APFC ALASKA PERMANENT FUND CORPORATION

Board of Trustees

Annual Meeting

October 1-2, 2025

Table of Contents

APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
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ANNUAL MEETING OF THE BOARD OF TRUSTEES

Marriott Downtown
Skagway/Valdez Room
820 W 7th Avenue
Anchorage, AK 99501

Wednesday, October 1, 2025	Thursday, October 2, 2025
Time: 8:30 am – 12:15 pm	**Time: 8:30 am – 2:30 pm**
Day 1 Teams Webinar Access (Click here to join)	**Day 2 Teams Webinar Access (Click here to join)**

This will take you to a registration page and the link to join will be emailed to you. Due to a delay in receiving the email, please register in advance of the meeting to join on time.

Teleconference Option	*Teleconference Option*
Phone: 323-792-6284	Phone: 323-792-6284
Phone Conference ID: 881 503 704#	Phone Conference ID: 534 178 760#

Written comments can be sent to Trustees anytime at boardpubliccomment@apfc.org

AGENDA

WEDNESDAY, OCTOBER 1, 2025

08:30 a.m.	BOARD OF TRUSTEES ANNUAL MEETING CONVENES
	CALL TO ORDER
	ROLL CALL (Action)
	APPROVAL OF AGENDA (Action)
	OPPORTUNITY FOR PUBLIC PARTICIPATION
8:45 a.m.	CHIEF EXECUTIVE OFFICER'S REPORTS (Information/Standard Reports) Pending Board Matters, Trustee Education Report, Disclosure Report, Staff Summary Report, Staff Education & Training Report, HR Summary Report, Communications Report, Legislative Update, IT Update, Investment Referral Log, Financial Update, Financial Report, APFC Transfers, History & Projections, Investment Management Fee Report
9:30 a.m.	CHIEF INVESTMENT OFFICER REPORT (Information) Marcus Frampton, Chief Investment Officer
10:00 a.m.	RISK & COMPLIANCE OVERVIEW (Information) Sebastian Vadakumcherry, Chief Risk Officer
10:30 a.m.	*BREAK*
10:45 a.m.	INVESTMENT ADVISOR COMMENTS (Information) John Skjervem Janet Becker-Wold George Zinn

11:15 a.m.	ASSET ALLOCATION (Board Education & Information) Marcus Frampton, Chief Investment Officer Sebastian Vadakumcherry, Chief Risk Officer
12:15 p.m.	*RECESS FOR THE DAY*

Board of Trustees Group Photo – please remain on site for further instructions

THURSDAY, OCTOBER 2, 2025

8:30 a.m.	MEETING RECONVENES
8:35 a.m.	FUND PERFORMANCE (Board Education & Information) Greg Allen, Callan LLC Steve Center, Callan LLC
10:00 a.m.	PUBLIC MARKETS OVERVIEW (Board Education & Information) Jim Parise, Deputy CIO – Public Markets
10:30 a.m.	*BREAK*
10:45 a.m.	PRIVATE MARKETS OVERVIEW (Board Education & Information) Allen Waldrop, Deputy CIO – Private Markets
11:15 a.m.	ASSET CLASS UPDATE – PUBLIC EQUITIES (Board Education & Information) Fawad Razzaque, Director of Investments – Public Equities
12:15 p.m.	*LUNCH*
12:45 p.m.	INCENTIVE COMPENSATION DISCUSSION (Information) Shannon McCain, Director of Human Resources
1:15 p.m.	INVESTMENT ADVISOR COMMENTS (Information) Janet Becker-Wold John Skjervem
1:25 p.m.	ADDITIONAL OPPORTUNITY FOR PUBLIC PARTICIPATION
1:35 p.m.	ELECTION OF CORPORATE OFFICERS (Action) APPOINTMENT OF COMMITTEE ASSIGNMENTS
2:00 p.m.	OTHER MATTERS (Action) 2026 and 2027 Calendar of Board Meetings Deven Mitchell, Chief Executive Officer
2:15 p.m.	TRUSTEE COMMENTS FUTURE AGENDA ITEMS
2:30 p.m.	*ADJOURNMENT*

NOTE: TIMES MAY VARY AND THE CHAIR MAY REORDER AGENDA ITEMS
(Please telephone Jennifer Loesch at 907-796-1519 with agenda questions)

SUBJECT: Chief Executive Officer Report ACTION:

DATE: October 1, 2025 INFORMATION: X

BACKGROUND:

The CEO's report provides reports detailing Board matters, disclosures, staffing and budget updates, and financial reports.

STATUS:

Executive Director, Deven Mitchell, will present highlights from the following reports:

- Pending Board Matters
- Trustee Education Report
- Disclosure Report
- Staff Summary Report
- APFC Staff Education Training Report
- HR Summary Report
- Communications Report
- Legislative Update
- IT Update
- Investment Referral Log
- Financial Update
- Financial Report
- APFC Transfers
- APFC History and Projections
- Investment Management Fee Report

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SUBJECT: Pending Board Matters ACTION:

DATE: October 1, 2025 INFORMATION: __X__

BY	TASK	CAPTURED	TARGET	COMPLETED
Mitchell/McCain	Incentive Compensation Review	9/25	10/25	10/25
Mitchell/Frampton	Proxy Voting Review and Voting Audit	7/23 & 12/24	5/25 and 10/25	5/25 and 10/25
Mitchell	Update Compensation Structure	12/22 4/23	TBD	
Mitchell	Peer Group Definition	7/22	TBD	

SUBJECT: Trustee Education ACTION: _____

DATE: October 1, 2025 INFORMATION: _____X_____

BACKGROUND:

The Board of Trustees of the APFC has established a Trustee Education Policy with the following objectives:

- To ensure that the members of the Board have access to the knowledge and information necessary for them to fulfill their fiduciary duties as trustees of the Alaska Permanent Fund; and
- To assist them in becoming well informed in all matters pertaining generally to the management of a large institutional fund, both public and private, and more specifically to the management and investments of the APFC.

In accordance with the Trustee Education Policy, the following is a list of conferences and seminars that Trustees may wish to attend.

TRAINING OPPORTUNITY	TOPIC	LOCATION	DATES
Callan	2025 October Workshop 2026 National Conference *Please see page 70 of the Callan Presentation*	Chicago San Francisco Scottsdale	October 28, 2025 October 30, 2025 April 20, 2026
PPI	Asia Pacific Roundtable	Sydney	October 22-24, 2025

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Memo

To: Governance Committee

From: Deven Mitchell, Chief Executive Officer

Date: October 1, 2025

Re: Investment Disclosure Report

As required by AS 37.13.110(b) and Alaska Permanent Fund Corporation policy relating to personal investments conduct and reporting, trustees and staff must disclose certain financial interests. Below is a list of disclosures for transactions made by trustees and staff, covering initial, quarterly, and annual disclosures for reportable holdings as of June 30, 2025.

APFC Investment Policy Disclosures			
Name	**Position Title**	**Disclosure Type**	**Received**
Craig Richards	APFC Trustee	Quarterly	7/11/25
Adam Crum	APFC Trustee	Quarterly	7/16/25
Ryan Anderson	APFC Trustee	Quarterly	7/18/25
John Binkley	APFC Trustee	Quarterly	7/21/25
Ethan Schutt	APFC Trustee	Quarterly	7/30/25
Jason Brune	APFC Trustee	Quarterly	7/31/25
Marcus Frampton	Chief Investment Officer	Quarterly	7/13/25
Steven Gagliardo	Senior Associate	Quarterly	7/25/25
Mike Gumz	Credit Analyst	Quarterly	7/23/25
Lillie Haggard	Investment Analyst	Quarterly	7/22/25
Matthew Ives	Credit Analyst	Quarterly	7/22/25
Luke Kirkham	Investment Analyst	Quarterly	7/25/25
Roman Lajala	Investment Operations Analyst	Quarterly	7/22/25
Jordan Perletti	Portfolio Accountant	Quarterly	7/8/25
Eric Ritchie	Senior Portfolio Manager	Quarterly	7/22/25
Terek Rutherford	Investment Associate	Quarterly	7/25/25
Joe Shinn	Public Equity Analyst	Quarterly	7/30/25
Alex Smith	Investment Operations Manager	Quarterly	7/31/25
Allen Waldrop	Deputy CIO – Private Markets	Quarterly	7/3/25
Andre Peirovi	Intern - Investments	Initial	6/10/25

As a reminder, only subsequent new Reportable Investments made during the quarter must be disclosed by the thirtieth (30) day following the end of each quarter. For the purpose of clarity, acquiring additional shares or

selling shares of an already disclosed Reportable Investment does not need to be disclosed again as a quarterly investment.

All disclosures are under review as required per the APFC Investment Disclosure Policy. After review, disclosures are filed in the appropriate personnel file. Detailed records are kept on file and available upon request.

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Memo

To: Board of Trustees

From: Deven Mitchell
Chief Executive Officer

Date: October 1, 2025

Re: Travel, Training, and Diligence Summary Report

Background:

This report includes APFC staff completed travel in and due diligence numbers for the period April 1 –June 30, 2025. The travel report is presented to the Board of Trustees for review at each board meeting as required by APFC Resolution 04-10.

Due Diligence Summary:

Department	Number of Meetings Held	
	In Person	Telephonic/Virtual
Executives	19	37
Fixed Income	12	20
Public Equity	7	35
Private Income	15	86
Absolute Return	8	76
Real Estate	71	76
Private Equity	50	137
Total Fund Cash	1	44

Travel Summary:

Budget-to-Actual Report: July 1, 2024-June 30, 2025

CORPORATE OPERATIONS	BOARD-AUTHORIZED BUDGET	EXPENDITURES
Travel	$775,000	$501,767
Staff	$627,000	$417,667
Trustees	$18,000	$41,597
Moving/Non-Employee	$130,000	$42,502

Trip Summary – 4th Quarter – April 1 through June 30, 2025

TRAVELER	PURPOSE	DATES OF TRAVEL		LOCATION
Alexander	Annual General Meeting	4/5/25	4/11/25	Mumbai, India
Poag	Juneau Office Visit – New Trustee Orientation	4/6/25	4/9/25	Juneau
Binkley	New Trustee Orientation	4/7/25	4/11/25	Juneau
Razzaque	Due Diligence	4/7/25	4/11/25	San Francisco/Laguna Beach
Gagliardo	Manager Meetings	4/8/25	4/10/25	New York

Waldrop	Juneau Office Visit	4/14/25	4/18/25	Juneau
Alexander	Annual General Meeting	4/15/25	4/17/25	Toronto, Canada
Skuratovskaya	Manger Meetings	4/20/25	4/24/25	Washington DC
Gagliardo	Manager Meetings	4/20/25	4/25/25	London
Mitchell	ATAA/ANVCA Symposium	4/21/25	4/22/25	Anchorage
Adams	Juneau Office Visit	4/21/25	4/26/25	Juneau
Ungar	Annual General Meeting	4/22/25	4/24/25	Boston
Anderson	Callan Conference	4/25/25	4/30/25	Scottsdale, AZ
Balovich	Conference	4/25/25	4/30/25	Florida
Mitchell	Callan Conference	4/26/25	4/30/25	Scottsdale, AZ
Binkley	Callan Conference	4/26/25	5/1/25	Scottsdale, AZ
Frampton	Callan Conference	4/26/25	4/30/25	Scottsdale, AZ
Brune	Callan Conference	4/26/25	4/29/25	Scottsdale, AZ
Schutt	Callan Conference	4/27/25	4/29/25	Scottsdale, AZ
Richards	Callan Conference	4/27/25	4/29/25	Scottsdale, AZ
Vadakumcherry	Callan Conference	4/27/25	4/29/25	Scottsdale, AZ
Mertz	Callan Conference	4/27/25	4/29/25	Scottsdale, AZ
Waldrop	Callan Conference	4/27/25	4/29/25	Scottsdale, AZ
Haggard	Annual General Meeting	4/27/25	5/1/25	Washington DC
Rime	Property Inspections	4/27/25	5/2/25	Boston
Adams	Annual General Meeting	4/28/25	5/2/25	New York
Rutherford	Manager Meetings	4/28/25	4/30/25	Miami
Ungar	Due Diligence	4/28/25	5/1/25	Boston
Waldrop	Conference	5/4/25	5/7/25	Los Angeles
Adams	Quarterly Partnership Meetings	5/5/25	5/9/25	Washington DC, Virgina
Gagliardo	Annual General Meeting	5/5/25	5/11/25	Brooklyn, NY
Pollock	Annual General Meeting	5/12/25	5/16/25	Dallas Fort Worth
Ritchie	Manager Meetings	5/12/25	5/17/25	Dallas
Gumz	Conference	5/12/25	5/17/25	New York
Ungar	Annual General Meeting	5/12/25	5/16/25	Houston
Rutherford	Manager Meetings	5/12/25	5/13/25	Dallas
Loesch	Quarterly Board of Trustees Meeting	5/26/25	5/29/25	Sitka, AK
Balovich	Quarterly Board of Trustees Meeting	5/26/25	5/29/25	Sitka, AK
Crum	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Mitchell	Quarterly Board of Trustees Meeting	5/27/25	5/30/25	Sitka, AK
Vadakumcherry	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Schutt	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Richards	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Brune	Quarterly Board of Trustees Meeting	5/27/25	5/30/25	Sitka, AK
Anderson	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Mertz	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Frampton	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK

Alexander	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Parise	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Rutherford	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Poag	Quarterly BOT Meeting/Juneau Office Visit	5/27/25	5/30/25	Sitka/Juneau
Ritchie	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Swanson	Quarterly Board of Trustees Meeting	5/27/25	5/29/25	Sitka, AK
Thornsburry	Training	5/30/25	5/31/25	Anchorage
Rutherford	Annual General Meeting	6/1/25	6/5/25	New York
Adams	Conference	6/2/25	6/6/25	Chicago
Ritchie	Training	6/2/25	6/14/25	Chicago/Dallas
Adams	Property Inspections	6/8/25	6/13/25	Dallas
Rutherford	Annual General Meeting	6/9/25	6/11/25	New York
Adams	Property Inspections	6/17/25	6/18/25	Denver
Alexander	Annual General Meeting	6/22/25	6/25/25	Los Angeles
Rime	Property Inspections	6/23/25	6/27/25	Ontario/San Diego

ALASKA PERMANENT FUND CORPORATION

	EMPLOYEE	DEPT	TRAINING TYPE*	VENDOR	COURSE TITLE	CLASS HOURS	CITY	ST
1	Sarah Struble	Accounting	College Course	UAS	Intermediate Accounting I	3.0	Remote	
4	Cassie King	Accounting	CS	Pryor	Microsoft Excel Basics	7.0	Remote	

CS	- Conferences & Seminars
LT	- Local Training
OTT	- Out of Town Training
OL	- Online

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SUBJECT: Human Resources Report ACTION:

DATE: October 1, 2025 INFORMATION: X

Training & Development (FY26): Meetings with supervisors are underway to discuss professional development plans and assist in utilizing training budgets.

Intern Program Summer 2026: The Human Resources team is preparing for the APFC Internal and External Internship Program for the summer of 2026. We are working with APFC's external partners to finalize participation details. Outreach for both programs will include collaboration with Alaska high school counselors, in- and out-of-state colleges, student clubs, Alaska Native corporations, and government agencies to increase awareness and strengthen connections that support the success of APFC's internship program. Recruitment will begin in October 2025.

Recruitment and Hiring Activity: Since the May Board meeting, progress has been made in filling vacant roles. Brady Owen joined APFC as our new Risk Analyst on September 15, 2025 while the Private Equity Portfolio Manager has been filled by an internal promotion following OMB/GOV approval and the Administrative Operations Manager hire is still pending OMB/GOV approval.

Vacancy date	Dept	Section/ Asset Class	Title	Recruitment Status
5/8/2024	Investment	Fixed Income	Analyst (Global Rates)	Recruitment Closed: Interviewing applicants
7/8/2024	Investment	Private Income	Portfolio Manager	Recruitment Active: Candidates under review
10/12/2024	Investment	Private Equity	Portfolio Manager /Analyst	Vacant
2/20/2025	Investment	Public Equity	Portfolio Manager	Vacant
3/8/2025	Investment	Real Estate	Director of Investments - RE	Vacant
3/15/2025	Operations	Risk & Compliance	Risk Analyst	Hire made- Brady Owen start date 9/15/2025
4/17/2025	Operations	Admin Ops	Admin Ops Mgr / Admin Specialist	Hire made: pending OMB/Gov approval
4/23/2025	Operations	Middle Office	Investment Operations Analyst	Vacant
5/10/2025	Operations	Admin Ops	Chief Operating Officer	Vacant
6/9/2025	Operations	Risk & Compliance	Business Analyst	Vacant

Investments vacant	5
Operations vacant	3
Total Vacancy	**8**

APFC Turnover Rates - September 17, 2025				
Fiscal Year	Annual	Average Monthly	Operations Staff Turnover	Investments Staff Turnover
FY21	18.60%	1.50%	4	5
FY22	13.70%	1.10%	4	2
FY23	19.00%	1.60%	9	1
FY24	17.30%	1.40%	8	2
FY25	17.10%	1.40%	5	5
FY26 YTD	0	0	0	0

Headcount & Vacancies as of September 19, 2025			
Division	Total FTE	Filled FTE	Vacant FTE
Investments	32	27	5
Operations	35	32	3
Total FTE	67	59	8

SUBJECT: Communications Update ACTION:

DATE: 10/1/2025 INFORMATION: X

APFC Communications
As the investment manager of the Alaska Permanent Fund, APFC is accountable to many audiences: Alaskans, national partners, and global investors. We are committed to providing reliable, accurate information to meet each audience's unique needs while fostering trust, transparency, and accountability.

Communications Vision: to be a trusted voice in fostering transparency, engagement, and understanding of APFC's mission.

In-State Mission of Education & Awareness
Together with our Alaska-based partner, Yuit Communications, we aim to strengthen our education efforts and better support Alaskans' understanding.

Financial Focus on Institutional Investing
The coverage of APFC in respected financial publications enhances institutional investor credibility. It ensures accurate, high-quality information about the Fund and our team's stewardship reaches partners, policymakers, stakeholders, and the public.

Combining our local team's insight and our national partner's institutional investment fluency builds trust and credibility, elevating APFC's expertise while sharing Alaska's story.

Presentations, Interviews, Outreach
May 2025 – Sept 2025

- **Infrastructure Investor** with Ross Alexander on May 1
- **WSJ** interview with Allen Waldrop on May 5
- **Pensions & Investments** interview with Allen Waldrop on May 5
- **Bloomberg** interview with Allen Waldrop on May 6
- **City of Sitka Assembly** BOT meeting preview with Deven Mitchell on May 13
- **Pensions & Investments** Byline "5 things public fund investors should keep in mind in today's market," by Marus Frampton and Sebastian Vadakumcherry, published on May 19
- **CIO Magazine** interview with Deven Mitchell on May 27
- **City of Sitka Assembly** Fund overview with Chair Brune and Deven Mitchell on May 29
- **Northwest Territories Legislative Assembly** presentation with Deven Mitchell on June 11
- **Markets Group** interview with Marcus Frampton on June 18
- **WSJ** interview with Marcus Frampton on June 25
- **PitchBook News** interview with Allen Waldrop on July 1
- **Infrastructure Investor** Interview with Ross Alexander on July 11
- **Bloomberg** interview with Allen Waldrop on July 15
- **Odd Lots/Bloomberg** podcast with Deven Mitchell and Marcus Frampton aired on Aug 18
- **Financial Times** interview with Ross Alexander on Aug 8
- **IPE Infrastructure Investor** Survey with Ross Alexander on Aug 19
- **Financial Times** interview with Eric Ritchie on Sept 17
- **UAS Networking Dinner** with Deven Mitchell and Shannon McCain on Sept 17
- **Institute of the North** dialogue with Deven Mitchell on Sept 19

Comms Strategic Plan Alignment
In Q1 and Q2, emphasis is on APFC's role as an expert manager of Alaska's most valuable financial asset, reinforcing the importance of professional investment stewardship to deepen the recognition of the Fund as the state's largest source of unrestricted revenue. Efforts to advance thought leadership continue to align with our broader communications goals—positioning APFC as Alaska's primary revenue generator and a respected global leader in sovereign wealth management.

Statutory Publication: 2025 APFC Annual Report 49 Forward
The Annual Report is a key resource for Fund transparency. It fulfills a statutory requirement and provides audited financials and a summary of APFC's activities, governance, and investment performance.

For 49 years, the Fund has transformed resource wealth into a legacy of stability, opportunity, and shared prosperity for every generation. As we look ahead to its 50th year, we celebrate the vision, resilience, and enduring strength of Alaska, the 49th state. The 2025 Annual Report, "49 Forward," was published at the end of September, complemented by a webpage and media outreach.

Thought Leadership

People Behind the Fund
In collaboration with our Partners at Yuit, the "People Behind the Fund" campaign is anticipated to launch this fall ahead of the Fund's 50th anniversary, interviews were filmed on June 18 and Sept. 2. The series aims to build trust, and improve public understanding of the Fund and the work of APFC.

Speaker's Bureau
In anticipation of the 50th anniversary, a speaker's bureau will offer statewide opportunities to educate on key issues and provide foundational knowledge about Alaska's largest financial resource. The plan includes tailored messaging for diverse audiences in key communities, groups and sectors.

Statewide Opinion Pieces
Alongside key events, we will distribute statewide opinion pieces highlighting the release of the 2025 Annual Report, "49 Forward," the 2025 annual Board of Trustees meeting, the 50th anniversary of the Fund, and educational initiatives on the Fund's structure, "One Fund, Built for Generations."

Outreach and Education

APFC Insights
APFC Insights, an email newsletter, delivers the Fund's monthly financial statements, performance reports, and Board of Trustees meeting notices, informational content, and key publications or Corporation information. The aim is simple: give Alaskans timely, accurate data and context in one place, with direct links to full statements, releases, and Board materials.

May 2025 – Sept 2025:

- May 19: April Fund Values, Board Meeting and Q3 Performance
- June 23: May 2025 Fund Values, Inflation Proofing, 'Purpose-Driven Talent' in CIO Magazine
- July 1: The Key to a Stronger Fund: Diversification
- July 29: June 2025 Preliminary Fund Values
- Aug 27: APFC on "Odd Lots" Podcast and Upcoming Board Meeting on Sept. 4
- Sept 11: APFC FY-End and FY-Start Shifts, Monthly Fund Values for July 31, 2025
- Sept 17: Monthly Fund Values for August 2025
- Sept 25: 2025 Annual Report and Upcoming Board Meeting on October 1

AK Youth Education Program Delivery
The curriculum, "Alaska's Renewable Resource: the Alaska Permanent Fund, now includes corresponding teacher-training video series in addition to an established classroom-ready materials. New materials were printed for the 2025-2026 school year and include sturdier packaging and corresponding folder. As of the June 2025 quarterly report, ARE has reached over 16 districts, 51 communities and 1,065 students.

Organic Social Media
APFC's social media serves as a valued public education channel. Posts include consistent and relevant messaging about the Fund and Corporation, with Q1 and Q2 content mirroring the strategic priorities.

Website Update
As a trusted and reliable source of information, apfc.org will be updated to enhance the stakeholder experience, anticipated at the end of 2025.

Looking Forward

50th Anniversary of the Alaska Permanent Fund
The 50th Anniversary of the Fund presents a strategic opportunity to acknowledge the legacy and long-term impact of the Alaska Permanent Fund. We are currently planning activities to celebrate this milestone in November 2026 (Q2 of FY27). Our goal is to showcase APFC's global reputation and to enhance our efforts in broadening engagement and forming partnerships.

Together, we can celebrate the Fund's 50 years of growth and the benefits for all Alaskans. The Permanent Fund is Alaska's financial legacy; a model admired around the world.

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SUBJECT: Legislative Update ACTION:

DATE: 10/1/2025 INFORMATION: X

The 34th Alaska State Legislature's 2nd regular session will convene on January 20, 2026.

Looking ahead to the session, having alignment and focus on APFC's objectives lays the groundwork for future success.

The following legislative objectives have been identified based on past priorities:

- Acquire resources to enhance and sustain APFC's investment management capabilities
- Educate stakeholders to establish a solid foundation for informed policy decisions
- Monitor and respond to legislation that impacts the Fund and the Corporation
- Pursue Board Initiatives
    - Constitutional amendment for a single-fund endowment
    - Rules-based inflation proofing under the two-account structure
    - Executive Director Recruitment and Personnel Record Confidentiality legislation

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SUBJECT: APFC IT UPDATE ACTION:

DATE: October 1, 2025 INFORMATION: X

APFC IT UPDATE

- APFC IT is well into the implementation phase of Microsoft Copilot in partnership with our vendor. Our initial focus is on deploying general Copilot capabilities across the organization, while also developing more specialized, custom copilots designed to enhance automation and strengthen our analytics capabilities.

- APFC IT is underway in implementing an AI-OPS based security ecosystem across the corporation. This effort is focused on strengthening our ability to detect, respond to, and prevent threats through advanced automation and intelligence, ensuring a more resilient and adaptive security posture.

- Other projects of note: Windows 10 is end of life and APFC is targeting Windows 11 roll-out project in December with user training. CIS security auditing and penetration testing to begin in the fall.

- APFC IT is fully staffed.

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SUBJECT: Investment Referral Tracking Log – 4th Quarter FY25 ACTION:

DATE: October 1, 2025 INFORMATION: X

Referred from	via	Company	Date of referral	Action taken	Follow-up Date	Other Notes
Trustee Adam Crum	email	GTM Capital	3/9/25 (this should have been reported last quarter)	Forwarded to Marcus and Deven		Determined not to be a good fit
Trustee Adam Crum	email	CurvePoint Capital	5/23/25	Forwarded to Marcus & Deven, Marcus forwarded to Allen & Ross	5/29/2025	Ross to follow up directly

SUBJECT: FY25 Year-end Financial Update ACTION:

DATE: October 1, 2025 INFORMATION: X

KEY TAKEAWAYS:

- Total return for the fourth quarter of FY25 of 4.36%, bringing the return for the year to 9.35%. Total fund outperformed the performance benchmark by 6 basis points and underperformed the passive benchmark by 384 basis points for the year.
- Accounting net income year-to-date of $7.8 billion, a gain of $4.2 billion for the fourth quarter
- Realized (statutory) net income year-to-date of $5.9 billion, $1.7 billion for the fourth quarter
- Total market value as of June 30th of $85.1 billion, an increase of $4.6 billion for the year
- $3.7 billion transferred to the General Fund during the year in accordance with SB26; $857 million transferred in the fourth quarter
- $489 million of mineral deposits transferred during the fiscal year
- Committed Earnings Reserve balance of $3.8 billion for FY26 General Fund transfers

Overall, the portfolio gained $3.5 billion in value between the end of March and the end of June. All asset classes experience positive performance during the fourth quarter led by public equities and tactical opportunities at 9.5% and 9.0%, respectively.

Net assets increased by $4.6 billion year-to-date through June. This is a result of the net income of $7.8 billion and $489 million received in mineral royalty deposits offset by the FY25 POMV transfer to the General Fund in the amount of $3.7 billion. Corporate operating expenses and other appropriations for the year totaled $163 million.

The statutory net income for the year totaled $5.9 billion, strong relative to historical levels and to Callan's mid-point projection. In addition to nearly $2 billion in cash flow income, the biggest contributor to realized earnings was public equities with $1.3 billion in realized gains. The net realized earnings balance at the end of June was $6.4 billion, which was sufficient to cover the commitment for the FY27 General Fund transfer on July 1.

Three transfers totaling $857 million were made to the General Fund during the fourth quarter of FY25. This brings the total transfers for the year to $3.7 billion. Staff is in communication with the cash managers at the Department of Revenue to ensure that amounts designated for the General Fund remain invested in the Fund as long as possible, while being available to meet the liquidity needs of the State.

APFC ALASKA PERMANENT FUND CORPORATION

Financial Report
June 30, 2025

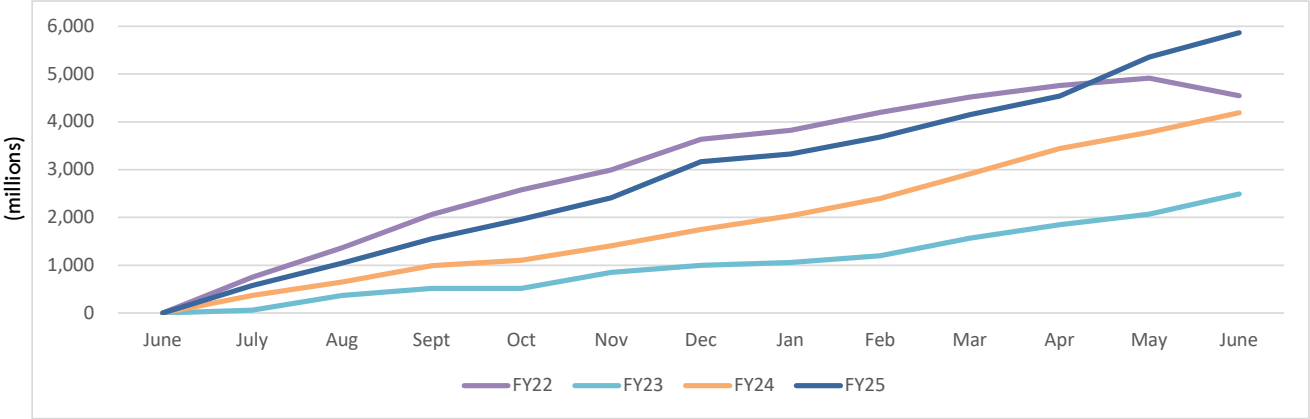
Fiscal Year 2025 Net Assets

Balances through June 30, 2025 *(in millions)*		
Total assets	$	86,040.7
Less liabilities		(940.9)
Net assets	$	85,099.8
Fund Balances:		
Non-spendable		
Permanent Fund corpus—contributions and appropriations		58,854.5
Not in spendable form—unrealized appreciation on invested assets		13,642.2
Total non-spendable fund balance	$	72,496.7
Committed		
General Fund Commitment		3,798.9
Current FY inflation proofing		-
Current FY Alaska Capital Income Fund		-
Committed fund balance	$	3,798.9
Assigned for future appropriations		
Realized earnings		6,432.6
Unrealized appreciation on invested assets		2,371.6
Total assigned fund balance		8,804.2
Total fund balances	$	85,099.8

Fiscal Year 2025 Income

For the twelve months ending June 30, 2025 *(in millions)*		
Statutory (Realized) Net Income		
Interest, dividends, real estate, and other income	$	1,997.0
Realized gains on the sale of invested assets		4,063.1
Less operating expenses/legislative appropriations		(163.0)
Less Alaska Capital Income Fund committed realized earnings		(31.3)
Statutory net income	$	5,865.8
GAAP (Accounting) Net Income		
Statutory net income	$	5,865.8
Unrealized gain on invested assets		1,939.8
Alaska Capital Income Fund committed realized earnings		31.3
Accounting net income	$	7,836.9

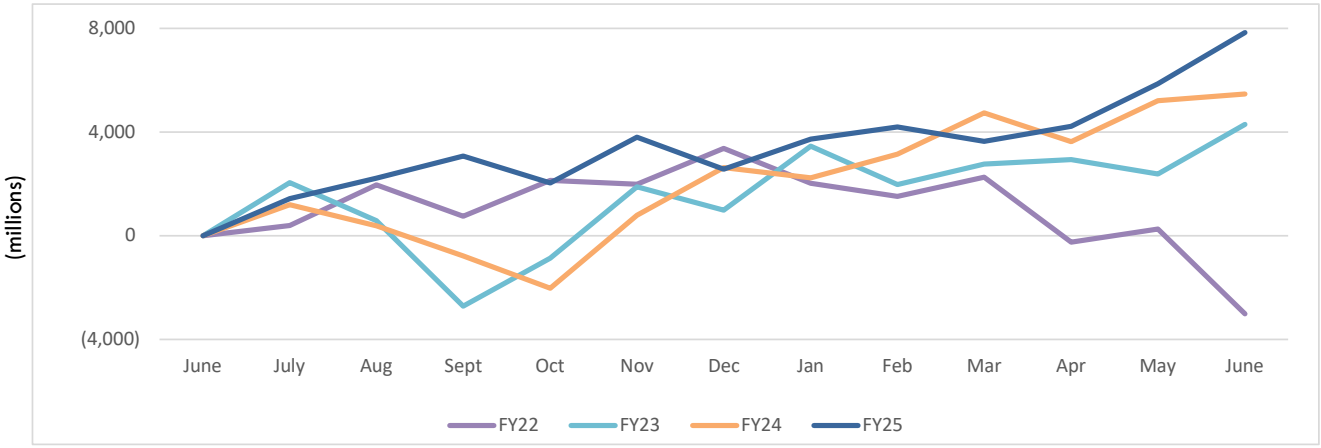
Statutory Net Income, Fiscal Years 2022 - 2025



• Comprised of receipts from interest on fixed income, real estate rentals, stock dividends, and all realized gains and losses on the sales of invested assets, less AK Capital Income Fund committed amounts and operating expenses.

• FY22 statutory net income was $4,543.6 million.
• FY23 statutory net income was $2,491.1 million.
• FY24 statutory net income was $4,195.5 million.
• FY25 statutory net income was $5,865.8 million.

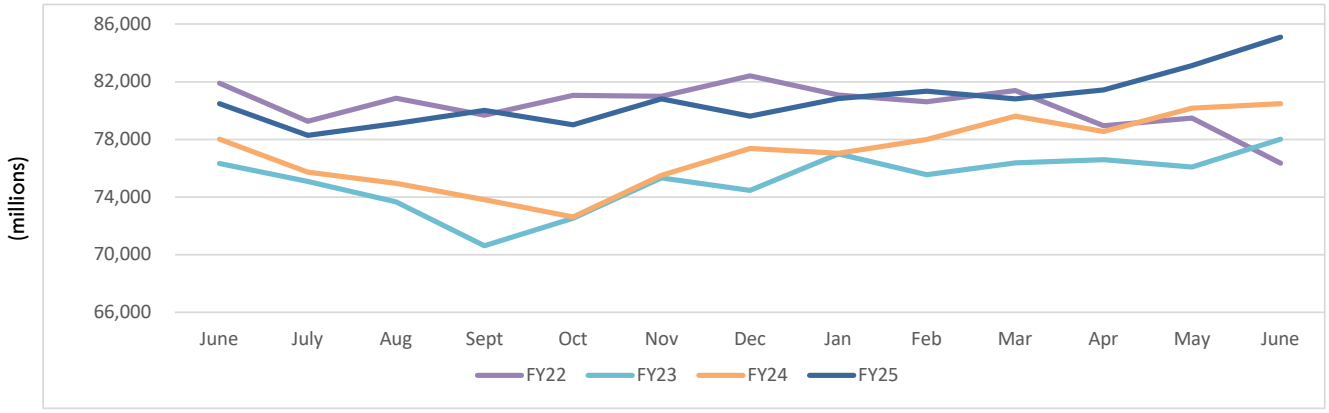
GAAP Accounting Net Income, Fiscal Years 2022 - 2025



• Accounting net income is the same as statutory net income, except it includes unrealized gains and losses.

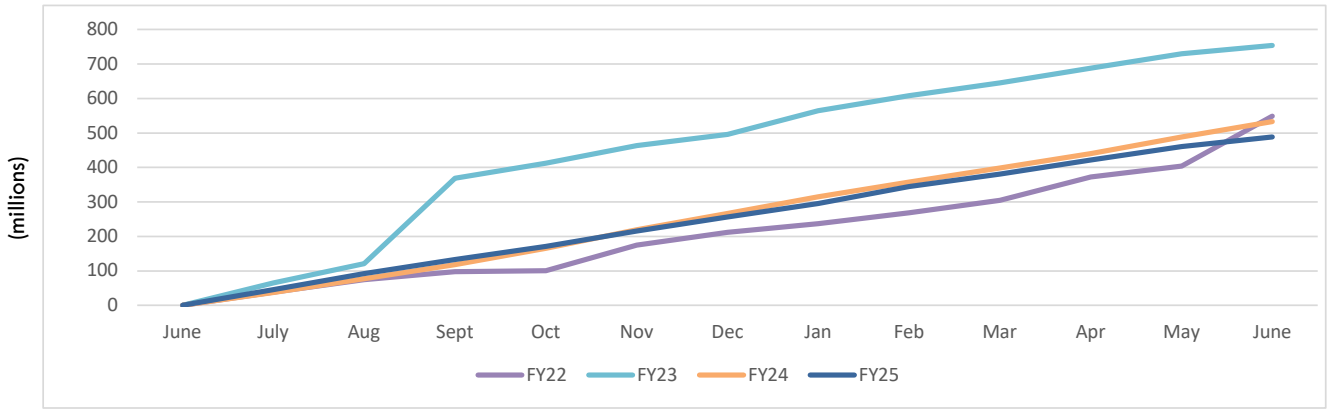
• Accounting net loss for FY22 was $3,015.2 million.
• Accounting net income for FY23 was $4,295.9 million.
• Accounting net income for FY24 was $5,467.9 million.
• Accounting net income for FY25 was $7,836.9 million.

Market Value of Fund Net Assets, Fiscal Years 2022 - 2025



- FY22 net assets as of June 2022 were $76.3 billion, a decrease of $5.6 billion over the FY21 ending balance.
- FY23 net assets as of June 2023 were $78 billion, an increase of $1.7 billion over the FY22 ending balance.
- FY24 net assets as of June 2024 were $80.5 billion, an increase of $2.5 billion from the FY23 ending balance.
- FY25 net assets as of June 2025 were $85.1 billion, an increase of $4.6 billion from the FY24 ending balance.

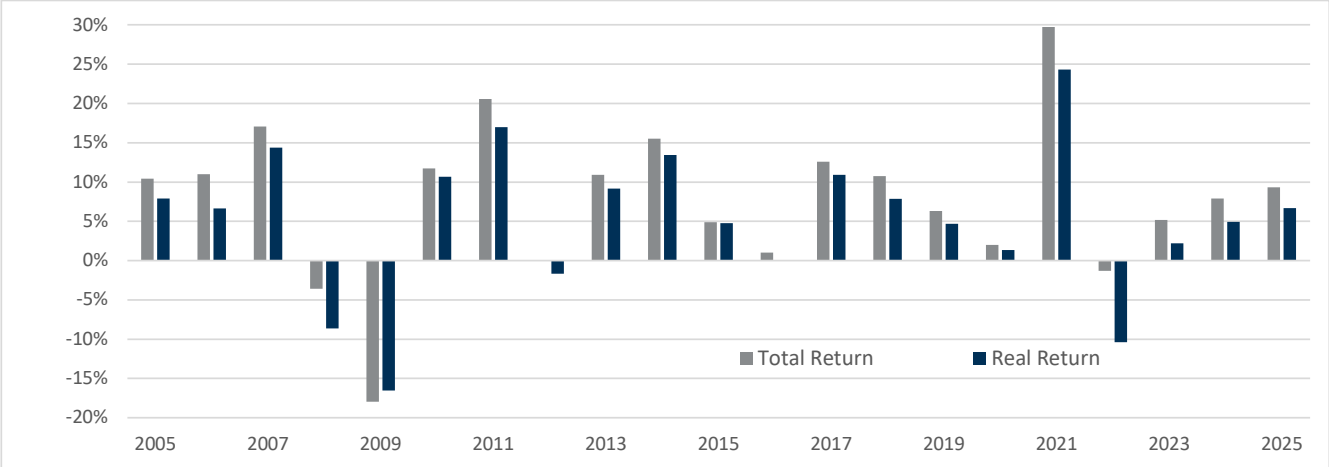
Dedicated Mineral Revenues, Fiscal Years 2022 - 2025



- FY22 mineral revenue was $548.9 million.
- FY23 mineral revenue was $753.6 million.
- FY24 mineral revenue was $532.6 million.
- FY25 mineral revenue was $488.7 million.

Alaska Permanent Fund Historical Returns, Fiscal Years 2005 - 2025

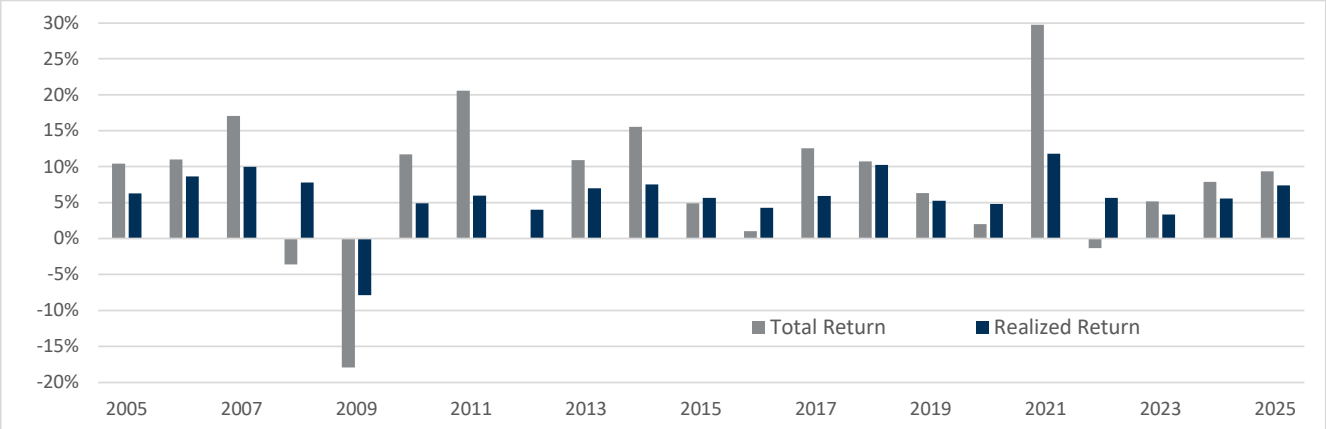
Total return minus inflation equals real return



- Total return annualized over 41 years is 8.8%
- Real return annualized over 41 years is 6%

Alaska Permanent Fund Historical Returns, Fiscal Years 2005 - 2025

Total return minus unrealized gains/losses equals realized return



- Total return annualized over 41 years is 8.8%
- Realized return annualized over 41 years is 7.34%

APFC ALASKA PERMANENT FUND CORPORATION

Board of Trustees - APFC Transfers - April 1, 2025 through June 30, 2025

Type of Transfer	April	May	June	Total
Public Equities	698,905,549	(1,401,059,935)	(859,524)	(703,013,910)
Fixed Income	(400,729,163)	401,860,162	278,274,785	279,405,784
Private Equity & Special Opportunities	(2,148,351)	(48,755,822)	(124,978,941)	(175,883,113)
Real Estate	4,250,163	(36,149,134)	1,647,474	(30,251,497)
Private Income	(92,861,088)	(16,849,548)	(46,220,406)	(155,931,042)
Absolute Return	(179,427,752)	(1,499,808)	(1,098,789)	(182,026,348)
Tactical Opportunities	(219,958,041)	-	10,294,500	(209,663,542)
Total Fund Cash	(90,964,068)	829,706,242	(344,023,951)	394,718,222
Net Transfers	**(282,932,750)**	**(272,747,844)**	**(226,964,853)**	**(782,645,447)**

APFC ALASKA PERMANENT FUND CORPORATION

Board of Trustees - APFC Transfers - April 2025

Description	Total Fund Cash	Public Equities	Fixed Income	Pvt. Equity & Spec. Opps.	Real Estate	Private Income	Absolute Return	Tactical Opportunities	Net
State of Alaska & Administrative									
Mineral revenue	41,518,188								**41,518,188**
AIM STIF interest	1,393,794								**1,393,794**
Commission recapture proceeds	12,221								**12,221**
Class action proceeds	20,285								**20,285**
General Fund Transfer	(300,000,000)								**(300,000,000)**
AMHT Draw	(16,199,300)								**(16,199,300)**
Corporate expenses	(9,677,938)								**(9,677,938)**
Public Equities									
APF Tactical Tilts	(699,148,716)	699,148,716							-
APF Tactical Tilts Cash	(851,284)	851,284							-
Public EQ Securities Lending	1,094,451	(1,094,451)							-
Fixed Income									
APF China Bond Market	34,223,516		(34,223,516)						-
APF Dom Struc Prod	50,000,000		(50,000,000)						-
APF FI Cash	16,211,641		(16,211,641)						-
APF FI Overlay	(2,411,641)		2,411,641						-
APF FI Plus Holding	136,079		(136,079)						-
APF Global Rates	215,776,484		(215,776,484)						-
APF Global Rates Cash	(13,800,000)		13,800,000						-
APF TBA Collateral	544,135		(544,135)						-
APF US AGG	100,000,000		(100,000,000)						-
FI Securities Lending	37,376		(37,376)						-
Oaktree High Yield Fixed Income	11,573		(11,573)						-
Private Equity & Special Opportunities									
Private Equity distributions	108,952,149			(108,952,149)					-
Private Equity capital calls	(110,215,894)			110,215,894					-
Special Opportunities distributions	22,437,252			(22,437,252)					-
Special Opportunities capital calls	(19,025,157)			19,025,157					-
Real Estate									
Direct Real Estate distributions	8,010,738				(8,010,738)				-
Direct Real Estate capital calls	(13,068,573)				13,068,573				-
Real Estate Funds distributions	807,672				(807,672)				-
Private Income									
Infrastructure distributions	11,414,717					(11,414,717)			-
Infrastructure capital calls	(21,281,427)					21,281,427			-
Private Credit distributions	64,342,631					(64,342,631)			-
Private Credit capital calls	(12,541,451)					12,541,451			-
Private Income distributions	53,926,618					(53,926,618)			-
Private Income capital calls	(3,000,000)					3,000,000			-
Absolute Return									
Absolute Return distributions	191,239,737						(191,239,737)		-
Absolute Return capital calls	(11,811,985)						11,811,985		-
Tactical Opportunities									
APF Tactical Opps Public	226,579,288							(226,579,288)	-
APF Tactical Opps Private	(6,621,246)							6,621,246	-
Net Transfers	**(90,964,068)**	**698,905,549**	**(400,729,163)**	**(2,148,351)**	**4,250,163**	**(92,861,088)**	**(179,427,752)**	**(219,958,041)**	**(282,932,750)**

APFC ALASKA PERMANENT FUND CORPORATION

Board of Trustees - APFC Transfers - May 2025

Description	Total Fund Cash	Public Equities	Fixed Income	Pvt. Equity & Spec. Opps.	Real Estate	Private Income	Absolute Return	Net
State of Alaska & Administrative								
Mineral revenue	40,894,522							**40,894,522**
AIM STIF interest	2,810,501							**2,810,501**
Commission recapture proceeds	1,382							**1,382**
Class action proceeds	7,612							**7,612**
PCE Contribution	329,820							**329,820**
General Fund Transfer	(300,000,000)							**(300,000,000)**
Corporate expenses	(16,791,681)							**(16,791,681)**
Public Equities								
Acadian Asset Management	300,000,000	(300,000,000)						-
APF Tactical Tilts	1,625,965,835	(1,625,965,835)						-
APF Tactical Tilts Cash	18,222,920	(18,222,920)						-
APF US Tactical Tilt	300,027,229	(300,027,229)						-
DFA Intl LC	300,000,000	(300,000,000)						-
DFA Intl Small Cap Value	100,000,000	(100,000,000)						-
DFA Value EM	200,000,000	(200,000,000)						-
LSV Intl EQ	400,000,000	(400,000,000)						-
Mellon MSCI World Ex-US	(925,000,000)	925,000,000						-
Mellon R3000	(100,000,000)	100,000,000						-
Mellon S&P 500	(50,000,000)	50,000,000						-
Public EQ Securities Lending	1,059,935	(1,059,935)						-
Schroders Intl EQ	300,000,000	(300,000,000)						-
SSGA Domestic EQ	5,784,016	(5,784,016)						-
SSGA EM	(175,000,000)	175,000,000						-
SSGA MSCI ACWI IMI	(900,000,000)	900,000,000						-
Fixed Income								
APF China Bond Market	2,619,671		(2,619,671)					-
APF Dom Struc Prod	(100,000,000)		100,000,000					-
APF FI Cash	(126,185,531)		126,185,531					-
APF FI Overlay	(3,814,469)		3,814,469					-
APF Global Rates	(2,619,671)		2,619,671					-
APF HY Corporate	(170,000,000)		170,000,000					-
APF TBA Collateral	(1,909,595)		1,909,595					-
FI Securities Lending	48,287		(48,287)					-
Ninety One EMD BL	153		(153)					-
PGIM EMD BL	993		(993)					-
Private Equity & Special Opportunities								
Private Equity distributions	91,589,508			(91,589,508)				-
Private Equity capital calls	(50,943,433)			50,943,433				-
Special Opportunities distributions	10,144,337			(10,144,337)				-
Special Opportunities capital calls	(2,034,590)			2,034,590				-
Real Estate								
Direct Real Estate distributions	35,966,353				(35,966,353)			-
Direct Real Estate capital calls	(7,388,165)				7,388,165			-
Real Estate Funds distributions	7,570,946				(7,570,946)			-
Private Income								
Infrastructure distributions	51,285,977					(51,285,977)		-
Infrastructure capital calls	(43,528,288)					43,528,288		-
Private Credit distributions	26,734,063					(26,734,063)		-
Private Credit capital calls	(25,219,082)					25,219,082		-
Private Income distributions	7,576,878					(7,576,878)		-
Absolute Return								
Absolute Return distributions	1,499,808						(1,499,808)	-
Net Transfers	**829,706,242**	**(1,401,059,935)**	**401,860,162**	**(48,755,822)**	**(36,149,134)**	**(16,849,548)**	**(1,499,808)**	**(272,747,844)**

APFC ALASKA PERMANENT FUND CORPORATION

Board of Trustees - APFC Transfers - June 2025

Description	Total Fund Cash	Public Equities	Fixed Income	Pvt. Equity & Spec. Opps.	Real Estate	Private Income	Absolute Return	Tactical Opportunities	Net
State of Alaska & Administrative									
Mineral revenue	33,332,473								**33,332,473**
AIM STIF interest	3,078,903								**3,078,903**
Commission recapture proceeds	11,077								**11,077**
AMHT Contribution	1,800,000								**1,800,000**
General Fund Transfer	(257,263,378)								**(257,263,378)**
PCE Draw	(5,694,800)								**(5,694,800)**
Corporate expenses	(2,229,128)								**(2,229,128)**
Public Equities									
ACI US Value Yield	(50,000,000)	50,000,000							-
APF Equity Overlay	(9,384,998)	9,384,998							-
APF Global EQ	123,846,857	(123,846,857)							-
APF Global LV	11,825,742	(11,825,742)							-
APF Global LV Value	11,500,783	(11,500,783)							-
APF Intl LV	12,118,396	(12,118,396)							-
APF Intl LV Value	12,672,531	(12,672,531)							-
APF SPDR Low Vol	4,306,120	(4,306,120)							-
APF SPDR Momentum	807,470	(807,470)							-
APF SPDR Yield	6,651,867	(6,651,867)							-
APF Tactical Tilts	1,752,587,077	(1,752,587,077)							-
APF Tactical Tilts Cash	2,270,730	(2,270,730)							-
APF US Tactical Tilt	670,797,423	(670,797,423)							-
CastleArk Growth LC	(100,000,000)	100,000,000							-
Domestic Transition	277	(277)							-
DSM Growth LC	(250,000,000)	250,000,000							-
Eagle Asset Management, Inc.	(90,000,000)	90,000,000							-
Jennison Associates LLC	(90,000,000)	90,000,000							-
Mellon MSCI World Ex-US	165,000,000	(165,000,000)							-
Mellon R1000V	(200,000,000)	200,000,000							-
Public EQ Securities Lending	859,247	(859,247)							-
Pzena Investment Management LLC	(90,000,000)	90,000,000							-
RBC Asset Management, Inc.	(90,000,000)	90,000,000							-
SSGA EM	110,000,000	(110,000,000)							-
SSGA LC	(250,000,000)	250,000,000							-
SSGA MSCI ACWI IMI	(1,175,000,000)	1,175,000,000							-
SSGA R1000 Low Vol	(50,000,000)	50,000,000							-
SSGA R1000V Low Vol	(100,000,000)	100,000,000							-
T. Rowe Price Value SC	(90,000,000)	90,000,000							-
Voya LC	(250,000,000)	250,000,000							-
Fixed Income									
APF China Bond Market	(29,186,843)		29,186,843						-
APF FI Cash	1,809,623		(1,809,623)						-
APF FI Overlay	(1,809,623)		1,809,623						-
APF FI Plus Holding	30,843		(30,843)						-
APF Global Rates	(120,813,157)		120,813,157						-
APF IG Corporate Bonds	(30,000,000)		30,000,000						-
APF TBA Collateral	1,648,114		(1,648,114)						-
APF US AGG	(100,000,000)		100,000,000						-
FI Securities Lending	34,636		(34,636)						-
Oaktree High Yield Fixed Income	11,622		(11,622)						-
Private Equity & Special Opportunities									
Private Equity distributions	179,321,388			(179,321,388)					-
Private Equity capital calls	(85,023,043)			85,023,043					-
Special Opportunities distributions	43,335,197			(43,335,197)					-
Special Opportunities capital calls	(12,654,600)			12,654,600					-
Real Estate									
Direct Real Estate distributions	11,983,794				(11,983,794)				-
Direct Real Estate capital calls	(9,946,123)				9,946,123				-
Real Estate Funds distributions	3,453,286				(3,453,286)				-
Real Estate Funds capital calls	(7,138,431)				7,138,431				-
Private Income									
Infrastructure distributions	94,276,494					(94,276,494)			-
Infrastructure capital calls	(67,734,087)					67,734,087			-
Private Credit distributions	40,556,163					(40,556,163)			-
Private Credit capital calls	(28,540,240)					28,540,240			-
Private Income distributions	18,333,262					(18,333,262)			-
Private Income capital calls	(10,671,185)					10,671,185			-
Absolute Return									
Absolute Return distributions	1,098,789						(1,098,789)		-
Tactical Opportunities									
APF Tactical Opps Private	(10,294,500)							10,294,500	-
Net Transfers	**(344,023,951)**	**(859,524)**	**278,274,785**	**(124,978,941)**	**1,647,474**	**(46,220,406)**	**(1,098,789)**	**10,294,500**	**(226,964,853)**

APFC ALASKA PERMANENT FUND CORPORATION

ALASKA PERMANENT FUND
FUND FINANCIAL HISTORY & PROJECTIONS
as of June 30, 2025

Projections extend ten years, and are based on best available information ($ in millions)

	Nonspendable Fund Balance - Principal						Assigned Fund Balance - Earnings Reserve								TOTAL FUND	
								Distributions								
FY	FY-Begin Contrib. Balance	Dedicated [1] State Revenues	Inflation Proofing & Special Approp.	FY-End Balance Contributions	Unrealized Gain (Loss) FY-End Balance	FY-End Non-spendable Balance	Statutory Net Income	Div/POMV [5] Transfer [7]	Inflation [7] Prfg & Spec Approp.	ACIF [7]	Committed	FY-End Balance Realized	Unrealized Gain (Loss) FY-End Balance	FY-End Assigned Balance	FY	FY-End Balance
77-16	0	16,173	23,275	39,448	4,750	44,198	51,912	23,699	19,977	555		7,649	921	8,571	77-16	52,769
17	39,448	365	0 [4]	39,813	7,155	46,968	3,214	0	0 [4]	25		10,863	1,952	12,816	17	59,784
18	39,813	353	0 [4]	40,166	5,863	46,030	6,324	726	0 [4]	43	2,723	13,738	2,403	18,864	18	64,894
19	40,166	385	989	41,541	6,278	47,820	3,305	2,723	989	22	5,933	10,121	2,426	18,482	19	66,300
20	41,541	319	4,758 [6]	46,618	5,789	52,407	3,106	2,933	4,758 [6]	21	3,091	8,378	1,424	12,894	20	65,302
21	46,618	320	0 [4]	46,938	13,810	60,748	7,962	3,091	0 [4]	50	7,069	9,271	4,807	21,148	21	81,897
22	46,938	549	4,000 [4] [6]	51,487	8,700	60,187	4,544	3,069	4,000 [4] [6]	24	3,361	10,454	2,334	16,150	22	76,337
23	51,487	754	4,179	56,420	11,100	67,520	2,491	3,361	4,179	14	3,526	5,240	1,725	10,491	23	78,012
24	56,420	533	1,413	58,366	12,373	70,739	4,195	3,526	1,413	24	3,657	4,366	1,701	9,724	24	80,463
25	**58,366**	**489**	**0 [4]**	**58,855**	**13,642**	**72,497**	**5,866**	**3,657**	**0 [4]**	**31**	**3,799**	**6,432**	**2,372**	**12,603**	**25**	**85,100**
26	58,855	386	0 [4]	59,241	14,416	73,657	4,941	3,799	0 [4]	27	3,997	7,376	2,768	14,142	26	87,799
27	59,241	419	1,491	61,151	15,588	76,740	5,098	3,997	1,491	27	4,056	6,927	2,800	13,783	27	90,522
28	61,151	450	1,540	63,141	16,798	79,939	5,260	4,056	1,540	27	4,198	6,449	2,832	13,479	28	93,418
29	63,141	467	1,590	65,198	18,062	83,260	5,429	4,198	1,590	27	4,352	5,936	2,850	13,138	29	96,398
30	65,198	485	1,642	67,325	19,384	86,709	5,604	4,352	1,642	27	4,511	5,386	2,850	12,748	30	99,457
31	67,325	535	1,697	69,557	20,770	90,327	5,783	4,511	1,697	27	4,655	4,818	2,829	12,302	31	102,629
32	69,557	581	1,753	71,891	22,215	94,106	5,971	4,655	1,753	27	4,803	4,233	2,792	11,828	32	105,934
33	71,891	619	1,813	74,324	23,721	98,044	6,165	4,803	1,813	27	4,957	3,628	2,740	11,326	33	109,370
34	74,324	631	1,874	76,828	25,289	102,117	6,367	4,957	1,874	27	5,117	3,004	2,673	10,795	34	112,912
Cumulative Totals Proj. for FY25-FY34		**5,062**	**13,400**				**56,483**	**42,984**	**13,400**	**270**						

Assumptions:	Total Return	- Inflation =	Total Real Return	Statutory Return
FY25 [2]	9.35%	2.95%	6.40%	7.38%
FY25-FY34 [3]	7.65%	2.50%	5.15%	6.25%

Notes related to financial history and projections:

[1] Dedicated State Revenues in current and future fiscal years are based on the Spring 2025 Department of Revenue forecast.

[2] Current year returns are based on 2024 Callan capital market assumptions. The inflation amount is as appropriated.

[3] Future returns are based on 2024 Callan capital market assumptions and median expected returns (the mid case). Actual results will vary.

[4] There was no appropriation for inflation proofing in FY16, FY17, FY18, FY21, FY22 and FY26. An amount less than the statutory amount was appropriated in FY24 and FY25.

[5] Per AS 37.13.140, beginning in FY19, transfers are based on a percent of market value (POMV) calculation and are to the General Fund. In previous years, transfers were based on an earnings calculation and were to the Dividend Fund.

[6] In FY20 and FY22, an additional $4 billion was appropriated from the ERA to principal.

[7] All transfers out of the Earnings Reserve are subject to Legislative appropriation.

FY25 POMV Distribution (actual) [7]

Ending Fund Value (ex Am Hess)	
FY23	$ 77,587.5
FY22	75,912.8
FY21	81,472.8
FY20	64,877.8
FY19	65,876.1
Average	$ 73,145.4
Statutory Distribution	$ 3,657.3

FY25 Statutory Dividend Transfer (actual) [7]

Statutory Net Income	
FY24	$ 4,195.0
FY23	2,491.0
FY22	4,544.0
FY21	7,962.0
FY20	3,106.0
Avail for Dist (21%)	$ 4,682.6
Statutory Trnsfr Amt	$ 2,341.3

FY26 POMV Distribution (actual) [7]

Ending Fund Value (ex Am Hess)	
FY24	$ 80,038.5
FY23	77,587.5
FY22	75,912.8
FY21	81,472.8
FY20	64,877.8
Average	$ 75,977.9
Statutory Distribution	$ 3,798.9

FY26 Statutory Dividend Transfer (projected) [7]

Statutory Net Income	
FY25	$ 5,865.8
FY24	4,195.0
FY23	2,491.0
FY22	4,544.0
FY21	7,962.0
Avail for Dist (21%)	$ 5,262.1
Statutory Trnsfr Amt	$ 2,631.1

Income Year-to-Date as of June 30, 2025

FY25 YTD Statutory Net Income

Interest, dividends, real estate & other income	$ 1,997.0
Realized gains (losses) on the sale of assets	4,063.1
Less operating expenses	(163.0)
Less AK Capital Income Fund realized earnings	(31.3)
	$ 5,865.8

FY25 YTD Accounting (GAAP) Net Income

Statutory net income (loss)	$ 5,865.8
Unrealized gains (losses) on invested assets	1,939.8
AK Capital Income Fund realized earnings	31.3
Accounting (GAAP) net income (loss)	$ 7,836.9

APFC ALASKA PERMANENT FUND CORPORATION

FY 2025 Fees & Expenses by Funding Source*

Report Date	**June 30, 2025**
Total Fund Balance	**86,844,476,000**
FYTD Change in Total Fund Balance (Net of Transfers)	**8,001,733,000**

Investment Management Fees

	Paid from Investments	Paid from Investment Management Allocation	Paid from Operations Allocation	Total	Basis Points
Public Equity	2,136,000	54,243,000	2,336,000	58,715,000	**7**
Fixed Income	0	4,336,000	7,532,000	11,868,000	**1**
Absolute Return	108,095,000	849,000	1,016,000	109,960,000	**13**
Private Equity & Special Opps	149,939,000	31,167,000	5,759,000	186,865,000	**22**
Private Income	81,488,000	3,418,000	2,419,000	87,325,000	**10**
Real Estate	54,892,000	5,419,000	4,538,000	64,849,000	**7**
Total Investment Management Fees	**396,550,000**	**99,432,000**	**23,600,000**	**519,582,000**	
Basis Points	**46**	**11**	**3**	**60**	

Profit Sharing/Performance

	Paid from Investments	Paid from Investment Management Allocation	Paid from Operations Allocation	Total	Basis Points
Public Equity	0	32,822,000	0	32,822,000	**4**
Absolute Return	111,851,000	0	0	111,851,000	**13**
Private Equity & Special Opps	184,295,000	0	0	184,295,000	**21**
Private Income	41,895,000	0	0	41,895,000	**5**
Real Estate	267,000	0	0	267,000	**0**
Total Profit Sharing/Performance	**338,308,000**	**32,822,000**	**0**	**371,130,000**	
Basis Points	**39**	**4**	**0**	**43**	

* All amounts presented, including fund balances and change net of transfers, are in USD and consist of APF, AMHT, and PCE combined.

SUBJECT: Chief Investment Officer's Report ACTION: _____

DATE: October 1, 2025 INFORMATION: X

BACKGROUND:

The Chief Investment Officer's report provides an overview of Fund performance, asset allocation, proxy voting, investment actions taken during the quarter, and other current topics in the Investment Department.

STATUS:

Marcus Frampton, CIO, will present on the topics described above.

APFC ALASKA PERMANENT FUND CORPORATION

CIO Report

October 1, 2025

Investment Department Current Topics

- Performance
- Asset Allocation
- Proxy Voting Review
- Appendix: Investment Actions

Recent Performance & Benchmarks

Performance Summary as of June 2025

	2025 Fiscal Year	3-Year Annualized	5-Year Annualized	10-Year Annualized	41.5-Year Annualized
Fund Return	9.35%	7.46%	9.73%	8.08%	8.74%
Performance Benchmark	9.29%	8.22%	9.49%	7.80%	8.83%
APFC (Under)/Out-Performance	*0.06%*	*(0.76%)*	*0.24%*	*0.28%*	*(0.09%)*
Passive Benchmark	13.19%	11.27%	8.60%	6.91%	N/A
APFC (Under)/Out-Performance	*(3.84%)*	*(3.81%)*	*1.13%*	*1.17%*	
Return Objective (CPI + 5%)	7.67%	7.87%	9.59%	8.06%	7.83%
APFC (Under)/Out-Performance	*1.68%*	*(0.41%)*	*0.14%*	*0.02%*	*0.91%*

Performance Benchmark

- What APFC portfolio managers manage against day-to-day; benchmark weights for asset classes equal to target asset allocation (32% global equities, 20% fixed income, 18% private equity, 11% real estate 10% private income, 7% absolute return, etc.)
- Investible benchmarks for public markets, universe of peers for private markets
- **APFC has outperformed FY 2025, 5-year, and 10-year time periods as of June 2025**

Passive Benchmark

- A benchmark portfolio that is investible "with the click of a mouse" – 60% global equities, 20% fixed income, 10% REIT's, 10% TIP's
- **APFC has outperformed on 5-year and 10-year time periods as of June 2025**

Return Objective (CPI + 5%)

- APFC's asset allocation targets, informed by third party consultant's capital market forecasts, are intended to build a portfolio that can deliver expected returns consistent with the return objective of CPI + 5%
- **APFC has outperformed on FY 2025, 5-year, 10-year, and inception-to-date time periods as of June 2025**

What Benchmarks Tell Us

Return Objective

Did APFC's asset allocation (with a lesser contribution from execution / implementation) achieve CPI +5?

Passive Benchmark

Over market cycles, does the complexity of APFC private markets and alternatives add value versus a "click-of-the-mouse" portfolio of liquid indices?

Performance Benchmark

Over any given time period, did APFC's execution and implementation add or subtract value versus broad industry averages for assigned asset classes?

Incentive Compensation KPIs

- APFC's incentive compensation program is 100% based on performance-benchmark-beating results with a blend of total fund and asset class performance depending on position.

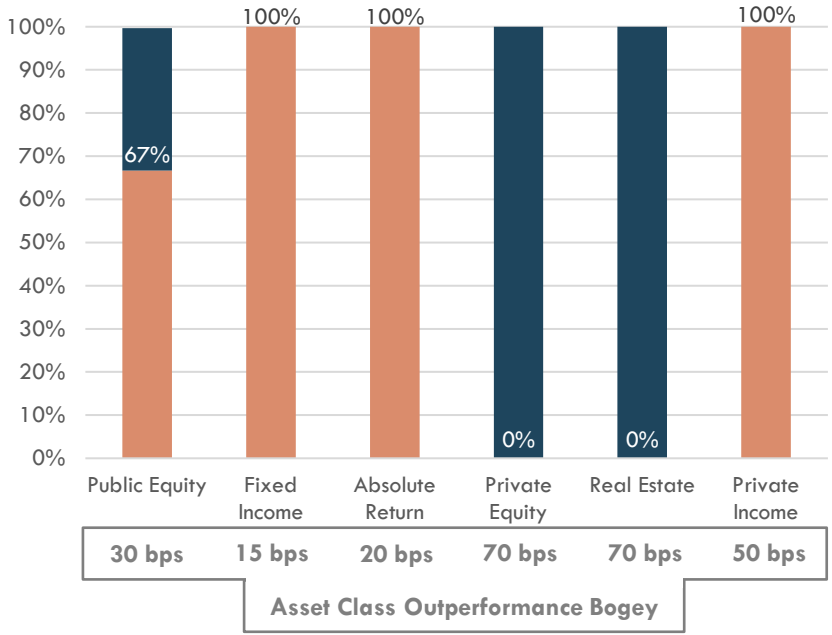
- For all positions, 80% is based on either 5-year numbers or employee tenure, whichever is shorter, with 20% based on 1-year results.

- Payouts range from 25–50% of salary for investment personnel and 5–15% for non-investment personnel.

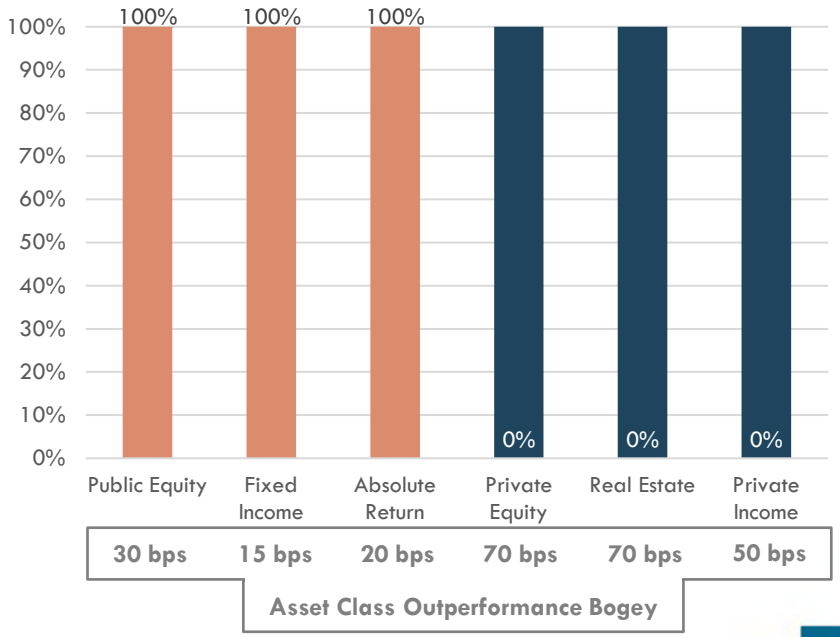
- For FY 2025, 15% of the 40-bps total fund performance bogey was earned for 1-year performance and 60% was earned for 5-year performance.

Asset Class Incentive Comp. KPIs

One-Year Performance Hurdle



Five-Year Performance Hurdle

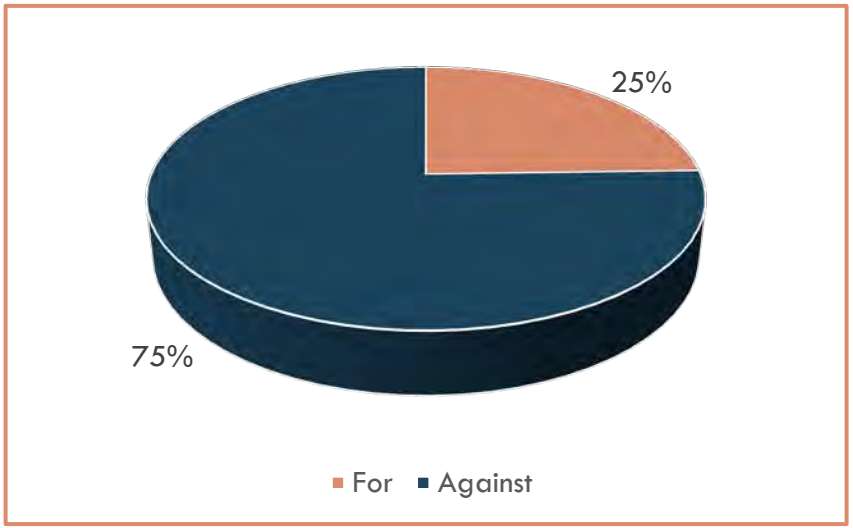


Public Equity Proxy Voting Review

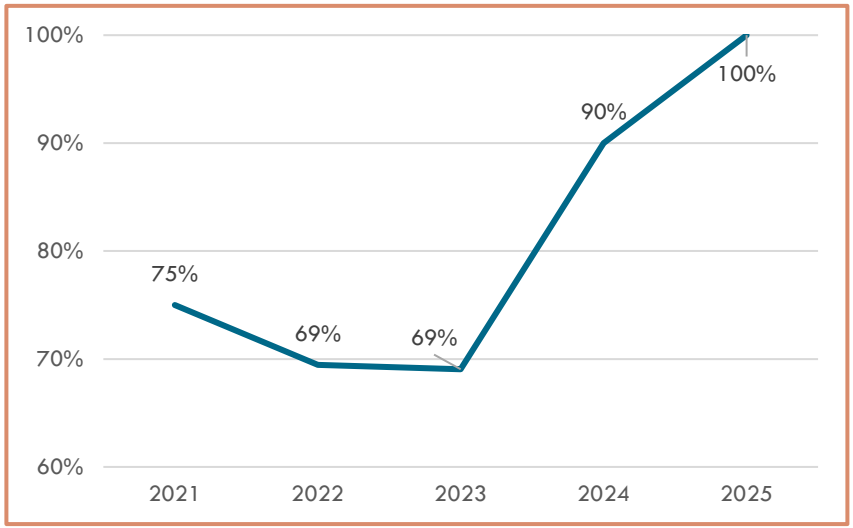
- At the Board's request, Staff conducted an RFP for a consultant to do a "quick review" check on proxy voting of APFC's equity managers with respect to ESG matters
- 14 domestic managers were surveyed about the proxy votes they cast for environmental and social proposals from 37 companies
  - The survey reviewed 65 shareholder proposals spanning 2021–2025, most of which ended up failing to pass
- In 75% of the votes in question, APFC equity managers voted against the ESG matter being proposed (100% in 2025 proxy matters reviewed)
- APFC's clear and consistent expectations and guidance to our equity managers is stated in the Investment Policy Statement and in all manager IMA's:
  - "Whether externally or internally managed, all proxy voting on behalf of shares held by the Fund shall be conducted to maximize the risk adjusted return of the Fund as prescribed in Alaska Statute 37.13.120."
- APFC staff has no reason to believe that our managers are not voting proxies as directed using their judgement governed by their fiduciary duties to the Fund
- Nonetheless, Staff intends to follow up in certain cases to better understand the proxy voting policies of managers reviewed

Public Equity Proxy Voting Review

2021–2025 Proxy Votes Cast on Social and Environmental Proposals



Proxy Votes Cast Against Social and Environmental Proposals by Year



Appendix – Investment Actions

October 2025

Investment Actions
Quarter-to-Date Ending September 30, 2025

Public Equity

During the quarter, Staff took the following investment actions:

- July 2nd: Redeemed **$750 million** from a Public Equity account and transferred the amount to Total Fund Cash
- August 7th: Redeemed **$200 million** from a Public Equity account and transferred the amount to Total Fund Cash
- August 18th: Redeemed **$500 million** from Public Equity accounts and transferred the amount to Total Fund Cash

July 2nd:

Redemption from	Amount
SSGA MSCI ACWI IMI	-$750 million

August 7th:

Redemption from	Amount
SSGA MSCI ACWI IMI	-$200 million

August 18th:

Redemption from	Amount
SSGA MSCI ACWI IMI	-$200 million
Arrowstreet Global Equity	-$100 million
Schroders International EQ	-$70 million
LSV International EQ	-$70 million
DFA Value – EM	-$30 million
DFA Small Cap – EM	-$30 million

Redemption of **$500 million**

Investment Actions (continued)
Quarter-to-Date Ending September 30, 2025

Private Equity

Commitments:

- **$100 million** to financial services co-investment
- **$75 million** to energy buyout CV
- **$100 million** to VC and growth side car co-investment
- **$35 million** to technology venture co-investment
- **$50 million** to US middle market buyout fund
- **$8 million** to environmental services buyout co-investment
- **$15 million** to healthcare buyout co-investment

Commitment Total: $383 million

Real Estate

- **$5 million** to secured debt investment – industrial
- **$6 million** to secured debt investment – residential
- **$25 million** to European realty fund investment
- **$90 million** from retail portfolio fund disposition
- **$242 million** from REIT redemption

- **Investment Action Total: $368 million**

Investment Actions (continued)
Quarter-to-Date Ending September 30, 2025

Private Income & Infrastructure

Commitments:

- **$75 million** to lower middle market direct lending fund

Absolute Return

- **$50 million** redemption from multi-strategy hedge fund
- **$20 million** redemption from multi-strategy hedge fund
- **$20 million** redemption from long-short hedge fund
- **$34 million** redemption from multi-strategy hedge fund
- **$9 million** redemption from multi-strategy hedge fund
- **$105 million** redemption from global macro hedge fund
- **$25 million** redemption from multi-strategy, market-neutral hedge fund
- **$50 million** sale of gold
- **$9 million** subscription to global macro hedge fund
- **$50 million** subscription to long-short credit hedge fund

Investment Action Total: $372 million

APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT: Risk & Compliance Overview ACTION: ____

DATE: October 1, 2025 INFORMATION: ___X_

BACKGROUND:

The Risk & Compliance Report provides an overview of historical and forward-looking measures of risk for the Total Fund and its underlying asset classes. The report also includes a summary of the compliance monitoring activity.

STATUS:
The current report contains the following parts:

- **Part-1 [Information]:** covers the main measures of risk for the Fund. Aggregate fund risk compared to approved risk appetite is a key strategic metric. Others include Value at Risk (VaR) on a standalone and relative-to-benchmark basis, tracking error, statistics that measure realized volatility and Sharpe ratios, asset class and factor contributions to risk and risk scenarios. It also covers Geographic, Currency, and Liquidity risks for the Total Fund.

- **Part-2 [Information]:** includes a summary of the compliance monitoring activity as of the 2025 June 30 quarter end.

APFC ALASKA PERMANENT FUND CORPORATION

Risk & Compliance Overview

October 1st, 2025

Part 1:

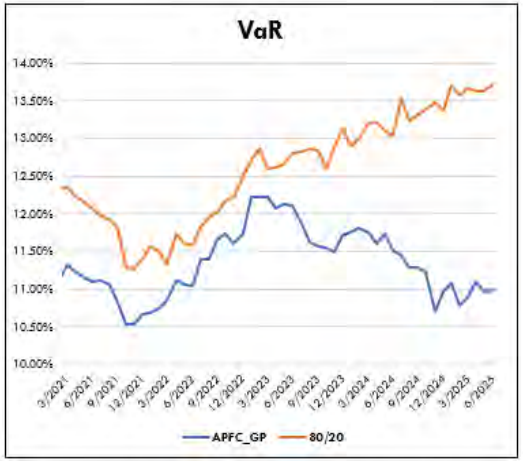
Key Risk Metrics
as of June 30, 2025

Fund Risk: relative to approved risk appetite

Risk appetite reflects the 80/20 equity/bond Risk Tolerance Portfolio (RTP)

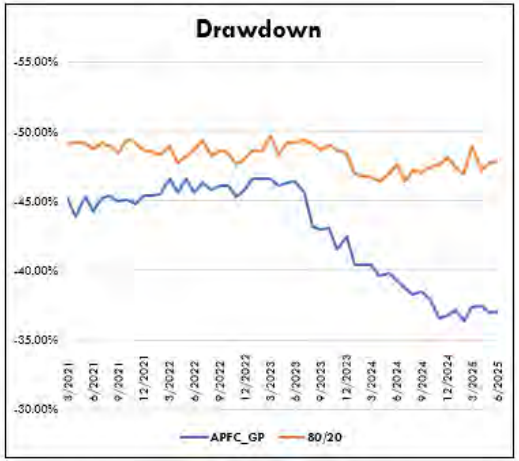
Value at Risk (VaR): Max
1 year, 1SD, 10-year monthly historical data equally weighted

As of Date	Total Fund	Risk Appetite	
6/30/2025	10.99%	13.72%	✓



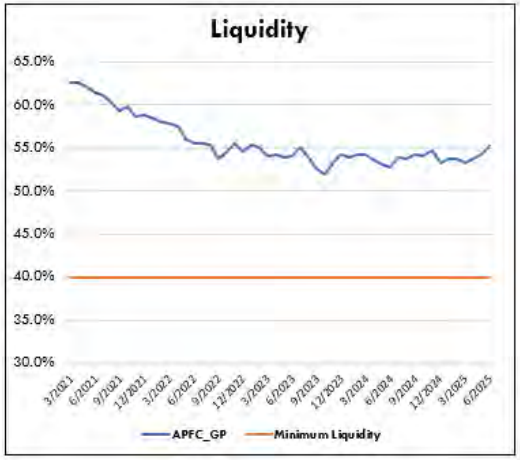
Drawdown Stress PnL: Max
Stress scenario simulating the GFC – Dec 2007 to Mar 2009

As of Date	Total Fund	Risk Appetite	
6/30/2025	(37.03%)	(47.93%)	✓



Liquidity Level: Min
Public Equities, Fixed Income and Cash, as a % of total fund

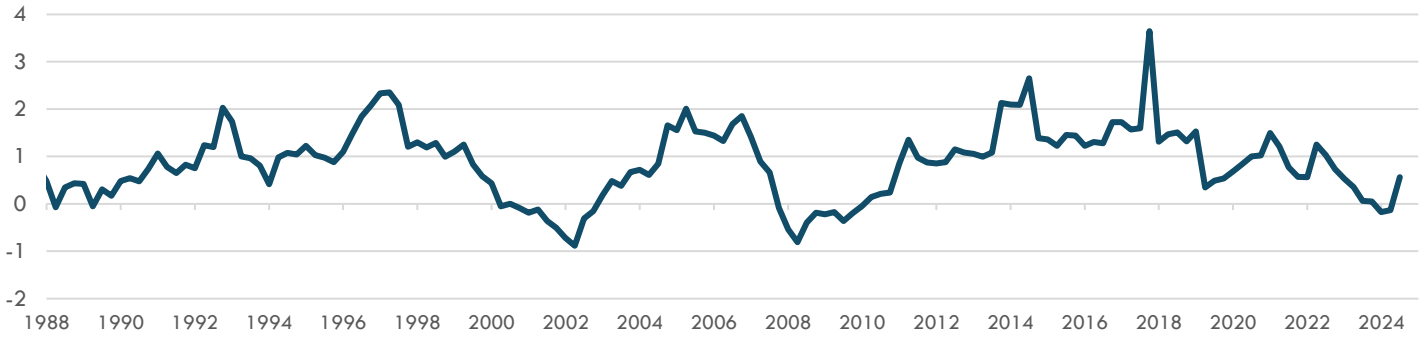
As of Date	Total Fund	Risk Appetite	
6/30/2025	55.2%	40%	✓



Total Fund: realized volatility & Sharpe ratio

Realized Fund Volatility

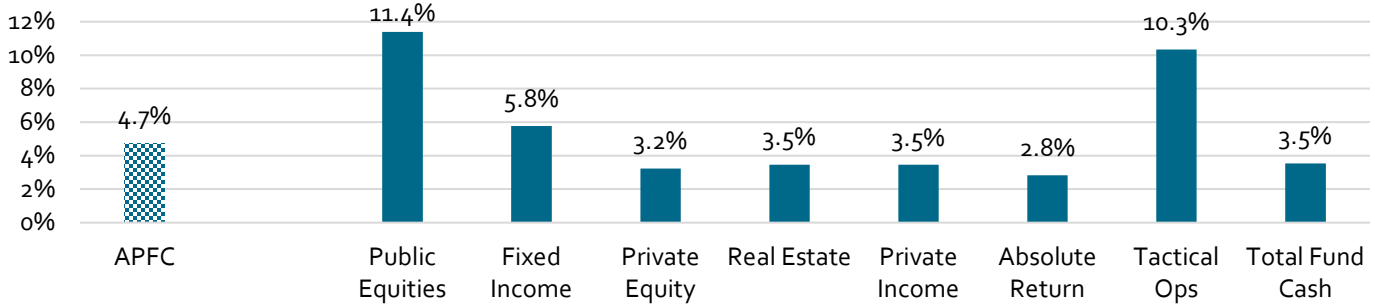
Realized Fund Sharpe Ratio



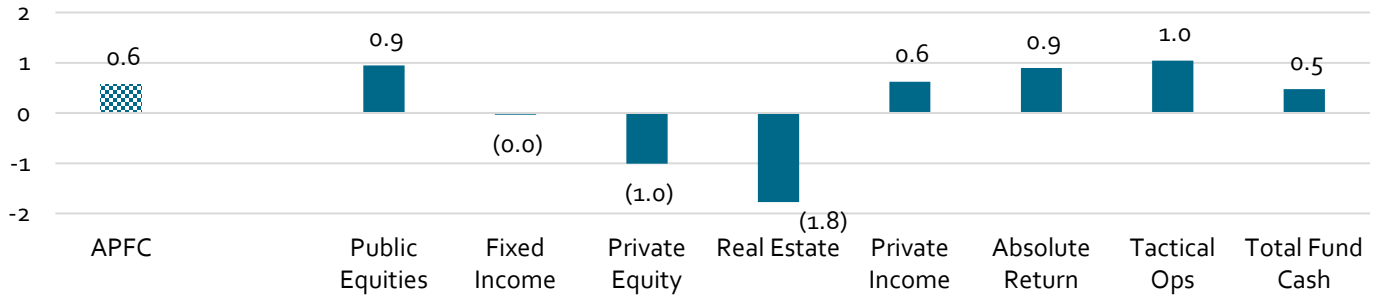
Volatility (standard deviation) and Sharpe ratio have been computed based on rolling 3 year quarterly returns for the Total Fund

Fund & Constituents: realized volatility & Sharpe ratio

Volatility

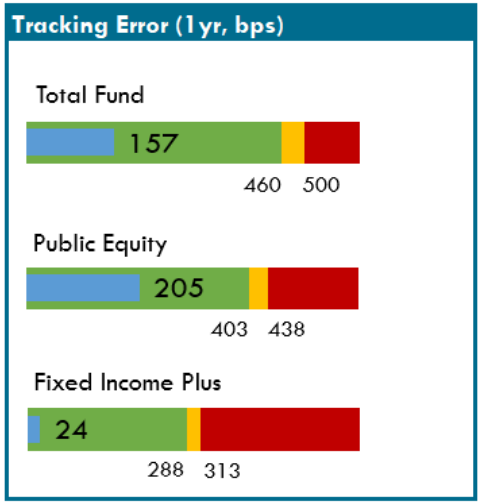


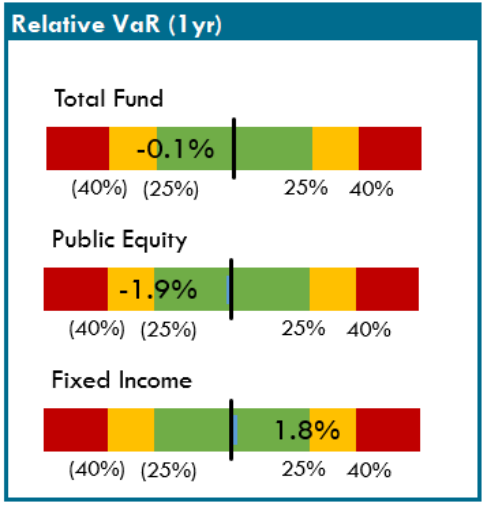
Sharpe Ratio



Volatility (standard deviation) and Sharpe Ratio have been computed based on historical 3 year quarterly returns

Tracking Error and VaR vs. Limits





- Tracking error is an indicator of performance relative to benchmark
- It represents the deviation of portfolio returns from benchmark returns
- It is directionally agnostic and does not indicate over or underperformance

- VaR is an estimate of value decline, based on a 97.5% confidence level and 1 year holding period
- The above chart reflects the Relative VaR of the portfolio versus respective benchmark

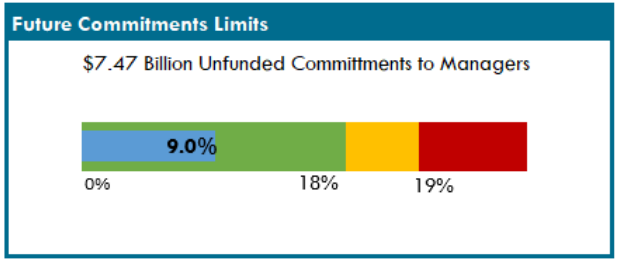
Liquidity Limits: Private Assets

Private Assets: Investments Vs Targets

	$ Billion	% of Total Fund		
		Actual	Target	Actual (Vs) Target
Private Equity	14.8	17.8%	18.0%	-0.2%
Private Income	7.4	8.9%	10.0%	-1.1%
Real Estate	9.6	11.6%	11.0%	0.6%
Tactical Ops	0.8	0.9%	1.0%	-0.1%
Total	**32.5**	**39.1%**	**40.0%**	

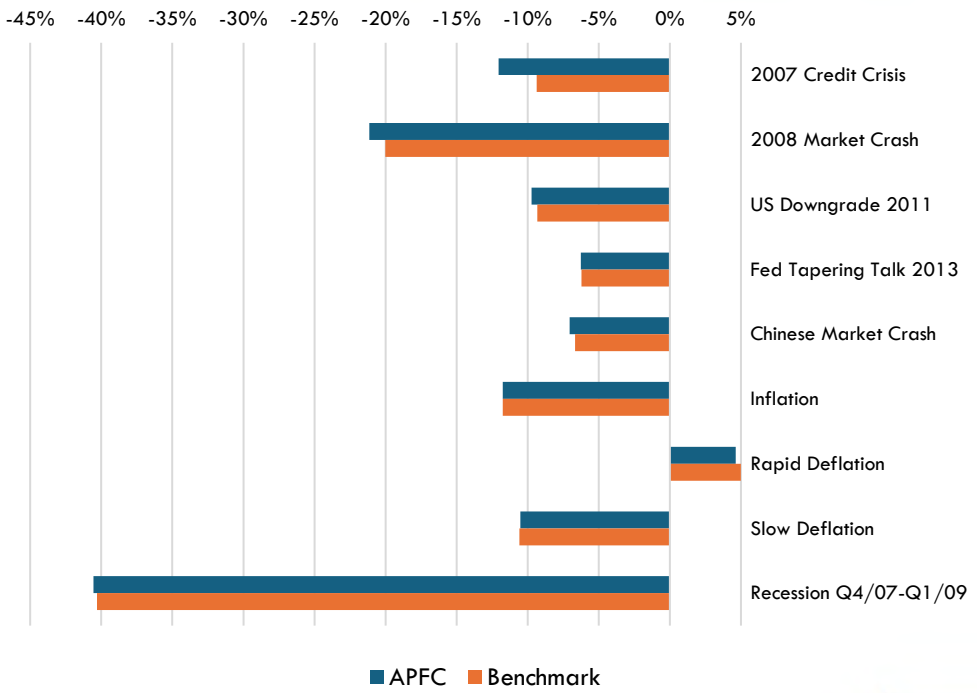
Private Assets: Future Commitments Vs Targets

	$ Billion	% of Total Fund		
		Actual	Target	Actual (Vs) Target
Private Equity	4.3	5.2%	7.0%	-1.8%
Private Income	2.9	3.4%	5.0%	-1.6%
Real Estate	0.3	0.4%	3.0%	-2.6%
Tactical Ops	0.0	0.0%	0.5%	-0.5%
Total	**7.47**	**9.0%**	**15.5%**	



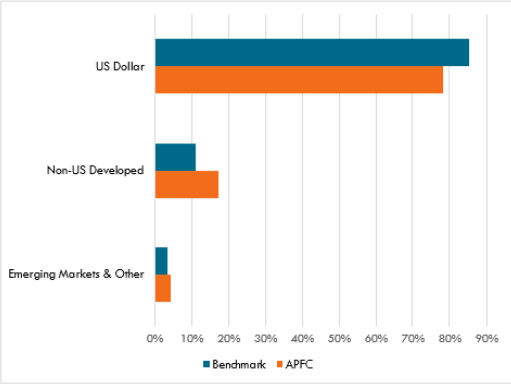
Tail Risk: Current portfolio during extreme events

Scenario	Definition
2007 Credit Crisis	Credit & liquidity crisis stemming from a severe slowdown in the housing market causing significant widening of credit spreads, higher implied volatility.
2008 Market Crash	S&P 500 down 20% (2000 bps).
US Downgrade 2011	The period starts with 50% chance US downgrade indication from S&P standards and ends with Operational Twist announcement from the Fed
Fed Tapering Talk 2013	Equity & bond markets sold off. EM suffered badly due to hot money flight back to U.S.
Chinese Market Crash	Chinese stock market crash beginning with the popping of the stock market bubble on June 12, 2015.
Inflation Overshoot	Economic recovery, pent-up demand, supply chain bottlenecks, and fiscal stimulus cause a surge in inflation, prompting higher interest rates in a taper tantrum-style sell-off.
Rapid Deflation	Oil down 60% (6000 bps); ST Inflation down 350 bps; Mortgage spreads tighten 25 bps.
Slow Deflation	LT deflation down 200 bps; LT Treasury Rates down 100 bps; Mortgage spreads tighten 25 bps.
Recession Q4/07-Q1/09	Recent recessionary period starting Dec 3, 2007, and ending March 9, 2009.



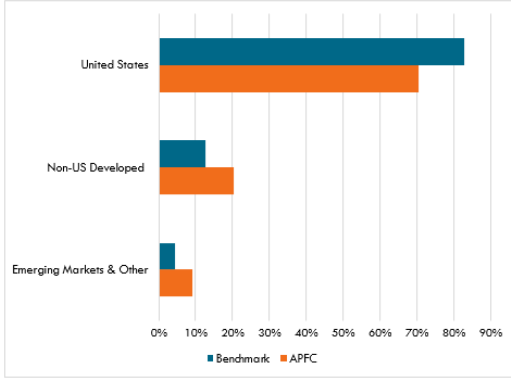
Geography & Currency breakdowns

Currency breakdown



Currency Name	Exposure
Euro	$6,354,564,405
British Pound	$2,359,660,479
Japanese Yen	$1,954,634,360
Canadian Dollar	$972,860,346
Hong Kong Dollar	$959,122,011
Australian Dollar	$557,574,132
Sub-Total	**$13,158,415,733 (15.1% of NAV)**
Total Non-US DM Exposure	**$14,573,606,105 (16.5% of NAV)**

Country breakdown



Country Name	Exposure ($)
China	1,569,658,273
India	710,885,172
Taiwan	617,383,278
Korea (South)	593,314,937
Indonesia	376,226,718
Brazil	291,959,262
Sub-Total	**4,159,428,639 (4.8% of NAV)**
Total EM Exposure	**5,095,355,427 (5.9% of NAV)**

Daily Dashboard - June 30, 2025

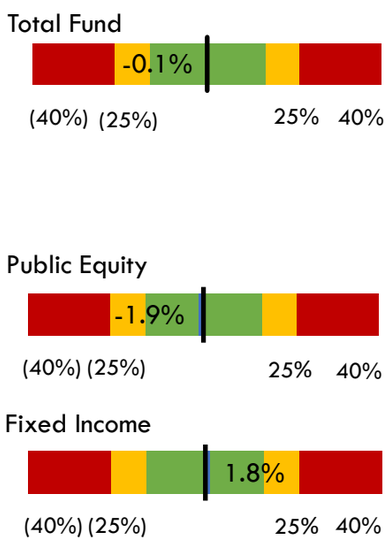
NAV : $ 86,259,927,834

ALASKA PERMANENT FUND CORPORATION

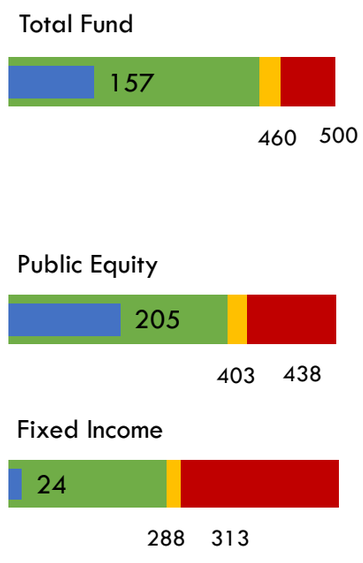
Permanent Fund:	98%	$	84,491,599,314
AMHT + PCE:	2%	$	1,768,328,521

Risk				Performance (%)				Asset Allocation				
Asset Class	1 SD	Rel VaR	TE	MTD	FYTD	CYTD	1 Year	NAV ($mill)	NAV	Target	Compliance	Under/Over
Total Fund	**10.3%**	**-0.1%**	**1.6%**	**1.7**	**9.6**	**6.0**	**9.6**	**86,260**				
Public Equity	14.4%	-1.9%	2.1%	4.0	16.7	11.2	16.7	28,434	33.0%	32%		1.0%
Fixed Income	4.5%	1.8%	0.2%	1.5	6.6	3.8	6.6	17,170	19.9%	20%		-0.1%
Private Equity	20.0%	-4.5%	7.2%	0.1	4.4	2.4	4.4	14,852	17.2%	18%		-0.8%
Real Estate	8.1%	-15.9%	3.5%	0.1	3.4	2.4	3.4	9,344	10.8%	11%		-0.2%
Inf. & Private Income	12.7%	71.0%	8.6%	0.3	12.2	6.4	12.2	7,732	9.0%	10%		-1.0%
Absolute Return	2.3%	-31.6%	3.5%	0.0	7.8	4.1	7.8	6,092	7.1%	7%		0.1%
Tactical Opps	15.1%	-7.1%	1.2%	4.9	13.0	4.6	13.0	617	0.7%	1%		-0.3%
Total Fund Cash	0.0%	-45.3%	0.0%	0.3	4.7	2.1	4.7	2,019	2.3%	1%		1.3%

Relative VaR (1yr)

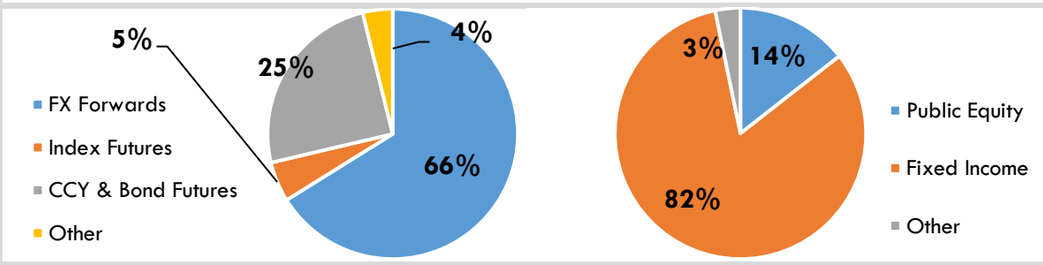


Tracking Error (1yr, bps)

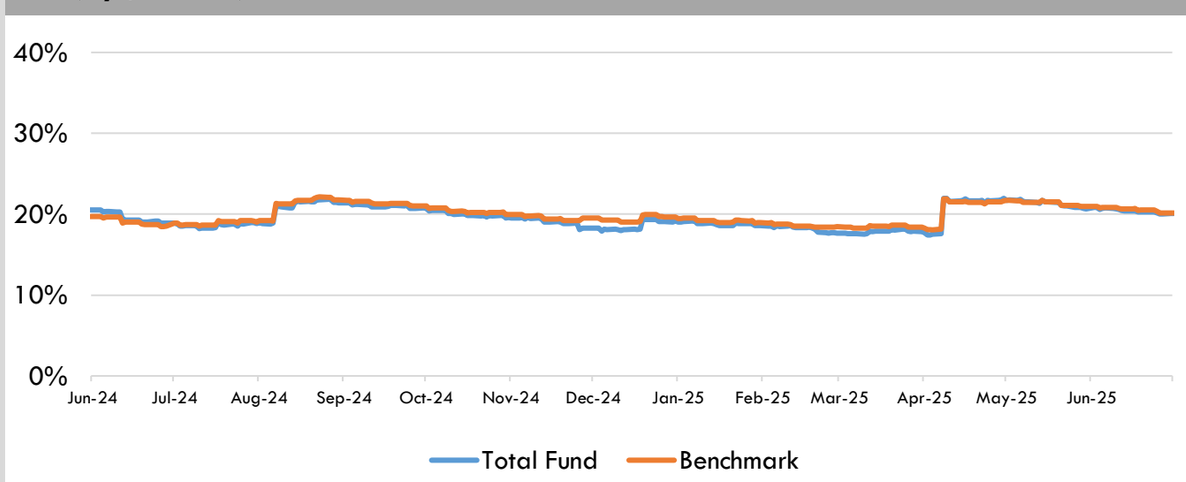


Derivative Exposures ($mill)

	Total Fund	Public Equity	Fixed Income	Other
Total Derivative	**9,844**	**1,422**	**8,104**	**319**
FX Forwards	**6,510**	56	6,137	317
Index Futures	**510**	508	-	2
CCY & Bond Futures	**2,443**	857	1,586	-
Other	**381**	0	381	-

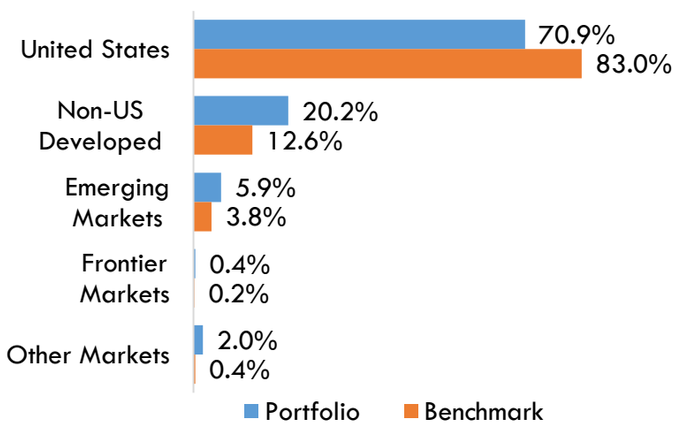


VaR (1yr, 97.5%) as a % of Total Fund NAV



Economic Indicators	6/30/25	6/27/25	% Change
VIX	16.73	16.32	2.5%
U.S. Dollar/Euro	1.18	1.17	0.6%
Credit Index OAS	0.79	0.80	-1.3%
Crude Oil (WTI) ($)	65.11	65.52	-0.6%
10-Year Treasury Yield	4.23	4.28	-1.1%
30-Year Treasury Yield	4.77	4.84	-1.3%
S&P 500	6,204.95	6,173.07	0.5%
MSCI ACWI	3,234.66	3,223.68	0.3%

Country Exposures

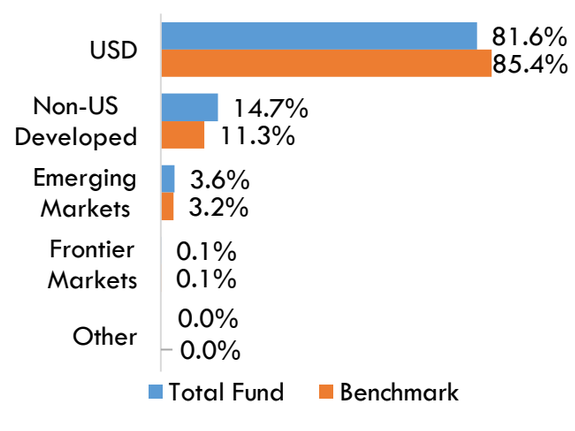


Specific Country Exposures

	Benchmark	APFC
Russia	0.00%	0.10%
Ukraine	0.00%	0.00%
China	1.18%	1.44%
Taiwan	0.65%	0.72%
Israel	0.11%	0.56%
Middle East & Africa	0.36%	0.45%
India	0.67%	0.82%
Pakistan	0.00%	0.01%

*Note: Limited granularity is available for the country exopures of private asset benchmarks.

Currency Exposures



Part 2:

Compliance Monitoring as of June 30, 2025

Regulatory/Legal Compliance

Task	Description	Total completed for the quarter ending 6/30/25
SEC 13 F Filing	The Securities & Exchange Commission's (SEC) Form 13F is a quarterly filing required of all institutional investors with >$100 million in assets. It discloses their public equity holdings and external managers.	1
U.S. KYC	Know Your Customer (KYC) is a process by which financial institutions verify their customers' identity and assess the risks associated with them. APFC must provide notarized passports and utility bills, bylaws, certify authorized signatories and more.	9
German KYC	Know Your Customer (KYC) requirements can vary by country. German requirements are far more in-depth than U.S. requirements and require assistance from external legal counsel. Items may include FBI background check, detailed information on controlled assets and more.	1
Counterparty onboarding	Upon engaging with a new counterparty, APFC signs contracts and completes forms to establish the trading relationship.	1
Tax Documentation Request	Form W-9 Request for Taxpayer Identification Number	4

Regulatory/Legal Compliance

Task	Description	Total completed for the quarter ending 6/30/25
FINRA 2242	From time-to-time certain broker/dealers distribute debt research solely to eligible institutional investors. Financial Industry Regulatory Authority (FINRA) requires eligibility to be verified.	1
Sanctions Questionnaire	As a matter of due diligence, counterparties assess whether clients have business dealings in or with sanction targets.	2
Authorized Traders Verification	Counterparties request verification of whom APFC authorizes to trade on its behalf.	2
Institutional Suitability Certificate FINRA 2111	Financial Industry Regulatory Authority (FINRA) requires investors to certify that they are capable of idependently evaluating investment risk and will exercise idependent judgement.	1
Beneficial Ownership Certification	APFC must verify that the Fund is wholly owned by the state, with no indivdual beneficial owners.	3
AML Questionnaire	Anti-money laundering (AML) efforts consist of the laws, regulations and procedures that are designed to prevent criminals from exchanging money obtained through illegal activities.	1

Regulatory/Legal Compliance

Task	Description	Total completed for the quarter ending 6/30/25
QIB certification	The Qualified Institutional Buyer certification allows APFC to participate in large-scale securities offerings.	2
Reg S Update	Reg S is a regulation by the U.S. SEC that allows companies to raise capital outside the United States without the need for SEC registration.	1
CRS/FATCA	Forms for the collection and reporting of tax identifiers and other financial account information.	1

Investment Policy (IPS) Compliance

IPS Section VII.G.Table-3 provides asset allocation target levels to ensure proper diversification of the Fund. In the table below, green indicates compliance to these limits. The values reflect the permissible largest concentrations for each matrix parameter, for informational purposes

	Public Equity	Fixed Income	Private Equity	Real Estate	Private Income	Absolute Return	Tactical Opps	Cash	Total Fund
Future Outstanding Commitments	0%	0%	7%	3%	5%	2%	0%	0%	17%
Benchmark	M664204USN	BBGEMBUSD	CAMB_PE	RE_2021	CAM_PI	HFRIPROXY	SNP500	LEH3MO_TB	LEHFTJPM
Tracking Error	3.5%	2.5%							4%
Relative VaR	100%	100%							100%
% of Asset Allocation									
Single Name / Issuer	4%	4%	2%	10%	2%	n/a	n/a	n/a	
Single Industry	20%	20%	30%	n/a	30%	n/a	n/a	n/a	
Single Country - EX US	10%	10%	20%	20%	20%	n/a	n/a	n/a	
Total EX US	50%	30%	50%	50%	50%	n/a	n/a	n/a	
Single Fund Investment	5%	10%	10%	10%	10%	15%	n/a	n/a	
Proportion of Ownership	5%	n/a	n/a	5%	5%	n/a	n/a	n/a	
Rating - Below Inv Grade	n/a	25%	n/a	n/a	n/a	n/a	n/a	0%	
Rating - Below A- & Unrated	n/a	50%	n/a	n/a	n/a	n/a	n/a	0%	
Rating - Unrated	n/a	5%	n/a	n/a	n/a	n/a	n/a	0%	
FX - Proportion Unhedged	50%	30%	50%	50%	50%	n/a	n/a	n/a	
Liquidity - w/o Weekly	10%	10%	100%	100%	100%	100%	n/a	5%	
Liquidity - w/o Monthly	2%	2%	100%	100%	100%	100%	n/a	0%	
Liquidity - w/o Quarterly	0%	0%	100%	100%	100%	40%	n/a	0%	
Cash & Equivalents	2%	10%	5%	5%	5%	n/a	n/a	100%	
MINIMUM Cash & Equivalents	0%	0%	0%	0%	0%	n/a	n/a	30%	

All Targets are Maximum Permitted except-Minimum Cash

Notes:

1 % of Total Fund

2 Ratio of Portfolio VaR to Benchmark VaR

3 Single Name/Issuer: represents security level exposure to single entity or operating company.
US Treasury & Govt Agencies are exempt. For Private Assets, the limit applies at the time of investment or cost basis.

4 Definition: GICS Sub-Industry

5 Single Fund Investment: represents exposure to an external fund or account-level strategy based vehicle.

6 Proportion Ownership: For Real Estate and Private Income, the limit is only applicable to the REIT and listed infra portfolios.

- The Public Equity single account concentration limit of 5% was in red zone as of 6/30/2025.
- This related to the SSGA account which increased in NAV as internal, active strategies were liquidated.
- Policy changes effective 7/1/2025 allow for greater concentration and returned this account to green zone.

Investment Policy Compliance

Asset Class	Parameter	Limit	Actual	Compliance Status
PUEQ	Limit Tactical Tilt portfolio Size to 15% of PUEQ	15%	liquidated	✓
PUEQ	Limit Tactical Tilt portfolio tracking error contribution to a max of 100 bps	100 bps	liquidated	✓
PUEQ	Prohibit single stock holdings within Tactical Tilt portfolio	0	liquidated	✓
PUEQ	Limit U.S. Large Cap Low P/E portfolio size to 3% of PUEQ	1.0%	liquidated	✓
PUEQ	Require U.S. Large Cap Low P/E portfolio to hold a minimum of 100 securities at all times, and be equally weighted at rebalance	>100	liquidated	✓
PUEQ	For the U.S. Large Cap Low P/E portfolio, 90% of holdings to be aligned with the lowest valuation quintile of the Russell 1000 index at the time of rebalance	>90%	liquidated	✓
PUEQ	The sum value of the 6 low volatility portfolios is limited to 5% of the public equity asset allocation	5%	liquidated	✓
PUEQ	For all 6 low volatility portfolios, individual security weights within each account are limited to 4% absolute weight and a +/- 1.5% deviation relative to benchmark weight	4%/1.5 %	liquidated	✓

Investment Policy Compliance

Asset Class	Parameter	Limit	Actual	Compliance Status
PUEQ	For all 6 low volatility portfolios, each account shall hold a minimum of 100 securities.	>100	liquidated	✓
PE	No more than 20% of the PE asset class shall be invested in public holdings.	<20%	6%	✓
PE	Following the public listing of any shares held by an APFC controlled vehicle, such shares shall be liquidated within 18 months.	18 months	1 month	✓
PE	No more than 30% of the PE portfolio may be invested with a single manager.	30%	5%	✓
PE	The PE portfolio shall be invested within the following strategy diversification ranges: venture 10-45%, growth equity 0-25%, buyouts 25-75%, specialized funds 0-50%.	Strategy Mix	29% VC, 1% Growth, 64% buyout, 6% specialized	✓
IPCIO	No more than 30% of the IPCIO portfolio may be invested with a single manager.	30%	9%	✓
AR	APFC shall not constitute more than 30% of a manager's AUM	30%	12%	✓

Investment Policy Compliance

Asset Class	Parameter	Limit	Actual	Compliance Status
AR	The AR portfolio shall follow these strategy restrictions: relative value managers 0-75%, event driven managers 0-50%, tactical managers 0-75%.	Strategy Mix	55% relative value, 14% event driven, 31% directional	✓
RE	No more than 35% of the RE portfolio may be invested with a single manager.	35%	19%	✓
RE	No more than 60% of the directly-held RE portfolio shall be invested in non-core holdings.	60%	20%	✓
RE	The RE portfolio property type mix is measured against a composite benchmark of 15% REIT plus 85% NCREIF. The portfolio property type weights shall not exceed 1.5x the benchmark or 5%, whichever is higher.	1.5xBM or 5%	<limit	✓
RE	RE Portfolio-wide leverage shall not exceed 50% and individual property level leverage are limited to 65%.	50%	21%	✓
TFCASH	Authorized investments within the TFCASH asset class include cash and the following cash equivalents: US treasuries with a max maturity of 24 months, IG corp bonds, reverse repos, money market funds, gold-backed ETFs, AAA rated asset backed securities, or other cash equivalents approved by the CRO and ED	asset type	cash & cash equivalents only	✓
TFCASH	At any point, min 80% of the TFCASH portfolio should be invested in instruments with a final maturity less than 181 days	80%	96%	✓


APFC
ALASKA PERMANENT
FUND CORPORATION

APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT: Asset Allocation Presentation ACTION: _____

DATE: October 1, 2025 INFORMATION: X

BACKGROUND:

The asset allocation presentation outlines the private market environment, discusses risk as it pertains to asset allocation, and evaluates portfolio optimization scenarios for APFC.

STATUS:

Marcus Frampton, CIO, and Sebastian Vadakumcherry, CRO, will present on the topics described above.

APFC ALASKA PERMANENT FUND CORPORATION

Asset Allocation

Marcus Frampton
Sebastian Vadakumcherry

October 1, 2025

Table of Contents

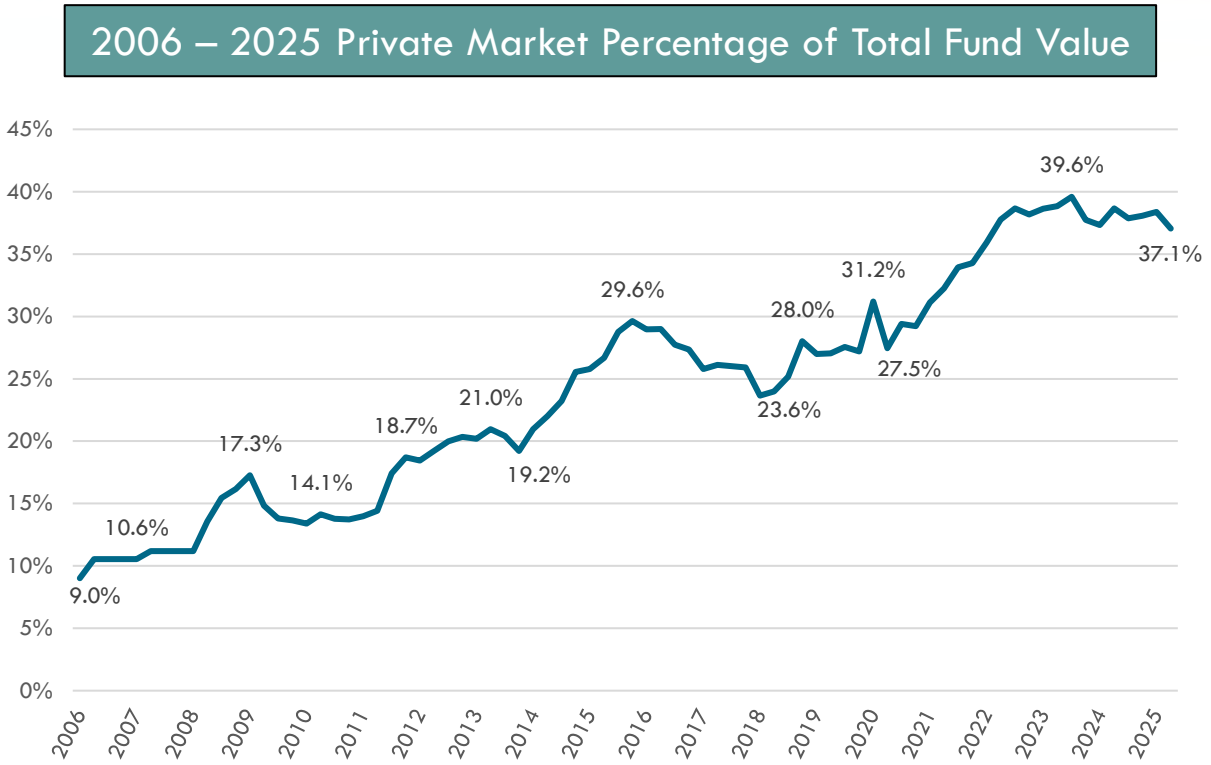
Part 1:

Private Markets Discussion

Executive Summary

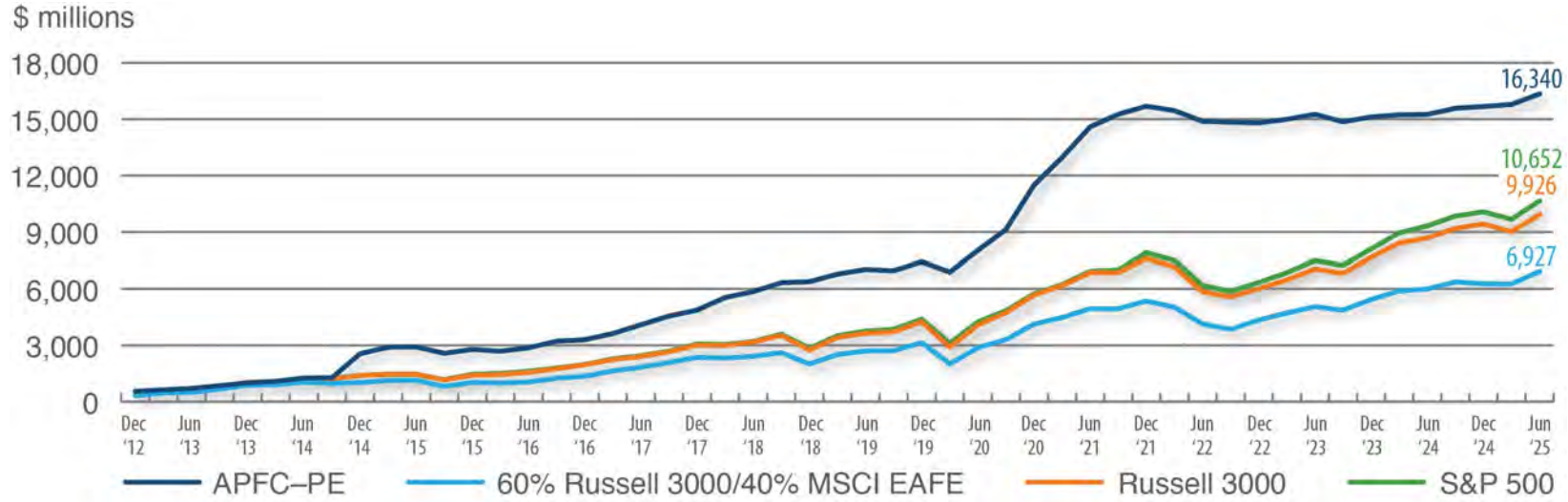
- Over the past 15 years the most notable asset allocation move / investment decision taken by APFC has been to very materially increase the Fund's allocation to private markets (Private Equity + Real Estate + Infrastructure + Private Credit)
- The characteristics and metrics around these private markets asset classes have changed dramatically since the decision to ramp them up was made and warrants periodic re-evaluation
- While investors and industry observers commonly make the observation that allocators "will receive an illiquidity premium" for allocation to private markets, the reality is that characteristics of private markets result in a situation where prudent allocators should rather "demand an illiquidity premium" for allocation to private markets
- Whether allocators receive an adequate illiquidity premium is subject to considerable judgement and can not be measured directly in the marketplace
- With no Board action around asset allocation required until May 2026, we believe that this is a good time to start a conversation about whether APFC should moderately and incrementally reduce its targets for private markets and, thereby, preserve optionality to deploy more aggressively in a more attractive market environment

APFC Long-term Private Markets Allocations



Strong Long-term Performance vs. PME's
Private Equity

SINCE-INCEPTION GAIN/LOSS COMPARISON WITH PUBLIC BENCHMARKS AS OF JUNE 30, 2025

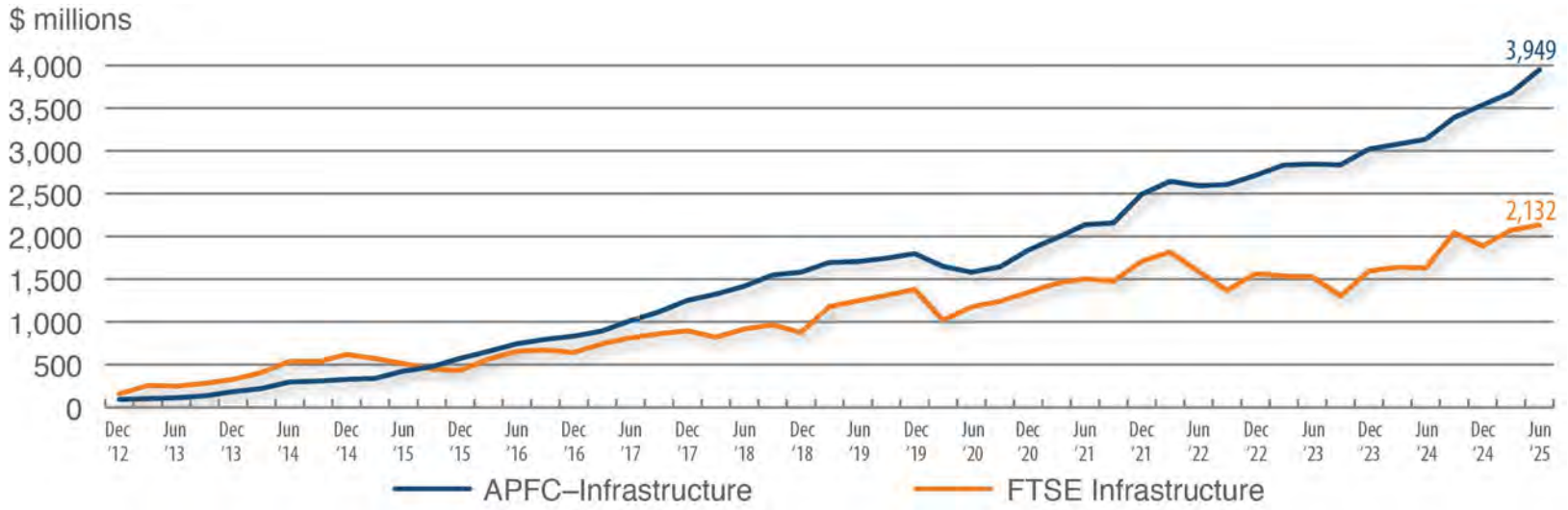


NOTES: Based on daily cash flows. As of June 30, 2025, 17.4% of the portfolio's market value reflects roll-forward values; therefore, market value is subject to change.

- Outperformance of public market benchmarks drove **$5.7bn - $9.4bn of additional value.**

Strong Long-term Performance vs. PME's
Private Infrastructure

SINCE-INCEPTION GAIN/LOSS COMPARISON WITH PUBLIC BENCHMARKS
AS OF JUNE 30, 2025

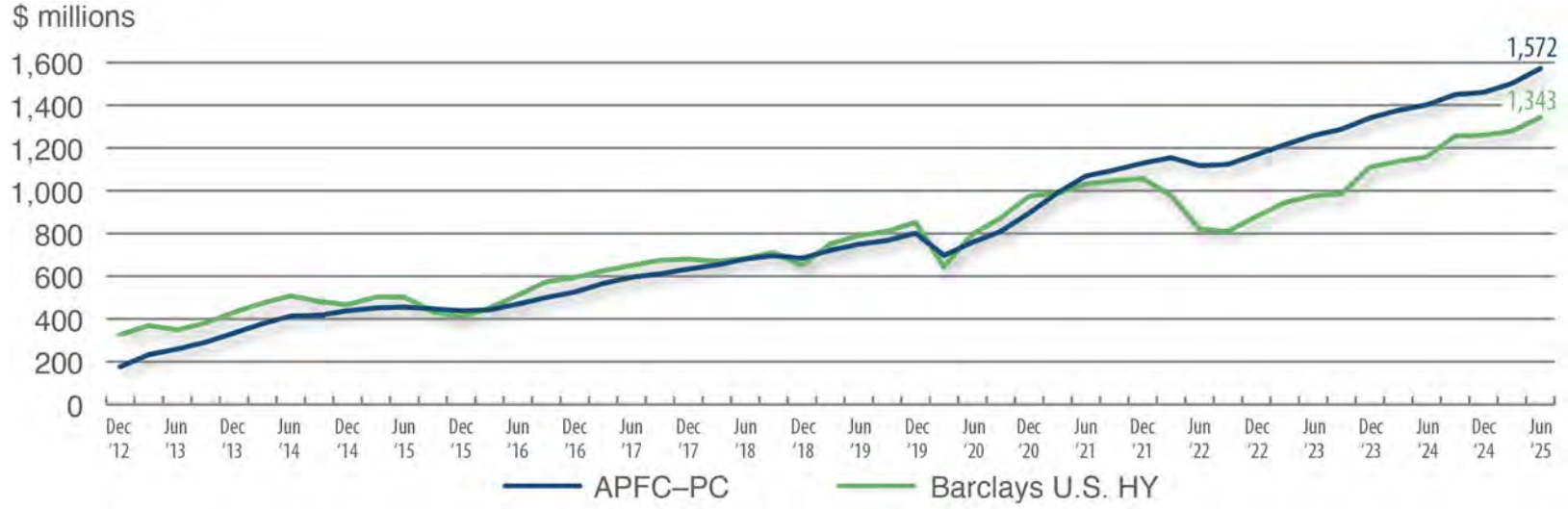


NOTES: Based on daily cash flows. As of June 30, 2025, 2.4% of the portfolio's market value reflects roll-forward values; therefore, market value is subject to change.

- Outperformance of public market benchmarks drove **$1.8bn of additional value.**

Strong Long-term Performance vs. PME's
Private Credit

SINCE-INCEPTION GAIN/LOSS COMPARISON WITH PUBLIC BENCHMARKS AS OF JUNE 30, 2025



NOTES: Based on daily cash flows. As of June 30, 2025, 8.7% of the portfolio's market value reflects roll-forward values; therefore, market value is subject to change.

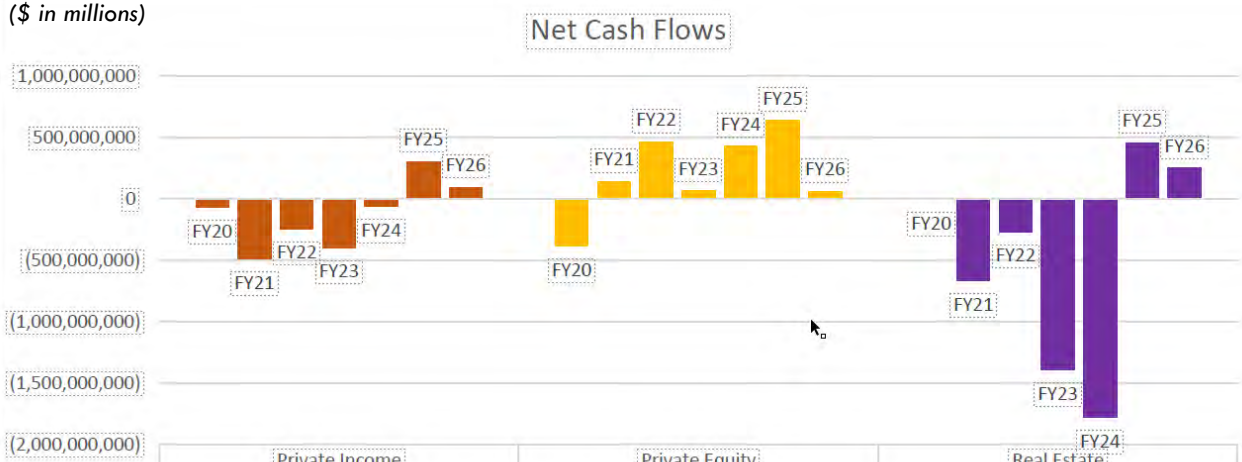
- Outperformance of public market benchmarks drove **$229m of additional value.**

Strong Cash Flow Generation

- Strong positive cash flows (net distributions less net capital calls) for APFC's private equity portfolio is not very common in the industry today as private equity exits have slowed down; this positive net cash flow position of APFC's private equity portfolio is one of the strongest and rarest attributes of our mature private equity portfolio vs. peers

- Real Estate net cash outflows from FY 2021 – FY 2024 reflect growth in portfolio following re-vamped strategy in 2020; switch to positive cash flows in FY 2025 reflects changes to ultimate target allocation

($ in millions)



	Private Income	Private Equity	Real Estate
FY2020	(69,665,463)	(382,986,184)	(4,540,668)
FY2021	(489,805,666)	143,647,829	(667,647,892)
FY2022	(241,361,444)	466,365,593	(265,911,076)
FY2023	(396,189,359)	67,139,898	(1,393,861,088)
FY2024	(62,162,072)	433,395,213	(1,780,611,941)
FY2025	307,598,783	639,786,596	459,811,600
FY2026	98,271,438	63,338,295	252,381,133

Source: APFC internal accounting data. As of 9/11/25.

Only makes sense to be active if top quartile

Average performance doesn't cut it in the Private Markets… and size, quite frequently, is the enemy of performance in alternative investments

- "The data indicate the average or median PE funds do not actually outperform their PME's, since the GFC."
  - John Ng and Richard Lietz, Harvard Business School (2024)
- "Returns dispersion in private equity has always been much wider than in public markets… Investors must aim to harvest an expertise premium from taking exposure to top-quartile managers rather than an illiquidity premium from taking exposure to the asset class"
  - Steffen Pauls, former KKR MD writing in *Financial Times* (2025)

US State Pension 10 Year Returns by Major Asset Classes
July 1, 2010 – June 30, 2020

	Total Fund	US Stocks	Non-US Stocks	Fixed Income	Real Estate	Private Equity	Absolute Return
Highest Return	9.74%	15.02%	8.24%	9.75%	13.47%	16.91%	7.27%
25th Percentile	8.93%	13.61%	6.67%	5.17%	11.41%	13.60%	6.15%
Median Return	8.57%	13.17%	6.07%	4.57%	10.65%	12.65%	5.17%
75th Percentile	7.81%	12.65%	5.41%	3.96%	9.86%	11.37%	4.33%
Lowest Return	6.71%	8.81%	4.13%	2.91%	8.20%	5.37%	2.65%
Average Return	8.63%	12.90%	6.26%	4.79%	10.43%	12.75%	4.95%

Source: AQR analysis from April 2024.

- "It seems investing in private assets only makes sense if you have access to top-quartile managers. And actually, I hear this all the time from wealth managers who are going to provide access, we're only going to give the top-quartile. First of all, won't giving retail investors access to private assets dilute those returns potentially? And also, are the top-quartile managers really going to care about the [retail] space."
  - Kunal Kapoor, CEO, Morningstar (2024)

Qualitative reasons you need a return premium

The following are qualitative challenges that all allocators to private markets face; given these challenges allocators must demand several hundred basis points premium in expected returns; this "illiquidity premium" at any given time is a matter of judgement and can not be directly measured in the market on a go forward basis

1. Difficulty managing portfolios against benchmarks (extremely high tracking error, PM's don't always know their bets)
2. High fees
3. Mis-aligned interests versus managers / partners
4. Inability for PM's to change their portfolios when they change their mind or when positions are inherited
5. Extreme difficulty for CIO, management and Board to assess the quality of decisions being made by investment teams (performance shows up and problems manifest with a multi-year lag)
6. Positions are illiquid and the illiquidity becomes most pronounced in difficult market environments
7. Valuation uncertainty (inaccuracy?) – risks masked by stale marks
8. Incentive fees paid on market beta as frequently or more frequently than alpha (e.g., fixed 6-8% hurdles in up markets)
9. Difficult to measure risks – typically smaller companies versus public markets and materially higher leverage than public markets
10. Inconsistent and often poor transparency
11. Median performance generally lags public market averages (see prior page); allocators must convince themselves that they are truly special to justify their activities

APFC has managed costs well…

- While APFC fees are more fully and prominently disclosed than peers, on an apples-to-apples basis, **our approach to private markets and alternatives investing is relatively efficient**
- A recent paper published by Richard Ennis summarizes fee and expense loads for the few public pension funds he could find that fully discloses these items
- The source paper in its entirely may be found at the following link:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5163511

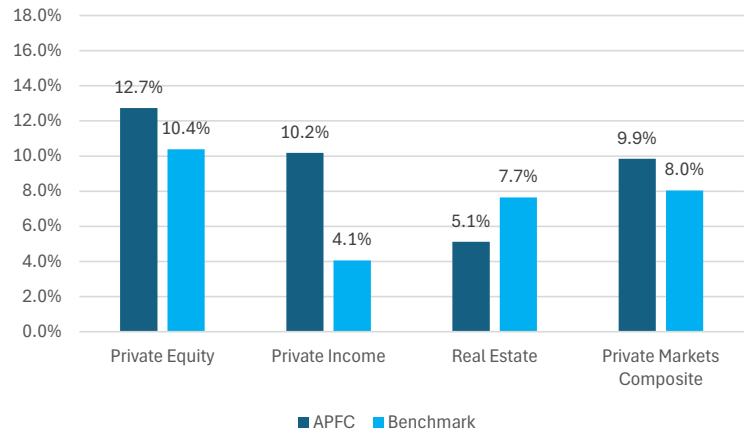
Private/Alternatives Allocation and Cost for Nine Public Pension Plans

Pension Plan	Private/Alts Allocation	Estimated Reported Annual Total Cost
1	0%	0.10%
2	29%	1.50%
3	30%	1.10%
4	38%	1.90%
5	38%	1.90%
6	39%	1.20%
7	43%	1.60%
8	43%	1.00%
9	49%	2.00%
Peer Average (Plans 2-9)	39%	1.53%
APFC	46%	0.97%

Source: Pension fund peers from Ennis (2025). APFC data is per June 2024 "Fees & Expenses" report.

...but Performance has Ebbed Past 5 Years...

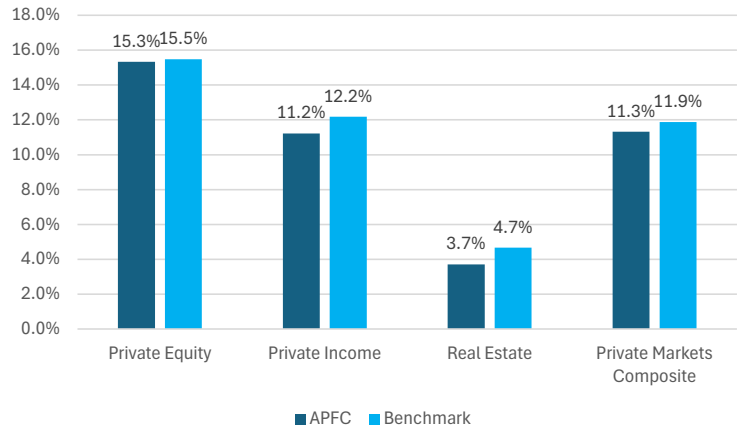
Five Year Returns
As of June 30, 2020



Performance vs. Benchmark

+235 bps +612 bps -253 bps +181 bps

Five Year Returns
As of June 30, 2025



Performance vs. Benchmark

-15 bps -96 bps -97 bps -55 bps

Source: APFC official performance reports.

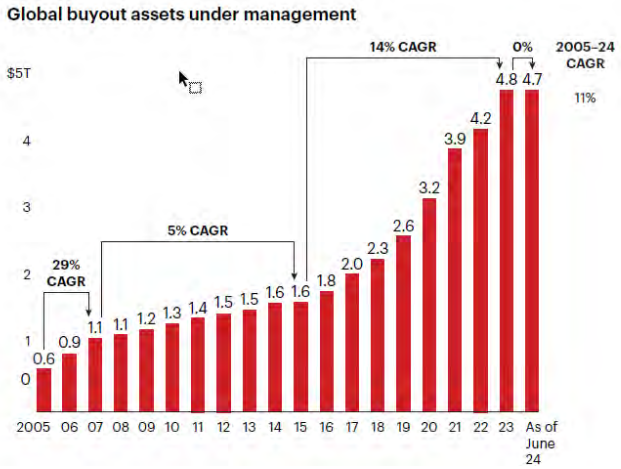
Note: Private Markets Composite weights PE, PE, and RE by their average AUM weights for the five-year period covered.

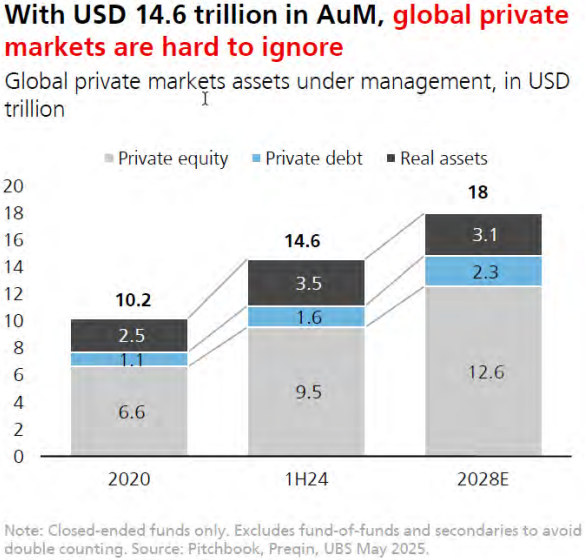
…Meanwhile Industry AUM has Ballooned…

- "There is probably at least a trillion dollars committed to trying to buy private businesses in the US market… the supply / demand situation for buying private businesses and leveraging them up has changed dramatically from what it was 10 or 20 years ago… we have seen a number of proposals from private equity funds where the returns are not calculated in a manner I would regard as honest."
  - Warren Buffett (2019)

AUM in private equity and private markets broadly have dramatically grown… and, as shown on the following slide, even though the last couple years have been tougher for fundraising than the prior years, "dry powder" remains at or near highs across strategies

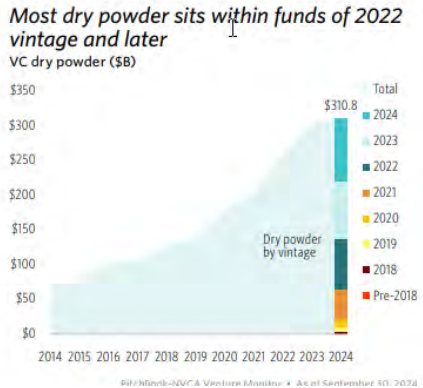
("dry powder" refers to the committed but undrawn funds available to private fund managers)



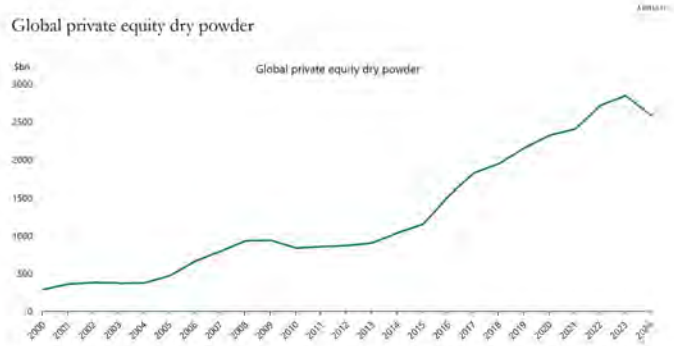


...and Dry Powder is Elevated Across Segments

Venture Capital

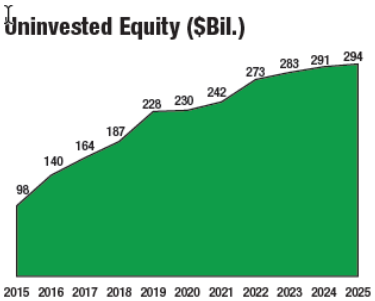


Private Equity



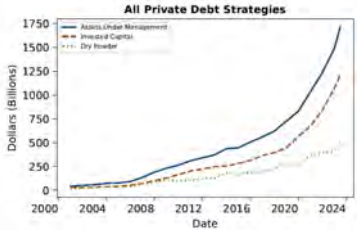
Source: Apollo.

Real Estate



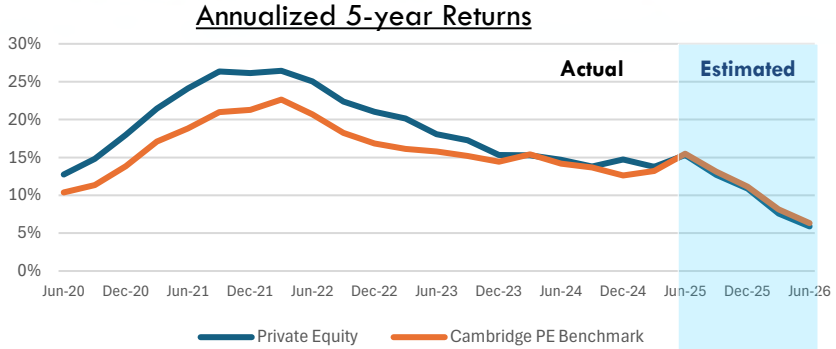
Source: Green Street March 2025.

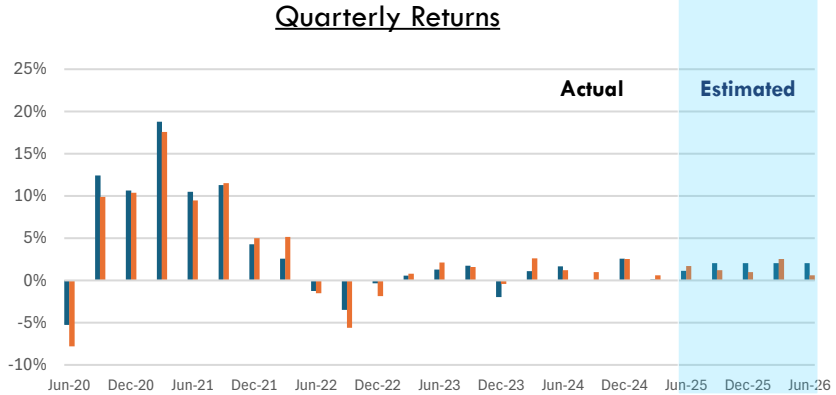
Private Credit



Source: 2024 Federal Reserve paper.

APFC Private Equity : performance trends





APFC private equity actual and estimated returns

- Annualized 5-year returns for APFC's private equity portfolio have been trending down since the peak in 2021
- The estimated 5-year annualized returns over the next year ending June 2026, based on Callan's capital market assumptions, trend even lower towards around 6%
- The overall private equity market, assumed to be represented by the Cambridge benchmark, has a similar downward trend
- The consistently lower quarterly returns since 2021reflects a changed (lower) return profile

Lower private equity returns : Cyclical of Structural?

Weakness could be Cyclical…

- Private equity (PE) returns have been cyclical — periods of outperformance often followed by weaker vintages, then rebounds.
- Valuation lag – PE valuations tend to adjust more slowly than public markets, so the markdowns from 2022–2023 may still be working through portfolios.
- Exit environment – IPOs and M&A slowed sharply with rising rates, hurting distributions and IRRs. This could change

…or could be Structural

Past Tailwinds (now mostly gone or reversed)

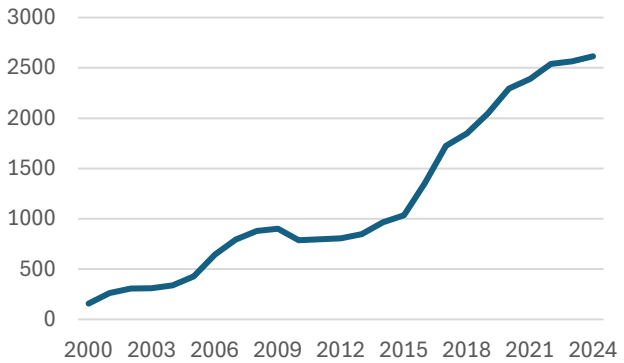
- Low interest rates – Cheap leverage boosted returns; higher rates increase financing costs, reduce deal multiples, and pressure portfolio company cash flows.
- Less competition for deals – there's more dry powder and more managers chasing deals, compressing entry multiples. "There is no investment idea so good that it cannot be ruined by too much capital"
- Untapped market– Many sectors have already been "PE-ized," reducing easy wins.

Current Headwinds

- High valuations – Even with recent adjustments, good companies rarely trade cheaply.
- Operational improvement ceiling – PE's toolkit is well-known; achieving incremental gains is harder in a mature industry.
- LP capital constraints – LPs committing more selectively, creating fundraising pressure.

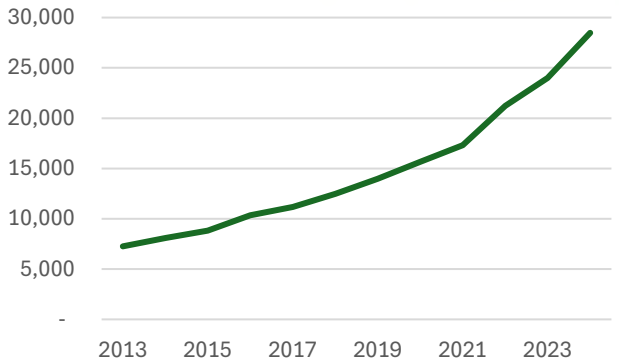
Private equity : "there is no investment idea so good that it cannot be ruined by too much capital"

Global Private Equity Dry Powder ($ Billions)



Source: S&P Global

Number of Private Equity & Venture funds in US



Source: SEC private funds database

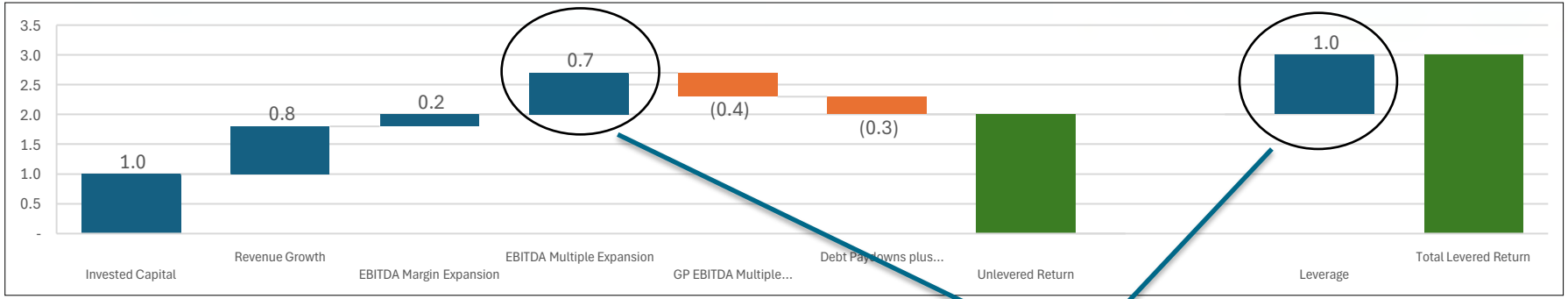
- Total capital committed but not yet deployed (dry powder) to private equity funds exceeds $2.6 trillion
- Comparatively, dry powder was only $157 billion in 2000, reflecting an expansion of more than 16 times or CAGR of 12% over 25 years

- The number of private equity funds grew steadily over the last decade crossing 28,000 in 2024
- In 2013 there were about a quarter of this number (7,259 funds).

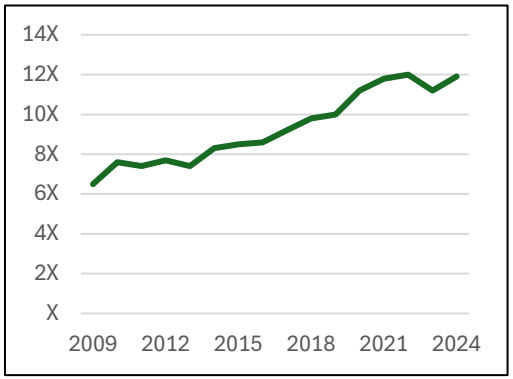
Private equity : High valuations – good companies rarely trade cheaply

Drivers of investment returns for realized buyout deals in 2010–22, multiple of invested capital

Source: (McKinsey global-private-markets-report-2025)



Median multiples of global buyout entry



Source: (McKinsey global-private-markets-report-2025)

The median global buyout entry multiple almost doubled over the last 15 years to about 12X in 2024.

Leverage and market multiple expansion drove 61 percent of investment returns for buyout deals from 2010 to 2022.

Private equity returns : a plausible future scenario

- Key drivers of private equity's "golden era" (past couple of decades) may have reversed. That period was unusually favorable and it's unlikely PE returns will snap back to those averages

- More plausible is a moderate rebound once exits improve, but with a lower ceiling due to structural headwinds. More likely to be high single-digit to low double-digit net returns, rather than the mid-to-high teens many investors became accustomed to.

- The winners in the next cycle will probably be those who:
    - Deploy capital selectively in today's higher-cost-of-capital world.
    - Avoid overpaying for trophy assets.
    - Generate operational value in less crowded niches.

Private versus Public equity: if the expected future returns are not adequately higher for private equity, the rationale for taking on higher risks (illiquid, levered, idiosyncratic, high fees) may have eroded

Private Equity is Less Attractive than the Past

Venture Capital

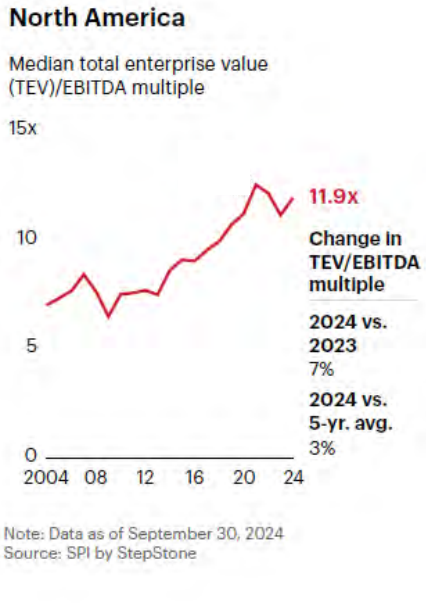
Pre-Money Valuations up Dramatically Across all Series

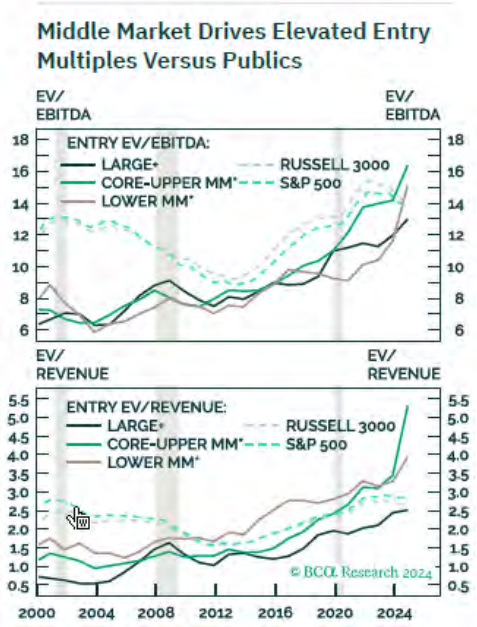
($ in millions)

Round	Average Pre-Money Valuation 2015	1H 2025	% Increase
Pre-Seed	$4	$12	223.7%
Seed	$7	$37	463.1%
A	$22	$76	253.7%
B	$72	$252	248.5%
C	$146	$789	439.0%
D+	$795	$2,694	239.1%

Source: Pitchbook.

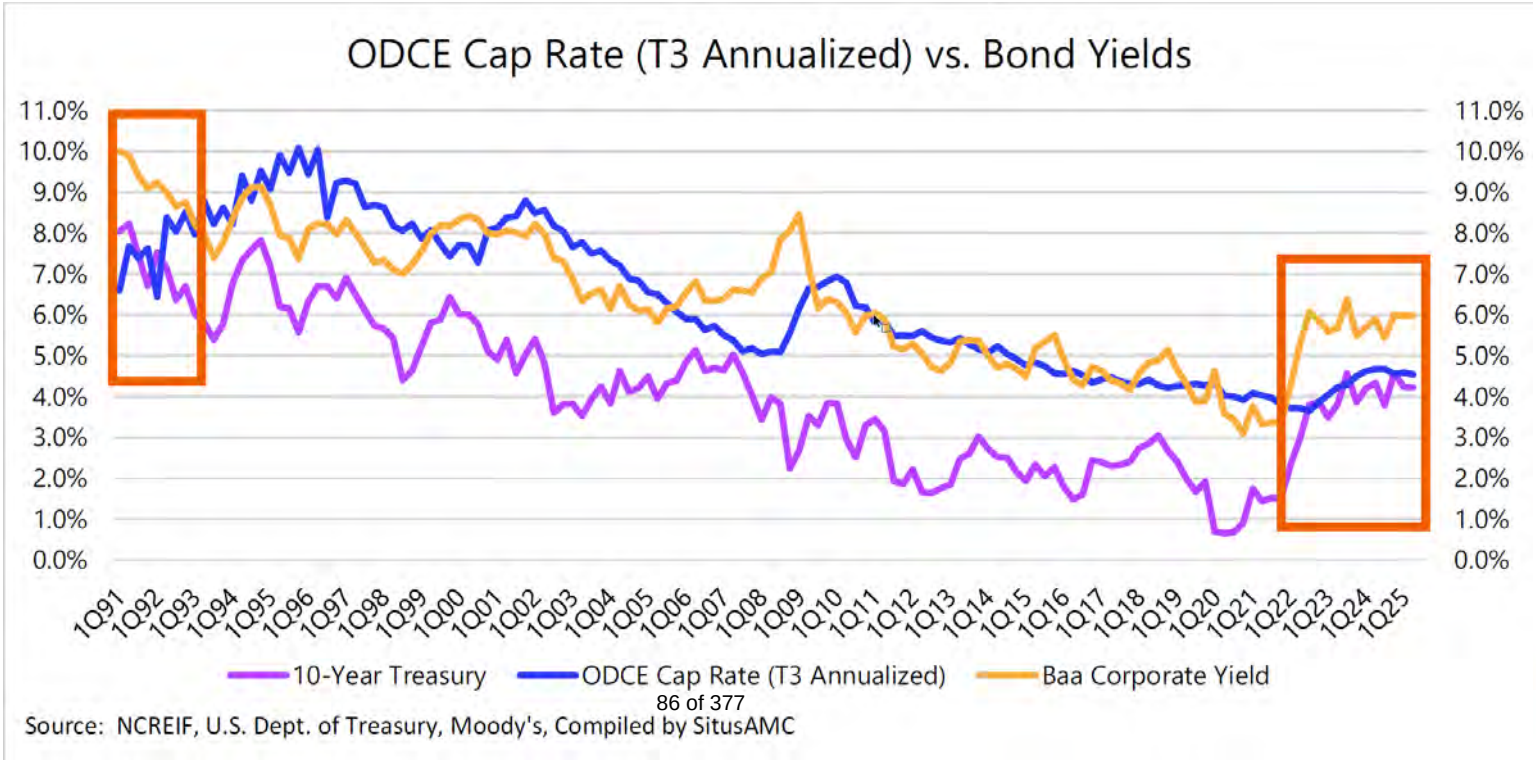
Leveraged Buy-outs





Private Real Estate is Less Attractive than the Past

Investors in private core Real Estate today are earning no yield premium to 10 year treasuries; the norm over time has been at least a couple of hundred basis points

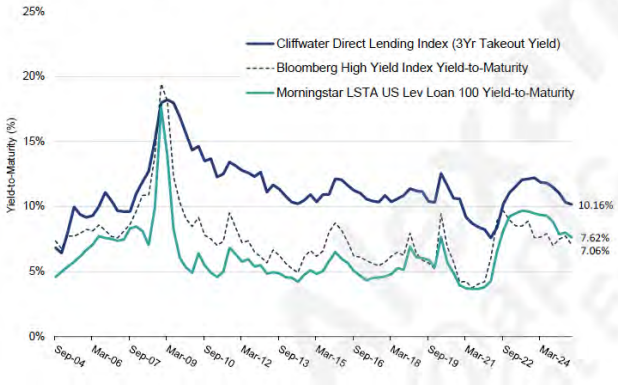


Private Income is Less Attractive than the Past

Private Credit

- We are seeing spreads between S+450bps and S+500 bps in the middle market and upper middle market for first lien loans; for comparison, the average new issue spread for single B rated broadly syndicated loans was S+355bps as of Q2 2025

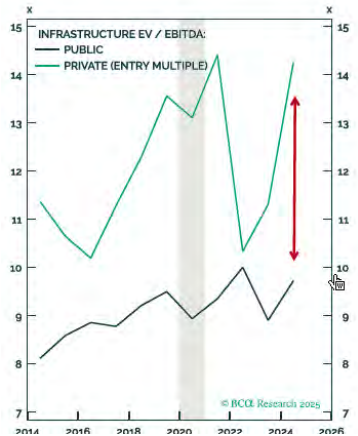
Exhibit 5: CDLI, High Yield Bond, and Leveraged Loan Yield-to-Maturity (Sep 2004 to Jun 2025)



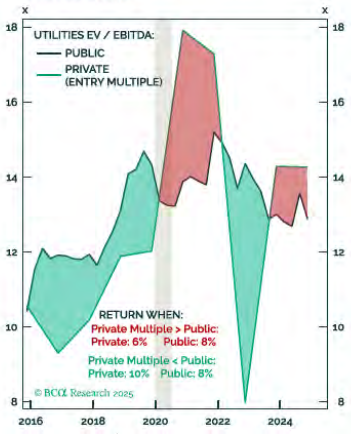
Private Infrastructure

- Private Infrastructure market has many different sectors than other private asset classes with different metrics, however, as a general matter we believe that private infrastructure managers pay large and growing premiums to value available in the public markets for similar quality assets
- Data also suggests weak returns for average private markets infra investments vs. historical listed infrastructure returns + materially higher leverage in privates than publics

Valuations Favor Publics



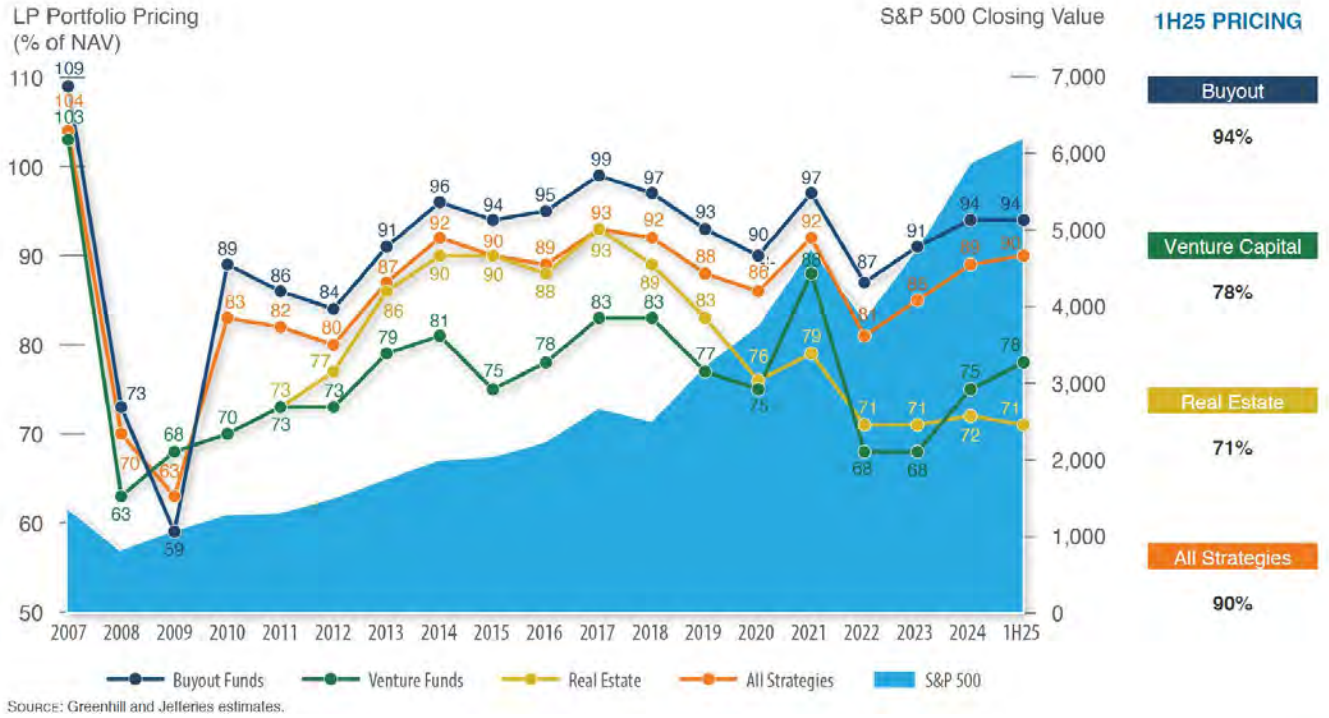
The Private Bid Is Apparent In The Utilities Sector



Changing Your Mind on Private Investments is Costly

Pricing to exit illiquid private markets fund investments in 1H 2025 ranged from 70's of cents on the dollar (Real Estate and Venture) to 94% (Buyouts)…

…and in periods where more institutional investors need liquidity (e.g., 2008 and 2022) pricing gets much worse



Asset Allocation Suggestions

- Last May, Staff reviewed the Status Quo portfolio allocation along with two alternatives (Option 1 and Option 2); ultimately Status Quo was reaffirmed, however, Trustees indicated desire to continue the review in the Fall

- In the next section the CIO and CRO will review materials from last May, but also will introduce a third option (Option 3) which they are recommending for serious consideration as being most consistent with their views and concerns around the private markets space broadly today

- Staff Recommended Option 3:
  - Move incrementally given the "steering the battleship" nature of private markets
  - Reduce allocation to each of Private Equity, Real Estate and Private Income by 1% over each of the next three years
  - Fixed Income allocation also reduced to 15% from 20%
  - Most of the reductions offset by increases to Public Equities with a minor increase to Absolute Return
  - Taken together moves do not represent a de-risking of the portfolio or a lower expected return, but they do result in material increase to portfolio liquidity and increase to future optionality around private markets
  - Review and optimize sub-portfolio allocations within Fixed Income to achieve higher Sharpe Ratio and higher expected return Fixed Income portfolio

- Callan to review Option 3 at their annual asset allocation review in February 2026; no Board action requested or needed until May 2026

Part 2:

Asset Allocation Discussion

Risk is Good: up to a limit

- APFC is in the business of taking risk
- The goal is to be Risk Aware not Risk Averse
- Principal preservation is paramount

Risk Appetite: is as important as target return in formulating strategy

- Defining a performance target in terms of 'returns' alone is not only incomplete but could also lead to inaccurate inferences and undesired outcomes
- Ignoring or not factoring the risks entailed in generating the return could be a costly mistake
- The flaw is more pronounced if comparative performance (say, versus peers) is measured solely in terms of returns. **The same return can be achieved by taking varying levels of risk**
- Risk appetite is a broad-based articulation of the corporation's thresholds, in terms of risks* it is willing to take in pursuit of its objectives. It quantitatively defines the acceptable level of risk

** For now, the focus is only on 'investment' or 'portfolio value' risk (other risks like operational, reputational, legal, etc. are not addressed here)*

APFC Risk Appetite: approved definition

APFC's Risk appetite is defined in terms of (a) a Risk Tolerance Portfolio (RTP) and (b) Liquidity level, as follows:

a) The maximum 'risk' of the APFC portfolio should not exceed that of the RTP (specified below):

- The RTP comprises of an **80/20:Equity/Bond** reference portfolio with the following constituents:
  - 80% MSCI ACWI IMI
  - 8% BB US AGG
  - 8% BB US CORP
  - 4% BB GLBL TRS ex-US

- Here risk is measured across the following volatility and drawdown parameters
  - Value at Risk (VaR), 1 year, 1SD (based on 10-year constant weighted historical monthly data)
  - Drawdown: Recession GFC – Dec 3, 2007 to Mar 9, 2009

b) Liquidity: The combined allocation to Public equities, Fixed income and Cash will not be lower than 40%

APFC Risk Appetite: key assumptions

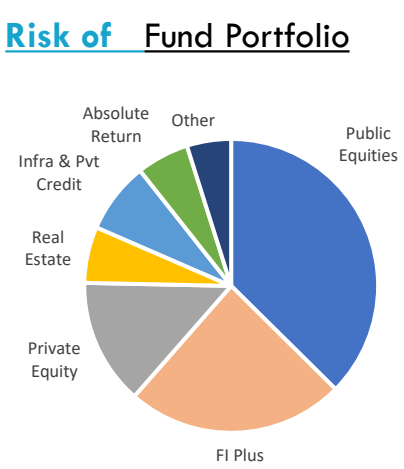
i. VaR and Drawdown risks will be measured using the Aladdin tool, incorporating the following assumptions:

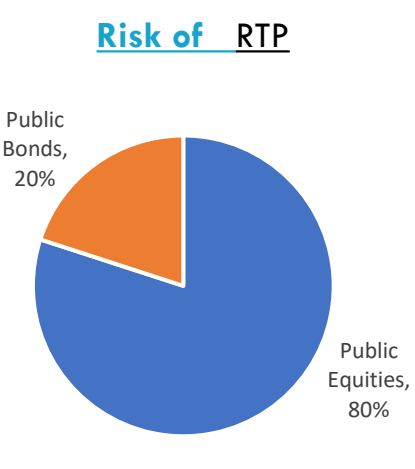
- Time Horizon & SD multiple : 1 year & 1 Standard Deviation
- Historical Data weighting : 10 years, monthly, constant weighted

ii. **The Private Equity risk estimate computed by Aladdin is at the Board's direction adjusted downward (reduced) by adjusting the private equity exposure to 75% of actual exposure when comparing to RTP (this board action was based on the view that Aladdin's methodology over-estimated risk for private equity)**

iii. Drawdown Stresses are based on and as defined within the Aladdin tool

Risk Appetite: how it works





The Fund portfolio can have any type and mix of asset classes subject to:

- VaR (volatility) <= that of RTP
- Drawdown <= that of RTP
- Public Equities + Fixed Income + Cash >= 40%

Risk Management independently computes risk of total Fund portfolio to ensure it's below the RTP risk level

Endowments do often feature lower allocations to fixed income than state pensions & APFC…

- **High Public Equity**
  - Roughly median allocation to public equities.
  - Median is 30%, APFC is 32%.
- **High Public Fixed Income**
  - Higher allocation to public fixed income than 70% of E&F's.
  - Median is 11%, APFC is 20%.
- **Low Private Markets**
  - Lower allocation to private markets than 65% of E&F's.
  - Median is 63%, APFC is 48%
- **Low Growth Assets**
  - Roughly median allocation to Growth Assets
  - Median is 68%, APFC is 66%

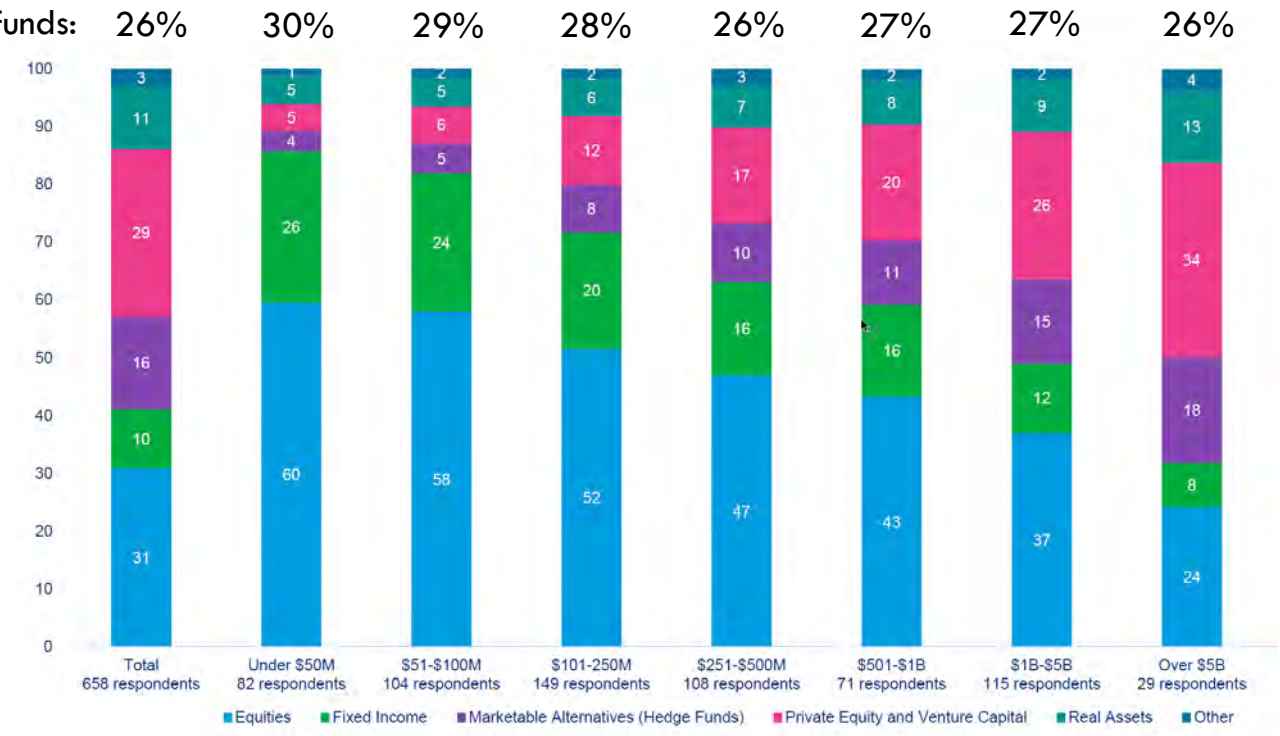
Asset Allocation Distribution as of December 31, 2022
Callan Large Endowment/Foundation (> $1 billion)

	Public Equity	Public Fixed Income	Private Markets	Growth Assets
APFC	**32%**	**20%**	**48%**	**66%**
Median	30%	11%	63%	68%
Rank	49%	30%	65%	65%

*Growth Assets include public equity, private equity, tactical opportunities, 70% of private real estate, 70% of private infrastructure/credit.

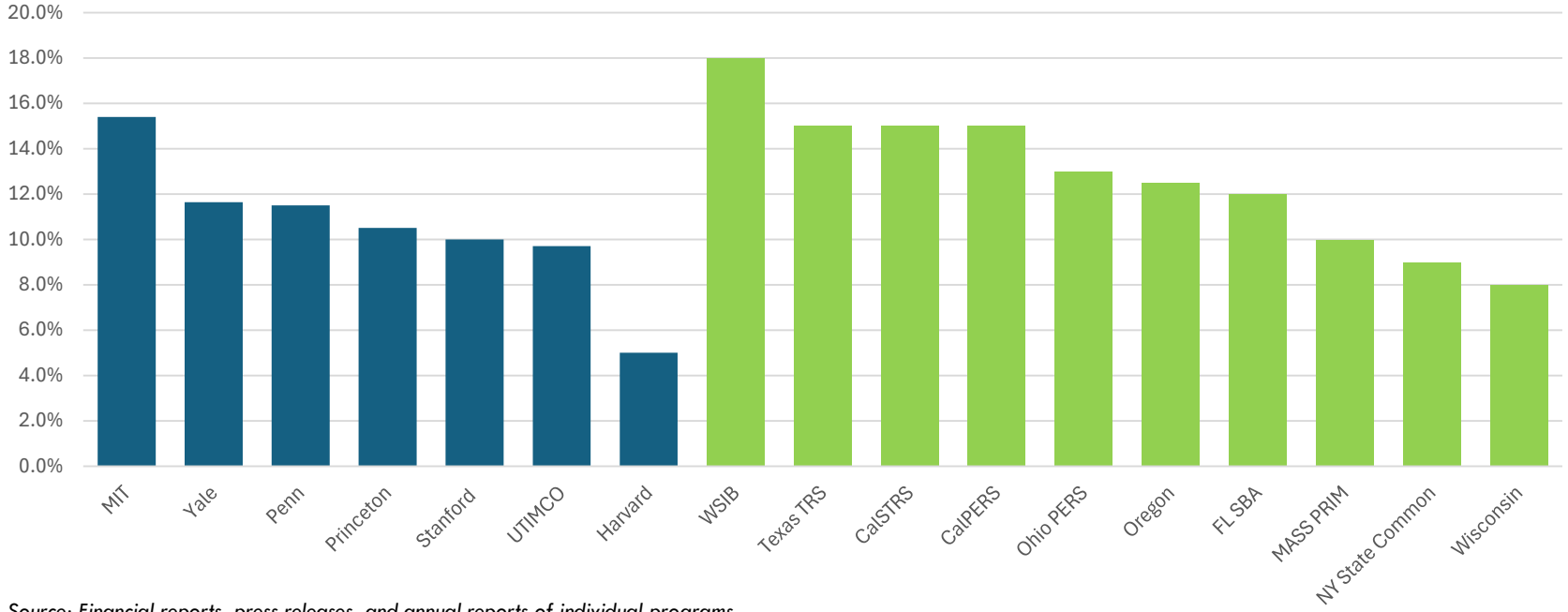
...however, typically other lower risk allocations, in particular hedge funds, offset this...

- Data from NACUBO (National Association of College and University Business Officers) 2024 survey
- Survey demonstrates heavy usage of Hedge Funds to achieve prudent diversification (16% overall average, $18% for $5 bn+ cohort)



...and All Endowments and Pensions we Reviewed Included Real Estate as a Further Diversifier

Large Public Pension and Large University Endowment Real Estate allocations



Source: Financial reports, press releases, and annual reports of individual programs.

Notes: (1) Represents target allocations unless only actual allocation is readily available; (2) When available, data reflects target allocation to Real Estate specifically. For certain programs "Real Assets" or similar asset class labels were used when it appeared that the majority of the asset class was Real Estate investments.

The "Art" of Asset Allocation

In just the last few years, Yale Endowment's philosophy on portfolio balance and asset allocation has undergone a material shift; between 2020 and 2024 the numbers behind the asset allocation and the endowment's purpose haven't shifted, but the University's judgements about these matters clearly have shifted

2020 (and earlier) Financial Reporting

"Yale targets a minimum allocation of 30% of the endowment to market-insensitive assets (cash, bonds, and absolute return). The university further seeks to limit illiquid assets to 50% of the portfolio."

-Yale Endowment Annual Letter, 2016, 2017, 2018, 2019, 2020

Total: $31.2 billion

Private Equity	41.0%
Absolute Return	23.5%
Public Equity	14.0%
Real Estate	9.5%
Fixed Income	7.5%
Natural Resources	4.5%
Total	**100.0%**
Market Sensitive	69.0%
Market Insensitive	31.0%

2024 Financial Reporting

"Roughly 95% of the endowment pool is invested in assets expected to produce equity-like returns, through domestic and international securities, real assets, and private equity."

-Yale University Financial Report 2023-2024

Total: $41.4 billion

Private Equity	53.2%
Public Equity	19.3%
Absolute Return	14.5%
Real Assets	11.6%
Fixed Income	1.4%
Total	**100.0%**
Market Sensitive	84.1%
Market Insensitive	15.9%

An additional judgement that can be inferred from Yale Endowment's allocation decisions is that they do not find the arguments for private credit/infra compelling

Part 3:

Portfolio optimisation & efficient frontier simulation

Introduction

- **No board action required at this point**: As requested by and based on feedback from Trustees', staff is bringing back proposals for modifying asset allocation. The aim is to facilitate preliminary discussions and share thoughts prior to asset allocation decisions scheduled for Feb/May 2026.

- This is a follow-up from the May 2025 board meeting, and several slides are a repeat from that meeting

- In general asset allocation works best if adhered to over the long term. Periodic review and necessary adjustments could add value. Staff recommends to alter asset allocation only if there are valid and tested justifications, and not to be based on interim market moves, public opinion, current (temporary) trends, one dimensional views, etc.

- While staff recommends making asset allocation changes deliberately and avoiding frequent changes to targets for illiquid asset classes, three options (Option-1, Option-2 and Option-3) were developed to target an expected return in line with the Fund's mandate of CPI + 5%. Staff recommends pursuing Option-3 with a three-year timeline for full implementation of new targets

- The following slides include a brief overview of modern portfolio theory (MPT), the Montecarlo simulation model staff utilized to generate the efficient frontier and how various portfolios aligned to this efficient frontier. Return and risk estimates for the various portfolios are also tabulated and reviewed in detail

Modern Portfolio Theory (MPT): diversification is a key aspect

- The modern portfolio theory (MPT) is a concept that can be used by investors to construct diversified portfolios that maximize their returns without unacceptable levels of risk
- MPT is a mathematical framework that optimizes asset allocation to maximize return for a given (acceptable) level of risk
- American economist Harry Markowitz pioneered this theory in his paper "Portfolio Selection," which was published in the Journal of Finance in 1952. He was later awarded a Nobel Prize for his work on modern portfolio theory
- It is important to note that all inputs into this mathematical framework are estimates, implying that the validity of the output, which is dependent on the accuracy of inputs, is uncertain. GIGO is a very real risk and so prudence and judgement are vital when assessing outputs

Montecarlo Simulation: to build an efficient frontier

Key steps and inputs:

- Define/select the asset classes we want in the overall portfolio (Fund)
- For each asset class, estimate the return achievable and risk (volatility) that would be entailed
- Additionally, estimate the correlation between the returns for each asset class with every other chosen asset class
- Develop scenarios by applying different weights to asset classes and computing the aggregate portfolio return and risk numbers – we simulated 25,000 different portfolios by randomly assigning weights to asset classes

Inputs (estimates)
(Callan's 2025-2034 projections)

- return for each asset class
- risk for each asset class
- correlations across all asset classes

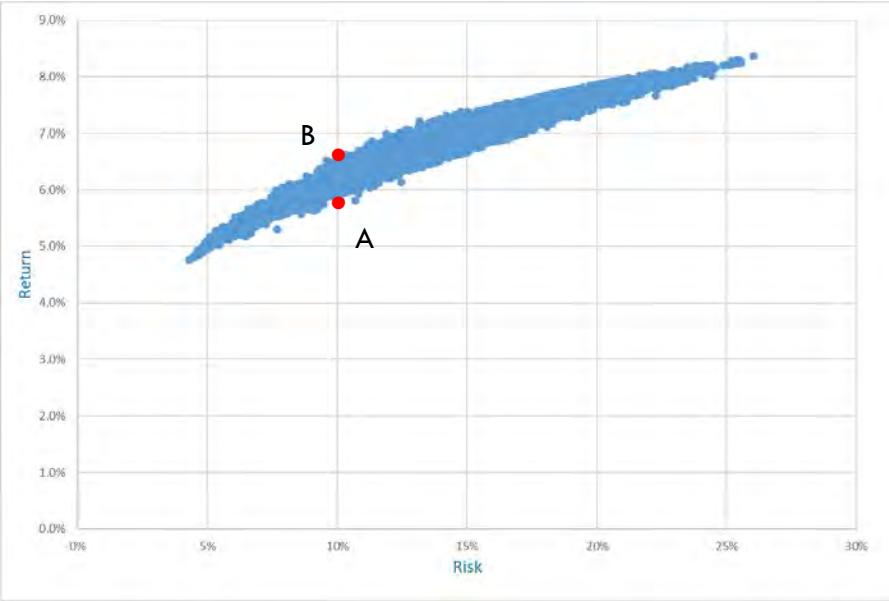
MC simulator

- Randomly assign weights for each asset class (total 100%)
- Compute aggregate return based on each asset class weight & return estimate
- Compute aggregate risk based on asset class weight and estimates of risk and correlations

Output

- 25,000 portfolios with different asset class mixes
- Each portfolio would have an aggregate return and risk associated
- Plot the data to generate an efficient frontier

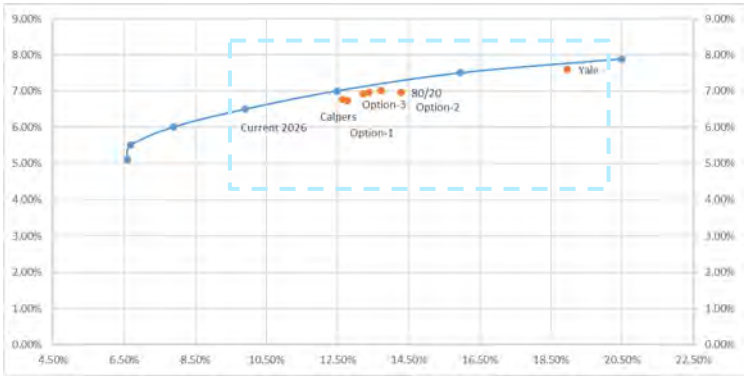
The efficient frontier: [concept] optimal vs. sub-optimal portfolios



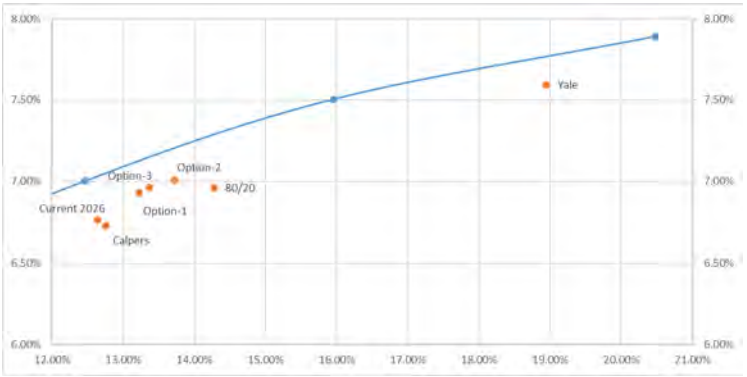
- The scatter plot represents 25,000 portfolios with different weights for the 8 asset classes
- Each portfolio has an associated return (vertical axis) and risk (horizontal axis)
- The upper outward arch represents portfolios on the efficient frontier – i.e., optimal portfolios
- To illustrate:
  - dot A represents a portfolio that has an estimated risk level of 10% and a return estimate of 5.8%
  - dot B represents another portfolio with the same estimated risk of 10% but has a higher expected return of 6.8%
  - B is on the efficient frontier and represents the optimal mix, if the acceptable risk level is 10%

The efficient frontier: [application] a range of portfolio mixes possible

Portfolios relative to the efficient frontier



Magnified View



- The following selection of portfolios (different asset class mixes) is charted against the efficient frontier from the previous page:
  Current 2026 allocation; the 80/20 portfolio; CalPERS; Yale; Option-1; Option-2; Option-3
- All six portfolios are close to the efficient frontier, with some slightly better optimized for risk-return
- Selecting asset class mixes that fall precisely on the efficient frontier may not be practical in terms of execution (e.g., one or more asset classes close to zero % and or an asset class greater than 50%)
- Note: all computations are based on estimates of risk and return – it is prudent to be aware of 'false precision'

Asset Allocation: options, select peers and risk appetite

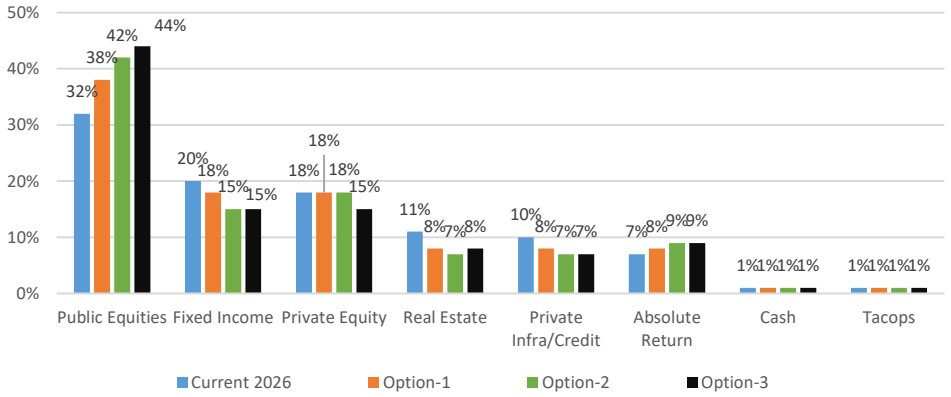
- Asset allocation %s, 10-year return and risk (volatility) estimates, stress drawdown projections and illiquidity levels are tabulated below
- The 'Current 2026' allocation represents the existing Board approved Fund portfolio for FY 2026.
- Options 1, 2 and 3 reflect fresh asset allocations for consideration for 2027 and beyond, based on staff interpretation of board preferences
- The 80/20 is the board approved risk appetite
- Calpers and Yale are two peers selected for reference

	Asset Allocation (based on publicly avilable information)								10-year Risk and Return estimates (computed based on Callan's 10-year projections)				(c) + (d) + (e) + (f)	Aladdin Estimates
	Public Equities (a)	Fixed Income (b)	Private Equity (c)	Real Estate (d)	Private Inf/Crd (e)	Absolute Return (f)	Cash (g)	Tacops (h)	Risk (Standard Deviation)	Weighted Average Return	GR Spread	Geometreic Return	% of Low Liquidity Assets	Stress (GFC scenario) Drawdown
Calpers	41.9%	26.5%	15.6%	13.2%	2.8%	0.0%	0.0%	0.0%	**12.8%**	6.7%	0.5%	**7.2%**	32%	-39%
Yale	19.3%	1.4%	53.2%	11.6%	0.0%	14.5%	0.0%	0.0%	**18.9%**	7.6%	0.5%	**8.1%**	79%	-46%
80/20	80.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**14.3%**	7.0%	0.5%	**7.5%**	0%	-48%
Option-1	38.0%	18.0%	18.0%	8.0%	8.0%	8.0%	1.0%	1.0%	**13.2%**	6.9%	0.5%	**7.4%**	42%	-39%
Option-2	42.0%	15.0%	18.0%	7.0%	7.0%	9.0%	1.0%	1.0%	**13.7%**	7.0%	0.5%	**7.5%**	41%	-41%
Option-3	44.0%	15.0%	15.0%	8.0%	7.0%	9.0%	1.0%	1.0%	**13.4%**	7.0%	0.5%	**7.5%**	39%	-39%
Current 2026	32.0%	20.0%	18.0%	11.0%	10.0%	7.0%	1.0%	1.0%	**12.6%**	6.8%	0.5%	**7.3%**	46%	-38%

Note: A (simplifying) assumption when comparing the return and risk estimates, especially across institutions, is that asset class characteristics are uniform. An exception is that for options 1,2 and 3 the fixed income sub-categories have been modified as described in the following page

Asset Allocation: Current 2026 (status quo), option-1, option-2 and option-3

Asset class weights



	Current 2026	Option-1	Option-2	Option-3
Key Changes	Status Quo	Target higher risk-adjusted return by increasing public equities with offsetting reductions in fixed income, private equity, real estate and private income. Modestly grow absolute return to take advantage of APFC's low vol/correlation/beta strategy here		
Return	7.3%	7.4%	7.5%	7.5%
Risk (volatility)	12.6%	13.2%	13.7%	13.4%
Risk (Drawdown)	-38%	-39%	-41%	-39%
Illiquidity	46%	42%	41%	39%

For options -1, -2, & -3: in addition to asset allocation, the proposal is to modify allocation withing fixed income with the aim of enhancing risk adjusted returns; Fixed Income projected returns in these three options is ~5% as compared to 4.6% in status quo. This reallocation is an option in status quo case as well, however, we are defaulting to existing allocations in that scenario in recognition of the false precision of these exercises and the preference for existing arrangements in that case.

- All return and risk numbers are estimates
- Execution of either options 1, 2 and 3 is expected to be over a period of 3 years

Appendices

Goldman Sachs Discussion on Bitcoin

March 2025: "Should Bitcoin Play a Role in Multi-Asset Portfolios?"

Goldman Sachs Asset Management

Key Takeaways:

1. Adding a Bitcoin Allocation Increased the Backtested Portfolio Value

"A hypothetical multi-asset portfolio with a 1% Bitcoin allocation returned 8.1% over the past decade, outperforming a traditional 60/40 portfolio by 0.8%."

2. The Added Value is Paired with Higher Volatility

"Over the past decade, Bitcoin realized a volatility of around 68%. This means that alongside sharp, frequent, and sustained rallies, Bitcoin has also experienced sharp, frequent, and sustained drawdowns. Since July 2010, Bitcoin has experienced five drawdowns that exceeded 70%, with the most recent being between November 2021 and November 2022 when Bitcoin's value declined by 77%."

3. The Greatest Realized Gains Were Closer to Inception

"…a large portion of the outperformance occurred prior to 2021…For example, between July 2010 and December 2021, Bitcoin delivered a staggering 220% annualized return, with an annualized volatility of 140%"

4. The Past Rate of Return is Unlikely to Continue

Scenario 1: A Re-run of the Last 10-Year Sharpe Ratio - Highly Unlikely

"…Bitcoin will need to generate an annualized return of 47% to achieve another decade with a Sharpe ratio of 1.1…Therefore, to repeat historical performance, Bitcoin's market capitalization would need to rise from less than 2% of the global money supply today to 47% by 2034.

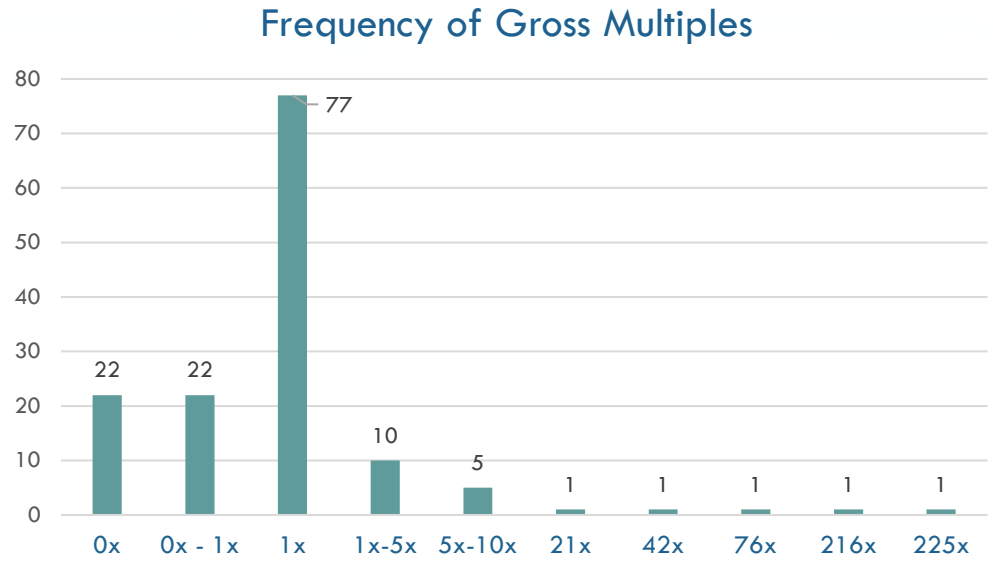
Scenario 2: Annualized Total Return of 10% - Plausible

"…[Bitcoin delivering an annualized total return of 10% over the next decade] would imply that Bitcoin's market capitalization would be equivalent to around 2.5% of the global money supply in 10 years, which seems more plausible in our view.

5. A Bitcoin Allocation is Not Recommended for Most Institutional Investors

"In summary, while Bitcoin has delivered high returns over the past decade, these returns are difficult to predict and should not be extrapolated. Even if Bitcoin achieves decent annualized returns in the coming years, any potential upside for multi-asset portfolios must be weighted against the significant idiosyncratic risks associated with Bitcoin. While an improved regulatory framework, tighter integration into the global financial system, and broader adoption by both institutions and major central banks could prompt us to re-evaluate Bitcoin's role in the strategic asset allocation of multi-asset portfolios in the future, our analysis suggests that a strategic allocation Bitcoin is not suitable for most institutional investors today and the bar for changing this view remains high.

Cryptocurrency Investments: Private Markets



Cryptocurrency Investments Undertaken as of March 31, 2025: 141

Value of Investments: $175 million (~1% of portfolio)

Total Gross Multiple: 8.5x ($30 mm invested, $81 mm realized)

Investment return has been positive, largely driven by a handful of high performers

Cryptocurrency Investments: Public Markets

Holdings by Business Type (in thousands):

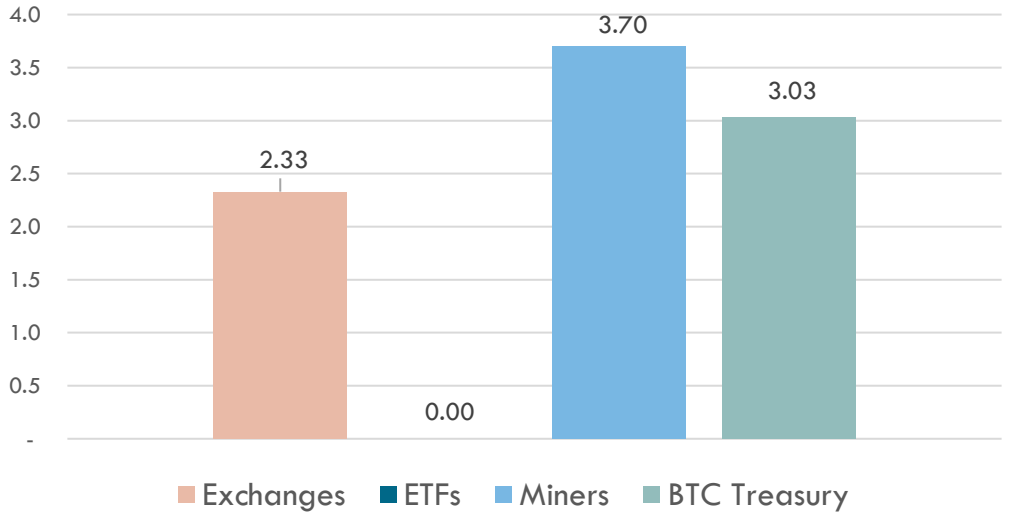
Crypto Exchanges
Coinbase - $2,330

Bitcoin Miners:
MARA Holdings - $89.6
Core Scientific - $17.7
Riot Platforms - $58.7
CleanSpark - $2,184
Hut 8 Corp. - $1,146
Bitdeer Technologies - $134.9
Cipher Mining - $4.8
TeraWulf - $5.2
Bitfarms - $61

Bitcoin Treasury Model:
Strategy (MSTR) - $3,032

Total Public Market Exposure
$9.06 Million

Cryptocurrency Exposure by Business Type (in millions USD)



Cryptocurrency : Investment Risks

- How do we classify crypto? Is it an asset class (commodity, security) or is it a form of fiat currency?
- It has attributes of both:
  - For example, scarcity like commodities (say, gold), is traded on commodity markets – the Commodity Futures Trading Commission (CFTC) has classified Bitcoin and Ethereum as commodities, meaning they can be traded on commodity futures exchanges like CME.
  - It has fiat currency characteristics as well, like being a medium of exchange with a couple of countries adopting it as an alternative currency, it can be viewed as unit of account and store of value.
- The fuzziness in its classification may be one of the biggest risks – regulatory frameworks are still evolving.
- While there is uncertainty in terms of potential policy changes based on changes in administration, there is almost near certainty that governments will generally be uneasy about crypto taking over as money; governments like to have the ability to expand/contract the money supply as they see fit.
- If cryptos don't operate as fiat currencies, how is its intrinsic value discerned? The likelihood of new "crypto" being mined/developed is not low – how do we differentiate and pick "winners".
- Unstable and unknown correlations to items such as inflation and equities make asset allocation modeling challenging. Very high volatility makes crypto a debatable addition based on asset allocation modeling.
- Reputational risk should this newly emergent investment area fizzle out.


APFC
ALASKA PERMANENT
FUND CORPORATION

MULTI-ASSET SOLUTIONS

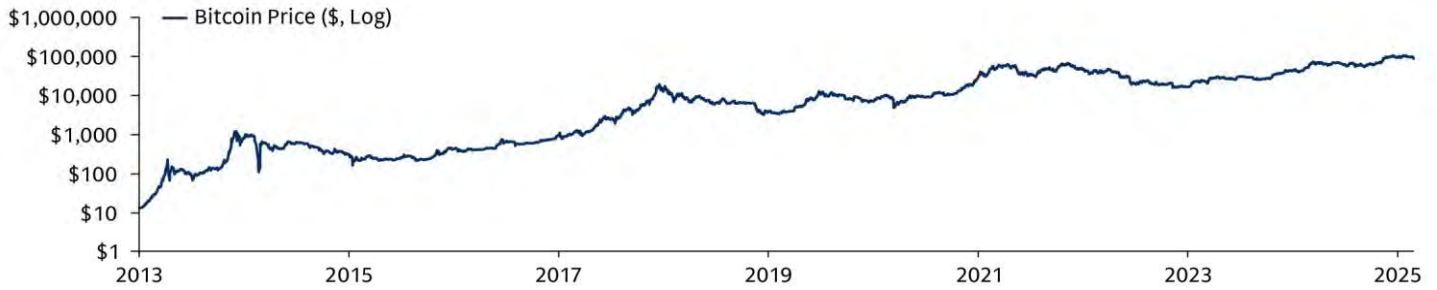
Should Bitcoin Play a Role in Multi-Asset Portfolios?

While Bitcoin has delivered high returns over the past decade, these returns are difficult to predict and should not be extrapolated. Our team discusses the necessary considerations for this investment.

Bitcoin's Historical Performance

Bitcoin, created in 2009, is the world's leading cryptocurrency, representing over 60% of the cryptocurrency market.[1] Over a decade ago, Forbes declared 2013 as the "Year of Bitcoin." That year, Bitcoin rallied from $13.50 to $805, a 60x increase, resulting in a surge in market capitalization from $143 million to $9 billion.[2] Since then, Bitcoin has experienced three rallies spanning 2015-2017, 2018-2021, and 2022-2024.[3] In 2023, Bitcoin returned 153%, and in 2024, it returned 123%, raising its market capitalization from $870 billion to $1.83 trillion in 2024.[4] We think strong performance was driven by increased investor adoption due to broadening market access (e.g., through the launch of spot Bitcoin ETFs on January 10, 2024), endorsements from US President Donald Trump, strong US household finances, and global demand due to geopolitical and fiscal concerns. However, year-to-date performance in 2025 has been slightly weak as relaxation of regulations have been somewhat slower than expected.

Bitcoin's Growth in Value from January 14, 2013, to January 14, 2025



Source: Bloomberg, Forbes, CoinMarketCap, Statista, Goldman Sachs Asset Management. As of February 25, 2025. Note: The y-axis is on a logarithmic scale, meaning each unit increase on the axis represents a tenfold increase in value. **Past performance does not predict future returns and does not guarantee future results, which may vary.**

[1] Source: CoinMarketCap As of February 25, 2025.
[2] Source: CoinMarketCap As of February 25, 2025.
[3] These rallies include January 14, 2015- December 16, 2017, December 15, 2018-November 8, 2021 and November 21, 2022-December 17, 2024.
[4] Source: Bloomberg, Forbes, CoinMarketCap, Statista, Goldman Sachs Asset Management, Datastream, Goldman Sachs Global Investment Research. As of February 25, 2025.

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Considerations for Strategic Asset Allocation

Bitcoin's market cap crossing above $2 trillion at the end of 2024 has naturally led investors to ask whether Bitcoin should play a part in multi-asset portfolios. Strategic asset allocation decisions require consideration of several factors, some of the most important factors in our view include expected returns, expected volatility, cross-asset correlations to determine diversification benefits, fundamental merits of the investment, liquidity needs, and regulatory risks.

Over the past decade, Bitcoin realized a volatility of around 68%.[5] This means that alongside sharp, frequent, and sustained rallies, Bitcoin has also experienced sharp, frequent, and sustained drawdowns. Since July 2010, Bitcoin has experienced five drawdowns that exceeded 70%, with the most recent being between November 2021 and November 2022 when Bitcoin's value declined by 77%.[6] This high level of volatility means that even a small allocation to Bitcoin in a traditional 60% equity, 40% bonds (60/40) portfolio could significantly alter the portfolio's risk and return profile relative to its benchmark.[7]

Portfolio Analysis: The Potential Impact of a 1% Allocation to Bitcoin

To quantify the potential impact of a small allocation to Bitcoin, our Multi-Asset Solutions team simulated the risk and return profile of a multi-asset portfolio that replaces 1% of its equity allocation with Bitcoin relative to a traditional 60/40 portfolio over the period spanning 2010 to 2024. Our analysis reveals the following observations:

1. A hypothetical multi-asset portfolio with a 1% Bitcoin allocation returned 8.1% over the past decade, outperforming a traditional 60/40 portfolio by 0.8%.

The Potential Risk-Return Impact of Adding a 1% Bitcoin Allocation to a Hypothetical Multi-Asset Portfolio

		Last 1-Year	Last 3-Year	Last 5-Year	Last 10-Year	Since July 2010
Return	60% Equity/ 40% Bond	14.5%	5.2%	7.6%	7.3%	8.1%
	1% Bitcoin / 59% Equity / 40% Bond	15.4%	5.5%	8.2%	8.1%	9.9%
Volatility	60% Equity/ 40% Bond	6.7%	9.3%	10.7%	8.8%	8.5%
	1% Bitcoin / 59% Equity/ 40% Bond	6.8%	9.4%	10.8%	8.9%	8.5%
Sharpe Ratio	60% Equity/ 40% Bond	1.37	0.12	0.46	0.61	0.79
	1% Bitcoin / 59% Equity / 40% Bond	1.48	0.15	0.52	0.70	1.00

Source: Goldman Sachs Asset Management, Bloomberg, MSCI. As of December 2024. Our backtest analysis[8] is based on the MSCI World Index (50% hedged, 50% unhedged) for equities and the Bloomberg Global Aggregate Index for Bonds. Data on Bitcoin is available since July 2010. Time period: July 2010 – December 2024. These results are based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under-or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved. For illustrative purposes only.

[5] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.
[6] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.
[7] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.
[8] Note that the figures in the table rely on or are based on backtested performance, which is not actual performance and in no way should be construed as indicative of future results. Backtested performance results are created based on an analysis of past market data with the benefit of hindsight, do not reflect any Goldman Sachs Asset Management product and are being shown for informational purposes only. The economic and market forecasts presented herein have been generated by Goldman Sachs Asset Management for informational purposes as of the date of this publication. They are based on proprietary models and there can be no assurance that the forecasts will be achieved. Please see additional disclosures at the end of this publication.

2. A large portion of the outperformance occurred prior to 2021, which featured outsized returns for Bitcoin. For example, between July 2010 and December 2021, Bitcoin delivered a staggering 220% annualized return, with an annualized volatility of 140%.[9]

3. Another benefit for the period prior to 2021 was low performance correlation with a traditional 60/40 portfolio and equities. Strong risk-adjusted returns along with a low correlation with a traditional 60/40 portfolio contributed to an improved Sharpe ratio for the multi-asset portfolio with a 1% Bitcoin allocation for that period.[10]

The Potential Return Boost from Adding Bitcoin into a Hypothetical Multi-Asset Portfolio Largely Pre-Dates 2021

Relative Performance of a 59% Equities, 1% Bitcoin, and 40% Bonds portfolio versus a 60% Equities and 40% Bonds portfolio

Source: Goldman Sachs Asset Management, Bloomberg, MSCI. As of December 2024. Our backtest analysis is based on the MSCI World Index (50% hedged, 50% unhedged) for equities and the Bloomberg Global Aggregate Index for Bonds. These results are based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under-or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved. **Past performance does not predict future returns and does not guarantee future results, which may vary.** For illustrative purposes only.

[9] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.
[10] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.

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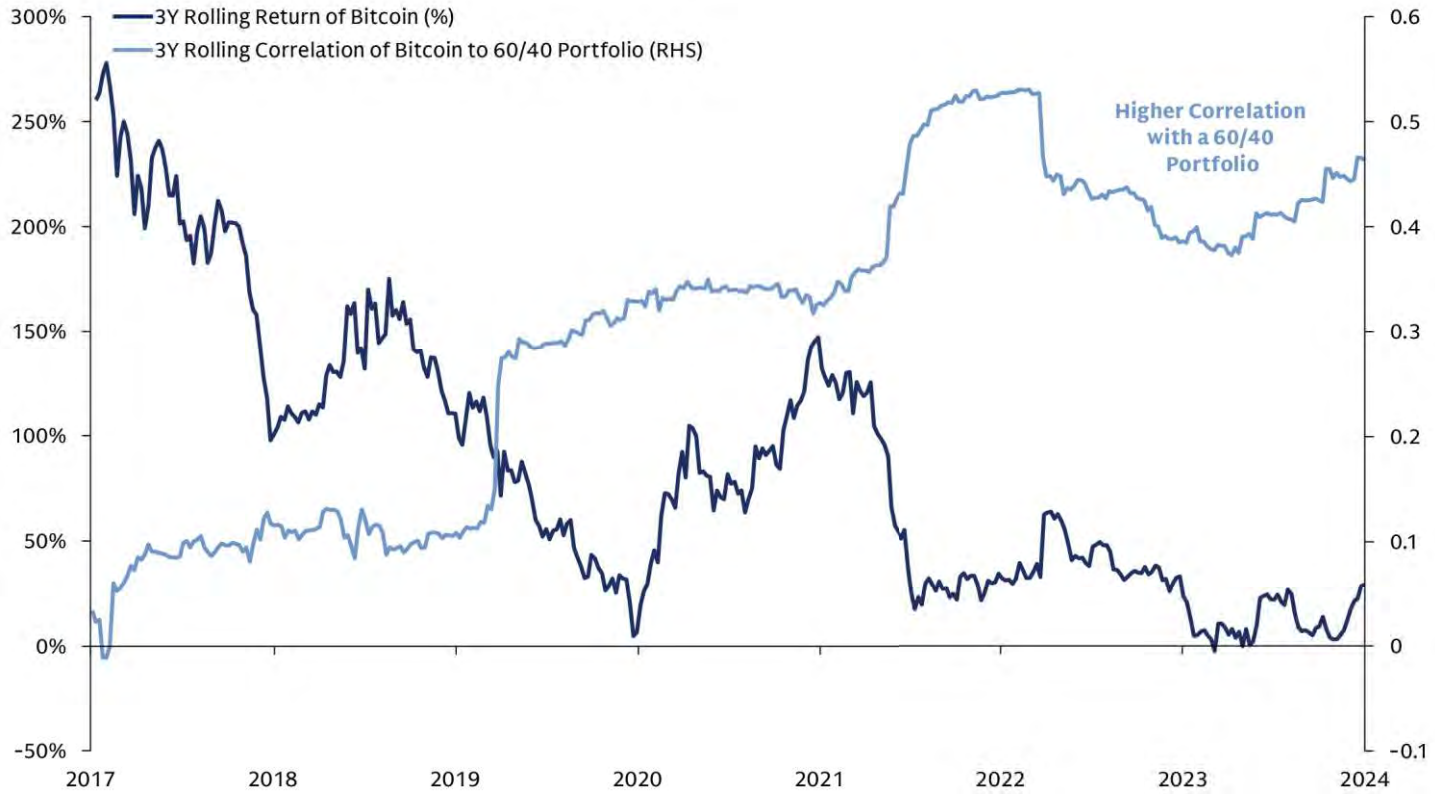
4. Since 2021, Bitcoin's performance, while still high compared to other assets, has moderated alongside its volatility, while its correlations with a traditional 60/40 portfolio and equities have trended higher.[11] As a result, the incremental portfolio value of an allocation to Bitcoin has declined.

Since 2021, Bitcoin's Return Boost Has Diminished and Its Correlation to a Multi-Asset Portfolio Has Increased



Source: Goldman Sachs Asset Management, Bloomberg, MSCI. As of December 2024. Our backtest analysis is based on the MSCI World Index (50% hedged, 50% unhedged) for equities and the Bloomberg Global Aggregate Index for Bonds. These results are based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under-or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved. **Past performance does not predict future returns and does not guarantee future results, which may vary.** For illustrative purposes only.

5. Overall, over the last 10 years, adding 1% Bitcoin to a multi-asset portfolio yielded an improved risk-adjusted return relative to a 60/40 allocation, with the Sharpe ratio of the Bitcoin portfolio standing at 0.7 compared to 0.6 for the traditional portfolio.

[11] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.

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What About the Next Decade?

Past performance is not a reliable indicator of future results, particularly in an asset class like Bitcoin, which has experienced few market cycles and has unpredictable future returns. We analyzed the impact of Bitcoin on a 60/40 portfolio in two potential scenarios and what, in our view, is the likelihood of each.

Scenario 1: A Re-run of the Last 10-Year Sharpe Ratio

Likelihood: Highly unlikely

Between 2014 and 2024, Bitcoin delivered an annualized total return of 77% with a volatility of 68%, resulting in a Sharpe ratio of 1.1. If we assume Bitcoin's volatility moderates to 40% from its last decade average of 68%, and the risk-free rate is 3%, Bitcoin will need to generate an annualized return of 47% to achieve another decade with a Sharpe ratio of 1.1. This would imply a significant increase in Bitcoin's market capitalization to approximately $90 trillion.

For perspective, global money supply (M2) is currently around $105 trillion.[12] If M2 grows at its last decade's annual trend of 6%, it will reach $190 trillion by 2034. Therefore, to repeat historical performance, Bitcoin's market capitalization would need to rise from less than 2% of the global money supply today to 47% by 2034. For added context, gold's market capitalization is equivalent to 18% of the money supply. Even if Bitcoin grows in popularity among certain investors, we think it would be challenging for its market capitalization to expand to these levels both on an absolute basis and relative to the global money supply.

Scenario 2: Annualized Total Return of 10%

Likelihood: Plausible

Based on recent correlation, volatility, and our long-term expected risk and return of a 60/40 portfolio.[13] Bitcoin would need to deliver an annualized total return of 10% over the next decade for a 1% allocation in a multi-asset portfolio to be justified. This would imply that Bitcoin's market capitalization would be equivalent to around 2.5% of the global money supply in 10 years, which seems more plausible in our view.

Long-Term Asset Allocation Entails Added Considerations

As outlined, Bitcoin has delivered high returns and while volatility has moderated over the years, it still exhibits significant volatility compared to other assets.[14] Our simulated analysis indicates a small allocation to Bitcoin could offer marginal value to a hypothetical traditional 60/40 portfolio over the next decade if it achieves an annualized return of more than 10%. However, long-term investors must consider the complex idiosyncratic risks associated with Bitcoin that extend beyond financial metrics such as return, volatility, and correlation. These risks and considerations include, but are not limited to:

Regulatory Risks: The current regulatory oversight for cryptocurrencies is relatively limited compared to traditional asset classes, with fragmentation and varying degree of advancement across jurisdictions. While the limited regulatory oversight has facilitated market growth, it has also led to numerous cases of investor losses due to fraud and other criminal activities, which has heightened policymakers concerns around the misuse of cryptocurrencies for illicit activity. As the market expands with more investment products introduced akin

[12] Source: Bloomberg. As of January 24, 2025.
[13] Source: Goldman Sachs Asset Management Multi-Asset Solutions. As of January 24, 2025. Our long-term assumptions for a 60/40 portfolio imply a 5.8% annualized return with a volatility of 9.5%. We assume a 0.35 correlation between Bitcoin and a traditional 60/40 portfolio, and a 55% volatility for Bitcoin. Alpha and tracking error assumptions reflect Multi-Asset Solutions' estimates for above-average active managers and are based on a historical study of the net-of-fee results of active management. Strategic long-term assumptions are subject to high levels of uncertainty regarding future economic and market factors that may affect future performance. They are hypothetical indications of a broad range of possible returns. All numbers reflect Multi-Asset Solutions' strategic assumptions as of September 30, 2024. Please see additional disclosures.
[14] Source: Bloomberg and Goldman Sachs Asset Management Multi-Asset Solutions. As of January 15, 2025.

to those familiar to a wider set of traditional investors (e.g. ETFs), and institutional adoption continues at a larger scale, there is an increasing likelihood of clearer and more constructive regulatory frameworks emerging.

Liquidity Risks: Bitcoin trading liquidity has improved notably in recent years. However, if buy-and-hold investors increase allocations, liquidity could decrease. Additionally, the total supply of Bitcoin is capped at 21 million coins, meaning that if certain investors capture a dominant market share, trading volume and liquidity might suffer.

Lack of Clarity Regarding the Economic Role of Bitcoin: Bitcoin and other cryptocurrencies can theoretically be used as a medium of exchange for goods and services. However, data from Statista shows that cryptocurrencies' share of transactions in global e-commerce payments remained subdued at 0.2% in 2022 and is only expected to rise modestly to 0.5% by 2026. Additionally, Bitcoin has experienced downturns of more than 75% twice in the last ten years, which does not align well with the characteristics of a financial instrument used to store value.

Technological Risk: Due to the technologically complex nature of Bitcoin, it is proned to heightened risk of cyber threats. Whether it is quantum computing invalidating the cryptography currently used in Bitcoin, bugs within wallet bridges, cyber-attacks to exchanges, investors should consider all cyber risks and controls when evaluating the use of distributed ledger technology.

These risks, combined with high uncertainty over expected returns, make it highly challenging for most long term/multi-asset investors to justify a strategic allocation to Bitcoin today, in our view.

What Could Change Our View?

In the US, the regulatory framework around Bitcoin has improved over the last decade, with the expectation that further clarity will emerge following President Trump issuing an Executive Order to establish a Digital Assets Regulatory Framework. The Securities and Exchange Commission (SEC) under the Biden Administration recognized most cryptocurrencies as securities, with the exception of Bitcoin, though the classification of these assets under the Trump Administration will be a focus of both the regulatory agencies and market structure legislation. Recently, the SEC rescinded its Staff Accounting Bulletin (SAB) No. 121, which required an entity to recognize a custodied crypto asset on balance sheet.[15] Additionally, the Internal Revenue Service (IRS) treats cryptocurrencies as property and applies taxation, and the Commodities and Futures Trading Commission (CFTC) has increased cryptocurrency regulation around trading. Nonetheless, the misuse of cryptocurrencies for illicit financing and money laundering remains a concern that needs to be addressed. An improved regulatory framework could also lead to wider adoption of cryptocurrencies for economic transactions.

Another potential upside for cryptocurrencies could be adoption by major central banks as part of their reserve policy. Currently, official foreign exchange reserves and gold holdings are around $15 trillion[5]. A small allocation of reserve assets to Bitcoin may or may not be prudent policy, but it could instil confidence among private investors, leading to further inflows into cryptocurrencies in general and Bitcoin in particular. Finally, we would need to see tighter integration and significant adoption of Bitcoin in the real economy. Without greater integration, understanding the real value of Bitcoin will continue to remain challenging and volatility likely elevated.

Current Unsuitability, High Bar

In summary, while Bitcoin has delivered high returns over the past decade, these returns are difficult to predict and should not be extrapolated. Even if Bitcoin achieves decent annualized returns in the coming years, any potential upside for multi-asset portfolios must be weighed against the significant idiosyncratic risks associated with Bitcoin. While an improved regulatory framework, tighter integration into the global financial system, and broader adoption by both institutions and major central banks could prompt us to re-evaluate Bitcoin's role in the strategic asset allocation of multi-asset portfolios in the future, our analysis suggests that a strategic allocation to Bitcoin is not suitable for most institutional investors today and the bar for changing this view remains high.

[15] Source: CFTC. As of February 18, 2025.

NOTES:

Our Strategic Long-Term Assumptions for Equities, Bonds, and 60/40 Portfolio

	Expected Return	Volatility
Equity	6.8%	15%
Bonds	4%	4%
60% Equities & 40% Bonds Portfolio	5.8%	9.5%

Multi-Asset Solutions Assumptions for Bitcoin

	Volatility	Correlation with 60/40 Portfolio
Bitcoin	55%	0.35

Our long-term horizon is ten years. Expected returns are estimates of hypothetical average returns of economic asset classes derived from statistical models. There can be no assurance that these returns can be achieved. Actual returns are likely to vary. Please see additional disclosures. Alpha and tracking error assumptions reflect Multi-Asset Solutions' estimates for above-average active managers and are based on a historical study of the net-of-fee results of active management. Strategic long-term assumptions are subject to high levels of uncertainty regarding future economic and market factors that may affect future performance. They are hypothetical indications of a broad range of possible returns. All numbers reflect Multi-Asset Solutions' strategic assumptions as of September 30, 2024. Please see additional disclosures. The returns presented herein are gross and do not reflect the deduction of investment advisory fees, which will reduce returns.
The data regarding strategic assumptions has been generated by MAS for informational purposes. As such data is estimated and based on a number of assumptions; it is subject to significant revision and may change materially with changes in the underlying assumptions. MAS has no obligation to provide updates or changes. The strategic long-term assumptions shown are largely based on proprietary models and do not provide any assurance as to future returns. They are not representative of how we will manage any portfolios or allocate funds to the asset classes.

GLOSSARY

The Sharpe ratio is a measure used to evaluate the risk-adjusted return of an investment. It is calculated by subtracting the risk-free rate from the investment's return and then dividing this result by the investment's standard deviation.

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The Ivy League Keeps Failing This Basic Investing Test

Elite universities are again stuck with illiquid assets just when they badly need cash

By Jason Zweig Follow

Aug. 22, 2025 10:00 am ET

ILLUSTRATION: ALEX NABAUM

Why does the smart money keep flunking Investing 101?

During the 2008-09 global financial crisis, many of the world's biggest investors found themselves in dire need of cash because they had sunk too much money into assets that couldn't be publicly traded.

Now they've made the same mistake all over again.

Over the past couple of decades, no group of investors has piled into what are called alternative assets more eagerly than the endowment funds of major colleges and universities. In their rush to emulate the stellar success of Yale University's endowment head David Swensen, who died in 2021, educational institutions pulled

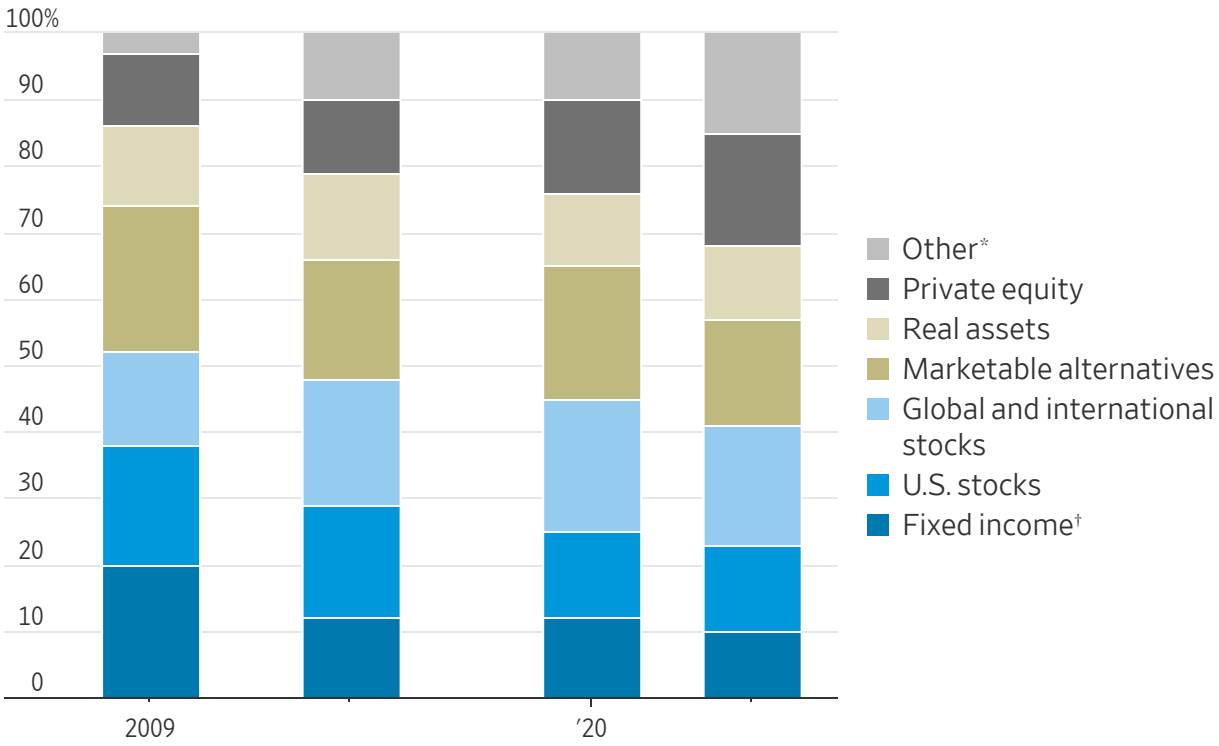
tens of billions of dollars out of stocks and bonds and poured it into hedge funds, private equity, venture capital and other investments that don't trade publicly.

The result looks nothing like the portfolio of 60% stocks and 40% bonds that has long been a guidepost for many investors. On average, in fiscal 2024, educational endowments with more than $5 billion in assets held only 2% in cash, 6% in bonds, 8% in U.S. stocks and 16% in international stocks, according to the National Association of College and University Business Officers. That left two-thirds of their total holdings in private funds and other non-traditional assets that can't readily be turned into cash.

Now you understand the life-or-death panic that seized such elite institutions as Brown, Columbia, Cornell, Harvard, Northwestern and other universities when the Trump administration threatened to cut off their federal funding. Even though their endowments hold billions of dollars, much of that immense wealth might as well be stored on the planet Proxima Centauri b, about 4.2 light years away.

These universities are slashing budgets, freezing their hiring and scrambling to raise money any way they can.

Average asset allocation of U.S. college and university endowments



*Includes venture capital †Includes cash Notes: Weighted by size of endowments. Marketable alternatives include hedge funds. Fixed income includes U.S. and international bonds, short-term debt, high yield and distressed debt, and private credit. Real assets include private real estate, energy, infrastructure. For 2024, "other" includes sustainable investments and secondary private-equity funds.
Source: NACUBO-Commonfund Study of Endowments

Brown, whose endowment assets exceed $7.2 billion, had to borrow $300 million in April and an additional $500 million in July "to protect the university against worst-case financial scenarios," it said this month. Northwestern, with its $14.3 billion endowment, borrowed $500 million earlier this year; Harvard, with its titanic $53.2 billion endowment, raised $750 million in April.

To be fair, much of the money at endowments is restricted, meaning it can be spent only for prespecified purposes. But that's all the more reason why putting so much of it in nontraded assets is a bad idea.

The saddest part of this sad saga is that it's déjà vu all over again. "A recent survey of college and university presidents found that 50% have, or will soon, put in a hiring freeze," I wrote in 2009. "Nearly 7% admitted selling assets into a bear market; another 9% have been forced to borrow money at punitive rates."

The lesson is so simple even Ivy Leaguers should be able to understand it.

In good times, investors give no thought to liquidity, because cash is plentiful and the need for it isn't pressing.

In hard times, liquidity becomes the only thing investors can think about, because cash is scarce and the need for it is desperate.

And when you have a sudden, urgent need for cash, good luck selling your alternative assets.

Yale—which started the whole craze for alternative assets decades ago—has reportedly been seeking to sell several billion dollars in private-equity funds for more than a year. The Wall Street Journal has reported that the funds are expected to sell for less than their stated value.

This spring, after months of effort, Harvard sold $1 billion in private-equity funds at about a 7% discount to their stated value, the Journal has also reported.

Note that this retrenchment is recurring amid one of the biggest bull markets in history. Just imagine how hard it would be for these institutions to raise cash if public markets were crashing, as in 2008-09, or if interest rates were skyrocketing, as in 2022.

Back in 2007, Laurence Siegel, then research director for the Ford Foundation's endowment, analyzed what would happen if institutional investors that had gorged on alternative assets suddenly needed to raise cash.

An endowment that had sold most of its bonds to fund the purchase of private assets, as many already had done by then, would have to sell its publicly traded stocks if it had to raise cash, he wrote.

In a bear market for stocks, Siegel warned, an institution with 50% of its assets in alternatives could run out of cash in as little as two years.

Nobody listened.

Within months, many institutional investors suffered their worst losses since the 1970s—and often turned those paper losses into real ones, selling their most liquid assets into a market panic.

What the university "smart money" should have learned is that liquidity is priceless and must never be taken for granted.

And that's why investors, no matter how large or small, should never put most of their assets into illiquid securities. No one can possibly predict when public markets will crash or public officials will take unprecedented action, turning private assets into albatrosses.

Of all the ailments investors suffer, amnesia is the most deadly. What happened less than 20 years ago feels as if it took place in ancient Mesopotamia. As Siegel told me this week, instead of learning the obvious lessons of 2008-09, university endowments "just doubled down."

But, I protested, aren't they supposed to be the smart money?

"They're not as smart as they look," Siegel said, "because they're human, and humans are quite closely related by evolution to monkeys."

Don't be a monkey. Don't put a penny into alternatives that you can't afford to have locked up when you suddenly need cash.

Write to Jason Zweig at intelligentinvestor@wsj.com

Appeared in the August 23, 2025, print edition as 'Colleges Fail This Basic Test'.

Further Reading

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OPINION Harvard's Pyrrhic Legal Victory

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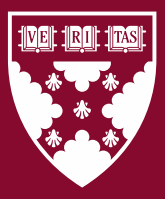
Does the Case for Private Equity Still Hold?

Nori Gerardo Lietz
Philipp Chvanov



Harvard Business School

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Nori Gerardo Lietz
Harvard Business School

Philipp Chvanov
Harvard Business School

Working Paper 24-066

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Does the Case for Private Equity Still Hold?

January 10, 2024

Nori Gerardo Lietz

Philipp Chvanov

Executive Summary

Private Equity ("PE") has received an extraordinary 10-fold increase in capital flows since the Great Financial Crisis ("GFC") by investors seeking higher nominal returns relative to those they could obtain in the public capital markets. This paper questions the fundamental assumptions underlying why investors should select PE as an asset class to be included in their composite portfolios.

The basic historical premises for including PE were:

- Superior returns relative to public markets or public market equivalents ("PMEs")
- Superior returns that would compensate the investor for the associated lack of liquidity
- Low correlations relative to the public markets and lower volatility
- Generating appropriate excess performance relative to the public markets net of fees
- Superior returns were due to:
    - Identifying appropriate target companies at "bargain" prices
    - Creating operational improvements within portfolio companies
    - Generating multiple expansion and increased value due to operational improvements
    - Restructuring the portfolio companies' balance sheets primarily by adding significant leverage
    - Exiting the investment at the appropriate inflection point

The current data raises questions about these predicate assumptions. All the actions PE firms claim add value to portfolio companies should result in superior returns relative to PMEs. The data indicate the average or median PE funds do not actually outperform their PMEs since the GFC. While the top quartile PE funds have outperformed the PMEs since the GFC, the data raises three particularly disturbing conclusions.

First, General Partner ("GP") fund performance persistence has eroded materially. Past performance is not necessarily indicative of future performance. While the top quartile GPs outperform relative to PMEs over time, they are not necessarily **the same** GPs over time. This conclusion relates to the aggregate data. There may be some individual firms who consistently perform exceptionally well or exceptionally poorly. Indeed, the most predictive information relates to those GPs who are more consistently in the bottom quartile.

The second disturbing conclusion is that if there is little persistence among the top quartile firms, then the selection of any GP is potentially a "random walk". If that is the case, then investors should expect to achieve at best only average or median PE results. There are two studies indicating that the results of successful GPs may be as much attributable to "luck" than skill, mirroring the conclusions of the venerable Eugene Fama regarding active equity managers.

The third conclusion is there has been a somewhat shocking concentration of capital flows among a small number of firms. Is this a good attribute for the industry? Given the general lack of performance persistence among PE GPs, one should ask whether (i) capital is flowing to the best firms, (ii) capital is flowing based upon the "brand" of the PE firm, or (iii) capital flows are based on investors "looking in the rear view mirror" or desiring one stop shopping?

In sum, the PE data suggest that (i) traditional methods of evaluating a given GP partnership are questionable; (ii) evaluating performance persistence post 2008 may be subject to doubt at the time the investment is made; (iii) selecting a given GP in the hopes of obtaining top quartile results may be a random walk; (iv) investment performance may possibly be as much attributable to luck rather than skill; (v) the recent median PE investments do not outperform PMEs and one is just as likely to select a median GP as a top quartile GP; and (vi) PE performance may actually underperform PMEs on a risk adjusted basis given the amount of leverage they employ generating equivalent results on a nominal basis.

These conclusions suggest that the PE industry may be ripe for disruption, much as the mutual fund industry after the introduction of ETFs and index funds. There are disruptive forces at play by investors attempting to reduce their costs, and thereby enhance their returns, by adopting alternative investment methods. Some are internalizing their investment efforts. Others may look for alternative investment products that will mirror PE results at a lower cost. Similar disruptive forces have been evidenced in other financial service industries which may affect where the very best talent wants to go.

Given the size of the private markets, investors are likely to continue to desire exposure to these segments of the capital markets. The fundamental question is not ***if*** they want exposure to private investments but ***how*** they will achieve it. In short, the PE industry may have to structurally change in order to continue to attract capital or the rationale for investing in PE may have to be revised.

Does the Case for Private Equity Still Hold?

Unfortunately, the last billionaire in private equity ("PE") has already been made. This statement will understandably disappoint the scores of Harvard Business School ("HBS"), other business school students, and others clambering to enter the industry. The PE and VC courses are among the most popular at HBS and students take them hoping to gain access to the industry. Securing a position within a PE firm is no easy task. Steve Schwarzman, CEO of Blackstone, has publicly claimed that getting into Blackstone is more competitive than getting into Harvard as they accept 0.6% of applicants[1].

It has been well documented that the PE industry has dramatically changed over the last decade. Among these changes discussed below are:

- A ten-fold increase in the assets under management ("AUM")
- A dramatic increase in the size of the mega funds
- A concentration of capital among the largest 20 PE General Partners ("GPs") firms, especially among the top five firms
- An acceleration of fund-raising cycles
- Reduced returns relative to the public markets over the past 10 years
- An economic environment in which interest rates fell or remained quite low for a sustained period; for purposes of this paper since the Great Financial Crisis ("GFC")

These industry changes and the public capital markets have had an impact on PE performance. The more recent results in the past decade call into question the basic premises as to why investors include PE within a mixed asset class portfolio.

This paper lays out the case for why the PE industry is ripe for disruption, and why this disruption is already beginning to occur. Major changes will likely occur for PE over the next several years. Some may perceive this paper as a PE indictment. That is not the case. The point is not to suggest that PE is inherently "bad". Rather, it is a call for investors to reexamine how and with whom they invest.

This is not a traditional academic paper. Academics tend to look at historical data and draw conclusions to be derived from the data explaining what happened in a historical context. The author lives on the hyphen between academia and the business world and wants to translate academic conclusions for practitioners. The purpose of this paper is not to replicate the excellent work other academics have already done but instead to extrapolate from their conclusions as to future industry ramifications. It should be emphasized these academics have not produced "pointy headed" exercises of angels dancing on the head of a pin. Their studies and conclusions are critically important.

The focus will be on PE, not venture capital ("VC") and real estate private equity as the conclusions from data for those asset classes are different. Real estate will be separately addressed in another paper.

Section 1 summarizes the historical case made for private equity. Section 2 analyzes whether the underlying assumptions associated with the case for private equity still hold true. Section 3 reviews pertinent academic research concerning PE performance. Section 4 reviews the trends in the mutual fund industry and whether its evolution portends potential changes that may occur in the PE industry. Section 5 addresses some of the incipient ideas for alternative investment approaches that may disrupt the PE industry.

Section 1: The State of the State of Private Equity

A. The Original Case for Private Equity

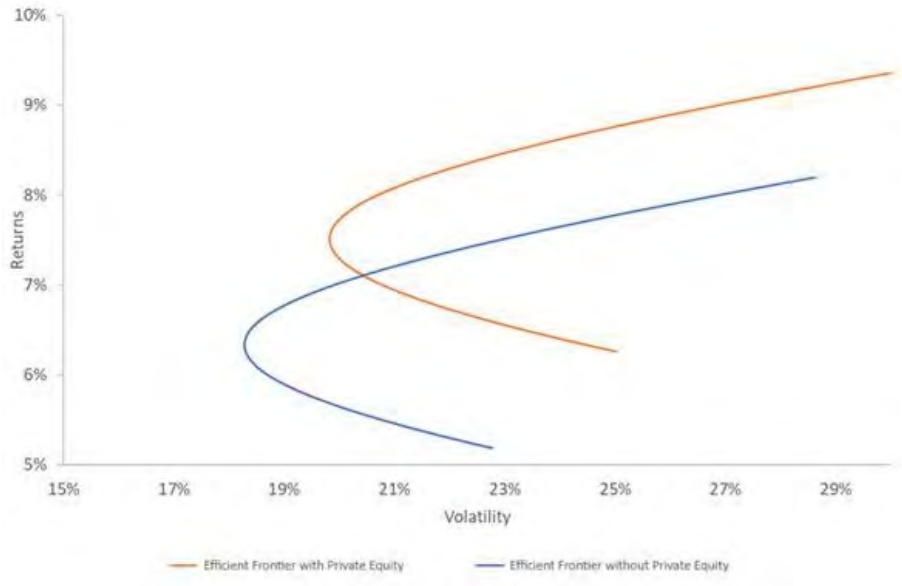
The early case for investing in private equity was made to institutional investors, most notably the Oregon and Washington state pension funds who were among the earliest PE investors. They invested in KKR's early funds in the 1980's. The State of Oregon was the author's initial client in 1988 and witnessed the early presentations of the now behemoth PE firms including KKR, Blackstone, TPG, among others. At the time, the firms' original founders made the "pitches". One of the most effective presentations was by George Roberts, co-founder of KKR, to the Oregon Investment Council. In the mid- 1990's he said to the Council, "You gave us $1 Billion. We've given you back $1 Billion. We conservatively value the remainder of your investment with us at $3 Billion. Any questions?" There were none.

There was a consistent story line associated with these presentations. These new firms would differentiate themselves from active public equity managers in that they would be directly involved in setting their portfolio companies strategies and exercise actual control over the companies by having a majority of the portfolio company's board seats. In short, their approach would add value to the company's operations and in the long run would generate outsized returns especially relative to public market alternatives.

At the time, pension funds turned to their advisors and asked for a more quantitative rationale to support the inclusion of a new asset class in their composite investment portfolios. The analysis led to the several conclusions concerning this new asset class based upon a series of assumptions about how the most inefficient PE asset class would perform, including: (i) low correlations with the traditional asset classes of public equities and public fixed income; (ii) higher potential returns than the traditional asset classes; and (iii) lower reported volatility and therefore a reduction of composite portfolio risk due to the lower reported volatility. The aggregation of these factors would help move the composite portfolio higher on the efficient frontier by increasing returns at a seemingly lower level of risk. Expected returns became codified as the "2 and 20" rule, otherwise known as a 2x MOIC (Multiple of Invested Capital) and a 20% IRR (Internal Rate of Return). The phrase 2 and 20 also refers to the fees the GPs received in terms of management fees and carried interest percentages.

Pension fund advisors created a series of efficient frontiers illustrating the impact of including PE as an asset class in a mixed asset portfolio. Not surprisingly composite portfolios became more "efficient" suggesting higher returns at a lower level of risk by including these private investments. The expected return and correlation assumptions for each asset class, which are the inputs into the "optimizer", are reflected in **Exhibit 1**. **Figure 1** illustrates how the inclusion of PE in a mixed asset portfolio improves risk adjusted performance over time.

Figure 1 Model Portfolios With and Without PE in a Mixed Asset Portfolio



Source: Authors.

See **Exhibit 1** for the underlying assumptions in constructing the Efficient Frontier in **Figure 1**.

The historic reported volatility, which has been used as a proxy for risk, is much lower in PE than in the public markets. The optimizer models used by institutions to determine their asset allocations gravitate to lower volatility asset classes with commensurate or higher returns, and uncorrelated results based on the reported returns used as inputs. An unconstrained asset allocation optimizer would allocate significant percentages to PE, real estate, and VC as they exhibited (i) lower reported correlations to traditional asset classes; (ii) lower reported volatility than the traditional asset classes; and (iii) historic returns in the 1990's and early 2000's that were higher in PE and VC.

However, sophisticated investors recognize this result is simply a function of the data inputs into the optimizer model and the private markets' volatility is understated. Consequently, the allocations to these asset classes are typically constrained. Does a rational, knowledgeable investor genuinely believe a private investment in a private company leveraged 65% is less risky than a comparable public company leveraged 30%?

It should be noted that the historical lower correlations and lower volatilities were largely attributable to the accounting methodology used in the private markets to report returns. Historically, most investments were held at cost until an "event" occurred, such as a follow-on investment or a sale, and were then marked to market at the transaction price. In short, they were held at the lower of cost or market until the event actually occurred. Investments were not marked to market each day as they are in the public markets or even on a quarterly or annual basis.

This reporting convention changed over time prompted in part by the 2008 Great Financial Crisis ("GFC") in which mortgages and real estate contributed to the heavy incurred losses. In 2009 the Financial Accounting Standards Board ("FASB") adopted guidelines of IFRS 13 and FASB ASC 820, which suggested that even private assets should be marked to market. These guidelines require PE firms to report using fair value accounting and mark their investments to market on a quarterly basis using internal valuations. PE firms continue to have audited annual financials in which their reported marked to market values are reviewed by the external accounting firm. The Securities and Exchange Commission has also recently proposed new regulations that would require audited marked to market values for their portfolios.

In marking to market PE firms frequently look to public market multiples of comparable companies as a proxy for the multiple to be used to value the private investment. Query whether this change in accounting methodology has caused the return convergence between the public and private markets as is reflected in **Figure 10** below. This reporting methodology change increases the volatility of PE investments and using public market comparables should increase the correlations with public market returns. Public market prices reflect investor psychology in a way that the private markets do not. More research needs to be done on this topic.

How would PE firms achieve these promised outsized returns relative to the public markets? The firms professed they would: (i) exercise their investment acumen by selecting appropriate target companies; (ii) negotiate the terms of the investment; (iii) restructure the target company's balance sheet typically by adding significant amounts of leverage; (iv) monitor the investment; (v) add value via operational improvements, by modifying the corporate strategy and/or by implementing cost cutting measures; and (vi) then exit the investment at an appropriate inflection point. The exits were often by taking the company public or a sale to another strategic investor. The early PE results supported the investment theses. GPs also maintained that their track records exhibited persistence and were predictive of future results.

In the 1980s and 1990s, most PE firms had a sole product line, which was their flagship fund. This paper focuses on the flagship PE funds that have attracted the bulk of investment capital. Further, given the amount of capital, the length of their track record and the academic research, the focus and conclusions are primarily on US private equity firms.

During this early time period PE was a cottage industry largely unknown outside the pension fund institutional market. Early PE funds were considered large if they exceeded $500 million. The backwater nature of the industry changed when Barbarians at the Gate (KKR's acquisition of RJR Nabisco) was published in 1989.[2]

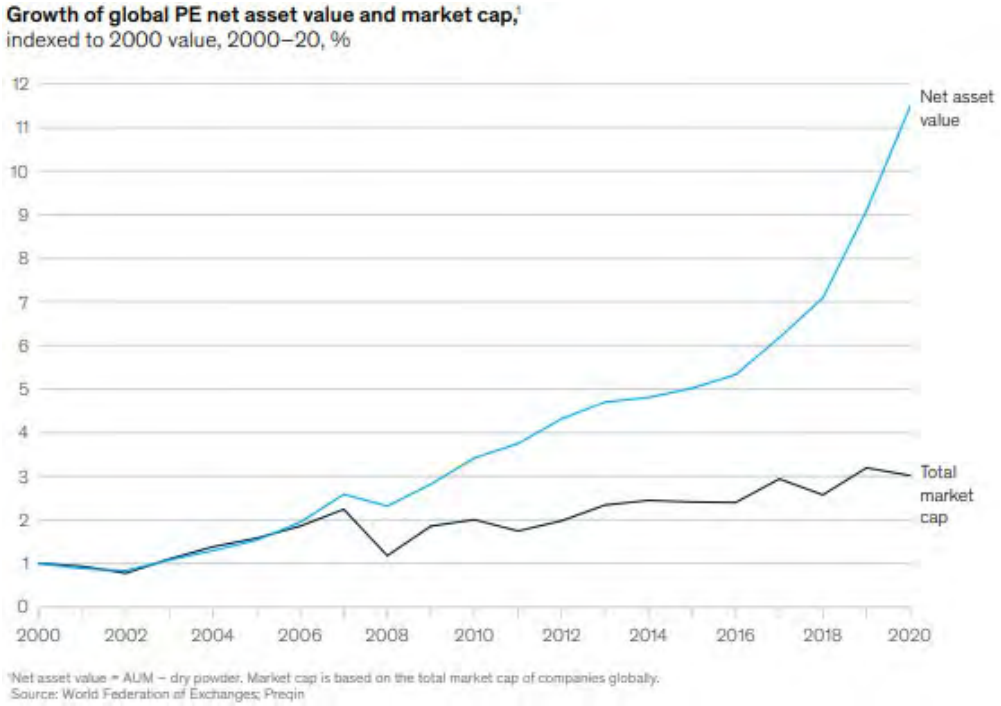
B. Current State of the Industry

Clearly, the industry has evolved dramatically over the decades. The PE industry has transformed the capital markets. The funds raised by these firms are now multibillion dollar portfolios. The largest firms have multi product lines including real estate and credit and have become global investment institutions. The aggregate size of their investment portfolios dwarfs the public markets as depicted in **Figure 2**. Most of the change has occurred in a comparatively short time period since the GFC. The industry today bears little resemblance to the PE industry pre-2010. Many of the largest PE fund managers are now public companies.[3]

The impact on the capital markets has been dramatic. The number of PE backed companies was 1,698 in 2000 and grew to 8,892 in 2020.[4] Further, the number of public companies declined from approximately 7,500 listed companies in 1998 to under 4,400 in 2018. [5] The value of these private companies grew almost exponentially when compared to an estimate of the size of the global public capital markets. Many of these private companies do not want to be bothered with the expense or "hassles" of being public companies.

Perhaps the better rationale for PE inclusion in a portfolio is to have access to these companies. But what is the most effective way one should invest to gain access to these companies is a legitimate question. Is the current PE model the best and most effective one to follow? It should be noted that the largest firms are for the most part no longer investing in the smaller, mid-market private firms via their flagship funds.

Figure 2 Growth of a Dollar of Global PE Net Asset Value and Market Cap, Indexed to 2000 Value, 2000-20, %



Source: "Private Markets Rally to New Heights," p. 23, Exhibit 15, McKinsey & Company, March 2022, https://www.mckinsey.com/~/media/mckinsey/industries/private%20equity%20and%20principal%20investors/our%20insights/mckinseys%20private%20markets%20annual%20review/2022/mckinseys-private-markets-annual-review-private-markets-rally-to-new-heights-vf.pdfm, accessed November 2023.

How did this exponential growth happen? The early PE funds generally delivered on the expectations created for these investments. Success begat success. In the last 13 years the industry has dramatically increased in terms of the proliferation of the number of both funds and firms as well as their fundraising activity. The number of funds focusing on US buyout strategies from

1996 to 2007 was 2,275, and by 2021 the number funds increased to 3,317.[6] The number of firms (fund managers) increased by 34% in the respective time periods, from 1,143 to 2,527.[7] Cumulative funds raised (starting from 1996) nearly trebled, from $1.3 trillion by the end of 2007 to $3.2 trillion by the end of 2021.[8] See **Figure 3**.

Figure 3 Growth of US Buyouts Industry at the End of the Respective Period

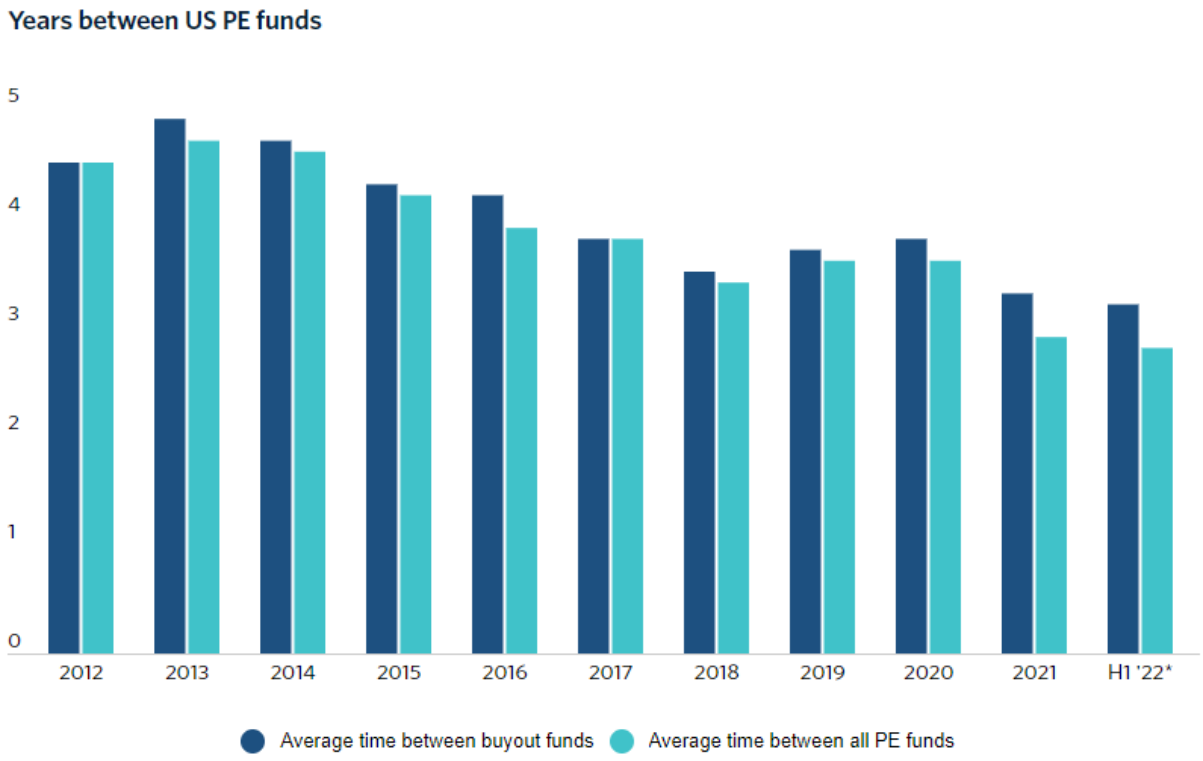
	1996-2007	2008-2021	Change
Number of fund managers	1,143	1,527	33.6%
Number of funds	2,275	3,317	45.8%
Funds raised	$1,322,203	$3,209,252	142.7%

Source: Created by authors using data from Refinitiv, accessed October 6, 2022.

The early firms' success in attracting capital was compounded by the needs of many institutional underfunded pension funds seeking higher nominal returns to reduce their unfunded liabilities. The promise of higher nominal returns was, and remains, an extremely attractive rationale for committing additional capital, especially with the decline in nominal returns in the equity and fixed income portfolios over the past several years. Many of the institutions have gradually increased their allocations to PE from the 8-10% range. Now the largest PE investor, the Canadian Pension Fund, has approximately 33% of their composite portfolio with more than $130 Billion allocated to PE.[9] Many others exceed 20%.

The largest PE firms now seek retail investors who similarly desire higher nominal returns.[10] They are either developing an internal distribution method with the assistance of external retail distributors, such as Blackstone or Partners Group, or simply buying smaller wealth management firms, such as KKR, Lightyear Capital, General Atlantic, or Oak Hill Capital.[11] In the latter instance the PE firm will sell their products through the acquired wealth management firms. The time frame between capital raises for their flagship funds has declined as shown in **Figure 4**. In short, the largest PE firms have recently been "Hoovering" up money and have cut the time-period between fundraising by approximately one-half. The industry is seeking an additional $1 Trillion of new funding.[12] Why is this happening? We address the rationale and its potential impact in Section 4.

Figure 4 Years Between US PE Funds

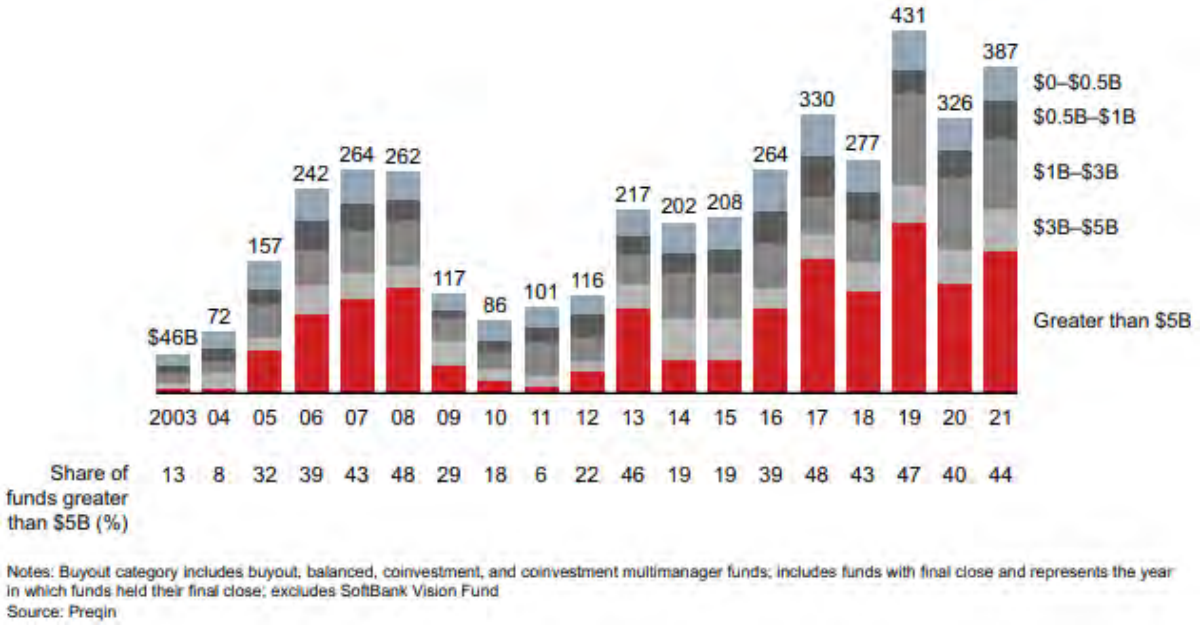


Source: "Charting US PE's performance in Q2," Pitchbook, 18 July 2022, https://pitchbook.com/news/articles/pe-breakdown-trends-charts#:~:text=The%20average%20time%20between%20PE,on%20average%20for%20buyout%20funds, accessed November 2023.

Additionally, PE firms' evolution spawned an entire ecosystem of other firms established to serve the PE firms and their investors. Investment banks received fees from transactions on both the buy and sell side when companies were acquired and later sold. Attorneys specialized in transactions, fundraising and other private market issues. Valuation firms specializing in underwriting private companies were created or new departments formed in management consulting and accounting firms to assist in transaction due diligence. An entire consulting or "gatekeeping" industry came into being to assist investors in underwriting the general partners and assessing their track records. In addition, LPs now have PE specialists whose sole responsibility is to select and monitor their PE portfolios. All these parties have a considerable vested interest in maintaining the status quo of a multibillion-dollar industry.

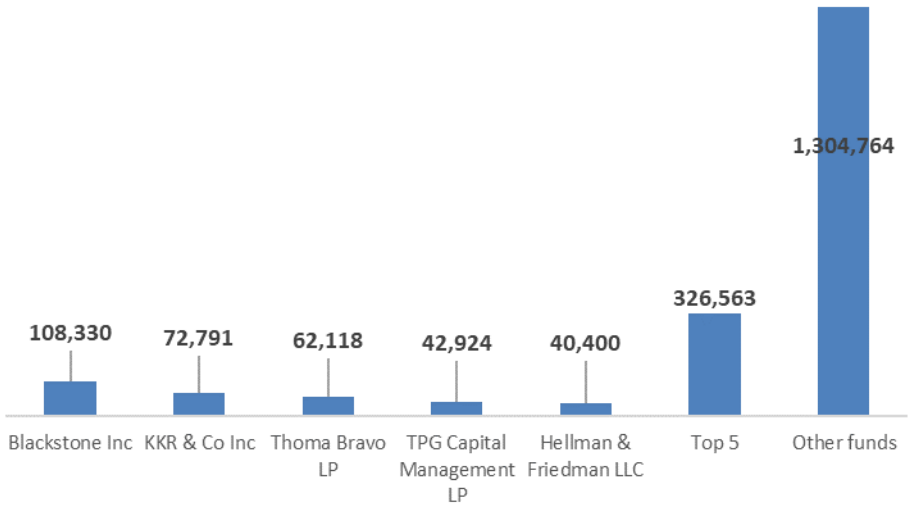
The industry has been transformed in multiple ways since 2000 but particularly post 2008. The assets under management have exploded ten-fold since 2003 as shown in **Figure 5** below. Other key trends show the concentration of capital among the largest firms. Funds over $5 billion have received between 43%-48% of all the capital raised in the last five years as shown in **Figure 5** below. Indeed, the top five firms account for **25% of all the capital raised** between June 2017 and June 2022 as shown in **Figure 6**.

Figure 5 Global Buyout Capital Raised, by Fund Size ($B)



Source: "Global Private Equity Report 2022," p. 22, Figure 24, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf , accessed November 2023.

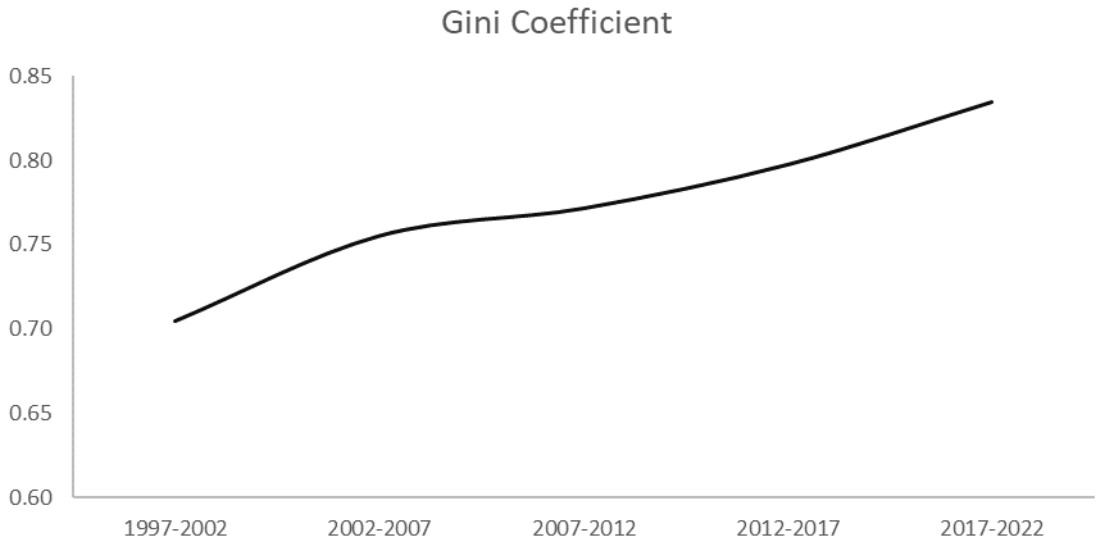
Figure 6 Concentration of PE Capital, $mm Funds Raised (Global Buyouts, June 2017 – June 2022)



Source: Created by authors using data from Refinitiv, accessed June 2022.

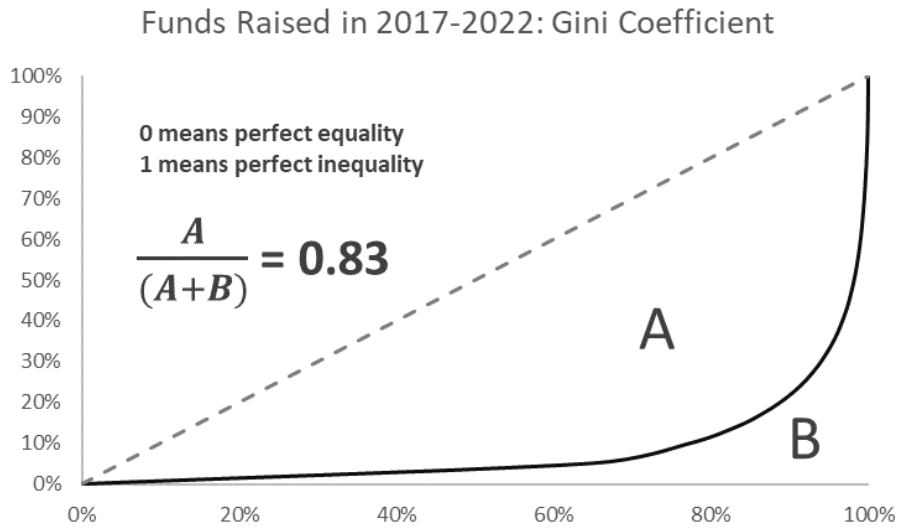
Concentration of the industry can be gauged by standard market measures such as the Herfindahl-Hirschman Index popular with antitrust regulators and the Gini coefficient, which is typically used to measure the level of inequality (see **Exhibit 4** for methodology disclosure). **Figures 7** and **8** confirm the thesis that the buyout industry has become more concentrated and unequal a with smaller number of firms capturing the largest amount of total funds raised.

Figure 7 Gini Coefficient (Global PE, All Strategies)



Source: Created by authors using data from Refinitiv and Preqin Pro.

Figure 8 Gini Coefficient for Funds Raised During 2017-2021

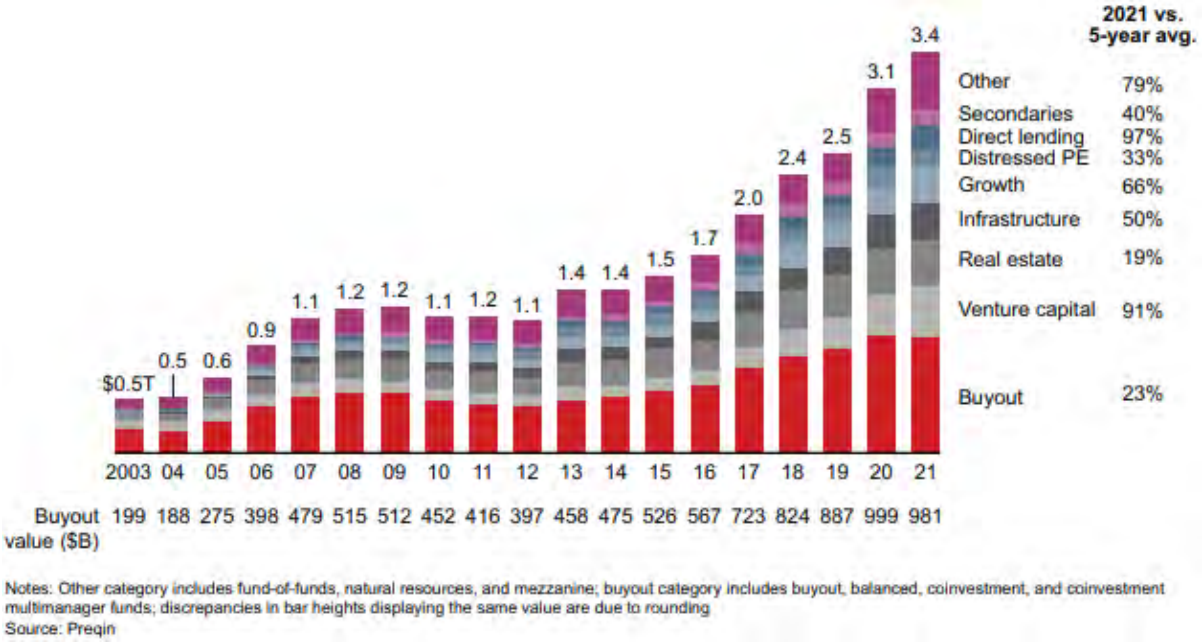


Source: Created by authors using data from Refinitiv and Preqin Pro.

Is the concentration of capital allocations beneficial to investors and the industry? The answer is yes only if the top firms consistently outperform in comparison to one another and to PMEs.

Similarly, the amount of capital to be invested or "dry powder" has grown substantially. It has been well documented that there is considerable uninvested capital in all private sectors, estimated to be over $3 Trillion sitting on the sidelines waiting to be invested. This is a potentially concerning phenomenon based on academic research as discussed below. The largest percentage of dry powder is in PE.

Figure 9 Global Private Capital by Dry Powder, by Fund Type ($T)



Source: "Global Private Equity Report 2022," p. 9, Figure 8, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf, accessed November 2023.

Section 2: Does the Case for Private Equity Still Hold True? Are the Fundamental Assumptions Still Valid?

Allocations to PE firms were predicated on the key assumptions referenced above. Do they still hold true? Many of the academic analyses utilize data dating back to the early days of the industry. The performance data in the early years are very different from those of the last decade. Given the structural changes in the industry since the GFC in terms of (i) the growth of the industry; (ii) the returns; and (iii) the change of accounting practices, one can question whether the early years data distort the conclusions one should derive based on the data since the GFC. PE is now a very different industry and the industry data post 2008 lead to different conclusions. This paper focuses on the industry metrics post 2008.

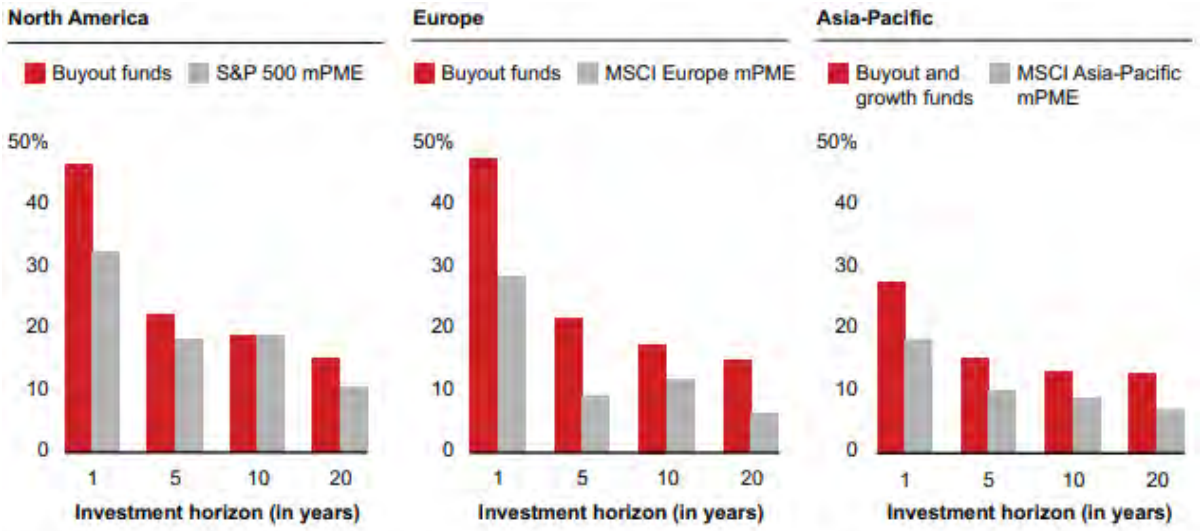
The first key assumption was that PE should generate superior results relative to public market alternatives. Part of the rationale for this assumption is the premise that long term, private

investments should provide some liquidity premium relative to public market alternatives. PE performance comparisons to the public markets have changed dramatically in the recent decade. This is likely partially attributable to the substantial industry changes noted above but more research on this topic should be done to determine whether this is accurate.

A. Nominal Return Outperformance Relative to Public Markets

Figure 10 illustrates that over the last decade the pooled IRRs of PE funds investing in North America have not outperformed a US customized benchmark created by Cambridge Associates, a leading PE consulting firm. This does not mean that in an individual year the PE firms will not outperform. This is the aggregated performance over time. The benchmark is comprised of PMEs to those typically acquired by PE firms. There does appear to be sizeable outperformance in Europe and Asia, but not in the US over the past 10 years. The amount of capital raised to be invested in the European and Asian markets has been dwarfed by the amount allocated to the US as shown in **Figure 11**.[13] While Figure 11 does not depict where the capital was actually invested, it is reasonable to assume that the preponderance of the capital was invested in North America relative to Europe and Asia Pacific. These capital flows may have had an impact on performance in the US market in the past decade relative to non-US markets in the past 10 years. The academic research concerning capital flows discussed in the next section supports this conclusion.

Figure 10 End-to-End Pooled Net IRR (as of Q3 2021) for North America, Europe, and Asia-Pacific at the end of the Trailing One Year, Five Year, Ten Year, and Twenty Year Periods at 12/31/2021



Notes: Data for US and Asia-Pacific calculated in US dollars; data for Europe calculated in euros; Europe includes developed economies only; Cambridge Associates Modified Public Market Equivalent (mPME) replicates private investment performance under public market conditions
Source: Cambridge Associates

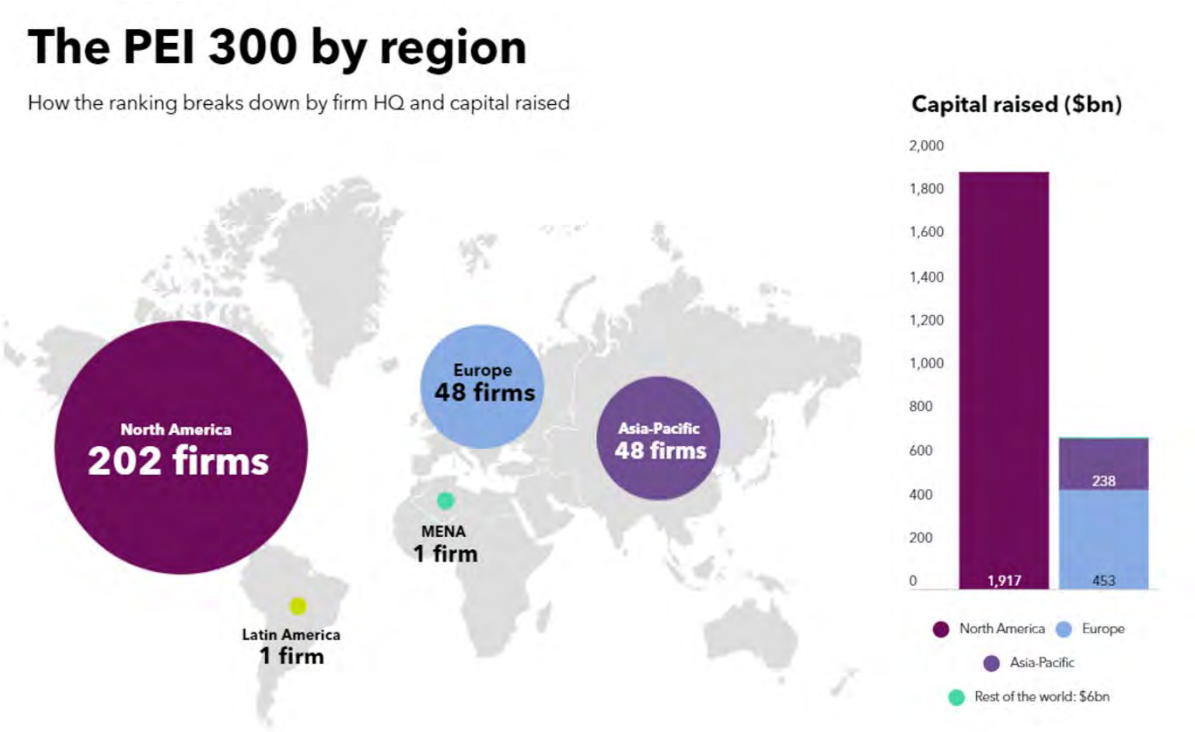
Source: "Global Private Equity Report 2022," p. 25, Figure 26, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf, accessed November 2023.

It is unclear whether these numbers are dollar weighted. If not, the results are **materially** distorted by including the superior results within the 20 year time period within the later 10 year time period. The funds in the early days of PE (from 2000 through 2010 had vastly lower aggregate capital commitments than those funds raised in the past 10 years. The early funds performed materially better than those in the subsequent 10 year time period. Including the results of both sets of funds in the 20 year time period makes the 20 year results artificially high if not dollar weighted. Thus, the conclusions one might draw about PE's performance relative to PMEs may be wrong.

If the 20 year time series were dollar weighted, the past 10 year dollar weighted PE results would likely be reduced, as they include the performance results of the much smaller funds for the preceding 10 years. It is not possible to estimate how many funds or how long the 20 year results are included in the shorter time period before they rolled out of the sample pool. **However, even if the results were dollar weighted, the conclusions would be the same.** During the last 10 years PE on average did not outperform the public markets in aggregate. Given the industry changes within the last decade, the 10-year comparison is the more relevant statistic than the 20 year time frame.

A few additional comments are warranted about **Figure 10**. The charts reflect pooled IRRs and not multiples on invested capital or "MOICs", which other data collectors present. IRRs can be manipulated in the early years and comparisons between one year and five year returns of private to public company performance are likely misleading. IRR comparisons in the first two to three years of a PE fund are often artificially distorted due to the use of Subscription Lines in the early years of a PE fund, which can inflate IRRs in a fund's early years.[14] The practice of using Subscription Lines to augment performance began approximately 15 years ago. The perhaps overstated one and five year results are included within and may distort the 10 year results.

Figure 11 The PEI 300 by Region



Source: "The 2022 PEI 300 in eight charts," p. 5, Private Equity International, 22 June 2022, https://www.privateequityinternational.com/download-this-years-pei-300-in-eight-charts/, accessed November 2023.

Given the industry changes within the last decade, the 10-year comparison is the more relevant statistic than the 20 year time frame. The 20-year comparison shows the industry did, in fact, outperform the PMEs over the past 20 years. This is notwithstanding the potential dilution of the past 10 years, as the results are included within the 20 year statistic. This chart suggests the PE industry did significantly better during the period of 1999 to 2009 relative to the public markets, if one extracted out the past 10 years at June 30, 2021 for those investments made in the United States.

Why are these observations important? Seventy five percent of PE capital raised has been by US based firms. While not all the capital raised has been invested in the US, the preponderance has been, as **Figure 11** above illustrates. The industry capital raised has increased 10-fold since 2003 as depicted in **Figure 5** above. **Figure 10** indicates that over the past decade the preponderance of the capital raised and invested in the US did not, on average and net of fees, outperform a comparable public market benchmark.

The resulting disappointing average performance versus PMEs may be attributable to the amount of capital invested in the US and the ensuing competition this created. If the US market has become more competitive, and possibly more efficient, this market context does not augur well for the sizeable amount of uninvested capital that may be targeting US based companies today. Academics have provided data that supports this concern.

Academic research by Steve Kaplan (one of the most respected academics specializing in PE) and his colleagues similarly found that the average PE performance in North America did not outperform the S&P 500 and other PME indices, net of fees, in the 1980's and 1990's contradicting the results depicted in **Figure 10**. Their research in this seminal piece, discussed in more detail below, analyzed the performance of 746 largely liquidated funds from 1980 to 1997. They found that: ***"Over the entire sample period (1980 to 1997), average [PE] fund returns net of fees are roughly equivalent to those of the S & P."***[15]

In subsequent updates to Kaplan's research in 2010, they noted that funds formed **before** 2005 did on average outperform the public market as measured by both the S&P and the Russell indices. However, **post 2005** until the time of their research the average PE funds did not outperform. They were equivalent.[16] These conclusions are consistent with **Figure 10** above. The average PE funds only outperformed on a gross of fees basis in a similar study conducted in roughly the same time period (Philippou).[17] This paper found underperformance when compared to a smaller cap value orientated (the types of companies PE firms then bought) PMEs on a net of fee basis. Others drew similar conclusions using different data sources.[18] The chart below, **Figure 12**, independently corroborates this conclusion.

Figure 12 S&P 500 vs Bloomberg Private Equity Index

Source: Bloomberg, accessed June 15th, 2022.

In **Figure 12**, the white line represents the performance of the Bloomberg Private Equity Index from 2012 through June 2022. The underperformance is evident.

In short, data from multiple sources, examining PE performance post 2005, call into question the premise that the average PE fund will outperform a PME benchmark on a nominal and net of fees basis, much less on a risk adjusted basis due to the leverage of PE portfolio companies. **It is plausible to argue that PE has underperformed on a risk adjusted basis relative to PMEs given the amount of leverage in their portfolios, if PE only delivers equivalent results on a nominal basis.**

The leverage comparisons are addressed next and then we examine whether there are different conclusions to be drawn from the top quartile, as opposed to the average or median performance of the funds.

B. Leverage Impacts

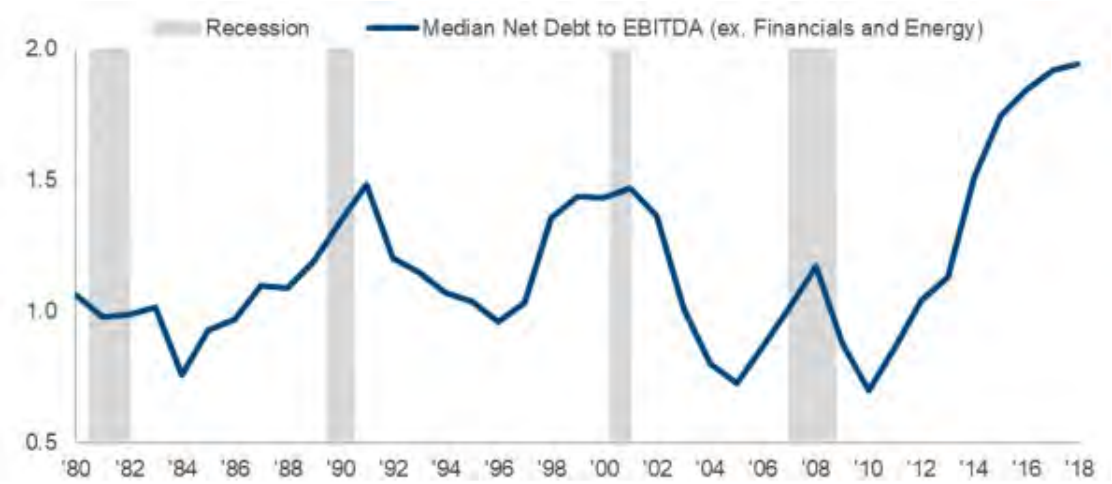
Given the material drawdown in the public markets through 2022 and given the higher leverage ratios of PE funds (See **Figures 13** and **14** below), the probability is that average PE funds may, on average, materially underperform the PMEs on a nominal basis in the near term. The PE leverage ratio as measured by debt to EBITDA was 7x as compared to a 2x ratio for the Russell 3000. While the leverage ratio of public companies increased dramatically from 2008 to the present, based on falling interest rates, it is nowhere near the ratio of their PE counterparts.

Figure 13 US Buyout Leverage Remained at Nearly Seven Times in 2021

Source: "Private Markets Rally to New Heights," p. 29, Exhibit 21, McKinsey & Company, March 2022, https://www.mckinsey.com/~/media/mckinsey/industries/private%20equity%20and%20principal%20investors/our%20insights/mckinseys%20private%20markets%20annual%20review/2022/mckinseys-private-markets-annual-review-private-markets-rally-to-new-heights-vf.pdfm, accessed November 2023.

Note: Russell 2000 Debt/EBITDA leverage YoY.

Figure 14 Net Leverage of Russell 3000 Companies (Ratio of Net Debt to EBITDA)



Source: FPA Risk is Where You're Not Looking, January 2, 2019, p. 10, https://fpa.com/docs/default-source/funds/fpa-crescent-fund/literature/risk-is-where-you're-not-looking.pdf?sfvrsn=8, Accessed May 30, 2022.

The difference in the leverage ratios between PE and PMEs and the equivalent performance of average PE funds over the past decade relative to these PMEs raises the question of whether PE firms are adding value on a risk adjusted basis. Even if they outperform, are they adding value or simply generating leveraged beta?

This is an important question, especially given the historical context since the GFC. Since the GFC the market economic environment was particularly salutary for PE given that interest rates either fell or remained quite low during this time period. In other words, investment performance may have been generated simply by "being there" with floating rate debt as opposed to some of the historically touted value enhancements PE GPs suggest they generate.

The likelihood that this historical pattern will continue prospectively seems highly unlikely given the Federal Reserve's actions in the past 18 months embarking on a continued pattern of raising rates to tame inflation. Indeed, some such as Howard Marks believe we are entering a "Sea Change" in the overall economy in which higher interest rates may be the norm.[19] In the face of rising rates, PE GPs will have to find other strategies to generate superior returns relative to PMEs.

Marks also highlighted that, "Relatively few investors today are old enough to remember a time when interest rates behaved differently. **Everyone who has come into the business since 1980 – in other words, the vast majority of today's investors – has, with relatively few exceptions, only seen interest rates that were either declining or ultra-low (or both).**" (emphasis in the original).[20] This points to the fact that the experience levels of current GPs in this market environment may be subject to question. They will no longer be able to necessarily rely on falling rates as one of the tools in their toolkit to generate returns.

However, some investors may still be attracted to the asset class notwithstanding the fact that the returns might be equivalent or slightly lower than the PMEs because the PE reported volatility is lower. Equivalent returns suggest PE results are superior on a risk adjusted basis

based upon the reported data because their Sharpe Ratios would be lower. Unfortunately, the analysis of whether this is an accurate conclusion requires further research particularly given the higher leverage levels at the transaction level in PE as shown in **Figures 13** and **14**. It would be helpful to extract out the impact of the excess leverage at the portfolio company level and then compare performance to comparable PMEs. This data has not been made readily available.

Academics have attempted to back out the impact of leverage, but these studies had to make certain key assumptions due to the lack of transparency at the portfolio company level so the leverage impacts, and thus their conclusions, are subject to question. For example, in one study the author attempted to increase the leverage of the PME benchmark to make it more comparable to leverage ratios of PE portfolio companies. [21] However, interest rates fluctuate over time and many GPs use floating rate debt, GPs pay down debt over time, or do dividend recapitalizations, so these comparisons are at best only approximate. It would be reasonable to conclude that in a falling interest rate environment and concurrent rising PME market, that the positive impact of leverage would be significant. However, the contra would be true in a rising interest rate environment and falling PME capital market context, which we experienced in 2021 through 2023.

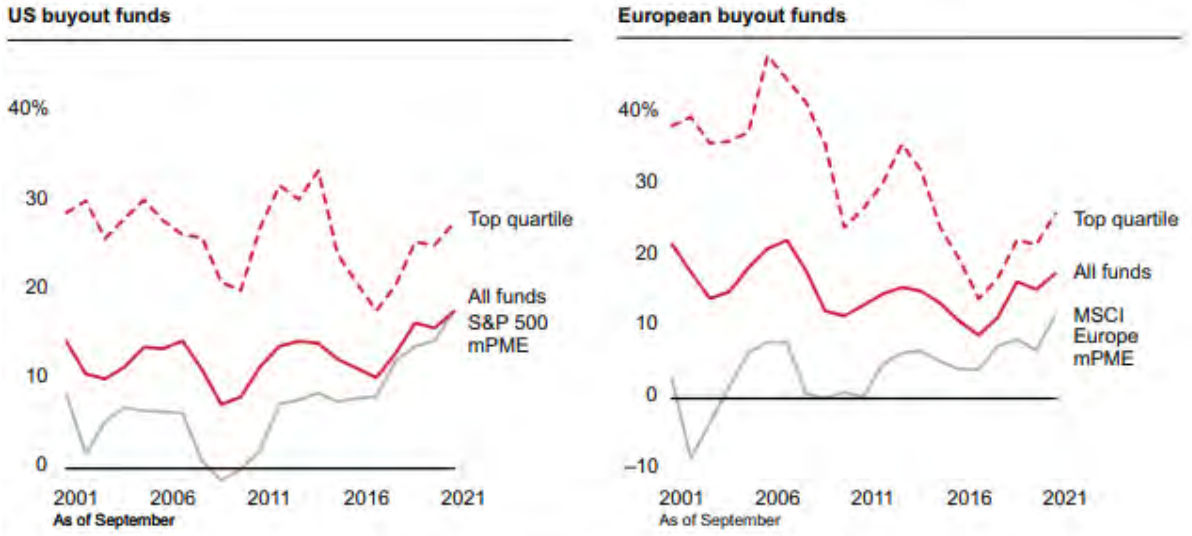
C. Average Versus Top Quartile PE Results

The fundamental question becomes whether there is a material difference between the performance of average performance versus top quartile performance of PE funds. The case for investing in the average PE funds is tenuous at best. If the top quartile firms do not consistently outperform PMEs, then the case for PE becomes largely obliterated. However, top quartile firms do appear to outperform the S&P PMEs and the MSCI PMEs (Cambridge Associates) in the US and Europe over the past 20 years at the end of 2021.

Figure 15 below illustrates the performance of the top and the aggregate average of PE quartiles against the public PME Index in the US and in Europe. One needs to focus on the more recent time period as the early time period from 2001 through 2008 with superior performance, as referenced above, distorts the results. Meaning, if we could separate out the performance of funds formed post 2008 the results might differ as the earlier better performing funds may have dropped out of the pool over the 20 year time period. The industry size exploded post 2008 and during this time period the practice of using fair value accounting was adopted as mentioned above. However, no matter what the underlying methodology was in creating this chart, it illustrates that the more recent **average** pooled PE net IRR results in the past five years have converged with the PMEs in the US.[22]

However, the **top quartile** funds did outperform the S&P 500 over the 20 year time period in the Cambridge Associates analysis. Similar results were reported by State Street over the time period of 2005 through 2021.[23] See **Figures 15** and **16**. Note again that these results may not be dollar weighted so the inclusion of the smaller, better performing funds early in the 20 year time period may distort the results. However, the early funds would likely have burned off after 2015 making the convergence of the more recent time periods more striking for the average funds.

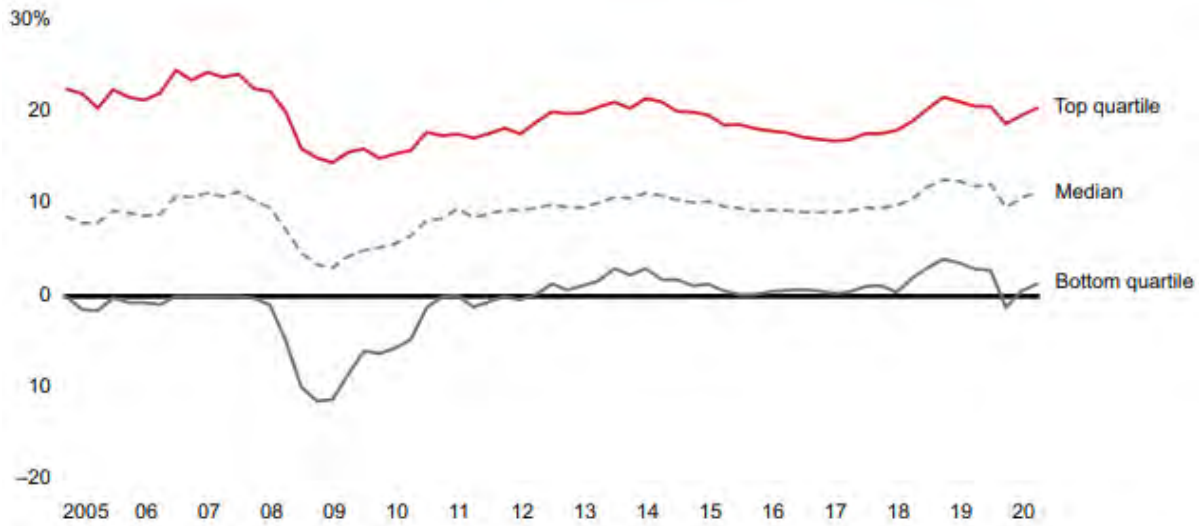
Figure 15 10-year horizon pooled net IRR for…



Notes: Data for US calculated in US dollars; data for Europe calculated in euros; Cambridge Associates Modified Public Market Equivalent (mPME) replicates private investment performance under public market conditions
Source: Cambridge Associates

Source: "Global Private Equity Report 2022," p. 26, Figure 27, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf, accessed November 2023.

Figure 16 10-Year Annualized IRR Global Buyouts



Sources: State Street Private Equity Index; State Street Global Markets

Source: "Global Private Equity Report 2021," p. 22, Figure 23, Bain & Company, 2021, https://www.bain.com/globalassets/noindex/2021/bain_report_2021-global-private-equity-report.pdf, accessed November 2023.

While there are some methodology differences between **Figures 15** and **16**, one would draw the same conclusions.[24] The top quartile firms outperformed the PMEs **substantially** over time in the US and Europe and the median firms did not. All one needs to do then is select those firms who will generate top quartile performance to obtain superior results relative to the PMEs. It has been one of the fundamental precepts of the PE industry that past performance **IS** predictive of future results. So, an investor might ignore the fact that the average PE firm will not outperform PMEs, indeed as historically that appears to be the case, so long as the investor can pick a prior top quartile performer.

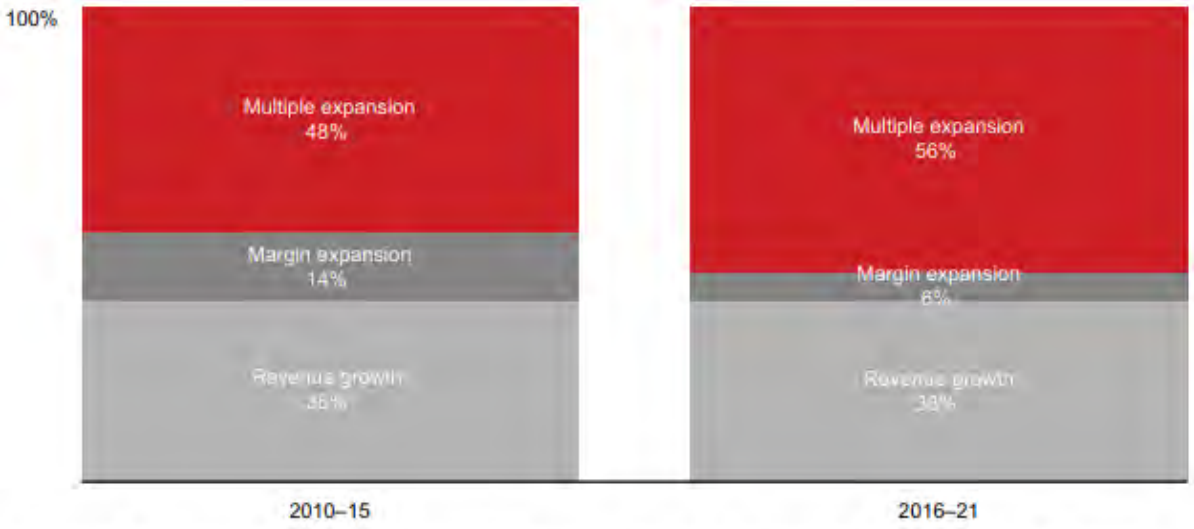
So, the critical question becomes can any investor consistently identify the top quartile firms who would hopefully outperform the PMEs going forward and capture this relative outperformance? This question is addressed in Section 3.

D. Adding Value Through Operational Improvements

An additional premise justifying PE investments is the added value the firms create via operational improvements to their portfolio companies and not just produce leveraged beta. These improvements should result in top line revenue growth, improved profit margins, and EBIDTA and Adjusted EBIDTA growth. Increases in these factors would justify increased multiples for the company, which would result in a higher valuation. Are these operational improvements actually happening?

Figures 17 and **18** below may call these assumptions into question as the impact of operational improvements as measured by margin expansion and revenue growth appear to have stalled. The primary driver of recent PE returns appears to be multiple expansion. This multiple expansion mirrors the multiple expansion that occurred in the PMEs over the respective time periods raising the question of whether the multiple expansion was actually attributable to operational improvements or capital market effects.

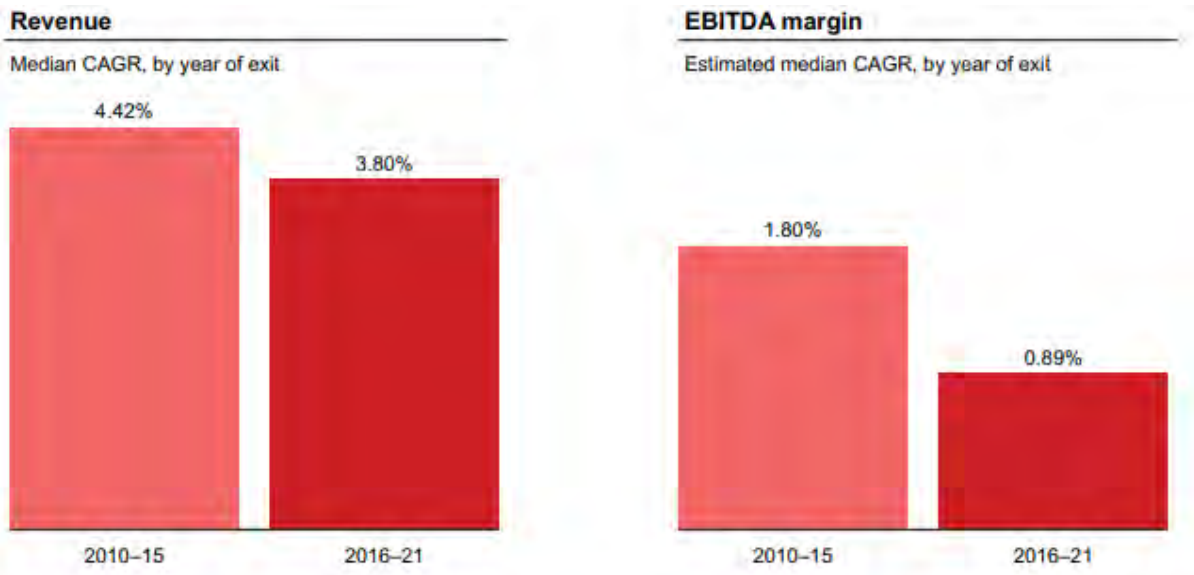
Figure 17 Median Value Creation, by Year of Exit



Notes: Includes fully realized global buyout deals with more than $50 million in invested capital; excludes deals with missing data; excludes real estate and infrastructure deals; 2021 data as of December 14, 2021
Source: CEPRES Market Intelligence

Source: "Global Private Equity Report 2022," p. 76, Figure 2, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf, accessed November 2023.

Figure 18 Median Value Creation by Revenue and EBIDTA Margin Growth



Notes: Includes fully realized global buyout deals with more than $50 million in invested capital; excludes real estate and infrastructure deals; 2021 data as of December 14, 2021
Sources: CEPRES Market Intelligence; Bain analysis

Source: "Global Private Equity Report 2022," p. 77, Figure 3, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf, accessed November 2023.

Note that Bain did not include updated charts in their Bain Global Private Equity Report 2023.

In the past six years over half of PE returns appear to be attributable to multiple expansion. Multiple expansion can be attributable to several factors. If the PE firm, in fact, drives operational improvements by accomplishing one or more of the factors enumerated above, then multiple expansion should be warranted. The trend line for revenue growth and margin improvements has declined suggesting the PE performance enhancements impacts may be waning. Given the PME performance over the past 13 years, one can question whether the multiple expansion for PE was generated as much by market beta as actual operational improvements.

Academics have struggled to analyze operational improvements as most GPs do not publish the financial results of their portfolio companies other than realized and forecasted IRRs. Some academic studies generally found some improvement in operations at the portfolio company level for buyouts that occurred in the 1980's by analyzing the results of corporate tax returns.[25]

However, more recent studies have questioned this conclusion. One academic study examined the tax returns of the portfolio companies and stated ***"… we find little evidence that LBOs in the 1990s and 2000s result in improvements in operating performance on average"***.[26] Another study reviewed the financial statements provided by the portfolio companies to mezzanine lenders and reached a similar conclusion.[27] This study was updated and reviewed the operating results of 933 transactions from 1996-2021 with data sourced from Capital IQ. The methodology reviewed the SEC public filings for companies that had issued public debt. They examined whether accelerated revenue growth, expanded profit margins and increased capital expenditures post-acquisition occurred when compared to the prior three years of operations. While admittedly a small sample, they concluded, ***"The industry mythology of savvy and efficient operators streamlining operations and directing strategy to increase growth just isn't supported by data."***[28]

Clearly, more research needs to be done to dissect how much value PE firms are adding to their portfolio companies. PE firms need to be more transparent regarding the actual performance of the portfolio companies, so investors can differentiate the factors driving performance: actual operational improvements versus market beta.

In short, even if PE firms are enhancing returns at the portfolio company level, it does not appear that these enhancements are translating into superior investor returns for their LPs based upon the more recent average industry results. Whether this fact is due to GPs (i) paying too much for their portfolio companies, thereby offsetting operational improvements; or (ii) buying inferior companies which can be operationally improved but are still unattractive; or (iii) not really adding value via operational improvements is unclear.

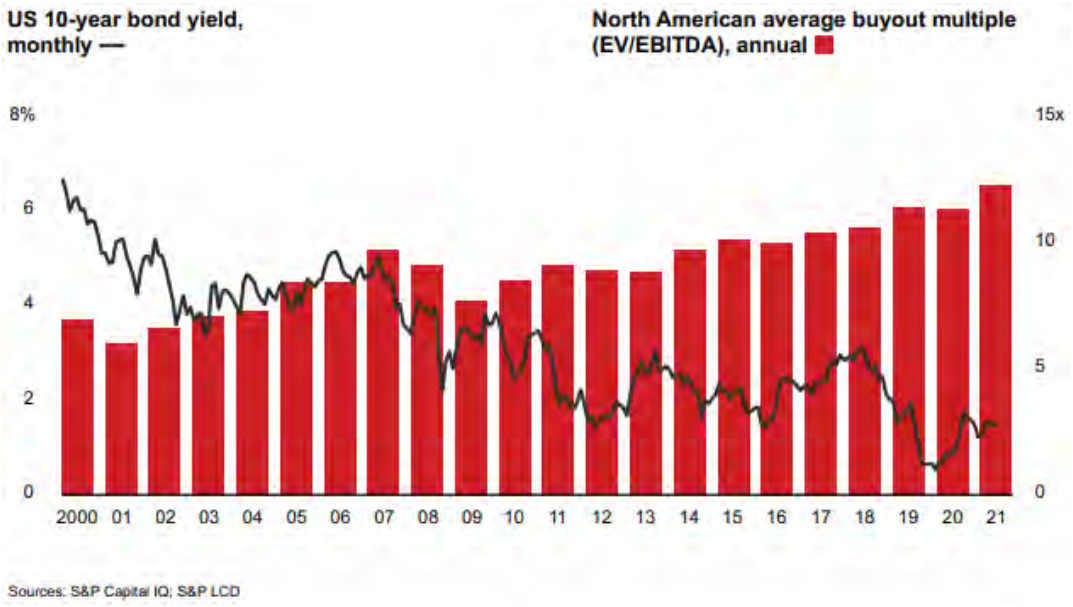
Without operational improvements and without falling interest rates, it is unclear how superior results will be generated.

E. Negotiating the Transaction

The fact that the impact of operational improvements appears to have declined over the past five years overlaps with the fact that PE firms are paying ever higher entry multiples on their

transactions driven in part by the decline in Treasury yields. In short, PE firms are on average paying more to acquire portfolio companies. As interest rates rise and multiples likely contract, PE firms will be under greater pressure to improve operations in their portfolio companies to make up for the doubtful near-term ability to rely on multiple expansion to bolster their returns. **Figure 20** shows the relationship between entry multiples on PE transactions versus PMEs. Other than the last year shown in the chart, they have generally been in the 200 bp range and increasing over time from 2008 through 2021.

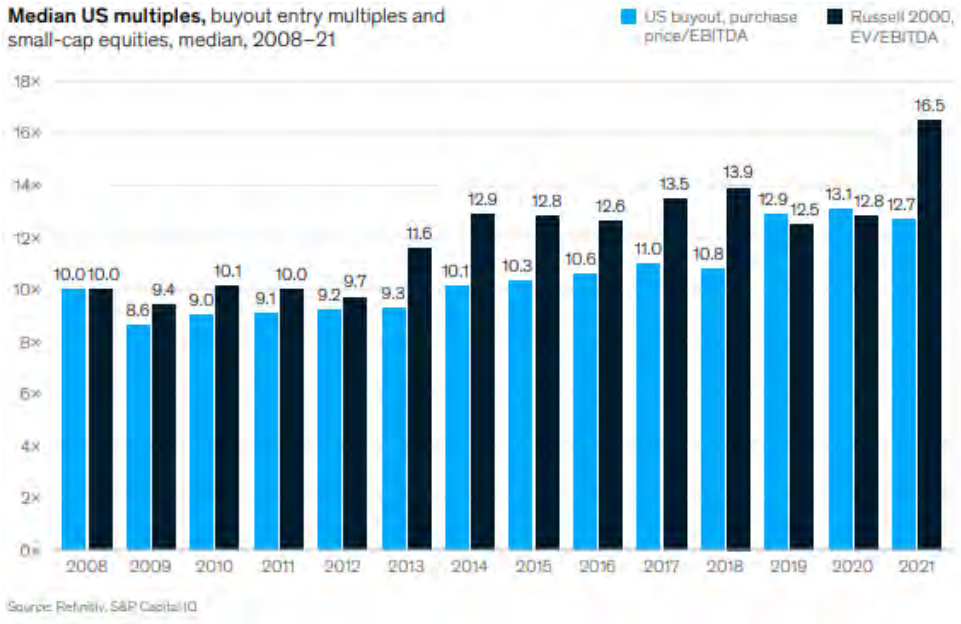
Figure 19 US Bond Yields Versus North American Annual EV/EBITDA Multiples



Source: "Global Private Equity Report 2022," p. 75, Figure 1, Bain & Company, 2022, https://www.bain.com/globalassets/noindex/2022/bain_report_global-private-equity-report-2022.pdf, accessed November 2023.

Part of the convergence of the US PE returns to the public market may be due to the fact that PE firms appear to be paying more for their portfolio companies when compared to historical prices. Entry EBIDTA multiples have grown higher over the past decade and have approached the same levels as those of comparable public companies except for 2021 as **Figure 20** illustrates. Indeed, in 2019 and 2020 PE firms actually paid higher entry multiples than the multiples of the Russell 2000.

Figure 20 Median US Multiples, Buyout Entry Multiples and Small-cap Equities, Median, 2008-2021



Source: "Private Markets Rally to New Heights," p. 28, Exhibit 20, McKinsey & Company, March 2022, https://www.mckinsey.com/~/media/mckinsey/industries/private%20equity%20and%20principal%20investors/our%20insights/mckinseys%20private%20markets%20annual%20review/2022/mckinseys-private-markets-annual-review-private-markets-rally-to-new-heights-vf.pdfm, accessed November 2023.

In the late 70's underpinning the rationale for investing in PE was the notion that GPs could exploit market inefficiencies. They could make attractive acquisitions of portfolio companies at more attractive prices than those available in the public markets. However, in today's market environment this assumption may no longer hold.

Compounding the increased entry multiple issue, making companies more expensive, is the fact that most large transactions are no longer "off market". They are brokered sales or auctions. Sellers, especially larger companies, have become quite sophisticated over time and are willing to retain expert advice in selling all or a portion of their companies. This clearly makes the acquisition market much more competitive and efficient, which should have a deleterious impact on returns. Indeed, part of the premise for potentially superior returns was predicated on the GP's ability to exploit market inefficiencies in the private markets. The academic research suggests that the VC market has produced more consistent, persistent results than large cap PE firms. Perhaps this is since VCs invest in a much smaller segment of the capital markets, which may, in fact, be more inefficient than the market segment in which large cap PE firms direct their attention.

Section 3: What Does Academic Research Suggest?

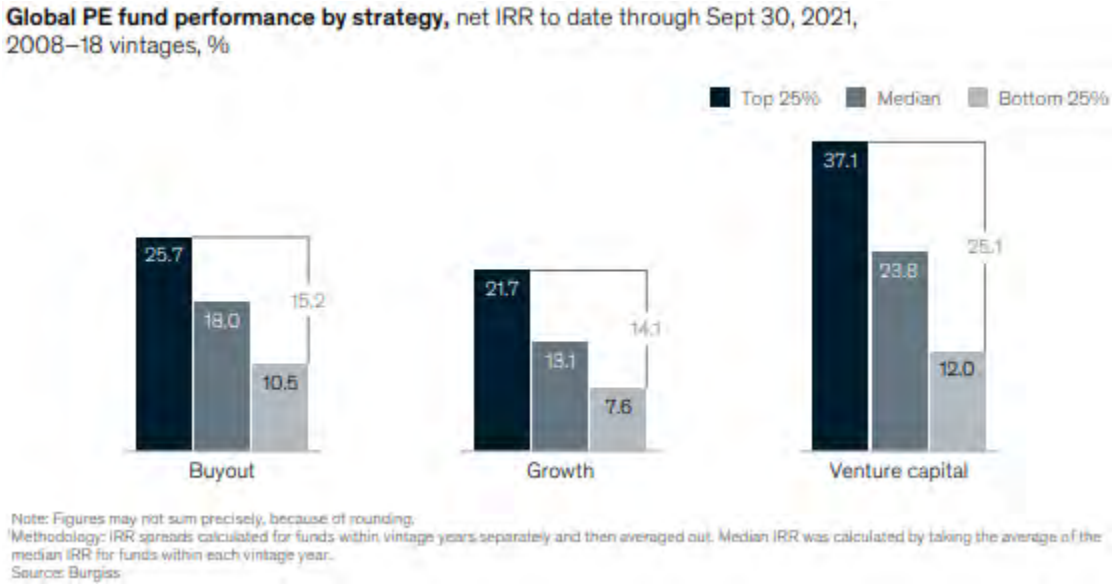
Academics have long struggled to better understand and interpret PE industry returns due in large part to poor data quality. It has taken years to aggregate sufficient data at the partnership level to be able to draw definitive conclusions as returns are only reported quarterly. Complicating matters is the fact that the data is poorly disclosed with regards to portfolio company performance other than IRR calculations both realized and unrealized. Audited financial statements are typically presented at the PE partnership level, not at the portfolio company level. Cash flows tracked by some monitoring firms again represent contributions and distributions primarily made only at the partnership level.

Since the GFC, data sources have improved materially, and academics have been pouring over the partnership level data leading to some startling conclusions. The primary questions they have addressed include: Is there persistence in returns that would serve as the basis for future investment decisions? Does a GP raising sequentially larger and larger partnerships have a negative impact on their performance? How do capital flows into the PE industry impact performance?

A. Persistence of Returns

One of the fundamental PE precepts is that a firm's track record is important and needs to be dissected. Investors have believed that unlike the public markets, past performance of PE funds **is** indicative of future results. The investment thesis is that one must ascertain the top quartile performing firms as it has been believed they are more likely to produce top quartile results in their subsequent funds. Given the dispersion in returns between the highest versus lowest quartiles, as illustrated in **Figure 21** below, return driven investors have had a laser focus on a firm's track record in the hopes of obtaining future top quartile results.

Figure 21 Dispersion of IRR Returns Across PE, Growth Equity and VC (globally)



Source: "Private Markets Rally to New Heights," p. 25, Exhibit 17, McKinsey & Company, March 2022, https://www.mckinsey.com/~/media/mckinsey/industries/private%20equity%20and%20principal%20investors/our%20insights/mckinseys%20private%20markets%20annual%20review/2022/mckinseys-private-markets-annual-review-private-markets-rally-to-new-heights-vf.pdfm, accessed November 2023.

In a seminal piece, Private Equity Performance: Returns, Persistence (2005)[29], Kaplan and Schoar analyzed the returns of PE and VC firms. The authors found persistence in the PE returns and even stronger evidence of persistence among VC firms. Similar studies, some using different databases, reached similar conclusions again for firms raising funds in the pre-2010 time.[30] These early studies were primarily focused on the results from US based funds.

In Performance Persistence in PE Funds, Chun (2012), using data for funds raised pre 2000 found that there was persistence between the first fund and the follow on fund, but that persistence was short lived. Performance dropped materially in subsequent funds thereafter. Indeed, he stated "**…that it is more difficult for funds in the top performing portfolios to sustain their performance.**" [31] He found, as others have, that the strongest persistence is among the poorer performing funds. His most disconcerting conclusion comparatively early in the industry analysis was that the data "**…raises doubts as to whether private equity partnerships have proprietary skills enabling them to maintain consistent performance."** [32] Further, he stated**, " …the results do not support buyout funds have differential or proprietary skills."**[33]

It should be noted that different databases (Burgiss, Preqin, PitchBook, Cambridge Associates being the primary sources) use different methodologies in presenting their results. While one might quibble as to which data source is superior, and whether one should analyze IRR only, IRR, MOIC, Multiple on Committed Capital ("MOCC"), cash flows, PMEs or all of them, the salient point is that while the data is imperfect, the early and subsequent studies directionally

reached similar conclusions over approximately comparable time periods. It is also important to note that the conclusions below relate to the aggregate conclusions based on the data samples. There may be performance outliers meaning there may indeed be some firms who exhibit performance persistence on the positive side and more conclusively on the negative side.

The early conclusions regarding persistence in PE and VC performance for the pre 2010 time period were important because the industry generally adopted the belief that analyzing a PE firm's track record was a critical component of an LP's due diligence for the subsequent fund. The belief in persistence became engrained among the LP community. The Kaplan and Schoar conclusions became the basis of the relentless pursuit of top quartile performing PE and VC firms. The entire gatekeeping industry was largely predicated on the assumption that their databases would enable them to identify the top quartile GPs and avoid those GPs who were "persistently" in the fourth quartile. All of this occurred notwithstanding the fact that a few academics early on raised some cautionary flags.

Similarly, in the analysis of LP performance, academics found there was return persistence of some LPs in the pre-2008 era, especially those following the so-called Yale investment model, which led to their outperformance relative to peers and benchmarks.[34] However, their outperformance evaporated in the post GFC era.[35]

Harris, Kaplan, and colleagues ("Harris et.al.") did an additional study in 2014[36] and updated their work in 2020 evaluating the performance of buyout partnerships from 1982 through 2014 and importantly reached different conclusions.[37] The authors noted material changes in the industry in terms of the size of the market and segregated the results between the performance results of PE partnerships pre-2001 and post-2000. Their conclusions are potentially profound.

In their latest paper the authors examined the data several ways. They looked at the cash flows, IRR and MOIC performance of over 2,220 PE and VC funds at the end of June 2019 for the vintages from 1984 to 2014. They excluded subsequent vintages as they believed they were still in their investment period. They grouped the partnerships by vintage years and performance quartiles and deciles. They also compared their performance to PMEs as well and ran regression analyses on both the PE and VC funds. The authors also adopted a novel strategy analyzing the GP's preceding funds' performance. They examined the information investors would have had at the time the GP was raising its next fund. In essence, this was the performance information and quartile rankings the investor would have had at the time when they were making the investment decision to invest in the next fund.

The results for VC and PE were different. The authors continued to find persistence among VC firm performance even in the post 2000 time period. This conclusion held even when using various analytic methodologies. They found:

> "Our results on VC funds have two implications. First, the persistence in VC suggests that the industry rule of thumb is to invest with GPs that have previously performed well and to avoid those that have not remains consistent with our results. The stronger performance persistence for VC as compared to buyout suggests that GP skills and networks for successful VC investing are harder to replicate than is true in buyout."[38]

In the case of VC, 44.6% of GPs that had been in the top quartile for the prior fund were in the top quartile subsequently, and 26.9% of those prior top quartile funds were subsequently in the second quartile.[39]

The PE firm results were mixed. When the authors looked at the results at the end of June 2019, they confirmed some persistence using quartile rankings for both the pre and post 2000 and 2001 funds, respectively, when looking at performance after the fact at June 2019. The persistence level among the top quartile funds for the next fund for pre-2001 funds was stronger than post-2000 funds at 41% and 33%, respectively. But, stated differently, two-thirds of the post 2000 funds in the top quartile were not subsequently in the top quartile for their subsequent funds.

However, the authors concluded that ***"For our overall sample, as well as for both pre-2001 and post 2000 funds, fund performance is persistent. The conventional wisdom would appear to hold."***[40] They also noted buyout performance persistence was described as "modest" when using PME regressions. [41] Indeed, the PME regression analyses and the persistence they found was driven by the funds in the **4th quartile**, not the top quartile, analogous to Chun's findings.[42] **Surprisingly, the persistence conclusions are driven more by the worst performing, not best performing funds.**

The predictive quality of using the top quartile rankings **fell** for the post-2000 funds. The predictive power of the 4th quartile results increased for funds in this time period, which is somewhat counterintuitive. 1984-2019 is a long time period; why are the poorer performing funds in the database still in existence? While the authors noted a large attrition rate in the 4th quartile, there were still sufficient firms in the quartile with results from prior funds to be able to draw these conclusions. The data suggests the most predictive information for the investor to know is which firms to avoid.

When Harris et. al. examined the predictive indication of quartile rankings looking at the available information at the time of the LP's investment, they found vastly different results. There was some persistence for the pre-2001 funds in that they found 37% of the top quartile in those vintage years produced top quartile results in the subsequent fund. For the post-2000 funds the persistence fell to 24% and they concluded ***"performance persistence based on fund quartiles disappears."***[43] Their conclusion was that ***"The conventional wisdom [for PE], therefore, does not appear to hold for buyout funds"*** [44] when looking at the available information at the time of the fund raise. ***"There is still no evidence of reliable outperformance by the top previous performers."*** [45] They also found **first time funds were just as likely to be in the top quartile as more seasoned investors contradicting the conventional wisdom of avoiding them until the firm has proven itself**.

These conclusions held regardless of which performance metric (IRR, MOIC, PMEs or regression analyses) was used. They found using PMEs as a metric was slightly more predictive than using quartile rankings.

The most recent 2023 study by Pitchbook confirms these conclusions. They analyzed multiple asset classes (PE, VC, Real Estate and Fund of Funds). They found **"At a high level we found no to weak performance persistence across asset classes…...Persistence was nonexistent for PE and fund of funds".**[46]

Using their updated database, Preqin found comparable results in using quartile rankings of the 1st through 4th quartiles at December 31, 2021.[47] Preqin used similar analytic methodologies as Harris et. al. They also bifurcated the results pre and post the GFC and also examined the results utilizing the information investors would have at the time of the GP fundraising. In their analysis they found that North American focused funds persistence declined post the GFC. Only 23% of top quartile firms in their database were in the top quartile in their next fund. Only 46% of the top quartile firms were subsequently above the median.[48]

Preqin concluded, **"[Results] show that relying on past performance would not necessarily increase the odds of a top quartile rank in the future for North America-focused funds".** [49] They found similar results in Europe. Preqin also found similar results concerning the bottom quartile funds as Harris et. al. and Chun papers.

Preqin stated, "These findings tell us that conventional investment wisdom has not always led to expected outcomes. .…The fact that performance persistence is neat and intuitively sensible means that any research that conflicts with this conventional wisdom is usually met with skepticism."[50]

We examined the Preqin database of the "Flagship Funds" of the firms within the Preqin database from 2008 through 2018 vintage years. We excluded the non-Flagship funds of the firms, or their ancillary products. In the Harris et. al. updated study, they found that the GP core funds performed better than their later *"**secondary style funds …launched later**."*[51] We excluded funds from 2019 through 2022 as they were still in their investment phases. The time period was selected due to the industry structural transformation as shown in **Figures 3** through 6 in the preceding section. We also segregated the returns associated with the largest 20 mega firms of portfolios over $1 Billion and those associated with 20 largest funds under $1 Billion.[52]

Again, we focused on the so-called "Flagship Funds" of PE firms, not their ancillary products. The results are illustrated in Panels A through V in **Exhibit 2**. These exhibits contain the raw data and identify the 954 funds and 444 firms in each quartile by vintage year measured by both IRR and MOIC.

Through 2021 the capital fund raising process had condensed to less than two years and less than a year in some instances, as shown in **Figure 4**. So, over the past decade one would expect each GP would have approximately three or four funds. Consequently, no firm could be in the top quartile in each vintage year, but one can draw conclusions as to how their more recent three funds performed in a rising market context.

Figures 22 and **23** depict the performance results of the top 20 firms in terms of size for funds over and under $1 billion, respectively. These firms were selected as they have raised the most capital in their respective categories. As illustrated above, there is a significant concentration of capital among the very largest firms. **The question this raises is whether the money is flowing to the best firms?**

The results of all these studies illustrate there is little persistence of the large (funds over $1 Billion) firms being consistently in the top quartile with a few exceptions. It appears that those firms operating in the technology sector and KKR over the past 10 years exhibited greater persistent performance. See **Figure 24**.

Interesting is the fact that of the top 20 large firms in terms of Assets under Management (AUM), only six firms, or 30%, appeared in the top quartile more than once during the time period measured. Note that the top five firms, as **Figure 5** illustrates, raised 25% of all the buyout capital in the last five years. The top 20 firms have raised nearly 40% of the committed capital in the past 10 years. The top 20 quartile rankings of the 20 largest firms are depicted in **Figure 22**.

Of the top 5 capital raising firms shown in **Figure 6**, KKR, Thoma Bravo and Hellman & Friedman had funds in the top quartile more than once. Their capital allocations appear, with the benefit of hindsight, to be appropriate. Of the top 20 firms in terms of raising capital over the past 10 years, only 30%, or 6 firms, of the top quartile funds had top quartile performance more than once. Two of these six firms specialized in the technology sector over the past 10 years. Was their outperformance during this time period driven by sector selection, or market beta, or portfolio company selection and operational improvements? Given the material technology sector drawdown in 2022, it remains to be seen if Thoma Bravo, Silver Lake and Vista Equity Partners will continue to remain in the top quartile.

Note that some of the top 20 in raised AUM did not appear even once in the top quartile. Some appeared once in the top quartile but not in second quartile for their other flagship funds. Others, such as CVC, which recently announced the largest PE fund ever raised[53], has only one fund in the second quartile and three in the third quartiles. Carlyle has more funds in the third and fourth quartiles than in the first quartile.

Figure 22 Top 20 PE Fundraisers and Funds above $1bn, Preqin Quartile Performance, at December 31, 2021

Fund Manager Name	Funds raised last 10 years, $mm	number of years top quartile	number of years 2nd quartile	number of years 3rd quartile	number of years 4th quartile
Blackstone Inc	140,361	1	0	2	0
KKR & Co Inc	118,116	1	3	0	0
Thoma Bravo LP	76,792	3	1	1	0
CVC Capital Partners SICAV FIS SA	67,507	0	1	3	0
Carlyle Group Inc	64,068	1	1	3	4
Ares Management LLC	63,192	0	0	1	1
TPG Capital Management LP	61,932	0	2	1	0
Apollo Asset Management Inc	53,551	0	1	1	0
Hellman & Friedman LLC	51,300	2	0	0	0
EQT Partners AB	48,652	2	2	1	1
Advent International Corp	45,475	1	1	1	1
Silver Lake Partners LP	45,300	2	0	0	1
Vista Equity Partners Management	41,611	1	3	1	0
Permira Advisers LLP	32,975	1	1	0	0
Leonard Green & Partners LP	28,688	0	1	0	0
Clearlake Capital Group LP	28,376	0	0	0	0
Clayton Dubilier & Rice LLC	28,000	2	1	0	0
Apax Partners LLP	27,517	2	0	1	0
Cinven Group Ltd	25,885	0	0	0	0
Oaktree Capital Management LP	24,527	1	0	1	0
Total Top 20	**1,073,822**				
Total worldwide	**2,776,256**				

Source: Created by authors using data from Refinitiv and Preqin.

Figure 23 Top 20 PE mid-market fundraisers and Funds below $1 Billion Preqin Quartile Performance, as of December 31, 2021

Fund Manager Name	funds raised last 10 years, $mm	number of years top quartile	number of years 2nd quartile	number of years 3rd quartile	number of years 4th quartile
Alpha Group	999	0	0	1	0
ICV Partners LLC	985	0	0	0	1
Warren Equity Partners LLC	983	0	0	0	0
Dignari Capital Partners HK Ltd	977	0	0	0	0
Lee Equity Partners LLC	970	0	1	1	0
Nonantum Capital Partners LLC	960	0	0	0	0
ECM Equity Capital Management C	958	0	0	0	1
Great Point Partners LLC	953	0	1	0	1
Crossharbor Capital Partners LLC	937	0	0	0	0
Diversis Capital LLC	930	0	0	0	0
Longreach Group Inc	925	0	0	0	0
Trinity Hunt Partners GP LLC	923	1	1	0	0
Birch Hill Equity Partners Managen	920	0	0	1	0
Fortissimo Captial Fund Israel LP	915	1	2	0	0
King Street Capital Management LF	911	0	0	0	0
Abris Capital Partners Sp z o o	896	0	0	0	0
Martis Capital Management LLC	895	0	0	0	0
Banc Funds Company LLC	893	0	0	0	0
Halifax Group LLC	893	0	0	1	0
ProA Capital de Inversiones SGEIC	892	0	2	1	0
Total Top 20	**18,715**				
Total worldwide	**2,776,256**				

Source: Created by authors using data from Refinitiv and Preqin.

With regards to the next category of firms and funds, in the under $1 Billion sized funds, the data for the 20 top fundraisers with funds below $1 Billion, shown in **Figure 23**, appears worse than for the largest firms in that they are even more inconsistent. **Figure 23** illustrates a few key observations. Only two firms (10%) in this category had one fund in the top quartile with a subsequent fund in the second quartile.

In this segment, there are many more funds than the mega funds (665 mega-funds versus 2008 mid-market funds or 293 mega-fund GPs and 1,191 mid-market GPs, according to Refinitiv database). This segment of the market is also far less concentrated than the mega fund category. The top 20 mid-market firms (with less than $1 billion capital raised cumulatively during the last 10 years) represent only 0.6% of the total capital raised in the buyout space ($18.7bn of total $2.78 Trillion).

Why is the question of concentration important? Capital should flow to those firms that have exhibited performance persistence over time. Of the top five firms that have raised 25% of the recent capital allocations, three had more consistent performance based upon the reported data. This suggests capital to these firms had been allocated rationally. Query whether this conclusion will hold after the technology sector inevitable write-downs.

Overall, the largest 20 fundraisers in the mega category had inconsistent results. Only 30% had more than one fund in the top quartile. Stated differently, 70% of the mega funds were not in the top quartile more than once. Only 9 of the 20 had more than two funds in the top two quartiles or 45%. This is hardly overwhelming evidence of persistence. This group of GPs raised

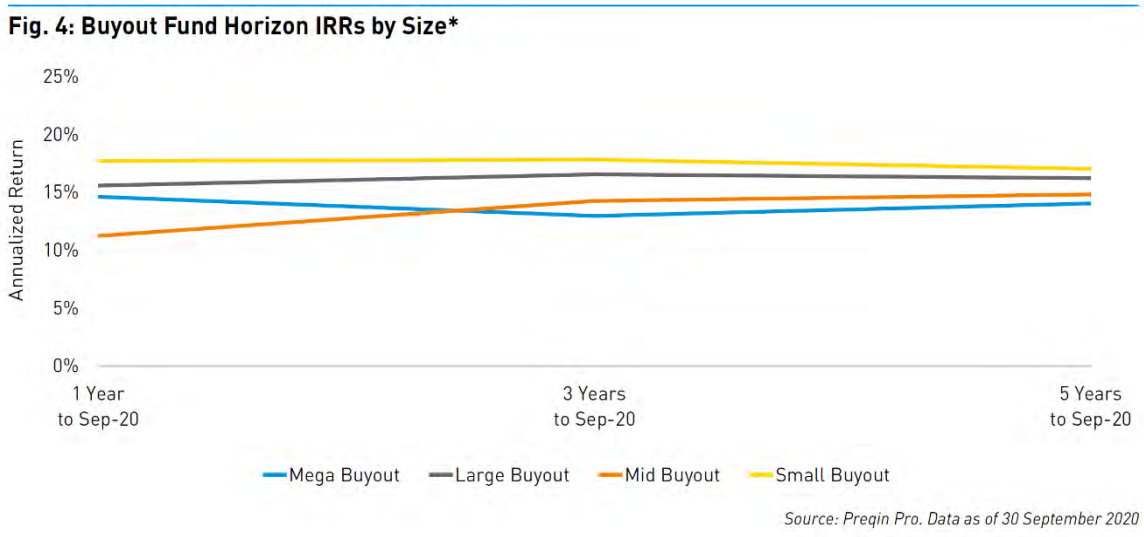
39% of the capital over the past 10 years. Investors appear to be chasing past returns with those firms in the mega fund category.

In the second category of funds under $1 Billion, only 10% of the top 20 fund raisers had even one fund in the top quartile. Fortississimo Capital and Trinity Hunt Partners had funds in both the top and second quartiles. **Figures 22** and **23** and the concentration figures suggest that capital may not have flowed to the correct firms.

Further, in terms of performance, capital appears to be flowing to the wrong subsector of PE. Small buyout funds consistently outperformed large cap buyout funds over the recent time period as **Figure 24** illustrates. It appears that the capital flows were inconsistent with the objective of obtaining the highest nominal returns. While the smaller funds as a group outperformed, the question becomes can one select the individual firms that will be in the top quartile in this subsector?

This analysis also raises the question of whether the same firms will remain in each of the respective categories. It has been documented that the more successful funds subsequently raise increasingly larger funds, discussed below, which tend to underperform the prior fund. A more successful investment strategy should focus on smaller buyout firms and those who have remained in this subsector. It also reaffirms the Kaplan conclusion that first time funds should be considered as they tend to raise smaller buyout funds and have as much of a probability of success as their larger counterparts. LPs may also have greater leverage in negotiating terms with first time funds further enhancing the probability of receiving higher returns.

Figure 24 Buyout Fund Horizon IRRs by Size (on a net-to-LP basis)



Source: “Private Capital Performance Update: Q3 2020,” p.3, Figure 4, 30 September 2020, https://docs.preqin.com/reports/Preqin-Private-Capital-Performance-Update-Q3-2020.pdf, accessed November 2023.

In their paper on private equity performance, Kaplan and Schoar analyzed the relationship between past performance and the flow of capital into subsequent funds.[54] They found that capital flows into PE are positively and significantly related to past performance and that during boom times, capital flows disproportionately to funds with lower performance instead of flowing to the best GPs.[55] In other words, the better the GP did in a prior fund, the more the GP can subsequently raise. The conclusion academia generally reached was that size does matter. Having significantly more capital to invest was negatively correlated to performance from an early fund to a later fund.[56] This concept became an industry accepted thesis.

The researchers offered two suggestions as to why the best performing funds might prefer staying smaller: (i) it is possible that the number of good deals in the economy is limited at each point in time; and (ii) better funds might face constraints, if GP human capital is not easily scalable, and new, qualified individual GPs are scarce.[57] In another paper, Brown, Fei and Robinson (Brown *et al*), were able to analyze performance at the transaction level using the Burgiss database. They found that larger transactions had lower returns, but exhibited less volatility, than smaller transactions.[58]

This PE behavior contrasts with the VC industry. The most successful VCs in terms of performance have not attempted to raise the largest possible sequential funds, with some notable exceptions. While they have increased their fund size, they have limited access to new LPs. Indeed, the most successful VCs in Silicon Valley have closed their funds to new investors. Scarcity of capital does impose a measure of investment discipline. Perhaps this investment discipline coupled with operating in a smaller, more inefficient market segment accounts for VC return persistence.

However, the conclusion that raising increasingly larger funds is deleterious for later performance due to the increased size of the subsequent fund has been challenged in a recent peer reviewed paper by Andrea Rossi.[59] He, like others, did find a ***"negative and significant relationship between fund growth and fund performance"***.[60] Rossi notes that many investors have been disappointed when they invest in a top quartile fund only to experience poorer performance in subsequent funds. The industry has attributed this trend to the subsequent increase in fund size. Rossi, however, hypothesized a different reason for the decline not related to fund growth. "I show that a substantial portion of the spread [decline in return from one fund to the next] in realized returns between funds whose follow-ons grow the most and funds whose follow-ons grow the least is attributable to noise or, in other words, luck."[61]

This suggests that the higher returns of the preceding fund were possibly more attributable to "luck" rather than skill. So, the subsequent, larger fund would be based on "luck" not superior investment acumen. Thus, he concludes that since there is no reason why "luck" will necessarily continue, the follow on funds will likely revert to the industry mean or have poorer returns than the prior fund. This is a potentially damming conclusion.

Most of the investor "disappointment" in his words is ***"due to luck in past winners reverting to zero rather than to the effects of fund growth"***. In short, firms raising successively larger funds based on their past performance, and whether this will negatively impact future performance, is not the right question. The better question is whether the prior fund generated superior results as a consequence of luck versus skill. This conclusion parallels the public equity

markets in which public equity money managers have had[62] significant difficulty outperforming their relevant indices.

Rossi's analysis suggests poorer subsequent performance due to its larger size is a classic example of correlation not causation result.

Brown *et al* reached similar conclusions when they performed an attribution analysis at the transaction level. They found that only 4% of the results were attributable to the GP's skill and over 90% of the results were attributable to "luck". They found more of an impact from the GP's portfolio construction.

The illustration of the recent success of the technology orientated funds being in the top quartile more consistently in the past 10 years may be consistent with Rossi's analysis. Sector selection by the GP may have had as much of an impact on their results as their ability to select individual companies. Brown *et al* found that more specialized funds in terms of sector and geographies had better performance than the more diversified portfolios. The conclusion one might draw from this analysis is that investors would be better served by focusing on sector selection first based on then existing market opportunities, and then finding the best specialists in that sector, as opposed to chasing returns of the past successful investment strategies.

Given the more recent performance (from 2008 to 2018) of PE firms, the assumption that analyzing past performance at the time of the investment decision will be predictive of future results is tenuous based on academic studies and the Preqin data when examining performance of the larger firms in both the mega fund and smaller fund subsectors. Investors have not consistently selected the top quartile firms based on to whom the capital has been allocated. The ramifications of this conclusion are discussed below. Capital has flowed to firms based more on early performance (in the 1980s and 1990s) or the "brand" name of the firm versus more recent performance over the past decade. Investor intransigence in terms of continuing commitments to firms not generating top quartile performance is discussed below.

B. Impact of Capital Flows

Notwithstanding Rossi's controversial conclusions, suggesting that "luck" not scale accounts for declining performance, there have been additional academic studies on the impact of capital flows on investment performance in the public markets[63]. In their research on the mutual funds industry, Berk and Green addressed the question why financial intermediaries are so highly rewarded despite the seeming uncertainty about whether their activities add value. Their econometric model confirmed the idea that active management did not outperform passive benchmarks, and the explanation they offered was based on the idea that ***"investors competitively supply funds to managers and there are decreasing returns for managers in deploying their superior ability; managers increase the size of their funds, and their own compensation, to the point at which at which expected returns to investors are competitive going forward***[64]***"***. In plain words, excess capital flows to a firm decreases their performance as they scale having a negative impact on their future performance.

The example of Fidelity's Flagship Magellan Fund provides an interesting example of performance declines due to growth. The Magellan Fund was initially run by Peter Lynch, one of the paragons of the mutual fund industry. It became a victim of its own success. The fund had extraordinary success when the portfolio size was quite small. The fund was initially only

available to Fidelity principals from 1963 until 1981 when it opened to the public. Based on its spectacular track record, Lynch‘s portfolio grew from $20 million to $52 Billion. Under Lynch’s guidance the Magellan Fund became one of the most successful actively managed mutual funds, usually outperforming its benchmark.

Lynch retired in 1990 and the Magellan Fund had a series of subsequent portfolio managers. However, Fidelity continued to grow Magellan’s AUM and the outperformance declined with the fund lagging the S&P. Its performance declined to the point that the Magellan Fund was closed to new investors in 1997 due to the belief it had become too large to outperform. Indeed, the Magellan Fund largely underperformed the S&P for the 20 year period from 2000 through 2020. It was not reopened until 2008. The fund shrank in size from ~$100 billion in 2000 to $23.6 billion in July 2022 (including a major capital distribution while the fund was closed). The performance of the smaller portfolio of late has improved. Notwithstanding the downsizing, the Magellan Fund performance relative to the S&P was 13.05% vs 13.08% over the past trailing 10 years at August 31, 2022.[65] In short, its returns were essentially comparable to the public benchmark.

Figure 20 above indicates that PE entry multiples increased over time overlapping the increase in capital flows into PE as well as the increase in multiples of public PMEs. The industry has raised unprecedented amounts of capital in recent years which does not augur well for the future performance generally for the PE industry.

The preponderance of PE capital has been concentrated with a comparatively small number of firms with inconsistent performance. Perhaps these PE funds are beginning to mirror the issues associated with Magellan’s portfolio managers at Fidelity and the other large mutual funds as illustrated in **Figure 25** below. One can legitimately ask whether the mega fund GP sponsors have gotten too large and whether the market in which they operate has become too efficient. Should the focus instead be on smaller funds that as a category have performed better and to which less capital has flowed? They are closer in size to some of the successful VC firms who have demonstrated more persistent performance.

The PE industry may be ripe for disruption. The evolution of other financial services companies who have faced disruptive forces may provide some insights as to the challenges the PE industry may face. The mutual fund industry and its trends over the past 15 years are especially relevant.

Section 4: Disruptive Potentials for PE

A. Mutual Fund Trends

Why do mutual funds have any bearing on the PE industry? There are several reasons. Structurally, the large PE GPs have essentially become mutual funds focusing on the private markets as opposed to the public markets. Like the large mutual fund managers, large PF firms have a “smorgasbord” of investment products ranging from their original flagship funds to numerous specialized products in a variety of asset classes. They have become “one stop” shopping platforms for private investing. As an example, Blackstone offers their flagship PE fund, Real Estate, Credit, Tactical Opportunities, Infrastructure, Hedge Funds, Secondaries, Life Sciences, Growth Equity, and registered products for retail investors.[66] The evolution of the mutual fund industry could provide guidance as to what may happen to the PE industry. Large

public mutual funds companies essentially have the same multi-product structure. Rarely has any mutual fund become the industry leader in each sector in which they had an investment strategy raising the question of whether one stop shopping works.

There have been multiple academic papers beginning with Eugene Fama documenting the difficulty active managers have in consistently outperforming their respective benchmarks.[67] The Efficient Market Hypothesis (EMH) coined by Fama in the 1960-1970s states that public markets are efficient, if current publicly traded security prices reflect all relevant information including past market data (such as stock prices and trading volume) as well as all publicly available and private information[68]. Therefore, if EMH holds, few active equity investors consistently "beat" the market, i.e., generate excess returns above their benchmark with a commensurate level of market risk over the long term.

The very term "random walk" in security selection suggested that ***"a blindfolded monkey throwing darts at a newspaper's financial pages could select a portfolio that would do just as well as one carefully selected by experts."***[69] In other words, investment manager results may be as much a function of luck versus skill. This conclusion results from stock price movements that are unpredictable and public markets that are too efficient, as well as the costs of trading. These conclusions are consistent with Rossi's about PE mentioned before.

EMH is a convenient theoretical framework that helps analyze how useful different investment toolkits could be under different market circumstances when trying to outperform a passive management approach. These toolkits include technical analysis, fundamental analysis, portfolio management techniques, and identifying various market anomalies.

These are the same acquisition tools used in PE. Historically, the argument has been that the private markets are inefficient so that market anomalies can be identified and exploited. The GP might try to achieve excess returns by gaining a competitive edge in analyzing various forms of information that can be costly or not readily available to other market participants. Such an approach requires extensive use of fundamental analysis that encompasses assessing the intrinsic value of assets using different valuation tools, using accounting data, incorporating management forecasts, and analyzing various macroeconomic assumptions. In short, if the PE firm is acquiring a private company, they can trade on inside information with management's cooperation. If the target is a public company, the PE firm must sign "stand off" agreements in which they cannot trade the company's securities in exchange for receiving inside information utilized to acquire the company.

The primary difference between the public and private market money managers is in the management of their portfolio companies post-acquisition. PE GPs typically take control over their portfolio companies and exert considerable influence over the company's strategy, and management's execution of that strategy, which public money managers do not do. One might ask how effective PE GPs have been in adding value via operational improvements based on the discussion above.

The markets in which PE GPs operate have changed so radically over the past decade that previous assumptions regarding their inefficiencies are subject to question. Information concerning potential acquisition targets is far more readily available. Couple this fact with the increased competition for transactions, the ability to exploit private market inefficiencies may be declining particularly at the larger cap size of the market. The ability for large cap PE GPs to

consistently outperform the average PE market performance may mirror the results of public active equity managers who historically do not consistently outperform their benchmarks net of fees. Fama's conclusions may now bear on large cap PE firms.

Historical data on the mutual fund industry showcases that the largest actively managed mutual funds have trailed the S&P and have not outperformed the index as **Figure 25** illustrates. The largest flagship mutual funds have outperformed the S&P Index only episodically.

Figure 25 Performance of Largest Actively Managed Mutual Funds vs. S&P 500

Source: Bloomberg, accessed November 2023.

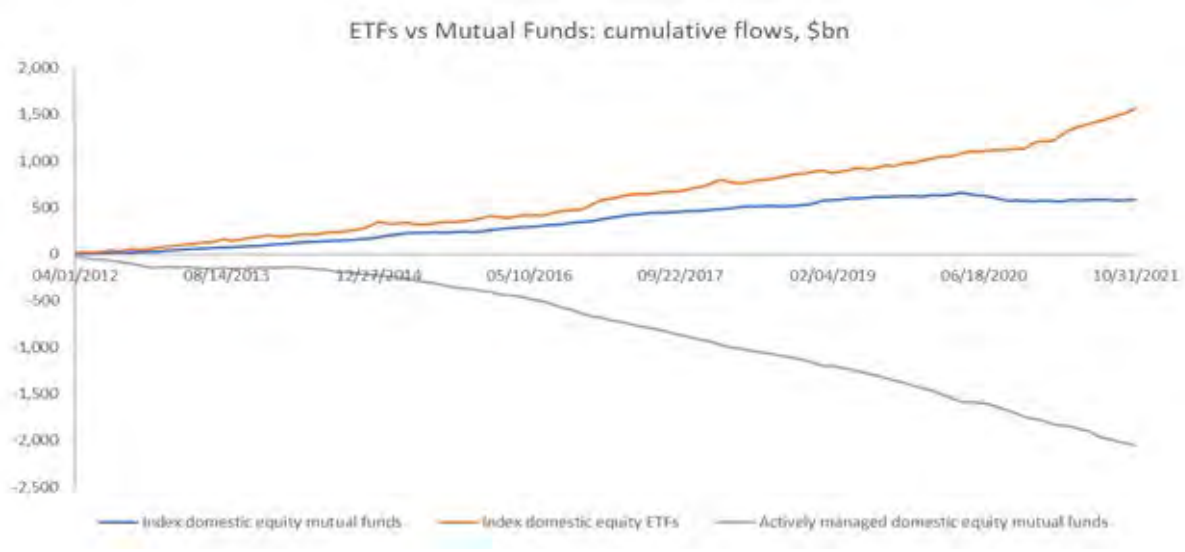
Note: S&P is shown in white, Fidelity Magellan Fund in blue, Vanguard Prime Cap Fund in red, and American Funds Core Fund Class A in purple.

It took decades for the public market to realize and to accept this information. In recent years the investment community has begun to vote with their money and shift into passive products as illustrated in **Figures 26** and **27**.[70]

Figure 26 Net New Cash Flow of Mutual Funds in the US from 2000 to 2020, by Fund Management Type (in billion US dollars)

Source: "Net new cash flow of mutual funds in the United States from 2000 to 2022, by fund management type," Statista, May 2023, https://www.statista.com/statistics/1263876/active-passive-mutual-funds-net-new-cash-flow-usa/, accessed November 2023.

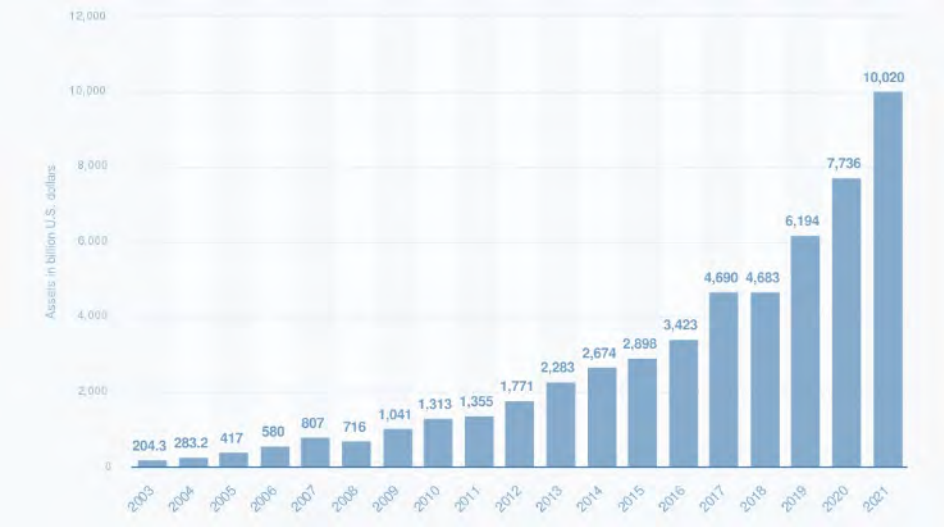
Figure 27 ETFs vs. Mutual Funds: cumulative flows, $bn



Source: Adapted by authors, from "2022 Investment Company Fact Book," Fig. 3.16, p. 62. Investment Company Institute, 2022, https://www.ici.org/system/files/2022-05/2022_factbook.pdf, accessed November 2023.

The mutual fund industry has become materially disrupted over the past 10 years because of active equity managers' difficulty in achieving and sustaining alpha. Other products offering passive replicating alternatives in the form of Index Funds and ETFs were developed. These products offer near benchmark returns at a fraction of the cost of active management. **Figure 28** illustrates the growth of the passive ETF investment strategies.

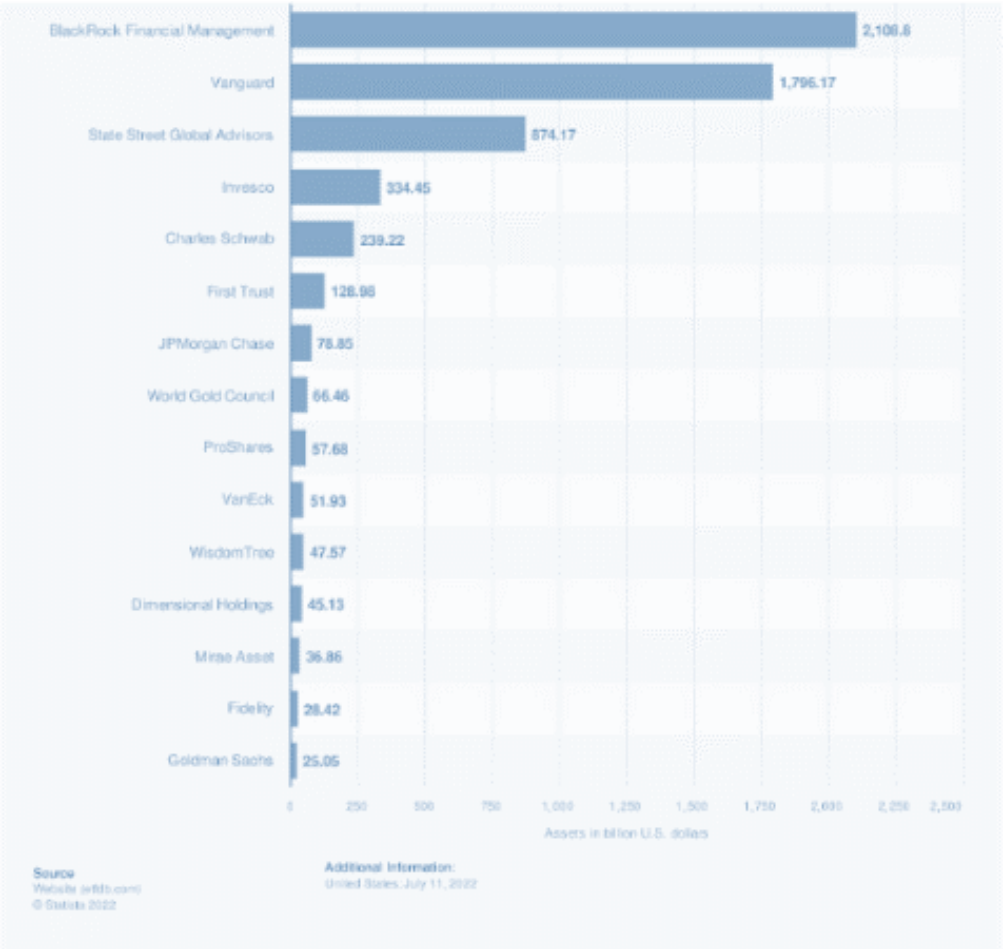
Figure 28 Development of Assets of Global ETFs from 2003 to 2021 (in billion US dollars)



Source: "Development of assets of global exchange traded funds (ETFs) from 2003 to 2022," Statista, February 2023, https://www.statista.com/statistics/224579/worldwide-etf-assets-under-management-since-1997/, accessed November 2023.

Mutual fund companies reacted by adapting and offering both active and passive management services: actively managed vehicles have historically considerably exceeded passively managed vehicles although passive management has recently demonstrated substantial growth. In 2018, passively managed assets comprised a fifth of global AUM with the top three managers (iShares, Vanguard, and State Street) accounting for 70% of the passively managed industry assets. According to the CFA Institute, there are two main catalysts for passive management development: first, more clients are attracted by lower fees compared to those in actively managed products; and second, greater challenges in generating alpha by active managers.

Figure 29 Largest ETF providers in the US, by AUM, as of July 2022



Source: "Largest providers of ETFs in the United States as of September 2023, by assets under management," Statista, September 2023, https://www-statista-com.ezp-prod1.hul.harvard.edu/statistics/269928/assets-under-management-of-the-largest-etf-providers-in-the-us/, accessed November 2023.

Figure 30 Largest ETF Providers Globally, by AUM

ETP Provider	Assets (US$ billions)	Market Share (%)
iShares	1,583	37
Vanguard	803	19
State Street Global Advisors	596	14
PowerShares	132	3
Nomura	100	2

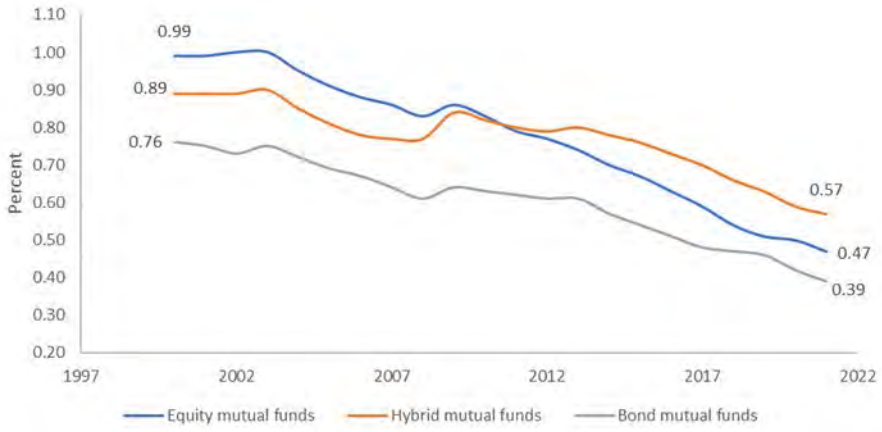
Source: ETFGI.

Source: "The Asset Management Industry," Fixed Income, Derivatives, Alternative Investments, Portfolio Management, vol. 5, CFA Institute, 2022, p. 522.

This concentration of assets mirrors what has happened in the PE industry notwithstanding the performance of some of the larger PE firms. Smaller PE firms will struggle to raise capital relative to the "brand" name firms, as has happened in the past few years comparable to what happened in the mutual fund industry. Capital has been disproportionally allocated to the larger PE firms at the expense of the smaller PE firms. So how are they likely to compete?

The public active equity managers' reaction to the potential disruption from ETFs and Index funds was clear. If you cannot compete on the basis of performance, the way to enhance performance is to reduce fees; in other words, compete on the basis of price. To stave off the capital outflows active equity managers began to offer their own passive products and began to compete on price by reducing their management fees on their active products. **Figure 31** below illustrates the expense ratios, of which the management fee is the largest component, trend for active public equity managers. In short it has been a race to the bottom. The mutual fund industry has become commoditized. So will the PE industry. Only the most consistent active equity managers have not yet sought to compete based on price.

Figure 31 Expense Ratios Incurred by Mutual Fund Investors

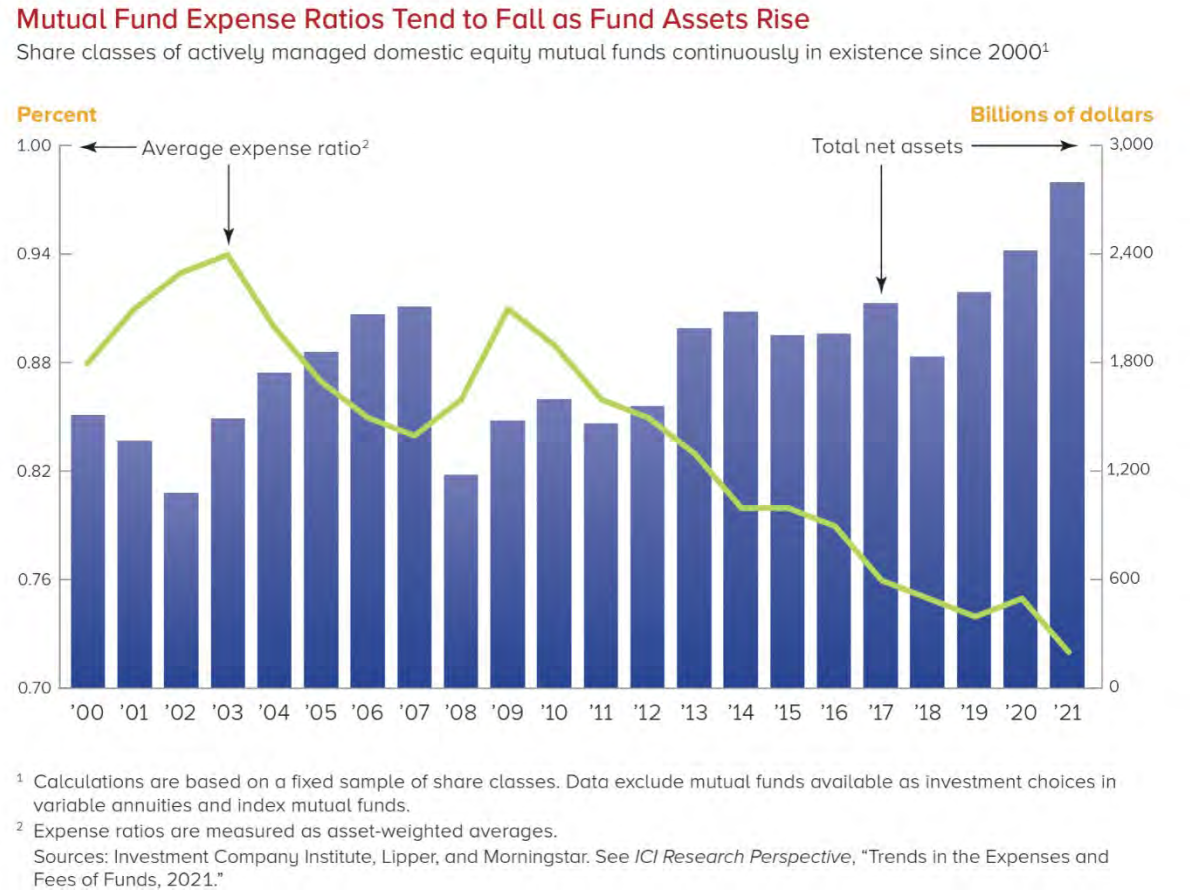


Source: Created by authors using data from "2022 Investment Company Fact Book," Fig. 6.1, p. 100, Investment Company Institute, 2022, https://www.ici.org/system/files/2022-05/2022_factbook.pdf, accessed November 2023.

Note: See ICI Research Perspective, "Trends in the Expenses and Fees of Funds, 2021."

Figure 32 illustrates that the expense ratios declined precipitously notwithstanding the fact that AUM grew. Since asset management fees are fixed as a percentage of AUM, one would have expected the line to parallel the growth of the industry. The decline illustrates the impact of the reduced fees associated with the competition from passive management.

Figure 32 Mutual Fund Expense Ratios



Source: "2022 Investment Company Fact Book," Fig. 6.2, p. 101, Investment Company Institute, 2022, https://www.ici.org/system/files/2022-05/2022_factbook.pdf, accessed November 2023.

Why did this structural change take so long given the fact that Fama et. al. identified the issues about the lack of alpha in active management decades before? There are two primary reasons, the first of which is the lack of products until the late 1990s that were widely accepted. John Vogel of Vanguard is credited with establishing the first indexed mutual fund in 1976, although it was not initially well received. He did not publish his classic Common Sense on Mutual Funds until 1999.[71]

The second reason why it took so long is attributable to human inertia and delays in modifying long held opinions. Although most researchers agree that public markets tend to be efficient, they have also identified various market anomalies (time-series, cross-sectional, and some others) that can be explained by various theories stemming from behavioral economics popularized by Kahneman and Tversky in the 1970-1980s.

Their ideas focus on understanding human beings' decision-making processes and the degree of their rationality. A key concept of behavioral economics is that people often deviate from

rational behavior, exhibit various cognitive errors and emotional biases (representativeness, herding, overconfidence, naïve diversification, etc.), and tend not to use all available information when making decisions. In the investment arena, they often resort to herd thinking and buy into bubbles and sell into crises.[72]

Kahneman's in his *tour de force* Thinking Fast and Slow,[73] showed a group of active investment managers that they had not produced any consistent alpha over time and even when confronted with the data, they could not believe it, nor more importantly, incorporate it. In short, the inertia associated with holding a strongly held belief makes it exceedingly difficult to change that belief.

Kahneman showed the firm that they were rewarding luck not skill and that:

> "The illusion of skill is not only an individual aberration; it is deeply engrained in the culture of the industry. Facts that challenge such basic assumptions – and thereby threaten people's livelihood and self-esteem -are simply not absorbed….the illusions of validity and skill are supported by a powerful professional culture. ….Given the professional culture of the financial community, it is not surprising that large numbers of individuals in that world believe themselves to be among the chosen few who can do what they believe others cannot."[74]

This quote could have been written about the PE industry.

In sum, the PE data suggest that (i) traditional methods of evaluating a given GP partnership are questionable; (ii) evaluating performance persistence post 2008 may be subject to doubt at the time the investment is made; (iii) selecting a given GP in the hopes of obtaining top quartile results may be a random walk; (iv) investment performance may possibly be as much attributable to luck rather than skill; (v) the recent median PE investments do not outperform PMEs and one is just as likely to select a median GP as a top quartile GP; and (vi) PE performance may actually underperform PMEs on a risk adjusted basis given the amount of leverage they employ generating equivalent results on a nominal basis.

The conclusions, should they become widely accepted, have the potential to materially disrupt the PE industry in terms of how capital is allocated. However, given the entrenched interests not only of the PE firms and those firms who support them in maintaining the status quo it may take years for these conclusions to be accepted by LPs and will most certainly be strongly resisted by the entrenched interests. Eventually, though, the data should prevail.

B. Other Disruptive Potentials for PE

There is no question that disruptive forces have radically changed the mutual fund industry that may be paralleled in PE. As it became apparent that active equity managers on average did not outperform their benchmarks on a sustained basis, investors sought alternative methods to invest on a more cost effective basis. What are potential disruptive forces in PE that could structurally change the industry?

These disruptive factors may include:

- PE firms converting from entrepreneurial incentives (carried interests) to asset gatherers (management fee orientated)
- Lower return expectations
- Increased competition from clients
- Alternative investment executions or products
- Industry consolidation and the hollowing out of the "middle"
- Structural changes to PE organizations
- Commodization of the PE industry

Need to Grow AUM and Change of Incentives

The dynamics of the PE industry have changed profoundly since the 1980's and 1990's. In the early years of the industry the GP's primary economic motivation was the carried interest they might earn. GPs then invested substantial amounts of their own capital alongside the LPs. Their collective interests were aligned.

The early successful market entrants are now large public companies. As public entities their primary motivation is to increase AUM and increase their base management fees. This is directly analogous to the mutual fund industry. The value of public PE firms is primarily driven by their AUM growth, and the derivative management fees that are easily quantifiable, as opposed to the value of carried interests that are generally viewed by the capital markets as non-recurring income. In short, public GPs have become asset gatherers and their incentive is to grow AUM as much as possible. While carried interests are still important there is a profound shift in the incentives of these GPs from the early days of the industry.

Indeed, the consequences of these incentives were identified 17 years ago by Howard Marks in one of his famous Memos, entitled "The New Paradigm". He stated,

"…**[Large] amounts of money are demanding access to the alternative markets… For this reason, investors may attach more importance to the ability to put large sums to work than to be able to attain historic returns and risk premiums, clear high due diligence hurdles, or structure fee arrangements that channel managers' energies for the benefit of clients.** (emphasis in the original)."[75] Marks identified the new paradigm as:

- **"First, raise a lot of money.**
- **Second try for a rate of return that clients will find acceptable.**
- **Third, don't take enough risk to possibly preclude an encore.**
- **Fourth, invest as prudently as possible, so that another fund can be raised while the markets are accommodating." (**emphasis in the original)[76]

Marks turned out to be prophetic. The trends he identified and the attitudes towards investors' attitudes towards risk and return have largely come to pass.

Their sheer current size requires these firms to continually invest as they keep raising capital or lose their commitments after the investment period. This business model takes away flexibility on the GP's part to put their "foot on the brake" when the market cycle hits a peak.

The recent behavior of GPs supports the conclusion of the shift to asset gathering. GPs have reduced the time period between fund raises shown in **Figure 4**. Indeed, it was announced in July 2022 that Blackstone intended to raise its next $30 Billion real estate opportunity fund this year even before its prior $30 Billion real estate opportunity fund, BREP X, had closed.[77] Blackstone announced it had passed the $1 Trillion mark in terms of AUM in its most recent earnings call.[78]

GPs have a new emphasis on the retail sector in an effort to tap into a new market, thereby augmenting their base fees. This trend results from the declining importance of defined benefit plans and the rise of defined contribution plans going forward. Again, this is to support the continued growth of their AUM. This investor category generally is less sophisticated than their institutional counterparts and more subject to marketing influences.

This business model shift incentivizes GPs to invest as quickly as possible so they can then raise the next fund to capture additional management fees. Most of the Limited Partnership agreements require the committed capital to be substantially committed (~70%) to investments before the next fund can be raised. **The fact that GPs are then continuously in the market forces them to become dollar cost averagers as opposed to opportunistic investors**. Dollar cost averagers generally do not exceed the market returns.

Additionally, to lock in fee streams, there is a new emphasis on creating long dated funds and engaging in secondary transactions in which the GP asks existing LPs to approve the transfer of all or a portion of an existing partnership into a new partnership for another 10 year term. According to PEI ***"…buying, holding and selling within five years is largely a thing of the past."***[79] GP attempts to raise capital to acquire or seek approval from LPs to rollover their commitments increased by 113% between 2020 and 2021.[80] Clearly, the intent on the part of the GPs is to lock in the management fees for a longer term as that is the primary driver of how the public markets value these companies.

Perhaps GPs see the clouds on the horizon for their future performance from the various factors identified above, which have also been identified in the press, including rising interest rates, and falling company entry multiples, as well as the fact that larger funds have underperformed prior funds.[81] Future performance issues may present challenges for future fundraising given the drawdown in the public capital markets in 2022. So, raising as much capital as possible today may protect them in the future.

The industry changes coupled with recent market changes have the potential to change GP incentives. At the inception of the industry the primary motivation of GPs was to maximize performance because the preponderance of their compensation was derived from the carried interest. Now, with multiple funds and new long-duration funds, the value of the management fee is as, if not more, valuable. These fees are "risk free" in that they are locked in for essentially 10 years. Given the importance of this category of fees the GP is highly motivated to ensure their continuity.

Does the shift to become asset gatherers matter? Incentive changes within GPs that they themselves have created may become a disruptive force as there is a potential for an impact on

future returns. It has been previously documented that increasing the size of subsequent funds has had a negative impact on performance. In the mutual fund industry as funds scaled, they had difficulty maintaining their alpha. **Scale was the enemy of returns.** Indeed, in 1997 Fidelity's flagship Magellan Fund closed to new investors due to the decline in performance as the fund had become too large. The shift to index funds was mirrored in the large public pension fund community when they realized that in aggregate their performance did not continually outperform a passive benchmark.

Further, the emphasis on increasing AUM, which is the same incentive for traditional mutual funds, may be at odds with PE firm's LPs in an actual partnership. From their perspective, the LPs want the highest possible returns and top quartile performance, not necessarily the returns associated with a dollar cost averaging approach. LPs are not interested in the GPs increasing their AUM, especially if it has the potential to negatively impact performance. They are not interested in the firm's stock price; they are interested in the performance of the fund in which they are invested. For LPs bigger isn't better; better is better. But when a material component of the firm's value is attributable to AUM, this incentive may be at odds with the LPs. Query whether the incentive today is to be just "good enough," as Marks suggested, to raise the next fund at a lower risk level as opposed to truly attempting to achieve the highest possible returns and assuming commensurate risks with those they historically took to maximize their carried interests.

The public shareholder interests are potentially at odds with the private LPs in that they are interested in the continued increase in AUM, which should help the stock price, as well as the potential to make distributions in the form of dividends. Managing these conflicts has the potential to disrupt the industry should the private LPs come to believe the conflicts are not being managed in their best interests.

C. PE Performance Attributes Changing

Historically, GPs promised their investors "2x and 20%" referenced above. Return expectations generally have declined in the past decade for PE. Investors today do not expect to receive a PE 20% return. Indeed, in **Exhibit 1** the asset allocation assumption for PE is 12%, which is materially lower. The recent net returns for the average global buyout funds approximated 12-13%.

As stated above, PE should generate excess returns against PMEs to compensate for the lack of liquidity and the higher leverage ratios. During the past decade the average pooled fund IRRs in the US, where the preponderance of capital has been invested, converged with the US public markets. Return expectations appear to be declining and the correlations with the PMEs may have increased making the case for PE less compelling. If this hypothesis is correct, then PE is beginning to behave more like the public markets suggesting certain segments of the private markets may have become more efficient. This appears to be particularly the case for the very large cap PE funds as the data above (concerning the median results) may be skewed by the market cap of these funds.

Intuitively this makes sense. The larger funds have moved into a larger market cap segment versus VC. The data suggests that the VC firms continue to have performance persistence perhaps in large part because they operate in a more inefficient market segment. The EMH

theory suggests that when the markets are efficient, active management strategies cannot consistently outperform passive holdings of a diversified market portfolio over time.

In the past decade the amount of market information in the private sector has increased dramatically. Research firms publish reams of data concerning the multiples of all companies in each sector. Larger PE firms have been investing larger transactions, in part because of the larger amount of capital they must deploy, and that sector of the market is far more transparent than VC and very small companies. Further, as mentioned earlier, many of these larger transactions are essentially auctions, because sellers have become more sophisticated, and buyers are subject to the "winner's curse" of paying the highest price. Fama's EMF conclusions may apply to PE, which would also support Rossi's conclusions.

Given the preponderance of capital raised and invested in the US, investors should closely monitor these trends. If the private markets have profoundly changed by becoming so large and more efficient thereby changing the fundamental assumptions driving the asset allocation models, this fact could disrupt the PE industry.

D. Potential Disruptions from Alternative Methods of Investing

When investors received 20% returns, they were somewhat indifferent to PE fund costs. When the median net returns are in the 12-13% range, the returns and costs associated with PE investments come into focus more clearly.

As returns come down and if alpha declines, the dilution associated with costs, primarily management fees and carried interests, becomes an investor concern. The simplest way to increase returns is to reduce fees. **Figures 31** and **32** illustrate what happened in the mutual fund industry. Investors gravitated towards lower cost alternatives. A number of PE investors now seek to replicate PE returns on a more cost effective basis.

It has been documented that the costs of investing in PE are considerable. It has been estimated that the return dilution from gross to net returns at a 20% return level is 600-700 basis points, suggesting net returns are then in the 13%-14% range.[82] These numbers do not include the costs of internal management and external hired consultants to monitor their investments. In fact, net returns for PE reported by numerous sources suggest that average net global returns are in the 10% range as shown in **Figure 16** above.

Should PE returns converge with the public markets over a longer time period, and if the other predicate assumptions concerning the rationale for investing in PE diminish, investors will seek alternatives as they did in the mutual fund industry. The primary pressure will be on PE fees.

Many large institutions have attempted to reduce PE costs by investing directly. Initially, they attempted to maximize the amount of their co-investments in which they would invest in an individual transaction alongside the PE fund. These investments were typically made on a no-fee, no carry basis. Such investments allowed the LP to reduce the overall PE investment costs by averaging down the aggregate fees they paid thereby increasing their net returns.

Why would GPs do this as they lose the associated fees with the co-investments? There are two primary reasons. First, if the GP wanted to acquire a particularly large transaction, it allowed the GP to avoid undue concentration in their fund. Second, GPs are acutely aware that investors

are very fee sensitive. This practice allows them to curry favor with the largest GPs by offering, in essence, a fee cut without having to advertise that fact to their smaller clients. This practice has historically been largely nontransparent, prompting the Securities and Exchange Commission to require GPs to disclose to all their LPs what these arrangements are on a going forward basis.

Many large LPs have gone beyond co-investments to reduce their costs. The fact that PE is so expensive has caused several large investors, such as the Canadian pension funds, Singapore's GIC and Temasek, to create their own internal PE teams on the theory that with a 600 basis point spread, they could invest themselves more effectively than investing in a PE fund managed by an external GP. They now have large internal investment teams.

Many large family offices are following suit. The rise of family offices has been an important development in the last decade. Many are consolidating and creating their own internal investment teams including individuals capable of making direct PE investments. UBS, one of the largest wealth managers in the world, surveyed 221 of the world's largest single family offices representing $493 Billion in assets about their investment activities.[83] They found these firms had increased their allocation to PE by 5% to 21% from 2019 to 2021 of their total portfolios. Forty-two percent were investing in both funds and directly. However, 21% were only investing directly and this percentage is anticipated to rise significantly. The rationale is how bad do they have to be, if they have a 600 basis point margin for error? In short, former PE LP clients, both large sovereigns and family offices, have become competitors and could materially disrupt the industry.

As potential competitors these organizations have a significant advantage over traditional PE firms in that their cost of capital is materially lower. These direct investors can target 17% gross returns and still be better off on a net basis than investing in a PE fund in which the net return would be 14% should the PE firm produce a 20% gross return. This 300 basis point delta theoretically allows the family offices and large institutional investors to be able to pay more than the PE firm and still achieve a better net return, due to their lower cost of capital. It remains to be seen whether companies will prefer to align themselves with this new category of investors as opposed to the traditional PE firms, again potentially disrupting the PE industry.

A few other alternatives are beginning to percolate in the investment community. There have been recent articles about the attempts to "democratize PE". For example, Hamilton Lane offers a product in which retail investors can invest.[84] These products are both for accredited investors and small investors who can invest in tokenized amounts as small as $10,000. Others, mentioned above, are similarly exploring other products at a reduced entry ticket to offer to the public. But to be clear, these are not "disruptive" products. These are fund of funds, and the retail investor will bear the higher costs due to higher distribution costs and consequently even lower returns relative to the institutional market.

The truly disruptive products are taking different forms. Some companies are executing with leveraged PMEs[85], others using Equity Index Option products[86]. The major issue with some of these products is the fact they have proposed to use REPO financing as their leverage source. In the 2022 drawdown of the public markets and the corresponding interest rate increases, the inevitable margin calls would have been difficult for a firm to cover unless the LPs were amenable to adding additional capital to the program to cover them. However, there should eventually be a practical solution to leveraging PMEs that product sponsors could arrange with the expanding private credit lender market. GPs should be able to duration match their debt

secured by the portfolio companies in which they invest. Others are using hedged leverage positions to structure their portfolios.[87] In the latter instance, the proposed fees are zero management fees and 15% over a designated benchmark.

Alternatively, on-line platforms have been created in venture capital, such as AngelsList and Funders Club, and real estate, such as Cadre and Alteinvest. These platforms offer investors an opportunity to invest directly into specific companies or individual buildings. They are, for now, available to accredited investors and institutions to potentially democratize investments in these asset classes. They also offer these investment opportunities at a fraction of the cost of traditional venture capital and real estate.

Even Vanguard is rumored to be exploring a synthetic product in lieu of the more traditional fund of funds product it has with HarbourVest. Should Vanguard be able to create such a product, it could be highly disruptive to the PE industry. These products will be offered at a drastically reduced cost to conventional PE. Further, as the market contracts due to the denominator effect referenced above, and capital commitments concentrate with fewer firms, GPs will have to choose how to attract capital. The mutual fund industry response was to reduce fees dramatically.

E. Structural Industry Changes in other Financial Services Industries and Consolidation

Other financial service industries such as law, accounting, private wealth management, and even investment banking have already exhibited trends that are relevant to the PE industry. These industries have been profoundly affected by disruptive alternatives in their organizational structures. These changes have impacted their ability to attract and retain talent.

All these firms followed similar evolutionary tracks in terms of their corporate organizational structures. At their inception these firms originated as true partnerships. They had comparatively flat organizational structures with a few partners and a few associates beneath them. When the firm had up to 100 employees, the founders still knew all the individuals with whom they worked. Over time the successful firms grew substantially and became large corporations, not traditional partnerships, and operated as such with all the ensuant corporate bureaucracies. Their organizational structures evolved into a pyramid. At the top of the pyramid the C Suite management/Executive Committee controlled all aspects of the firm. Over the past 40 years small law and accounting firms grew and merged until there were comparatively few very large firms that evolved into global organizations. Smaller firms chose to remain more specialized boutiques, or general mid-sized regional firms, or merged with others to become larger firms. They had to determine how to compete. Smaller PE firms are likely to follow a similar transition.

The impact of the structural evolution of PE firms when compared to other financial service companies is a topic for another paper. The patterns are very similar and do not necessarily bode well for PE. If incoming talent views going to a large cap PE firm as the equivalent of signing on with an investment bank, which appears to be the case among many business school students, it may impact large PE firms' ability to attract and more importantly retain the best talent. This is a consequence of the "institutionalization" of the PE industry which emphasizes scale, fees, margins and efficiencies when compared to more boutique firms.

The very best talent may prefer to gravitate to other organizations or create their own companies as their means to wealth creation. How the PE firms have grown and how they are

now institutionally configured has the potential to be disruptive. Even one of the original founders of Terra Firma, Guy Hands, has questioned the "institutionalization" of the PE industry as potentially negatively affecting the future "dealmakers" to execute like those who were the industry pioneers.[88]

Conclusion

So, What Does All of the Above Mean for PE?

There are certain key assumptions investors made for investing in PE. If one queried any PE investor, 100% would state they only want to invest in top quartile funds.[89] They assumed that the top quartile funds would outperform the public market alternatives over time. They assumed that examining the PE firms' track records was a critical exercise to determine which firms would be in the top quartile going forward. The key assumption was that there was persistence in performance and past top quartile performance would predict future outperformance. Lastly, top quartile performance was attributed to the investment skills of the GP and their ability to add value to their portfolio companies.

These assumptions have been called into question by recent research. The PE data suggest that traditional methods of evaluating a given GP partnership are questionable. While it is technically true that the top quartile firms outperform the public markets over time as illustrated in **Figure 12** above, the fact is that the **top quartile firms** generating that performance **are not** necessarily the **same** firms over time. The academic research by Harris et.al. suggests that if one examines the track records of PE firms at the time the investor is making the investment decision, the performance information they have at that time is essentially irrelevant in selecting a future top quartile fund. **Harris et.al. conclusions suggest that the selection of any PE firm by any investor based on the information they have at the time of the commitment may be a random walk.** The data from multiple sources illustrates that performance persistence has waned materially post 2008.

All one needs to do is review panels A through V to see a lack of consistent performance across the board, with a few exceptions. Query whether sector selection or market beta is the primary driver of superior performance as much as portfolio company selection. So perhaps the requirement of all public offering documents to state ***"Past performance does not guarantee future results"*** should apply to PE.

If the selection of any PE firm based on past performance is a poor basis on which to make an investment decision to select any firm, at the time they make the investment, the investor should assume that the probability of top quartile performance is substantially less likely than the probability of average or median performance. Will this conclusion be acceptable to investors?

If picking a given GP is a random walk, how should LPs react? Pick smaller firms? Select first time funds and negotiate the pricing? Reject firms that continue to successively raise larger and larger funds? Larger funds perform less well, based on the data, than the prior funds regardless of whether this fact is due to the size of the subsequent fund or the "luck" of the GP in the prior fund. Rossi's conclusions, if further substantiated, could disrupt the conventional wisdom concerning the factors driving PE performance in the same way as Eugene Fama's

conclusions did concerning the value of active equity management in his pioneering work in the 1960's and 1979's.[90] More research is required to answer these questions.

If one assumes that the investor will more likely receive over time the average performance of all PE funds, then the comparison to public markets becomes important. In the US, as shown in **Figure 12**, the aggregated pooled PE funds IRR performance in the past decade has converged with the public market notwithstanding the higher leverage ratios of the PE firms relative to the PMEs. The comparison may be even worse if the data is not dollar weighted. PE performance may actually underperform PMEs on a risk adjusted basis given the amount of leverage they employ should they generate equivalent results on a nominal basis.

Are these conclusions surprising? The PE results may be attributable to several factors. One is the fact that the concentration of capital among the top 20 firms has caused them to shift towards larger transactions, which is a more efficient segment of the market when compared to the early years of the industry. Large PE firms must focus on larger transactions given the amount of capital they have to deploy. This results in an increasingly smaller number of target companies in which they can invest. Further exacerbating the efficiency of the market is the concentration of capital in the US market. Many of the larger transactions are held via auctions, not off market transactions. The markets in Europe and Asia have received comparatively less capital and may be more inefficient than the US market. Another factor may be that GPs in the private markets behave more akin to their brethren in the public markets where it has been well documented that it is difficult to outperform the market consistently. Lastly, the sheer number of new firms and products has made the US overall market far more competitive.

As referenced above, the smallest segment of the PE buyout market has been the better performer over the past five years. But the statistics suggest that even this market segment is quite competitive, and its results are even more inconsistent than those of the mega funds.

What do these factors mean generally for the PE industry? What conclusions can we reach based upon the performance since the GFC when the industry changed profoundly as well as the behavior of the larger firms? Examining the mutual fund industry and its trends over the past 15 years may provide insights for the PE industry's future. Some thoughts for industry participants:

- The PE industry is simply different since the GFC
    - The capital concentration among a small number of firms is profound; is this a good thing?
    - Query whether the firms with the best performance are attracting capital, meaning are investors are rewarding the "brand" and early performance, not the performance of the past 10 years? Are investors allocating capital looking primarily in the rear view mirror?
    - Does the one stop shop approach to investing with a firm lead to optimal results?
    - The largest buyout firms are now public which has incentivized them to be AUM gatherers as opposed return optimizers. There are also potential conflicts between the private LP interests and the interests of the public shareholders.

- The increase in long duration funds and secondary funds (rollovers from prior funds) supports the suggestion that PE firms are attempting to secure long term management fees based on AUM.
- The industry appears ripe for disruption.
- Students coming out of college and business schools may reevaluate their prospects within these firms. The path to wealth may be in creating their own firms versus securing a position within a large PE firm.

- Investors may have to fundamentally change their investment approach to achieve the best possible nominal results.
  - The assumption that past performance for large cap and smaller cap PE firms predicts future performance is tenuous.
  - The return assumptions for large cap PE firms should be revisited.
  - The correlation assumptions between and among PE, public equities and fixed income should be reexamined.
  - Investors should consider that past results may be a function as much of luck versus skill.
  - Investors should consider that their future results, should they continue to invest in the same manner, will lead to average or median results.
  - Investors should consider alternative, disruptive investment strategies to achieve comparable results given the high costs associated with PE investments.
  - Investors should recognize that large GPs, both public and private, are now motivated by increasing their AUM, not necessarily producing the highest nominal returns. This fact has led to a shortened time between fund raising. This fact forces GPs to invest their committed capital as soon as possible because they cannot raise the next fund until 70-75% of the prior fund's committed capital has been "committed". The pressure to invest as quickly as possible has caused the large funds to essentially become "dollar cost averagers" as opposed to being able to respond to market cycles on a more opportunistic basis.
  - More direct investments and/or investments in lower cost vehicles with similar investment objectives may produce superior returns given the cost differentials, if the expected net returns are in the 13% range.
  - Investors may conclude that investing in the private markets is just another tool in their in their portfolio construction "toolkit" and that they want exposure to a large segment of the capital markets. However, if that is the conclusion, benchmarking, monitoring, and return expectations should be rethought. If some excess return premium is required, the data suggest the only obvious mechanism to achieve it is to reduce investment costs.

- GPs may need to rethink their investment strategies given the relative underperformance to the public PMEs

- Strategies focused on larger cap companies may be operating in a market that has become too efficient.
- GPs may need to return to their origins to better ensure their interests are better aligned with their investors, meaning they have actual "skin in the game", not corporate balance sheet co-investments, and that their primary compensation is derived from carried interests.
- When the facts that actively equity managers generally produced no alpha over time became accepted in the mutual fund business, profound changes occurred. Will that happen in PE?

As stated at the outset, this paper is not an indictment of the PE industry. Investors should want exposure to the large number of private companies that have opted to grow in the private markets. It is a call for investors to question **how to invest in the future, not whether they should invest in the industry** to avoid "average" PE returns. Average returns are, in essence, a "C". Is that good enough? Indeed, the academic literature suggests that the superior PE performance of certain private investors, such as the Yale Endowment, has waned over time. [91] These historically superior investors have regressed to the mean as the market has grown and become more efficient.

In the face of achieving only persistently average returns, investors in the mutual fund industry opted for passive alternatives that were less expensive. In essence, the clear trend in the public mutual fund industry has been to price investment management services as a commodity. This is the "race to the bottom" in terms of pricing. Will PE firms follow suit and cut their fees to attract capital? If current market conditions persist that is likely to happen.

When will this happen? The inertia associated with the belief in the benefits of active equity management was sustained for decades even after research clearly called this belief into doubt. As Kahneman said, ***"Cognitive illusions can be more stubborn than visual illusions."***[92] The very same factors exist and will likely persist in the PE industry, as the GPs, LPs, and the entire derivative service providers to it have an extraordinary interest in maintaining the status quo, for a very long time notwithstanding the evidence to the contrary regarding the fundamental assumptions concerning whether and how to invest in PE.

In the mutual fund industry, in addition to the inertia associated with strongly held beliefs supporting the belief in active management was the undeniable influence of pervasive and persuasive marketing. These efforts by the mutual fund industry to perpetuate the belief in the value of active management strongly reinforced these beliefs. The same powerful factor exists in the PE industry. The personal relationships between the GPs and LPs are strongly sustained by some of the most effective marketing professionals in the entire financial industry. These products are often "sold" not "bought" possibly explaining why so many of the GPs in the 4th quartile still exist and raise capital.

These conclusions, should they become widely accepted, have the potential to materially disrupt the PE industry in terms of how capital is allocated. However, given the entrenched interests not only of the PE firms and those firms who support them in maintaining the status quo, it may take an inordinate amount of time for these conclusions to be accepted by LPs and

will most certainly be strongly resisted by the entrenched interests. Eventually, though, the data should prevail, and the inexorable conclusion will be that the industry must change.

Exhibit 1 Assumptions on Returns, Volatilities, and Correlations for Various Asset Classes

Name	US Stock Market	Global ex-US Stock Market	Total US Bond Market	REIT	Commodities	Buyouts Proxy	Annualized Return	Annualized Standard Deviation	Sharpe ratio
US Stock Market	1	0.06	0.79	-0.05	0.76	0.21	14.72%	14.30%	0.925
Global ex-US Stock Market	0.06	1	0.05	0.6	0.18	0.26	6.59%	14.22%	0.358
Total US Bond Market	0.79	0.05	1	-0.02	0.61	-0.03	1.82%	3.60%	0.091
REIT	-0.05	0.6	-0.02	1	0.13	0.23	10.57%	15.98%	0.568
Commodities	0.76	0.18	0.61	0.13	1	0.27	-0.89%	22.02%	(0.108)
Buyouts Proxy - Accelerate Private Equity Alpha Fund ALFA.TO	0.21	0.26	-0.03	0.23	0.27	1	21.45%	21.75%	0.918

Covariance Matrix

	US Stock Market	Global ex-US Stock Market	Total US Bond Market	REIT	Commodities	US Buyouts
US Stock Market	0.02045	0.00122	0.00407	-0.00114	0.02393	0.00653
Global ex-US Stock Market	0.00122	0.02022	0.00026	0.01363	0.00564	0.00804
Total US Bond Market	0.00407	0.00026	0.00130	-0.00012	0.00484	-0.00023
REIT	-0.00114	0.01363	-0.00012	0.02554	0.00457	0.00799
Commodities	0.02393	0.00564	0.00484	0.00457	0.04849	0.01293
US Buyouts	0.00653	0.00804	-0.00023	0.00799	0.01293	0.04731

Risk-free rate ***1.49%***

Weights: Portfolio #1 with 5% standard deviation	
US Stock Market	7.87%
Global ex-US Stock Market	–
Total US Bond Market	68.18%
REIT	11.71%
Commodities	–
Buyouts Proxy - ALFA.TO	12.23%
Total	**100%**

Weights: Portfolio #2 with 5% standard deviation	
US Stock Market	22.86%
Global ex-US Stock Market	–
Total US Bond Market	43.71%
REIT	17.41%
Commodities	–
Buyouts Proxy - ALFA.TO	16.02%
Total	**100%**

Source: Compiled by authors from Refinitiv; Preqin; Portfoliovisualizer.com.

Exhibit 2 Buyouts Performance: Mega funds (more than $1bn), by vintage

Panel A

Buyouts Performance: 2018 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Blackstone Group	73	3.0x
Hg	60	2.2x
Searchlight Capital Partners	56	1.5x
Thoma Bravo	56	2.0x
The Jordan Company	54	2.0x
Nordic Capital	51	2.0x
Kelso & Company	49	1.7x
EQT	48	2.0x
GTCR	40	1.8x
Carlyle Group	34	–
Reverence Capital Partners	33	1.5x
Silver Lake	30	1.8x
Roark Capital Group	27	1.7x
Second Quartile		
Name	**IRR**	**MOIC**
TPG	53	1.6x
Hg	35	1.7x
American Securities	32	1.3x
Hillhouse Capital Managemer	29	1.4x
CVC	29	1.6x
PAI Partners	29	1.3x
Epiris	27	1.7x
Roark Capital Group	27	1.5x
Equistone Partners Europe	26	1.5x
Primavera Capital	26	–
Francisco Partners	25	1.7x
Siris Capital	25	1.6x
Wellspring Capital Manageme	24	1.3x
Vestar Capital Partners	23	1.4x
Certares	22	–
Third Quartile		
Name	**IRR**	**MOIC**
Inflexion Private Equity Partn	31	1.4x
PAI Partners	29	1.3x
Wellspring Capital Manageme	24	1.3x
Tailwind Capital	24	1.4x
Vestar Capital Partners	23	1.4x
Onex	22	–
Brookfield Asset Managemen	22	1.3x
Linden	22	1.3x
Charlesbank Capital Partners	20	1.3x
Centurium Capital	18	1.4x
Affinity Equity Partners	18	1.4x
H.I.G. Capital	17	1.3x
Nordic Capital	17	1.5x
Certares	15	–
Fourth Quartile		
Name	**IRR**	**MOIC**
Triton	18	1.2x
Silver Lake	15	1.3x
Palladium Equity Partners	13	1.3x
Novalpina Capital	13	1.1x
Platinum Equity	9	1.1x
Carlyle Group	8	1.1x
Pritzker Private Capital	7	–
Trilantic North America	5	–
Sycamore Partners	0	1.0x

Panel B

Buyouts Performance: 2017 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Veritas Capital	60	3.8x
Clayton Dubilier & Rice	53	2.1x
Vitruvian Partners	52	2.2x
KKR	42	2.2x
Altaris	38	1.9x
Parthenon Capital	37	2.2x
Genstar Capital Partners	33	2.4x
Second Quartile		
Name	**IRR**	**MOIC**
HGGC	34	1.8x
New Mountain Capital	33	2.0x
MidOcean Partners	32	–
EQT	29	1.8x
Leonard Green & Partners	28	2.1x
Permira	25	2.0x
Waud Capital Partners	24	1.7x
Third Quartile		
Name	**IRR**	**MOIC**
Waterland Private Equity Investr	33	1.5x
Brentwood Associates	27	1.4x
Kohlberg & Company	24	1.8x
Stone Point Capital	24	1.8x
Berkshire Partners	24	1.7x
MBK Partners	23	1.8x
Cornell Capital	23	1.4x
Quad-C	20	1.5x
BC Partners	19	1.6x
Lone Star Funds	18	1.5x
CVC	13	1.5x
Fourth Quartile		
Name	**IRR**	**MOIC**
GI Partners	23	1.6x
Corsair Capital	18	1.4x
Bain Capital	16	1.3x
Bernhard Capital Partners Mana	14	0.8x
Ares Management	10	1.3x
Levine Leichtman Capital Partne	8	1.2x
Chequers Capital	6	1.1x

Panel C

Buyouts Performance: 2016 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
TA Associates	42	2.6x
Apax Partners France	38	2.5x
Thoma Bravo	38	3.1x
Oaktree Capital Management	35	3.1x
Apax Partners	30	2.3x
Vista Equity Partners	28	1.9x
Hellman & Friedman	27	–
Bain Capital	27	1.6x
Audax Group	27	2.1x
The Sterling Group	27	2.2x
Harvest Partners	24	2.0x
PAG	20	2.0x
Second Quartile		
Name	**IRR**	**MOIC**
Ardian	29	1.85
Morgan Stanley	28	1.90
Oak Hill Capital Partners	27	1.59
FIMI	26	1.80
Advent International	26	2.25
Platinum Equity	25	1.85
Rivean Capital	24	2.02
Vista Equity Partners	24	2.15
Thomas H Lee Partners	24	1.87
Charterhouse Capital Partners	22	1.72
IK Partners	19	1.63
Third Quartile		
Name	**IRR**	**MOIC**
Blackstone Group	21	1.7x
ACON Investments	20	1.7x
Thoma Bravo	18	1.9x
KSL Capital Partners	17	1.6x
Investindustrial	15	1.5x
Carlyle Group	13	–
Ardian	10	1.3x
Fourth Quartile		
Name	**IRR**	**MOIC**
Goldman Sachs Asset Managem	20	1.5x
American Securities	14	1.5x
ONCAP	14	–
FIMI	12	–
Gamut Capital Management	11	1.3x
Trustar Capital	9	1.3x
Harvest Partners	8	–
Roark Capital Group	7	1.4x
Hony Capital	1	1.0x

Panel D

Buyouts Performance: 2015 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Brookfield Asset Management	48	2.5x
Francisco Partners	35	3.7x
Lindsay Goldberg	35	2.2x
Genstar Capital Partners	35	2.6x
Aquiline Capital Partners	34	2.1x
Wynnchurch Capital	31	2.4x
Veritas Capital	29	3.7x
Waterland Private Equity Investments B.V.	28	2.4x
EQT	27	2.2x
Bridgepoint	25	2.3x
Irving Place Capital	20	4.3x
Second Quartile		
Name	**IRR**	**MOIC**
Welsh, Carson, Anderson & Stowe	30	2.5x
Vector Capital	27	–
Searchlight Capital Partners	25	1.9x
Rhône Group	22	1.7x
One Equity Partners	22	2.1x
Partners Group	21	2.0x
Pacific Equity Partners	21	1.7x
Thoma Bravo	20	2.3x
TPG	20	1.8x
KKR	19	1.8x
Third Quartile		
Name	**IRR**	**MOIC**
Advent International	19	1.7x
Centerbridge Partners	19	1.6x
FFL Partners	18	1.7x
AEA Investors	18	1.9x
Inflexion Private Equity Partners	17	1.7x
Hahn & Company	17	1.8x
Madison Dearborn Partners	16	1.6x
Astorg	16	1.7x
Charlesbank Capital Partners	15	1.6x
Exponent Private Equity	13	1.7x
Fourth Quartile		
Name	**IRR**	**MOIC**
Siris Capital	14	1.5x
Crestview Partners	13	1.5x
RRJ Capital	12	1.3x
Lone Star Funds	12	1.3x
Cortec Group	12	1.5x
ABRY Partners	11	1.4x
Equistone Partners Europe	9	1.5x
Carlyle Group	6	–

Panel E

Buyouts Performance: 2014 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
GTCR	43	4.4x
Thoma Bravo	31	3.8x
Vitruvian Partners	30	–
TowerBrook	26	2.2x
Permira	25	3.1x
Sentinel Capital Partners	22	2.0x
Second Quartile		
Name	**IRR**	**MOIC**
H.I.G. Capital	25	1.9x
Stone Point Capital	23	2.3x
Vista Equity Partners	22	2.3x
The Jordan Company	21	2.1x
PAI Partners	18	2.1x
Altor	18	2.0x
Carlyle Group	18	–
Tailwind Capital	12	1.6x
Third Quartile		
Name	**IRR**	**MOIC**
CVC	17	1.8x
Altor	17	2.0x
Carlyle Group	16	2.0x
Olympus Partners	15	1.6x
HitecVision	14	1.6x
Apollo Global Management	12	1.5x
Freeman Spogli & Co	11	1.6x
Palladium Equity Partners	10	1.5x
Fourth Quartile		
Name	**IRR**	**MOIC**
H.I.G. Capital	15	1.5x
Onex	9	–
Littlejohn & Co.	8	1.4x
Sycamore Partners	5	1.2x
Hopu Investment Managem	1	1.1x
Odyssey Investment Partner	0	1.0x

Panel F

Buyouts Performance: 2013 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
TDR Capital	36	3.6x
Bain Capital	31	2.5x
Silver Lake	27	2.7x
New Mountain Capital	23	2.2x
Partners Group	19	2.4x
Hg	18	2.2x
Second Quartile		
Name	**IRR**	**MOIC**
Clayton Dubilier & Rice	27	2.4x
H.I.G. Capital	23	2.1x
Affinity Equity Partners	16	1.7x
IK Partners	15	1.9x
CCMP Capital Advisors	15	2.0x
Third Quartile		
Name	**IRR**	**MOIC**
Nordic Capital	17	1.8x
Vista Equity Partners	16	2.1x
Audax Group	15	1.8x
Carlyle Group	13	1.6x
CCMP Capital Advisors	13	1.8x
Archer Capital	13	1.7x
MBK Partners	12	1.7x
RRJ Capital	11	1.4x
Fourth Quartile		
Name	**IRR**	**MOIC**
EQT	9	–
Lone Star Funds	9	1.2x
Morgan Stanley Private Equi	8	1.4x

Panel G

Buyouts Performance: 2012 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Thoma Bravo	40	3.2x
Baring Vostok Capital Partners	23	2.9x
Second Quartile		
Name	**IRR**	**MOIC**
TSG Consumer Partners	30	2.7x
Platinum Equity	30	1.9x
Providence Equity	24	2.1x
KKR	20	2.2x
Bain Capital	19	–
Third Quartile		
Name	**IRR**	**MOIC**
Court Square	19	1.9x
Roark Capital Group	17	2.6x
AEA Investors	17	2.0x
Kohlberg & Company	16	1.7x
Ares Management	16	2.0x
Apax Partners	15	1.9x
Ardian	13	1.7x
Actera Group	8	1.4x
Fourth Quartile		
Name	**IRR**	**MOIC**
Audax Group	13	1.6x

Panel H

Buyouts Performance: 2011 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Waterland Private Equity Investments B.V.	41	3.3x
Sycamore Partners	29	2.2x
Hellman & Friedman	25	3.3x
Francisco Partners	24	3.5x
American Securities	23	2.3x
Second Quartile		
Name	**IRR**	**MOIC**
Harvest Partners	21	2.1x
GTCR	21	2.0x
PAG	19	2.0x
Berkshire Partners	18	2.1x
Wellspring Capital Management	17	1.7x
EQT	16	1.9x
Equistone Partners Europe	16	1.7x
Vista Equity Partners	16	2.1x
BC Partners	16	2.0x
Chequers Capital	16	1.9x
Third Quartile		
Name	**IRR**	**MOIC**
Equistone Partners Europe	16	1.7x
Wellspring Capital Management	16	1.7x
EQT	16	–
ABRY Partners	14	1.8x
Blackstone Group	13	1.8x
KSL Capital Partners	10	1.3x
BPEA EQT Asia	9	1.6x
Fourth Quartile		
Name	**IRR**	**MOIC**
Carlyle Group	8	–
Rhône Group	6	1.2x
Advent International	1	1.1x

Panel I

Buyouts Performance: 2010 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
TA Associates	27	3.9x
Birch Hill Equity Partners	23	3.6x
Second Quartile		
Name	**IRR**	**MOIC**
NA	NA	NA
Third Quartile		
Name	**IRR**	**MOIC**
Littlejohn & Co.	14	1.9x
Oaktree Capital Managem	13	1.6x
Stone Point Capital	12	1.9x
Fourth Quartile		
Name	**IRR**	**MOIC**
The Gores Group	1	1.0x

Panel J

Buyouts Performance: 2009 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Clayton Dubilier & Rice	26	2.7x
Second Quartile		
Name	**IRR**	**MOIC**
Clessidra Capital Partners	16	1.5x
Third Quartile		
Name	**IRR**	**MOIC**
Waterland Private Equity Ir	17	1.6x
Clessidra Capital Partners	16	1.5x
Charterhouse Capital Partn	13	1.5x
Triton	10	1.6x
Fourth Quartile		
Name	**IRR**	**MOIC**
Onex	11	–
FFL Partners	4	1.0x

Panel K

Buyouts Performance: 2008 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Madison Dearborn Partners	23	2.3x
American Securities	21	1.9x
Ares Management	20	2.1x
MBK Partners	20	2.3x
Altor	19	2.6x
Bain Capital	18	2.0x
CVC	17	2.0x
Advent International	17	2.1x
Second Quartile		
Name	**IRR**	**MOIC**
Apollo Global Management	25	1.7x
ABRY Partners	20	2.1x
Avista Capital Partners	16	1.7x
PAI Partners	13	2.2x
KKR	13	1.8x
Bridgepoint	13	1.8x
Third Quartile		
Name	**IRR**	**MOIC**
CVC	13	1.6x
GI Partners	13	1.6x
Welsh, Carson, Anderson & St	12	1.7x
Lone Star Funds	12	1.6x
TA Associates	11	1.8x
HGGC	10	1.3x
TPG	10	1.5x
Bain Capital	10	1.6x
Riverside Company	9	1.5x
Fourth Quartile		
Name	**IRR**	**MOIC**
Carlyle Group	12	1.6x
Yucaipa Companies	9	1.7x
TowerBrook	8	1.3x
Lindsay Goldberg	8	1.4x
Nordic Capital	8	1.6x
Pacific Equity Partners	8	1.4x
Kelso & Company	7	1.4x
Lee Equity Partners	6	1.2x

Buyouts Performance: Mid-Market Funds (less than $1bn), by Vintage

Panel L

Buyouts Performance: 2018 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Sole Source Capital	102	–
CONSTELLATION CAPITAL	69	3.9x
Periscope Equity	57	2.9x
WestBridge Capital	55	1.8x
INVL Asset Management	48	3.1x
LFM Capital	46	1.6x
New State Capital Partners	45	–
Wind Point Partners	42	2.5x
Exponent Private Equity	39	2.1x
ArchiMed	36	1.6x
ECI Partners	35	1.7x
Verdane Capital Advisors	33	1.6x
Acathia Capital	32	2.0x
Cressey & Company	30	1.4x
Revelstoke Capital Partners	30	1.6x
Second Quartile		
Name	**IRR**	**MOIC**
New Heritage Capital	43	1.6x
Cressey & Company	39	1.6x
Hastings Equity Partners	35	1.8x
Glenwood Private Equity	35	–
Miura Partners	31	1.6x
Andera Partners	31	1.5x
Advent Partners	28	1.5x
Behrman Capital	27	1.6x
Frazier Healthcare Partners	26	1.4x
Presidio Investors	26	1.8x
Lee Equity Partners	26	1.3x
Borromin Capital Management	25	1.6x
LightBay Capital	25	1.4x
Innova Capital	25	1.5x
B & Capital	24	1.4x
Third Quartile		
Name	**IRR**	**MOIC**
Lee Equity Partners	26	1.3x
Blue Point Capital Partners	21	1.4x
ParkerGale	20	1.3x
Windjammer Capital Investors	19	1.3x
Star Capital	19	1.3x
Anacacia Capital	18	1.3x
IK Partners	16	1.2x
Down 2 Earth Capital	15	–
Bolster Investment Partners	14	1.4x
GCP Capital Partners	12	1.3x
Progressio SGR	9	1.3x
Ardian	8	1.2x
Ethos	6	1.3x
Fourth Quartile		
Name	**IRR**	**MOIC**
Great Point Partners	11	1.1x
Water Street Healthcare Partners	9	1.2x
KJK Capital	3	1.1x
Crescendo Equity Partners	3	1.1x

Panel M

Buyouts Performance: 2017 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Hg	90	2.1x
GMT Communications Partners	89	2.1x
Francisco Partners	81	3.7x
Gemspring Capital	77	2.7x
Sole Source Capital	60	–
Value4Capital	57	2.9x
Novacap	55	2.6x
Prospect Hill Growth Partners	55	–
LongueVue Capital	41	2.7x
BV Investment Partners	39	1.9x
Seidler Equity Partners	36	1.9x
Marlin Equity Partners	33	2.1x
Main Capital Partners	32	2.2x
EmergeVest	28	3.0x
Second Quartile		
Name	**IRR**	**MOIC**
Trinity Hunt Partners	55	1.8x
Frontenac Company	50	2.3x
The Vistria Group	36	1.9x
Kinderhook Industries	30	1.9x
RUBICON Technology Partners	30	1.6x
Argos Wityu	28	1.7x
Incline Equity Partners	27	1.6x
Gilde Equity Management Benelux	25	1.6x
Procuritas Partners	23	1.5x
Lightyear Capital	22	1.7x
Montefiore Investment	20	1.7x
Axcel	19	1.8x
Amergent Capital	17	3.2x
Third Quartile		
Name	**IRR**	**MOIC**
New MainStream Capital	33	1.7x
Bain Capital	31	1.7x
Cotton Creek Capital	31	1.7x
Incline Equity Partners	26	1.6x
Gallatin Point Capital	22	1.4x
Lightyear Capital	22	1.8x
EmergeVest	20	–
Palatine Private Equity	19	1.4x
NB Renaissance Partners	16	1.4x
August Equity	14	1.5x
Innova Capital	11	2.1x
Fourth Quartile		
Name	**IRR**	**MOIC**
Centre Lane Partners	21	–
Marlin Equity Partners	17	1.5x
Riordan, Lewis & Haden Equity Partners	17	1.3x
Procuritas Partners	15	1.3x
Omaha Beach Capital	15	–
Vista Equity Partners	12	1.4x
Arcadia SGR	11	1.3x
Vaaka Partners	10	1.2x
Quadrant Private Equity	10	1.2x
EQT	7	–
Platte River Equity	6	1.1x

Panel N

Buyouts Performance: 2016 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Renovus Capital Partners	79	6.4x
Falfurrias Capital Partners	75	6.9x
Nautic Partners	53	1.7x
Avista Capital Partners	48	2.1x
Bridgepoint	43	2.3x
Bertram Capital	39	2.4x
EagleTree Capital	36	2.7x
Synova	36	2.7x
YFM Equity Partners	32	2.1x
Imperial Capital Group	32	2.6x
Palm Beach Capital	32	2.2x
Veronis Suhler Stevenson	31	2.0x
Atlantic Street Capital	31	2.1x
Cordovan Capital Management	30	2.2x
Speyside Equity	30	3.1x
Accelmed	30	–
Altaris	30	2.7x
Key Capital Partners	30	2.3x
Vendis Capital	23	2.6x
Second Quartile		
Name	**IRR**	**MOIC**
Graycliff Partners	46	1.9x
CBPE Capital	33	1.8x
Wind Point Partners	31	1.9x
Arlington Capital Partners	29	2.0x
DC Capital Partners	29	1.5x
Artá Capital	28	1.7x
DW Healthcare Partners	28	2.2x
WindRose Health Investors	28	2.3x
Branford Castle	28	–
CenterOak Partners	27	2.0x
Levine Leichtman Capital Partners	26	2.1x
Seaport Capital	25	2.0x
Via Equity	24	2.0x
MCH Private Equity	23	1.8x
Endeavour Capital	21	2.0x
AEA Investors	20	2.0x
Holland Capital	20	1.8x
OpenGate Capital	19	2.0x
Third Quartile		
Name	**IRR**	**MOIC**
DC Capital Partners	26	1.5x
Excellere Partners	24	1.6x
CenterGate Capital	24	1.9x
Phoenix Equity Partners	24	1.7x
Seaport Capital	24	2.0x
Korona Invest	23	1.1x
Argand Partners	22	1.8x
Growth Capital Partners	21	1.7x
Oriens Investment Management	21	1.6x
AEA Investors	20	2.0x
Holland Capital	20	1.8x
NB Renaissance Partners	20	1.8x
Angeles Equity Partners	20	1.6x
Mason Wells	19	1.9x
OpenGate Capital	19	2.0x
NorthEdge	18	1.7x
STAR Capital Partners	17	1.6x
Liberty Hall Capital Partners	16	1.3x
Flexpoint Ford	15	1.8x
Endeavour Capital	15	1.6x
OpCapita	15	1.6x
Quadrant Private Equity	14	1.6x
Glenwood Private Equity	12	1.1x
L Catterton	9	1.3x
Fourth Quartile		
Name	**IRR**	**MOIC**
EOS Investment Management Group	15	1.5x
Shamrock Capital Advisors	14	1.3x
Century Equity Partners	14	1.3x
Flexpoint Ford	13	1.3x
Frazier Healthcare Partners	13	1.5x
Swander Pace Capital	13	1.4x
Gen Cap America	12	1.2x
Mobeus Equity Partners	12	1.3x
MBO & Co	11	1.3x
PineBridge Investments	11	1.3x
DFW Capital Partners	10	1.4x
Livingbridge	9	1.3x
Omaha Beach Capital	8	–
Karmijn Kapitaal	8	1.4x
Arbor Private Investment Company	8	1.2x
TDR Capital	5	1.4x
Australis Partners	2	1.0x

Panel O

Buyouts Performance: 2015 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Gridiron Capital	55	6.1x
New State Capital Partners	42	–
Detong Capital	40	4.7x
Crescendo Equity Partners	39	2.9x
Linden	38	2.9x
Apax Partners	36	3.1x
J.F. Lehman & Company	35	2.6x
WM Partners	35	2.2x
Main Capital Partners	33	2.6x
Sumeru Equity Partners	32	2.8x
Sparring Capital	32	2.5x
Carlyle Group	32	–
EmergeVest	28	2.8x
Polaris Private Equity	26	2.1x
Lineage Capital	26	2.2x
Palatine Private Equity	25	2.0x
Evoco	24	2.1x
Crescent Capital Partners	22	3.3x
Revelstoke Capital Partners	21	2.4x
Second Quartile		
Name	**IRR**	**MOIC**
Riverside Company	46	1.5x
Cressey & Company	26	2.3x
Fortissimo Capital	25	2.0x
Invision	25	1.8x
Latour Capital	24	1.8x
Kedma Capital	24	2.1x
Panoramic Growth Equity	24	2.1x
Nippon Mirai Capital	23	2.1x
Amulet Capital Partners	23	2.1x
Hamilton Robinson	21	–
Kinderhook Industries	21	2.4x
SkyKnight Capital	20	–
Levine Leichtman Capital Partners	19	1.9x
Stirling Square Capital Partners	19	2.2x
Gilde Equity Management Benelux	16	1.9x
Third Quartile		
Name	**IRR**	**MOIC**
IK Partners	23	1.7x
Ridgemont Equity Partners	21	1.8x
Birch Hill Equity Partners	20	1.7x
Lovell Minnick Partners	20	1.7x
Encore Consumer Capital	19	1.8x
CapStreet Group	19	1.6x
Riverside Company	17	2.0x
Gilde Equity Management Benelux	16	1.9x
EQT	16	–
Shorehill Capital	14	1.6x
Bernhard Capital Partners Management	14	1.9x
IFM Investors	13	1.8x
MidOcean Partners	13	–
Azulis Capital	13	1.5x
Fourth Quartile		
Name	**IRR**	**MOIC**
Flexpoint Ford	16	1.6x
GHO Capital	14	1.6x
MSouth Equity Partners	14	1.6x
Brentwood Capital Advisors	13	1.2x
Comvest Partners	12	1.6x
AE Industrial Partners	12	1.5x
True North	12	1.6x
Linzor Capital Partners	11	1.4x
JZ Capital Partners	11	1.4x
Livingbridge	10	1.4x
ParkerGale	10	1.5x
Segulah	10	1.4x
Neuberger Berman	9	1.3x
AnaCap Financial Partners	9	1.2x
HCapital Partners	9	1.5x
Elysian Capital	9	1.4x
Harwood Capital Management Group	8	1.3x
CAI Capital Partners	8	1.4x

Panel P

Panel Q

Buyouts Performance: 2014 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Detong Capital	82	4.7x
ArchiMed	46	2.3x
Nautic Partners	43	4.1x
Novacap	43	4.1x
Riverside Company	39	5.9x
Alpine Investors	38	3.7x
Marlin Equity Partners	34	2.5x
Aksìa Group	34	2.6x
LFM Capital	32	2.6x
Harvest Capital	32	2.9x
Nordian Capital Partners	32	4.3x
Altaris	32	2.5x
Stripes	27	2.6x
Quadrant Private Equity	27	1.8x
Reverence Capital Partners	24	1.9x
Portobello Capital	23	1.9x
Second Quartile		
Name	**IRR**	**MOIC**
ACA Group	35	1.6x
ZMC	27	–
Glenwood Private Equity	27	1.7x
The Vistria Group	26	2.5x
Next Capital	26	2.3x
Tritium Partners	25	2.2x
Webster Equity Partners	24	2.5x
Andera Partners	23	1.9x
Miura Partners	20	2.3x
Seidler Equity Partners	19	2.3x
Novacap	19	1.9x
ProA Capital	18	1.8x
Egeria	18	1.9x
JLL Partners	17	1.8x
Bluegem Capital Partners	11	2.3x
Third Quartile		
Name	**IRR**	**MOIC**
Stellex Capital Management	21	1.5x
ProA Capital	19	2.0x
Hastings Equity Partners	18	1.8x
Blue Point Capital Partners	17	1.6x
RUBICON Technology Partners	16	1.6x
Timesbole Venture Capital	16	–
Sorenson Capital	16	1.8x
Union Park Capital	15	2.2x
Prospect Hill Growth Partners	15	–
Sovereign Capital Partners	13	1.5x
Sentica Partners	12	1.6x
STAR Capital Partners	8	1.6x
Ford Financial	8	1.7x
Fourth Quartile		
Name	**IRR**	**MOIC**
Content Partners	12	1.5x
Harbert Management Corporation	10	1.6x
New MainStream Capital	10	1.4x
Primary Capital Partners	10	1.5x
Paine Schwartz Partners	9	1.4x
Mill City Capital	8	1.5x
OpCapita	8	1.4x
EmergeVest	7	–

Panel R

Buyouts Performance: 2013 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Consonance Capital	74	3.5x
Holland Capital	74	5.1x
Eureka Equity Partners	41	3.0x
Down 2 Earth Capital	38	2.8x
Clarion Capital Partners	37	2.8x
Thoma Bravo	36	3.3x
Water Street Healthcare Partner	36	2.9x
Harren Equity Partners	36	3.3x
Accel-KKR	35	2.7x
Quad-C	30	2.6x
FSN Capital	28	2.9x
Synova	25	2.5x
Second Quartile		
Name	**IRR**	**MOIC**
Alvarez & Marsal Capital	27	2.1x
Clearview Capital	26	2.6x
Pencarrow Private Equity	23	2.0x
August Equity	23	2.2x
Montefiore Investment	22	2.3x
Insignia Capital Group	22	1.9x
Vaaka Partners	22	2.3x
Silver Oak Services Partners	22	2.6x
Great Point Partners	22	1.8x
CID Capital	20	2.2x
New Heritage Capital	19	1.9x
Windjammer Capital Investors	17	2.2x
HCI Equity Partners	15	2.2x
Third Quartile		
Name	**IRR**	**MOIC**
NorthEdge	18	1.6x
Invision	16	1.9x
GenNx360 Capital Partners	15	1.7x
High Road Capital Partners	15	1.9x
Guardian Capital Partners	13	1.8x
Parallax Capital Partners	13	1.6x
Anacacia Capital	10	1.4x
ACON Investments	10	1.6x
Nexus Group - Peru	9	1.5x
Swander Pace Capital	9	1.7x
Spire Capital	8	1.3x
Fourth Quartile		
Name	**IRR**	**MOIC**
Riverside Partners	12	1.7x
AAC Capital Partners	8	1.5x
ICV Partners	8	1.3x
Brentwood Associates	7	1.4x
JPB Partners	7	1.4x
Palatine Private Equity	6	1.3x
Graphite Capital Management	6	1.4x
CapMan	4	1.1x

Panel S

Buyouts Performance: 2012 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
CapVest	48	4.2x
WindRose Health Investors	44	4.2x
Imperial Capital Group	41	5.5x
BV Investment Partners	40	2.4x
Parthenon Capital	39	4.2x
Incline Equity Partners	37	2.5x
Frontenac Company	35	2.4x
DFW Capital Partners	34	2.9x
Cortec Group	31	4.1x
Trinity Hunt Partners	27	3.3x
Main Capital Partners	27	3.1x
Livingbridge	27	2.7x
The Growth Fund	21	2.7x
Second Quartile		
Name	**IRR**	**MOIC**
Excellere Partners	32	2.1x
One Rock Capital Partners	26	2.2x
Centre Lane Partners	25	–
Ridgemont Equity Partners	25	2.5x
Hg	23	2.4x
Bridgepoint	23	1.9x
Wicks Group	22	2.3x
Linsalata Capital Partners	21	2.1x
Thompson Street Capital Partners	21	1.8x
FIMI	20	2.5x
Elbrus Capital	20	2.9x
DW Healthcare Partners	19	2.2x
Procuritas Partners	18	2.3x
Fortissimo Capital	17	2.2x
Third Quartile		
Name	**IRR**	**MOIC**
Ridgemont Equity Partners	25	2.5x
Arsenal Capital Partners	25	2.4x
Ardian	19	2.2x
Yellow Wood Partners	18	1.5x
FIMI	15	2.2x
Juggernaut Capital Partners	14	1.9x
The Gores Group	14	1.4x
MSouth Equity Partners	14	1.7x
Heartwood Partners	13	1.5x
Summer Street Capital Partners	12	1.5x
Stripes	11	1.9x
The Halifax Group	3	2.1x
Fourth Quartile		
Name	**IRR**	**MOIC**
Harbour Group	13	1.6x
EagleTree Capital	12	1.5x
Fort Point Capital	10	1.3x
RFE Investment Partners	9	1.5x
Encore Consumer Capital	9	1.5x
Renovus Capital Partners	9	1.7x
ECM Equity Capital Management	8	1.3x
Riverside Company	8	1.2x
Karmijn Kapitaal	8	1.6x
Crescent Capital Partners	7	1.4x
KarpReilly	6	1.3x
Siris Capital	6	1.2x
LNK Partners	4	1.1x
SG Private Equity	3	1.0x
Turkven Private Equity	3	1.2x
Victoria Capital Partners	2	1.1x

Panel T

Buyouts Performance: 2011 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Via Equity	49	3.3x
Key Capital Partners	37	2.7x
Atlantic Street Capital	37	3.3x
Levine Leichtman Capital Partners	37	4.4x
Alpine Investors	28	6.9x
Novo Tellus Capital Partners	28	3.9x
Vestar Capital Partners	24	2.0x
Lightyear Capital	24	2.3x
Second Quartile		
Name	**IRR**	**MOIC**
Latour Capital	29	2.6x
Falfurrias Capital Partners	24	2.5x
Inflexion Private Equity Partners	21	1.8x
Blue Sea Capital	21	3.4x
Waud Capital Partners	20	2.1x
ONCAP	19	–
Rivean Capital	14	1.9x
Third Quartile		
Name	**IRR**	**MOIC**
Borromin Capital Management	26	2.4x
Rising Japan Equity	22	1.6x
Advent Partners	16	1.5x
Litorina	13	1.9x
Altus Capital Partners	13	1.7x
Argos Wityu	11	1.6x
Nexus Group - Peru	11	2.0x
Alpha Group	11	1.4x
Linden	10	1.8x
GCP Capital Partners	9	2.0x
American Industrial Partners	9	1.7x
Endeavour Capital	9	1.5x
Pegasus Capital Advisors	9	1.5x
Carousel Capital	1	3.3x
Fourth Quartile		
Name	**IRR**	**MOIC**
Brass Ring Capital	8	1.5x
Arcadia SGR	8	1.3x

Panel U

Buyouts Performance: 2010 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Riverside Company	47	9.6x
Seaport Capital	40	5.0x
Quadrant Private Equity	32	2.1x
The Sterling Group	29	2.8x
Seidler Equity Partners	27	22.7x
Dominus Capital	26	–
ECI Partners	25	2.3x
Bertram Capital	23	3.1x
GEC	19	2.0x
Growth Capital Partners	19	1.9x
Second Quartile		
Name	**IRR**	**MOIC**
Comvest Partners	27	1.8x
Wynnchurch Capital	25	2.0x
Gen Cap America	24	2.6x
Freeman Spogli & Co	23	2.8x
Palm Beach Capital	22	2.3x
Mason Wells	20	3.0x
L Catterton	20	2.4x
CBPE Capital	19	2.1x
AEA Investors	19	2.4x
Green Arrow Capital	17	1.8x
WestBridge Capital	15	1.8x
Rizvi Traverse Management	15	2.7x
Risk Capital Partners	13	1.9x
Third Quartile		
Name	**IRR**	**MOIC**
Silverhawk Capital Partners	21	1.8x
Cressey & Company	20	2.2x
Green Arrow Capital	17	1.8x
WestBridge Capital	15	1.8x
Risk Capital Partners	14	2.1x
MBO & Co	14	1.7x
Commerce Street Holdings	13	1.9x
J.H. Whitney & Co	13	1.9x
Hahn & Company	13	1.8x
Phoenix Equity Partners	12	1.6x
Corsair Capital	11	1.6x
Fourth Quartile		
Name	**IRR**	**MOIC**
Lovell Minnick Partners	11	1.6x
TruArc Partners	9	1.5x
Insight Equity	9	1.6x
Aquiline Capital Partners	8	1.5x
Andera Partners	7	1.4x
Castle Harlan	6	1.2x
Innova Capital	6	1.2x
Progressio SGR	5	1.3x
True North	4	1.2x
Bunker Hill Capital	3	1.2x
Linzor Capital Partners	2	1.1x

Buyouts Performance: 2009 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
Vista Equity Partners	39	3.0x
Karnell	38	2.3x
Sentinel Capital Partners	37	2.7x
Vendis Capital	26	3.5x
Egeria	22	2.2x
Bruckmann Rosser Sherrill & Co	22	2.5x
Bridgepoint	20	2.4x
Sentica Partners	20	2.5x
Second Quartile		
Name	**IRR**	**MOIC**
Partnership Capital Growth Investors	33	1.7x
KSL Capital Partners	25	2.2x
KPS Capital Partners	23	2.0x
Riverside Partners	21	2.4x
Harwood Capital Management Group	20	2.4x
Polaris Private Equity	19	2.0x
Leeds Equity Partners	18	2.5x
Elysian Capital	15	2.2x
Third Quartile		
Name	**IRR**	**MOIC**
Wind Point Partners	19	2.0x
Pfingsten Partners	16	2.1x
Stripes	13	1.7x
Azulis Capital	10	1.7x
Riverside Company	7	1.4x
Vision Capital	5	1.3x
Fourth Quartile		
Name	**IRR**	**MOIC**
Chart Capital Partners	11	1.9x
Lincolnshire Management	9	1.4x
21st Century Group	7	1.3x
Halder	3	1.2x
ACON Investments	2	1.1x
Carlyle Group	1	–
KKR	0	1.0x

KKR has small fund

Panel V

Buyouts Performance: 2008 Vintage		
Top Quartile		
Name	**IRR**	**MOIC**
OFS Energy Fund	123	3.5x
Thoma Bravo	45	3.8x
ZMC	44	2.7x
Anacacia Capital	41	3.4x
Helix Kapital	37	–
Egis Capital Partners	37	3.7x
Vaaka Partners	28	2.4x
Water Street Healthcare Partners	28	2.3x
Altaris	27	2.6x
MSouth Equity Partners	27	2.4x
CAI Capital Partners	26	5.1x
Fortissimo Capital	26	3.8x
Accel-KKR	24	5.6x
Procuritas Partners	22	2.3x
Imperial Capital Group	20	3.0x
FIMI	19	2.3x
Partners Group	17	2.6x
Carlyle Group	16	1.9x
Second Quartile		
Name	**IRR**	**MOIC**
CapStreet Group	25	2.1x
Graham Partners	23	2.3x
Evergreen Pacific Partners	22	2.0x
Guardian Capital Partners	21	2.6x
Chicago Growth Partners	20	2.1x
Amberjack Capital Partners	18	2.4x
Hamilton Robinson	18	–
Swander Pace Capital	17	2.3x
Pechel Industries	12	1.6x
FSN Capital	12	1.6x
ProA Capital	11	1.7x
Iwakaze Capital	11	2.1x
Capvis AG	8	1.4x
Third Quartile		
Name	**IRR**	**MOIC**
Calera Capital	14.93	1.7x
Transportation Resource Partners	14.51	1.9x
Hastings Equity Partners	12.76	1.5x
Brazos Private Equity Partners	12.71	1.6x
High Road Capital Partners	11.00	1.5x
Endeavour Capital	10.70	2.0x
MCH Private Equity	8.70	1.5x
RLJ Equity Partners	8.10	1.5x
RFE Investment Partners	7.95	1.7x
Halyard Capital	6.60	1.5x
Turkven Private Equity	6.20	1.5x
Accent Equity Partners	5.60	1.3x
Altra Investments	5.25	1.5x
Bowmark Capital	5.10	1.4x
Fourth Quartile		
Name	**IRR**	**MOIC**
Sparring Capital	5	1.3x
Vance Street Capital	4	1.2x
Riverside Company	4	1.1x
Riverlake Partners	2	1.1x

Source: Preqin, accessed December 21, 2021.

Note: Quartile performance is calculated by Preqin and includes both IRR and MOIC metrics

Exhibit 3 Concentration Measures - Methodology

We use **Preqin** database to analyze aggregate capital raising dynamics of Top 100 fund managers that operate across buyouts verticals. We study the data in four dimensions: Top 25 and Top 100 fund managers in the world; Top25 and Top 100 fund managers in the US

The goal of the analysis is to gauge private capital industry consolidation in terms of concentration of funds in industry constituencies. For this purpose, we use two standard market concentration measures:

- **Herfindahl–Hirschman Index** defined as $H = \sum_{i=1}^{N} S_i^2$ where and S_i is the market share of fund manager ***i*** (funds raised by fund manager relative to total funds raised) and N is the number of fund managers. HHI below 2000 signifies relatively competitive markets.
- **Concentration Ratio** defined as $CR = \frac{S_1 + \ldots + S_n}{T}$ where S is fund manager, n is chosen to be 5, and T is the total funds raised during the period. CR between 40-70% implies medium concentration.

Source: Authors.

Endnotes

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[13] This Figure depicts where the capital has been raised. Some of the capital has been raised by global firms to be invested outside the US. Some of the European capital may have also been invested in the US. However, the preponderance of the capital is presumably invested regionally.

[14] Subscription Lines are credit facilities obtained by General Partners collateralized by the Limited Partners capital commitments used to finance early acquisitions and initial expenses so that the General Partners do not need to draw Limited Partner capital early in the life cycle of a fund. This practice can have the result of artificially increasing the reported returns early on by reducing or eliminating the so-called J Curve.

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They observed outperformance versus the public markets in the vintage years pre 2006. Funds formed post 2005 did not outperform, similar results to those depicted in **Figure 10**.

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[21] FPA Risk is Where You're Not Looking, January 2, 2019, p. 10, https://fpa.com/docs/default-source/funds/fpa-crescent-fund/literature/risk-is-where-you're-not-looking.pdf?sfvrsn=8, Accessed May 30, 2022.

[22] We have assumed this data reflects the average, not the median results. We contacted both Bain Capital and Cambridge Associates to ask whether the data reflects the average or median results and did not receive clarification.

[23] Note that State Street reported median results not average results and their results were for Global funds, not US funds.

[24] The performance discrepancies between **Figures 15** and **Figure 16** are explained by such factors as time horizon (**Figure 15** reflects the performance from 2001 to 2021 while **Figure 16** measures the performance during the period between 2005 and 2020), geography (**Figure 15** focuses on the US and European markets separately while **Figure 16** addresses the global market), as well as being annualized IRRs, calculated slightly differently than the pooled IRRs.

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[29] Kaplan, Steven and Schoar, Antionette Private Equity Performance: Returns, Persistence and Capital Flows, Journal of Finance, Vol. LX, No. 4, August 2005. Referred to herein as "the Original Persistence Paper". They analyzed the essentially realized performance of 746 funds invested from 1980 through 1997.

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[37] Ibid

[38] Ibid., p.22

[39] Ibid., p 30

[40] Ibid., p. 2

[41] Ibid.p., 9

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[43] Ibid., p. 2

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APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT: Fund Performance Review
Greg Allen, Callan CEO & Chief Research Officer
Steve Center, Callan Senior VP

DATE: February 12, 2025 INFORMATION: X

BACKGROUND:

Callan is currently under contract to perform APFC's core general consulting services of 1) Investment policies and procedures review; 2) annual preparation of an asset allocation plan; 3) performance reporting and analysis; 4) risk analysis; 5) statistical modeling, manager searches, selection, and oversight; and 6) other special consulting services as needed.

STATUS:

At every quarterly board meeting or as requested, Callan provides an extensive review of the Fund's performance as well as updates on market conditions. Greg Allen, Chief Executive Officer and Chief Research Officer, and Steven Center, Senior Vice President, will be the presenters at this meeting.

Callan

October 1, 2025

Alaska Permanent Fund Corporation

2nd Quarter 2025

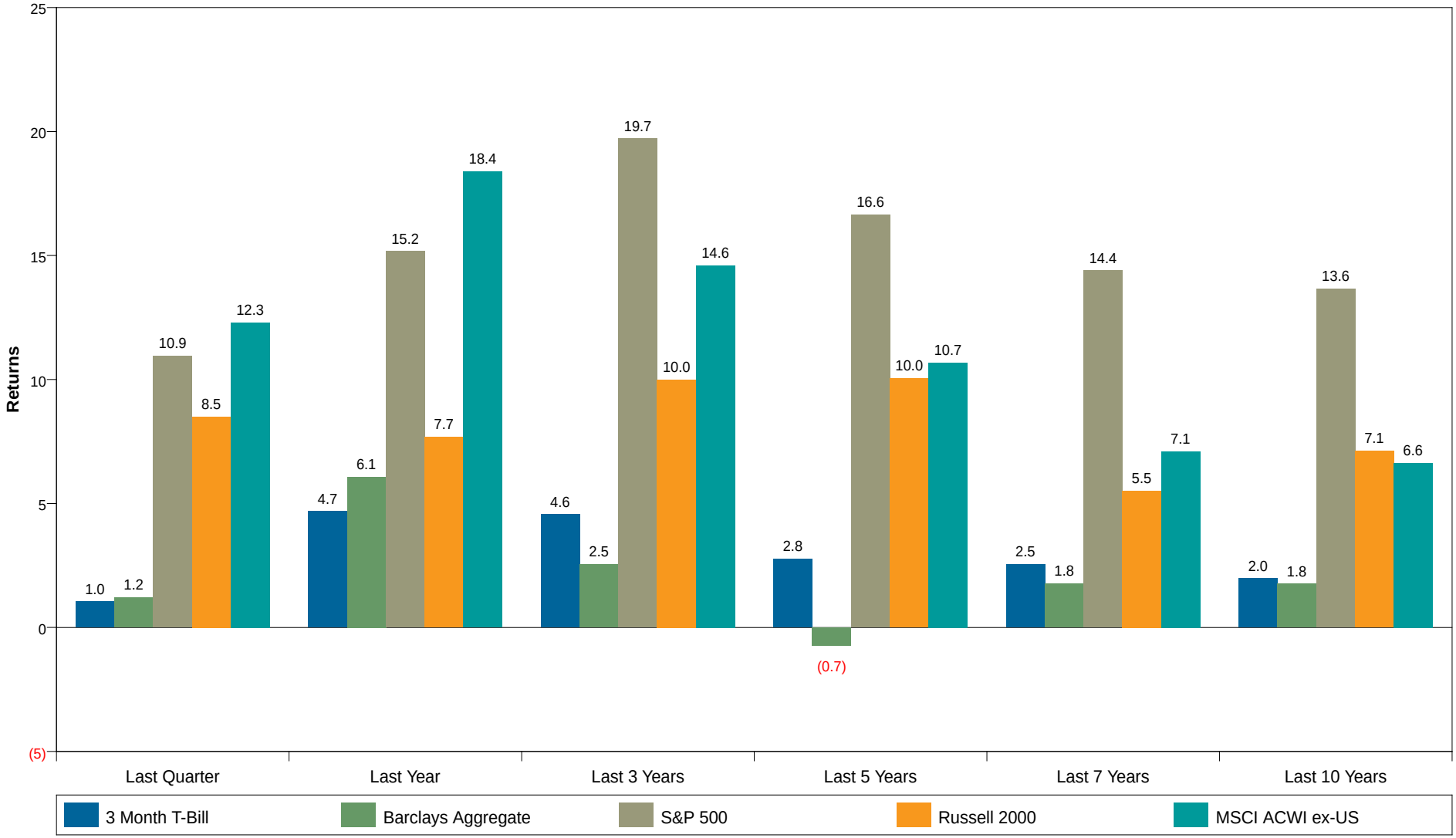
Capital Markets and Performance Review

Greg Allen
CEO and Chief Research Officer

Steven Center, CFA
Senior Vice President

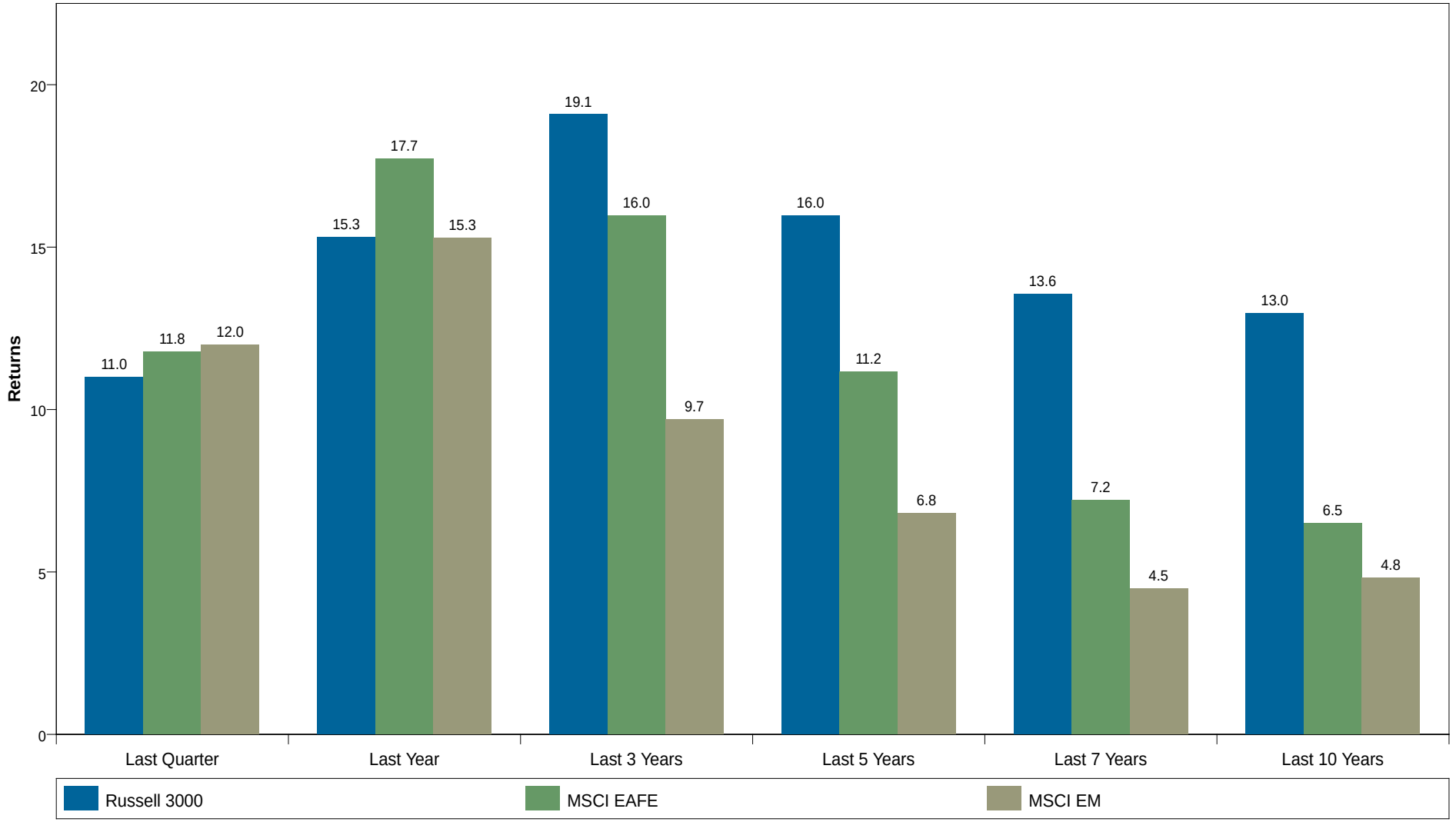
Broad Capital Market Performance

Periods Ended June 30, 2025



Public Equity Capital Market Performance

Periods Ended June 30, 2025



Callan Periodic Table of Investment Returns

Returns for Key Indices

2016	2017	2018	2019	2020	2021	2022	2023	2024	2 Qtrs. 2025
Russell 2000 21.31%	MSCI Emerging Markets 37.28%	Bloomberg Aggregate 0.01%	S&P 500 31.49%	Russell 2000 19.96%	S&P 500 28.71%	Bloomberg Corp High Yield -11.19%	S&P 500 26.29%	S&P 500 25.02%	MSCI World ex USA 18.99%
Bloomberg Corp High Yield 17.13%	MSCI ACWI ex USA SC 31.65%	Bloomberg Corp High Yield -2.08%	MSCI:ACWI IMI 26.35%	S&P 500 18.40%	MSCI:ACWI IMI 18.22%	Bloomberg Aggregate -13.01%	MSCI:ACWI IMI 21.58%	MSCI:ACWI IMI 16.37%	MSCI ACWI ex USA SC 17.68%
S&P 500 11.96%	MSCI World ex USA 24.21%	Bloomberg Global Agg ex US -2.15%	Russell 2000 25.52%	MSCI Emerging Markets 18.31%	Russell 2000 14.82%	MSCI World ex USA -14.29%	MSCI World ex USA 17.94%	Russell 2000 11.54%	MSCI Emerging Markets 15.27%
MSCI Emerging Markets 11.19%	MSCI:ACWI IMI 23.95%	S&P 500 -4.38%	MSCI World ex USA 22.49%	MSCI:ACWI IMI 16.25%	MSCI ACWI ex USA SC 12.93%	S&P 500 -18.11%	Russell 2000 16.93%	Bloomberg Corp High Yield 8.19%	Bloomberg Global Agg ex US 10.01%
MSCI:ACWI IMI 8.36%	S&P 500 21.83%	MSCI:ACWI IMI -10.08%	MSCI ACWI ex USA SC 22.42%	MSCI ACWI ex USA SC 14.24%	MSCI World ex USA 12.62%	MSCI:ACWI IMI -18.40%	MSCI ACWI ex USA SC 15.66%	MSCI Emerging Markets 7.50%	MSCI:ACWI IMI 9.82%
MSCI ACWI ex USA SC 3.91%	Russell 2000 14.65%	Russell 2000 -11.01%	MSCI Emerging Markets 18.44%	Bloomberg Global Agg ex US 10.11%	Bloomberg Corp High Yield 5.28%	Bloomberg Global Agg ex US -18.70%	Bloomberg Corp High Yield 13.44%	MSCI World ex USA 4.70%	S&P 500 6.20%
MSCI World ex USA 2.75%	Bloomberg Global Agg ex US 10.51%	MSCI World ex USA -14.09%	Bloomberg Corp High Yield 14.32%	MSCI World ex USA 7.59%	Bloomberg Aggregate -1.54%	MSCI ACWI ex USA SC -19.97%	MSCI Emerging Markets 9.83%	MSCI ACWI ex USA SC 3.36%	Bloomberg Corp High Yield 4.57%
Bloomberg Aggregate 2.65%	Bloomberg Corp High Yield 7.50%	MSCI Emerging Markets -14.57%	Bloomberg Aggregate 8.72%	Bloomberg Aggregate 7.51%	MSCI Emerging Markets -2.54%	MSCI Emerging Markets -20.09%	Bloomberg Global Agg ex US 5.72%	Bloomberg Aggregate 1.25%	Bloomberg Aggregate 4.02%
Bloomberg Global Agg ex US 1.49%	Bloomberg Aggregate 3.54%	MSCI ACWI ex USA SC -18.20%	Bloomberg Global Agg ex US 5.09%	Bloomberg Corp High Yield 7.11%	Bloomberg Global Agg ex US -7.05%	Russell 2000 -20.44%	Bloomberg Aggregate 5.53%	Bloomberg Global Agg ex US -4.22%	Russell 2000 -1.79%

Source: Bloomberg, FTSE Russell, MSCI, Standard & Poor's

Callan Periodic Table of Investment Returns

Returns for Key Indices

Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 20 Years
MSCI ACWI ex USA SC 16.93%	MSCI World ex USA 18.70%	S&P 500 19.71%	S&P 500 16.64%	S&P 500 14.39%	S&P 500 13.65%	S&P 500 10.73%
MSCI World ex USA 12.05%	MSCI ACWI ex USA SC 18.34%	MSCI:ACWI IMI 16.80%	MSCI:ACWI IMI 13.39%	MSCI:ACWI IMI 10.28%	MSCI:ACWI IMI 9.69%	MSCI:ACWI IMI 8.18%
MSCI Emerging Markets 11.99%	MSCI:ACWI IMI 15.89%	MSCI World ex USA 15.73%	MSCI World ex USA 11.51%	MSCI World ex USA 7.43%	Russell 2000 7.12%	Russell 2000 7.76%
MSCI:ACWI IMI 11.62%	MSCI Emerging Markets 15.29%	MSCI ACWI ex USA SC 13.46%	MSCI ACWI ex USA SC 10.74%	MSCI ACWI ex USA SC 5.95%	MSCI World ex USA 6.65%	MSCI ACWI ex USA SC 6.96%
S&P 500 10.94%	S&P 500 15.16%	Russell 2000 10.00%	Russell 2000 10.04%	Russell 2000 5.52%	MSCI ACWI ex USA SC 6.54%	Bloomberg Corp High Yield 6.62%
Russell 2000 8.50%	Bloomberg Global Agg ex US 11.21%	Bloomberg Corp High Yield 9.93%	MSCI Emerging Markets 6.81%	Bloomberg Corp High Yield 5.31%	Bloomberg Corp High Yield 5.38%	MSCI Emerging Markets 6.45%
Bloomberg Global Agg ex US 7.29%	Bloomberg Corp High Yield 10.29%	MSCI Emerging Markets 9.70%	Bloomberg Corp High Yield 5.97%	MSCI Emerging Markets 4.48%	MSCI Emerging Markets 4.82%	MSCI World ex USA 5.90%
Bloomberg Corp High Yield 3.53%	Russell 2000 7.68%	Bloomberg Global Agg ex US 2.74%	Bloomberg Aggregate -0.73%	Bloomberg Aggregate 1.77%	Bloomberg Aggregate 1.76%	Bloomberg Aggregate 3.09%
Bloomberg Aggregate 1.21%	Bloomberg Aggregate 6.08%	Bloomberg Aggregate 2.55%	Bloomberg Global Agg ex US -1.63%	Bloomberg Global Agg ex US -0.50%	Bloomberg Global Agg ex US 0.61%	Bloomberg Global Agg ex US 1.71%

Source: Bloomberg, FTSE Russell, MSCI, Standard & Poor's

U.S. Equity Markets Back Up Sharply in 2Q25

Global ex-U.S. markets lead the way for the second quarter in a row, showing diversification

Big gains for U.S. stocks

- S&P 500 rose 11% in 2Q25. U.S. small cap gained 8.5%. Both markets were spooked by tariff policy early in the quarter, then recovered when the implementation was delayed.

Weaker 2Q for core fixed income

- The Bloomberg Aggregate rose 1.2%, down from the surge in 1Q. Long duration lost 0.2%.
- CPI-U came in at 2.7% (year-over-year) through June, and the core index rose 2.9%. Both figures are up from May. Energy continues to push down the total headline number.

Solid economic growth resumed

- The job market keeps expanding and real incomes are rising. 1Q GDP came in at -0.5% but grew 3.3% in 2Q. Consumer spending held up while business spending has paused.

Returns for Periods ended 6/30/25

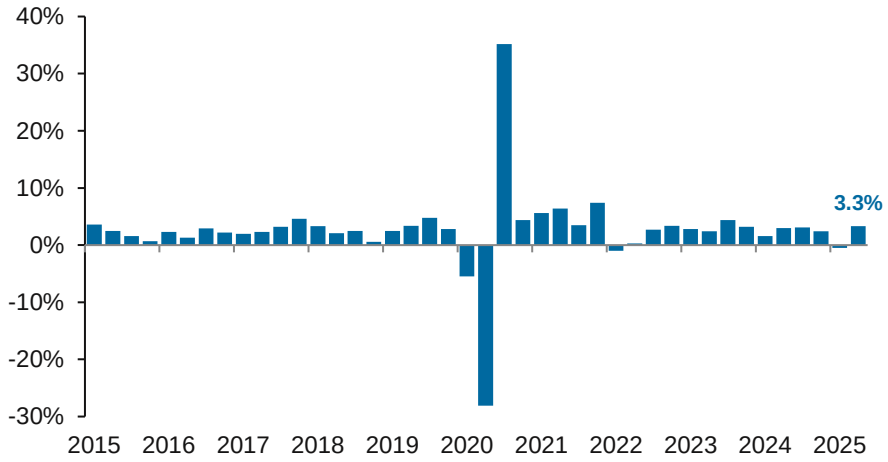
	Quarter	1 Year	3 Years	5 Years	10 Years	25 Years
U.S. Equity						
Russell 3000	10.99	15.30	19.08	15.96	12.96	8.04
S&P 500	10.94	15.16	19.71	16.64	13.65	7.98
Russell 2000	8.50	7.68	10.00	10.04	7.12	7.35
Global ex-U.S. Equity						
MSCI World ex USA	12.05	18.70	15.73	11.51	6.65	4.63
MSCI Emerging Markets	11.99	15.29	9.70	6.81	4.82	--
MSCI ACWI ex USA Small Cap	16.93	18.34	13.46	10.74	6.54	7.02
Fixed Income						
Bloomberg Aggregate	1.21	6.08	2.55	-0.73	1.76	3.94
90-day T-Bill	1.04	4.68	4.56	2.76	1.98	1.88
Bloomberg Long Gov/Credit	-0.18	3.32	-0.31	-4.93	1.79	5.24
Bloomberg Global Agg ex-US	7.29	11.21	2.74	-1.63	0.61	2.94
Real Estate						
NCREIF Property Index^	1.28	2.72	-2.11	3.25	5.42	7.54
FTSE Nareit Equity	-1.16	8.60	5.35	8.63	6.32	9.29
Alternatives						
Cambridge Private Equity*	0.77	5.85	1.17	13.28	13.12	11.01
Cambridge Senior Debt*	-1.81	4.14	6.07	6.81	7.11	4.36
HFRI Fund Weighted	4.32	8.43	7.78	8.56	5.40	5.46
Bloomberg Commodity	-3.08	5.77	0.13	12.68	1.99	1.73
Gold Spot Price	5.00	41.38	22.32	12.93	10.93	10.20
Inflation: CPI-U	0.86	2.67	2.87	4.58	3.06	2.54

*Cambridge Private Equity and Cambridge Senior Debt data as of 4Q24. ^NCREIF Property Index data as of 1Q25.
Returns greater than one year are annualized.
Sources: Bloomberg, Callan, Cambridge, FTSE Russell, HFRI, MSCI, NCREIF, S&P Dow Jones Indices

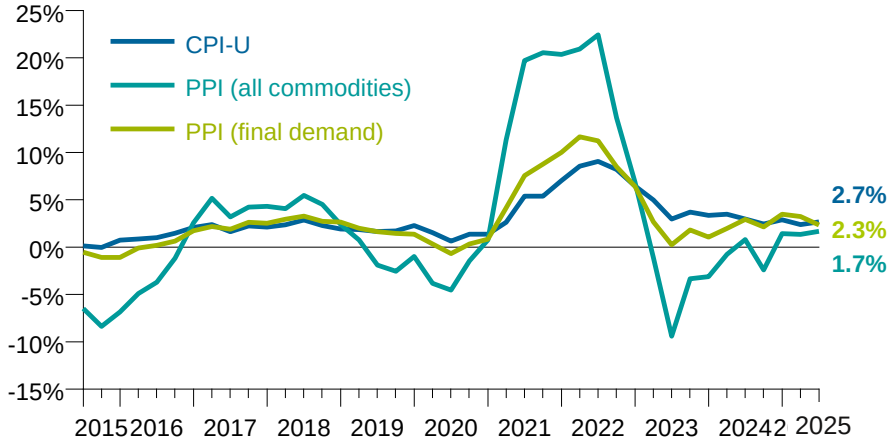
U.S. Economy—Summary

For periods ended 6/30/25

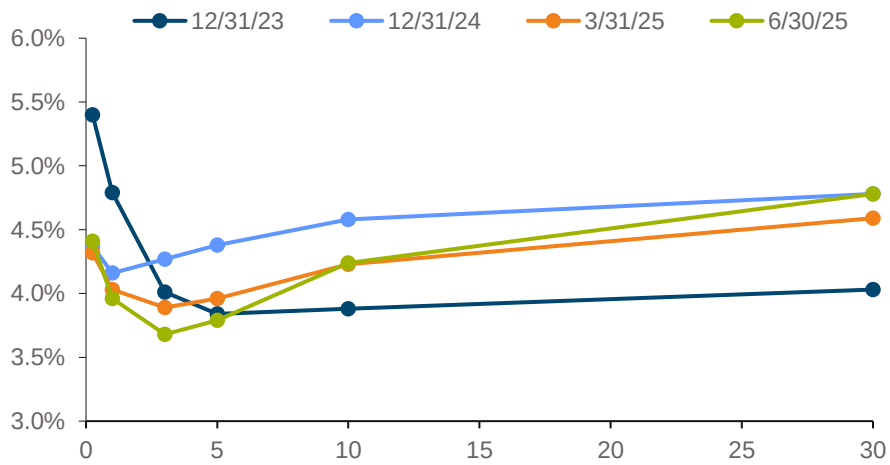
Quarterly Real GDP Growth



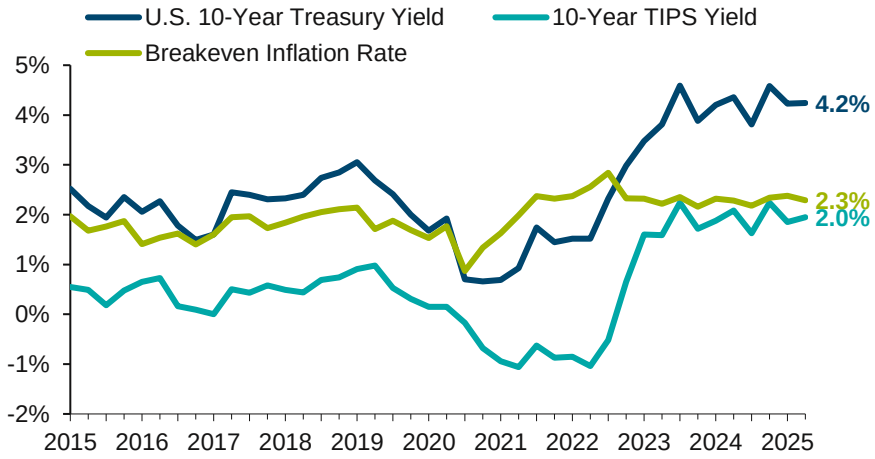
Inflation Year-Over-Year



U.S. Treasury Yield Curves



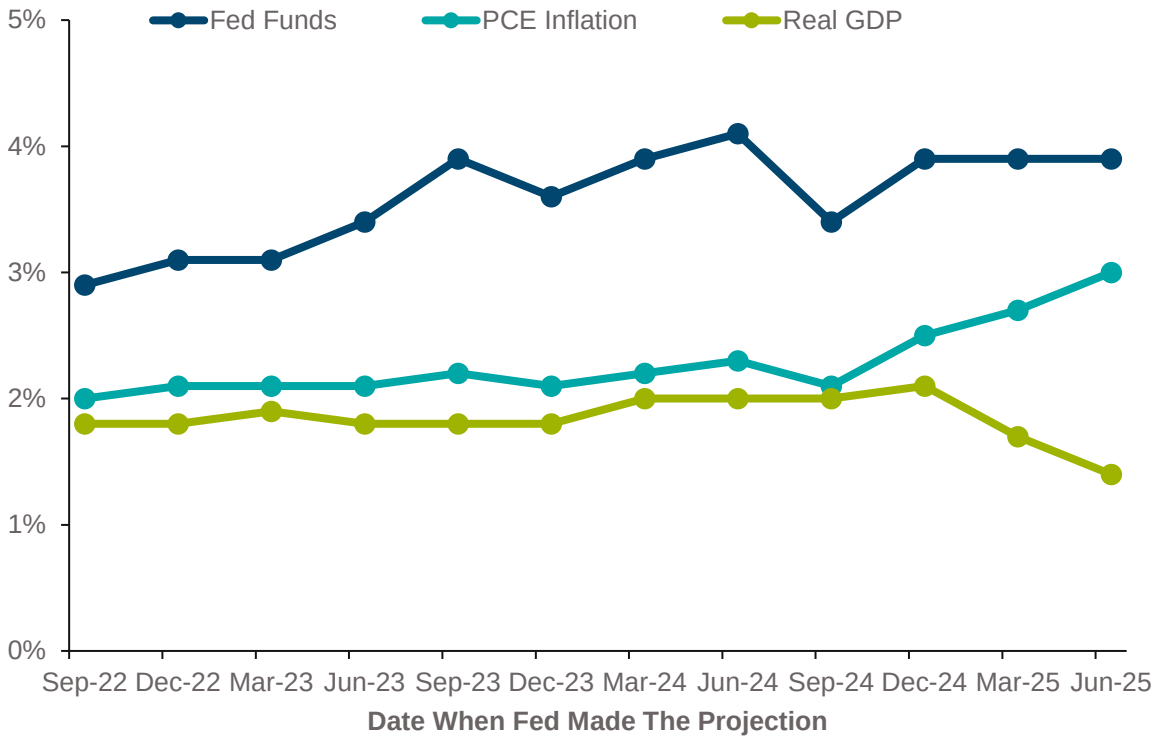
Historical 10-Year Yields



Sources: Bureau of Labor Statistics, Callan, Federal Reserve

The Shifting Mindset at the Fed

Consensus FOMC Economic Projections for 2025



Projections for the Fed Funds Rate at the end of 2025 reflect expectations for two 0.25 percentage point cuts.

– Long-term neutral rate of 3.0% expected to be hit after 2027.

In reaction to tariffs and economic policy, the Fed has lowered its GDP growth forecast and increased inflation expectations.

– The Fed appears to be netting out these competing forces and leaving the projected Fed Funds Rate unchanged.

Inflation is expected to reach Fed's target of 2% after 2027.

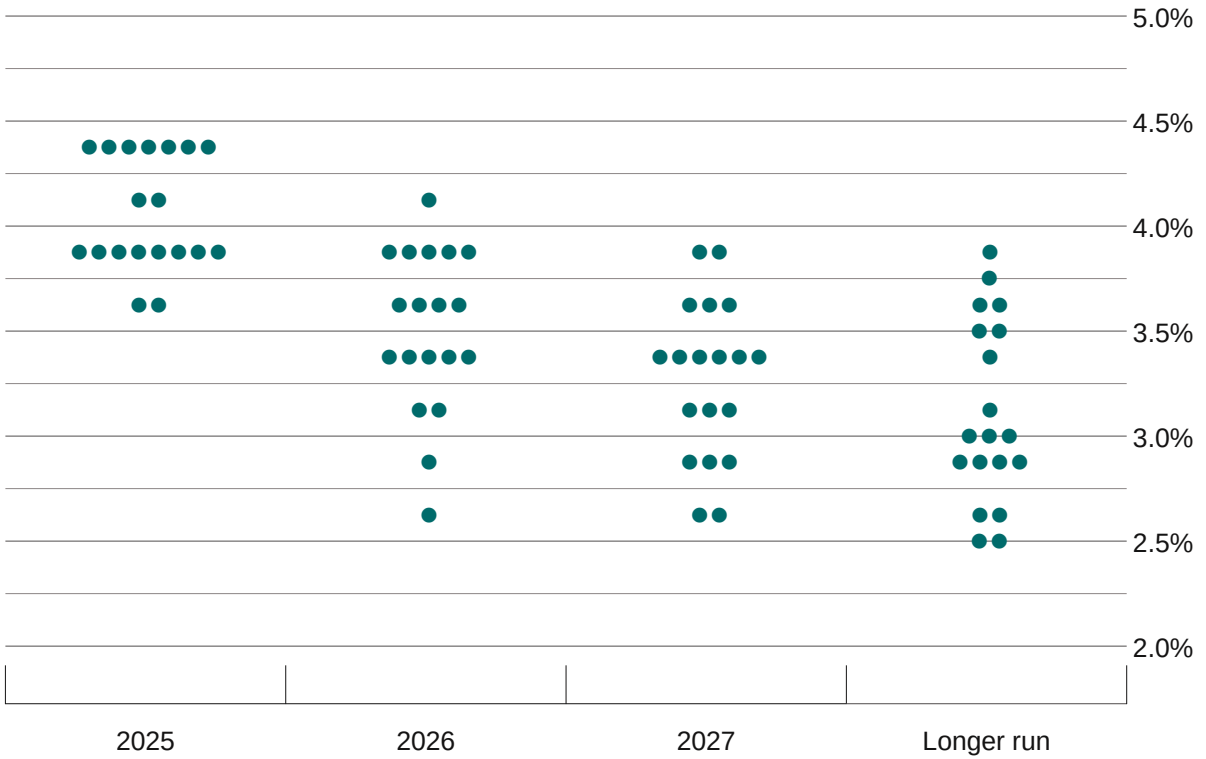
Sources: Federal Reserve, Financial Times

The Fed's 'Dot Plot'

June 18, 2025

Federal Open Market Committee (FOMC) participants' assessments of appropriate monetary policy

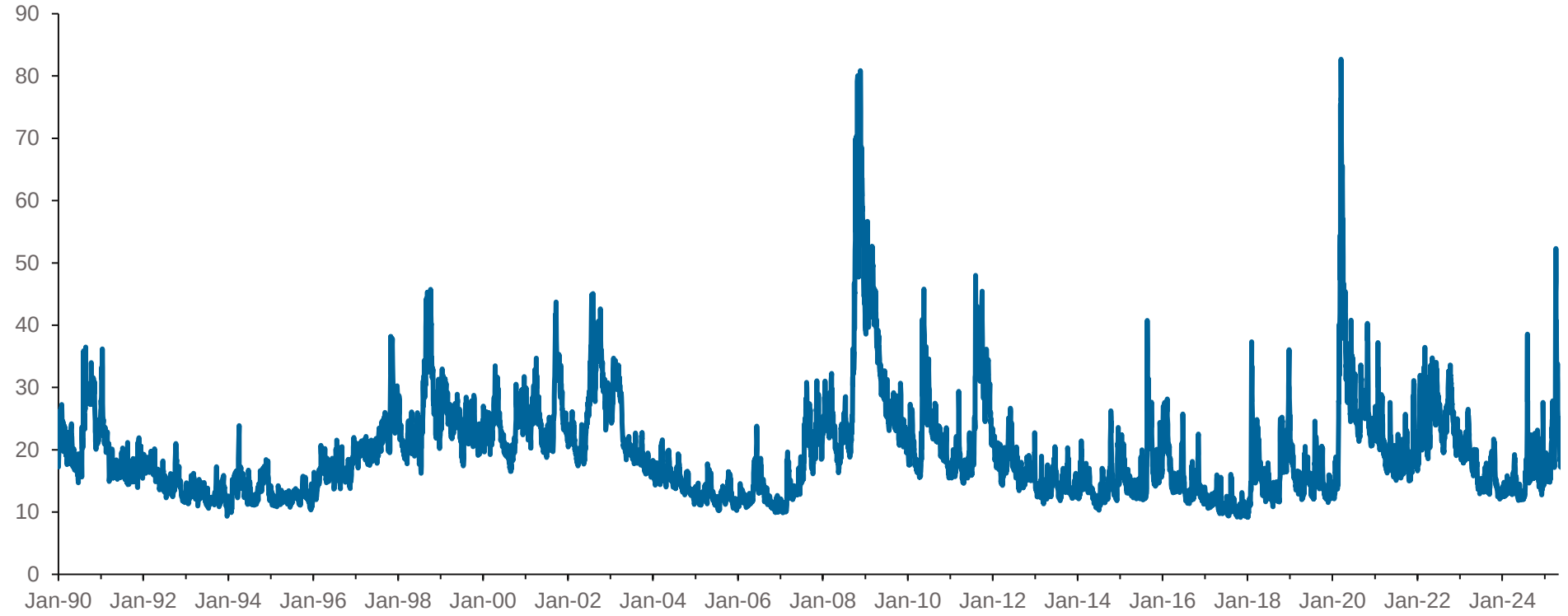
- Median year-end in 2025 = 3.9% (unchanged from December and March meetings)
- "Longer run" median held at 3.0%
  - Bias is toward higher rates; lower bound is 2.6% but higher bound is 3.6%.
- Dispersion of views widens in 2026 and beyond.
- Longer run unchanged from the March meeting.



Source: Federal Reserve

Market Volatility in Context

CBOE Volatility Index (VIX)



VIX measures the market expectation of near-term volatility conveyed by stock index option prices.

Implied market volatility spiked to high but not unprecedented levels in April before receding in May and June.

Sources: Chicago Board Options Exchange, CBOE Volatility Index: VIX [VIXCLS], retrieved from FRED, Federal Reserve Bank of St. Louis.

Thoughts on Public Equity Structure

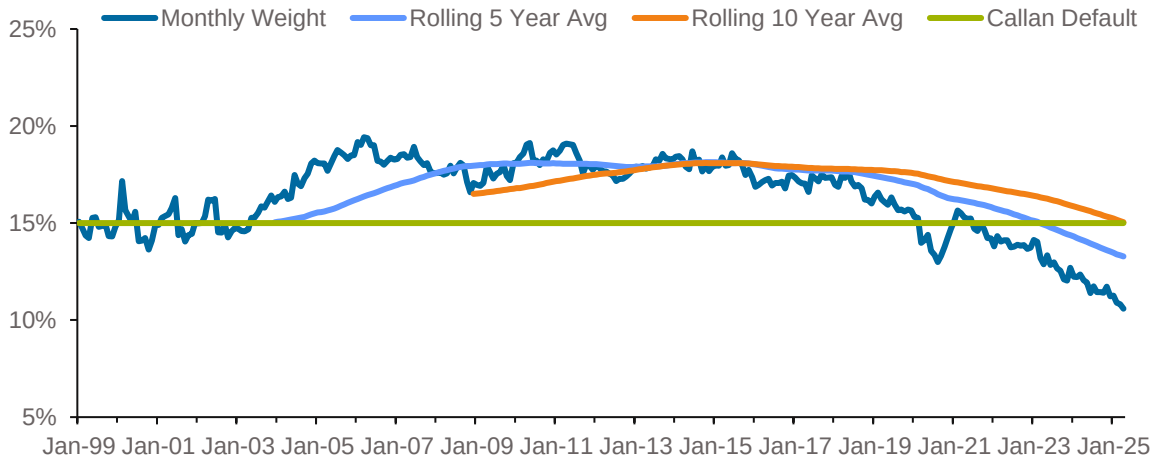
Extended equity market cycles have changed the market cap structure for small/mid cap relative to large cap and the U.S. region allocation relative to non-U.S.

By taking a long-term view, the anchor allocations for capitalization and region do not yet need to change.

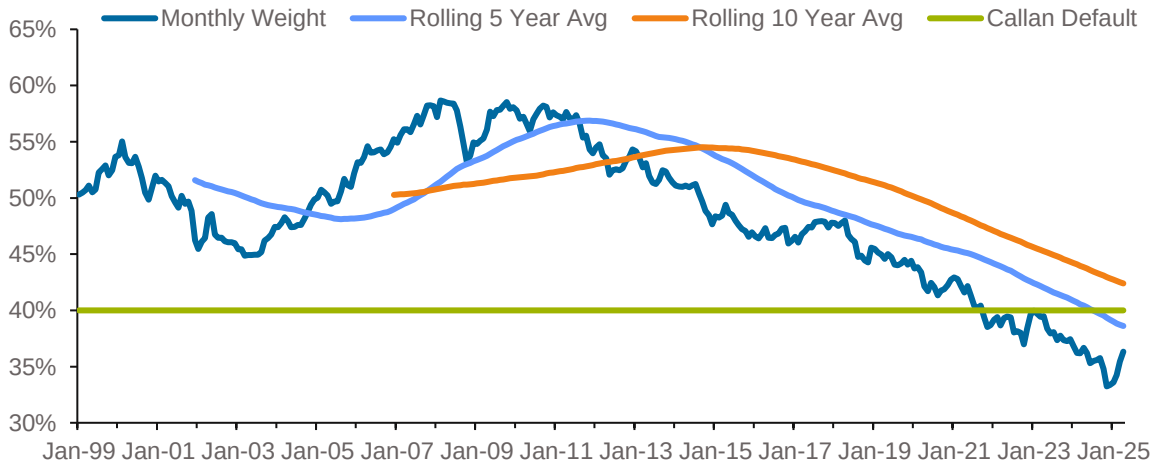
Investors should follow the market into higher large cap and U.S. region allocations only if they believe:

- The market cycle will continue for some structural reason.
- They can maintain conviction and stick with those weights even if the market cycle takes those factors out of favor.

SMID Weight in Russell 3000

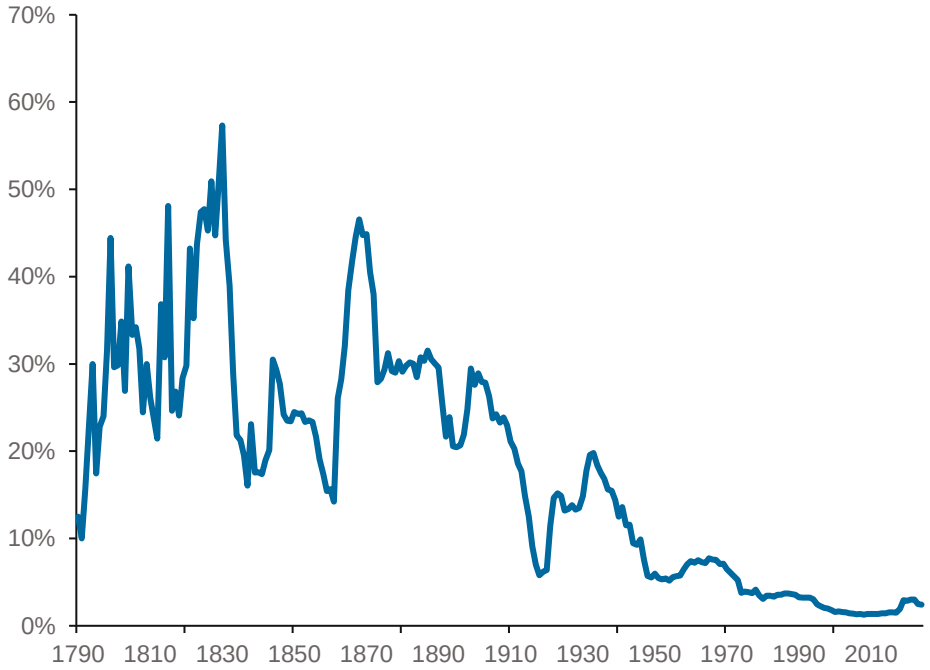


Non-U.S. Weight in MSCI ACWI

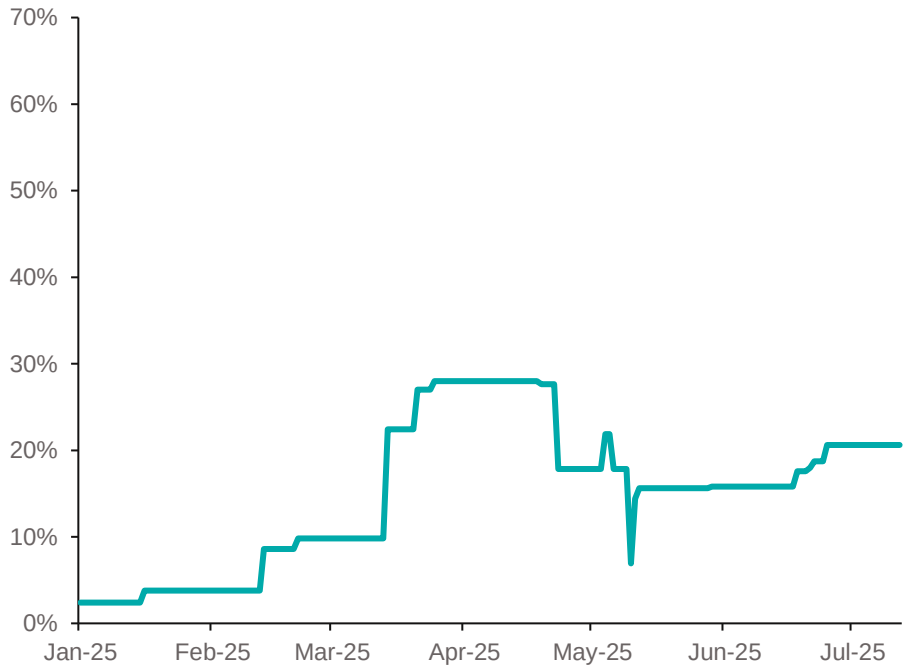


Tracking the Effective Tariff Rate

Historical Effective Tariff Rate



Estimated Average Effective Tariff Rate



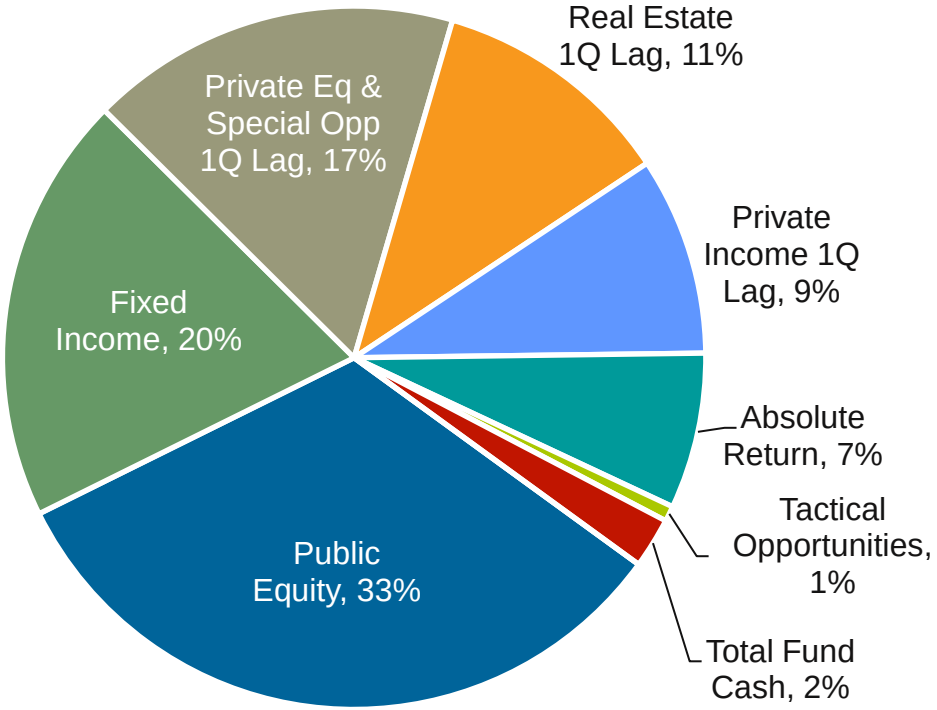
- The charts compare the historical effective tariff rate in the United States through 2024 to the estimated average effective tariff rate in 2025 based on the shifting policies throughout the year.
- The current estimate would put the effective tariff rate at the highest since 1910.

Source: The Budget Lab at Yale

Total Fund Asset Allocation

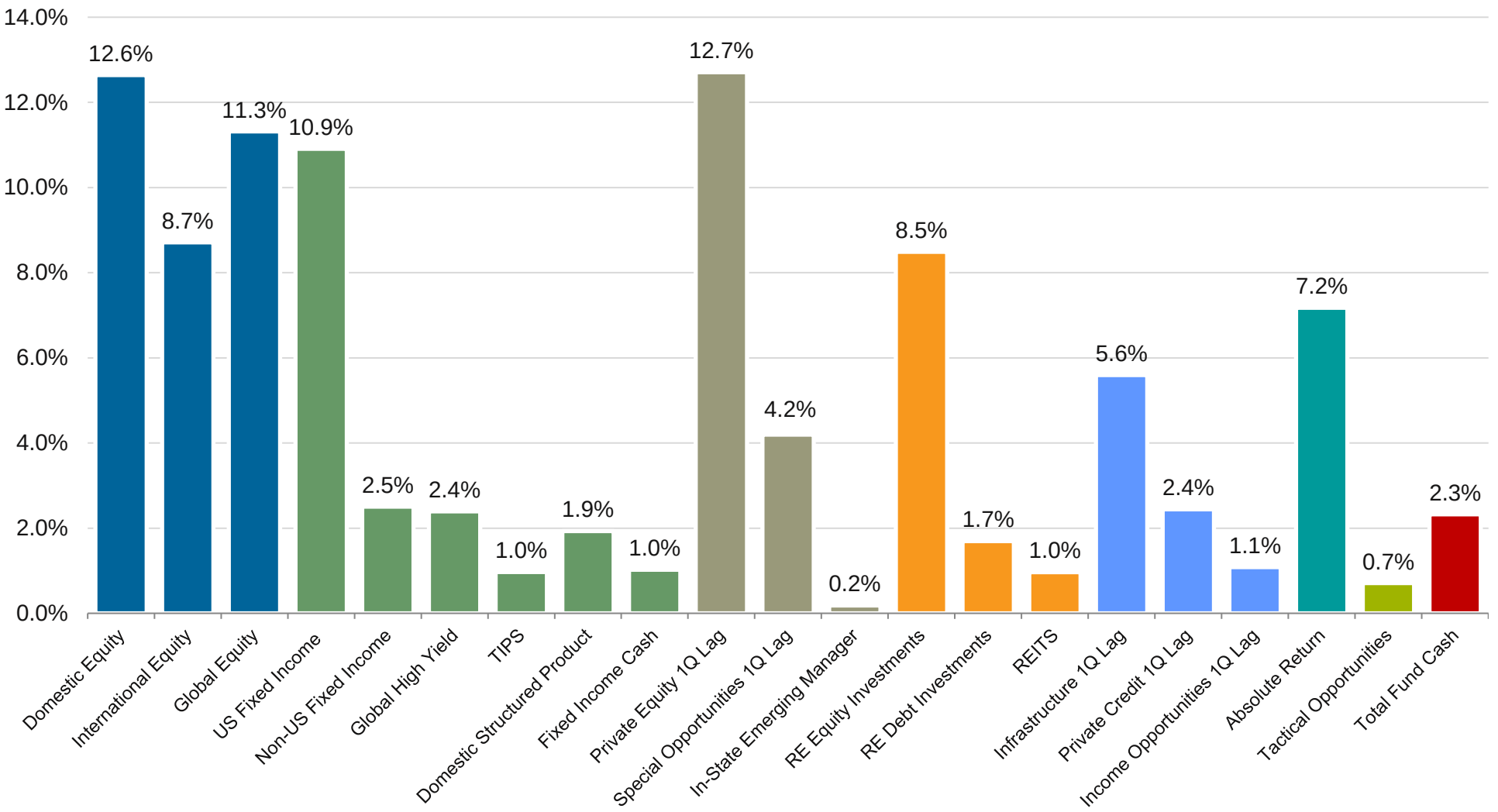
As of June 30, 2025: $86.9B

- APFC portfolio is well diversified across all major asset classes employed by institutional investors.
- Using institutional standard asset class definitions, the portfolio is currently allocated 33% to public equity, 20% to fixed income, 45% to alternative investments and 2% cash.
- Compared to allocations in the first quarter, weights to public equity and cash increased modestly while weights to alternatives decreased.
- Alternatives include private equity, special opportunities, real estate, private infrastructure, private credit, private income, absolute return, and tactical opportunities.
- Private Equity & Special Opportunities, Real Estate, and Infrastructure & Private Income are reported on a one-quarter lag.



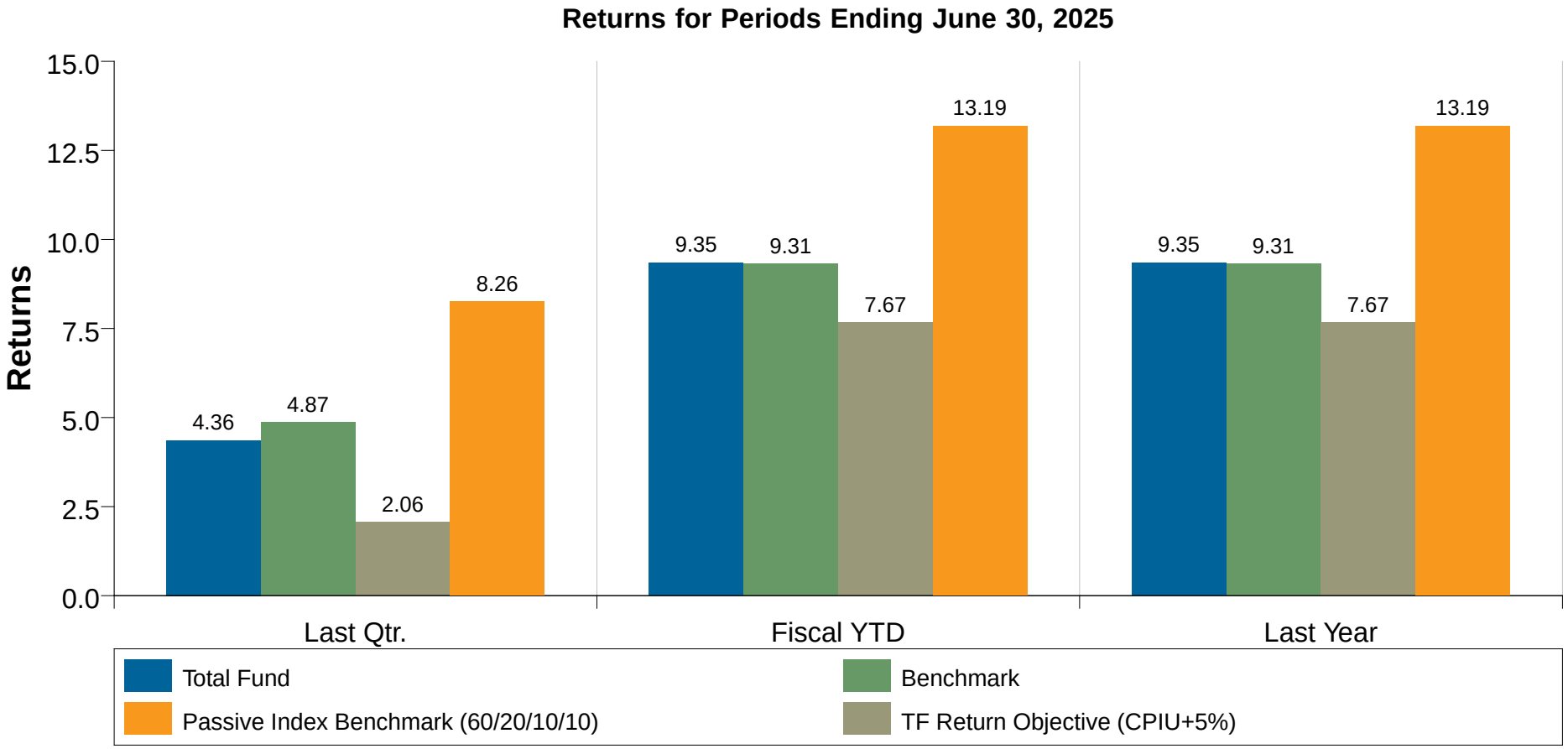
Total Fund Asset Allocation

Periods Ended June 30, 2025



APFC Total Fund Cumulative Returns

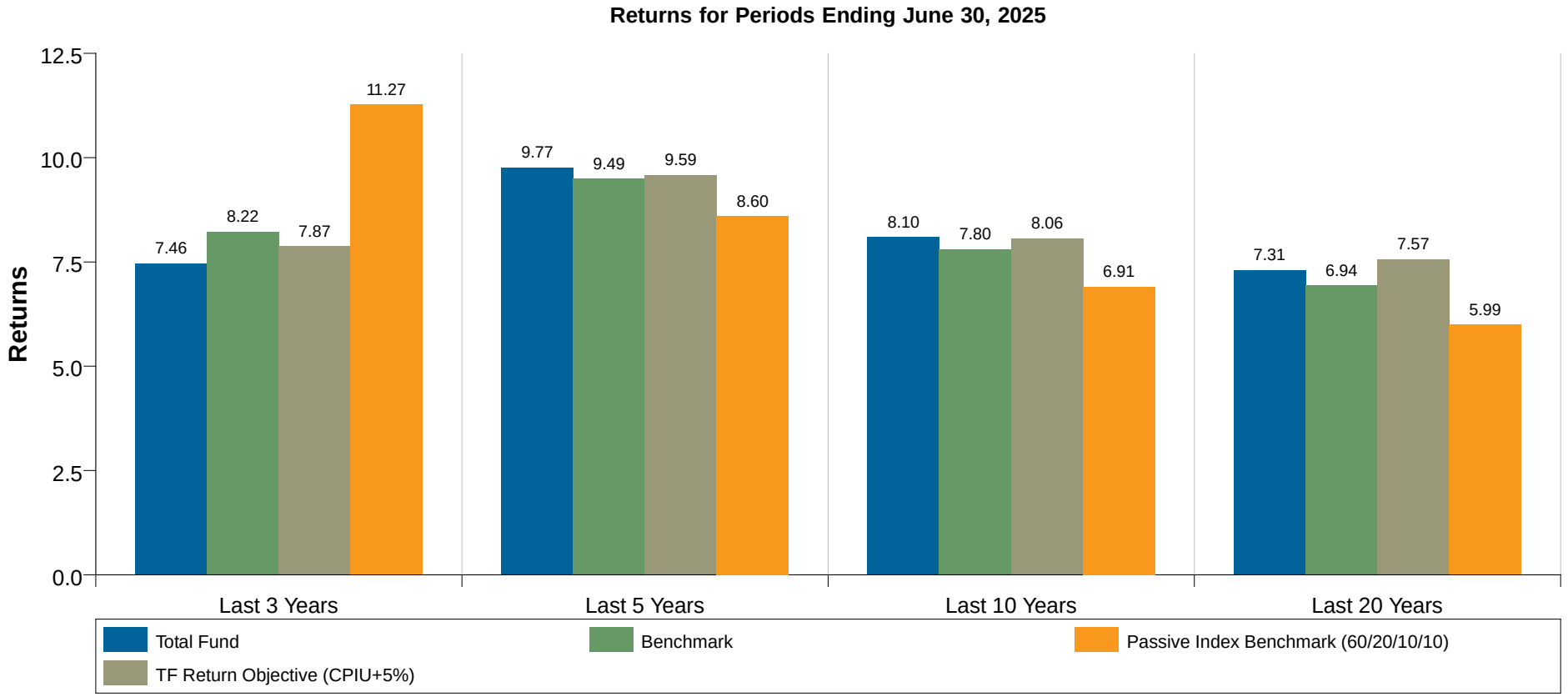
Total Fund versus Total Fund Targets



- Benchmark (FY24-FY25) = 32% MSCI ACWI IMI, 1.0% 90 Day T-Bills, 1.0% BB US TIPS, 5.5% BB Agg, 5.5% BB Corp IG, 3.0% BB Global Treasury xUS Hdgd, 2.0% BB US BB HY, 2.0% BB US Securitized, 18% Cambridge PE (lagged), 9.4% NCREIF Total Index (lagged), 1.7% MSCI US REIT (lagged), 6.0% Cambridge Global Pvt. Infrastructure (lagged), 4.0% Cliffwater Direct Lending TR (lagged), 3.5% HFRI EH Equity Market Neutral, 3.5% HFRI Macro, 1% 90 Day T-Bills, and 1% S&P 500 Index.

APFC Total Fund Cumulative Returns

Total Fund versus Total Fund Targets



- Benchmark (FY24-FY25) = 32% MSCI ACWI IMI, 1.0% 90 Day T-Bills, 1.0% BB US TIPS, 5.5% BB Agg, 5.5% BB Corp IG, 3.0% BB Global Treasury xUS Hdgd, 2.0% BB US BB HY, 2.0% BB US Securitized, 18% Cambridge PE (lagged), 9.4% NCREIF Total Index (lagged), 1.7% MSCI US REIT (lagged), 6.0% Cambridge Global Pvt. Infrastructure (lagged), 4.0% Cliffwater Direct Lending TR (lagged), 3.5% HFRI EH Equity Market Neutral, 3.5% HFRI Macro, 1% 90 Day T-Bills, and 1% S&P 500 Index.

APFC Total Fund Attribution

One Quarter Ended June 30, 2025

Relative Attribution Effects for Quarter ended June 30, 2025

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Public Equity	32%	32%	9.49%	11.62%	(0.66%)	0.01%	(0.65%)
Fixed Income	20%	20%	1.73%	1.66%	0.01%	0.02%	0.04%
Private Eq & Special Opp	18%	18%	1.13%	1.70%	(0.10%)	0.02%	(0.09%)
Real Estate	11%	11%	1.63%	1.27%	0.04%	(0.01%)	0.03%
Private Income	9%	10%	2.95%	2.35%	0.06%	0.02%	0.08%
Absolute Return	7%	7%	3.29%	1.08%	0.17%	(0.01%)	0.15%
Tactical Opportunities	1%	1%	9.00%	10.94%	(0.01%)	(0.02%)	(0.03%)
Total Fund Cash	2%	1%	1.01%	1.04%	(0.00%)	(0.04%)	(0.04%)
Total			**4.36% =**	**4.87%**	**+ (0.50%)**	**+ (0.01%)**	**(0.51%)**

- In the second quarter, the Total Fund underperformed the Performance Benchmark by 51 basis points.
- Manager effects in Public Equity and Private Equity & Special Opportunities were the largest detractors of relative returns.
- In aggregate, active management subtracted 50 basis points from relative performance, while deviations from the Policy Target lost 1 basis points.

APFC Total Fund Attribution

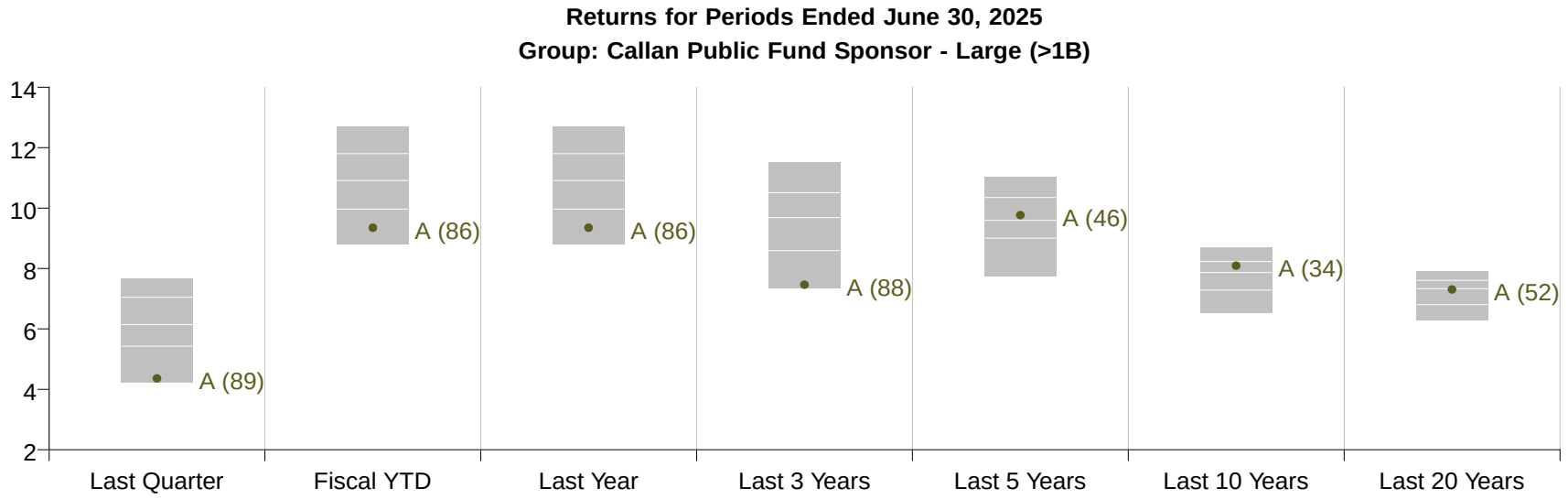
One Year Ended June 30, 2025

One Year Relative Attribution Effects

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Public Equity	32%	32%	16.09%	15.89%	0.06%	(0.00%)	0.06%
Fixed Income	20%	20%	6.67%	6.49%	0.03%	0.01%	0.05%
Private Eq & Special Opp	18%	18%	4.13%	6.30%	(0.40%)	(0.00%)	(0.40%)
Real Estate	11%	11%	1.57%	4.00%	(0.29%)	(0.00%)	(0.30%)
Private Income	9%	10%	11.50%	8.32%	0.28%	0.00%	0.29%
Absolute Return	7%	7%	10.18%	4.08%	0.45%	(0.01%)	0.44%
Tactical Opportunities	1%	1%	13.07%	15.16%	(0.02%)	(0.02%)	(0.04%)
Total Fund Cash	2%	1%	4.65%	4.68%	(0.00%)	(0.05%)	(0.05%)
Total			**9.35% =**	**9.31%**	**+ 0.12%**	**+ (0.08%)**	**0.04%**

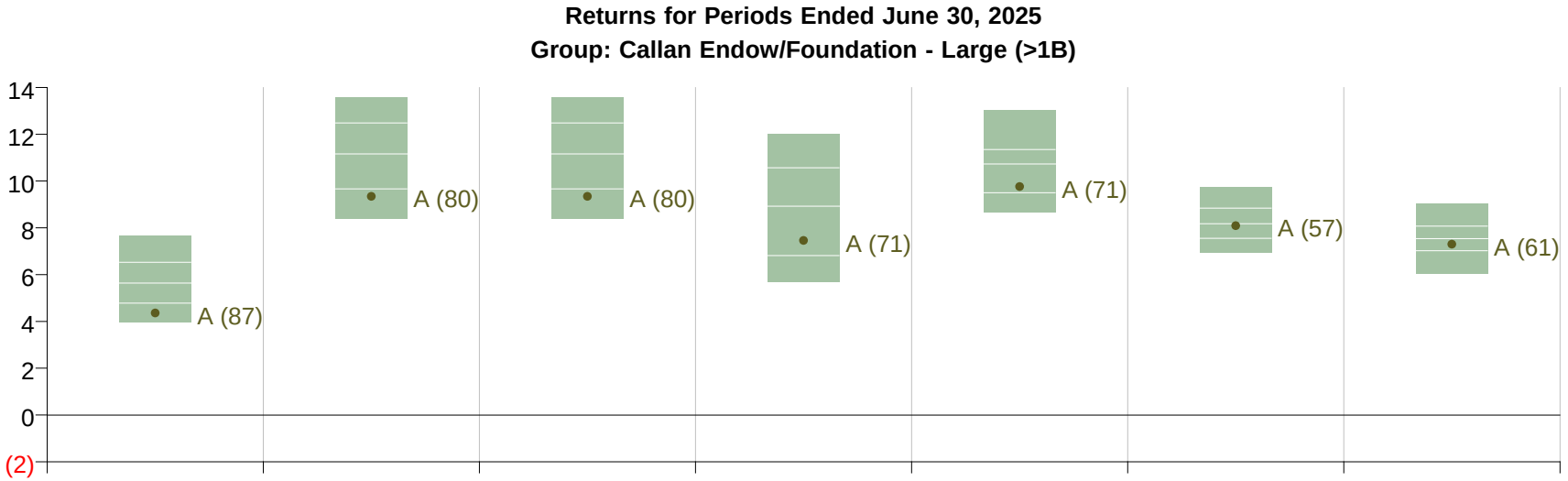
- For the fiscal year, the Total Fund outperformed the Performance Benchmark by 4 basis points.
- Manager performance in Private Equity & Special Opportunities and Real Estate dampened relative results. Positive contributions from Absolute Return and Private Income offset the losses.
- Asset allocation, particularly a moderate overweight in cash, detracted from relative performance.
- In aggregate, active management added 12 basis points to relative performance, while deviations from the Policy Target cost 8 basis points.

APFC Total Fund Relative to Callan's Large Public Fund Database



	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 20 Years
10th Percentile	7.66	12.68	12.68	11.51	11.04	8.69	7.92
25th Percentile	7.05	11.80	11.80	10.51	10.35	8.23	7.61
Median	6.14	10.91	10.91	9.69	9.60	7.87	7.33
75th Percentile	5.43	9.97	9.97	8.59	9.00	7.29	6.80
90th Percentile	4.22	8.80	8.80	7.34	7.76	6.52	6.29
Member Count	121	119	119	111	110	108	96
Total Fund • A	4.36	9.35	9.35	7.46	9.77	8.10	7.31

APFC Total Fund Relative to Callan's Large Endowment / Foundation Database

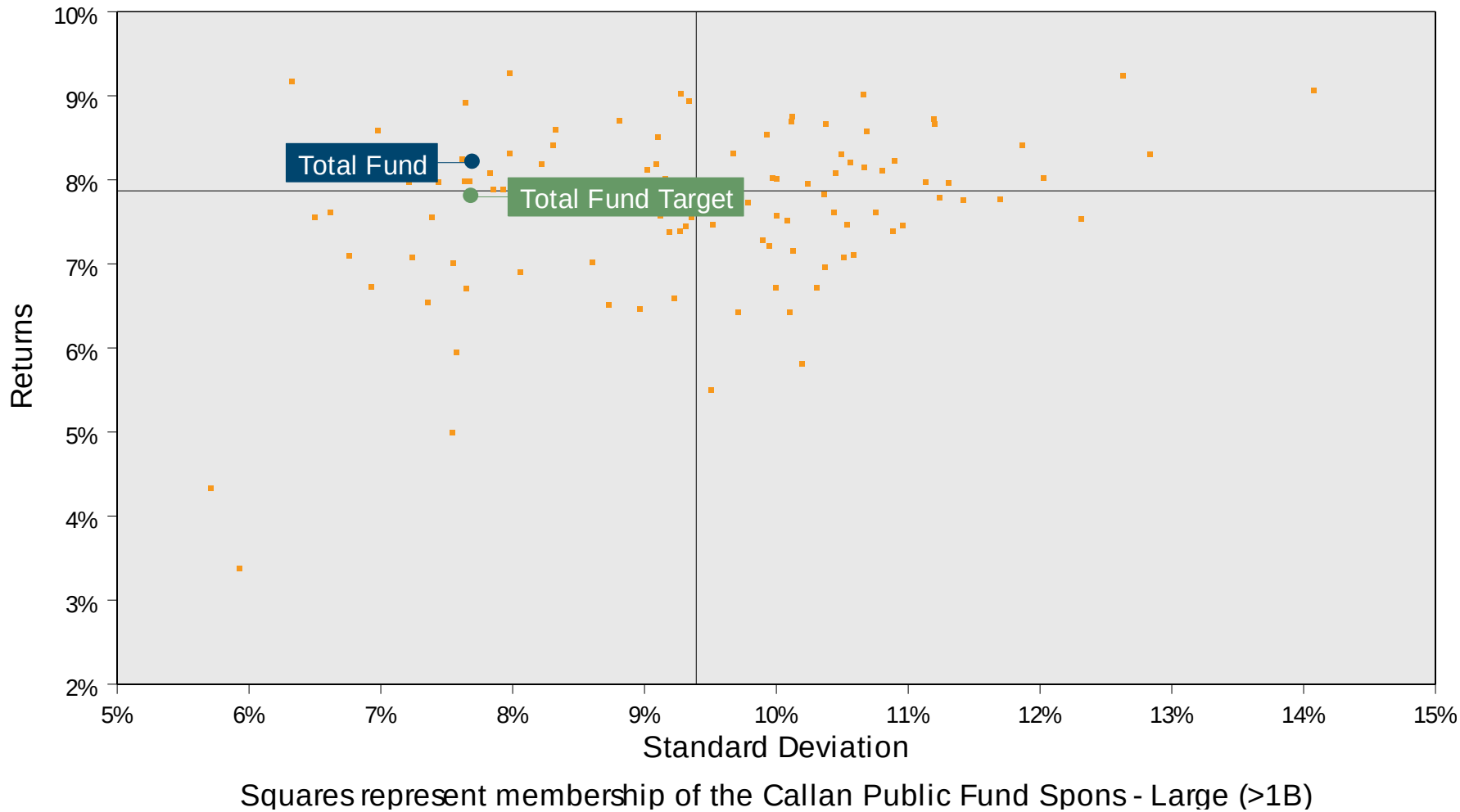


	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 10 Years	Last 20 Years
10th Percentile	7.67	13.57	13.57	12.01	13.04	9.75	9.02
25th Percentile	6.53	12.49	12.49	10.57	11.35	8.84	8.07
Median	5.64	11.17	11.17	8.93	10.73	8.18	7.54
75th Percentile	4.78	9.67	9.67	6.82	9.50	7.55	7.02
90th Percentile	3.97	8.37	8.37	5.69	8.69	6.95	6.04
Member Count	71	71	71	71	71	71	56
Total Fund • A	4.36	9.35	9.35	7.46	9.77	8.10	7.31

APFC Total Fund Return versus Standard Deviations

Relative to Callan's Large Public Fund Database

Ten Year Annualized Risk vs Return

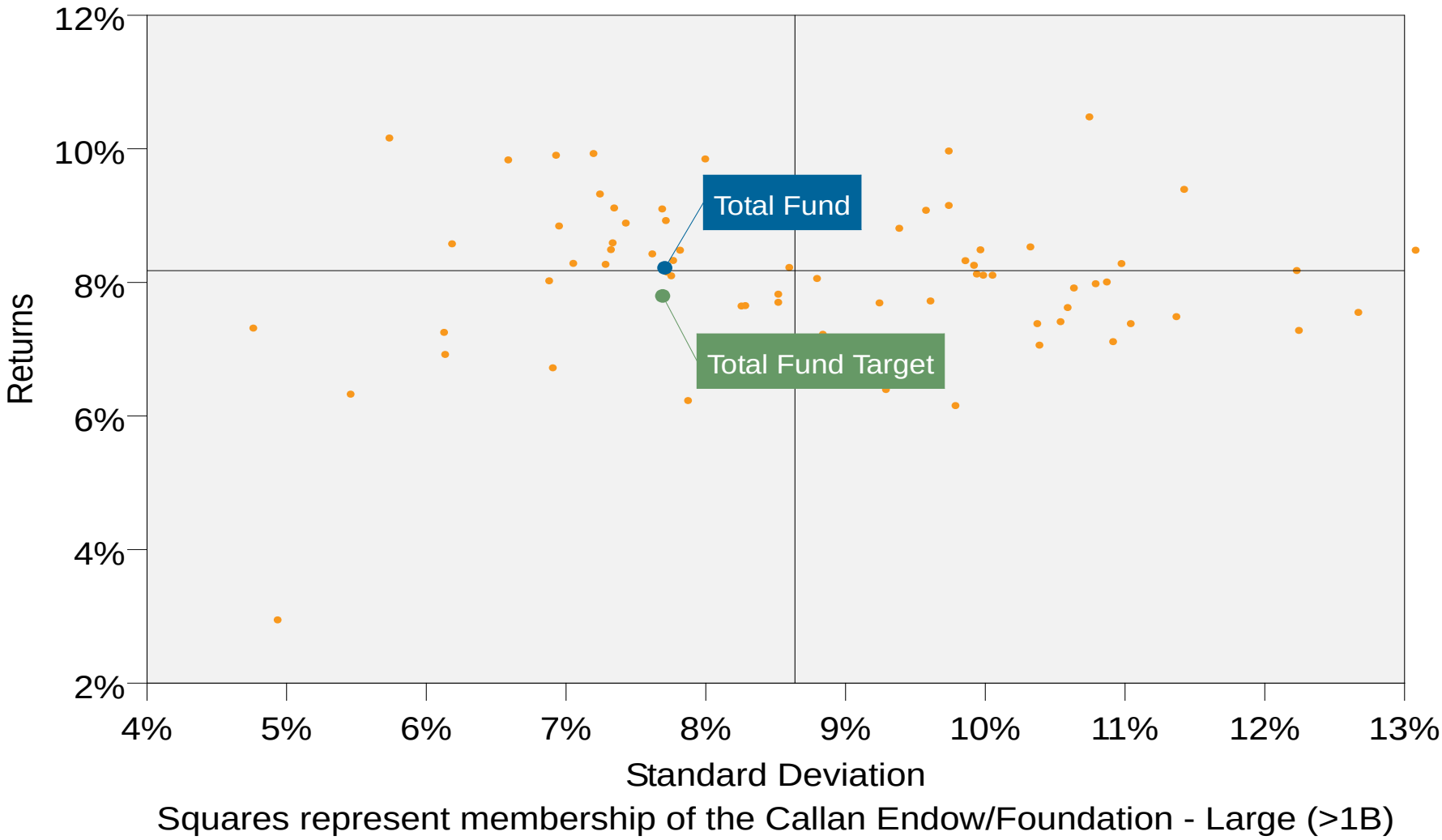


Squares represent membership of the Callan Public Fund Spons - Large (>1B)

APFC Total Fund Return versus Standard Deviations

Relative to Callan's Large Endowment / Foundation Database

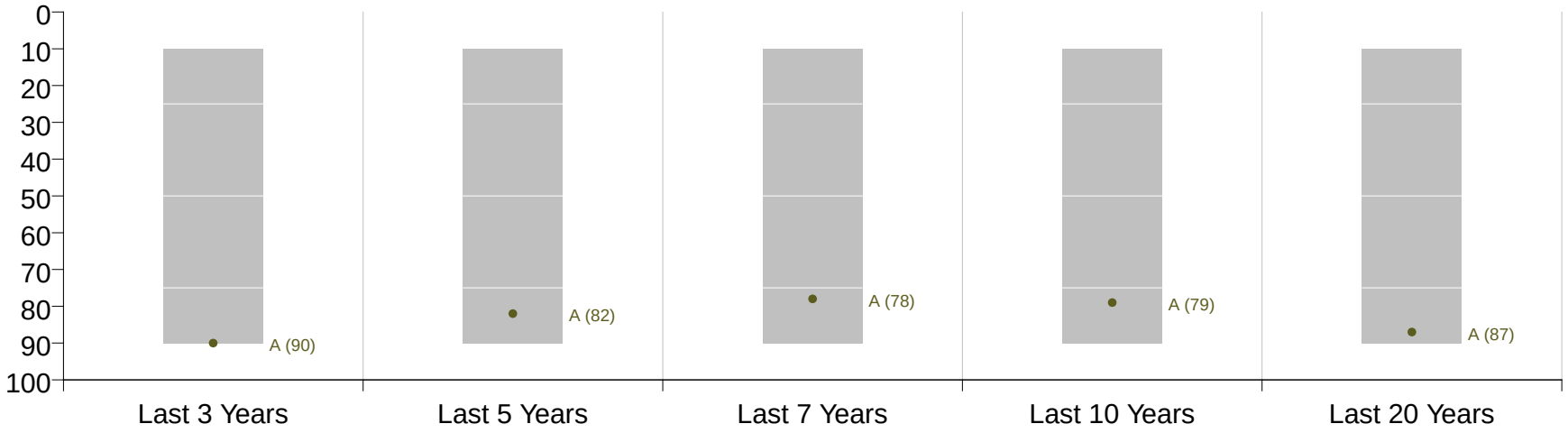
Ten Year Annualized Risk vs Return



Squares represent membership of the Callan Endow/Foundation - Large (>1B)

APFC Total Fund Standard Deviation Relative to Callan's Large Public Fund Database

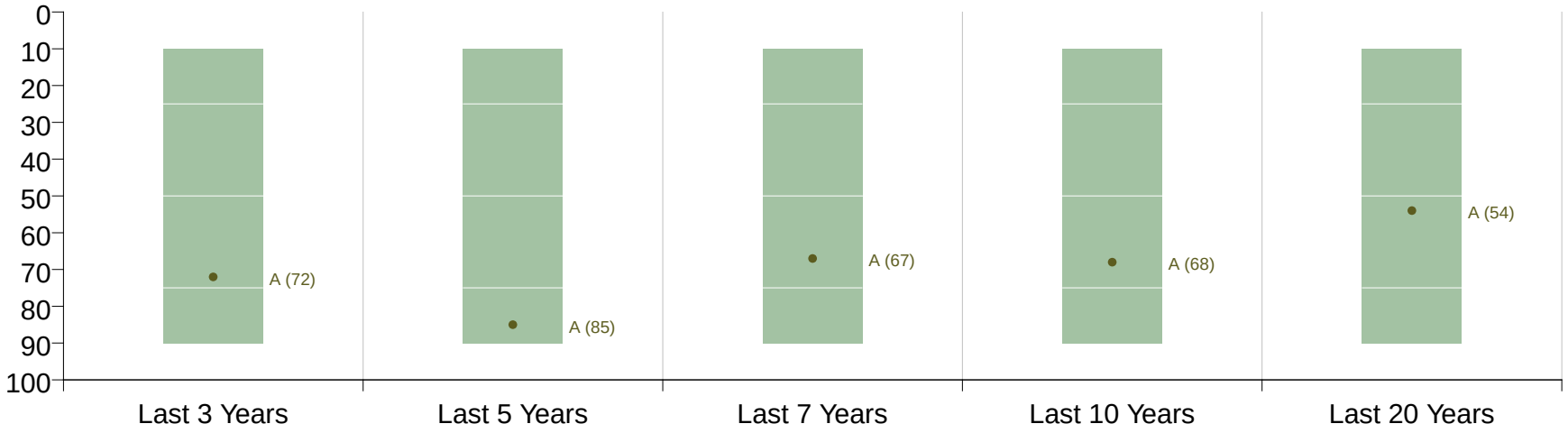
Standard Deviation for Periods Ended June 30, 2025
Group: Callan Public Fund Sponsor - Large (>1B)



	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 20 Years
10th Percentile	8.46	10.55	12.99	11.27	11.65
25th Percentile	7.85	9.99	12.07	10.51	10.73
Median	7.02	9.06	10.80	9.39	9.94
75th Percentile	5.76	7.46	8.99	7.94	9.28
90th Percentile	4.96	6.86	8.32	7.26	8.63
Member Count	111	110	110	108	96
Total Fund • A	4.94	7.16	8.78	7.71	8.77

APFC Total Fund Standard Deviation Relative to Callan's Large Endowment/Foundation Database

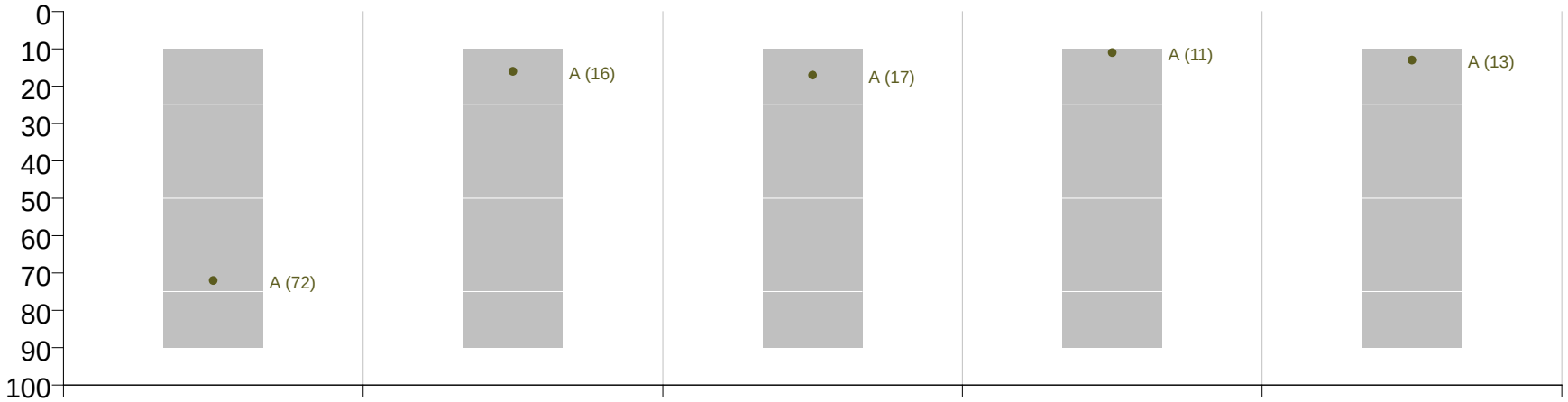
Standard Deviation for Periods Ended June 30, 2025
Group: Callan Endow/Foundation - Large (>1B)



	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 20 Years
10th Percentile	8.83	11.13	13.10	11.30	10.85
25th Percentile	7.39	9.74	11.95	10.37	9.84
Median	5.63	8.70	9.75	8.64	8.81
75th Percentile	4.80	7.61	8.31	7.33	8.10
90th Percentile	4.24	6.62	7.15	6.27	7.15
Member Count	71	71	71	71	56
Total Fund • A	4.94	7.16	8.78	7.71	8.77

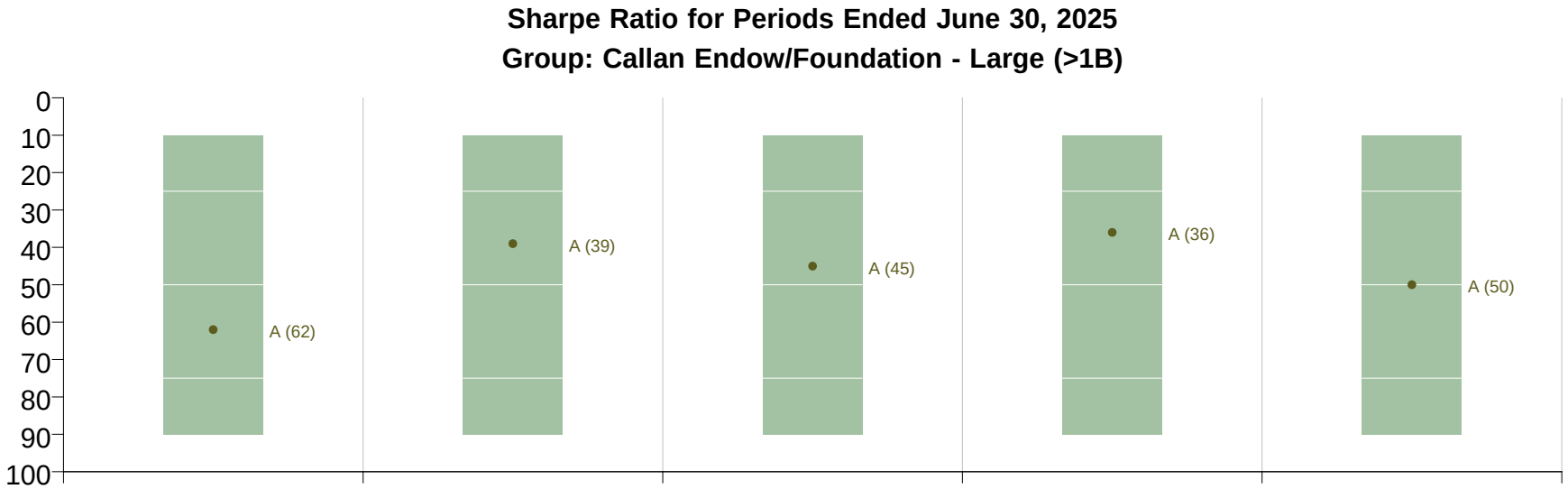
APFC Total Fund Sharpe Ratio Relative to Callan's Large Public Fund Database

Sharpe Ratio for Periods Ended June 30, 2025
Group: Callan Public Fund Sponsor - Large (>1B)



	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 20 Years
10th Percentile	0.96	1.13	0.71	0.82	0.65
25th Percentile	0.86	0.93	0.61	0.73	0.61
Median	0.71	0.74	0.48	0.60	0.54
75th Percentile	0.63	0.63	0.41	0.52	0.50
90th Percentile	0.46	0.56	0.37	0.48	0.46
Member Count	111	110	110	108	96
Total Fund • A	0.63	1.01	0.66	0.81	0.65

APFC Total Fund Sharpe Ratio Relative to Callan's Large Endowment/Foundation Database



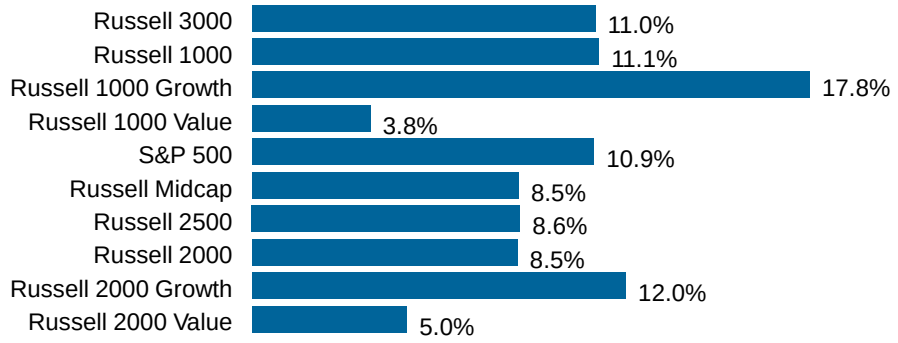
	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years	Last 20 Years
10th Percentile	1.06	1.24	0.92	1.01	0.97
25th Percentile	0.86	1.09	0.77	0.88	0.78
Median	0.70	0.93	0.62	0.69	0.65
75th Percentile	0.48	0.73	0.48	0.56	0.53
90th Percentile	0.25	0.56	0.39	0.48	0.47
Member Count	71	71	71	71	56
Total Fund • A	0.63	1.01	0.66	0.81	0.65

U.S. Equity Performance: 2Q25

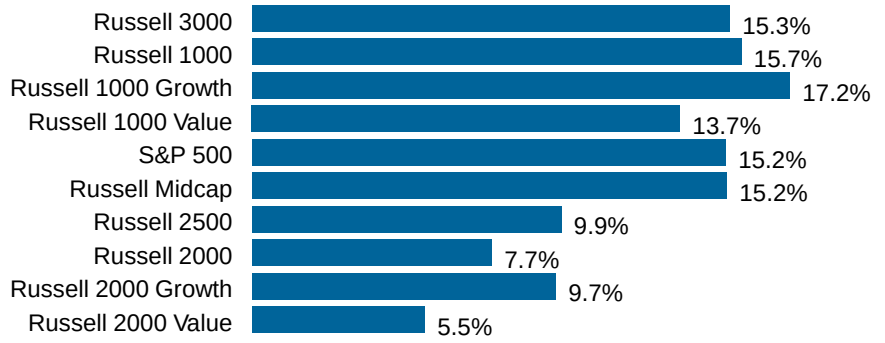
Reversal of fortune leads to gains across large and mid-cap indices YTD

- The U.S. equity market reversed 1Q25 losses in 2Q25 as the S&P 500 Index gained 10.9%, driven by a pause in tariff implementation, continued earnings growth, and stronger than expected economic indicators.
- Technology, Communication Services, Consumer Discretionary, and Industrials all gained over 10% during the quarter; Energy and Health Care performed the worst.
- Market cap performance was monotonic, with large cap stocks performing best followed by mid-cap and then small cap stocks.
- Growth outperformed value across the market cap spectrum, reversing the 1Q25 pattern and returning to the long-term trend of growth outperformance.
- Strong results in 2Q25 offset poor results in 1Q25, leading to gains of 6.2% YTD for the S&P 500.

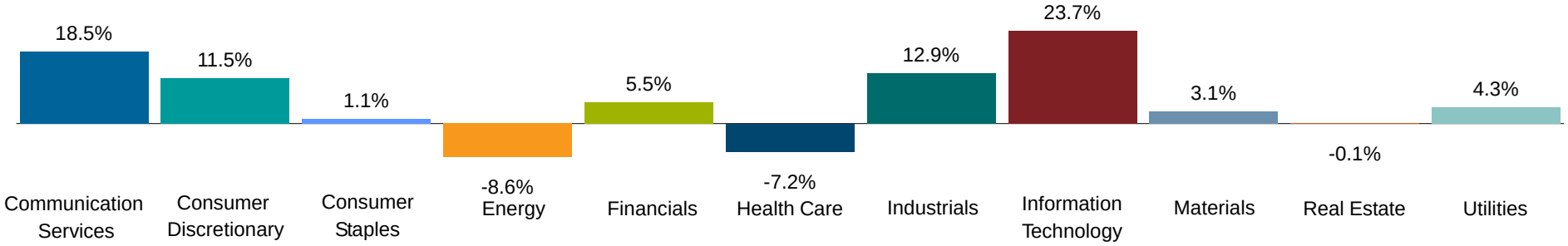
U.S. Equity: Quarter Ended 6/30/25



U.S. Equity: One Year Ended 6/30/25



Industry Sector Quarterly Performance (S&P 500) as of 6/30/25



Sources: FTSE Russell, S&P Dow Jones Indices

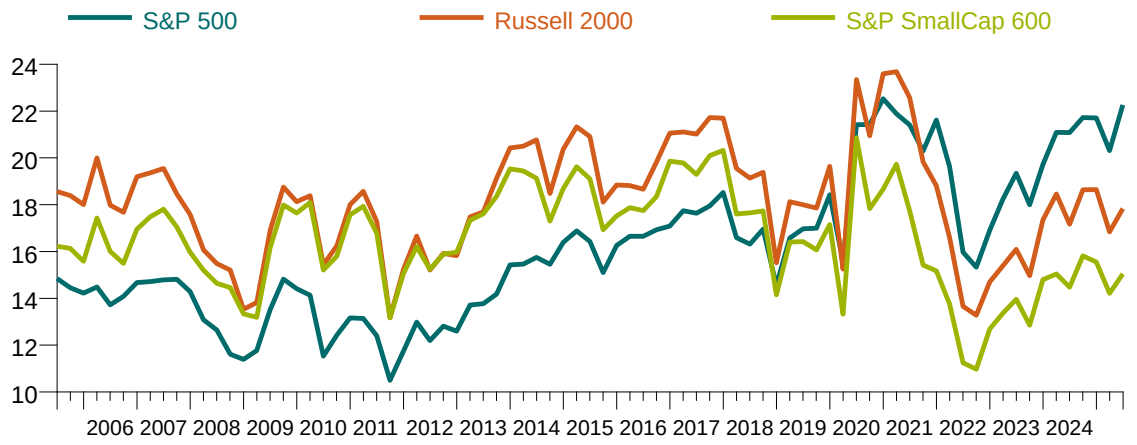
Valuations Vary Widely between Small and Large Cap, Value and Growth

Large cap and growth style trading at ever larger premiums

Small cap discount vs. large cap

- Russell 2000 Index trading at meaningful forward P/E discount (17.8x) versus large caps (22.3x for S&P 500) even when negative and non-earners are screened out.

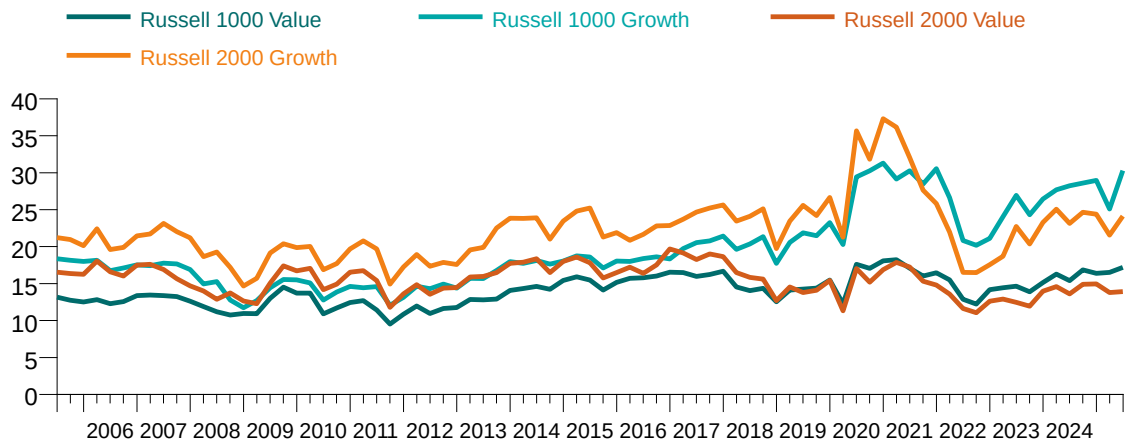
Forecasted P/E (exc neg) for 20 Years Ended 6/30/25



Valuation gap more pronounced between growth and value across market caps

- Russell 1000 Growth trades at 30.1x forward P/E vs 17.2x for Russell 1000 Value; the
  -57% discount for value is nearly 2x the -30% long-term average
- Russell 2000 Growth trading at 10.2x premium relative to Russell 2000 Value

Forecasted P/E (exc neg) for 20 Years Ended 6/30/25



Sources: Callan, FTSE Russell

Growth vs. Value Continues to Dominate U.S. Equity Discourse

Reconstitution raises question: What is 'value' in this market?

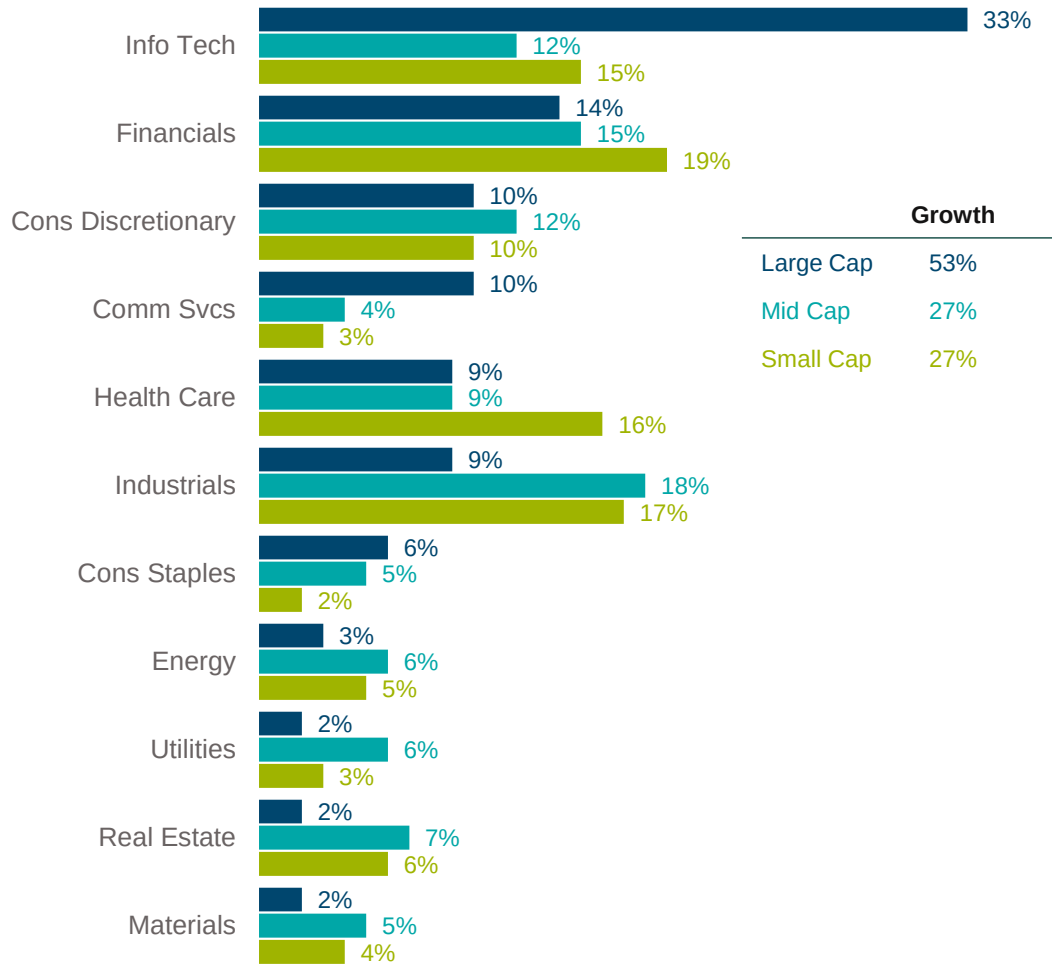
Russell Index reconstitution highlights

- **Russell 1000:** Magnificent 7 comprise 30% of index post-rebalance; 10 largest companies increased combined market cap by 20% YOY.
- **Russell 1000 Growth:** name count of 390 (historic low for index); Information Technology sector weight increased by 2.2% YOY to 51%.
- **Russell 1000 Value:** name count of 870; new positions include larger positions in Mag 7 names such as Alphabet (2.4%), Amazon (2.1%), and Meta (1.0%).

Value vs. growth disparity by market cap

- Mag 7 account for just 21% of YTD S&P 500 return (vs. 55% to 63% in 2023-24).
- Traditional "value" sectors dominate small and mid-cap index weightings, creating a headwind to performance relative to growth-weighted large cap index.

Percent of Russell 3000 Market Cap



	Growth	Value
Large Cap	53%	47%
Mid Cap	27%	73%
Small Cap	27%	73%

*Growth = Information Technology, Consumer Discretionary, and Comm Services
Sources: Compustat, FactSet, FTSE Russell, J.P. Morgan Asset Management.

Global/Global ex-U.S. Equity Performance: 2Q25

Modest edge for global ex-U.S. markets

Broad market

- Global ex-U.S. equities outperformed the U.S. Both had strong absolute results as tariff concerns subsided, and Technology stocks led the market rally.

Emerging markets

- Emerging markets rose 12%, supported by a weaker U.S. dollar and strong gains in Tech and Industrials; year-to-date returns (MSCI Emerging Markets: +15.3%) are more than double those of the S&P 500 (+6.2%).
- India gained 9%, though investor caution is rising due to high valuations and slowing earnings after a multi-year rally.
- China underperformed, up only 2%, with modest gains offset by weakness in consumer discretionary stocks.

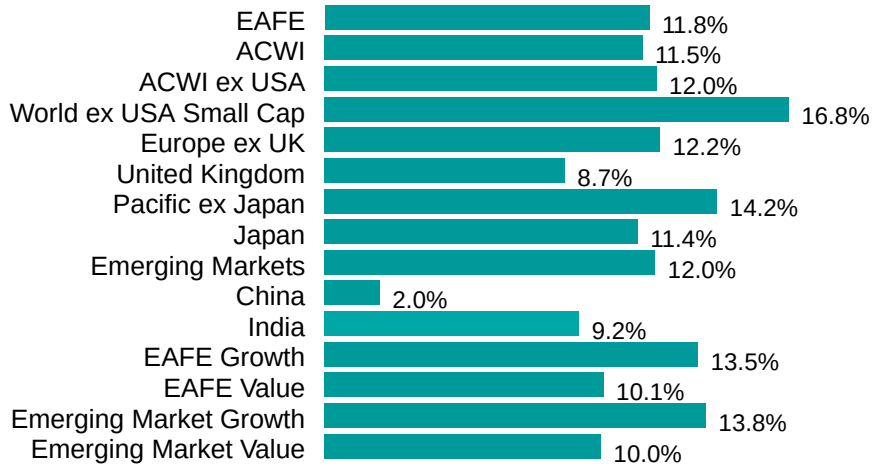
Growth vs. value

- Growth outperformed value as markets favored risk, with high-volatility stocks leading the way. Technology was a standout, while quality lagged and Energy fell due to lower oil prices.

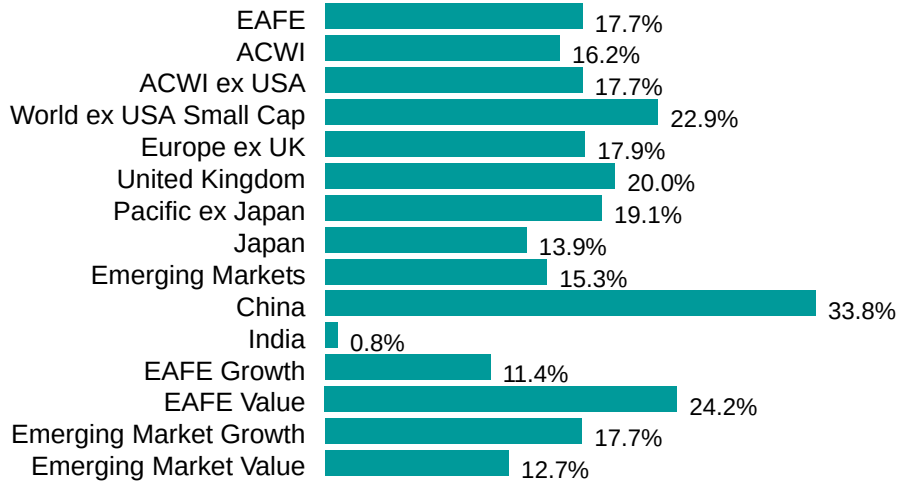
U.S. dollar

- The U.S. dollar posted its worst start to a year since 1973, falling about 10% year to date amid trade tensions, Fed policy-easing expectations, fiscal concerns, and global efforts to reduce dollar reliance.

Global Equity Returns: Quarter Ended 6/30/25



Global Equity Returns: One Year Ended 6/30/25



Source: MSCI

Global/Global ex-U.S. Equity Key Themes

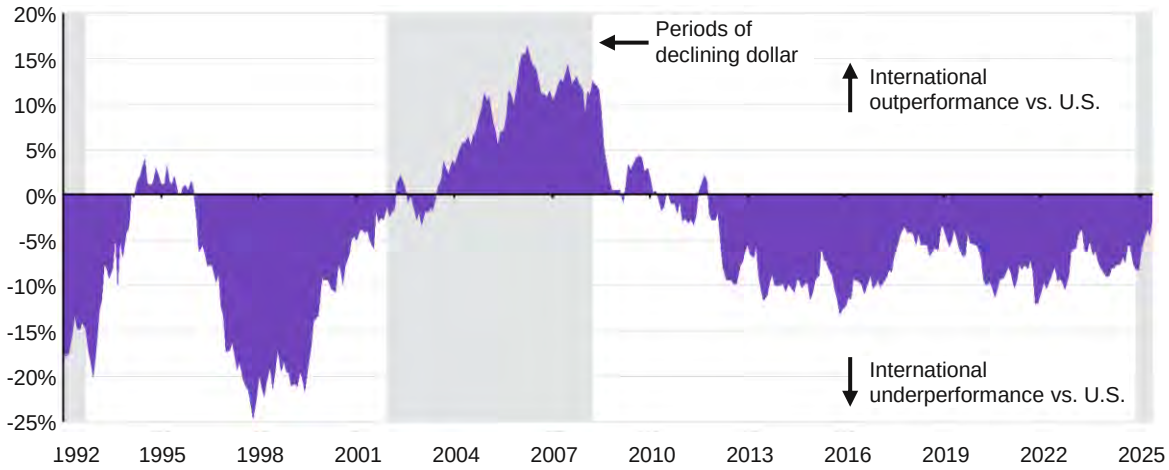
Tailwind for non-U.S. equities as U.S. dollar weakens

U.S. dollar trends

- The U.S. dollar has historically moved in long bull and bear cycles, with the most recent complete bear cycle occurring from 2002-08.
- Since 1970, bear cycles have averaged 6.4 years, with the dollar falling 40.8%.
- The dollar's more than 10% decline in the first half of 2025 was its worst start to a calendar year since 1973.
- Reasons include:
  - Policy uncertainty around aggressive U.S. tariffs on global trading partners
  - Surging U.S. fiscal deficits and rising debt
  - Global portfolio rebalancing as foreign investors reduce dollar exposure
  - Expectations of Fed rate cuts
- After a long cycle of dollar strength and U.S equity dominance, a sustained weakening of the dollar could provide global ex-U.S equities with a tailwind toward relative outperformance vs. U.S. equities.

Cycles of Global ex-U.S. Outperformance and the U.S. Dollar

MSCI ACWI ex-USA, S&P 500, total return, USD, rolling 3-years annualized



Bloomberg U.S. Dollar Index

Sources: FactSet, MSCI, S&P Dow Jones, J.P. Morgan Asset Management

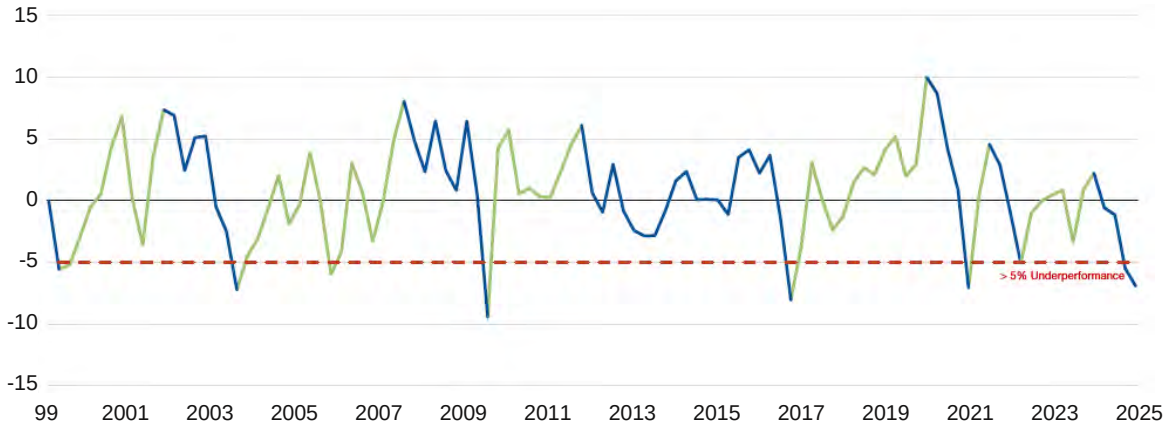
Global/Global ex-U.S. Equity Key Themes

Style headwinds for quality and growth factors

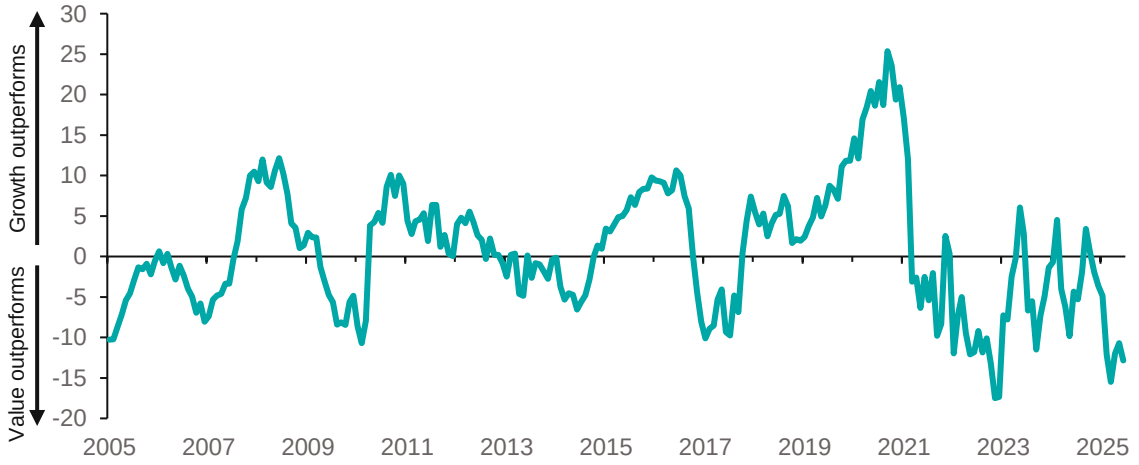
Factor volatility has increased since 2020

- Through the recent volatility, value has generally outperformed growth while quality exposure has been a headwind.
- The momentum factor has performed well in recent years as high beta growth stocks and deep value stocks have taken turns leading the market.
- When evaluating manager performance relative to a benchmark and against peers, parsing through performance attributable to factor exposures or stock selection is as important as ever.

EAFE Quality – EAFE (Rolling 6-month spread)



MSCI EAFE Growth – Value (1 Year)

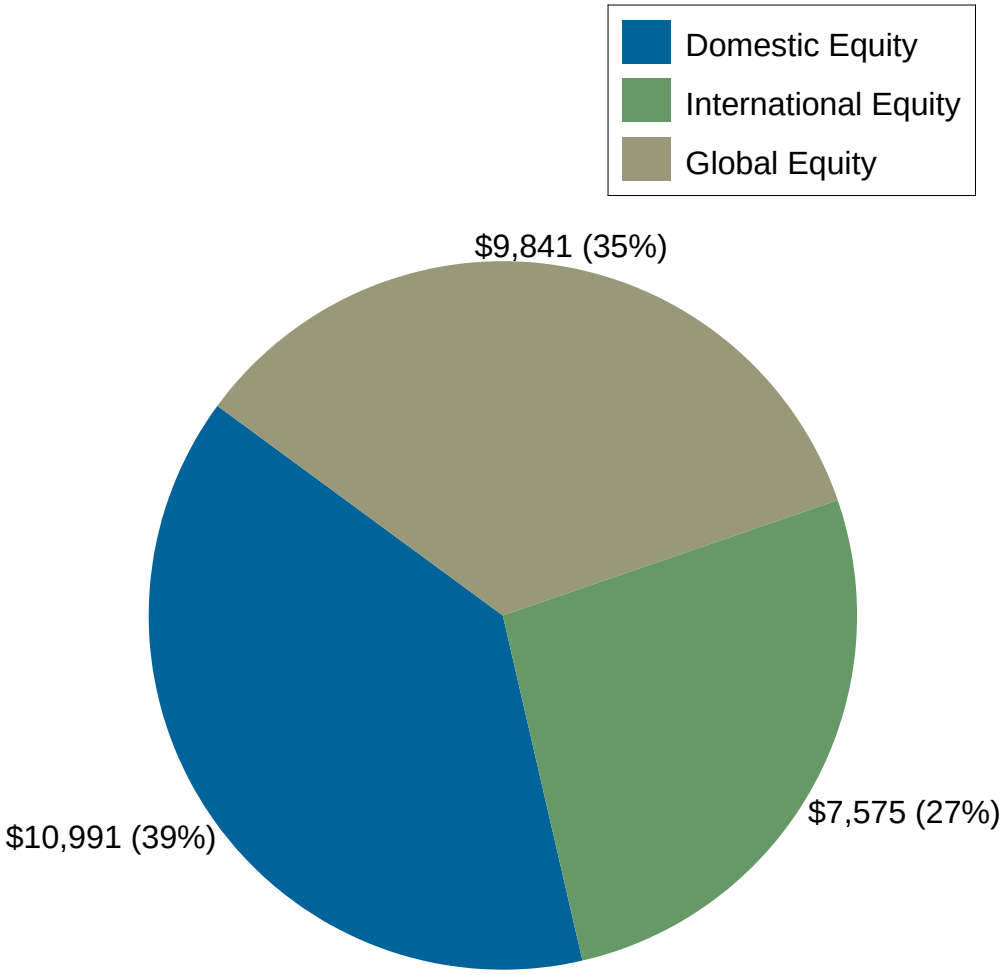


Sources: Lazard, FactSet, MSCI

APFC Public Equity Structure

As of June 30, 2025

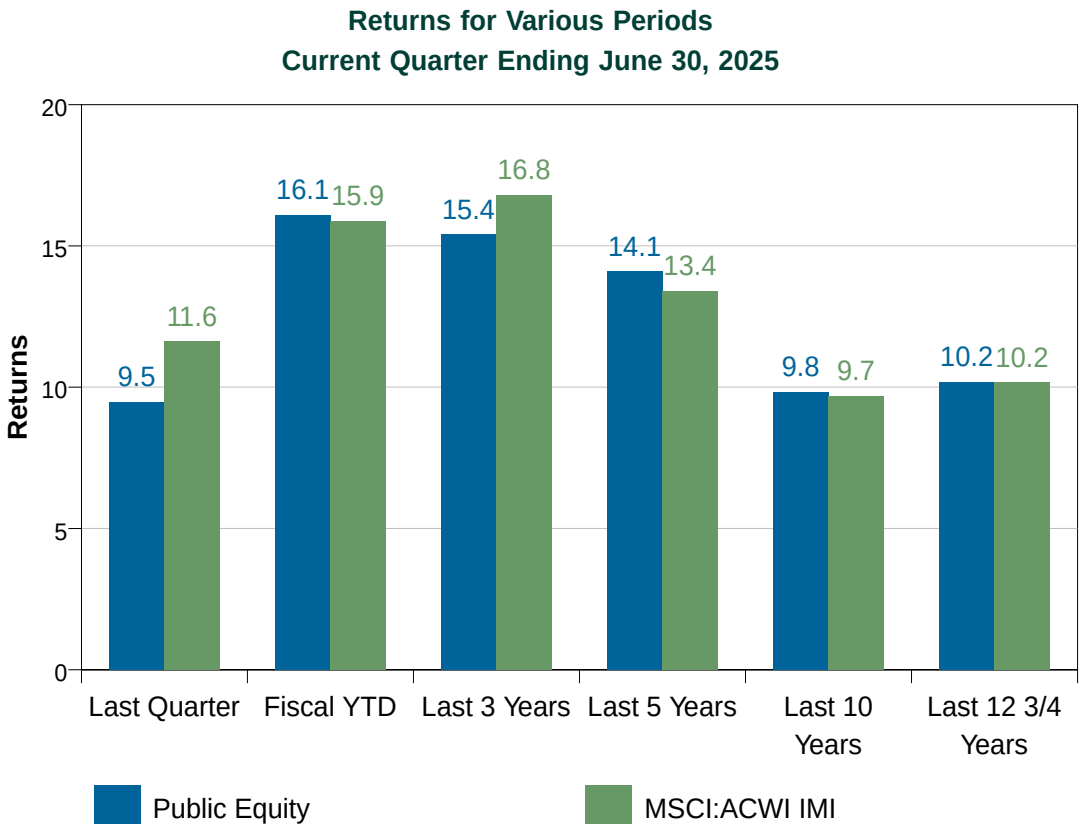
- APFC Public Equity portfolio is comprised of Domestic, International and Global Equity.



APFC Public Equity vs. MSCI ACWI-IMI

Periods Ended March 31, 2025

- APFC Public Equity portfolio trailed the MSCI ACWI IMI index for the quarter and over the trailing three years. The asset class slightly outperformed for the fiscal year and over the trailing five and ten years.
- Domestic and Global Equity composites lagged their respective benchmarks for the quarter, while the International Equity composite ended ahead of its benchmark. For the fiscal year, International and Global Equity beat the benchmarks while domestic equity lagged.
- Overall, the portfolio is well diversified across regions, countries, and underlying strategies.

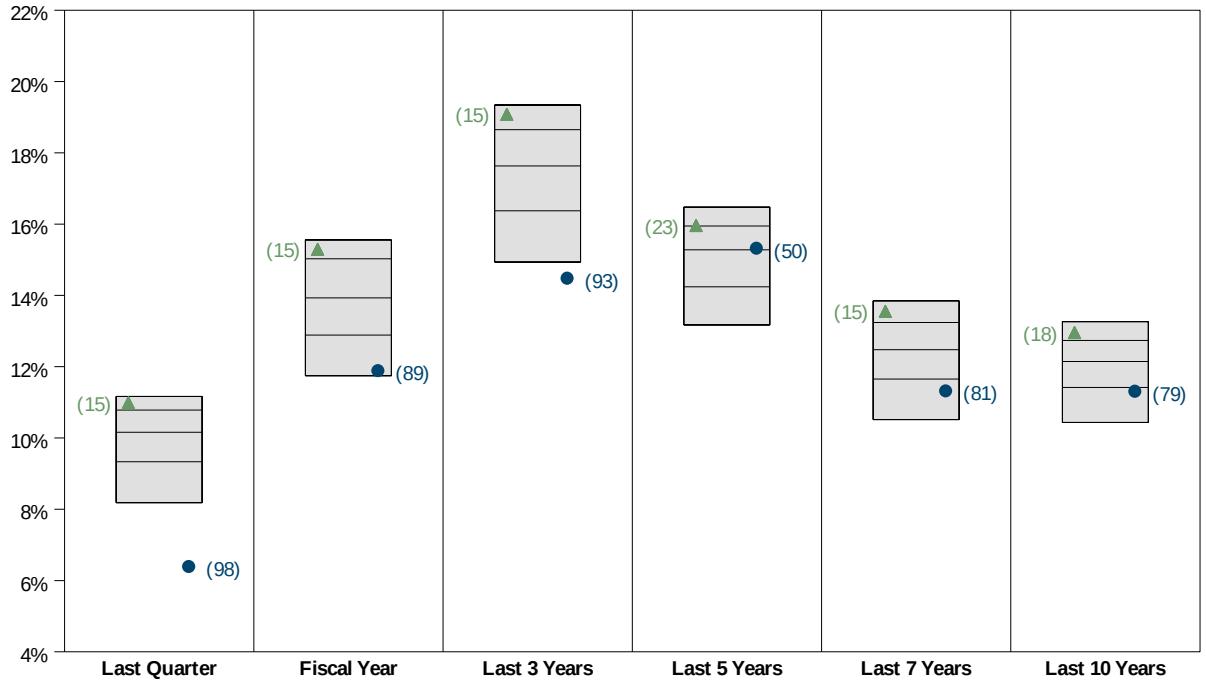


APFC US Equity Performance vs. Fund Sponsor US Equity

Periods Ended June 30, 2025

- The universe is comprised of total domestic equity portfolios of large institutional investors in Callan's Fund Sponsor Database.
- APFC US Equity portfolio lagged the Russell 3000 Index for all time periods shown.
- When compared to US Equity portfolios of other large institutional investors, APFC's US Equity composite ranked below median in longer term periods.

Performance vs Fund Spnsor - Domestic Equity (Gross)



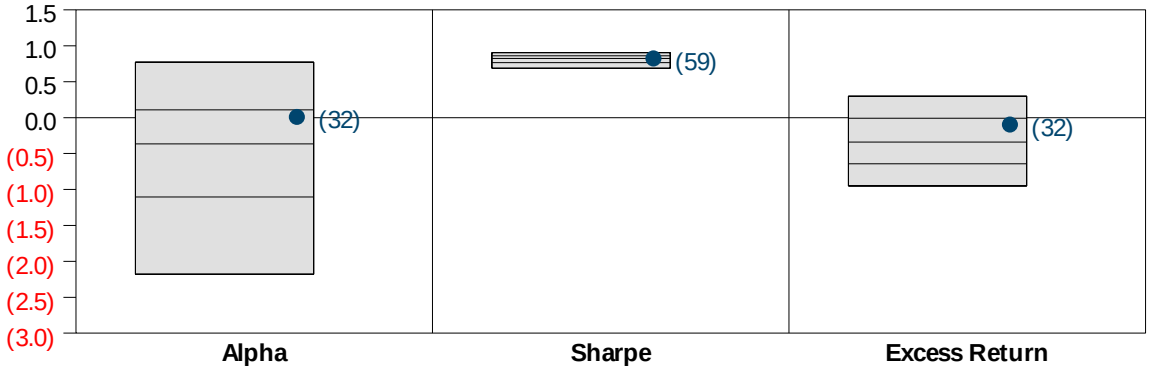
	Last Quarter	Fiscal Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	11.16	15.56	19.34	16.48	13.85	13.26
25th Percentile	10.78	15.03	18.65	15.95	13.24	12.74
Median	10.16	13.93	17.63	15.28	12.48	12.14
75th Percentile	9.33	12.89	16.37	14.24	11.65	11.42
90th Percentile	8.18	11.75	14.94	13.17	10.52	10.44
Domestic Equity ●	6.36	11.85	14.45	15.29	11.28	11.28
Russell 3000 Index ▲	10.99	15.30	19.08	15.96	13.55	12.96

APFC US Equity Portfolio Risk Adjusted Return Rankings

Periods Ended June 30, 2025

- The universe is comprised of total domestic equity portfolios of large institutional investors in Callan's Fund Sponsor Domestic Equity Database.
- For the trailing five-year period, APFC portfolio ranked above median for alpha and excess return ratio.
  - Alpha measures contribution to performance – portfolio's return above index adjusted for risk.
  - Sharpe Ratio represents return gained per unit of risk taken (return/risk).
  - Excess Return Ratio measures alpha (return above benchmark) divided by tracking error (risk versus benchmark).

Risk Adjusted Return Measures vs Russell 3000 Index
Rankings Against Fund Sponsor – Domestic Equity (Gross)
Five Years Ended June 30, 2025

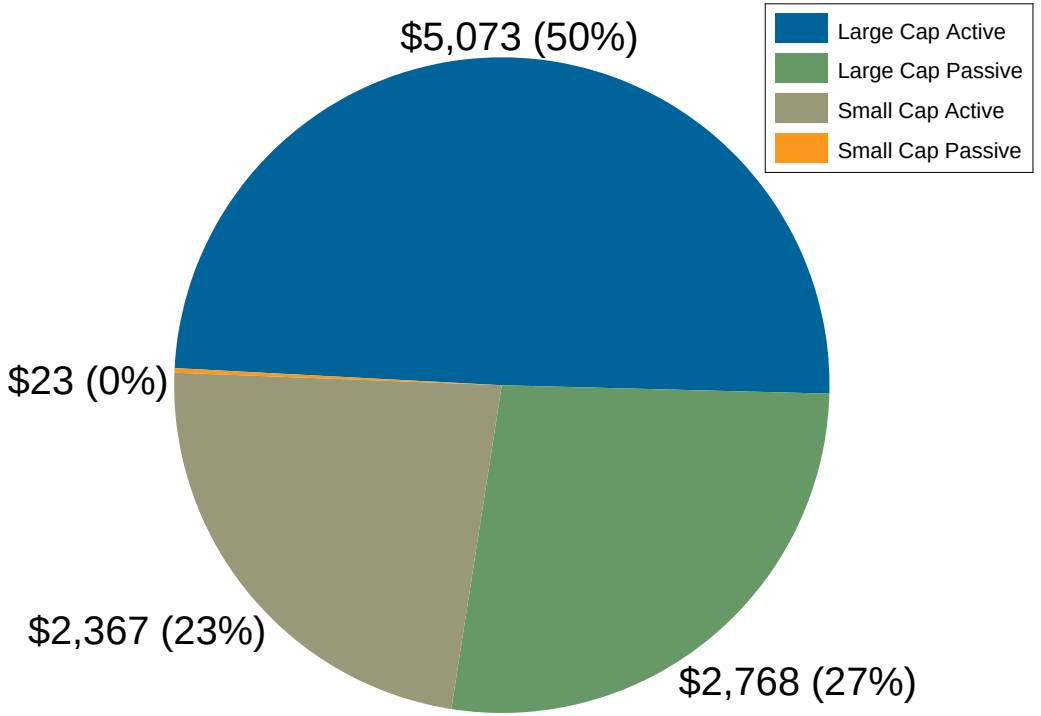


	Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile	0.77	0.90	0.30
25th Percentile	0.11	0.86	(0.01)
Median	(0.36)	0.82	(0.34)
75th Percentile	(1.10)	0.77	(0.64)
90th Percentile	(2.18)	0.69	(0.95)
Domestic Equity ●	(0.01)	0.80	(0.12)

APFC US Equity Structure

As of June 30, 2025

- US equity portfolio is roughly 73% actively managed and 27% passive (or quasi-passive).
- Roughly 65% of the large cap allocation is actively managed while 99% of the small cap allocation is actively managed.



APFC Large & Small Cap Equity Relative to Peer Universe

Periods Ended June 30, 2025

- APFC's Large Cap and Small Cap portfolios both underperformed the benchmark for the quarter. Over the trailing year, both the Large and Small Cap portfolios underperformed their respective benchmarks.
- Small Cap portfolio ranked below the peer group median over the quarter and over the trailing year. The Large Cap portfolio ranked below median over the quarter and above median over the trailing year.

Performance vs Callan Large Capitalization (gross)

	Last Quarter		Fiscal YTD		Last Year		Last 3 Years		Last 5 Years		Last 7 Years		Last 10 Years	
Large Cap Equity	7.35	(65)	14.47	(41)	14.47	(41)	16.47	(64)	16.34	(31)	12.27	(61)	11.98	(60)
S&P 500 Index	10.94	(53)	15.16	(32)	15.16	(32)	19.71	(49)	16.64	(27)	14.39	(39)	13.65	(39)
Russell 1000 Index	11.11	(51)	15.66	(28)	15.66	(28)	19.59	(50)	16.30	(33)	14.09	(42)	13.35	(42)
Callan Large Cap	11.15		13.47		13.47		19.42		15.28		13.55		12.78	

Performance vs Callan Small Capitalization (gross)

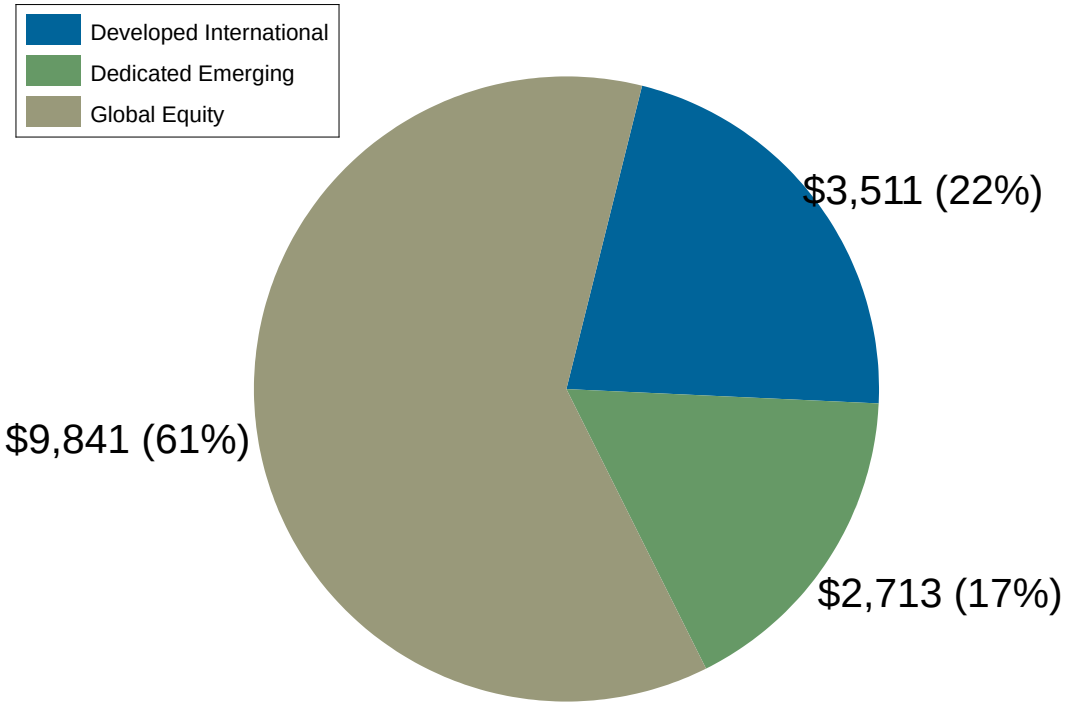
	Last Quarter		Fiscal YTD		Last Year		Last 3 Years		Last 5 Years		Last 7 Years		Last 10 Years	
Small Cap Equity	5.58	(67)	2.68	(77)	2.68	(77)	9.46	(57)	11.89	(38)	7.40	(34)	8.83	(27)
Russell 2000 Index	8.50	(43)	7.68	(35)	7.68	(35)	10.00	(51)	10.04	(51)	5.52	(74)	7.12	(67)
Callan Small Cap	7.76		5.55		5.55		10.08		10.08		6.82		7.73	

*Peer group returns reflect median

APFC Non-US and Global Equity Structure

As of June 30, 2025

- Portfolio is divided between global, non-US, and emerging markets mandates.
- Both global and non-US equity managers invest in emerging markets.
- Global managers invest in US markets as part of their mandate.

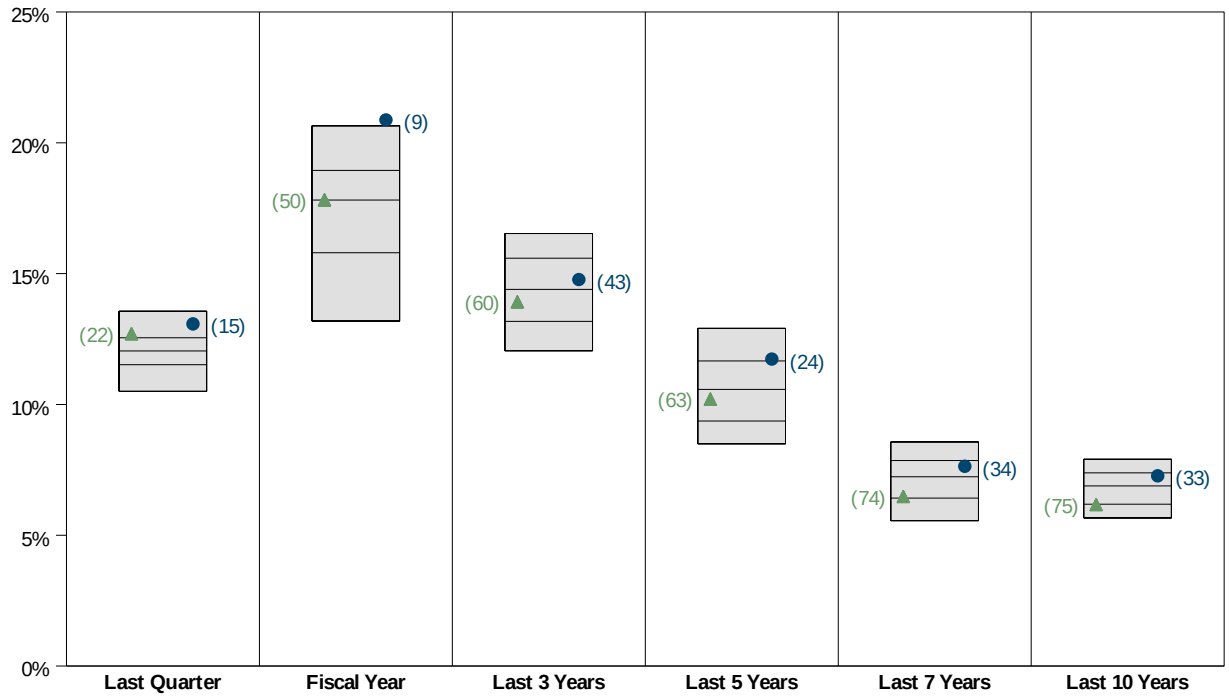


APFC International Equity Relative to Fund Sponsor Universe

Periods Ended June 30, 2025

- International Equity ended the quarter and trailing year ahead of its benchmark. Relative to the peer group the segment was in the top quartile for the quarter and top decile for the year.
- The portfolio outperformed its benchmark over all measured time periods.
- Relative to other fund sponsor portfolios, International Equity ranked above median for all measured time periods.

Performance vs Fund Spnsor - International Equity (Gross)



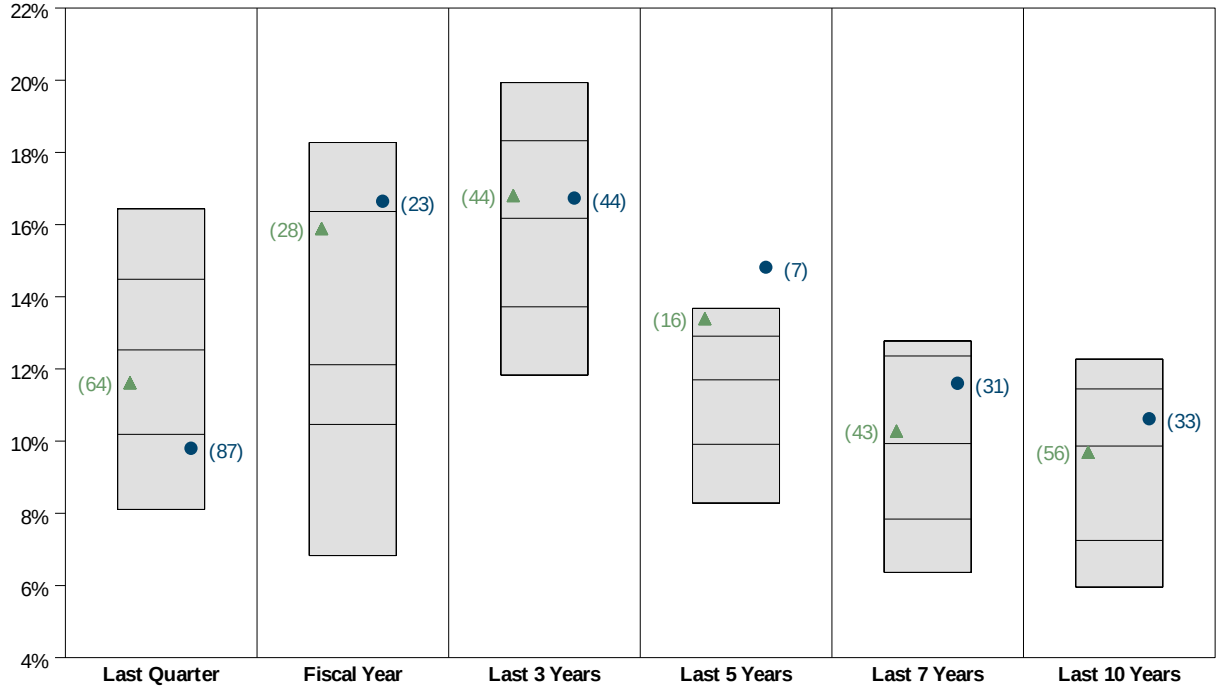
	Last Quarter	Fiscal Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	13.56	20.65	16.53	12.91	8.57	7.91
25th Percentile	12.55	18.95	15.59	11.66	7.85	7.39
Median	12.05	17.81	14.40	10.57	7.23	6.88
75th Percentile	11.52	15.80	13.17	9.37	6.42	6.19
90th Percentile	10.50	13.18	12.05	8.50	5.55	5.66
International Equity	13.03	20.83	14.72	11.68	7.59	7.22
MSCI ACWI xUS IMI	12.71	17.83	13.92	10.20	6.49	6.18

APFC Global Equity Relative to Global Universe

Periods Ended June 30, 2025

- APFC Global Equity portfolio lagged its benchmark and peers over the trailing quarter. Over the last year, the portfolio outperformed the benchmark and ranked in the top quartile of the peer group.
- The portfolio was ahead of its benchmark and above peer group median over longer time periods.

Performance vs Callan Global Equity MFs (Institutional Net)



	Last Quarter	Fiscal Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	16.44	18.27	19.94	13.68	12.77	12.27
25th Percentile	14.49	16.36	18.32	12.91	12.36	11.44
Median	12.53	12.12	16.17	11.70	9.93	9.86
75th Percentile	10.19	10.46	13.72	9.91	7.84	7.25
90th Percentile	8.11	6.83	11.83	8.28	6.36	5.95
Global Equity ●	9.77	16.61	16.70	14.78	11.57	10.59
MSCI ACWI IMI ▲	11.62	15.89	16.80	13.39	10.28	9.69

APFC International & Global Equity Relative to Fund Sponsor Universe

Periods Ended June 30, 2025

Performance vs Callan Non-US Equity (gross)

	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
International Developed	14.36 (14)	22.34 (32)	22.34 (32)	16.34 (48)	13.01 (30)	8.10 (45)	7.64 (38)
MSCI ACWI xUS (net)	12.03 (52)	17.72 (63)	17.72 (63)	13.99 (78)	10.13 (72)	6.58 (83)	6.12 (88)
Callan Non-U.S. (gr)	12.06	19.59	19.59	16.08	11.57	7.98	7.29

Performance vs Emerging Markets Equity Database (gross)

	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
Emerging Markets	11.38 (73)	14.22 (55)	14.22 (55)	10.23 (37)	8.31 (18)	5.86 (20)	5.96 (19)
MSCI EM	11.99 (62)	15.29 (30)	15.29 (30)	9.70 (47)	6.81 (36)	4.48 (36)	4.82 (41)
EM Equity DB (gr)	12.21	14.60	14.60	9.40	5.94	4.04	4.55

Performance vs Global Equity Database (gross)

	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
Global Equity	9.77 (87)	16.61 (23)	16.61 (23)	16.70 (44)	14.78 (7)	11.57 (31)	10.59 (33)
MSCI ACWI IM Index	11.62 (64)	15.89 (28)	15.89 (28)	16.80 (44)	13.39 (16)	10.28 (43)	9.69 (56)
Global Equity DB (gr)	12.53	12.12	12.12	16.17	11.70	9.93	9.86

*Peer group returns reflect median

- APFC's International Developed bested its benchmarks for the quarter and over the trailing year.
- The Emerging Markets portfolio fell short of its benchmark over the quarter and trailing year.
- The Global Equity portfolio underperformed its benchmark for the quarter but outperformed over the last year.
- All three programs above peer group medians over the trailing 3, 5 & 7 year periods with emerging markets ranking in the top quartile.

U.S. Fixed Income Performance: 2Q25

With Fed on hold, yield curve steepens as intermediate and long-end rates diverge

Macro environment

- The Fed held rates steady at both meetings during the quarter, citing persistent inflation and economic uncertainty.
- U.S. Treasury yields were mixed, with intermediate rates declining while yields at the long end moved higher.
- The yield curve steepened, with the 2s/10s spread-widening as much as 67 bps—the steepest level since the curve first inverted in 2022—before ending at 52 bps.

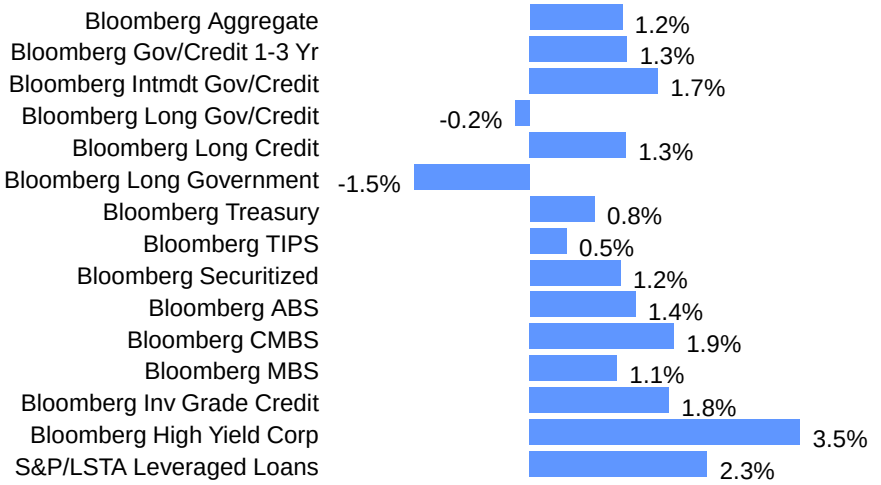
Performance and drivers

- Despite the rise in long-term rates, the Bloomberg US Aggregate Bond Index rose 1.2%, supported by the rate declines between one- and seven-year maturities.
- IG corporates outperformed Treasuries on a duration-adjusted basis amid modestly tighter spreads; securitized also outperformed, though by a smaller margin.
- HY and bank loans delivered the strongest returns as non-investment grade spreads tightened, though dispersion across quality tiers was relatively modest.

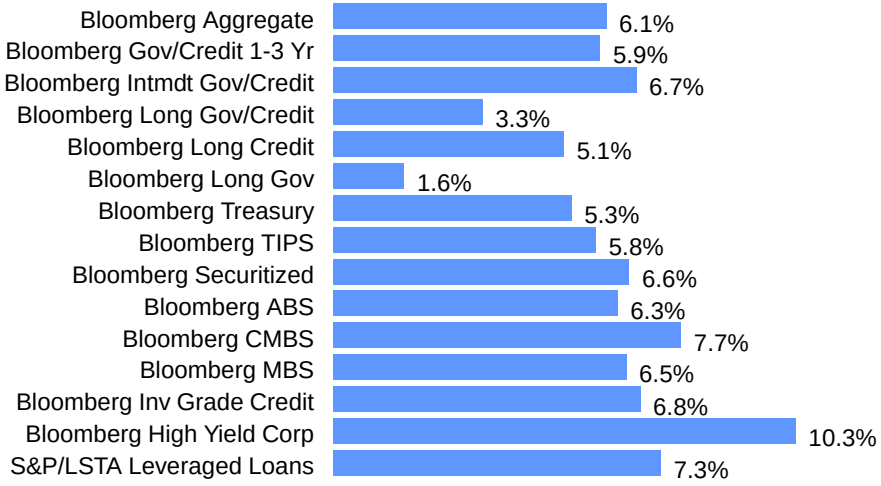
Valuations

- Corporate credit spreads widened sharply following Liberation Day but retraced in the second half, ending below 1Q levels.
- New issuance slowed from 1Q, but volumes remained healthy with $396 billion in IG and $73 billion in HY, contributing to strong YTD totals.

U.S. Fixed Income Returns: Quarter Ended 6/30/25



U.S. Fixed Income Returns: One Year Ended 6/30/25



Sources: Bloomberg, Callan, J.P. Morgan, S&P Dow Jones Indices, U.S. Treasury

Global Fixed Income Performance: 2Q25

U.S. dollar continues to weaken amid tariff uncertainty

Macro environment

- Global rates declined as growth expectations moved lower, while renewed U.S. tariff threats added to uncertainty.
- The ECB and BOE both cut rates, citing moderating inflation, slowing economic growth, and trade policy uncertainty as drivers of the decisions.

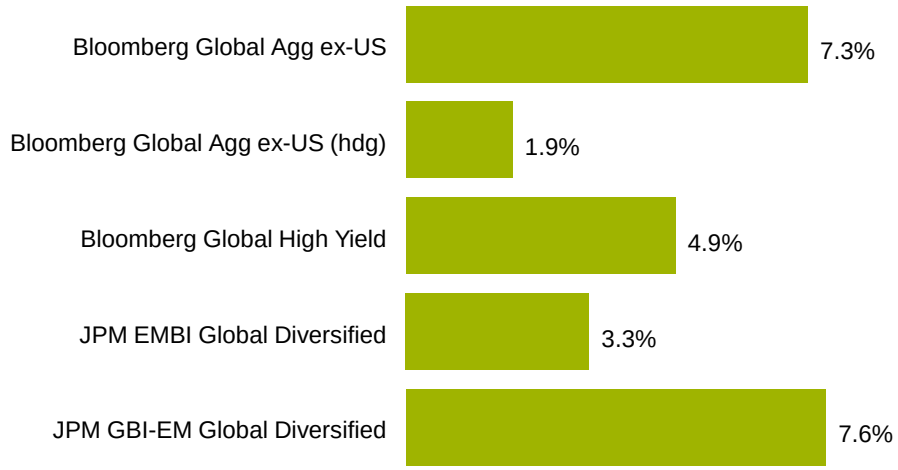
U.S. dollar weakened

- Major currencies strengthened against the U.S. dollar for a second consecutive quarter as the ICE U.S. Dollar Index fell 10.7% in 1H25—its worst first-half performance since a 14.8% decline in 1973.
- The Bloomberg Global Aggregate ex US Hedged Index was positive for the quarter, but the dollar weakness resulted in substantially higher returns for the Unhedged Index.

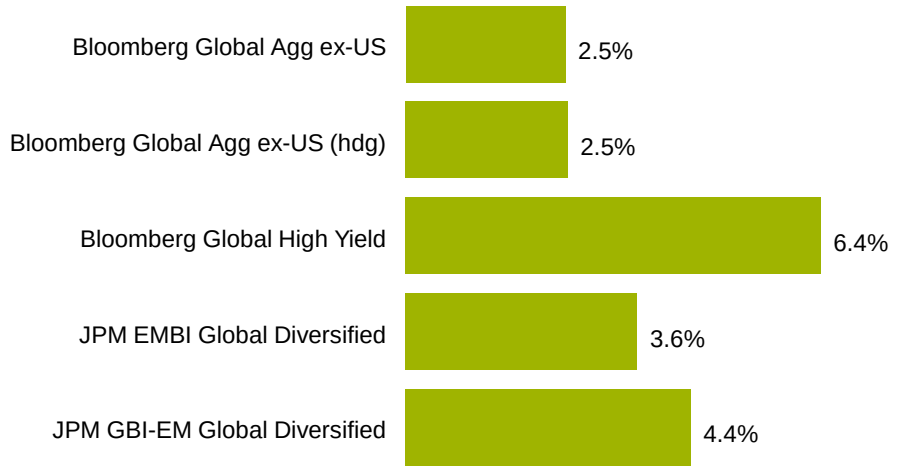
Emerging market debt delivers another strong quarter

- The dollar's decline also supported emerging market debt, with the local currency-denominated JPM GBI-EM Global Diversified Index returning 7.6%, outperforming the USD-denominated JPM EMBI Global Diversified Index.
- Sovereign spreads initially widened on tariff concerns but tightened into quarter-end, with lower-quality debt outperforming higher-quality.

Global Fixed Income Returns: Quarter Ended 6/30/25



Global Fixed Income Returns: One Year Ended 6/30/25

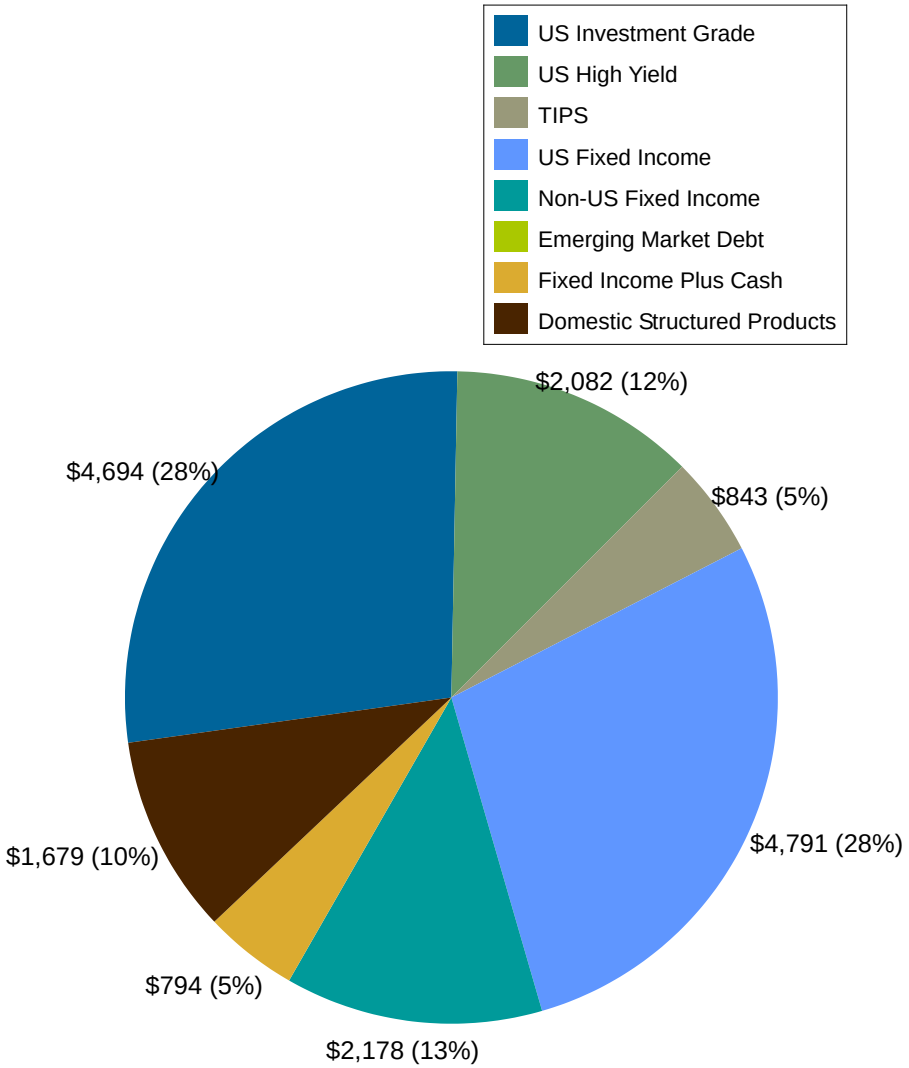


Sources: Bloomberg, J.P. Morgan, ICE Data Indices

APFC Fixed Income Structure

As of June 30, 2025

- The fixed income portfolio is now managed internally, including allocations within Fixed Income Plus Cash, US Fixed Income Aggregate, US Investment Grade Corporate, Non-US Fixed Income, Structured Products, Emerging Market Debt, US High Yield and TIPS.



Fixed Income Relative to Benchmarks

Periods Ended June 30, 2025

- Broader fixed income outperformed the benchmark over all measured trailing time periods.
- Over the quarter US fixed income, US investment grade, Non-US fixed income, US high yield, TIPS, and Structured products finished roughly in line with their respective benchmarks.
- Over the trailing year, US fixed income, US investment grade, US high yield, and TIPS outperformed their respective benchmarks.

	Last Quarter	Fiscal YTD	Last Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
Fixed Income	1.73	6.67	6.67	4.39	1.01	2.61	--
Fixed Income Benchmark	1.66	6.49	6.49	3.93	0.56	2.05	--
US Fixed Income Aggregate	1.36	6.34	6.34	3.19	(0.17)	2.28	2.17
Blmbg:Aggregate	1.21	6.08	6.08	2.55	(0.73)	1.77	1.76
US Investment Grade Corporate	1.89	7.14	7.14	5.07	0.70	3.49	3.50
Blmbg:Corporate	1.82	6.91	6.91	4.34	0.14	2.89	2.94
Non US Fixed Income	1.85	5.37	5.37	3.62	0.40	1.98	2.40
Blmbg Global Treasury ex-US	1.91	5.54	5.54	3.59	0.43	1.96	2.48
US High Yield	3.34	9.23	9.23	9.50	6.02	5.13	5.05
US High Yield Benchmark	3.44	8.91	8.91	8.85	5.34	4.86	5.06
TIPS	0.54	6.08	6.08	2.65	1.98	3.30	2.92
Blmbg TIPS	0.48	5.84	5.84	2.34	1.61	2.99	2.67
Domestic Structured Products	1.14	6.43	6.43	2.22	(0.56)	--	--
BB US Securitized	1.18	6.58	6.58	2.44	(0.48)	1.35	1.39

Fixed Income Benchmark components: 5% 90 Day T-Bills, 5% BB US TIPS, 25% BB US Agg, 25% BB US Corp Inv Grade TR, 10% Gl Treas xUS Hdg, 2.5% JPM EMBI Gl Div, 2.5% JPM GBI-EM Gl Div, 10% BB US HY 2% Issuer, 10% S&P Gl REIT & 5% S&P Gl Listed Inf to 6/30/20.
5% 90 Day T-Bills, 5% BB US TIPS, 27.5% BB US Agg, 27.5% BB US Corp Inv Grade TR, 10% Gl Treas xUS Hdg, 2.5% JPM EMBI Gl Div, 2.5% JPM GBI-EM Gl Div, 10% BB US HY 2% Issuer, and 10% BB US Sec Idx to 6/30/22.
5% 90 T-Bills, 27.5% BB US Corp Inv Gr TR, 15% Gl Treas xUS Hdgd, 27.5% BB US Agg, 10% BB HY Corp Ba, 5% BB US TIPs, and 10% BB US Securitzed Idx thereafter.

U.S. Private Real Estate Performance: 2Q25

Sector appreciation turns positive, outside of Office and Hotel

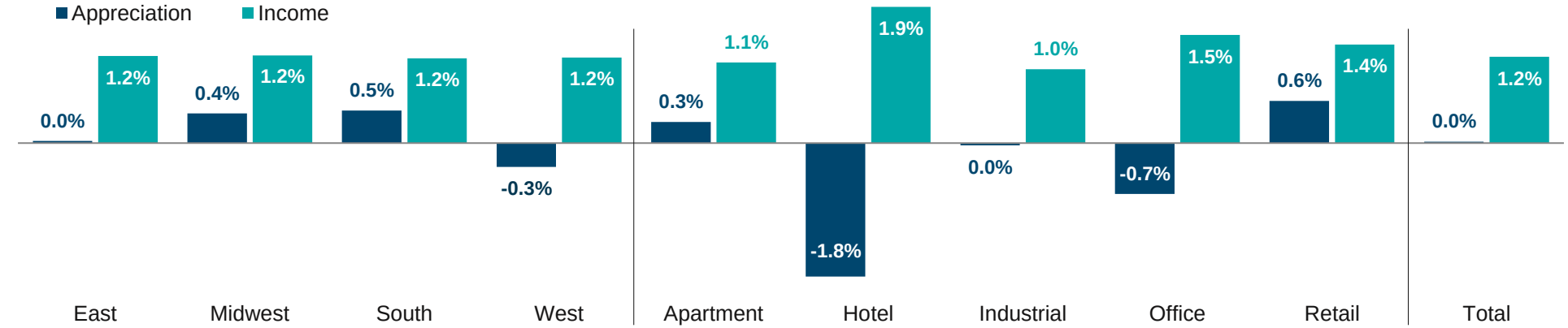
Valuations reflect higher interest rates

- Valuations appear to have bottomed and are in the very early stages of a recovery.
- Income returns were positive across sectors and regions.
- Property sectors were mixed; Office and Hotel experienced negative appreciation, while the remaining sectors had positive appreciation.
- West region underperformance was driven by repricing of industrial in Southern California.
- Return dispersion by manager within the ODCE Index was due to the composition of underlying portfolios.

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
NCREIF ODCE	0.8%	2.7%	-6.2%	2.5%	4.4%
Income	0.8%	3.3%	3.0%	3.0%	3.2%
Appreciation	0.0%	-0.6%	-9.0%	-0.4%	1.4%
NCREIF Property Index	1.2%	4.2%	-2.8%	3.7%	5.2%
Income	1.2%	4.8%	4.5%	4.3%	4.5%
Appreciation	0.0%	-0.6%	-7.0%	-0.6%	0.7%

Returns are geometrically linked

NCREIF Property Index Quarterly Returns by Region and Property Type

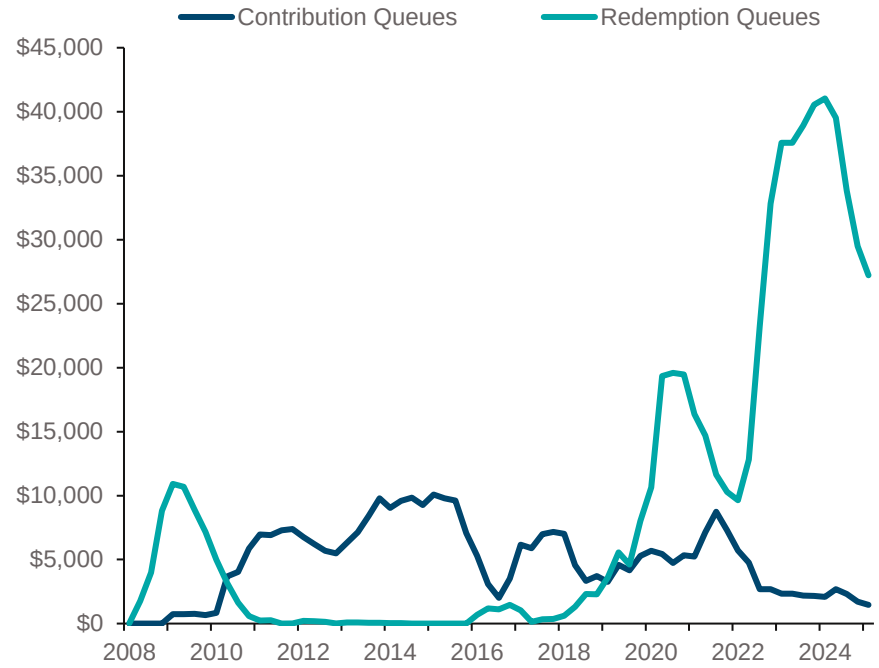


Source: NCREIF; ODCE return is net

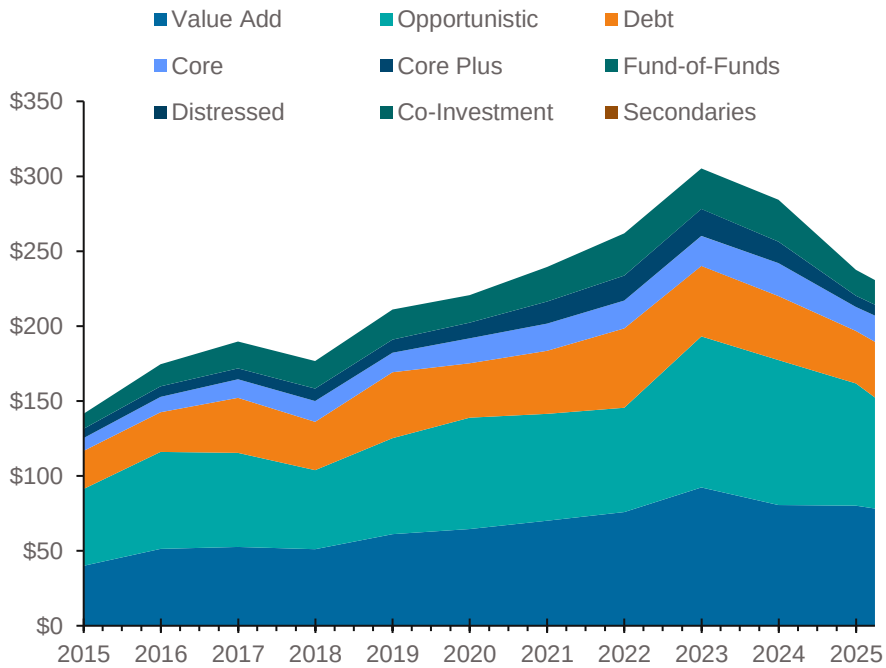
U.S. Private Real Estate Market Trends

Over $230 billion of dry powder

Core Fund Contribution/Redemption Queues ($mm)^



Dry Powder for CRE Investment in North America ($bn)



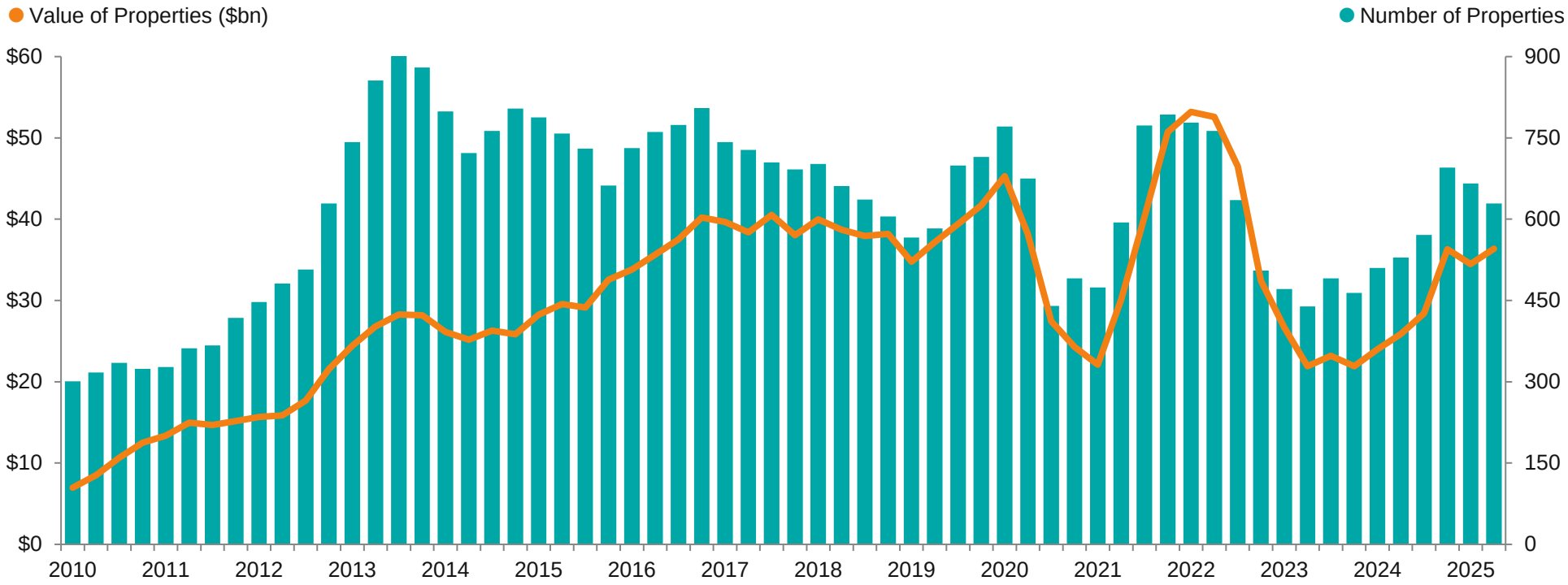
- ODCE redemption queues are approximately 12.0% of net asset value (NAV) with a median queue of 9.5%. This compares to the Global Financial Crisis, when queues peaked at approximately 15% of NAV.
- Outstanding redemption requests for most large ODCE funds are approximately 0% to 52% of NAV.
- Redemption queues are now sharply decreasing after having peaked at 19.3% of NAV in 1Q24. This has been driven primarily by rescissions of redemption requests within a handful of managers with large queues and increased redemption payments due to increased transactions.

Sources: AEW, NCREIF, Preqin
^Queue data as of 1Q25 the latest available at time of publication

U.S. Private Real Estate Market Trends

Pricing and transaction volumes are increasing after bottoming

NCREIF Property Index Rolling 4-Quarter Transaction Totals

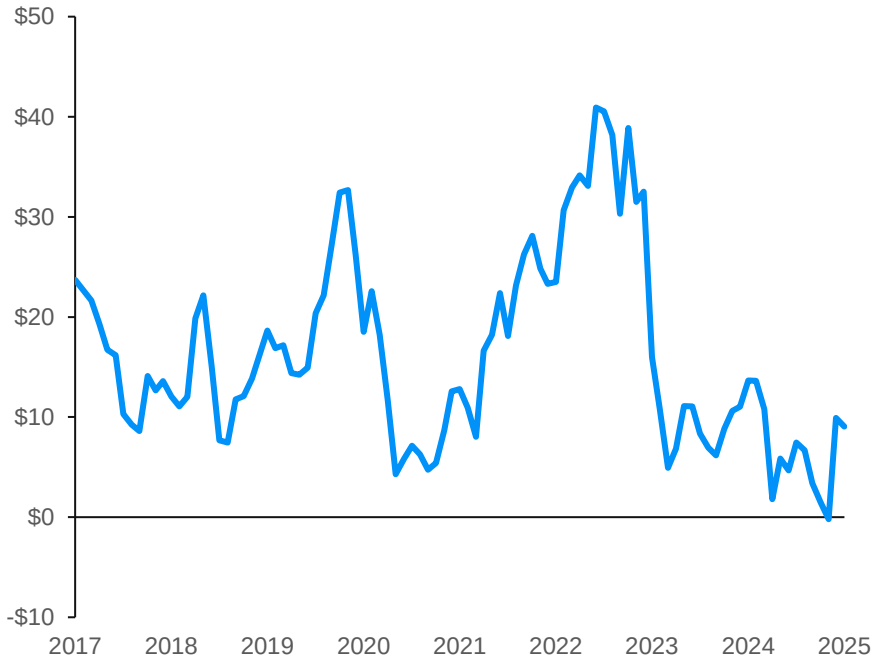


- Transaction volume is increasing on a rolling four-quarter basis yet remains below five-year averages.
- In 2Q25, transaction volume slightly decreased on a quarter-over-quarter basis, driven by the volatility of the tariff announcements. Transaction volume remains lower compared to 2022.
- The volatile rise in interest rates is the driving force behind the slowdown in transactions. Valuations have largely adjusted to increased borrowing costs.

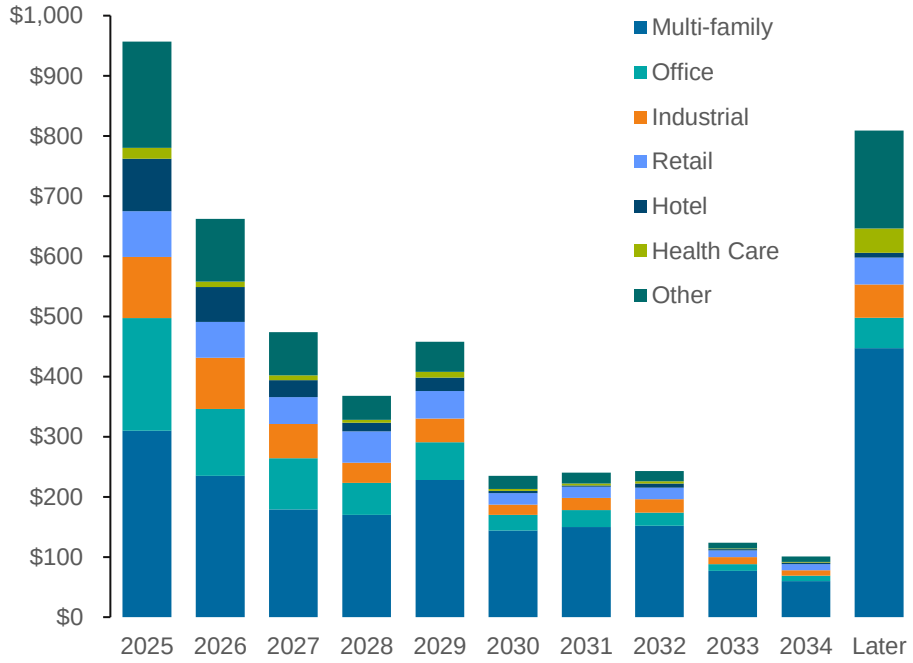
Source: NCREIF

Real Estate Capital Markets

Bank CRE Net issuance (Rolling 3 Months) $bn



Loan Maturities by Sector ($bn)



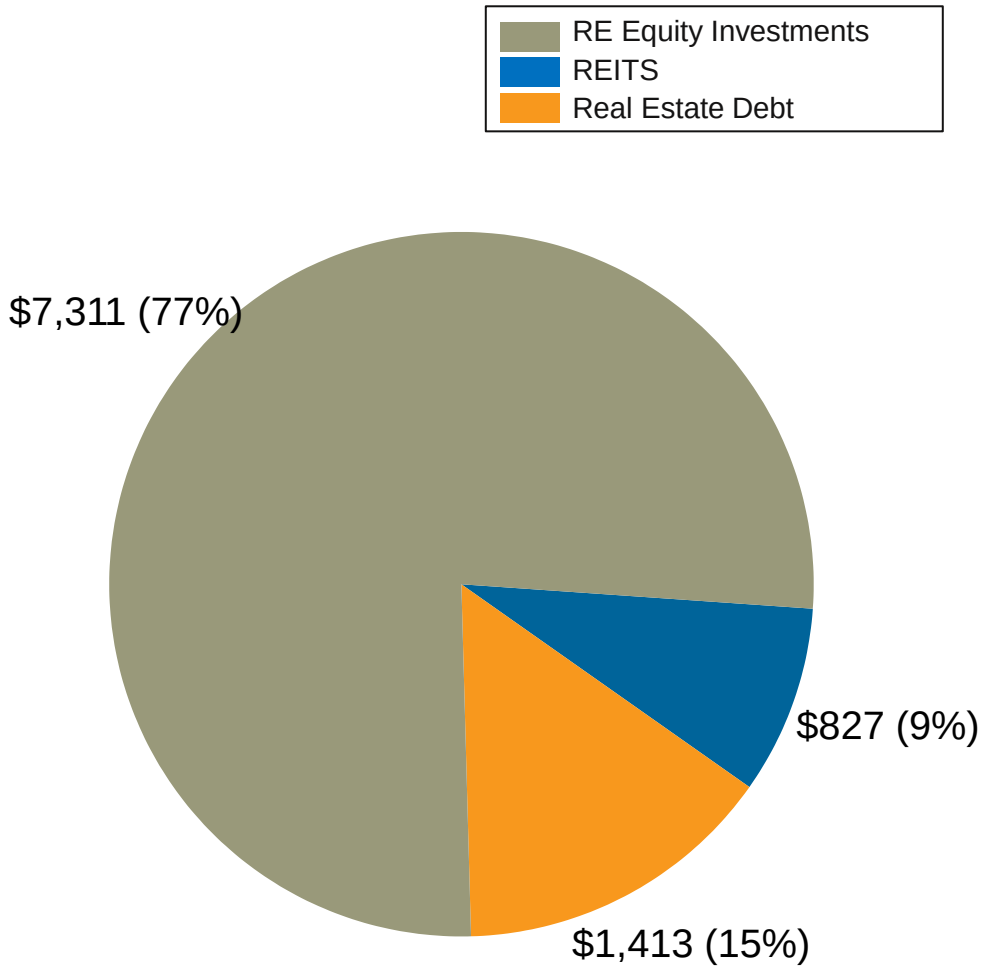
- Bank issuance is increasing, but additional sources of lending are needed, and debt investment opportunities appear increasingly attractive.
- A sizeable pool of loans maturing in 2025 is driven by short-term extensions from prior years, particularly multi-family and office loans, and will put further pressure on lending markets.

Sources: FDIC, JP Morgan Asset Management, MBA, Moody's

APFC Real Estate Structure *(1Q LAG)*

As of March 31, 2025

- The real estate portfolio is comprised of Real Estate Equity Investments, REITS, and Real Estate Debt Investments.
- Real Estate Debt Funds moved from Real Estate Separate Accounts and Direct Investments, and REITS from Fixed Income Plus.

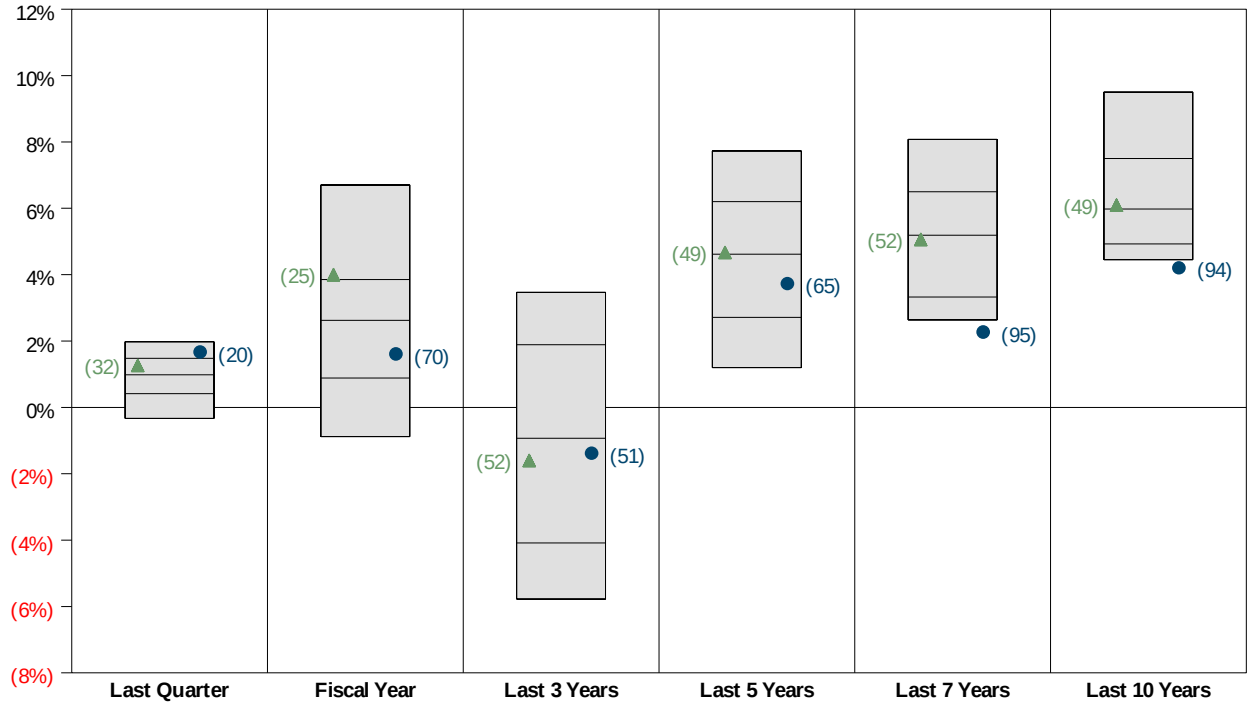


Real Estate Relative to Callan's Total Real Estate Database *(1Q LAG)*

Periods Ended March 31, 2025

- APFC Real Estate portfolio performance is shown net of fees for all investments.
- The real estate portfolio exceeded its benchmark for the quarter and but underperformed over the trailing year.
- The portfolio ranked in the top quartile in the Real Estate peer group for the quarter and but below median over the trailing year.

Performance vs Public Fund - Real Estate (Gross)



	Last Quarter	Fiscal Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	1.97	6.70	3.47	7.73	8.08	9.50
25th Percentile	1.48	3.85	1.89	6.20	6.50	7.50
Median	0.98	2.62	(0.93)	4.62	5.19	5.98
75th Percentile	0.41	0.88	(4.09)	2.71	3.33	4.93
90th Percentile	(0.33)	(0.88)	(5.77)	1.20	2.64	4.45
Real Estate ●	1.63	1.57	(1.42)	3.70	2.24	4.17
Real Estate Target ▲	1.27	4.00	(1.60)	4.67	5.06	6.10

Real Estate Target components: Real Estate Custom: NCREIF Total Index through 6/30/20, then 85% NCREIF Total Index and 15% MSCI US REIT thereafter

Real Estate Performance *(1Q LAG)*

Periods Ended March 31, 2025

	Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
RE Equity Investments	**1.56**	**-0.35**	**-2.01**	**1.46**	**--**
RE EQ Separate Accts & Direct	1.89	-3.24	-4.22	-0.64	1.96
RE EQ Funds & Co-Invest	0.69	4.09	0.89	10.18	--
RE EQ Development	1.90	7.47	--	--	--
RE Debt Investments	**2.01**	**7.93**	**9.53**	**11.69**	**--**
RE Debt Separate Accounts	2.04	7.89	9.69	9.39	--
RE Debt Funds & Co-Invests	1.63	8.06	8.81	--	--
NCREIF Monthly	1.28	2.72	-2.11	3.25	5.42
REITS	**1.55**	**10.76**	**-0.69**	**11.72**	**--**
MSCI:US REIT Index	1.07	10.26	-0.55	11.32	5.28
Real Estate Composite	**1.63**	**1.57**	**-1.42**	**3.70**	**4.17**
Real Estate Target	1.27	4.00	-1.60	4.67	6.10

- In the quarter, all Real Estate portfolios outperformed their respective benchmarks. Over the trailing year, the Real Estate Debt portfolio and REITs portfolio exceeded their benchmarks.
- Overall, the Real Estate Composite exceeded its custom benchmark over the quarter but lagged over the trailing year.

Private Credit Fundraising Landscape

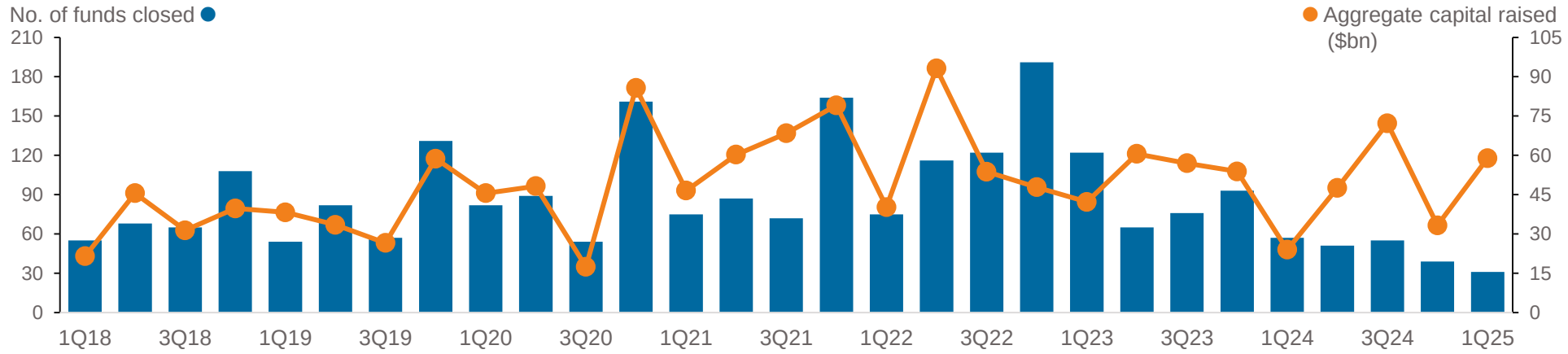
Activity continued to be relatively slow in 1Q25

- The number of funds raised in 1Q25 was the lowest first quarter in the last seven years.
- The top four funds raised in 1Q25 were all European-focused funds.
- Direct lending continues to dominate fundraises, with mezzanine following.
- Private credit stayed in high demand among Callan clients, and most LPs look to maintain or increase their target allocation.
- We continue to notice increased interest in specialty finance/ABL strategies for more mature PC portfolios.

Largest Funds Holding Closes in 1Q25

Name	Amount ($millions)	Strategy
Ares Capital Europe VI	$17,589	Direct Lending
Corinthia Fund I	$5,000	Direct Lending
ICG Europe Mid-Market Fund II	$3,258	Mezzanine
Capital Four Private Debt V	$3,247	Direct Lending

Quarterly Private Debt Fundraising

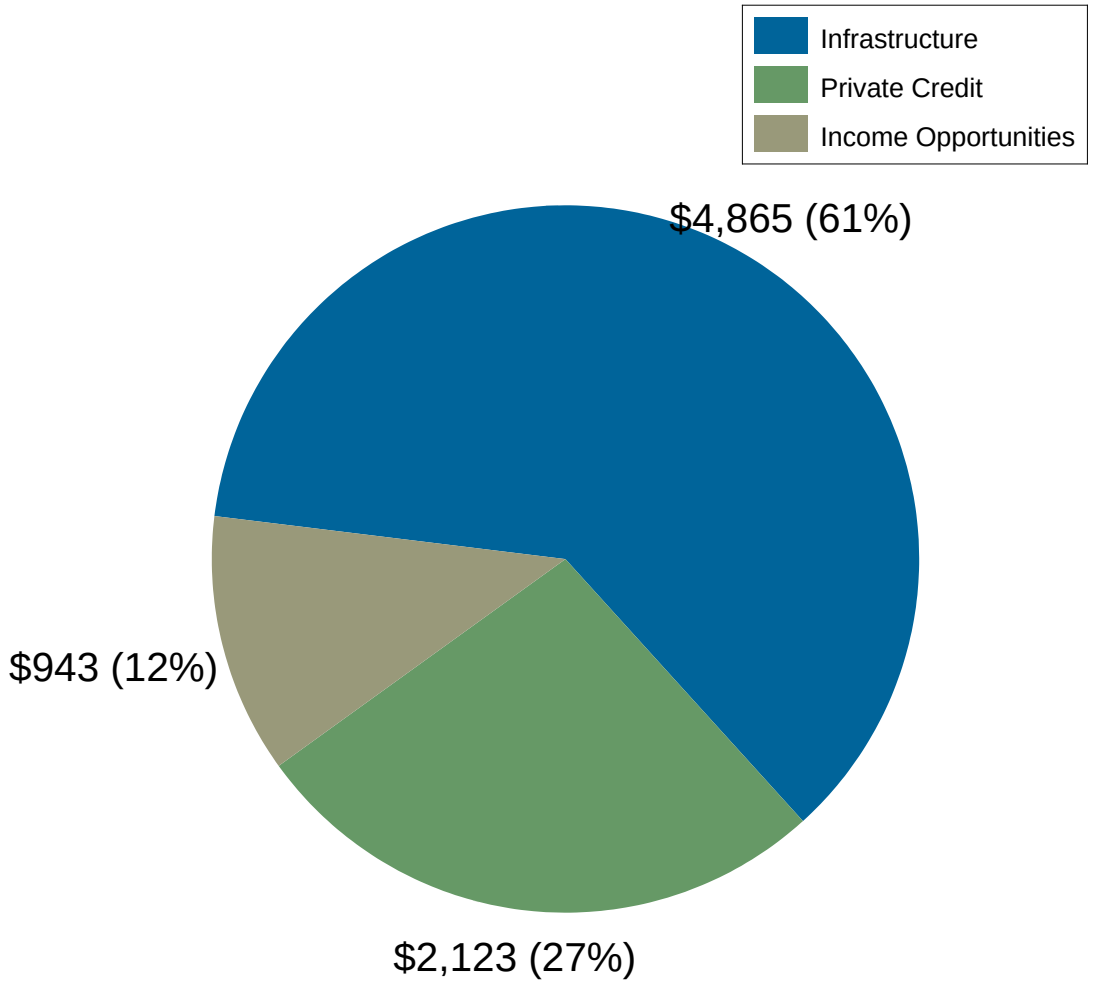


Source: Preqin

APFC Private Income Structure *(1Q LAG)*

As of March 31, 2025

- 61% of the structure is invested in infrastructure funds, which includes a diversified portfolio of infrastructure, energy, and generation assets. Listed Infrastructure makes up just 7.5% of this allocation.
- 27% of the structure was invested in private credit mandates including mezzanine debt, opportunistic credit, and direct lending strategies.
- 12% of the structure was invested in income opportunities including structured credit, alternative credit, AH4R2, APFC ADAC and timber.



Private Income Performance *(1Q LAG)*

Periods Ended March 31, 2025

	Quarter	Last Year	Last 3 Years	Last 5 Years
Private Income	**2.95**	**11.50**	**7.38**	**11.22**
Private Income Custom	2.35	8.32	8.70	12.18
Infrastructure	**3.23**	**14.44**	**8.48**	**13.93**
Cambridge Global Pvt Infrastructure	2.50	6.97	7.83	11.66
Private Credit	**2.21**	**7.22**	**7.27**	**9.87**
Cliffwater Direct Lending TR	2.14	10.37	10.02	12.95
Income Opportunities	**3.28**	**7.43**	**2.98**	**6.64**
Private Income Custom	2.35	8.32	8.70	12.18

- APFC's Private Income composite finished ahead of its benchmark (60% Cambridge Global Private Infra and 40% Cliffwater Direct Lending TR) for the quarter and over the trailing year.
- All Private Income sub-strategies outperformed their respective benchmarks over the quarter. Over the trailing year, Infrastructure outperformed its benchmark while Private Credit and Income Opportunities missed their respective benchmarks.

Private Income Custom Benchmark components: 60% FTSE Dev Core Infr and 40% BB US Corp HY 2% to 6/30/20, 60% Cambridge Global Pri Inf and 40% Cambridge Pri Cdt

Hedge Fund Performance: 2Q25

Managers ended a volatile quarter with strong performance

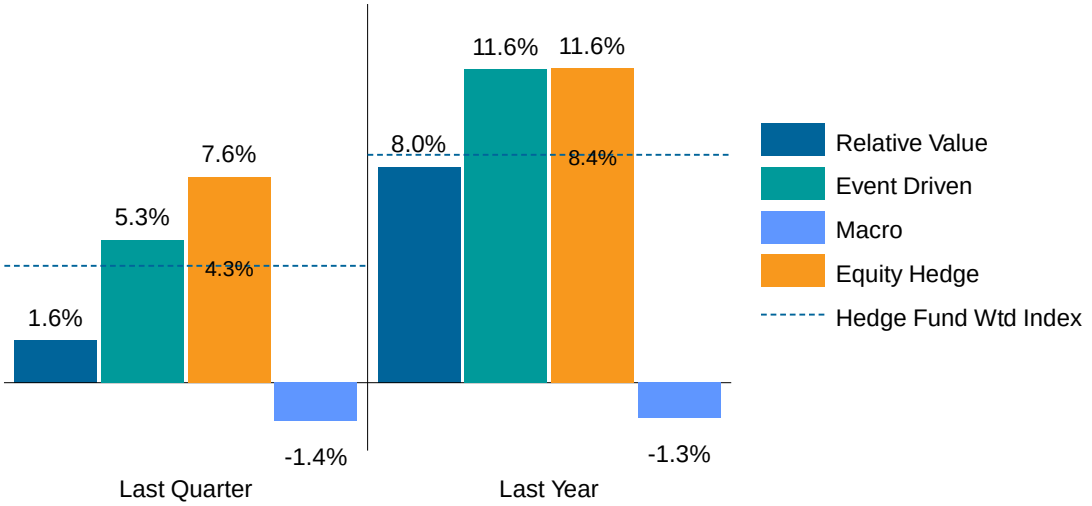
Equities had a strong rally to end 1H25

- Equity hedge led performance during the quarter, as large gains came from sector-focused strategies in Technology and Industrials.
- Event-driven strategies gained momentum throughout the quarter on speculation around M&A situations.
- Relative value strategies also had a positive quarter, as they were able to profit from volatility around credit and equity positions.
- Macro strategies ended lower, as some had difficulty trading around interest rate volatility, while commodity trading offset some of the losses.

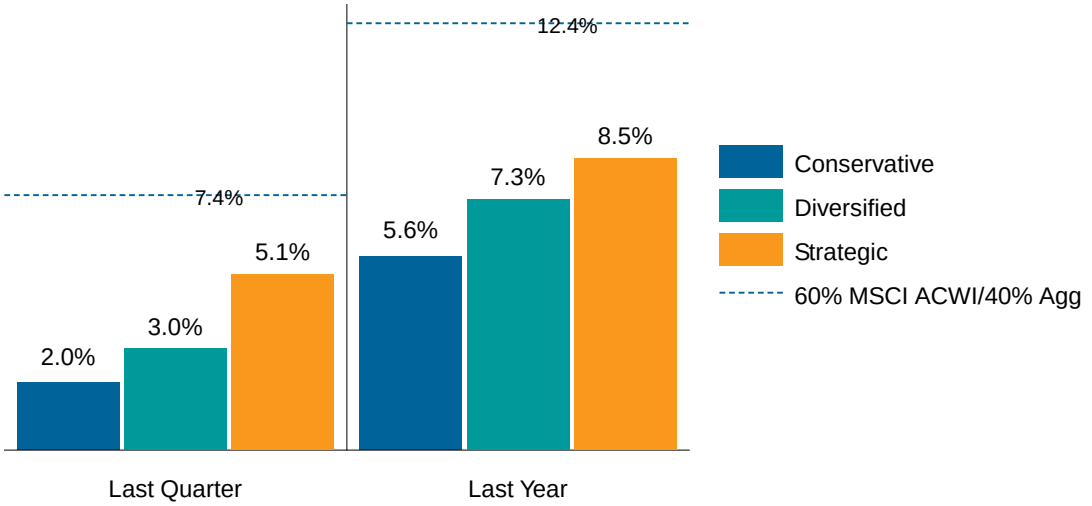
FOFs saw strong 2Q performance

- FOFs with more exposure to equity hedge strategies performed better.
- FOFs with more diversification across credit strategies saw performance that lagged those with more equity beta.

HFRI Strategy Index Returns vs. Broad Hedge Fund Universe as of 6/30/25



HFRI Fund-of-Funds Returns vs. 60% Stock/40% Bond Mix as of 6/30/25



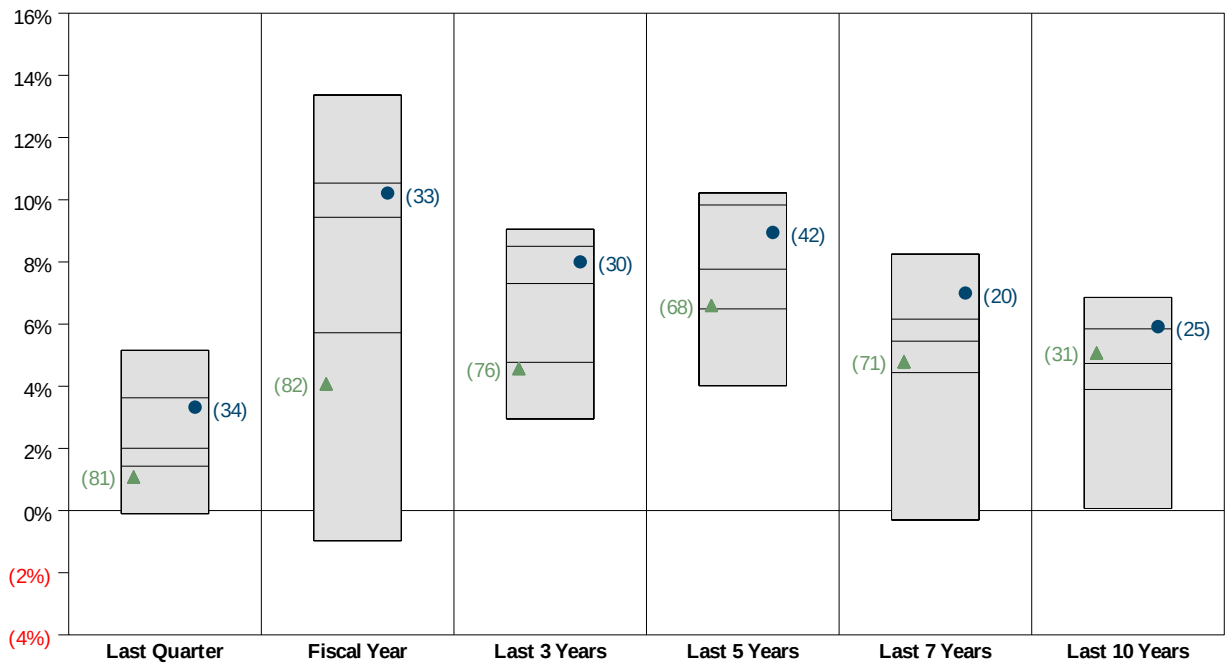
Source: Hedge Fund Research

Absolute Return Portfolio Relative to HFOF Universe

Periods Ended March 31, 2025

- The Absolute Return portfolio bested its benchmark in the quarter and over the trailing year.
- Over longer time periods the Absolute Return portfolio ranked in the top quartile relative to its peer group.

Performance vs Callan Absolute Rtn Hedge Fund of Funds (Net)



	Last Quarter	Fiscal Year	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	5.15	13.37	9.05	10.22	8.25	6.85
25th Percentile	3.62	10.53	8.50	9.83	6.16	5.84
Median	2.00	9.43	7.30	7.77	5.45	4.73
75th Percentile	1.43	5.72	4.77	6.49	4.44	3.89
90th Percentile	(0.10)	(0.98)	2.95	4.02	(0.30)	0.07
Absolute Return ●	3.29	10.18	7.96	8.91	6.96	5.88
Absolute Return Benchmark ▲	1.08	4.08	4.57	6.60	4.79	5.07

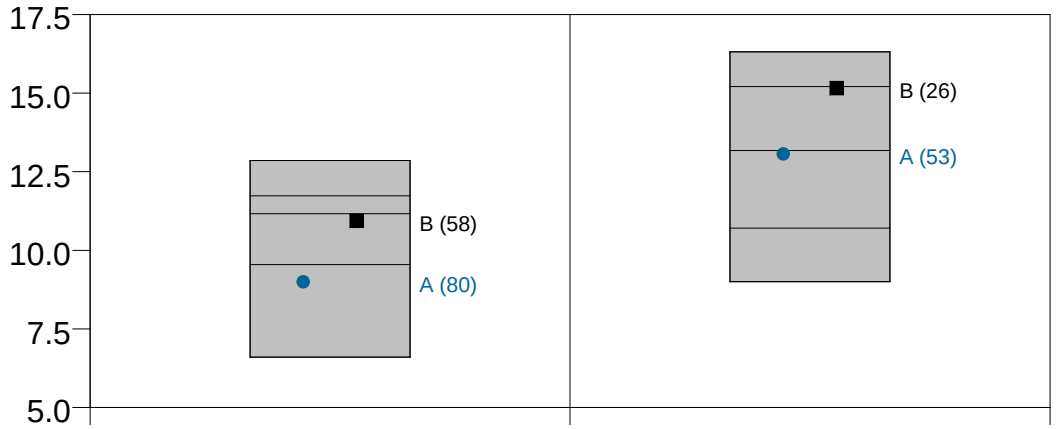
Absolute Return Benchmark components: LIBOR + 4% to 6/30/13, LIBOR + 6% to 6/30/15, LIBOR + 5% to 9/30/16, HFRI Total HFOF Universe to 6/30/22, and 50% HFRI EH Equity Market Neutral and 50% HFRI Macro thereafter

Tactical Opportunities Relative to S&P 500 Index

Periods Ended June 30, 2025

- The Tactical Opportunities portfolio is managed internally to complement the bottom-up stock selection strategies employed by external managers and achieve excess returns from top-down selection decisions emphasizing sectors/industries, countries/regions, and style factors.
- The Tactical Opportunities portfolio underperformed the benchmark and peer group median over the quarter and trailing year.

Performance vs Callan Large Cap Core (Gross)



	Last Quarter	Last Year
10th Percentile	12.86	16.32
25th Percentile	11.74	15.21
Median	11.17	13.18
75th Percentile	9.55	10.71
90th Percentile	6.60	9.00
Member Count	35	35
Tactical Opportunities ● A	9.00	13.07
S&P:500 ■ B	10.94	15.16

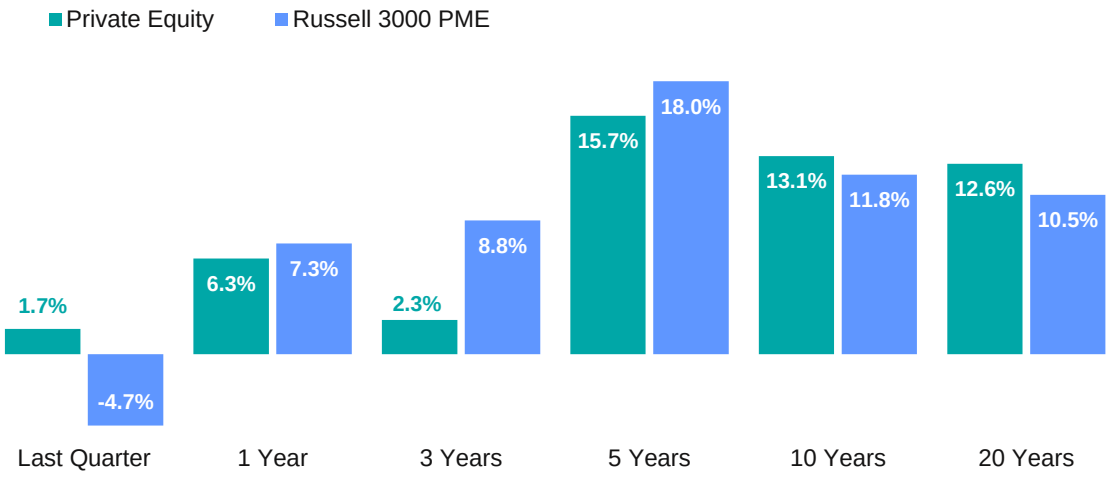
Private Equity Trends

Private equity tops public equity for first time since 2023

Performance

- For the first time in six quarters, private equity outperformed public equity.
- Because private holdings are valued internally by managers, private equity returns are less prone to dramatic rises and falls.
- Private equity tends to underperform when public equity rises quickly, and it likewise does not drop as sharply when public equity drops.
- Over the 10-year and 20-year time horizons, private equity has outperformed by 1%-2%.

Net IRRs as of 3/31/25



Net IRRs by Strategy as of 3/31/25

Strategy	Last Quarter	1 Year	3 Years	5 Years	10 Years	20 Years
Venture Capital	2.0%	4.8%	-4.6%	15.1%	13.3%	12.2%
Growth Equity	1.6%	7.8%	0.5%	14.8%	13.1%	13.2%
Buyouts	1.8%	6.7%	5.1%	17.0%	14.0%	13.2%
Mezzanine	2.1%	8.4%	8.0%	12.7%	10.7%	11.1%
Credit Opportunities	1.3%	8.1%	6.9%	11.5%	7.9%	9.0%
Control-Oriented Distressed	-0.2%	0.4%	2.2%	15.7%	10.3%	10.4%
Private Equity	**1.7%**	**6.3%**	**2.3%**	**15.7%**	**13.0%**	**12.6%**

Source: LSEG/Cambridge. PME: Public Market Equivalent

Private Equity Trends

Fundraising still at depressed levels, but deal activity shows momentum

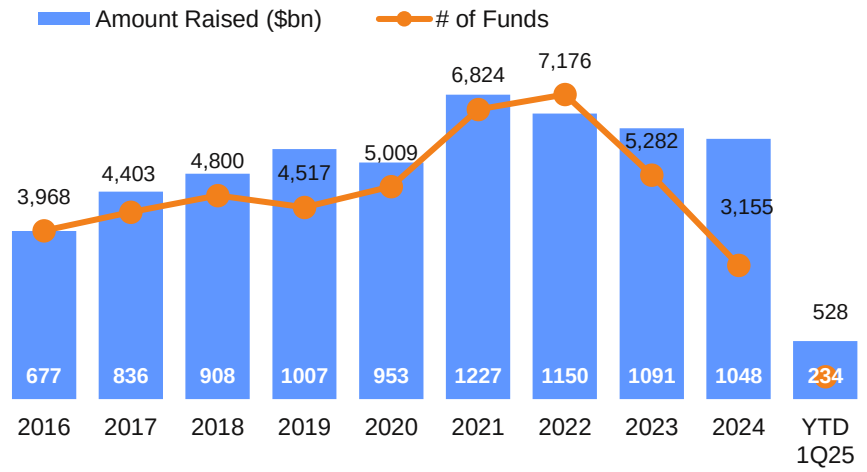
Fundraising

- With the distribution drought of the last three years, 1Q25 fundraising continues at the same depressed levels of the prior year.
- While fundraising volume remains in line with recent quarters, capital has become ever more concentrated in the largest funds (e.g., Blackstone's flagship fund closed at $21 billion this quarter).
- LPs continue to be selective with commitments, with limited capital available to put back into the asset class.

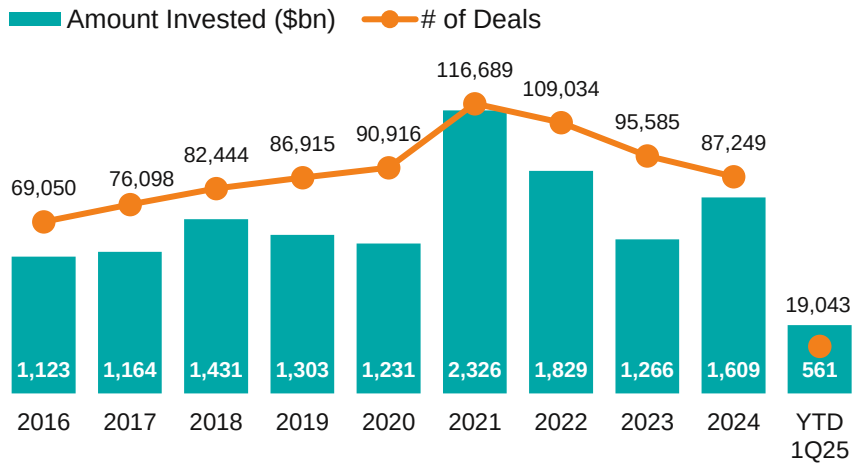
Deal activity

- 1Q25 deal volume continued the momentum gained in 4Q24, buoyed by expectations for more favorable market conditions under the new administration. This momentum was soon stifled in 2Q25 following Liberation Day and its resulting tariff fluctuations and macroeconomic uncertainty.
- From a longer-term perspective, overall deal activity is still above pre-pandemic levels by about a third, reflecting the broader growth of the asset class.

Annual Fundraising



Annual Deal Activity

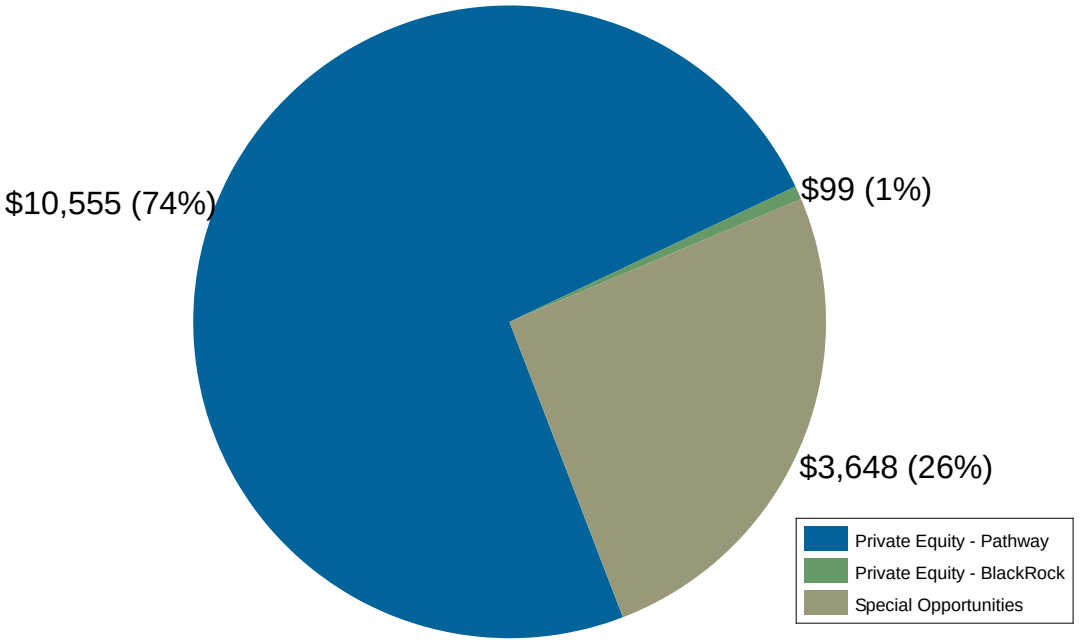


Source: PitchBook

APFC Private Equity and Special Opportunities Structure *(1Q LAG)*

As of March 31, 2025

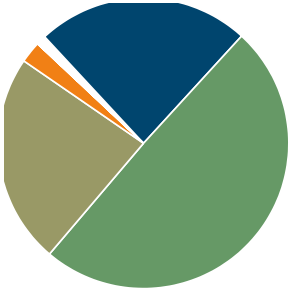
- 74% of the structure was invested in private equity.
- 26% of the structure was invested in special opportunities.



APFC Private Equity and Special Opportunities Structure *(1Q LAG)*

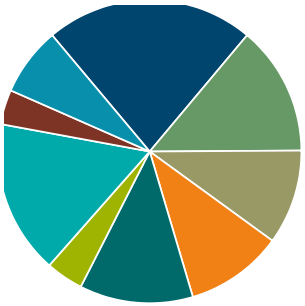
As of December 31, 2024

- APFC's Total Private Equity Portfolio continued to be well-diversified by strategy, geography, and industry.
- Buyouts, Venture Capital and Special Situations remained the largest strategy allocations.
- The largest non-U.S. geographic exposure was Europe. The largest industry exposure was in Technology.



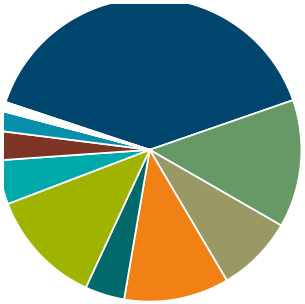
Strategy Mix by Net Asset Value

Venture Capital	23.70%
Buyout	49.36%
Special Situations	23.37%
Distressed for Control	2.35%
Mezzanine	0.13%



Geographic Mix by Net Asset Value

West/Pacific Northwest	22.16%
North Atlantic	13.82%
Southeast	10.13%
Mid-West	10.37%
Southwest/Rockies	12.08%
Mid-Atlantic	4.03%
Europe	16.39%
Asia/Pacific	3.69%
Other	7.33%



Industry Mix by Net Asset Value

Technology	39.62%
Financial	13.56%
Consumer Discretionary	8.17%
Health Care	11.22%
Communication Services	4.24%
Industrials	12.27%
Energy	4.71%
Consumer Staples	3.12%
Materials	2.13%
Other/Misc	0.16%
Utilities	0.38%
Real Estate	0.43%

APFC Private Equity and Special Opportunities Performance *(1Q LAG)*

Periods Ended March 31, 2025

	Last Quarter	FYTD	Last Year	Last 3 Years	Last 5 Years
Private Equity and Special Opportunities	1.13	4.09	4.13	1.51	15.33
Cambridge Private Equity	1.70	5.19	6.30	2.31	15.48

- APFC's Private Equity and Special Opportunities composite underperformed the Cambridge Private Equity benchmark in all measured time periods.
- In the last reported quarter, Private Equity was up 1.79% and Special Opportunities was down 0.82%.

Total Fund Cash

Periods Ended June 30, 2025

	Quarter	Last Year	Last 3 Years	Last 5 Years
TOTAL FUND CASH	**1.01**	**4.65**	**6.36**	**3.63**
3 Month T-Bill	1.04	4.68	4.56	2.76
APF Operating Cash	**0.98**	**4.44**	**4.23**	**2.72**
APF Internal Cash	**1.09**	**4.83**	**4.56**	**2.78**

- APFC's cash accounts were within expectations relative to the 3-month Treasury Bill Index.
- Funded in the first quarter of 2022 and included in the Total Fund Cash composite, the allocation to Gold was liquidated during the second quarter of 2023 (approximately $320M).

Closing Remarks

- Total Fund ended the second quarter of 2025 with $86.9 billion in assets up from $83.2 billion in the prior quarter. The trailing quarter performance placed the Total Fund below median relative to other large public funds and relative to large endowments/foundations peer group.
- For the quarter, the Total Fund underperformed the Passive Index Benchmarks and the allocation benchmark but exceeded the CPI + 5% Benchmark. Over the long-term, the Fund outperformed the passive and performance benchmarks.
- The Public Equity portfolio missed its benchmark for the quarter but outperformed it over the trailing year. Domestic and Global Equity composites underperformed their respective benchmarks for the quarter, but Global Equity outperformed the benchmark for the trailing year. International Equity bested its benchmark for the quarter and trailing year. Public Equity longer-term performance remains favorable.
- The Fixed Income portfolio finished slightly ahead of its benchmark over the quarter and over the trailing year. In the quarter, sub-strategies: US Investment Grade, Non-US, US High Yield, TIPS, and Domestic Structured products all finished within 10 basis points of their respective benchmarks. US Fixed Income Aggregate returned 15 basis points above the benchmark for the quarter.
- In the Alternatives portfolio, Private Equity & Special Opportunities underperformed its benchmark for the quarter and trailing year. The Real Estate, Private Income, and Absolute Return portfolios outperformed their respective benchmarks over the quarter, and Private Income and Absolute Return exceeded their benchmarks over the last year.
- Prudent asset allocation with appropriate levels of diversification and a long-term perspective remain Callan's recommended course.

Callan

Callan Update

Published Research Highlights: 2Q25

Office-to-Residential Conversions Update

2025 Cost of Doing Business Study

Nuclear Power's Rebound and Institutional Investors

2025 DC Trends Survey

Recent Blog Posts

Wait on Changing Market Cap Weights

Adam Lozinski

Navigating Volatility: An Expert Guide for Nonprofits

Tony Lissuzzo

Historic Market Volatility and Our 10-Year CMAs

Jay Kloepfer

Additional Reading

Active vs. Passive quarterly charts
Capital Markets Review quarterly newsletter
Monthly Updates to the Periodic Table
Market Pulse Flipbook quarterly markets update
Market Intelligence (clients-only)
Real Estate Indicators market outlook

Key Findings of the 2025 Callan Cost of Doing Business Study

Callan's *2025 Cost of Doing Business Study* reflects 2024 investment management fees for **180 asset pools** with more than **$772 billion in assets**, including public defined benefit (DB) plans, corporate DB plans, nonprofits, and insurance pools. These pools generate **$4.2 billion in fees** per year. In addition to 2024 results, it reveals trends and changes since 2010.

40 bps

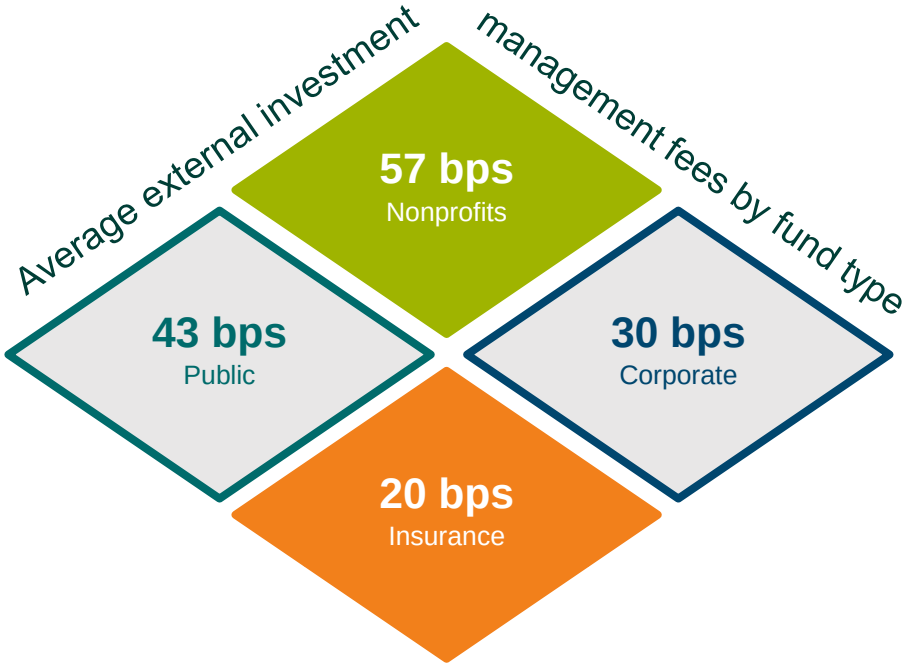
Average total investment fees paid by all institutional investors

Custody Fees by Fund Size

	Core Fee	Flat Fee Arrangement
< $500 million	3.7 bps	7%
$500 million to < $2 billion	1.2 bps	12%
$2 to < $10 billion	0.9 bps	13%
> $10 billion	0.6 bps	19%

On average larger funds have **24%–37%** higher fees than smaller funds

Corporate TR funds have **50%** higher fees than corporate LDI funds



Average Passive Weight

Corporate	32%
Public	31%
Nonprofit	22%
Insurance	23%

Change to average investment management fees since 2020

Corporate	-17%
Public	-4%
Nonprofit	+16%

Average Alternatives Weight

Corporate	8%
Public	15%
Nonprofit	19%
Insurance	4%

Callan Institute Events

Upcoming conferences, workshops, and virtual events

2025 October Workshop

Assessing the Role of Alternatives in Modern Plan Design

As defined contribution (DC) plans evolve beyond traditional core menus, there is increased interest in exploring alternative investments to enhance outcomes—particularly within target date funds (TDFs) and custom solutions. In this workshop, we will explain why alternatives are being considered, discuss which are most feasible and how to implement, and provide opportunities and challenges with these investments.

Workshop Dates

- October 28, 2025 – Chicago
- October 30, 2025 – San Francisco

Workshop Agenda

- 8:00 - 9:00 AM | Continental Breakfast
- 9:00 - 10:15 AM | Workshop and Q&A
- 10:15 - 11:00 AM | Roundtable Discussions

Mark Your Calendar

2026 National Conference

April 20-22, 2026 – Scottsdale, Arizona

Watch your email for further details and an invitation.

Upcoming Virtual Events

August 21, 2025

Research Café: Modeling Returns and Managing Market Cap Weights

Introducing Callan On-Demand Education (CODE)

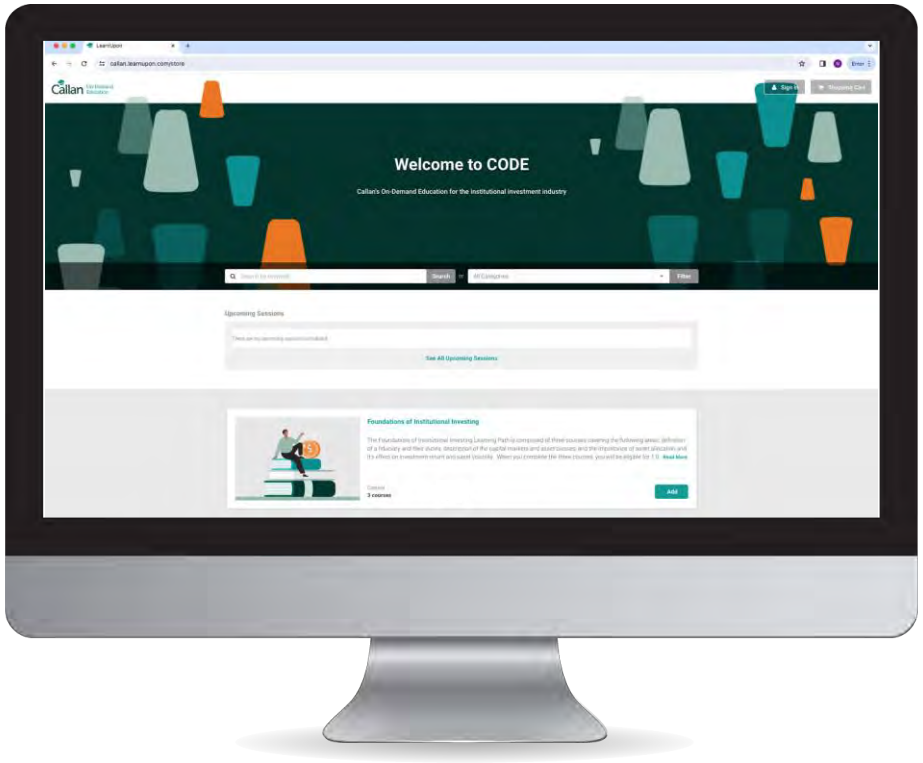
Callan On-Demand Education

- Variety of educational courses
- Interactive and engaging
- Self-guided modules
- Eligible for continuing education credits
- Learning at your own pace

CODE courses are designed for investment professionals of all levels—and they're self-guided. Access them anytime, from anywhere, and get continuing education credits for each completed course.

CODE is for you, your colleagues, your new hires, and your interns. It's for anyone interested in learning about institutional investing.

callan.com/code



3 Reasons to Take CODE Courses

1. Become a better fiduciary
2. Showcase your skills and knowledge
3. Learn from Callan's investment experts

Callan Updates

Firm updates by the numbers, as of June 30, 2025

Total Associates: ~205

Company Ownership:

- 100% employee ownership
- ~70% of employees are equity owners
- Well-diversified ownership

Total Investment Consultants: 50+

Total Specialty and Research Consultants: 65+

Total CFA/CAIA/FRMs: 60+

Total Institutional Investor Clients: 475+

Provides advisory services to institutional investor/asset owner clients with more than $4+ trillion

NEW ON CODE: Callan clients have free access to all CODE courses, all of which offer continuing education credits.

- **Framework for Defined Contribution Plans:** Topics include DC plan fiduciary training, legal & regulatory history and trends, fund performance evaluation & monitoring, designing investment menus, and fee studies & monitoring
- **Coming soon:** Training on Callan*DNA*, Callan's client portal, where clients can dive deep into their asset allocation and investment managers.

"Callan is a truly special place to develop a career in investment consulting. Since joining the firm, I have enjoyed collaborating with long-tenured colleagues to build successful investment programs for Callan's clients. I look forward to continuing to help my team and clients navigate challenges and seize the opportunities presented in this dynamic industry."

— Uvan Tseng, CFA, SVP, on his promotion to lead Callan's West Coast Consulting team

Important Disclosures

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Unless Callan has been specifically engaged to do so, Callan does not conduct background checks or in-depth due diligence of the operations of any investment manager search candidate or investment vehicle, as may be typically performed in an operational due diligence evaluation assignment and in no event does Callan conduct due diligence beyond what is described in its report to the client.

Any decision made on the basis of this document is sole responsibility of the client, as the intended recipient, and it is incumbent upon the client to make an independent determination of the suitability and consequences of such a decision.

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Past performance is no guarantee of future results.

APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT:	APFC Public Markets Asset Class Update	ACTION:
DATE:	October 2, 2025	INFORMATION: X

BACKGROUND:

The Public Markets presentation provides information on the APFC Public Equities, Fixed Income, and Cash Portfolio.

STATUS:

At this meeting, Deputy CIO/Director of Fixed Income, Jim Parise, will present key elements of APFC Public Markets allocation and performance.

APFC ALASKA PERMANENT FUND CORPORATION

Public Markets Board Presentation

October 2025

Public Equities

- $28.4 billion portfolio
- 98% of Portfolio is outside managers
- 2% of Portfolio is managed in-house across various strategies
- Outside managers have added~40bps/yr in outperformance historically.

Fixed Income

- $17.2 billion portfolio
- 100% of Portfolio is internally managed
- Primary strategies are relative value and reversion to the mean.

As of 6/30/2025

Public Equities FY25 Q4 Overview

Factor	Positioning
Market Cap	Overweight to Small and Mid
Value vs Growth	Overweight to Value
Developed vs Emerging Market (EM)	Overweight to Emerging Market

Market Cap

Large cap outperformed small and mid.

	FY25 Q4	1 Yr
S&P 500	10.9%	15.2%
Mid Cap Core	8.5%	15.2%
Small Cap Core	8.5%	7.7%

Value vs Growth

Growth outperformed value.

	FY25 Q4	1 Yr
Large Cap Value	3.8%	13.7%
Large Cap Growth	17.8%	17.2%
Mid Cap Value	5.3%	11.5%
Mid Cap Growth	18.2%	26.5%
Small Cap Value	5.0%	5.5%
Small Cap Growth	12.0%	9.7%

Developed vs Emerging

EM outperformed DM.

	FY25 Q4	1 Yr
S&P 500	10.9%	15.2%
MSCI EM	12.0%	15.3%

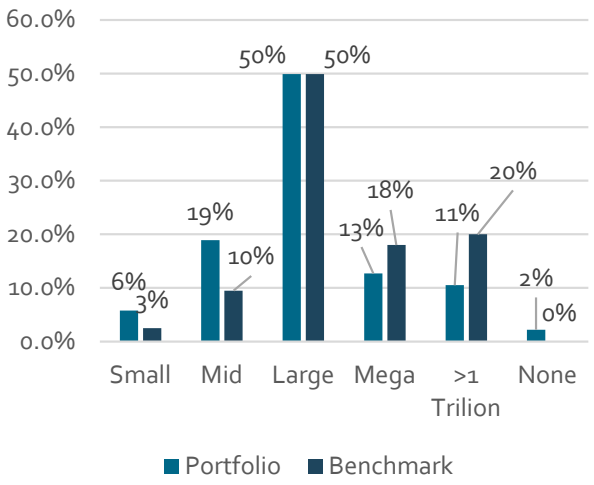
As of 6/30/2025

Public Equities Factor Positioning

Market Cap

Large cap outperformed small and mid.

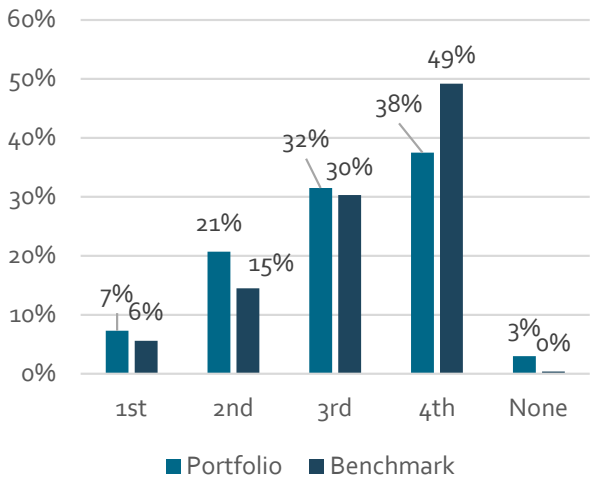
Market Cap Positioning (%MV)



Value vs Growth

Growth outperformed value.

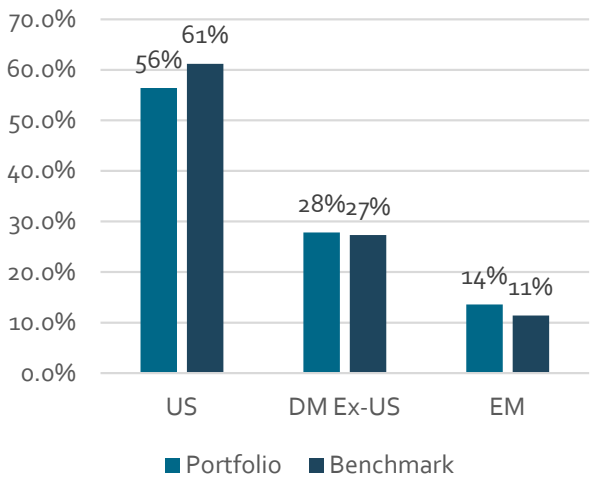
Value vs Growth Positioning by Price/Earnings Quartile (%MV)



Developed vs Emerging

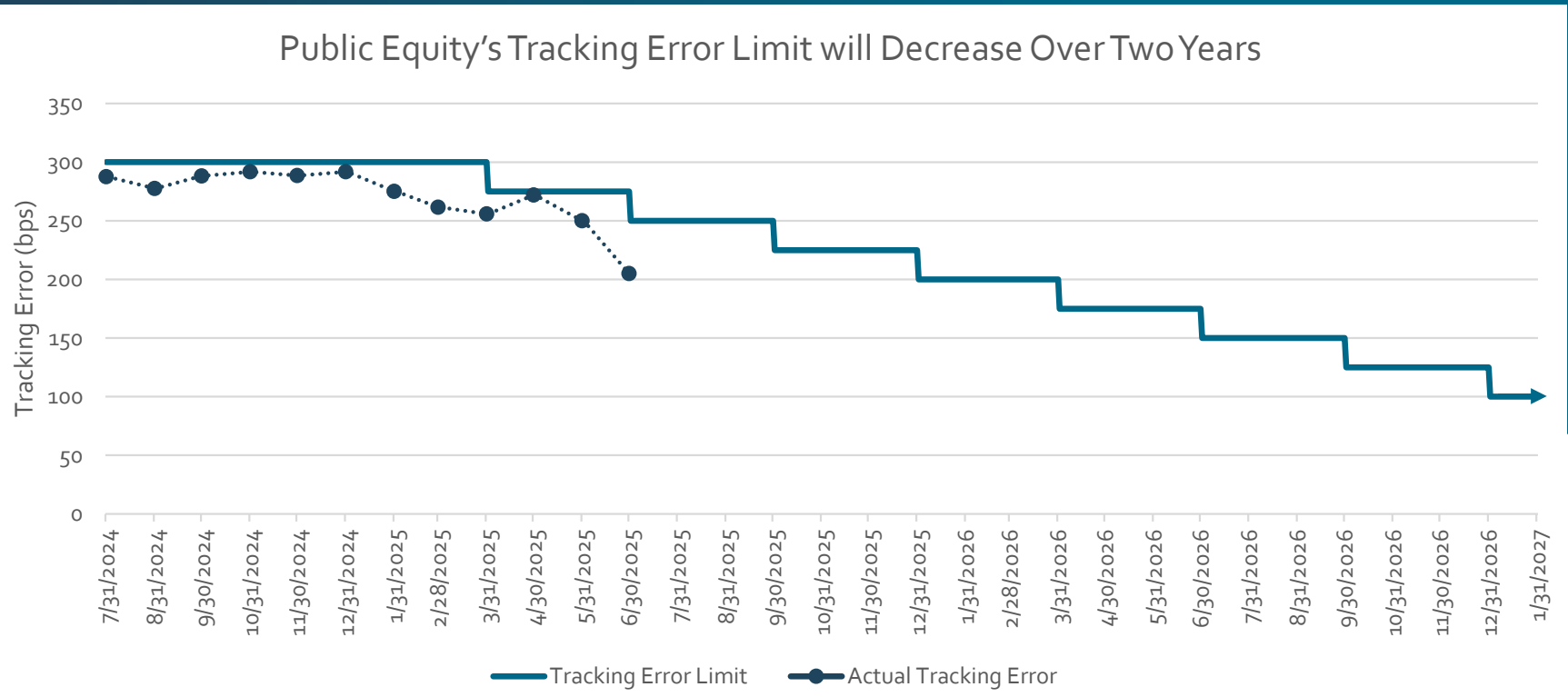
EM outperformed DM.

US, DM, and EM Positioning (%MV)



As of 6/30/2025

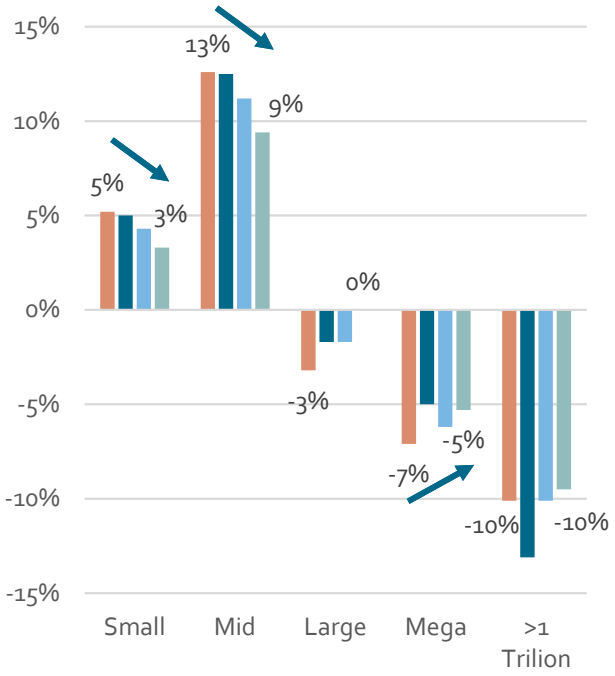
Public Equity Tracking Error



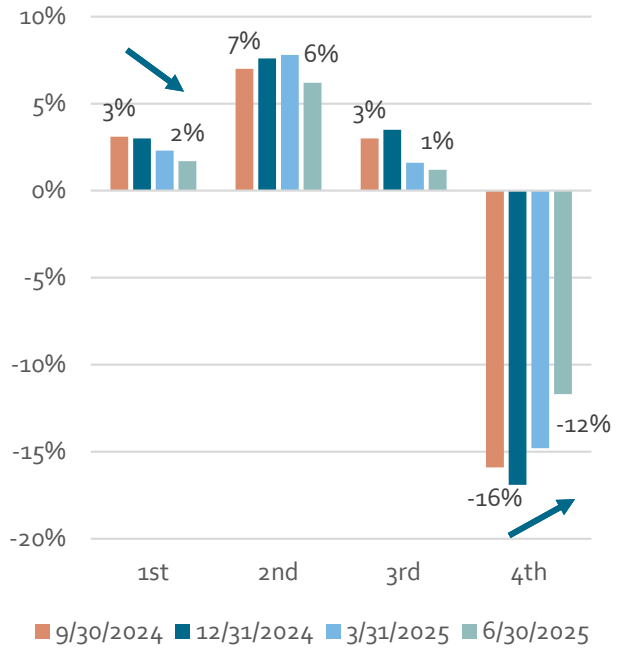
As of 6/30/2025

Positioning Trending Closer to Benchmark

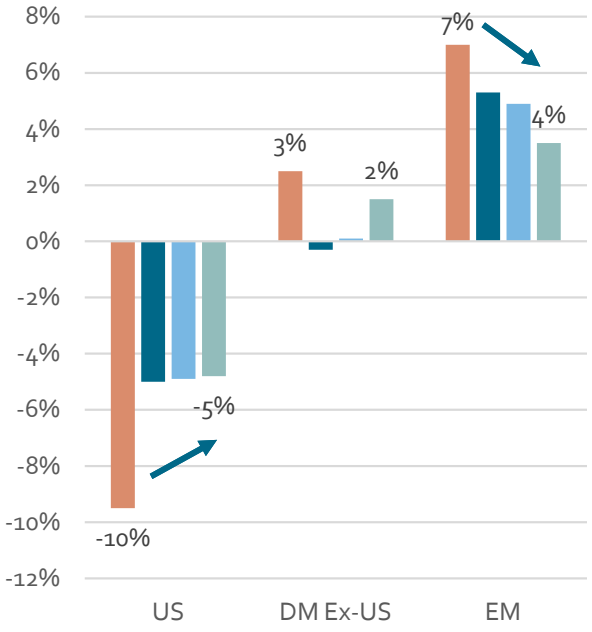
Active Market Cap Positioning (%MV)



Active Value vs Growth Positioning by Price/Earnings Quartile (%MV)



Active US, DM, and EM Positioning (%MV)



Public Equities FY25 Performance

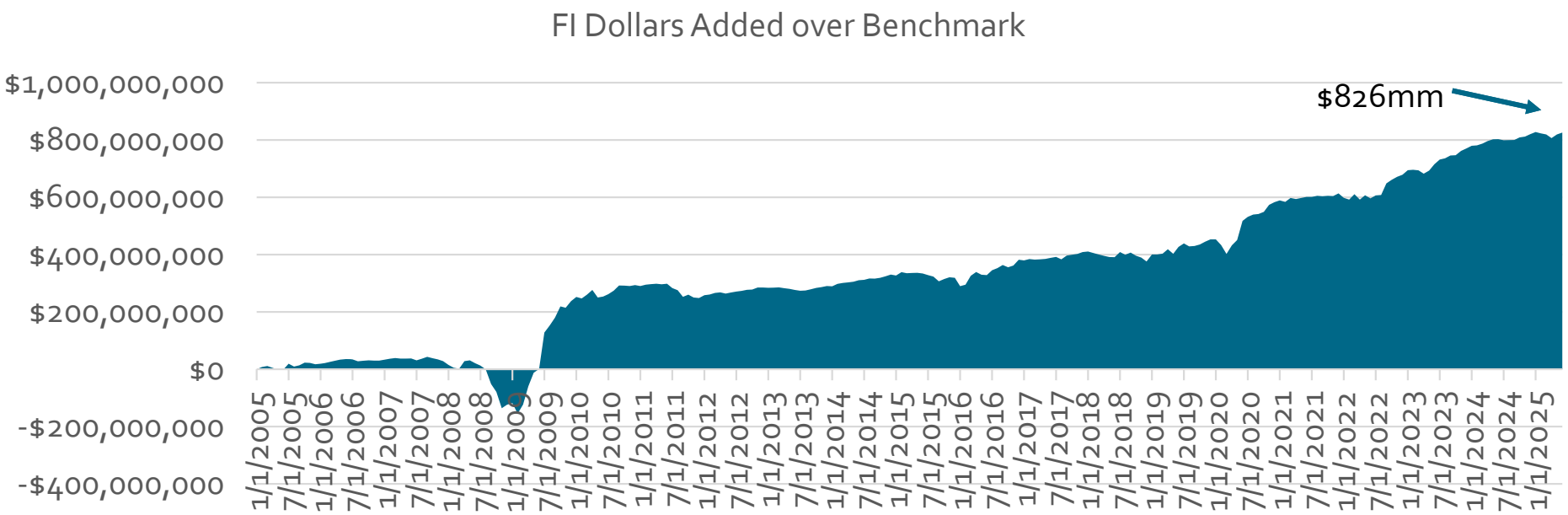
Attribution (bps)	FY25	Q4	Q3	Q2	Q1
Active Selection	**+5**	**+20**	**+20**	**+29**	**-64**
External Active Managers	**+5**	+20	+20	+29	-64
Active Allocation	**+2**	**-233**	**+258**	**-181**	**+158**
Tactical Tilts, US Tactical	**+97**	-	+86	-42	+53
Factor-based External and Internal strategies	**-18**	-79	+75	-37	+23
Positioning across External Managers *	**-77**	-154	+97	-102	+82
Other	**+13**	-	-	-	-
Performance	**+20**	**-213**	**+278**	**-152**	**+94**

* *Plug figure*

During the quarter, Active Allocation was the primary detractor from excess returns. Within Allocation, Low Volatility, US Value, and US Small Caps were the top detractors from excess returns.

As of 6/30/2025

Fixed Income Dollars Added over Benchmark



Internal Fixed Income team has beaten its primary benchmark every year since 2013.

Fixed Income Overview

	FY25 Q4	1yr	3yr (annualized)	5yr (annualized)
Fixed Income Plus ($17,170mm)	1.73%	6.67%	4.39%	1.01%
Custom Index	1.66%	6.49%	3.93%	0.56%
US Aggregate ($4,791mm)	1.36%	6.34%	3.19%	-0.17%
Bloomberg US Aggregate Bond Index	1.21%	6.08%	2.55%	-0.73%
US Corporate ($4,694mm)	1.89%	7.14%	5.07%	0.70%
Bloomberg Investment Grade Corporate Index	1.82%	6.91%	4.34%	0.14%
High Yield ($2,082mm)	3.34%	9.23%	9.50%	6.02%
Bloomberg Corporate High Yield BB (Ba) Index	3.44%	8.91%	8.85%	5.34%
Non-US Rates ($2,178mm)	1.85%	5.37%	3.62%	0.40%
Bloomberg Global Treasury ex-US (USDH) Index	1.91%	5.54%	3.59%	0.43%
Securitized ($1,679mm)	1.14%	6.43%	2.22%	N/A
Bloomberg US Securitized Index	1.18%	6.58%	2.44%	-0.48%
TIPS ($843mm)	0.54%	6.08%	2.65%	1.94%
Bloomberg US Treasury: US TIPS Index	0.48%	5.84%	2.34%	1.61%
Cash ($890mm)	1.06%	4.86%	4.69%	2.85%
90 Day T-Bills Index	1.04%	4.68%	4.56%	2.76%

As of 6/30/2025

Fixed Income FY25 Q4 Performance

Portfolio	Portfolio Weights	Portfolio Returns	Benchmark Returns	Portfolio Allocation Excess Contribution	Portfolio Return Excess Allocation	Total Return Contribution
US Aggregate	27.9%	1.36%	1.21%	0.00%	0.05%	0.05%
US Corporate	27.3%	1.89%	1.82%	0.00%	0.02%	0.02%
High Yield	12.1%	3.34%	3.44%	0.01%	-0.01%	-0.01%
Securitized	9.8%	1.14%	1.18%	0.00%	0.00%	0.00%
Non-US Rates	12.7%	1.85%	1.91%	0.00%	-0.01%	0.00%
TIPS	4.9%	0.54%	0.48%	0.00%	0.01%	0.01%
Cash	5.2%	1.06%	1.04%	0.00%	0.00%	0.00%
Total	99.9%	1.73%	1.66%	0.01%	0.06%	0.07%

As of 6/30/2025

Fixed Income Overview

	Portfolio		Benchmark		Active		Alloc Change
	%	Market Value	%	Market Value	%	Market Value	Q3E to Q4E
US Aggregate	27.9%	$ 4,791,383,097	27.5%	$ 4,721,755,385	0.4%	$ 69,627,713	-0.59%
US Corporate	27.3%	$ 4,693,935,478	27.5%	$ 4,721,755,385	-0.2%	$ (27,819,907)	-0.25%
High Yield	12.1%	$ 2,081,536,498	10.0%	$ 1,717,001,958	2.1%	$ 364,534,540	1.04%
Securitized	9.8%	$ 1,678,767,977	10.0%	$ 1,717,001,958	-0.2%	$ (38,233,981)	0.09%
Non-US Rates	12.7%	$ 2,177,976,029	15.0%	$ 2,575,502,937	-2.3%	$ (397,526,908)	-0.80%
TIPS	4.9%	$ 842,985,214	5.0%	$ 858,500,979	-0.1%	$ (15,515,765)	-0.14%
Cash	5.2%	$ 889,616,436	5.0%	$ 858,500,979	0.2%	$ 31,115,457	0.61%

	FY 25 Q4	FYTD
US Aggregate	1.36%	6.34%
US Corporate	1.89%	7.14%
High Yield	3.34%	9.23%
Securitized	1.14%	6.43%
Non-US Rates	1.85%	5.37%
TIPS	0.54%	6.08%
Cash	1.06%	4.86%

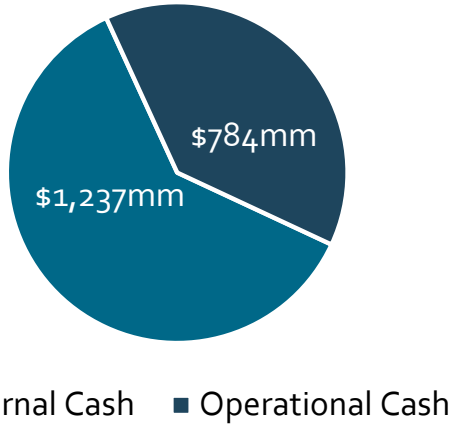
	Spread (bps)	Change in Spread (bps)					
	6/30/2025	5/31/2025	12/31/2024	6/30/2024	6/30/2024	6/30/2023	6/30/2022
US Aggregate	32	-2	-2	-7	-7	-17	-23
US Corporate	83	-5	3	-11	-11	-40	-72
High Yield	168	-25	-11	-9	-9	-83	-233
Non-US Rates	13	-1	-4	-8	-8	-7	-9
Securitized	40	-4	-5	-11	-11	-17	-10
ABS	57	-2	13	0	0	-11	-18
MBS	37	-5	-6	-11	-11	-15	-9
CMBS	84	-3	4	-13	-13	-50	-17

As of 6/30/2025

Cash Management Overview

- Internal Cash ($1,237mm)
  - Internally managed
  - Short-dated bills, treasuries, commercial paper, repo, and asset-backed securities
  - Most assets held to maturity
- Operational Cash ($784mm)
  - Invested in overnight STIF (short-term investment fund)
  - 100% of portfolio is immediately liquid
- Liquidity enables the Fund to meet operational needs, capital calls, and appropriations to the State.

$2.021 Billion Cash at Q4E



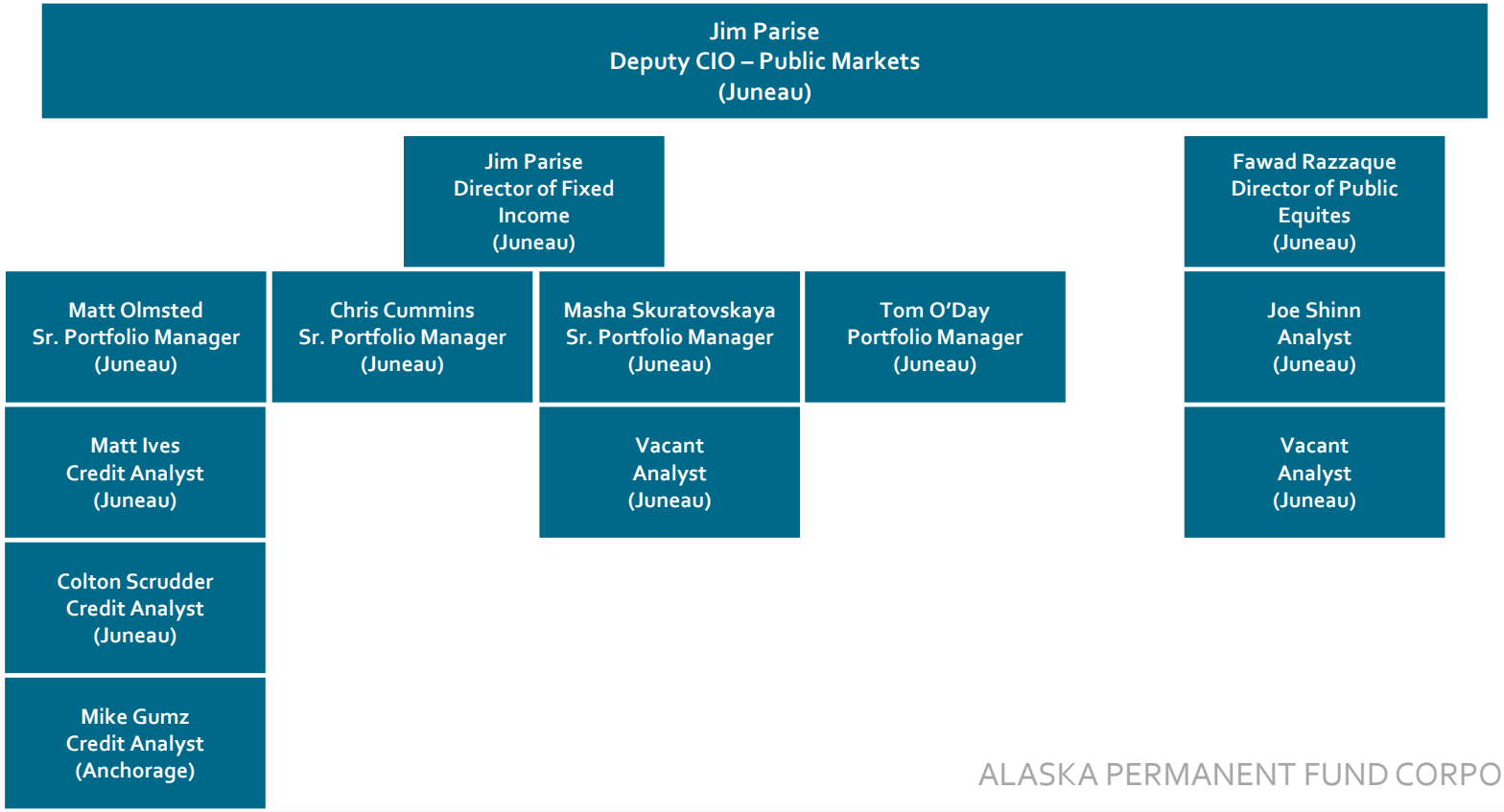
FY25 Q4 Transfers

- $4.3bn asset class rebalancing (gross)
- Sent $853mm state appropriation
- Received $116mm in DNR royalties

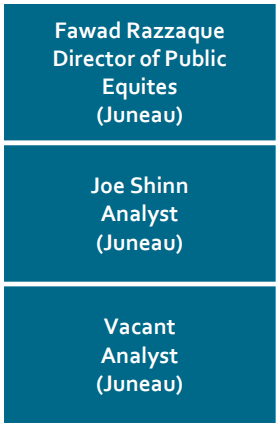
As of 6/30/2025

Appendix

Public Markets – Overview



Public Equity – Strategy Summary

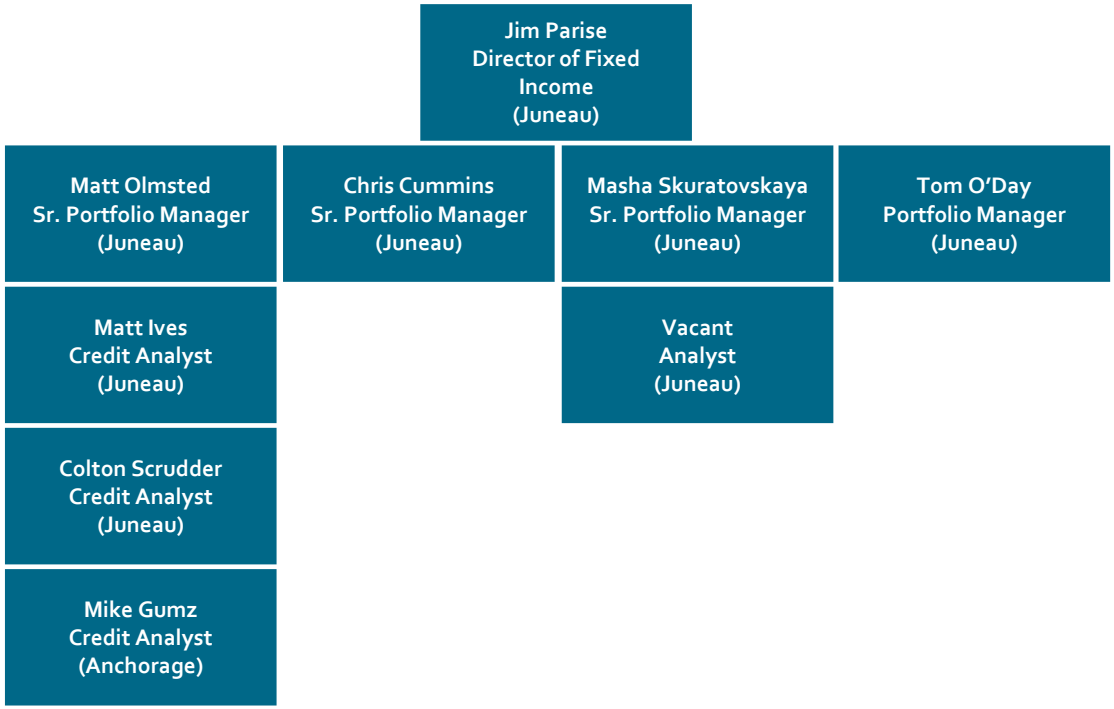


- Current team includes 3 professionals (1 Vacancy)
- $28.4 billion portfolio
- 98% of Portfolio is outside managers
- 2% of Portfolio is managed in-house across various strategies

- Current Strategy
  - Long-standing Value and Country tilt toward EM
  - Internal accounts are factor-based and/or best ideas.
  - Outside managers historically have add ~40 bps/yr in outperformance.
- Future Strategy
  - Reduce tracking error closer to industry standard
  - Tracking error reduced over time to allow for tilts to manifest
  - Eliminate internally managed portfolio to focus on outside managers
  - Align overall benchmark to match mandate and portfolio structure

As of 6/30/2025

Fixed Income – Strategy Summary



- Current Strategy
  - 100% internally managed across seven portfolios
  - Relative value and reversion to the mean are primary strategies
- Future Strategy
  - Reduce tracking error closer to industry standard
  - Recruit analyst for Global Rates Portfolio

APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT: Private Markets Overview

ACTION:

DATE: October 2, 2025

INFORMATION: X

BACKGROUND:

The presentation provides an overview of APFC's Private Markets portfolios, including Private Equity, Private Income and Real Estate.

STATUS:

Allen Waldrop, Deputy CIO-Private Markets, will present an update on the performance, liquidity, recent investment activity and pacing of the various Private Markets portfolios.

APFC ALASKA PERMANENT FUND CORPORATION

Private Markets Update

October 2, 2025

Contents

Highlights

- Allocation of 17.3% under target of 18% (NAV remains at ~$15bn)
- Deployment pace remains consistent at $1.5bn annually
- Executed on 39 opportunities in FY25 across a range of types (funds, co-investments, directs and CVs), including 7 new relationships
- Differentiated structures drive significant fee savings over the long term
- Performance improved significantly in FY25 (7.5%) and appears to have bottomed in FY24 (0.1%)
- Liquidity position continues to be strong – 5th consecutive year of distributions exceeding contributions
- Team is fully staffed and operating with enhanced processes and systems

Portfolio

Strategy	Commit. Amount[a]	Total Contrib.	Total Distrib.	Market Value	% of MV	Total Value	Gain/ Loss	TVPI	DPI	IRR
Buyouts	$10,294.0	$8,788.3	$8,732.6	$6,426.2	42%	$15,158.8	$6,370.5	1.72x	0.99x	14.0%
Venture Capital	4,541.6	4,146.2	5,759.7	3,917.4	26%	9,677.2	5,531.0	2.33x	1.39x	22.0%
Growth Equity	1,979.1	1,644.5	1,751.6	1,505.1	10%	3,256.7	1,612.2	1.98x	1.07x	21.1%
Special Sits/Other	6,914.8	6,143.5	5,524.8	3,444.7	22%	8,969.5	2,826.0	1.46x	0.90x	9.7%
Total	**$23,729.4**	**$20,722.4**	**$21,768.7**	**$15,293.4**	**100%**	**$37,062.2**	**$16,339.7**	**1.79x**	**1.05x**	**15.1%**

NOTES: Represents since-inception returns (2004 through June 30, 2025). As of June 30, 2025, 17.4% of the portfolio's market value reflects roll-forward values; therefore, performance is subject to change. Amounts may not foot due to rounding.
[a]Commitments to non-USD-denominated investments are calculated using exchange rates at the time of commitment.

Investment Activity and Pacing

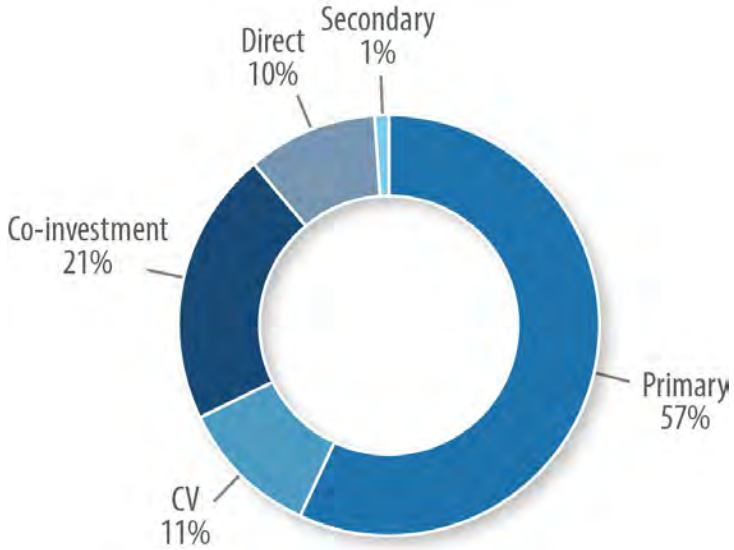
FY 2025 COMMITMENTS

($ in millions)

Category	Closed	Target	Percentage
APFC	$971	$1,200	81%
APFC–PCM	298	300	99%
Total	**$1,269**	**$1,500**	**85%**

NOTE: Represents activity from July 1, 2024, through June 30, 2025.

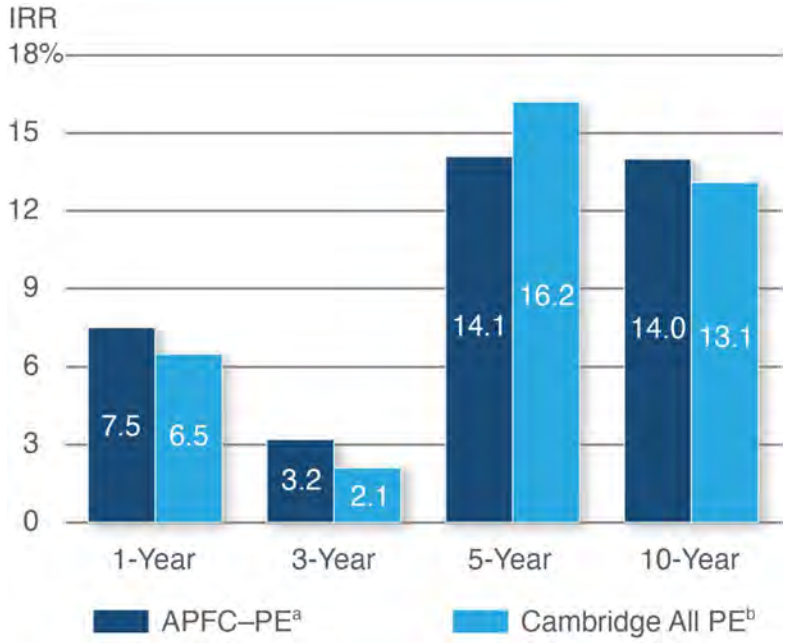
FY 2025 COMMITMENT ACTIVITY BY INVESTMENT TYPE



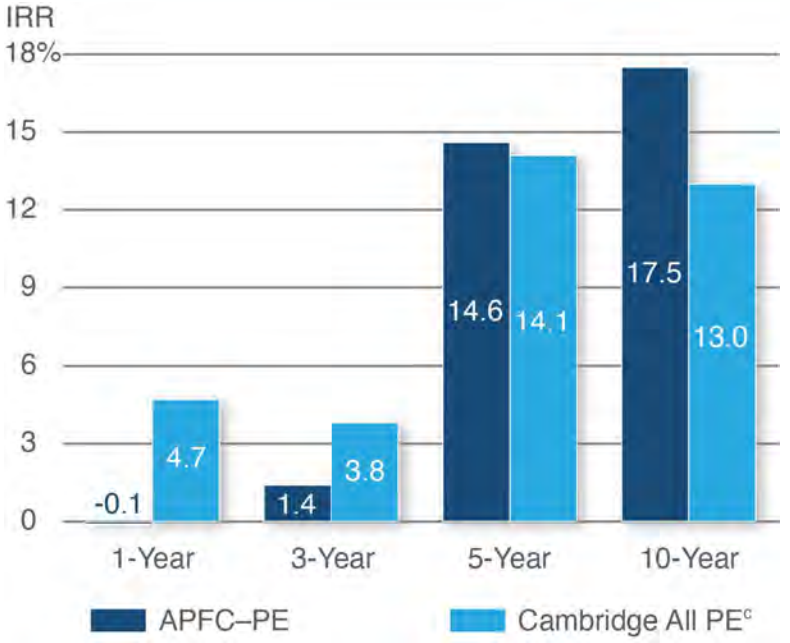
- Activity includes 19 primary funds, 12 co-investments, 5 CVs, 2 direct investments, and 1 secondary portfolio.
- Broad range of deal flow provides for interesting opportunity set along with potential fee savings.

Performance

AS OF JUNE 30, 2025



AS OF JUNE 30, 2024

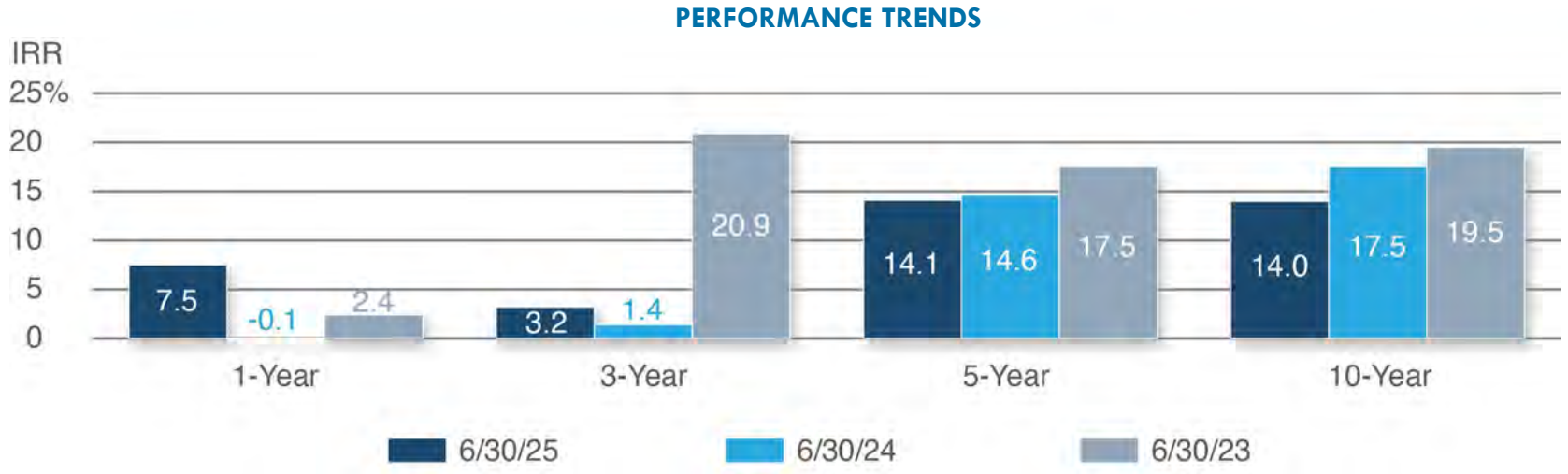


[a]As of June 30, 2025, 17.4% of the portfolio's market value reflects roll-forward values; therefore, performance is subject to change.

[b]Cambridge pooled global all private equity benchmarks (excluding debt-related strategies) for 2004- through 2025-vintage fund, as of March 31, 2025. Cambridge pooled global all private equity benchmarks, as of June 30, 2025, are not yet available.

[c]Cambridge pooled global all private equity benchmarks (excluding debt-related strategies) for 2004- through 2024-vintage fund, as of June 30, 2024.

Performance (2)

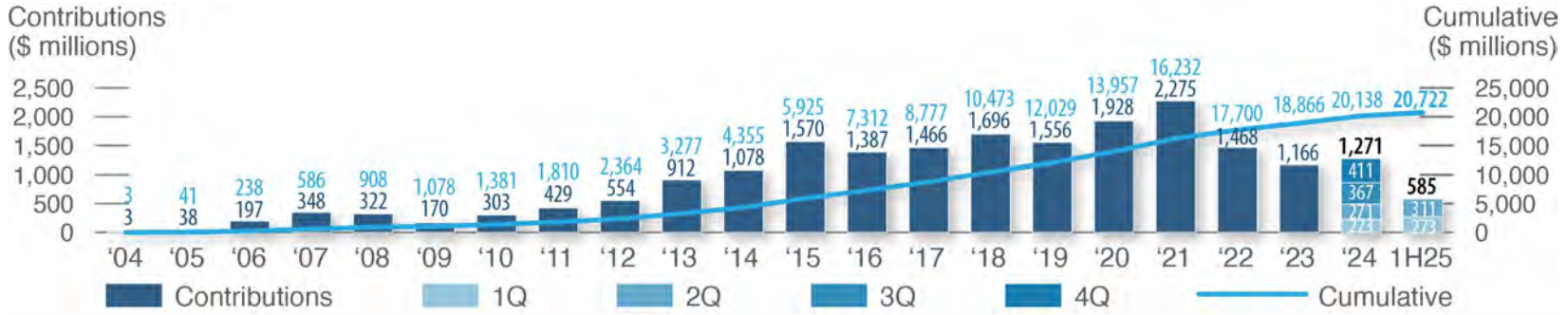


NOTE: As of June 30, 2025, 17.4% of the portfolio's market value reflects roll-forward values; therefore, performance is subject to change.

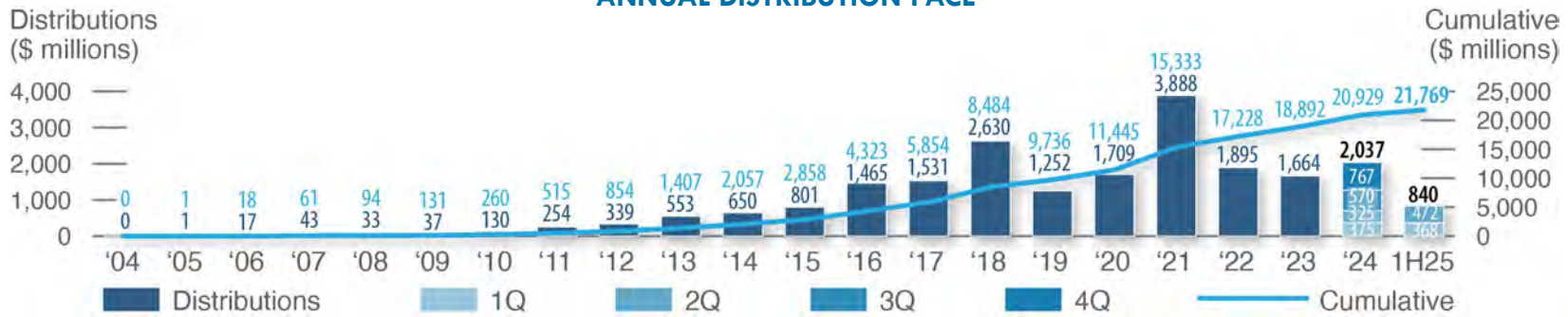
- Short-term performance continues to improve, with the 1-year return increasing to 7.5% from the low of 0.1% in FY24.
- Decline in the 3-year return from FY23 to FY25 is due to the roll-off of 2021 returns and higher weighting of two underperforming years (FY23 and FY24).

Cash Flows

ANNUAL CONTRIBUTION PACE



ANNUAL DISTRIBUTION PACE



Contents

Highlights

- Allocation of 9% under target of 10%
- Deployment pace remains consistent at $1.3bn annually
- Executed on 15 funds, co-investments and secondaries in FY25
- Performance improved significantly in FY25 (14.4%) pushing the since inception return to 9.1% with gains of $6bn
- Portfolio has been cash flow positive (distributions exceeding contributions) over the last five years, breakeven over the last three years
- Recruiting in process to replace Portfolio Manager departure

Portfolio

Strategy	Commit. Amount[a]	Total Contrib.	Total Distrib.	Market Value	% of MV	Total Value	Gain/ Loss	TVPI	DPI	IRR
Private Credit	$6,196.7	$5,465.5	$4,958.9	$2,078.6	26%	$7,037.5	$1,572.0	1.29x	0.91x	7.1%
Infrastructure	7,832.2	7,060.9	5,899.6	5,110.6	63%	11,010.2	3,949.3	1.56x	0.84x	11.1%
Income Opps	1,501.3	2,234.3	1,823.6	880.0	11%	2,703.6	469.3	1.21x	0.82x	5.7%
Total	**$15,530.1**	**$14,760.6**	**$12,682.0**	**$8,069.2**	**100%**	**$20,751.2**	**$5,990.6**	**1.41x**	**0.86x**	**9.1%**

NOTES: As of June 30, 2025, 5.2% of the portfolio's market value reflects roll-forward values; therefore, performance is subject to change. Amounts may not foot due to rounding.
[a]Commitments to non-USD-denominated investments are calculated using exchange rates at the time of commitment. Commitments to AK Credit Co-Investment Fund represent underlying asset-level commitments.

Investment Activity and Pacing

FY 2025 COMMITMENTS

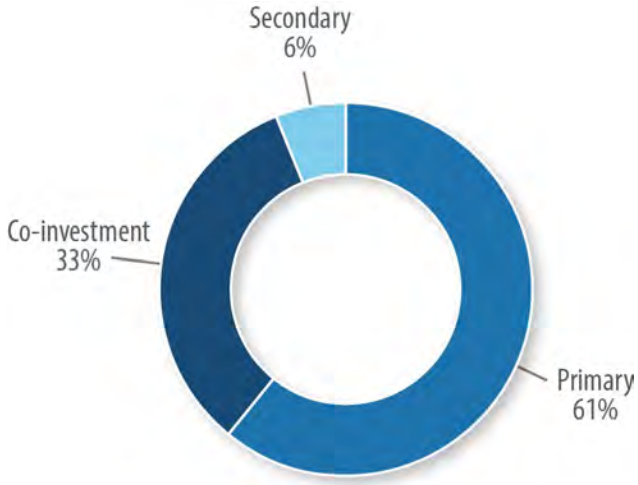
($ in millions)

Category	Closed	Target	Percentage
Private Credit	$269[a]	$520	52%
Infrastructure	501	780	64%
Total	**$770**	**$1,300**	**59%**

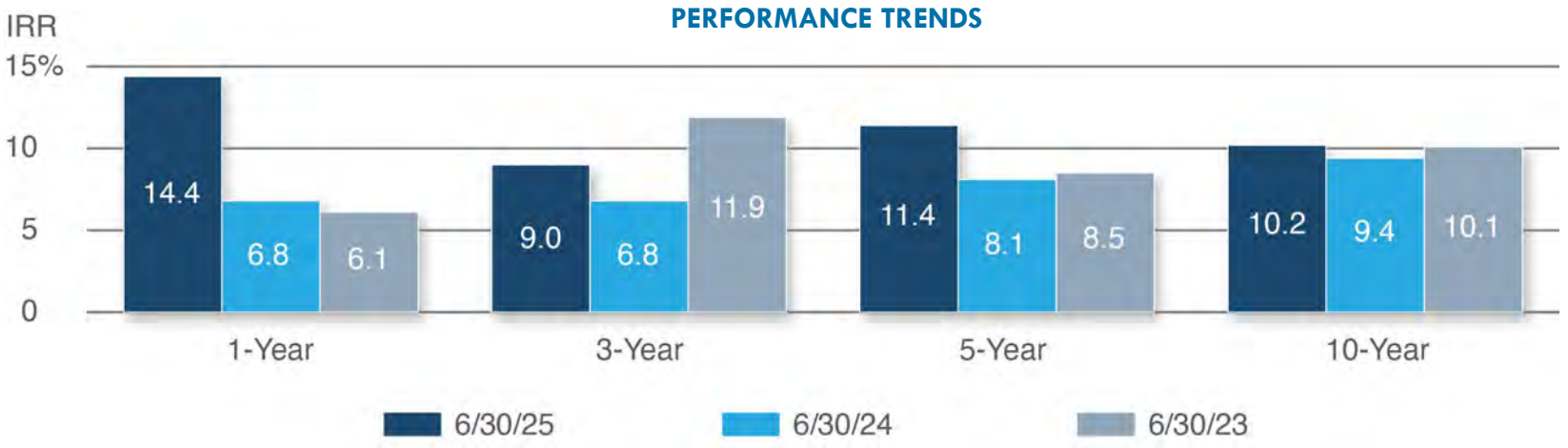
NOTE: Represents activity from July 1, 2024, through June 30, 2025.
[a]Includes one co-investment that was approved in FY 2025 but has not yet closed.

- Activity includes 5 primary investments, 2 secondary investments, and 8 co-investments.
- Broad range of deal flow provides for interesting opportunity set along with potential fee savings.

FY 2025 COMMITMENT ACTIVITY BY INVESTMENT TYPE



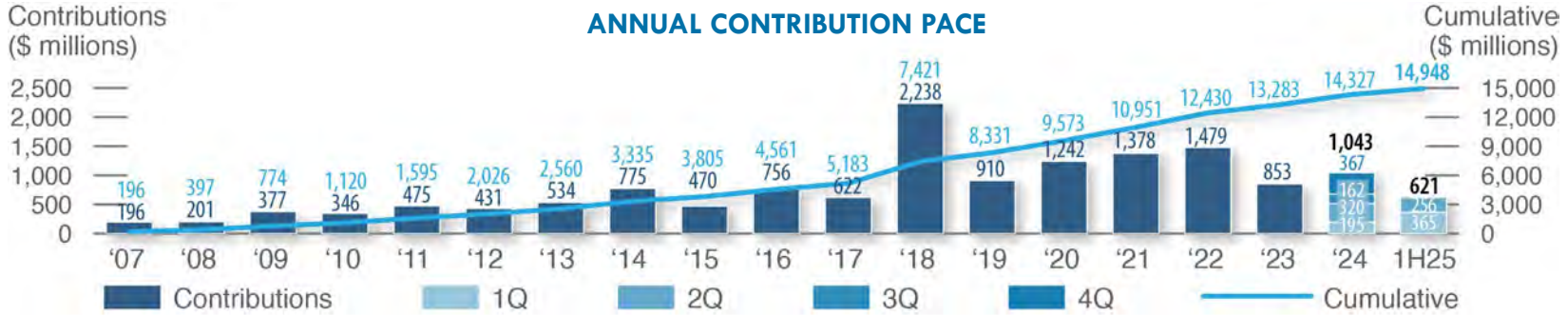
Performance

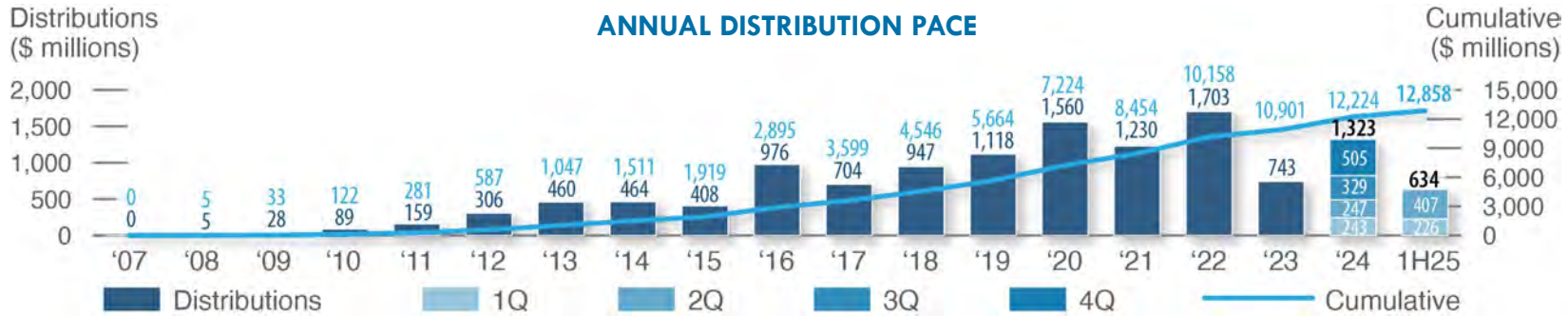


NOTE: As of June 30, 2025, 9.7% of the portfolio's market value reflects roll-forward values; therefore, performance is subject to change.

- FY25 performance across all time periods improved relative to FY24.

Cash Flows



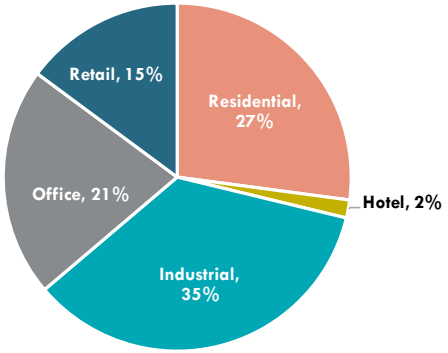


NOTE: Represents cash-flow activity at the investment level and excludes investments that have been terminated or transferred out of AK Credit Opportunities.

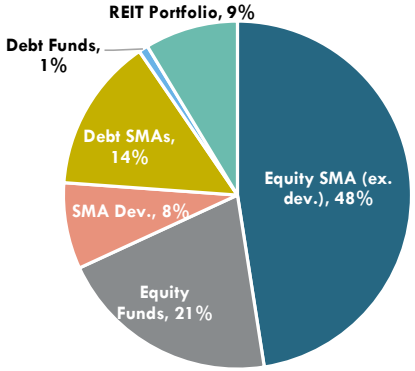
Contents

Portfolio Overview

Allocation by Sector



Investment by Vehicle



Key Portfolio Metrics

Portfolio	NAV ($M)
Equity SMA (incl. dev.)	5,385
Equity Funds	1,996
Debt (Funds & SMAs)	1,474
REIT Portfolio	839
Total	**9,695**

Equity SMA Metrics	
SMA GAV ($M)	7,154
SMA Leverage	24.7%
# SMA Assets	75
SMA Occupancy	81%

Allocation

- 10.1% actual versus target of 11%

Equity Investments

- 75 direct investments managed by 8 advisors (7 external and 1 internal)
- 5 development partners
- 8 fund investments (4 open-ended and 4 closed-end)

Debt Investments

- 2 funds
- 2 Separately Managed Accounts

REITs

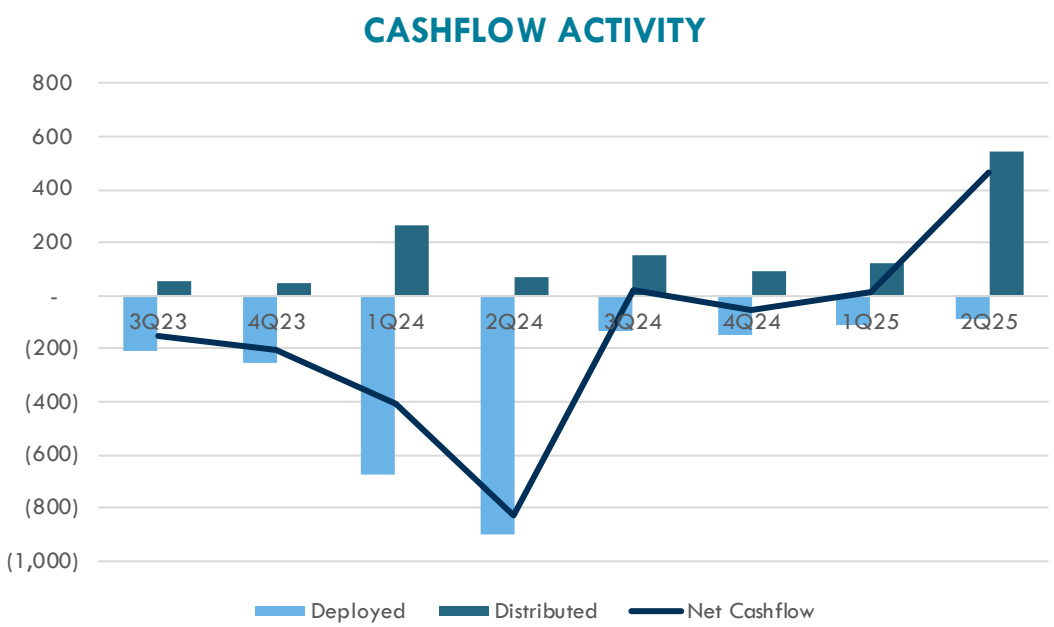
- Allocation target of ±5% (hard cap of 10%)
- Shift from a completion strategy to tactical

Performance

	NAV ($M)	Returns					Over / (Under) Performance				
		1 Quarter	1 Year	3 Year	5 Year	10 Year	1 Quarter	1 Year	3 Year	5 Year	10 Year
Total Portfolio											
Benchmark	**-**	**1.27%**	**4.00%**	**-1.60%**	**4.67%**	**6.10%**	**-**	**-**	**-**	**-**	**-**
APFC Real Estate	9,695	1.63%	1.57%	-1.42%	3.70%	4.17%	0.36%	-2.43%	0.18%	-0.97%	-1.93%
APFC Vehicle vs. Benchmark Component											
REITs Portfolio	839	1.55%	10.76%	-0.69%	11.72%	6.69%	0.48%	0.50%	-0.14%	0.40%	1.41%
Equity Funds Portfolio	1,996	0.69%	4.09%	0.89%	10.18%		-0.59%	1.37%	3.00%	6.93%	
Debt Funds / SMA Portfolio	1,474	2.01%	7.93%	9.53%	11.69%		0.73%	5.21%	11.64%	8.44%	
SMA Portfolio	4,608	1.89%	-3.24%	-4.22%	-0.64%	1.96%	0.61%	-5.96%	-2.11%	-3.89%	-3.46%
SMA Development Portfolio	*777*	1.90%	7.47%				0.62%	4.75%			
APFC SMA vs. NCREIF Sector Benchmark											
SMA Industrial Portfolio (incl. dev.)	1,011	2.05%	1.65%	8.36%	21.07%	16.48%	0.73%	-2.22%	7.37%	8.78%	3.65%
SMA Residential Portfolio (incl. dev.)	1,162	1.98%	7.51%	3.50%	6.42%	6.82%	0.67%	3.69%	4.54%	2.13%	1.19%
SMA Retail Portfolio (incl. dev.)	1,390	3.64%	-8.60%	-8.42%	-6.30%	-0.97%	1.87%	-15.12%	-10.60%	-7.74%	-4.29%
SMA Office Portfolio (incl. dev.)	1,756	0.47%	-3.91%	-6.64%	-3.98%	-0.52%	-0.37%	-0.63%	3.36%	0.67%	-1.61%
SMA Hotel Portfolio (incl. dev.)	67	0.40%	8.09%	4.48%	1.31%	6.34%	-0.07%	1.93%	-3.98%	0.16%	3.09%

**1Q lag; periods ended 3/31/2025*

Liquidity



- The real estate portfolio has been partially repositioned and continues to generate steady cash flow to the fund
- New investments focused on high cash yield and total risk adjusted return
- Direct investments and open-end funds provide signific flexibility to access liquidity
- Upon adjustment of the multiyear increase plan initiated in 2020, new deployment has fallen substantially
- Net cashflow became positive again in 3Q24
- It has remained so for 3 of the last 4 quarters, and is positive by ~$400M over that period

Benchmark Comparison

RE Portfolio Sector Allocation - 3.31.2025					
	Total Portfolio Exposure		NCREIF	Spread (+/-)	Upper Limit
Residential	2,427,332,155	25.0%	28.3%	(3.2%)	42.4%
Hotel	161,635,504	1.7%	0.4%	1.3%	5.0%
Industrial	2,924,982,488	30.2%	33.4%	(3.2%)	50.1%
Office	2,067,342,898	21.3%	19.2%	2.2%	28.7%
Retail	1,439,891,161	14.9%	13.1%	1.8%	19.6%
Senior Housing	201,848,180	2.1%	1.3%	0.7%	5.0%
Self Storage	200,763,783	2.1%	2.5%	(0.5%)	5.0%
Other	269,949,205	2.8%	1.9%	0.9%	5.0%
Total	**$9,693,745,374**	**100.0%**	**100.0%**		

Key Considerations

- Sector underweight to residential (-3.2%) and industrial (-3.2%); overweight Retail (1.8%), Office (2.2%), and Hotel (1.3%), with Senior Housing, Self Storage, and Other roughly equivalent to the NCREIF Expanded NPI benchmark
- APFC's REIT allocation is 8.7% relative to benchmark of 15% for this quarter, though this is removed at the end of the fiscal year

Key Initiatives / Activity

New Investments

- Deployed $25M into European focused fund to maintain diversification while exiting directly held real estate in Europe
- Updated REIT investment structure to a tactical strategy that seeks highest risk adjusted returns in the US Market

Direct Dispositions

- There are 14 assets currently in the disposition process and are anticipated to generate $500M of proceeds
- Five retail dispositions are in advanced stages and are expected to return $210M in net sale proceeds in Q3/Q4 2025
- Several additional assets have been targeted for sale and will be taken to market following completion of various asset-specific initiatives, repositioning, etc.

Portfolio Initiatives

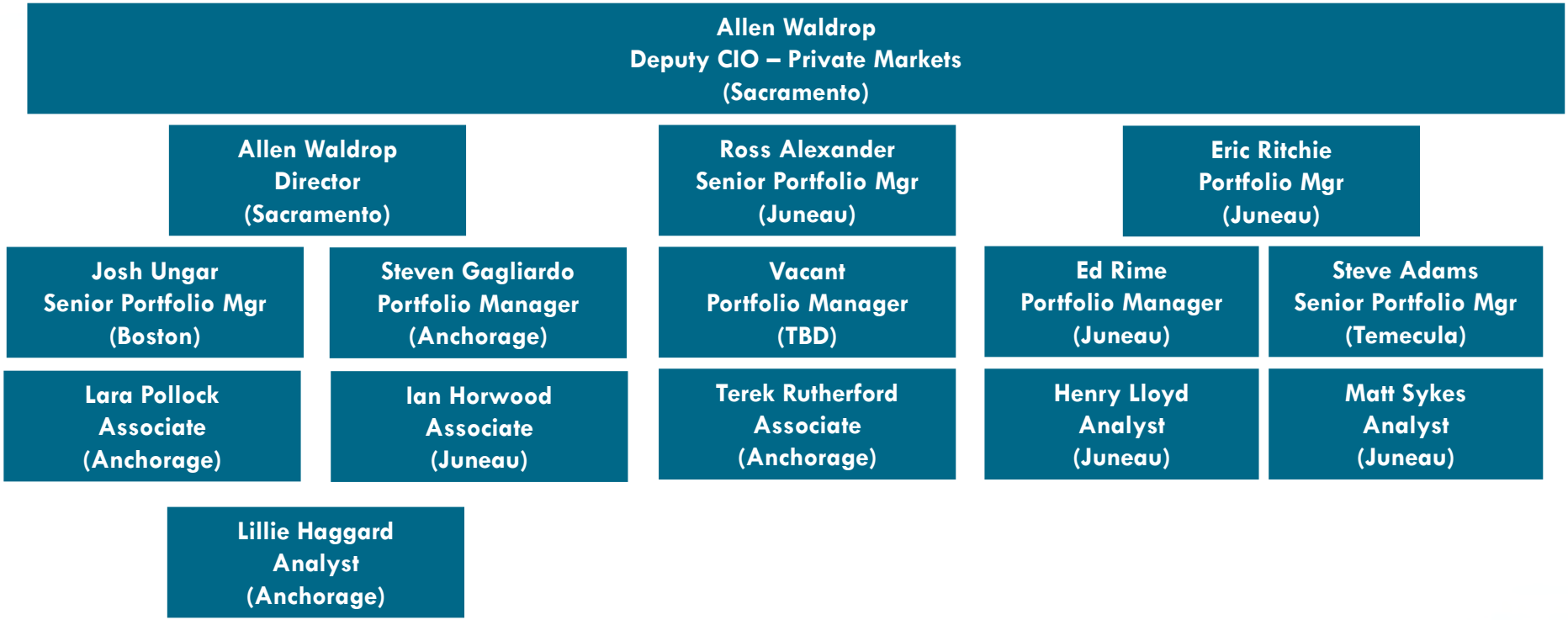
- Hold / Sell Process - Annual evaluation / re-underwriting process in place for all assets
- REITs – Dispositions have returned $236M; shifting remaining REITs from a completion strategy to tactical strategy
- Debt Program - Received $240M from three loan payoffs, three additional payoffs totaling ~$472M expected through June 30, 2026
- Finalized warehouse facility generating proceeds of $323M for APFC; reduced debt investment from 14% to 9% of RE NAV

Team

- Initiating further development of junior staff via technical training programs, strategic collaboration, and continued involvement in asset dispositions, new investments, and portfolio management assignments

Contents

Private Markets – Overview



Private Equity – Strategy Summary

Allen Waldrop
Director
(Sacramento)

Josh Ungar
Senior Portfolio Mgr
(Boston)

Steven Gagliardo
Portfolio Manager
(Anchorage)

Lara Pollock
Associate
(Anchorage)

Ian Horwood
Associate
(Juneau)

Lillie Haggard
Analyst
(Anchorage)

- Team includes six professionals
- Focus primarily on fund investments, but also covers co-investments and other projects

- New hires have enhanced our in-house capabilities
- Developing a plan for SPM role and backfilling Analyst role
- Current deployment pace is $1.5bn annually, consistent with prior year
- Target 50% - 75% of annual capital deployment into funds annually, focusing on our best existing relationships and select new relationships
- Increase co-investment activity to get capital deployed in a more attractive investment environment, drive stronger returns / asset growth and reduce fees
- Targeted 200 bps outperformance of median Cambridge benchmarks on a rolling 5-year basis , long term returns in line with
- PE team leverages several third-parties for market research, deal sourcing, deal evaluation / due diligence, legal assistance, financial and tax accounting, distribution management and post investment monitoring and reporting

Private Equity – Strategy Summary (2)

- Funds
  - Maintain focused, highly selective approach targeting leading existing and new relationships
  - Continue portfolio rebalancing efforts to reduce VC, increase exposure to Europe and Energy
- Co-investments / Directs / CVs
  - Enhance sourcing, screening and relationship building efforts
  - Leverage additional team capacity and skill sets to increase execution pace
  - Develop processes to capitalize on smaller, harder to access opportunities with partners
- Process
  - Continue process improvement initiatives around the investment sourcing, screening and execution function
  - Improve portfolio management efforts
  - Evaluate / implement CRM system to more effectively manage data
- Team
  - Continue professional development efforts with targeted training and education opportunities

Private Income – Strategy Summary

Ross Alexander
Senior Portfolio Mgr
(Juneau)

Vacant
Portfolio Manager
(TBD)

Terek Rutherford
Associate
(Anchorage)

- Current team includes two professionals with one vacancy

- Focus is on fund investments and co-investments
- Current deployment pace is $1.3bn annually, consistent with prior year
- Target 60% - 75% of annual capital deployment into funds annually
- Team is working to increase co-investment deal flow and commitments to enhance returns from best ideas in lower fee structures
- Across PI, targeting 50 bps outperformance versus composite benchmark consisting of 60% Cambridge Global Private Infra (lagged) and 40% Cliffwater Direct Lending Index
- PI team leverages several third-parties to supplement deal sourcing, due diligence, and post-investment monitoring and reporting

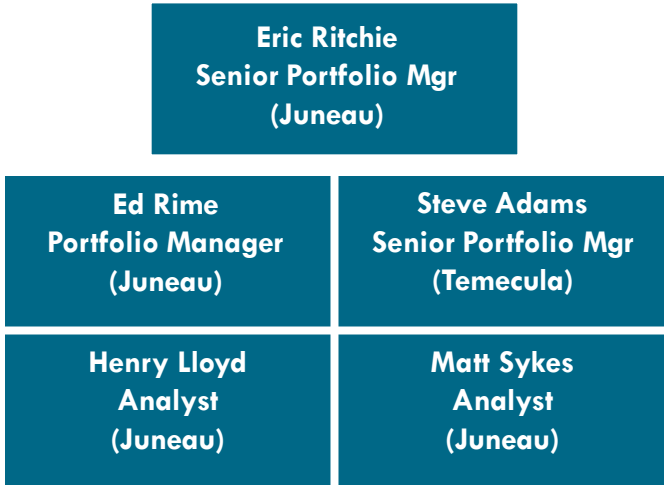
Private Income – Strategy Summary (2)

- Private Credit
  - US-focused, with selective investments in Europe and Rest of World
  - Portfolio is concentrated in senior loans to mid-sized companies with returns primarily from current yield
  - Continuing to back top-tier managers focused on capital preservation and low loss ratios across cycles
  - Concentrating fund commitments to generate increased co-investment deal flow
  - Building co-investment book to 25-35% of private credit to generate enhanced returns from reduced fee drag; currently at ~15%

- Infrastructure
  - Diversified across strategy, sector, and geography
  - Primarily invest through funds in core-plus and value-add strategies to achieve attractive returns mainly from capital appreciation
  - OECD bias with limited emerging market exposure
  - Continuing to back top-tier managers for funds
  - Focusing on mid-market and specialist funds for new commitments
  - Proactively increasing co-investment deal flow and commitments to enhance returns
  - Co-investments are in best ideas across sectors and geographies

- Income Opps
  - Opportunities that have similar characteristics to infra or private credit, but do not fit those mandates
  - High bar for new commitments
  - Likely to remain less than 15% of Private Income NAV + unfunded going forward
  - Focused on opportunities that primarily provide significant current yield and return enhancement due to market inefficiencies and niche strategies

Real Estate – Strategy Summary



- Current focus on fund investments, co-investments, and strategic direct / SMA portfolio dispositions (reduction target of 50%)
- New investments focused on high cash yield (4% to 6%) and total risk adjusted returns (8%-10%)
- Staff development through industry / technical trainings as well as development of specific goals and objectives
- Will add new debt managers to diversify the debt investment program with the aim to continue to generate outsized returns throughout all market cycles
- The RE team leverages, several third-parities for market research, deal sourcing, deal evaluation / due diligence, legal assistance, financial, property, and tax accounting
- APFC's Real Estate portfolio is comprised of over 100 different investment vehicles and ~2,000 assets across the globe

Real Estate – Strategy Summary (2)

Direct Investments

- Focus direct investments on stabilized core and core+ assets in major markets with stable fundamentals and growth tailwinds
- Increase reliance on SMAs for property-level decisions such as leasing, maintenance, improvements
- Routine evaluation of asset performance and business plan progress to optimize exit timing and returns
- Sale of non-strategic assets to reduce risk positions and optimize portfolio composition

Development Projects

- Limit development as a percent of total RE portfolio and through annual commitment limits
- Focus development on certain sectors and markets (e.g. Develop to Core, Multi-Family)

Fund Investments

- Focus fund commitments on higher-risk strategies (value-added and opportunistic) and international markets
- Utilize a mix of closed-end and open-ended funds to balance capital flows across different market environments
- Provide co-investment opportunities to gain additional exposures and manage capital flows and reduce fee impacts

Debt

- Maintain the sizing of the debt program at ~10% of RE NAV and tranche it over a longer periods to diversify across different economic and interest rate environments, and to smooth cash flow demands
- Increase the use of specialized real estate debt managers (via SMAs or commingled funds) to reduce staff burden
- Improve alignment with managers through GP commitments and refined fee structures

REITs

- Shifted from completion to tactical strategy
- Leveraging strategy to gain access to high quality managers and assets in the public market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APFC ALASKA PERMANENT FUND CORPORATION
801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT:	APFC Public Equities Asset Class Update	ACTION:	_____
DATE:	October 2, 2025	INFORMATION:	X

BACKGROUND:

The Public Equities presentation provides information on the APFC Public Equities Portfolio.

STATUS:

At this meeting, Fawad A Razzaque, Director of Public Equity, will review all aspects of APFC Public Equity Portfolio, including Allocation (positioning versus benchmark), External Management program, and Internal Management.

Public Equities

Asset Class & Active Management Review

June 30, 2025

Asset Class: Public Equities

Performance (Gross)	FY 2025	3 Yr	5 Yr
Public Equities	16.1%	15.4%	14.1%
MSCI ACWI IMI	15.9%	16.8%	13.4%
Excess Returns (%)	**+0.2%**	**-1.4%**	**+0.7%**

Excess Return Target: + 30 bps net of fee
Investment Universe/Index: Global/ MSCI ACWI IMI

Drivers of excess return target: Active Allocation, Active Selection

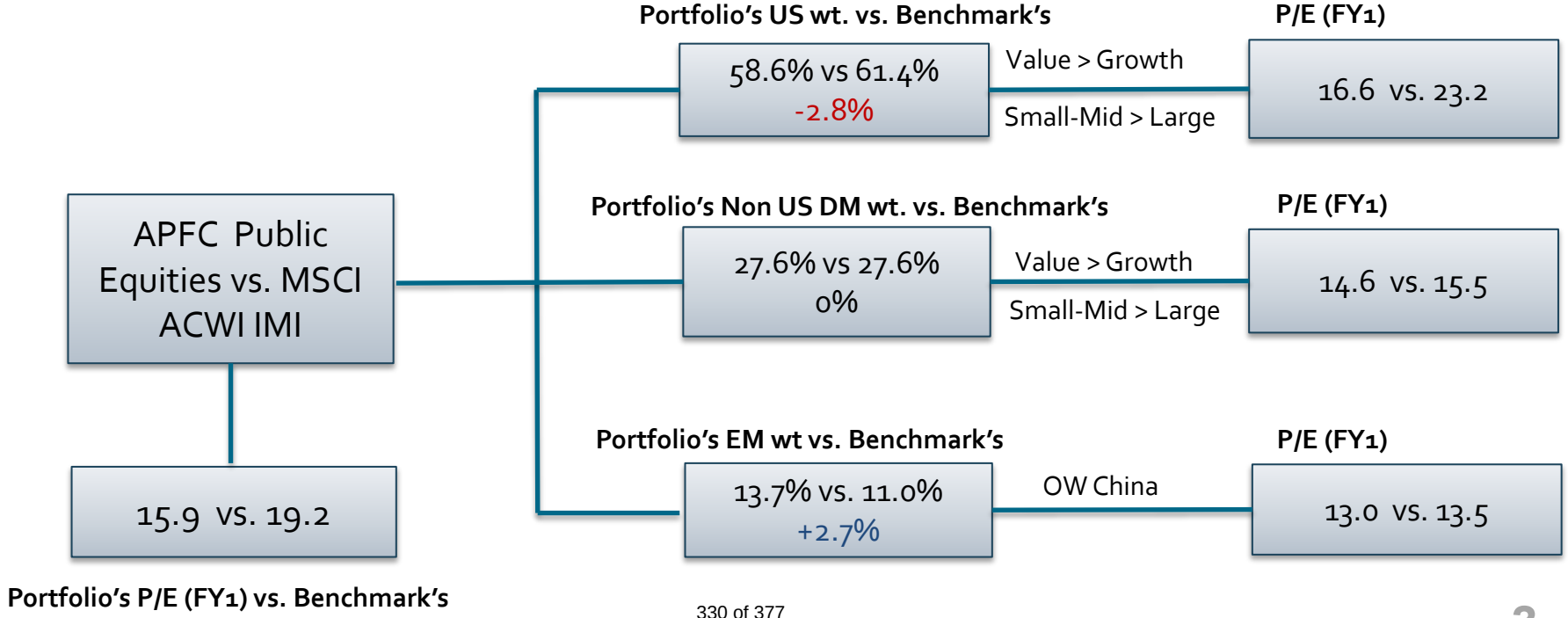
External Management: Primarily Active Selection
Internal Management: Primarily Active Allocation

Investment Team

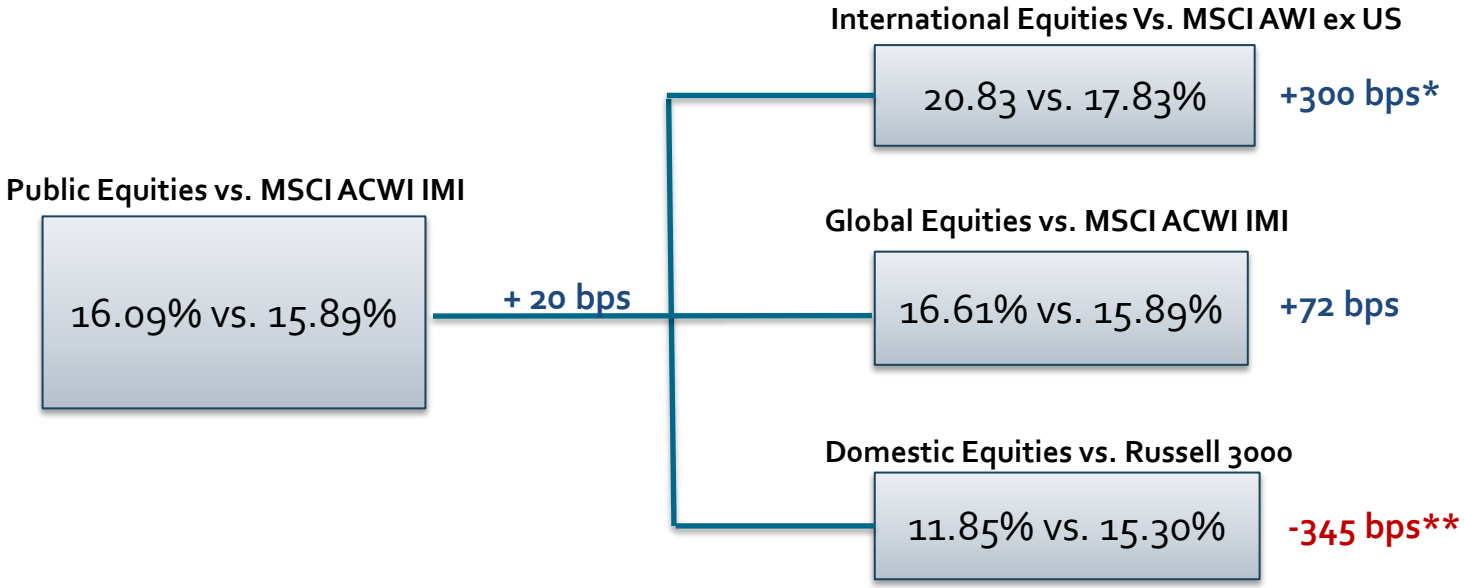
Fawad A Razzaque
Director, Public Equities

Joe Shinn
Analyst

Portfolio Allocation & Valuation as of Jun 30, 2025



Performance: Fiscal Year 2025



* Allocation effect was **positive** in International Equities as valuation spreads compressed leading to outperformance of value and small caps during the quarter

** Allocation effect was **negative** in US Equities as valuation spreads expanded leading to underperformance of value and small caps during the quarter

Public Equities: Active Management – Allocation and Selection

1. **Active Selection**
   - Seek consistent net of fee outperformance through active selection
   - Primary source of active selection is our External Manager Program, representing 80% of APFC Public Equity assets
   - Long term success depends on skillful manager selection and allocation across strategies
   - Over the past 13 years, APFC's track record suggests we have been executing successfully, and results have exceeded our expectations

2. **Active Allocation**
   - Seek positive active returns over a 5-year horizon
   - Focus on valuation spreads and Reversion-to-the-Mean investor behavior never changes
   - Lower starting valuations enhances the probability of greater long-term returns but may add volatility to the short-term return profile
   - Over the past 5 years, active allocation has detracted from Public Equity returns, however, valuation spreads are very wide relative to history, and have yet to revert
   - In view of the new Tracking Error objective, the scope of Active Allocation will be gradually lowered over the next 15 months

3. **Internal Management**
   - Fund's Investment Strategy shifted away from internal management
   - ETF strategies (such as Tactical Tilts) are closed
   - Certain factor-based strategies that were internally designed with respect to portfolio requirements are continued to be run but would be implemented externally

Active Selection - External Management Program Overview

Active Selection (External) – Assets*	CY 2024	CY 2023	CY 2022	CY 2021	CY 2020	CY 2019	CY 2018	CY 2017	CY 2016	CY 2015	CY 2014	CY 2013	CY 2012
External Active Managers (%)	68	69	64	66	65	66	65	66	62	59	58	57	55
External Factor-Based (Quasi Passive)	8	8	9	10	10	11	11	11	13	19	20	20	19
Total External Active & Factor Based (%)	**76**	**77**	**73**	**76**	**75**	**77**	**76**	**77**	**75**	**78**	**78**	**77**	**74**
Passive - index (%)	4	5	9	8	4	7	10	10	16	19	22	23	26
Total External Assets (%)	**80**	**82**	**82**	**84**	**79**	**84**	**86**	**87**	**91**	**97**	**100**	**100**	**100**
Fixed Fee	**14**	**15**	**14**	**14**	**13**	**15**	**16**	**17**	**18**	**21**	**19**	**24**	**25**
Incentive Fee	**23**	**17**	**19**	**14**	**27**	**13**	**11**	**11**	**8**	**4**	**3**	**<1**	**0**
Total External Fee (bps)**	**38**	**32**	**33**	**28**	**40**	**28**	**27**	**28**	**26**	**25**	**22**	**24**	**25**

- *Average assets over the four calendar quarters
- ** Weighted Manager fee

Active Selection (External) - External Manager Program

Success of the External Management Program depends on skill of execution measured as:

1)	Manager Selection:	Above average (>50%) or below average (<50%)
2)	Manager Performance Skew:	Positive or negative (average of outperformance vs. average underperformance)
3)	Allocation Effect:	Allocation to outperforming vs underperforming managers
4)	Outperformance (Gross):	Positive or negative
5)	Outperformance (Net-of-Fee):	Positive or negative (fee paid to managers is an important factor)
6)	Consistency in execution:	Mitigate volatility in the (net-of-fee) outperformance over time

External Manager Program – History of Success Rate & Skew

Managers	Since	Yrs	Ex Ret./Yr	Terminated	
WCM Global Equity	2017	7	5.96		
Acadian INTL LCV	2007	17	5.60		
LSV INTL LCV	2014	11	5.00		
Arrowstreet Global	2017	7	3.61		
Trustbridge China	2015	9	3.07		•
Hardman INTL LCG	2014	11	2.92		
Allspring China	2016	8	2.92		
Pzena US SCV	2008	17	2.75		•
Schroders INTL LCV	2014	10	2.65		
Macquarie EM	2013	11	2.32		
McKinley Global	2006	18	2.27		
DFA EM Value	2015	10	2.20		
Jennison US SC	2005	20	2.12		
Lyrical LCV	2013	12	2.09		•
T. Rowe US SCV	2001	23	2.08		
MEASA EM	2018	7	1.88		
Voya US LCG	1984	38	1.85		
JP Morgan EM	2023	11	1.76		•
Eagle US SCG	2008	17	1.54		
RBC US SCG	2005	20	1.48		
DFA INTL SCV	2010	15	1.48		
JP Morgan INTL LCG	2013	11	1.45		
SKBA US LCV	2013	12	0.88		•
AQR Global	2007	18	0.77		
DFA INTI SC	2010	15	0.66		
William Blair EM	2013	11	0.49		
Lazard Global	1995	30	0.47		
GMO Global	2007	7	0.44	5/2014	
DFA INTL LC	2010	15	0.34		•
Mondrian EM	2005	20	0.25		
LSV US LCV	2015	9	0.23		
DFA EM SC	2015	10	0.00		
Lee Munder EM	2013	4	-0.18	4/2018	
SSGA US LCG	2004	20	-0.19		•
Longview Global	2018	7	-0.54		
SSgA Russell Funda	2009	16	-0.61		
RBA Global	2017	7	-0.63		
DSM US LCG	2013	12	-0.83		
GE INTL LC	2007	10	-0.93	10/2007-11/2017	
Capital Group EM	1999	16	-1.52	7/1999-10/2015	•
Mellon FTSE RAFI US	2010	15	-1.82		
CastleArk US LCG	2013	12	-1.88		
Herndon US LCV	2013	4	-2.86	4/2013-10/2017	
ACI US LCV	2022	2	-3.99		
AGI Struc Alpha	2016	5	-4.77	1/2016-7/2021	
CDAM Global	2017	7	-5.79		

Inception to Date Performance as of 06/30/2025

31/46 Managers outperformed (including 6 terminations

Average Holding period: **13 Yrs**

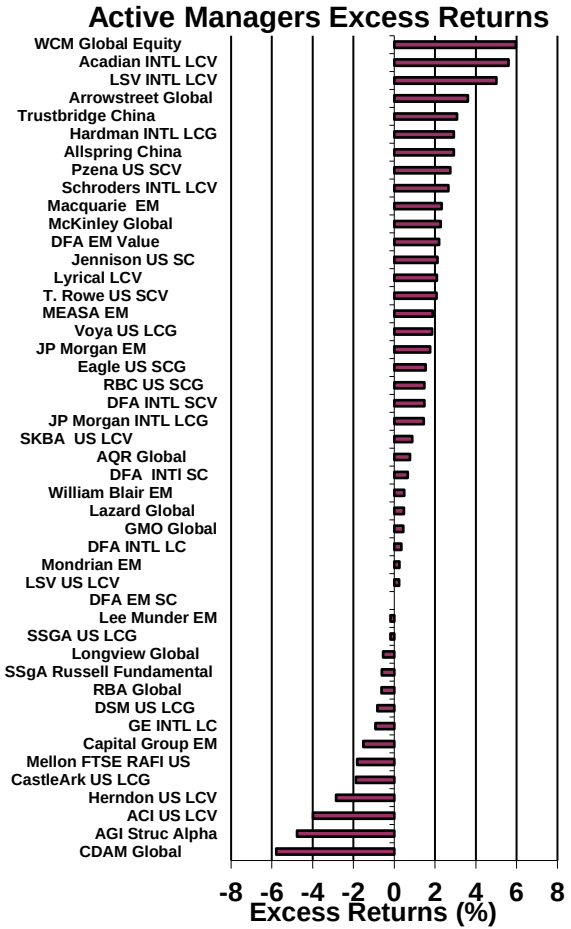
Success rate: **67%** managers outperformed on inception-to-date basis (through 06/30/2025)

Average outperforming manager beat the benchmark by: **+205 bps**

Average underperforming manager lagged the benchmark by: **- 190 bps**

Positive skew: Average outperformance more than the average underperformance

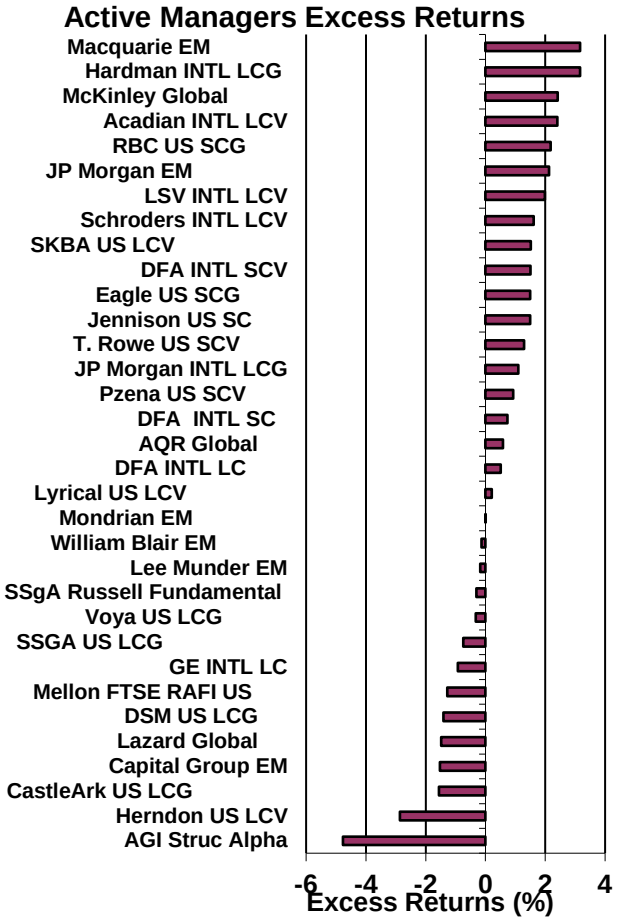
No survivorship bias since March 2012



External Manager Program – History of Success Rate & Skew

Managers	Annualized	Terminated
Macquarie EM	3.16	
Hardman INTL LCG	3.16	
McKinley Global	2.41	
Acadian INTL LCV	2.4	
RBC US SCG	2.18	
JP Morgan EM	2.12	
LSV INTL LCV	1.99	
Schroders INTL LCV	1.61	
SKBA US LCV	1.51	
DFA INTL SCV	1.5	
Eagle US SCG	1.49	
Jennison US SC	1.49	
T. Rowe US SCV	1.29	
JP Morgan INTL LCG	1.1	
Pzena US SCV	0.93	
DFA INTL SC	0.73	
AQR Global	0.58	
DFA INTL LC	0.51	
Lyrical US LCV	0.21	
Mondrian EM	0.01	
William Blair EM	-0.13	
Lee Munder EM	**-0.18**	12/2013 - 04/2018
SSgA Russell Fundamental	-0.31	
Voya US LCG	-0.33	
SSGA US LCG	-0.74	
GE INTL LC	**-0.93**	10/2007 - 11/2017
Mellon FTSE RAFI US	-1.28	
DSM US LCG	-1.41	
Lazard Global	-1.48	
Capital Group EM	**-1.52**	7/1999 - 10/2015
CastleArk US LCG	-1.56	
Herndon US LCV	**-2.86**	4/2013 - 10/2017
AGI Struc Alpha	**-4.77**	1/2016 - 7/2021

- **10 Yr Performance as of 06/30/2025**
- 20/33 Managers outperformed (include 6 terminations
- **Success rate**: **61%** managers outperformed on inception-to-date basis (through 06/30/2025)
- Average outperforming manager beat the benchmark by: **+152 bps**
- Average underperforming manager lagged the benchmark by: **- 135 bps**
- **Positive skew**: Average outperformance more than the average underperformance
- **No survivorship bias since March 2012**



Active Selection (External) - Gross and Net-of-Fee Excess Returns in CY 2024

External Managers: Calendar 2024	Percent of Public Equities	Weighted Average Fee	Active Returns Gross	Active Returns Net of Fee
Active Managers (37 Managers)	67.7%	0.37%	0.39%	**0.02%**
Factor-Based (Quasi Passive)	8.1%	<0.01%	-0.47%	**-0.48%**
Passive (9 Index Managers)	4.0%	<0.01%	0.00%	
Total External	**79.8%**	**0.37%**	**-0.08%**	**-0.46%**

CapW vs EW Returns	CY 2024
S&P 500	**25.02%**
S&P 500 EW	**13.01%**
Diff	**12.01%**

External Factor-Based (Quasi Passive)	Percent Allocation	Weighted Average Fee	Active Returns Gross	Active Returns Net-of Fee
MCM FTSE RAFI – US LC*	1.9%	0.001%	-0.14%	**-0.14%**
SSGA Russell Fdmtl – Global LC*	4.1%	0.003%	-0.34%	**-0.34%**
Total External (Factor-Based)			**-0.47%**	**-0.48%**

* These Quasi Passives are closer to Equal weighted than Capitalization weighted portfolios

Active Selection (External) - Gross and Net-of-Fee Excess Returns in CY 2023

External Managers: Calendar 2023	Percent of Public Equities	Weighted Average Fee	Active Returns Gross	Active Returns Net of Fee
Active Managers (37 Managers)	68.7%	0.31%	0.46%	**0.15%**
Factor-Based (Quasi Passive)	8.0%	0.01%	-0.33%	**-0.34%**
Passive (9 Index Managers)	5.0%	<0.01%	0.00%	
Total External	**81.7%**	**0.32%**	**0.12%**	**-0.19%**

External Factor-Based (Quasi Passive)	Percent Allocation	Weighted Average Fee	Active Returns Gross	Active Returns Net-of Fee
MCM FTSE RAFI – US LC *	1.7%	0.001%	-0.17%	**-0.17%**
SSGA Russell Fdmtl – Global*	4.0%	0.002%	-0.17%	**-0.17%**
Total External (Factor-Based)			**-0.34%**	**-0.34%**

CapW vs EW Returns	CY 2023
S&P 500	**26.29%**
S&P 500 EW	**13.87%**
Diff	**12.42%**

***** These Quasi Passives are closer to Equal weighted than Capitalization weighted portfolios

Active Selection (External Active) – Average Excess Returns over the 13-Year Period

Year	Ext. Active Mgr. Fee	Ext. Active Mgr. Gross-of-Fee Outperformance	Ext. Active Mgr. Net-of-fee Outperformance	Rolling Net-of-fee Outperformance
2024	0.37%	0.39%	**0.02%**	**0.41% (13 yrs)**
2023	0.31%	0.46%	**0.15%**	**0.44% (12 yrs)**
2022	0.33%	1.17%	**0.84%**	**0.46% (11 yrs)**
2021	0.27%	0.93%	**0.66%**	**0.43% (10 yrs)**
2020	0.39%	1.63%	**1.24%**	**0.40% (9 yrs)**
2019	0.27%	0.90%	**0.63%**	**0.29% (8 yrs)**
2018	0.26%	-0.61%	**-0.87%**	**0.25% (7 yrs)**
2017	0.30%	1.68%	**1.38%**	**0.43% (6 yrs)**
2016	0.24%	-0.66%	**-0.91%**	**0.24% (5 yrs)**
2015	0.23%	1.32%	**1.08%**	**0.53% (4 yrs)**
2014	0.20%	0.00%	**-0.20%**	**0.35% (3 yrs)**
2013	0.22%	1.02%	**0.80%**	**0.62% (2yrs)**
2012	0.23%	0.67%	**0.44%**	**0.44% (1 yr)**
Average Annualized Cumulative (13 yrs)	**0.28%**	**0.68%**	**0.41%**	

Active Selection (External Factor-Based Quasi Passive) - Average Excess Returns over the 13-Year Period

Year	Ext. Active Mgr. Fee	Ext. Active Mgr. Gross-of-Fee Outperformance	Ext. Active Mgr. Net-of-fee Outperformance	Rolling Net-of-fee Outperformance
2024	0.01%	-0.47%	**-0.48%**	**-0.05%** (13 yrs)
2023	0.00%	-0.33%	**-0.34%**	**-0.02%** (12 yrs)
2022	0.01%	0.85%	**0.85%**	**0.01%** (11 yrs)
2021	0.01%	0.31%	**0.30%**	**-0.07%** (10 yrs)
2020	0.01%	-0.78%	**-0.79%**	**-0.11%** (9 yrs)
2019	0.01%	-0.35%	**-0.36%**	**-0.03%** (8 yrs)
2018	0.01%	-0.21%	**-0.22%**	**0.02%** (7 yrs)
2017	0.03%	-0.08%	**-0.11%**	**0.06%** (6 yrs)
2016	0.01%	0.48%	**0.46%**	**0.09%** (5 yrs)
2015	0.02%	-0.41%	**-0.43%**	**0.00%** (4 yrs)
2014	0.02%	-0.13%	**-0.15%**	**0.14%** (3 yrs)
2013	0.02%	0.46%	**0.44%**	**0.29%** (2yrs)
2012	0.02%	0.15%	**0.13%**	**0.13%** (1 yr)
Average Annualized	**0.01%**	**-0.04%**	**-0.05%**	
Cumulative (13 yrs)				

Active Selection (External) – Average Excess Returns over the 13-Year Period

Year	Fee	Gross-of-Fee Outperformance	Net-of-fee Outperformance	Rolling Net-of-fee Outperformance	Net-of Fee Outperformance in USD
2024	0.38%	-0.08%	-0.48%	0.36% (13 yrs)	-$120.5mm
2023	0.32%	0.12%	-0.19%	0.43% (12 yrs)	-$51.4mm
2022	0.33%	2.02%	1.70%	0.49% (11 yrs)	+463.9mm
2021	0.28%	1.23%	0.96%	0.36% (10 yrs)	+294.1mm
2020	0.40%	0.85%	0.45%	0.30% (9 yrs)	+118.7mm
2019	0.28%	0.63%	0.27%	0.28% (8 yrs)	+62.7mm
2018	0.27%	-0.80%	-1.07%	0.28% (7 yrs)	-216.4mm
2017	0.28%	1.51%	1.23%	0.50% (6 yrs)	+253.2mm
2016	0.26%	-0.17%	-0.44%	0.36% (5 yrs)	-71.8mm
2015	0.25%	0.97%	0.72%	0.56% (4 yrs)	+120.0mm
2014	0.22%	-0.12%	-0.34%	0.50% (3 yrs)	-57.8mm
2013	0.24%	1.50%	1.26%	0.93% (2yrs)	+195.6mm
2012	0.25%	0.84%	0.60%	0.60% (1 yr)	+75.1mm
Average Annualized	**0.29%**	**0.65%**	**0.36%**		
Cumulative (13 yrs)					**$1,076,090,335**

Active Selection (External) - External Manager Program

Success of the External Management Program depends on skill of execution, measured as:

1)	Manager Selection:	**67%** of External Managers outperformed
2)	Manager Performance Skew:	**Positive** (avg. outperformance +205 bps > avg. underperformance -190 bps)
3)	Allocation Effect:	**Positive**
4)	Outperformance (Gross):	**65** bps per year over the past 13 years
5)	Outperformance (Net-of-Fee):	**36** bps per year over the past 13 years
6)	Consistency in Execution:	Achieve relatively consistent outperformance over time

Public Equities: Active Management – Active Allocation

Active Allocation

- Utilizes valuation and reversion-to-the-mean
- Make active allocations only when valuation spreads are very wide relative to history
- Increases the probability of greater long-term expected return but adds volatility to the expected return profile

Active weights in the order of importance:

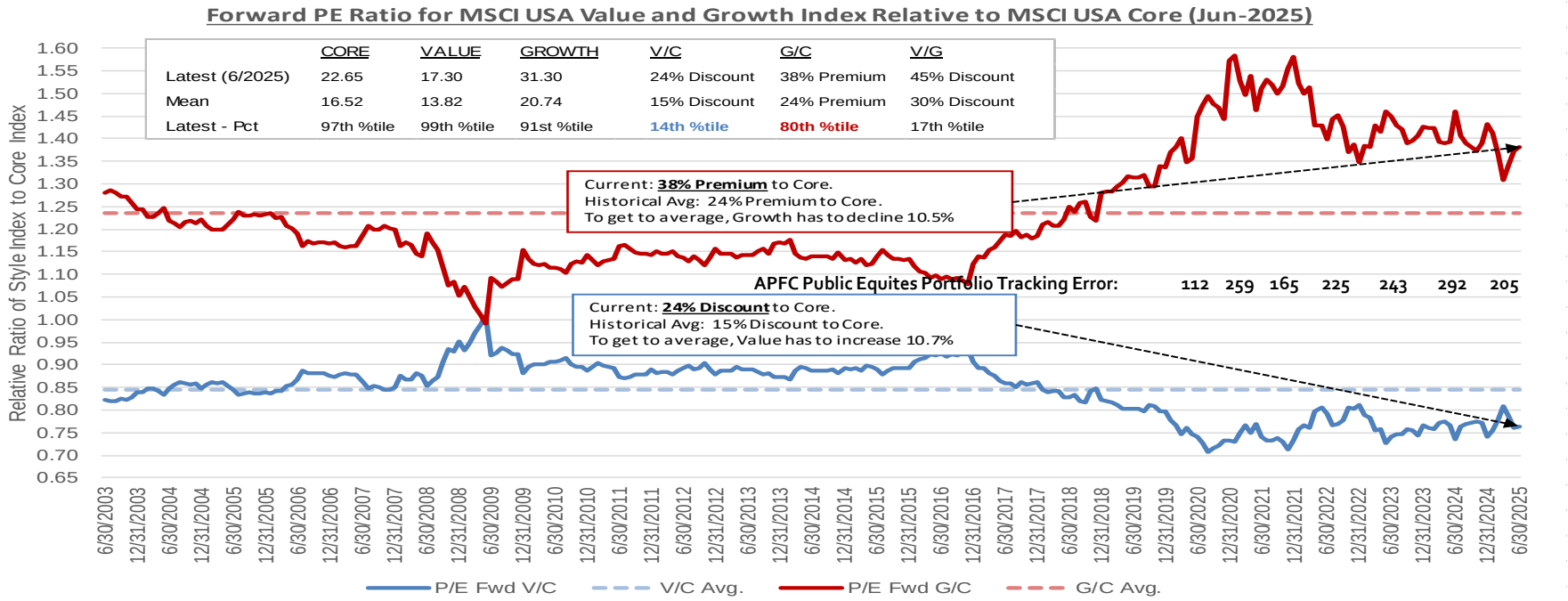
• Value (approx. 20% overweight):	valuation spreads are historically wide and favor Value vs. growth
• Small Caps (approx. 10% overweight):	valuation ratio of small/large historically low and favor small vs. large
• Emerging Markets (approx. 3% overweight):	attractive relative valuation versus US Equities.
• China (approx. 1.5% overweight)	attractive relative valuation within EM and versus all major markets

Performance Expectations

Over the short term, APFC Public Equity could underperform in significantly narrow market environments led by the most expensive stocks in the global equity benchmark.

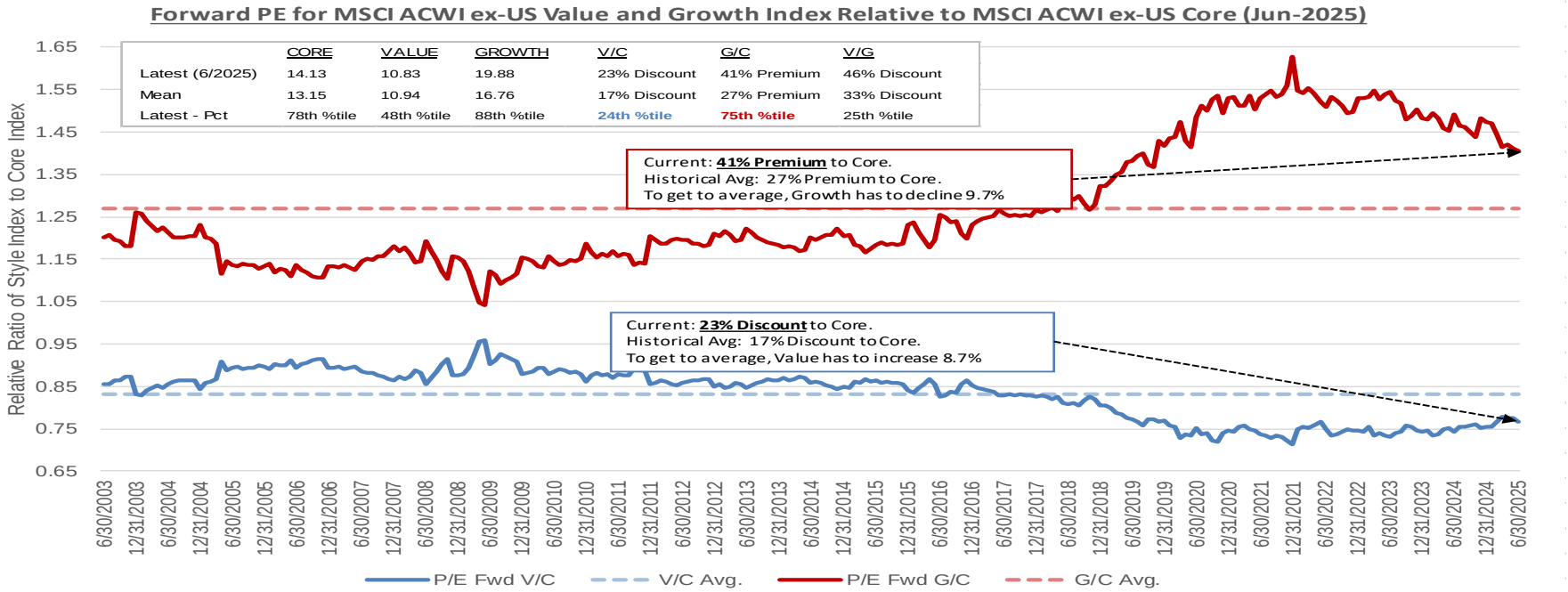
APFC Public Equity is expected to outperform in most other market environments.

Active Allocation: Value-Valuations of Value vs. Growth at Extreme Levels



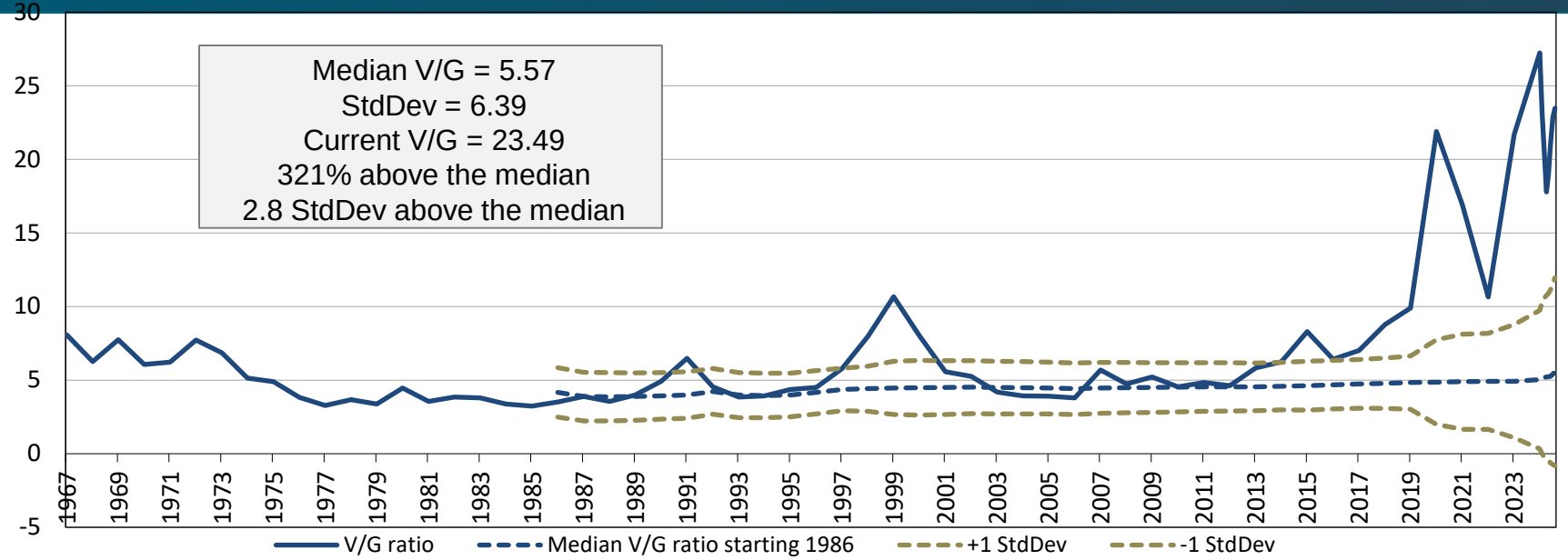
Source: LSV Asset Management

Active Allocation: Value-Valuations of Value vs. Growth at Extreme Levels



Source: LSV Asset Management

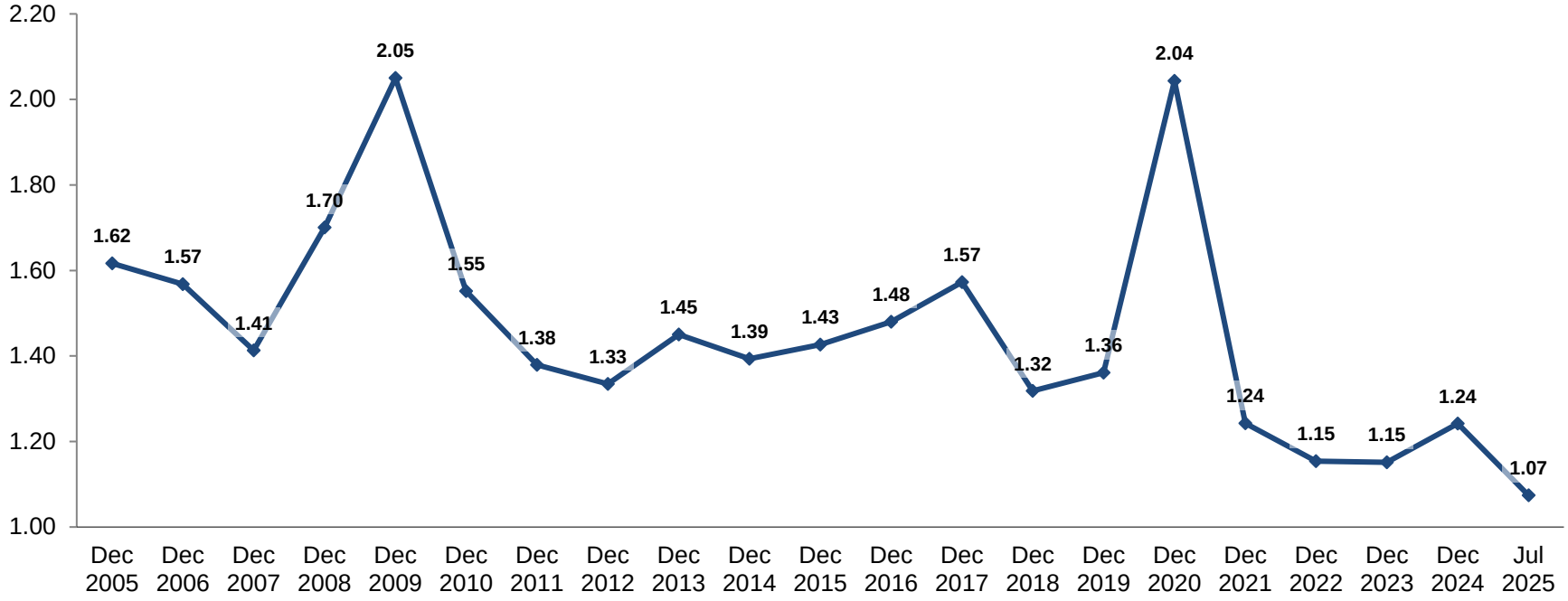
Active Allocation: Value-Value vs. Growth Relative Valuation in the U.S. – B/M ratios



- Historically, value has been about 5.57 times cheaper than growth in the U.S.
- As of July 31, 2025, value is 23.49 times cheaper than growth; still higher than1999.

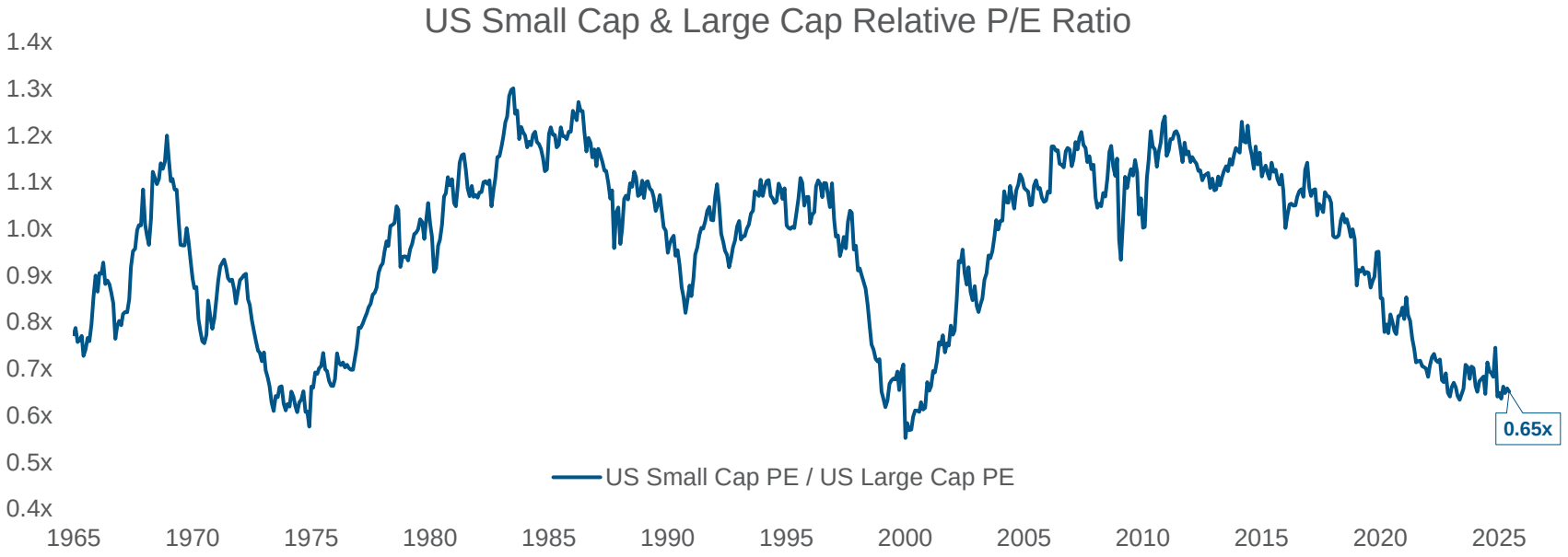
Source: LSV Asset Management

Active Allocation: Small Caps - Russell 2000 P/E (FY1) / S&P 500 P/E (FY1)



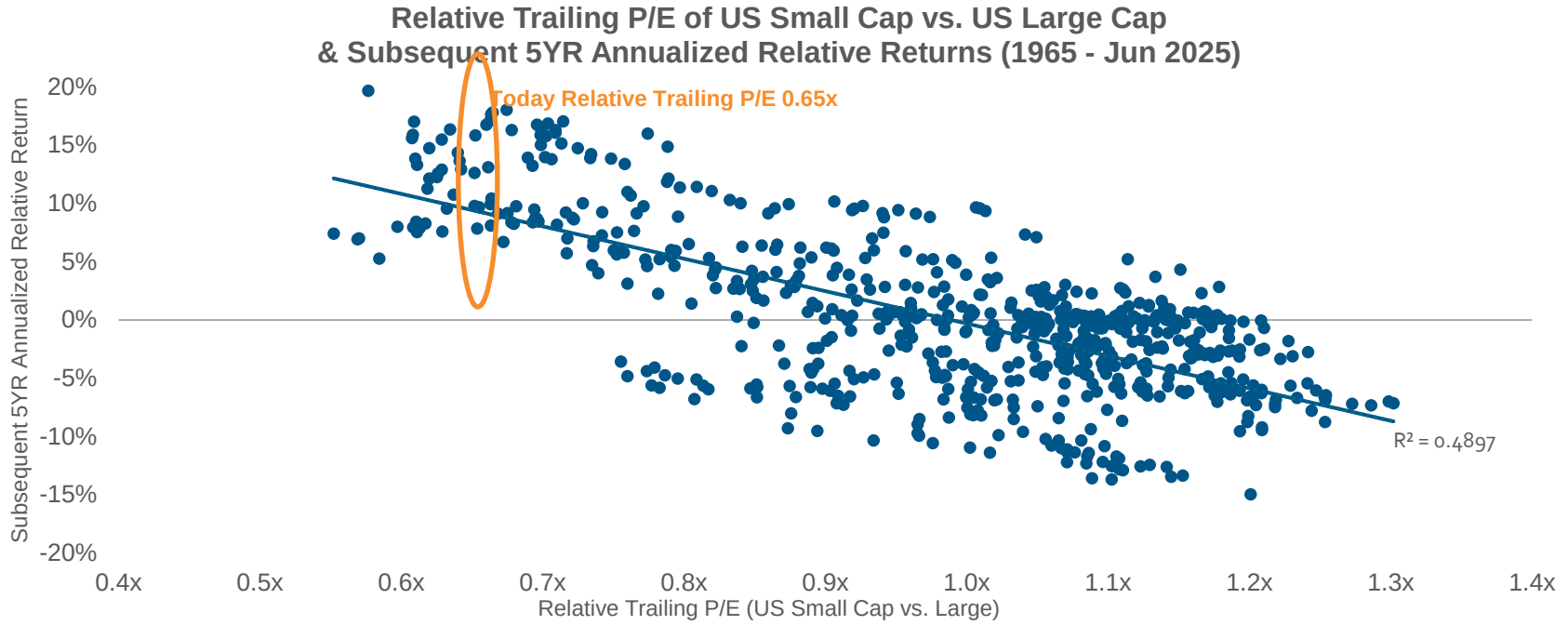
Source: LSV Asset Management

Active Allocation: Small Caps - US Small Cap Near Record Low Valuation versus Large Cap



Source: Empirical Research Partners, Pzena analysis
Large Cap = Largest 1000 US stock universe. Small Cap = Next 2000 largest stock universe.
Trailing price/earnings data from January 31, 1965 – June 30, 2025.

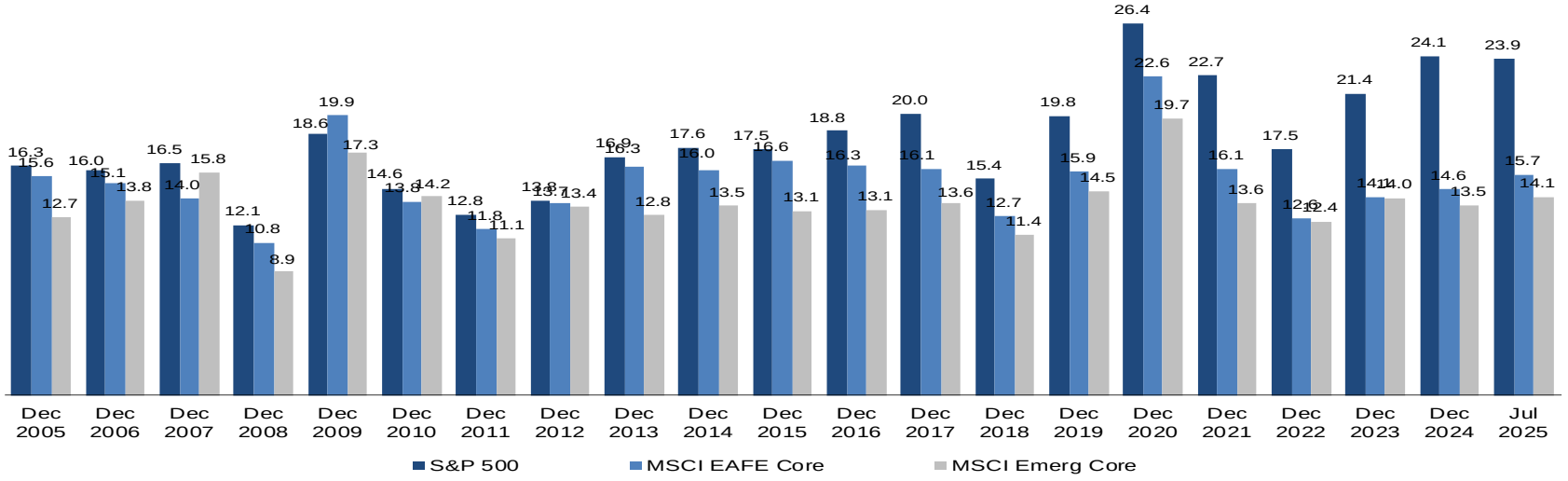
Active Allocation: US Small Cap vs. Large Cap Relative Valuation & Forward Returns



Source: Empirical Research Partners, Pzena analysis
Large Cap = Largest 1000 US stock universe. Small Cap = Next 2000 largest stock universe.
Trailing price/earnings and US dollar total return data from January 31, 1965 – June 30, 2025.
Does not represent any specific Pzena product or service. Past performance is not indicative of future returns.

Active Allocation: Emerging Markets - U.S. vs. EAFE vs. Emerging – P/E (FY1): 2005-2023

	Forecasted P/E Discount			Discount vs EM		Discount vs EAFE	
	Current	Median	Discount	Current	Median	Current	Median
S&P 500	23.9	17.5	37%	70%	34%	53%	15%
MSCI EAFE	15.7	15.6	1%	11%	12%		
MSCI EM	14.1	13.5	4%				



Source: LSV Asset Management

Public Equities: Excess Return Attribution as of June 30, 2025

Performance (Gross)	CY 6/30/25	CY 2024	CY 2023	CY 2022	CY 2021	CY 2020	CY 2019	CY 2018	CY 2017
Public Equities	10.77%	12.92%	18.09%	-14.47%	20.53%	16.76%	26.53%	-11.07%	25.30%
MSCI ACWI IMI	9.82%	16.37%	21.58%	-18.40%	18.22%	16.25%	26.35%	-10.08%	23.95%
Excess Returns (bps)	+95	-345	-349	+393	+231	+51	+18	-99	+135
Active Allocation* (bps)	+48	-299	-330	+224	+135	+6	-12	+8	+12
Tracking Error	205	292	243	225	165	259	112		

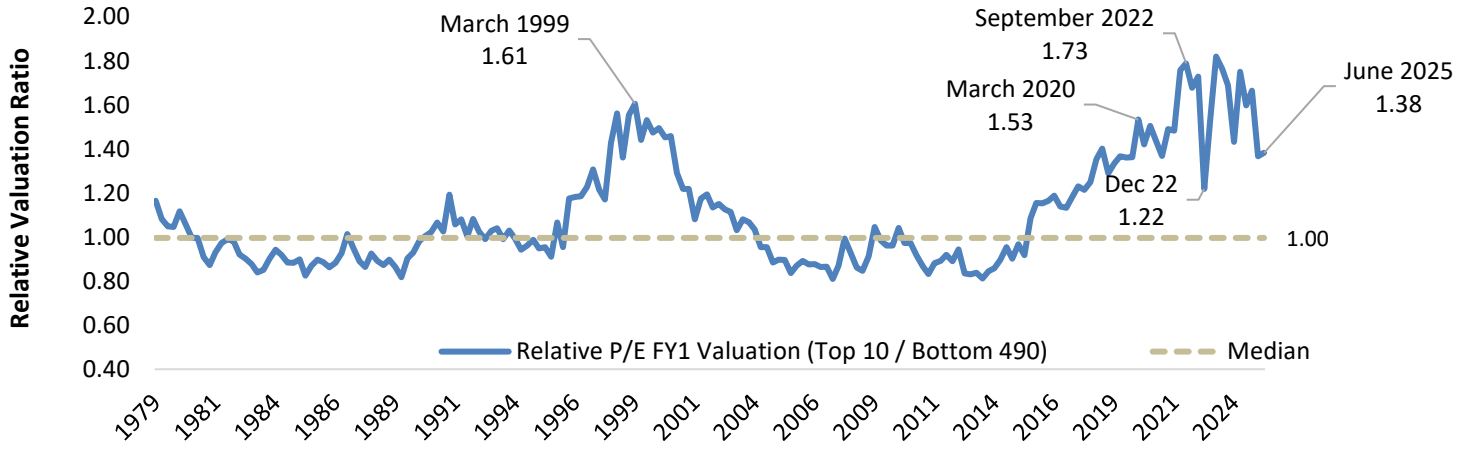
*Plug figure

APFC Public Equity is expected to outperform in most market environments.

Over the short term, APFC Public Equity could lag in significantly narrow market led by the most expensive stocks in the global equity benchmark.

In CY 2023 and CY 2024, the primary detractor to performance was the negative allocation effect, as market was led by a narrow set of expensive stocks that contributed most of the index returns.

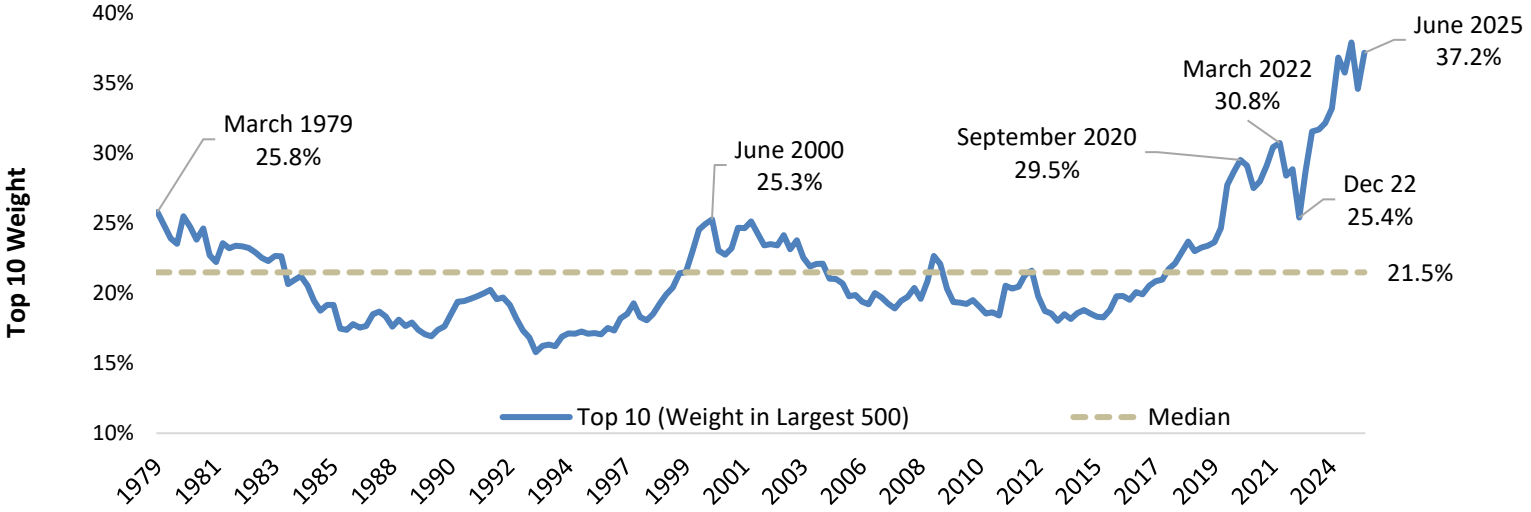
Relative Valuation of Top 10 Stocks vs. Bottom 490 in the U.S. Over Time



- **The Top 10 stocks in the U.S. are also incredibly expensive today relative to the Bottom 490 companies**
  - Historically, the Top 10 stocks and Bottom 490 trade on par with one another.
  - As of June 2025, the relative valuation ratio stands at 1.38.

Source: LSV Asset Management

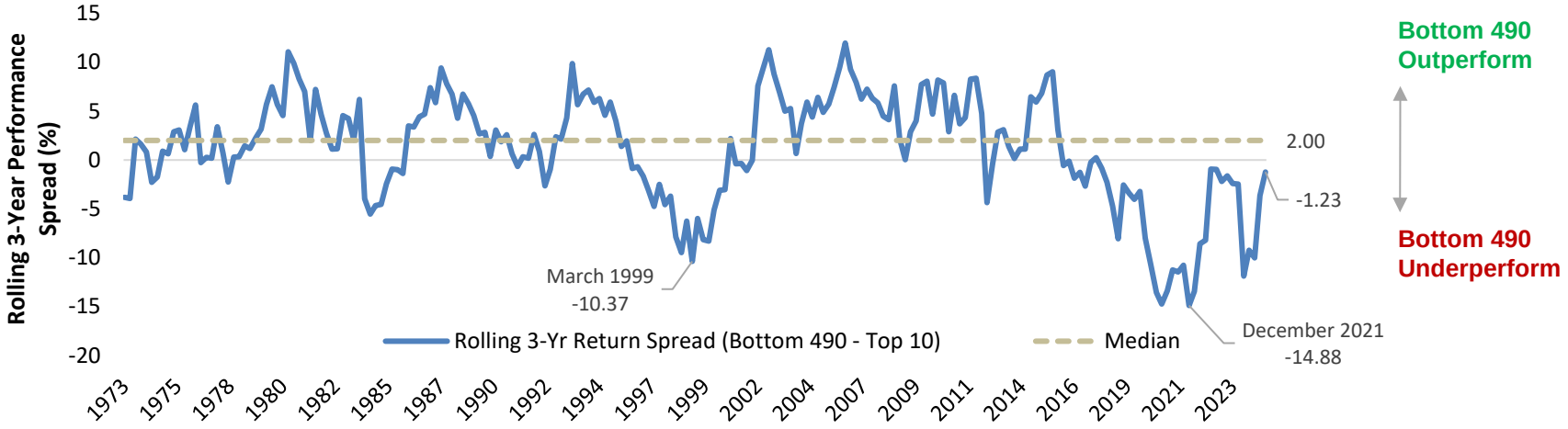
Market Concentration: Weight of Top 10 Stocks in the U.S. Over Time



- **As of June 2025, the Top 10 stocks in the U.S. represent 37.2% of the market cap of the largest 500 companies, one of the highest on record dating back to the 1970's**
  - The historical median weight of the top 10 names is 21.3%.

Source: LSV Asset Management

Performance of Top 10 Stocks in the U.S. Over Time



- **Historically, the Top 10 stocks in the U.S. have underperformed the Bottom 490 by 2.00% annualized over rolling 3-year periods (historical median)**
  - Over the past 3 years, the Top 10 stocks outperformed the Bottom 490 by 1.23% annualized.
- **It is extremely rare to find periods in which the Top 10 stocks are <u>1) highly concentrated 2) expensive and 3) have outperformed significantly over the past 3 years</u>. History would suggest that now is a good time to be contrarian.**

Source: LSV Asset Management

Internal Management Program Overview

Internal Management	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Active Allocation (Tactical Tilts)	11%	10%	11%	9%	15%	10%	9%	9%	6%	3%	0	0	0
Active Selection (Factor-based)	9%	8%	7%	6%	6%	6%	4%	4%	4%	0	0	0	0
Total Internal Assets (%)	**20%**	**18%**	**18%**	**15%**	**21%**	**16%**	**13%**	**13%**	**10%**	**3%**	**0**	**0**	**0**

APFC Internal Management

APFC Internal Management Program

Active Allocation (ETFs)

The following strategies were closed in June 2025, the assets were moved to a mix of external active and passive index managers

	Inception date	Closed	Performance History
• APF Tactical Tilts	June 2015	June 2025	10 years/Outperformed
• APF US Tactical Tilt	July 2021	June 2025	Less than 4 Yrs/Underperformed

Active Selection

Implementation of the following strategies was transitioned to SSGA		Transitioned	
• APF Domestic Low P/E	Sep 2019	June 2025	More than 5 yrs/Outperformed
• APF R1000 Low Vol	Dec 2021	June 2025	Less than 4 yrs/Underperformed
• APF R1000 Low Vol Value	Dec 2021	June 2025	Less than 4 Yrs/Underperformed

Active Allocation (Internal) – APFC Tactical Tilts (Closed June 2025)

Performance	1 Yr period ending 5/31/25	5Yr	10 Yr	SI 5/31/2015
APF Tactical Tilts	15.56%	15.20%	9.85%	9.85%
MSCI ACWI IMI	12.92%	13.10%	8.96%	8.96%
Excess Returns	**+2.64**	**+2.10%**	**+88%**	**+0.88%**

- Tactical Tilts, as the name implies, is a tactical strategy. It utilizes Exchange Traded Funds (ETFs), employs top-down allocation decisions, and has positions with time horizons anywhere from less than a month to 18 months with flexibility to hold a larger cash position when necessary.
- **Key Objective**: Achieve excess returns vs. MSCI ACWI IMI from asset allocation decisions across sectors, regions, and style factors.
- The strategy was closed in June 2025

Performance	CY Jan-May 2025	CY 2024	CY 2023	CY 2022	CY 2021	CY 2020	CY 2019	CY 2018	CY 2017	CY 2016
APF Tactical Tilts	10.37%	13.14%	14.3%	-10.9%	22.8%	27.2%	28.9%	-11.4%	21.7%	8.6%
MSCI ACWI IMI	5.06%	16.37%	21.6%	-18.4%	18.2%	16.3%	26.4%	-10.0%	24.0%	8.4%
Excess Returns	**+5.31%**	**-3.23%**	**-7.3%**	**+7.5%**	**+4.6%**	**+10.9%**	**+2.5%**	**-1.4%**	**-2.3%**	**+0.2%**

Active Selection (Internal) – APFC Domestic Low P/E – Implementation transitioned to SSGA in May 2025

Strategy	1 Yr	3 Yrs	5 Yrs	Since Inception (9/19)
APF Domestic Low P/E	12.27%	13.06%	17.98	11.34%
Russell 1000 Value	13.70%	12.76%	13.93	10.48%
Excess Returns	**-1.43%**	**+0.30%**	**+4.05%**	**+0.86%**

- First internally managed factor-based (selection) strategy.
- Opportune time to add to Deep Value style (V-G spreads became historically wide).
- Objective: Capture the Value premium within the US R1000 universe.
- All stocks are equally weighted in the portfolio.
- Implementation transitioned to State Street Global Advisers

Public Equities: Active Management – Summary

1. **Active Selection**
   - Delivered on net-of fee performance expectations over the past 13 years.
   - The most consistent source of APFC Public Equity active performance.

External Managers	2025 6/30/25	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Net Excess Returns (bps)	+47	-48	-19	+170	+96	+45	+27	-107	+123	-44	+72	-34	**+126**	**+60**

2. **Active Allocation**
   - Delivered modest underperformance underperformance over the past 5 years, owing to highly concentrated and narrow market leadership in CY 2023 and 2024, however, Valuation spreads are historically wide and have yet to revert to their means.
   - Active return profile has been volatile as valuation is not a timing tool.
   - Execution requires patience, commitment and discipline.

Active Allocation	2025 6/30/25	2024	2023	2022	2021	2020	2019	2018	2017
Excess Returns (bps)	+48	-299	-330	+224	+135	+6	-12	+8	+12

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801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT: Incentive Compensation Plan Overview ACTION:

DATE: October 2, 2025 INFORMATION: X

BACKGROUND:
Shannon McCain, APFC Director of Human Resources, will provide the Board of Trustees with an overview of the APFC Incentive Compensation Plan 2025. The Plan, last amended and approved by the Board on February 13, 2025, outlines policies and procedures for incentive compensation.

RECOMMENDATION: This item is presented for informational purposes only. No action is requested.

APFC ALASKA PERMANENT FUND CORPORATION

APFC Incentive Compensation

Shannon E. McCain, Director of Human Resources

October 2, 2025

APFC Incentive Compensation

Presentation Agenda

- Why Incentive Compensation Matters
- Overview of the APFC Incentive Compensation Plan
- Who is Eligible
- How Awards are Determined
- The Hurdle Chart Explained
- Transitional Weighting Explained

Why Incentive Compensation Matters

Benefits for APFC, staff and Fund performance

Attracting Top Talent

Investment Management is a global, highly competitive industry.

Without incentives, government funds struggle to recruit professionals who could otherwise earn multiples of their salary in the private sector.

A fair, performance-based incentive plan makes APFC competitive while still operating with transparency and accountability.

Retaining Top Talent

Institutional knowledge and continuity are critical for long term fund success.

Incentives make APFC market competitive for employees.

Aligning Staff Interests with Alaskan's Interests

Ensures accountability: no outperformance = no incentive payout.

Even small improvements in performance generate hundreds of millions in added value, far outweighing the cost of incentives.

This makes the plan an investment in stewardship, not just an expense.

Overview of the APFC Incentive Plan

Objectives

Attract and retain top talent - Reward strong long-term performance - Align staff decisions with the success of the fund - Encourage teamwork and accountability

Authority

Requires APFC Board of Trustee approved budget, appropriated by the Alaska Legislature and signed into law by the Governor of Alaska before awarding.

Any changes to the Plan must be approved by the Board before implementation.

Who is Eligible

Status
Must be a full-time employee.

Minimum length of employment:
Must be employed at least one calendar quarter.

Performance
Must be in “good standing” (overall performance rating of “meets expectations” or higher).

Years of employment
Award calculation is based on actual years employed at APFC.

How Awards are Determined
INVESTMENTS

Incentive Compensation Range
Investment staff can earn incentives from 25% to 50% of their base salary depending on their level of position, responsibility and authority.

Weighted Performance Model
Performance awards are weighted 80% on five-year results and 20% on one-year results for employees with 5+ years of service.
Performance awards between 1-4 years of service are transitionally based on years of service.

Role-based Performance Weights
Directors have an equal split in performance metrics, while Analysts emphasize asset class performance more.

Balanced Incentive Alignment
The structure ensures staff focus on both total fund success and specific asset class contributions.

How Awards are Determined (cont.)

OPERATIONS

Incentive Compensation Range

Operations staff can earn incentives from 5% to 15% of their base salary, depending on their level of position and responsibility.

Weighted Performance Model

Performance awards are weighted 80% on five-year results and 20% on one-year results for employees with 5+ years of service.

Performance awards between 1-4 years of service are transitionally weighted.

Total Fund Performance Basis – 100%

Awards are solely based on the Total Fund Performance

How Awards are Determined (cont.)

How Incentive Awards Work by Position

The chart below shows the maximum bonus each type of role can earn (as a percent of salary) and whether it is based on the Total Fund, or a mix of Fund and asset class performance.

Title	Total Fund Weight	Asset Class Weight	Percent of Salary Eligible
Chief Investment Officer	100%	0%	50%
Director – Asset Class	50%	50%	50%
Senior Portfolio Manager / Portfolio Manager	45%	55%	50%
Senior Analyst / Analyst	35%	65%	25%
Executive Director	100%	NA	At the discretion of Board
CFO, CRO, GC[1]	100%	NA	15%
Non-Investment Directors	100%	NA	15%
Trade Operations	100%	NA	7.5%
All other - Operations[2]	100%	NA	5%

**Percent of Salary Eligible column is the maximum a participant can receive.*

The Hurdle Chart Explained

The performance hurdle is the minimum amount of outperformance the Fund must achieve above its benchmark before incentive bonuses are paid.

1. If the Fund only slightly outperforms, payouts are smaller.

2. If performance is strong, payouts are larger but cannot exceed the max.

3. If the Fund underperforms or just barely meets the benchmark no bonus is earned.

Hurdle

	Outperformance	Credit
Total Fund	40 bp or more 20 b 0 bp	100% 50% 0%
Public Equities	30 bp or more 15 bp 0bp	100% 50% 0%
Fixed Income	15 bp or more 7.5 bp 0 bp	100% 50% 0%
Private Equity	70 bp or more 35 bp 0bp	100% 50% 0%
Real Estate	70 bp or more 35 bp 0 bp	100% 50% 0%
Private Income	50 bp or more 25 bp 0 bp	100% 50% 0%
Absolute Return	20 bp or more 10 bp 0 bp	100% 50% 0%

The following performance bands, weighted 80% to five-year performance and 20% weighted to one-year performance, will be applied to determine the percentages of "Total Fund Weight" and "Asset Class Weight" that each Plan Participant will be awarded:

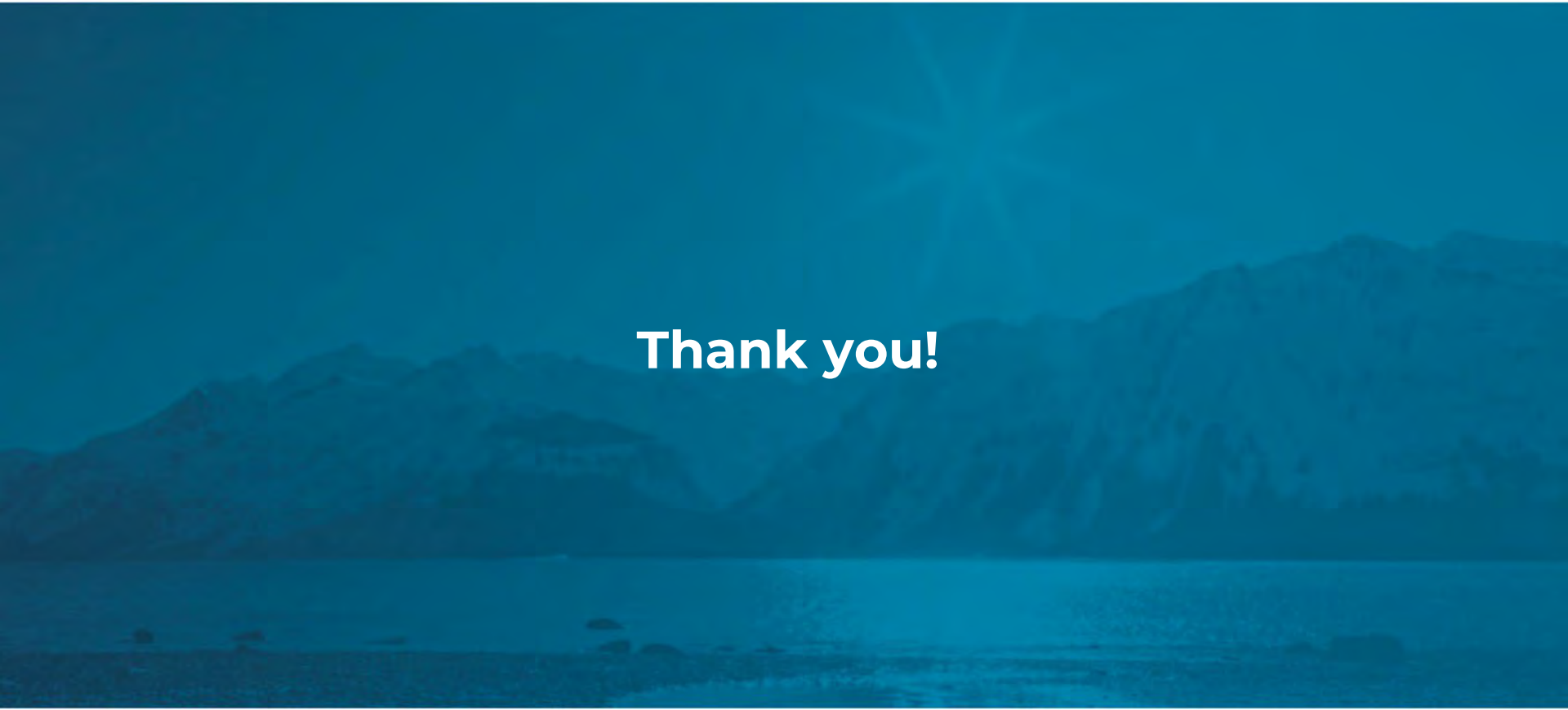
Transitional Weighting Explained

How performance periods transition between 1-4 years

Incentive compensation payments are calculated based on an employee's years of employment at APFC.

This method is a balanced approach for new staff who had no role in influencing long term performance (3-5 years. Additionally, this allows rewards to begin immediately based on results they can reasonably impact. At the same time, it gradually shifts responsibility toward long-term Fund performance as tenure increases.

Transitional Weighting - Years of Service	
Year 1	100% 1-year performance
Year 2	80% 2-year performance, 20% 1-year performance
Year 3	80% 3-year performance, 20% 1-year performance
Year 4	80% 4-year performance, 20% 1-year performance
Year 5+	Converts to standard (80% 5-year / 20% 1-year)


Thank you!

SUBJECT: Election of Corporate Officers ACTION: ____X_____

DATE: October 2, 2025 INFORMATION: _____

BACKGROUND:

Section 6 of Article II of the APFC Bylaws states that the election of the Chair and Vice Chair of the Board of Trustees shall occur at the annual meeting of the Corporation, and those officers shall hold office for one year or until their successors are elected and qualified.
In accordance with APFC Board of Trustees Charters and Governance Policy the following, the election of corporate officers and the committee assignments are noted below.

Charter of the Chair of the Board (excerpts)

1. Alaska Law, Article 01, Section 37.13.050 requires the Board of Trustees to elect a Chair annually from among its members.

2. The Chair will perform the duties and responsibilities and exercise the powers as specified below:

(a) Appoint the members of the committees of the Board and the committee chairs (other than the chair of the Governance Committee);

Charter of the Vice Chair of the Board (excerpt)

1. The Bylaws of the APFC establish the Vice Chair as an officer of the Board. The Vice Chair is elected annually.

Charter of the Governance Committee of the Board (excerpt)

2. The Vice Chair of the Board will serve as the Chair of the Governance Committee. The Vice Chair may act on behalf of the Governance Committee in performing the following duties with the approval of the full Board.

Charter of the Audit Committee of the Board (excerpt)

7. The Committee will consist of at least three Trustees, each of whom must have a basic understanding of finance and accounting and be able to read and understand financial statements.

RECOMMENDATION:

- Elect a Board of Trustees Chair
- Elect a Board of Trustees Vice-Chair
- Vice Chair to serve as Chair of the Governance Committee
- Chair to Appoint at least two additional Trustees to the Governance Committee
- Chair to Appoint at least three Trustees to the Audit Committee

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801 W 10TH SUITE 302 | JUNEAU, AK 99801
907.796.1500 | apfc.org

SUBJECT: Board of Trustees Meeting Calendar ACTION: X

DATE: October 2, 2025 INFORMATION:

BACKGROUND:

APFC's Board of Trustees holds quarterly and regular meetings to review and evaluate the investment performance of the portfolio, the asset allocation and investment risk of the Fund, and the compliance program in relation to applicable laws, regulations, and governance policies. Special meetings of the Board of Trustees are scheduled as required.

The 2026 Board of Trustees Meeting schedule has been previously approved, however, there are suggested changes to review. Please note that the December 2025 Quarterly Board Meeting will be held December 9-10 in Juneau, in person optional. Attached are the calendars for your information, please mark your schedules.

RECOMMENDATION:

- Review and approve suggested changes to the 2026 Board of Trustees Meeting Schedule
- Approve 2027 Board of Trustees Meeting Schedule

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801 W 10TH SUITE 302 | JUNEAU, AK 99801
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2026 ADOPTED BOARD OF TRUSTEES MEETING CALENDAR

With possible changes in red

Date	Location	Type of Meeting	Recurring Topics
February 11-12, 2026 Wed/Thurs NEW PROPOSED DATES February 25-26 Wed/Thurs Allows for more time from the quarter end (December 31) to prepare materials for this meeting	Juneau	Quarterly	• CEO/CIO/CRO/COO reports • Performance for quarter ending 12/31 update • Asset class update/review TBD • Opportunity to discuss CIO recommendations and provide input/concerns. • Legislative update – Opportunity for Board to weigh in on legislative strategy, pending legislation affecting APFC, or process. • Discuss Investment policy ahead of May meeting, final discussion before the revised policy is provided in May.
May 27-28, 2026 Wed/Thurs	Valdez	Regular Ethics, Audit & Cybersecurity Committee	• CEO/CIO/CRO/COO reports • Investment Policy review and adoption – policy is functionally finalized • Legislative update/end of session review • Asset class update/review TBD • Performance for quarter ending 3/31 – Callan • Budget review • Private markets pacing approval • Review YTD financials and coming year audit plan
September 2, 2026 Wednesday	Juneau Potentially Virtual	Ethics, Audit & Cybersecurity Committee* Regular Meeting (Budget Session)	• Review audit and audit process • Budget Discussion ahead of annual meeting ask for adjustment to budget to meet goals • Potentially approve audit and budget

September 23-24, 2026 Wed/Thurs Potential to move this meeting to the following week 9-30 to 10-1	Anchorage NEW PROPOSED LOCATION Nome	Annual Meeting	• CEO/CIO/CRO/COO reports • Performance for FY end 6/30 - Callan • Asset Class Update/Review TBD • Election of Corporate Officers – Chair and Vice-Chair • If earlier date - Approve annual audit • If earlier date - Budget approval – This is the budget that will be submitted to the Governor's Office for consideration. • Calendar of meetings for next two years
December 9-10, 2026 Wed/Thurs	Juneau In-Person Optional	Regular	• CEO/CIO/CRO/COO reports • Performance for quarter end 9/30 - Callan • CEO Evaluation – Chair coordinates – executive session • Asset class update/review TBD

Committee Meetings and Special or additional APFC board meetings will be scheduled as needed.

*The Ethics, Audit & Cybersecurity Committee Meeting must be scheduled in advance to coordinate with the release date for the Audited Statements and the Annual Report as required in statute.

Standard Topics for Quarterly Meetings include Callan Updates and Asset Class Updates. Asset Class Updates are scheduled throughout the year and will rotate through the Asset Classes

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2027 PROPOSED BOARD OF TRUSTEES MEETING CALENDAR

Date	Location	Type of Meeting	Recurring Topics
February 24-25, 2027 Wed/Thurs	Juneau	Quarterly	• CEO/CIO/CRO/COO reports • Performance for quarter ending 12/31 update • Asset class update/review TBD • Opportunity to discuss CIO recommendations and provide input/concerns. • Legislative update – Opportunity for board to weigh in on Legislative Strategy, pending legislation affecting APFC, or process. • Discuss Investment Policy ahead of May meeting, final discussion before the revised policy is provided in May.
May 26-27, 2027 Wed/Thurs	Anchorage	Regular Ethics, Audit & Cybersecurity Committee	• CEO/CIO/CRO/COO reports • Investment policy review and adoption – policy is functionally finalized • Legislative update/end of session review • Asset class update/review TBD • Performance for quarter ending 3/31 – Callan • Budget review • Private markets pacing approval • Review YTD financials and coming year audit plan
September 1, 2027 Wednesday	Juneau	Ethics, Audit & Cybersecurity Committee* Regular Meeting (Budget Session)	• Review Audit Process • Budget Discussion ahead of annual meeting ask for adjustment to budget to meet goals • Potentially approve audit and budget

September 29-30, 2027 Wed/Thurs	Anchorage	Annual Meeting	• CEO/CIO/CRO/COO reports • Performance for FY end 6/30 - Callan • Asset class update/review TBD • Election of Corporate Officers – Chair and Vice-Chair • Report of annual audit • Budget approval – This is the budget that will be submitted to the Governor's Office for consideration. • Calendar of meetings for next two years
December 8-9, 2027 Wed/Thurs	Juneau	Regular	• CEO/CIO/CRO/COO reports • Performance for quarter end 9/30 - Callan • CEO Evaluation – Chair coordinates – executive session • Asset Class Update/Review TBD

Committee Meetings and Special or additional APFC board meetings will be scheduled as needed.

*The Ethics, Audit & Cybersecurity Committee Meeting must be scheduled in advance to coordinate with the release date for the Audited Statements and the Annual Report as required in statute.

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