuarial Certification

Actuarial Certification

The purpose of this presentation is to illustrate for the ARMB Actuarial Committee the steps involved in the calculation of the FY23 Additional State Contribution for TRS. All calculations are based on the data, assumptions, methods and plan provisions described in the June 30, 2020 actuarial valuation reports, as well as preliminary June 30, 2021 asset statements. The second scenario for TRS reflects the resetting of Actuarial Value of Assets to Market Value of Assets as of June 30, 2021.

Please see the June 30, 2020 actuarial valuation reports for a detailed description of (i) Buck's projection models which are the same ones used for this presentation (ASOP 56), and (ii) risk factors related to future funding of the plan (ASOP 51).

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and 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 results were prepared under the direction of David Kershner and Scott Young, both of whom meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice.

David Kershner
FSA, EA, MAAA, FCA
Principal, Retirement

Scott Young
FSA, EA, MAAA, FCA
Director, Health

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BUCK

State of Alaska Retirement Systems

Presentation to ARMB Actuarial Committee

Development of FY23 Additional State Contribution - PERS

September 22, 2021

Background

Background

- AS 39.35.255(a): Each *non-State* employer contributes 22% of total base salaries
- AS 39.35.255(i): The *State-as-an-employer* contributes the Actuarially Determined Contribution rates applied to total base salaries of its employees (per SB 55 which was passed in June 2021)
- DB and DCR salaries are based on the 6/30/20 data provided to us; future salaries are estimated based on the salary increase assumptions used in the valuation

($000's)	State-as-an-Employer*		Non-State Employers	
	FY21 Payroll	FY23 Projected Payroll	FY21 Payroll	FY23 Projected Payroll
PERS DB	459,729	382,871	470,332	391,701
PERS DCR				
- P/F	100,498	n/a	102,816	n/a
- Others	612,785	n/a	626,918	n/a
- Total	713,283	805,958	729,734	824,546
PERS DB/DCR	1,173,012	1,188,829	1,200,066	1,216,247

* payroll of State's employees assumed to be 49.43% of total PERS payroll based on 6/30/20 valuation data

Background (cont'd)

- The actuarial valuations produce the two components of the Actuarially Determined Contribution
  - Normal Cost (the cost of active members' benefit accruals in the upcoming year)
  - 25-year layered amortizations of the unfunded liability

- Once these amounts are determined by the valuations, we project them to FY23
  - DB – Step 1
  - DCR – Steps 2-4

- In Step 5, the FY23 projected amounts are converted to a % of FY23 total pay

- In Step 6, the FY23 DB and DCR contribution rates from Step 5 are combined to calculate the FY23 Additional State Contribution

Summary of Steps

Summary of Steps

- **Step 1*:** Calculate Projected FY23 DB Contribution Amounts (2-year roll-forward from 6/30/20)
- **Step 2*:** Calculate FY21 DCR Contribution Amounts as of 6/30/20
- **Step 3:** Convert DCR Contribution Amounts (Step 2) to % of FY21 DCR Pay
- **Step 4:** Calculate Projected FY23 DCR Contribution Amounts
- **Step 5:** Convert FY23 DB & DCR Contribution Amounts (Steps 1 & 4) to % of FY23 Total Pay
- **Step 6:** Calculate FY23 Additional State Contribution

* the outputs of the 6/30/20 actuarial valuations are used in Steps 1 and 2

Step 1

Calculate Projected FY23 DB Contribution Amounts

Step 1: Calculate Projected FY23 DB Contribution Amounts ($000's)

Total Projected FY23 Contribution Amount = Normal Cost + 25-Year Layered Amortizations (cannot be less than Normal Cost)

WITHOUT RESET OF AVA TO MVA	Pension	Healthcare	Total
1) Normal Cost - Total	110,560	68,304	178,864
2) Less: Employee Contributions (excl. indebtedness)	(53,633)	0	(53,633)
3) Normal Cost - Employer	56,927	68,304	125,231
4) 25-year Layered Amortizations	385,126	(118,877)	385,126
5) DB Total Contribution Amount [3 + 4, not less than 3]	442,053	68,304	510,357

WITH RESET OF AVA TO MVA	Pension	Healthcare	Total
1) Normal Cost - Total	110,560	68,304	178,864
2) Less: Employee Contributions (excl. indebtedness)	(53,633)	0	(53,633)
3) Normal Cost - Employer	56,927	68,304	125,231
4) 25-year Layered Amortizations	319,227	(173,444)	319,227
5) DB Total Contribution Amount [3 + 4, not less than 3]	376,154	68,304	444,458

Step 2

Calculate FY21 DCR Contribution Amounts as of 6/30/20

Step 2: Calculate FY21 DCR Contribution Amounts as of 6/30/20 ($000's)

Total FY21 Contribution Amount = Normal Cost + 25-Year Layered Amortizations (cannot be less than Normal Cost)

		P/F		Others		
		ODD	Healthcare	ODD	Healthcare	Total
1)	Normal Cost	1,380	1,770	3,754	13,412	20,316
2)	25-year Layered Amortizations	(391)	75	(1,994)	675	750
3)	DCR Contribution Amount [1 + 2, not less than 1]	1,380	1,845	3,754	14,087	21,066

Step 3

Convert DCR Contribution Amounts to % of FY21 DCR Pay

Step 3: Convert DCR Contribution Amounts (Step 2) to % of FY21 DCR Pay ($000's)

FY23 DCR Contribution Rate = Contribution Amount / FY21 DCR Pay

		P/F		Others		Total	
		ODD	Healthcare	ODD	Healthcare	ODD	Healthcare
1)	6/30/20 DCR Contribution Amount (from Step 2)	1,380	1,845	3,754	14,087	5,134	15,932
2)	FY21 DCR Pay (from Slide 3)	203,314	203,314	1,239,703	1,239,703	1,443,017	1,443,017
3)	FY23 DCR Contribution Rate (% of DCR pay)* [1 / 2]	0.68%	0.91%	0.30%	1.13%	0.36%	1.10%

* FY23 DCR contribution rate is based on FY21 contribution amount and DCR payroll without adjustment

Step 4

Calculate Projected FY23 DCR Contribution Amounts

Step 4: Calculate Projected FY23 DCR Contribution Amounts ($000's)

FY23 Contribution Amount = FY23 Contribution Rate x FY23 DCR Pay

		ODD	Healthcare	DC Match*	HRA*	Total
1)	FY23 DCR Contribution Rate (from Step 3)	0.36%	1.10%	5.00%	3.00%	9.46%
2)	FY23 DCR Pay (from Slide 3)	1,630,504	1,630,504	1,630,504	1,630,504	1,630,504
3)	FY23 DCR Total Contribution Amount [1 x 2]	5,870	17,936	81,525	48,915	154,246

* fixed contribution rates

Step 5

Convert FY23 DB & DCR Contribution Amounts to % of FY23 Total Pay

Step 5: Convert FY23 DB & DCR Contribution Amounts (Steps 1 & 4) to % of FY23 Total Pay ($000's)

FY23 Contribution Rate = FY23 Contribution Amount x FY23 Total Pay

WITHOUT RESET OF AVA TO MVA		DB			DCR
		Pension	Healthcare	Total	
1)	FY23 Contribution Amount (from Steps 1 & 4)	442,053	68,304	510,357	154,246
2)	FY23 Total Pay (from Slide 3)	2,405,076	2,405,076	2,405,076	2,405,076
3)	FY23 Contribution Rate (% of total pay) [1 / 2]	18.38%	2.84%	21.22%	6.41%

WITH RESET OF AVA TO MVA		DB			DCR
		Pension	Healthcare	Total	
1)	FY23 Contribution Amount (from Steps 1 & 4)	376,154	68,304	444,458	154,246
2)	FY23 Total Pay (from Slide 3)	2,405,076	2,405,076	2,405,076	2,405,076
3)	FY23 Contribution Rate (% of total pay) [1 / 2]	15.64%	2.84%	18.48%	6.41%

Step 6

Calculate FY23 Additional State Contribution

Step 6: Calculate FY23 Additional State Contribution ($000's)

WITHOUT RESET OF AVA TO MVA		State-as-an-Employer	Non-State Employers	Total
1)	FY23 DB Contribution Rate (from Step 5)	21.22%	21.22%	21.22%
2)	FY23 DCR Contribution Rate (from Step 5)	6.41%	6.41%	6.41%
3)	FY23 DB/DCR Contribution Rate [1 + 2]	27.63%	27.63%	27.63%
4)	Statutory Employer Contribution Rate	27.63%	22.00%	n/a
5)	FY23 Additional State Contribution Rate [3 – 4]	0.00%	5.63%	n/a
6)	FY23 Total Pay (from Slide 3)	1,188,829	1,216,247	2,405,076
7)	FY23 Additional State Contribution [5 x 6]	0	68,475	**68,475**

WITH RESET OF AVA TO MVA		State-as-an-Employer	Non-State Employers	Total
1)	FY23 DB Contribution Rate (from Step 5)	18.48%	18.48%	18.48%
2)	FY23 DCR Contribution Rate (from Step 5)	6.41%	6.41%	6.41%
3)	FY23 DB/DCR Contribution Rate [1 + 2]	24.89%	24.89%	24.89%
4)	Statutory Employer Contribution Rate	24.89%	22.00%	n/a
5)	FY23 Additional State Contribution Rate [3 – 4]	0.00%	2.89%	n/a
6)	FY23 Total Pay (from Slide 3)	1,188,829	1,216,247	2,405,076
7)	FY23 Additional State Contribution [5 x 6]	0	35,150	**35,150**

Actuarial Certification

Actuarial Certification

The purpose of this presentation is to illustrate for the ARMB Actuarial Committee the steps involved in the calculation of the FY23 Additional State Contribution for PERS. All calculations are based on the data, assumptions, methods and plan provisions described in the June 30, 2020 actuarial valuation reports, as well as preliminary June 30, 2021 asset statements. The second scenario for PERS reflects the resetting of Actuarial Value of Assets to Market Value of Assets as of June 30, 2021.

Please see the June 30, 2020 actuarial valuation reports for a detailed description of (i) Buck's projection models which are the same ones used for this presentation (ASOP 56), and (ii) risk factors related to future funding of the plan (ASOP 51).

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and 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 results were prepared under the direction of David Kershner and Scott Young, both of whom meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice.

David Kershner
FSA, EA, MAAA, FCA
Principal, Retirement

Scott Young
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Director, Health

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BUCK

State of Alaska Retirement Systems

Presentation to ARMB Actuarial Committee

FY23-FY39 State Contribution Projections

September 22, 2021

Background

Background

- All projections are based on the June 30, 2020 valuations and reflect SB 55 for PERS
- Under SB 55, which went into effect July 1, 2021:
  - The State-as-an-employer contributes the Actuarially Determined Contribution rate
  - Other employers continue to contribute 22% of pay
- State contribution projections for FY23-FY39 are provided under 3 scenarios:

	Scenario 1	Scenario 2	Scenario 3
FY21 market return	7.38%	28.00%	28.00%
FY22+ market return	7.38%	7.38%	7.38%
AVA reset to MVA as of 6/30/21	no	no	yes

- FY21 market return of approximately 28% generated asset gains of approximately $3.5B for PERS and $1.7B for TRS
- Reset of Actuarial Value of Assets (AVA) to Market Value of Assets (MVA) increases June 30, 2021 valuation assets by approximately $2.4B for PERS and $1.1B for TRS
- For additional projection assumptions, please see Section 3.1 of the PERS/TRS June 30, 2020 valuation reports

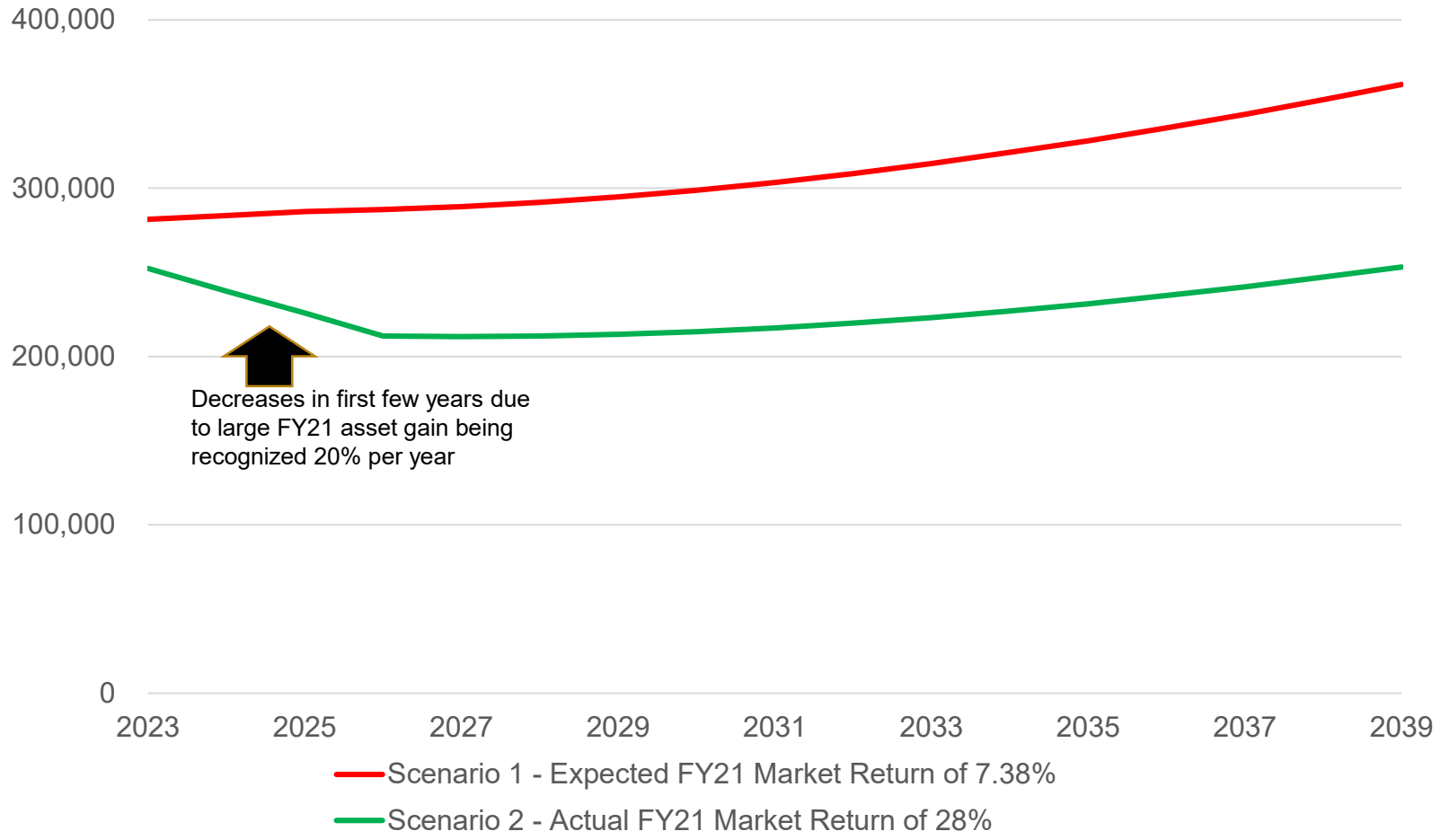
State Contribution Projections – PERS (Employer and ASC's)

Scenarios 1 and 2

State-as-an-Employer Contributions – PERS

Scenarios 1 and 2 – Impact of FY21 Market Return

($000's)



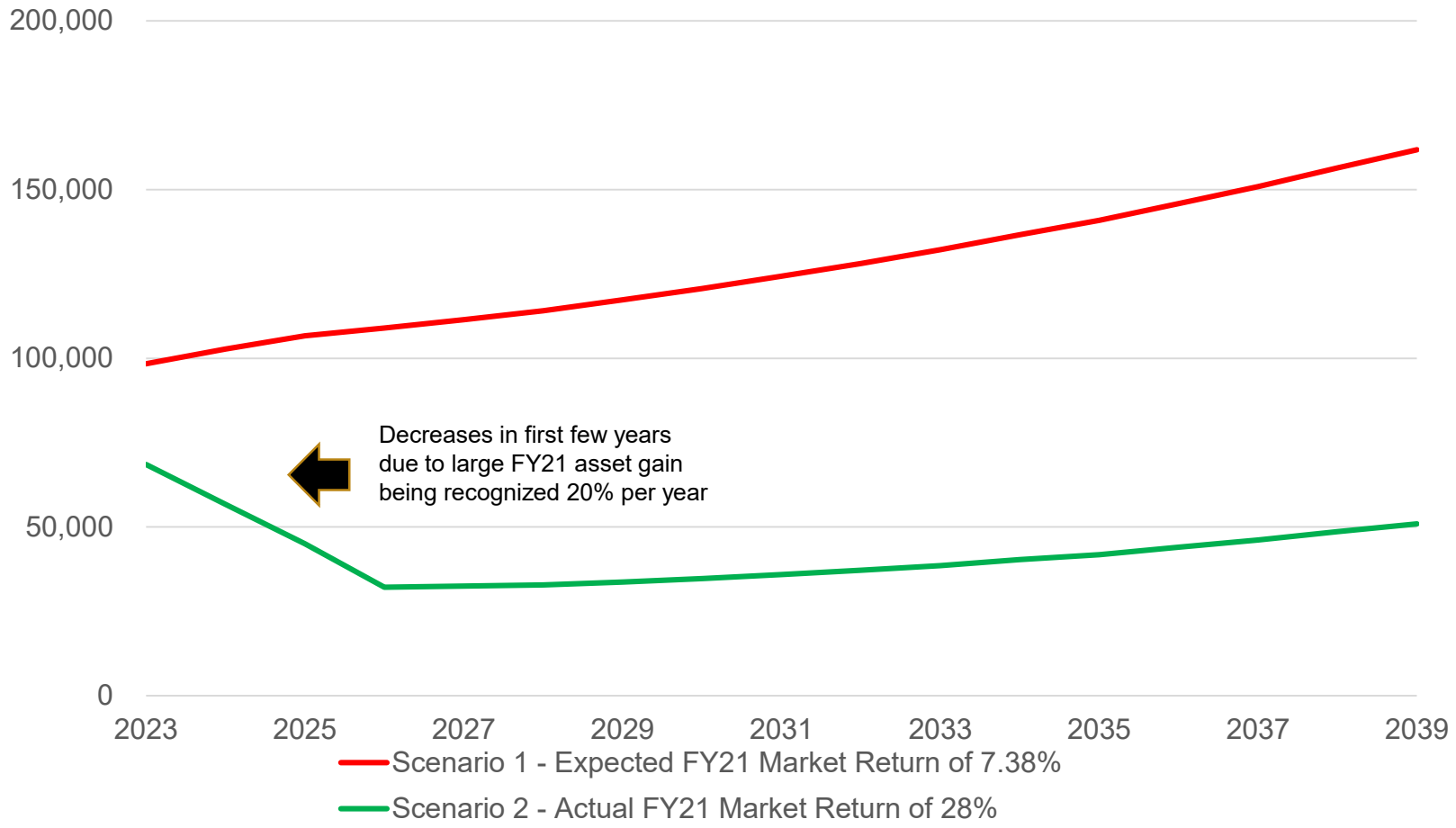
Total projected contributions for FY23-FY39:

- Scenario 1 = $5.28B
- Scenario 2 = $3.88B
- Decrease = $1.40B

Additional State Contributions – PERS

Scenarios 1 and 2 – Impact of FY21 Market Return

($000's)



Total projected contributions for FY23-FY39:

- Scenario 1 = $2.16B
- Scenario 2 = $719.3M
- Decrease = $1.44B

State Contribution Summary – PERS

Scenarios 1 and 2 – Impact of FY21 Market Return

($000's)

	State-as-an-Employer Contributions			Additional State Contributions			Total State Contributions		
Fiscal Year	*Expected* FY21 Asset Return Scenario 1 (A)	*Actual* FY21 Asset Return Scenario 2 (B)	Increase/ (Decrease) (C)	*Expected* FY21 Asset Return Scenario 1 (D)	*Actual* FY21 Asset Return Scenario 2 (E)	Increase/ (Decrease) (F)	*Expected* FY21 Asset Return Scenario 1 (G)	*Actual* FY21 Asset Return Scenario 2 (H)	Increase/ (Decrease) (I)
2023	281,515	252,270	(29,245)	98,394	68,475	(29,919)	379,909	320,745	(59,164)
2024	283,761	238,767	(44,994)	102,742	56,711	(46,031)	386,503	295,478	(91,025)
2025	286,172	225,906	(60,266)	106,688	45,032	(61,656)	392,860	270,938	(121,922)
2026	287,279	212,176	(75,103)	108,975	32,140	(76,835)	396,254	244,316	(151,938)
2027	289,059	211,877	(77,182)	111,439	32,476	(78,963)	400,498	244,353	(156,145)
2028	291,514	212,125	(79,389)	114,070	32,850	(81,220)	405,584	244,975	(160,609)
2029	294,885	213,130	(81,755)	117,308	33,667	(83,641)	412,193	246,797	(165,396)
2030	298,769	214,659	(84,110)	120,711	34,661	(86,050)	419,480	249,320	(170,160)
2031	303,403	216,926	(86,477)	124,324	35,852	(88,472)	427,727	252,778	(174,949)
2032	308,682	219,807	(88,875)	128,103	37,178	(90,925)	436,785	256,985	(179,800)
2033	314,627	223,104	(91,523)	132,197	38,563	(93,634)	446,824	261,667	(185,157)
2034	321,228	227,092	(94,136)	136,605	40,298	(96,307)	457,833	267,390	(190,443)
2035	328,119	231,254	(96,865)	140,911	41,812	(99,099)	469,030	273,066	(195,964)
2036	335,837	236,292	(99,545)	145,836	43,994	(101,842)	481,673	280,286	(201,387)
2037	343,873	241,426	(102,447)	150,907	46,097	(104,810)	494,780	287,523	(207,257)
2038	352,600	247,162	(105,438)	156,466	48,597	(107,869)	509,066	295,759	(213,307)
2039	361,618	253,196	(108,422)	161,815	50,894	(110,921)	523,433	304,090	(219,343)
Total	5,282,941	3,877,169	(1,405,772)	2,157,491	719,297	(1,438,194)	7,440,432	4,596,466	(2,843,966)

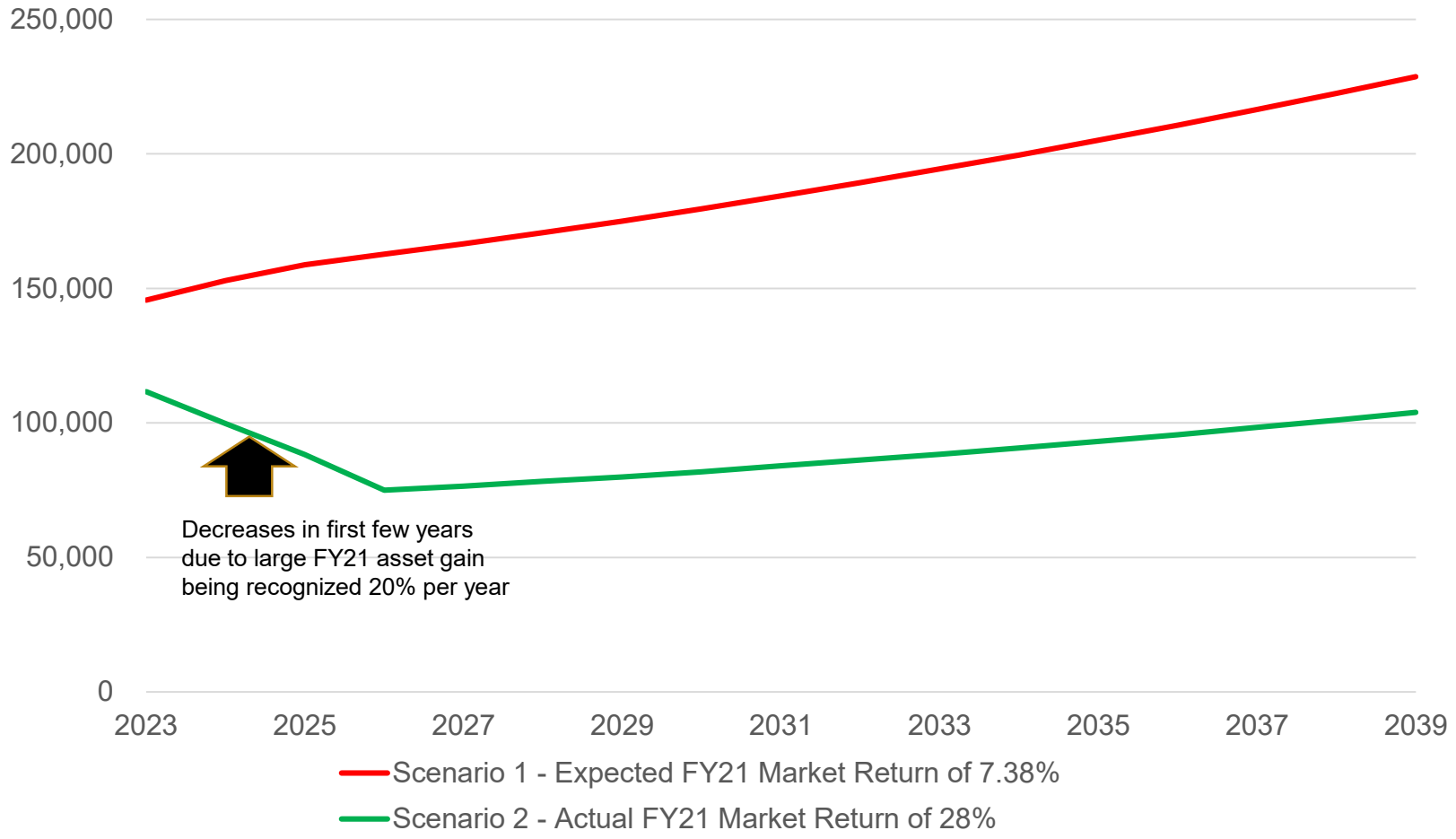
State Contribution Projections – TRS (ASC's)

Scenarios 1 and 2

Additional State Contributions – TRS

Scenarios 1 and 2 – Impact of FY21 Market Return

($000's)



Total projected contributions for FY23-FY39:

- Scenario 1 = $3.16B
- Scenario 2 = $1.53B
- Decrease = $1.63B

Additional State Contribution Summary – TRS

Scenarios 1 and 2 – Impact of FY21 Market Return

($000's)

Fiscal Year	Additional State Contributions		
	Expected FY21 Asset Return Scenario 1 (A)	*Actual* FY21 Asset Return Scenario 2 (B)	Increase/ (Decrease) (C)
2023	145,601	111,560	(34,041)
2024	152,859	99,793	(53,066)
2025	158,813	88,186	(70,627)
2026	162,694	74,993	(87,701)
2027	166,575	76,519	(90,056)
2028	170,766	78,261	(92,505)
2029	175,032	79,897	(95,135)
2030	179,570	81,814	(97,756)
2031	184,399	84,028	(100,371)
2032	189,331	86,147	(103,184)
2033	194,428	88,376	(106,052)
2034	199,591	90,715	(108,876)
2035	205,075	93,157	(111,918)
2036	210,628	95,618	(115,010)
2037	216,515	98,381	(118,134)
2038	222,475	101,025	(121,450)
2039	228,679	103,880	(124,799)
Total	3,163,031	1,532,350	(1,630,681)

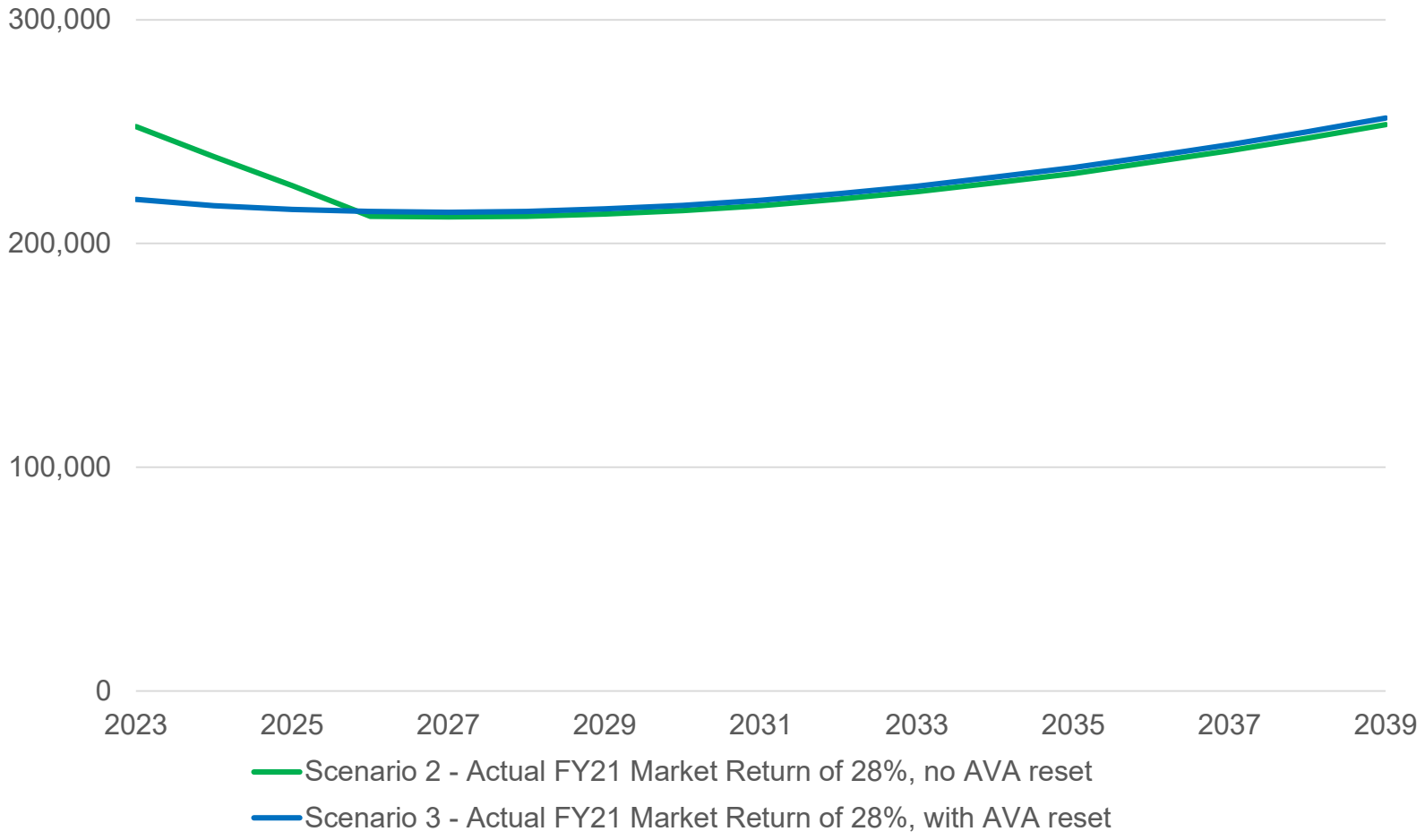
State Contribution Projections – PERS (Employer and ASC's)

Scenarios 2 and 3

State-as-an-Employer Contributions – PERS

Scenarios 2 and 3 – Impact of AVA Reset

($000's)



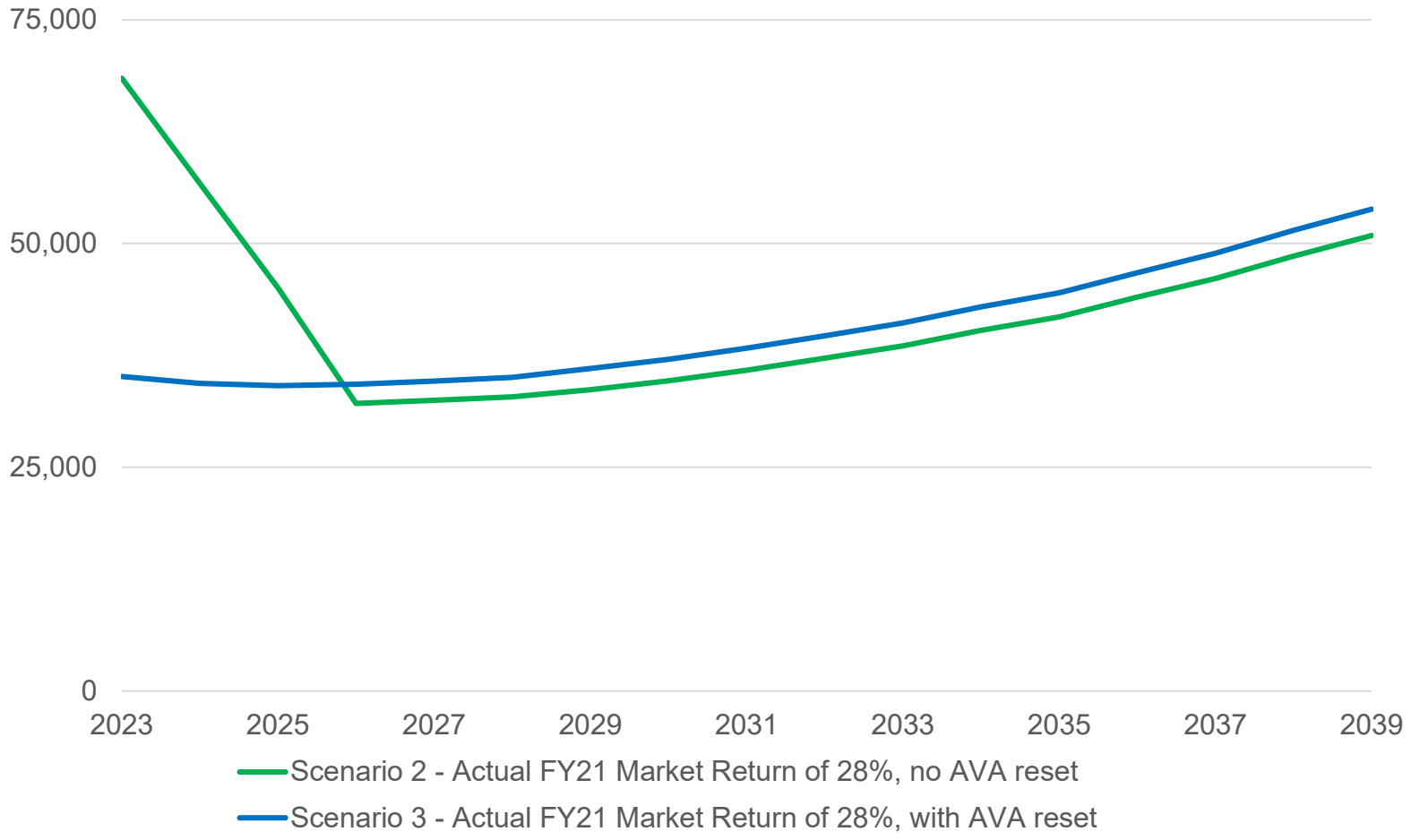
Total projected contributions for FY23-FY39:

- Scenario 2 = $3.88B
- Scenario 3 = $3.85B
- Decrease = $30.4M

Additional State Contributions – PERS

Scenarios 2 and 3 – Impact of AVA Reset

($000's)



Total projected contributions for FY23-FY39:

- Scenario 2 = $719.3M
- Scenario 3 = $688.2M
- Decrease = $31.1M

State Contribution Summary – PERS

Scenarios 2 and 3 – Impact of AVA Reset

($000's)

Fiscal Year	State-as-an-Employer Contributions			Additional State Contributions			Total State Contributions		
	Without AVA Reset Scenario 2 (A)	*With* AVA Reset Scenario 3 (B)	Increase/ (Decrease) (C)	*Without* AVA Reset Scenario 2 (D)	*With* AVA Reset Scenario 3 (E)	Increase/ (Decrease) (F)	*Without* AVA Reset Scenario 2 (G)	*With* AVA Reset Scenario 3 (H)	Increase/ (Decrease) (I)
2023	252,270	219,696	(32,574)	68,475	35,150	(33,325)	320,745	254,846	(65,899)
2024	238,767	216,930	(21,837)	56,711	34,370	(22,341)	295,478	251,300	(44,178)
2025	225,906	215,235	(10,671)	45,032	34,115	(10,917)	270,938	249,350	(21,588)
2026	212,176	214,263	2,087	32,140	34,274	2,134	244,316	248,537	4,221
2027	211,877	213,994	2,117	32,476	34,641	2,165	244,353	248,635	4,282
2028	212,125	214,275	2,150	32,850	35,049	2,199	244,975	249,324	4,349
2029	213,130	215,444	2,314	33,667	36,034	2,367	246,797	251,478	4,681
2030	214,659	217,013	2,354	34,661	37,070	2,409	249,320	254,083	4,763
2031	216,926	219,324	2,398	35,852	38,306	2,454	252,778	257,630	4,852
2032	219,807	222,256	2,449	37,178	39,684	2,506	256,985	261,940	4,955
2033	223,104	225,608	2,504	38,563	41,125	2,562	261,667	266,733	5,066
2034	227,092	229,652	2,560	40,298	42,916	2,618	267,390	272,568	5,178
2035	231,254	233,872	2,618	41,812	44,490	2,678	273,066	278,362	5,296
2036	236,292	238,970	2,678	43,994	46,735	2,741	280,286	285,705	5,419
2037	241,426	244,166	2,740	46,097	48,901	2,804	287,523	293,067	5,544
2038	247,162	249,966	2,804	48,597	51,465	2,868	295,759	301,431	5,672
2039	253,196	256,066	2,870	50,894	53,830	2,936	304,090	309,896	5,806
Total	3,877,169	3,846,730	(30,439)	719,297	688,155	(31,142)	4,596,466	4,534,885	(61,581)

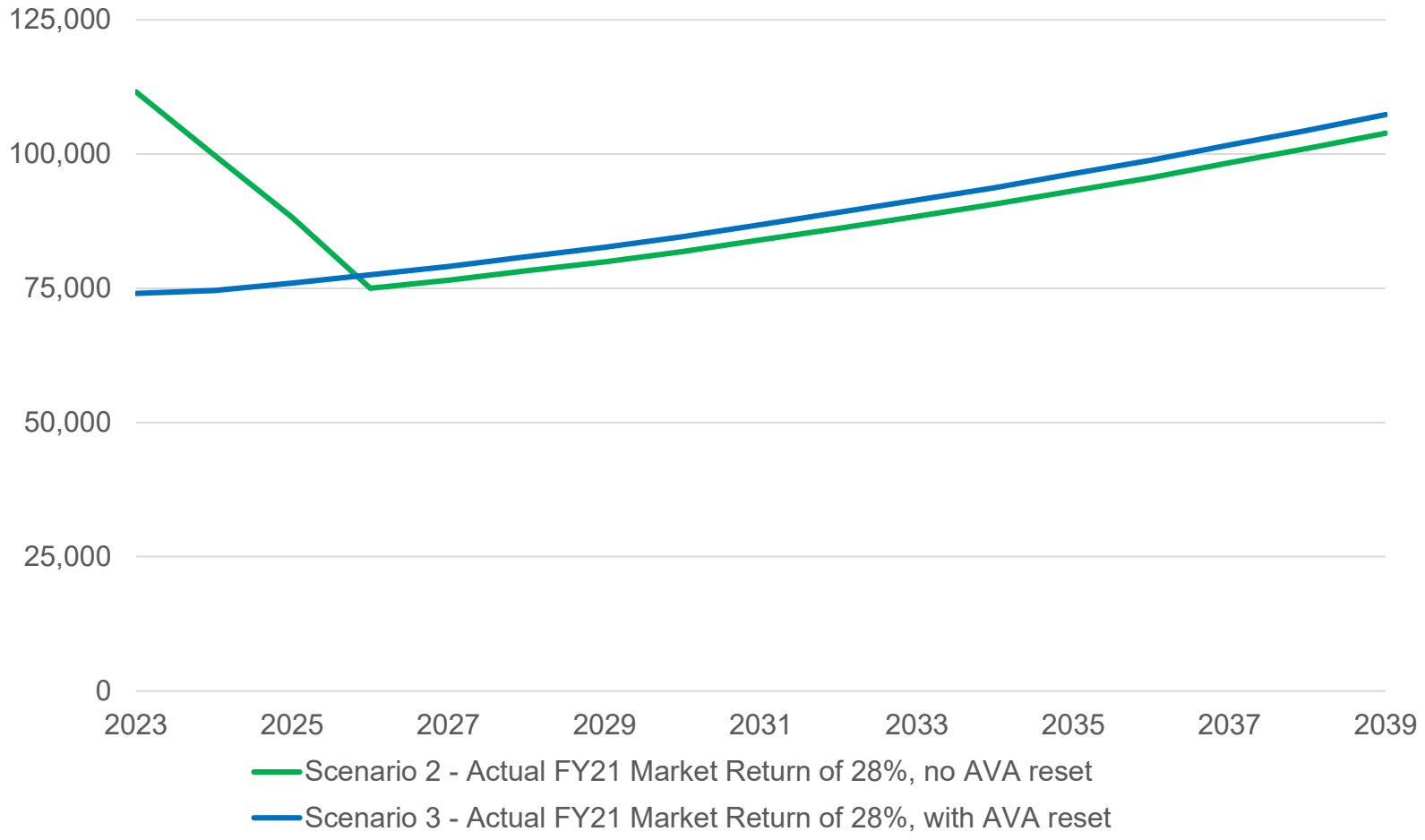
State Contribution Projections – TRS (ASC's)

Scenarios 2 and 3

Additional State Contributions – TRS

Scenarios 2 and 3 – Impact of AVA Reset

($000's)



Total projected contributions for FY23-FY39:

- Scenario 2 = $1.53B
- Scenario 3 = $1.50B
- Decrease = $33.3M

Additional State Contribution Summary – TRS

Scenarios 2 and 3 – Impact of AVA Reset

($000's)

Fiscal Year	Additional State Contributions		
	Without AVA Reset Scenario 2 (A)	*With* AVA Reset Scenario 3 (B)	Increase/ (Decrease) (C)
2023	111,560	74,046	(37,514)
2024	99,793	74,597	(25,196)
2025	88,186	75,964	(12,222)
2026	74,993	77,503	2,510
2027	76,519	79,067	2,548
2028	78,261	80,851	2,590
2029	79,897	82,615	2,718
2030	81,814	84,583	2,769
2031	84,028	86,851	2,823
2032	86,147	89,118	2,971
2033	88,376	91,411	3,035
2034	90,715	93,726	3,011
2035	93,157	96,330	3,173
2036	95,618	98,866	3,248
2037	98,381	101,706	3,325
2038	101,025	104,429	3,404
2039	103,880	107,366	3,486
Total	1,532,350	1,499,029	(33,321)

Actuarial Certification

Actuarial Certification

The purposes of this presentation are to illustrate for the ARMB Actuarial Committee the impact on the projected PERS/TRS State contributions for FY23-FY39 due to (i) FY21 asset returns, and (ii) resetting the Actuarial Value of Assets to Market Value of Assets as of June 30, 2021. The projections are based on the data, assumptions, methods and plan provisions described in the June 30, 2020 actuarial valuation reports, except as described herein. Preliminary June 30, 2021 asset statements were reflected in Scenarios 2 and 3 for PERS and TRS. All scenarios for PERS reflect SB 55 effective July 1, 2021.

Please see the June 30, 2020 actuarial valuation reports for a detailed description of (i) Buck's projection models which are the same ones used for this presentation (ASOP 56), and (ii) risk factors related to future funding of the plans (ASOP 51).

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and 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 results were prepared under the direction of David Kershner and Scott Young, both of whom meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice.

David Kershner
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Principal, Retirement

Scott Young
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Director, Health

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State of Alaska
Projected Funded Status as of June 30, 2021

Based on June 30, 2020 Valuations and Preliminary June 30, 2021 Asset Statements

($000's)	Actuarial Accrued Liability	Actuarial Value of Assets (AVA)	AVA Funded Ratio	Market Value of Assets (MVA)	MVA Funded Ratio
PERS					
• Pension	$ 15,580,788	$ 10,429,012	66.9%	$ 11,715,256	75.2%
• Healthcare	7,218,788	8,551,254	118.5%	9,621,514	133.3%
• Total	$ 22,799,576	$ 18,980,266	83.2%	$ 21,336,770	93.6%
TRS					
• Pension	$ 7,527,449	$ 5,888,765	78.2%	$ 6,619,715	87.9%
• Healthcare	2,560,350	3,257,672	127.2%	3,662,470	143.0%
• Total	$ 10,087,799	$ 9,146,437	90.7%	$ 10,282,185	101.9%

Notes:

1. FY21 investment return, contributions, subsidies, benefit payments, and administrative expenses are based on preliminary June 30, 2021 asset statements provided by the State.
2. Liabilities rolled-forward from June 30, 2020 to June 30, 2021 assuming no gains or losses.
3. Data, plan provisions, assumptions and methods are as described in the June 30, 2020 actuarial valuation reports, except as noted above.
4. The funded ratio may be appropriate for evaluating the need and level of future contributions, but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e., purchase annuities) for a portion or all of its liabilities.

PUBLIC COMMENT

Thursday, September 23, 2021

1. Elaine Schroeder
2. Doug Woodby
3. Diane Graham
4. Doug Gray
5. John Hudson

Friday, September 24, 2021

1. Jim Simard

Written Testimony Received by:

1. Jim Simard, regarding fossil fuel divestment
2. Barbara Mosier, in opposition to resetting to market value
3. Richard Waisanen, in opposition to resetting to market value
4. Patricia Stark, in opposition to resetting to market value