



## Investment Advisory Committee (IAC) Meeting

Wednesday, 11/6/2024  
9:00 AM - 12:30 PM ET

### 1. Approval of Minutes (August 14, 2024)

*IAC Meeting Minutes 08142024 - Final - Page 2*

### 2. CIO Report

*CIO Report - November 2024 - Page 6*

*Performance Summary 08-31-2024 - Page 14*

*Asset Allocation Report - August 2024 - Page 15*

*Daily Asset Allocation Report 10-30-2024 - Page 16*

*New Investments and Terminations 11-06-2024 - Page 17*

### 3. Global Equity Benchmarking

*Global Equity Benchmarking, 103124 - Page 18*

*RBA - Approve Policy Related to Certain Foreign Investments, 103124 - Page 39*

### 4. Asset Allocation Scenario Analysis

*IAC Scenario Analyses 2024 110124 - Page 41*

### 5. Risk and Liquidity Analyses – Scenarios

*Risk and Liquidity Analyses - Scenarios, 103124 - Page 57*

### 6. Asset Allocation Glide Path Update

*Asset Allocation Glide Path Update, 102924 - Page 74*

### 7. Private Market Program Reviews

*Private Markets Overview, 103124 - Page 81*

*Real Assets, 110124 - Page 91*

*Private Equity, 103124 - Page 110*

*Credit Strategies, 103124 - Page 131*

*Private Investment Partnerships, 103024 - Page 149*

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## Minutes

A meeting of the Investment Advisory Committee of the Virginia Retirement System was held on August 14, 2024 with the following members present:

Larry Kochard  
Michael Beasley  
Theodore Economou, joined remotely under § 2.2-3708.3(B)(3)  
Palmer Garson  
Nancy Leake  
Bryan Lewis  
Rod Smyth  
Hance West

The following Board members were present:

A. Scott Andrews (remote)  
John Bennett (remote)  
Lawrence Bernert  
Michael Disharoon  
Jessica Hood  
Matthew James

The following staff members were in attendance:

Trish Bishop, Andrew Junkin, Stephen Adelaar, John Alouf, Advait Apte, Rory Badura, Parham Behrooz, Brock Bell, Matt Bennett, Lee Buchanan, Warren Chang, Jeanne Chenault, Michael Cooper, Perry Corsello, Sara Denson, Laurie Fennell, Laura Fields, Antonio Fisher, Kenneth Fleming, Josh Fox, Holly Glass, Katherine Grawe, JT Grier, Mehtab Haleem, Greg Hines, K.C. Howell, Ross Kasarda, Jennifer Kazzie, Jeannie Kim, Kristina Koutrakos, Matt Lacy, Vu Le, Chung Ma, Jennifer MacKnight, Curt Mattson, Scott Mootz, Teresa Nguyen, Walker Noland, Greg Oliff, Jeffery Pereira, Steven Peterson, Vera Pleasants, Laura Pugliese, Shawn Rabalais, Mark Rein, Daniel Schlussler, Michael Scott, Larry Tentor, Korey Turner, Daniel Whitlock, and Steve Woodall.

Also in attendance were Lauren Albanese with Financial Investment News; Harrison Bader with BlackRock; Zach Borgerding, Justin Ferrell, and Erin Shell of the Virginia Auditor of Public Accounts; Doston Bradley of Cerberus Capital; Alfie Crooks with PEI Group; Cyril Espanol of Pageant Media; Mitchell King with BlackRock; Justin Mitchell with Financial Investment News; Alec Ostrowidzki with Goldman Sachs; Katharine Smith

with Financial Investment News, and Spencer Witherspoon with Shenkman Capital Management.

Mr. Kochard called the meeting to order at 8:59 a.m.

Mr. Kochard announced that Mr. Economou would be participating remotely in accordance with § 2.2-3708.3 (B)(3) of the Code of Virginia.

Mr. Kochard took a roll call of each Committee member for attendance purposes:

Mr. Beasley – present  
Mr. Economou – present  
Ms. Garson – present  
Mr. Gayner – not present  
Ms. Leake – present  
Mr. Lewis – present  
Mr. Smyth – present  
Mr. West – present  
Mr. Kochard – present

#### **Minutes**

A motion was made by Mr. Kochard and seconded by Mr. Beasley to approve minutes for the April 10, 2024 Committee meeting. The motion was unanimously approved via roll call:

Mr. Beasley – aye  
Mr. Economou – aye  
Ms. Garson – aye  
Ms. Leake – aye  
Mr. Lewis – aye  
Mr. Smyth – aye  
Mr. West – aye  
Mr. Kochard – aye

#### **Charter Review**

Mr. Cotter, Director of Legislative and Government Affairs, discussed proposed updates on changes being made to the Investment Advisory Committee charter. A motion was made by Mr. Smyth and seconded by Ms. Leake to approve the changes to the Committee Charter. The motion was unanimously approved via roll call:

Mr. Beasley – aye  
Mr. Economou – aye  
Ms. Garson – aye  
Ms. Leake – aye  
Mr. Lewis – aye  
Mr. Smyth – aye  
Mr. West – aye  
Mr. Kochard – aye

**CIO Report**

Mr. Junkin opened his CIO report by commenting on current market conditions. Mr. Junkin then discussed asset allocation, total fund performance, and tracking error. Last, Mr. Junkin reviewed the New Investments and Terminations Report.

Mr. Beasley commented and wanted it noted that credit should be given to all VRS associates that have done the work to get the investment returns that Mr. Junkin presented today.

**Portfolio Solutions  
Group Review**

Mr. Ma provided an overview of the Portfolio Solutions Group and also introduced Mr. Bell and Mr. Mootz, new hires to the group.

Mr. Apte provided a review of the State Plans' forward returns summary, external manager's forward returns comparison, VRS's long term forward returns, and forward returns attribution.

Mr. Mootz provided an overview of Risk Management at VRS. Review topics included an overview of the team, objectives, keys to success, philosophy, looking forward, and a case study.

Mr. Lacy provided a review of the Portfolio Integration and Treasury team. Review topics included reasons to deploy leverage and current funding channels. Mr. Bell provided a review of Treasury enhancements, potential future funding sources, and additional Treasury initiatives in progress.

Mr. Kasarda and Ms. Koutrakos provided a program overview of Diversifying Strategies and discussed the program evolution and objectives. Review topics included an overview of the team, objectives, performance, and looking forward.

Ms. Grawe provided an overview of the Exposure Management Portfolio. Review topics included objectives, investment criteria, diligence framework, and keys to success.

The Committee members engaged in general discussion throughout the presentation.

**Adjournment**

Mr. Beasley made a motion to adjourn the meeting. Mr. West seconded the motion. Mr. Kochard asked for the Committee members to vote on the motion, the motion was unanimously approved via roll call:

Mr. Beasley – aye  
Mr. Economou – aye  
Ms. Garson – aye  
Ms. Leake – aye  
Mr. Lewis – aye  
Mr. Smyth – aye  
Mr. West – aye  
Mr. Kochard – aye

The meeting was adjourned at 12:07 p.m.

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Larry Kochard, Chairperson



# Chief Investment Officer Report

Market Review – November 2024  
Andrew Junkin

# Forward (implied) vs Fed Fund (target)

Effective Date  
To 9/30/2024 12:00:00 AM

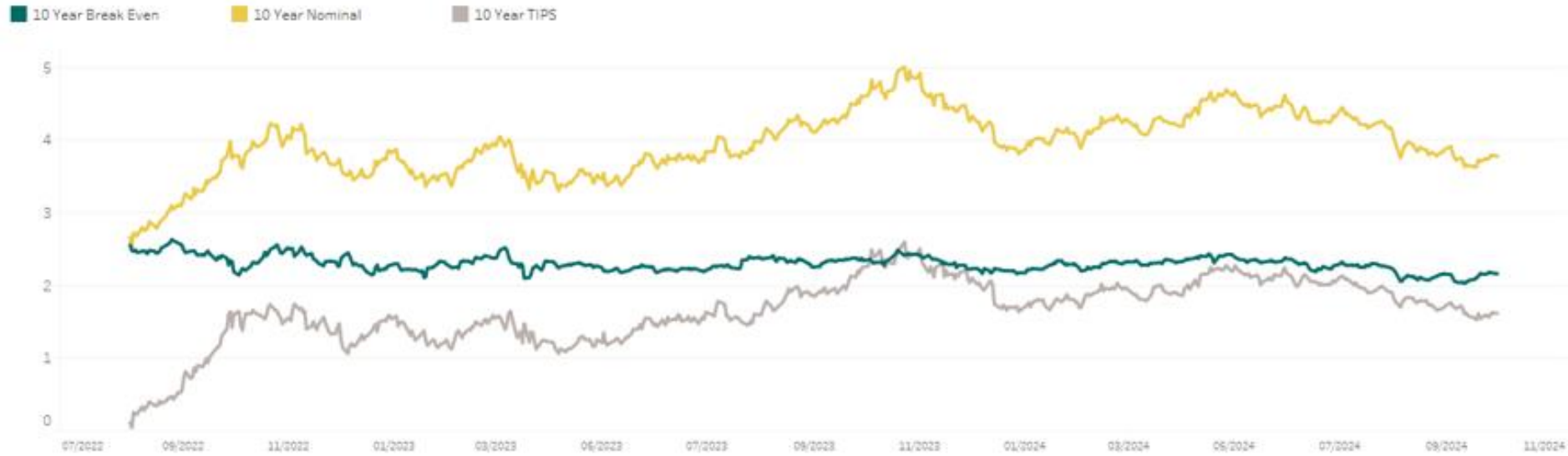


Data Source: Bloomberg

\*\* Implied curve replaced with Dec 2024 Index which started in June 2023.

# Rate Moves (10Y Nominal, Real & BEI)

Effective Date  
To 9/30/2024 12:00:00 AM



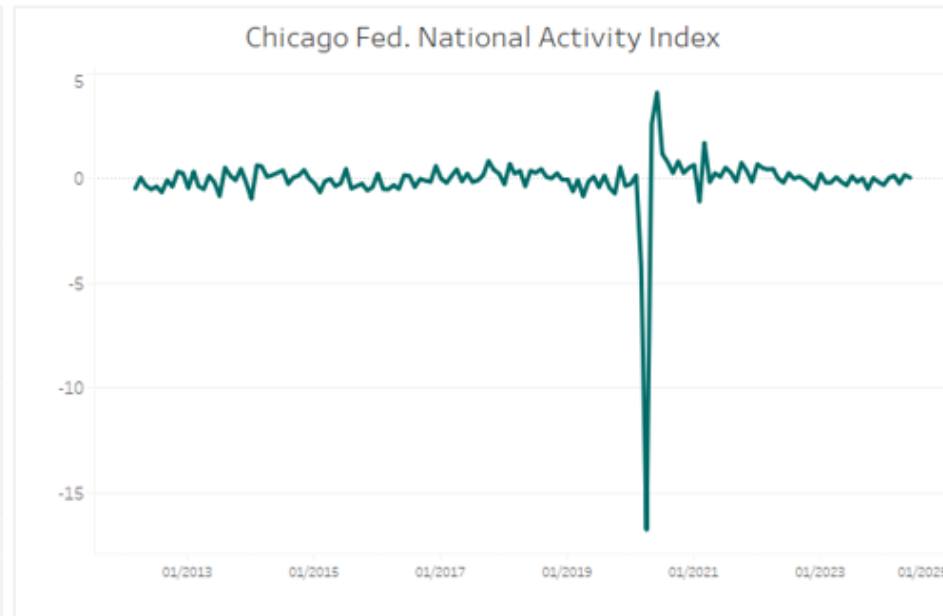
Data Source: Bloomberg

\*\* Implied curve replaced with Dec 2024 Index which started in June 2023.



# Economic Growth - Quarterly

EffectiveDate  
To 6/30/2024 12:00:00 AM



Data Source: Bloomberg

# Inflation & Employment

Effective Date  
To 9/30/2024 12:00:00 A..

10 Year BE    Headline CPI    Core



Job Growth/Loss    Unemployment Rate



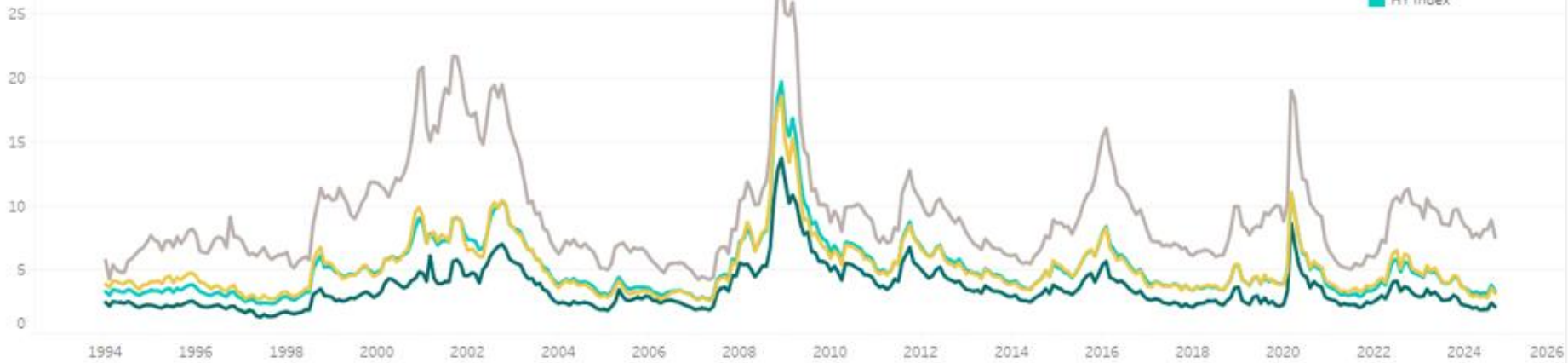
Data Source: Bloomberg

# High Yield Bond Market

Effective Date  
To 9/30/2024 12:00:00..

Fixed Income Option Adjusted Spread(%)

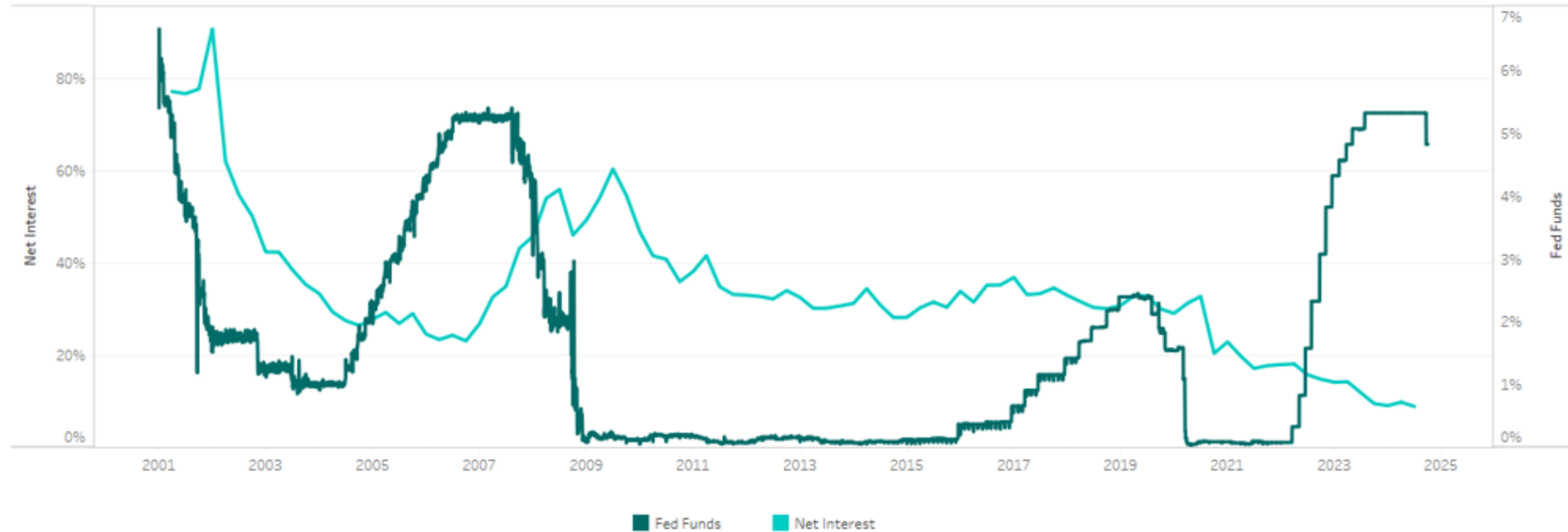
B  
BA  
CAA  
HY Index



Data Source: Bloomberg

# Corporate Net Interest as % of After Tax NIPA Profits

Effective Date  
To 9/30/2024 12:00:00 AM

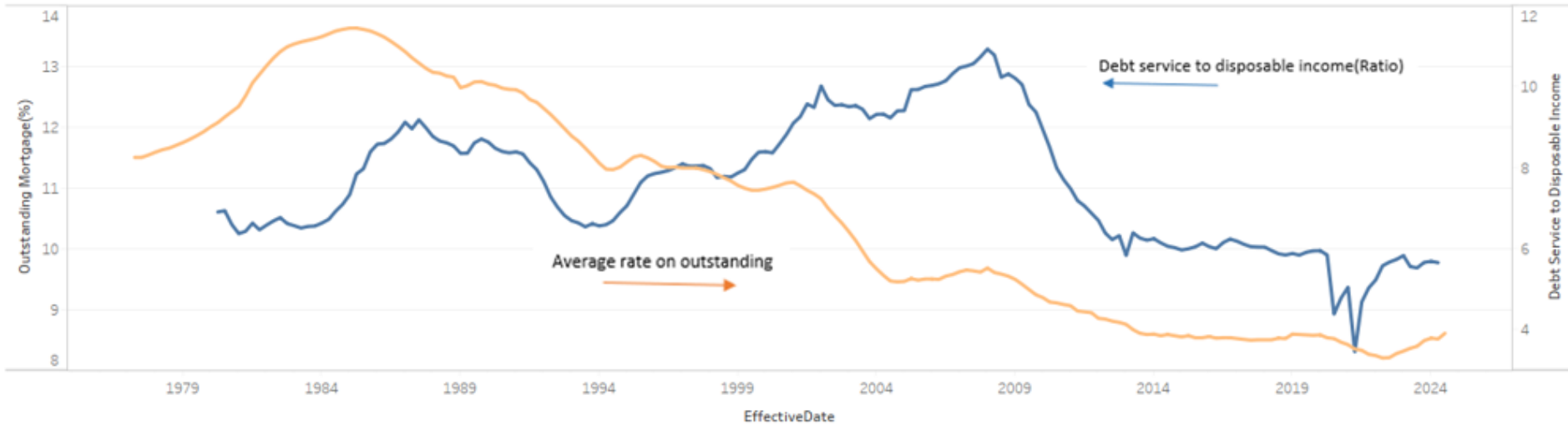


Data Source: Bloomberg

# US Household Debt

EffectiveDate  
To 9/30/2024 12:00:00 AM

## US Household Debt



Data Source: Bloomberg

**PERFORMANCE SUMMARY**  
**Rolling Periods Ending**  
**August 31, 2024**



**TOTAL FUND PERFORMANCE**  
*(Net of Fees)*

	10 Yr	5 Yr	3 Yr	1 Yr	Qtr	Month	Fiscal YTD	Cal YTD	Market Value (\$MM)
<b>Total Public Equity</b>	<b>8.9</b>	<b>12.1</b>	<b>6.4</b>	<b>24.8</b>	<b>5.5</b>	<b>2.5</b>	<b>4.6</b>	<b>16.5</b>	<b>38,612</b>
<i>Benchmark</i>	9.0	12.0	5.6	23.2	7.1	2.8	5.3	15.5	
<b>Total Private Equity</b>	<b>14.4</b>	<b>15.8</b>	<b>10.3</b>	<b>6.0</b>	<b>1.2</b>	<b>0.0</b>	<b>0.1</b>	<b>3.9</b>	<b>19,065</b>
<i>Benchmark</i>	11.3	12.9	5.3	25.1	4.2	4.6	0.8	22.2	
<b>Total Real Assets</b>	<b>8.2</b>	<b>6.1</b>	<b>6.1</b>	<b>-2.9</b>	<b>-0.3</b>	<b>0.1</b>	<b>0.2</b>	<b>-2.3</b>	<b>14,272</b>
<i>Benchmark</i>	5.9	3.6	2.5	-4.9	-0.1	0.0	0.1	-3.7	
<b>Total Credit Strategies</b>	<b>6.1</b>	<b>7.4</b>	<b>6.2</b>	<b>11.6</b>	<b>2.7</b>	<b>0.3</b>	<b>0.8</b>	<b>5.9</b>	<b>17,206</b>
<i>Benchmark</i>	5.0	5.2	4.7	11.1	3.0	1.1	2.3	5.9	
<b>Total Diversifying Strategies</b>	<b>n/a</b>	<b>5.5</b>	<b>3.4</b>	<b>7.8</b>	<b>-1.6</b>	<b>-0.1</b>	<b>-0.8</b>	<b>4.6</b>	<b>3,835</b>
<i>Benchmark</i>	n/a	5.4	2.3	9.5	1.9	0.7	1.3	5.3	
<b>Total Private Investment Partnerships</b>	<b>n/a</b>	<b>9.8</b>	<b>9.3</b>	<b>9.5</b>	<b>3.2</b>	<b>1.1</b>	<b>1.1</b>	<b>5.6</b>	<b>2,365</b>
<i>Benchmark</i>	n/a	7.9	4.8	9.5	2.3	1.9	1.1	7.4	
<b>Total Fixed Income</b>	<b>2.5</b>	<b>1.2</b>	<b>-1.4</b>	<b>8.4</b>	<b>5.1</b>	<b>1.6</b>	<b>3.9</b>	<b>3.9</b>	<b>17,375</b>
<i>Benchmark</i>	1.7	0.2	-1.9	7.8	4.8	1.5	3.8	3.4	
<b>Total Fund</b>	<b>7.8</b>	<b>9.2</b>	<b>5.8</b>	<b>11.9</b>	<b>3.0</b>	<b>1.1</b>	<b>2.2</b>	<b>7.3</b>	<b>115,406</b>
<i>VRS Custom Benchmark</i>	6.9	7.9	4.0	14.3	4.3	2.1	2.9	9.7	

Effective July 2013, the VRS Custom Benchmark is a blend of the Asset Class Benchmarks at policy weights.

Effective January 2024, the Total Fund includes leverage.

The VRS Cash Account, the Treasurer Short-Term Investment Account, the VRS Rebalancing Account, transition activity and accounts with market values of less than \$1 million are included in the Total Fund's market value. Differences in market value totals are due to rounding.

**Leverage Cost Measurement Information**

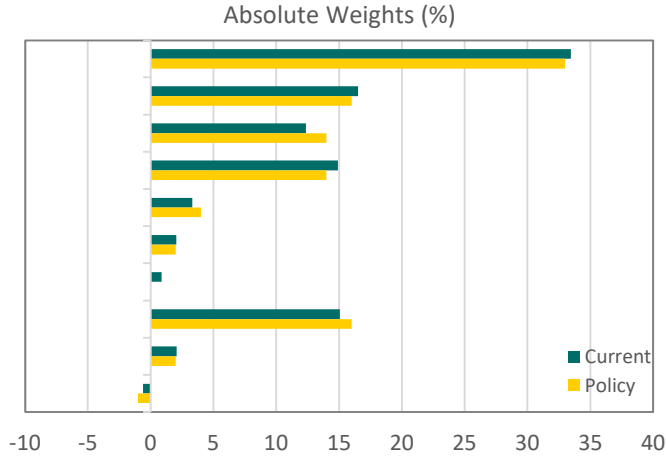
*(Information provided for purposes of monitoring the cost effectiveness of leverage implementation.)*

	10 Yr	5 Yr	3 Yr	1 Yr	Qtr	Month	Fiscal YTD	Cal YTD	Market Value (\$MM)
<b>Leverage</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>1.6</b>	<b>0.6</b>	<b>1.1</b>	<b>n/a</b>	<b>(704)</b>
<i>Benchmark</i>	n/a	n/a	n/a	n/a	1.5	0.5	1.0	n/a	

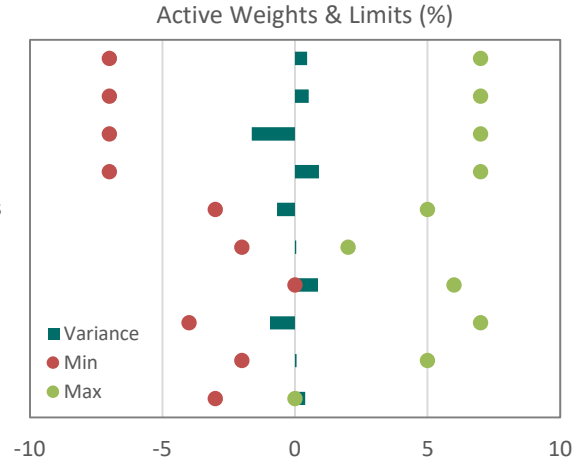
Effective January 2024, the Leverage Custom Benchmark is the Secured Overnight Financing Rate (SOFR) plus 50 basis points per annum.

# Asset Allocation Report

## August 31, 2024



Public Equity  
Private Equity  
Real Assets  
Credit Strategies  
Diversifying Strategies  
PIP  
EMP  
Fixed Income  
Cash  
Leverage



Tracking Error (%)	
5Yr Fund	2.3
5Yr Public	1.7

Asset Class	Billions (\$)	Weights (%)					
		Current	Policy	Variance	Min	Max	Internal
Public Equity	38.6	33.5	33.0	0.5	26	40	51
Private Equity	19.1	16.5	16.0	0.5	9	23	0
Real Assets	14.3	12.4	14.0	-1.6	7	21	0
Credit Strategies	17.2	14.9	14.0	0.9	7	21	0
Diversifying Strategies	3.8	3.3	4.0	-0.7	1	9	0
Private Investment Partnerships (PIP)	2.4	2.0	2.0	0.0	0	4	0
Exposure Management Portfolio (EMP)	1.0	0.9	0.0	0.9	0	6	0
Fixed Income	17.4	15.1	16.0	-0.9	12	23	95
Cash	2.4	2.1	2.0	0.1	0	7	0
Leverage	-0.7	-0.6	-1.0	0.4	-3	0	0
<b>Total Fund (Net Market Value)</b>	<b>115.4</b>	<b>100.0</b>	<b>100.0</b>	<b>0.0</b>	<i>n.a.</i>	<i>n.a.</i>	<b>31</b>
Total Fund (Gross Market Value)	116.1	100.6	101.0	-0.4	<i>n.a.</i>	<i>n.a.</i>	0

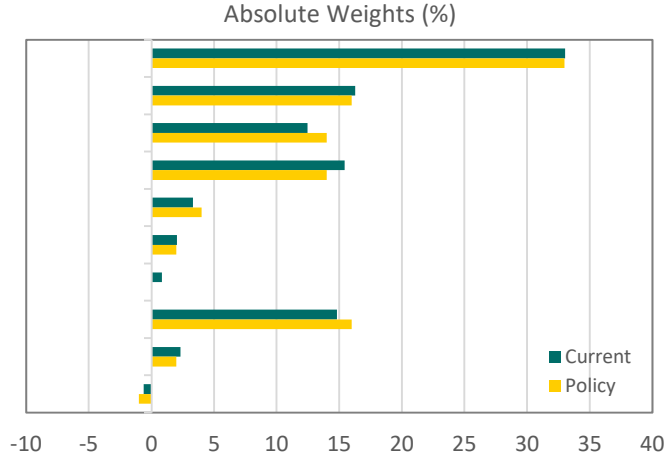
### Exposures by Policy Groups

Public + Private Equity	57.7	50.0	49	1.0	39	59	<i>n.a.</i>
Fixed Income + Cash	19.8	17.1	18	-0.9	12	27	<i>n.a.</i>

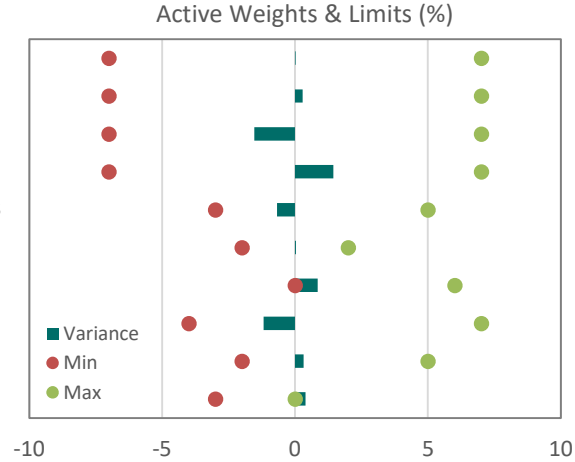
- Total Fund includes the following amount held by the Treasurer of VA: \$ 58 million
- The values shown for each asset class on this report may reflect adjustments related to derivative positions in the Rebalance Account, pending transactions and certain accruals, in order to provide a more descriptive representation of the true economic exposure to each asset class (0 adjustments applied)
- The VRS Defined Benefit Plan Investment Policy Statement established the total fund tracking error range as the allowable observed tracking error calculated quarterly using 5 years of history as of 06/30/2024.
- Differences in totals are due to rounding

# Daily Asset Allocation Report

October 30, 2024



Public Equity  
Private Equity  
Real Assets  
Credit Strategies  
Diversifying Strategies  
PIP  
EMP  
Fixed Income  
Cash  
Leverage



Tracking Error (%)	
5Yr Fund	2.4
5Yr Public	1.7

Asset Class	Billions (\$)	Weights (%)					
		Current	Policy	Variance	Min	Max	Internal
Public Equity	38.4	33.0	33.0	0.0	26	40	50
Private Equity	18.9	16.3	16.0	0.3	9	23	0
Real Assets	14.5	12.5	14.0	-1.5	7	21	0
Credit Strategies	17.9	15.4	14.0	1.4	7	21	0
Diversifying Strategies	3.9	3.3	4.0	-0.7	1	9	0
Private Investment Partnerships (PIP)	2.4	2.0	2.0	0.0	0	4	0
Exposure Management Portfolio (EMP)	1.0	0.9	0.0	0.9	0	6	0
Fixed Income	17.2	14.8	16.0	-1.2	12	23	95
Cash	2.7	2.3	2.0	0.3	0	7	0
Leverage	-0.7	-0.6	-1.0	0.4	-3	0	0
<b>Total Fund (Net Market Value)</b>	<b>116.2</b>	<b>100.0</b>	<b>100.0</b>	<b>0.0</b>	<i>n.a.</i>	<i>n.a.</i>	<b>31</b>
Total Fund (Gross Market Value)	116.9	100.6	101.0	-0.4	<i>n.a.</i>	<i>n.a.</i>	0

### Exposures by Policy Groups

Public + Private Equity	57.3	49.3	49	0.3	39	59	<i>n.a.</i>
Fixed Income + Cash	19.9	17.2	18	-0.8	12	27	<i>n.a.</i>

- Total Fund includes the following amount held by the Treasurer of VA: \$ 383 million
- The values shown for each asset class on this report may reflect adjustments related to derivative positions in the Rebalance Account, pending transactions and certain accruals, in order to provide a more descriptive representation of the true economic exposure to each asset class (0 adjustments applied)
- The VRS Defined Benefit Plan Investment Policy Statement established the total fund tracking error range as the allowable observed tracking error calculated quarterly using 5 years of history as of 6/30/2024
- Differences in totals are due to rounding



**VRS Investment Department**  
 Recap of New Investments/Terminations  
 Time Period: 08/15/2024 – 11/06/2024



<b>Program</b>	<b>Action</b>	<b>Effective Date</b>	<b>Commitment/ Current Value</b>	<b>Funding/ Defunding Period</b>	<b>Description</b>
Real Assets	Hired	08/19/2024	\$200 Million	1 year	<b>MV Real Estate SMA I</b> – A closed-end, separately managed account focused on core real estate in select global gateway cities.
Real Assets	Hired	09/26/2024	\$200 Million	3 years	<b>AML Residential III</b> - A joint venture with an experienced apartment operator focused on core, class A properties in select target markets in the U.S.
Diversifying Strategies	Hired	09/20/2024	\$37.5 Million	Immediate	<b>NISA Alpha Strategies</b> – A multi-asset absolute return strategy.
Credit Strategies	Hired	09/24/2024	\$500 Million	3 years	<b>Apollo Libra</b> – A closed-end, separately managed account focused on opportunistic credit.
Private Equity	Hired	09/10/2024	\$300 Million	6 years	<b>Trident X</b> - A large buyout fund with a focus on the global financial services industry.



# Global Equity Benchmarks

Andrew Junkin  
Chief Investment Officer

November 6, 2024

# Code of Federal Regulations - Foreign Adversaries

- The Secretary of Commerce has defined a foreign adversary as “any foreign government or foreign non-government person determined by the Secretary to have engaged in a long-term pattern or serious instances of conduct significantly adverse to the national security of the United States or security and safety of United States persons”
- Currently, the Secretary has determined the following to be foreign adversaries:
  1. The People's Republic of China, including the Hong Kong Special Administrative Region (China);
  2. Republic of Cuba (Cuba);
  3. Islamic Republic of Iran (Iran);
  4. Democratic People's Republic of Korea (North Korea);
  5. Russian Federation (Russia); and
  6. Venezuelan politician Nicolás Maduro (Maduro Regime).

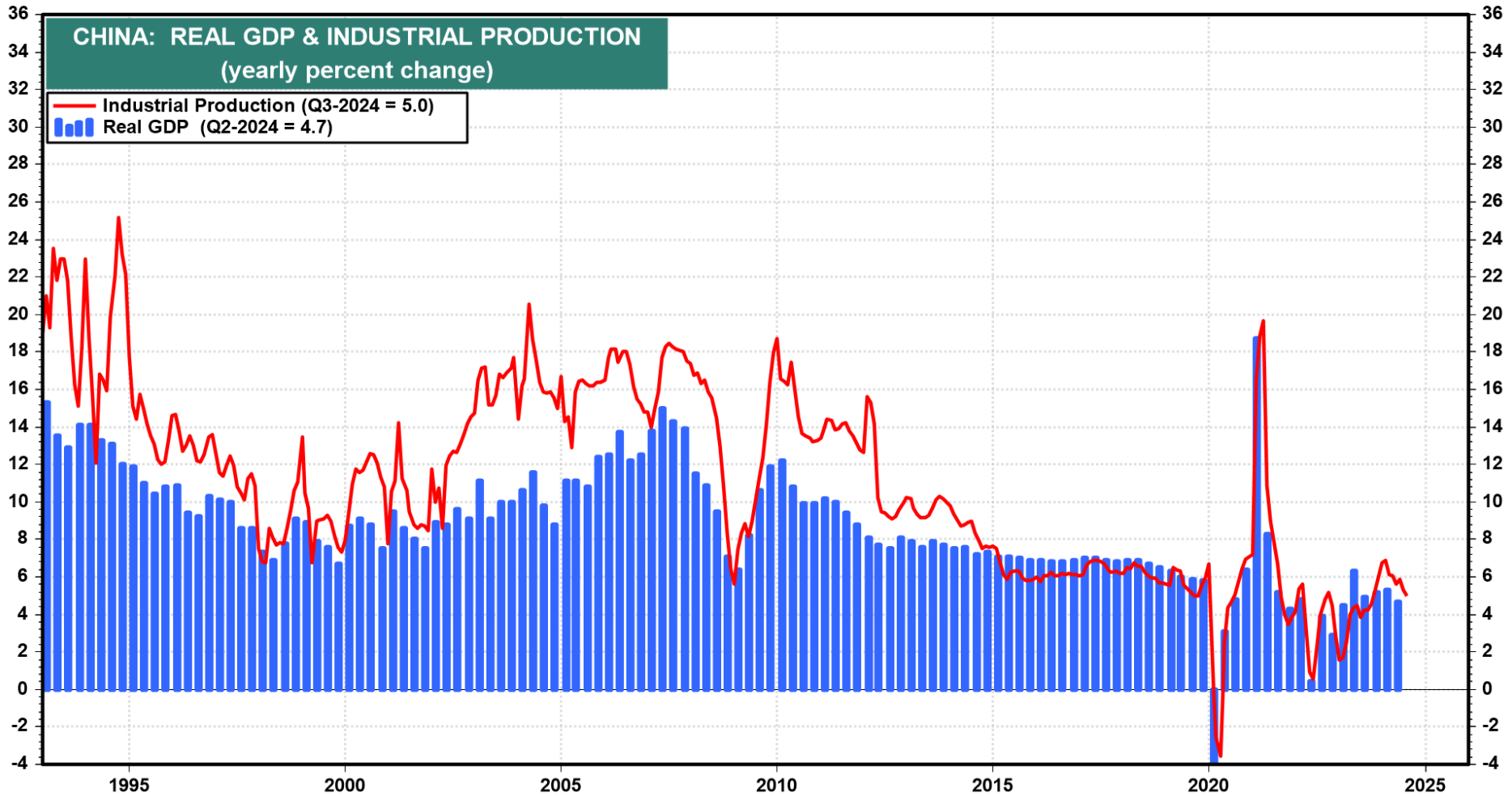
# Existing Exposure

	Exposure as of June 30, 2024 (000s)			Notes
	Private Markets	Public Markets	Total	
China (including Hong Kong)	\$ 759,095	\$ 1,385,409	\$ 2,144,334	Adjusted in total due to \$170mm notional short in certain strategies
Russia	\$ -	\$ 1,912	\$ 1,912	Non liquid due to ongoing sanctions
Cuba	\$ -	\$ -	\$ -	
North Korea	\$ -	\$ -	\$ -	
Iran	\$ -	\$ -	\$ -	
Venezuela	\$ -	\$ 6,408	\$ 6,408	Not on foreign adversaries list, not Maduro regime
Total Exposure	\$ 759,095	\$ 1,393,729	\$ 2,152,654	
Percent of Total Fund			1.9%	

# Existing Exposure

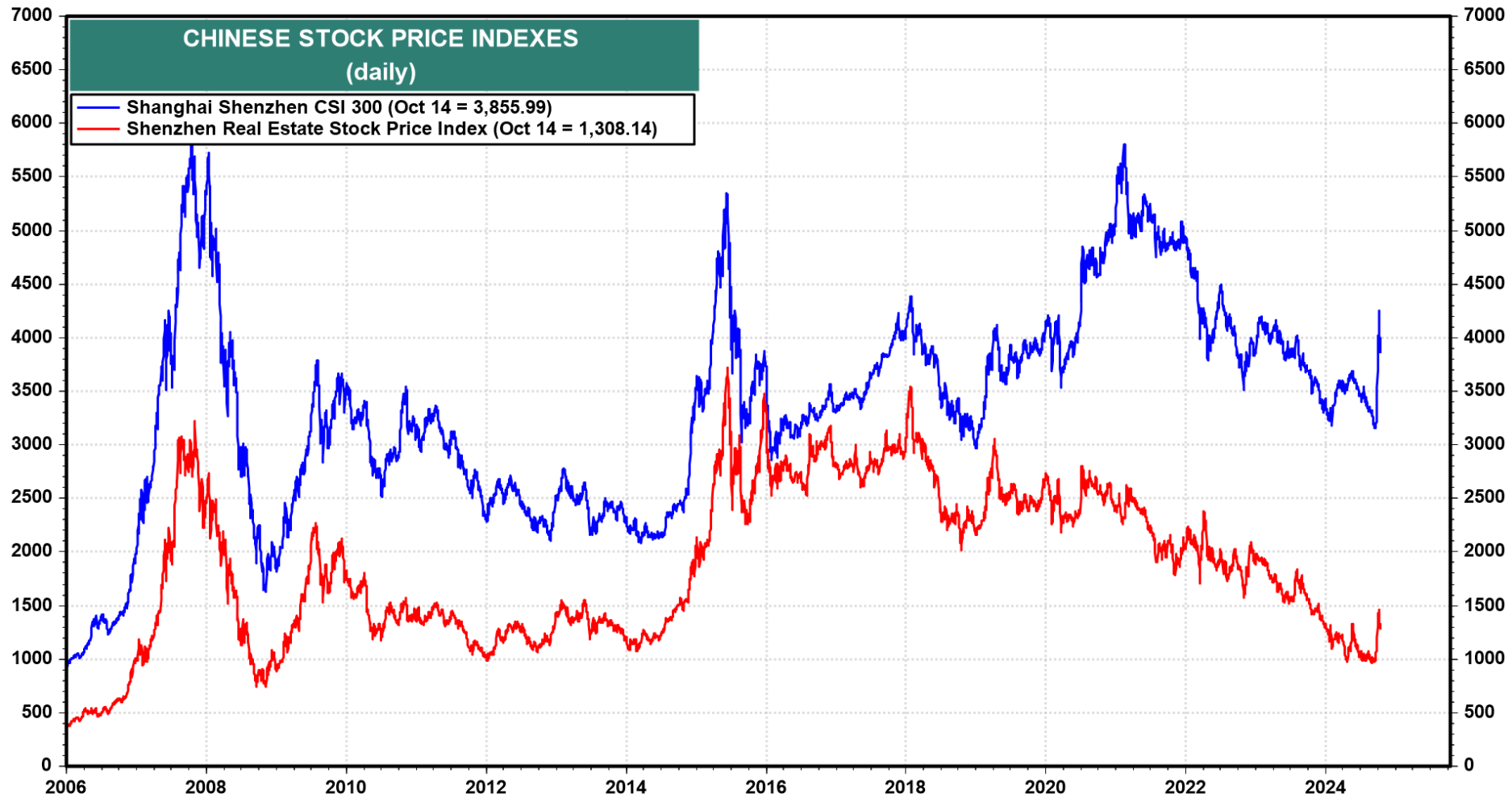
- Dominated by China
  - Two critical issues
    - Investment environment
    - Geopolitics

# China – Economic Growth Slowing



Source: LSEG Datastream and © Yardeni Research.

# Real Estate and Equity Market Performance



Source: LSEG Datastream and © Yardeni Research, and China Securities Index Company (CSI) and Shenzhen Stock Exchange.

# Value or Value Trap?

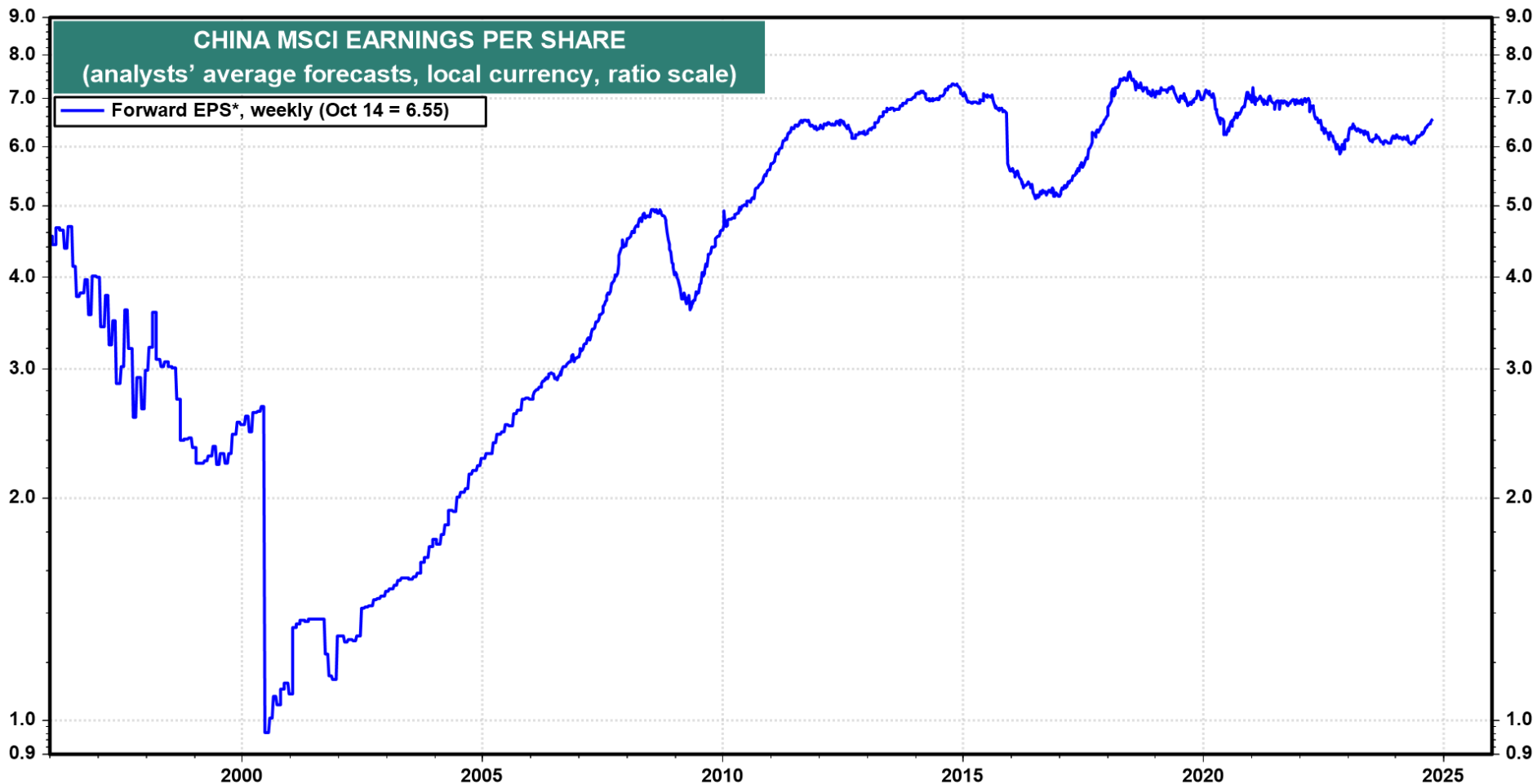


Source: LSEG Datastream and © Yardeni Research, and MSCI.

\* Price divided by 12-month forward consensus expected operating earnings per share.



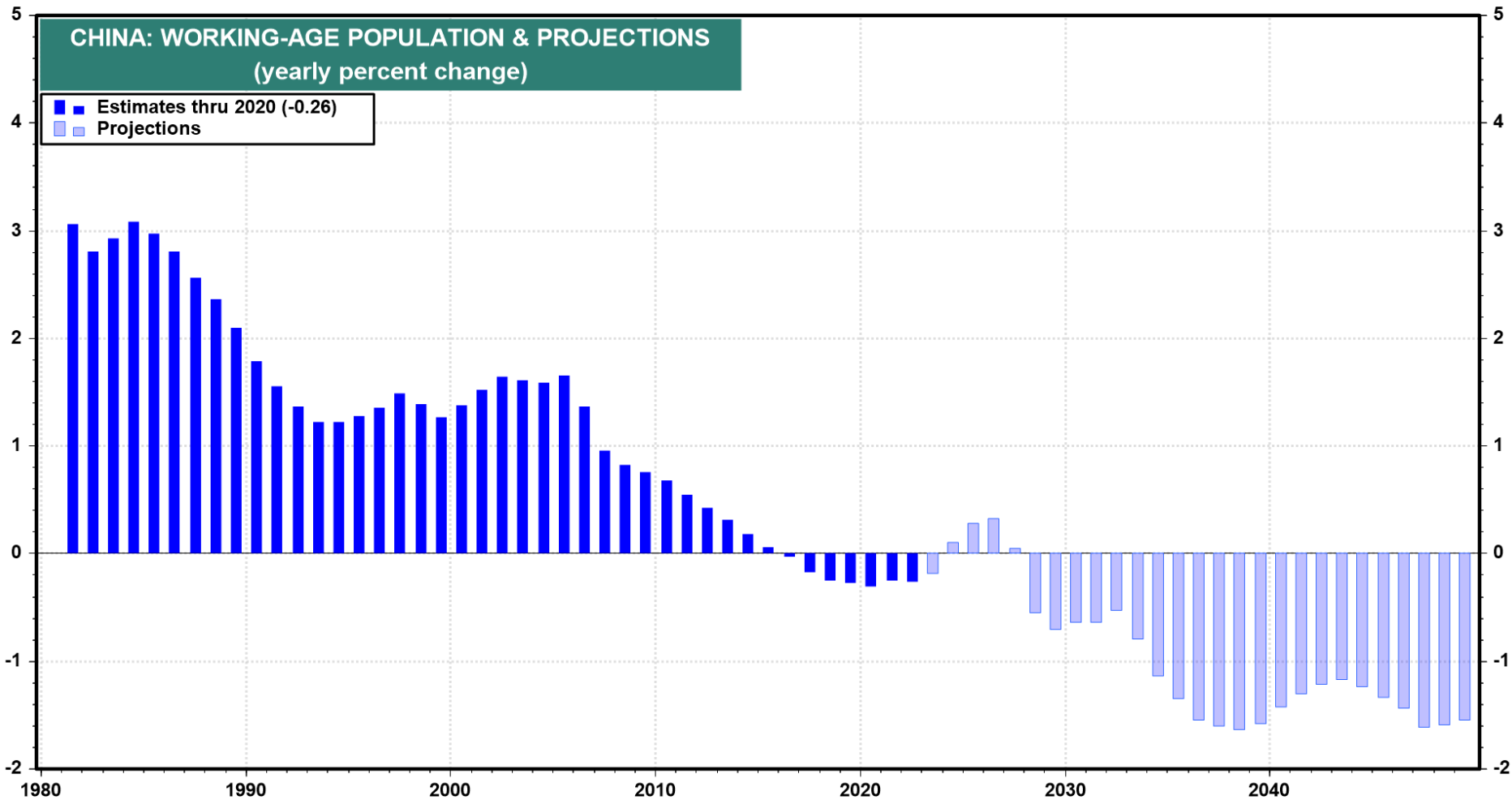
# Earnings Stagnating



Source: LSEG Datastream and © Yardeni Research, and MSCI.

\* Time-weighted average of consensus estimates for current year and next year.

# Demographic Headwind



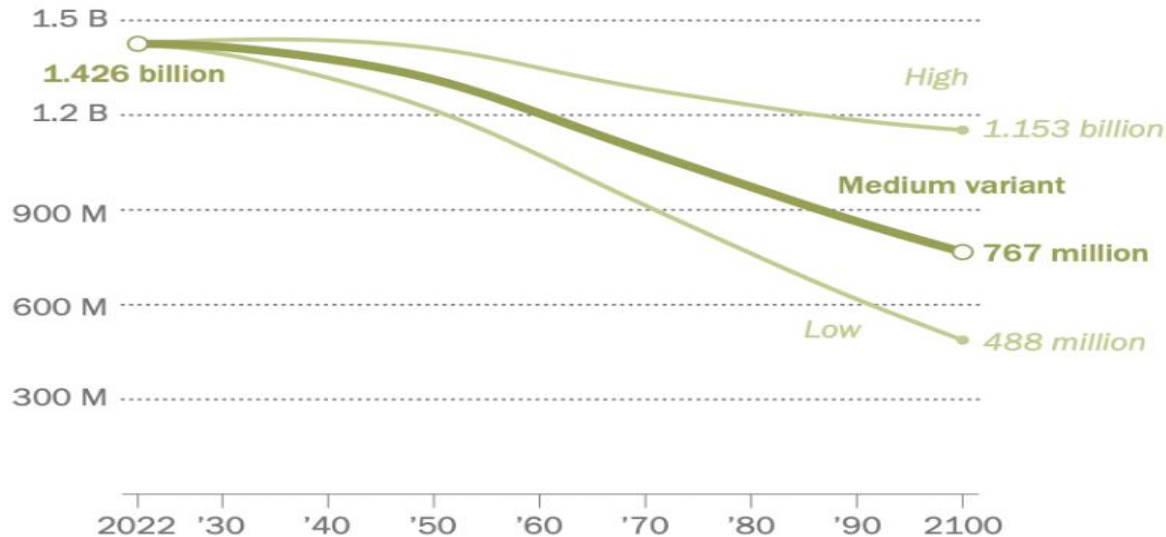
Source: LSEG Datastream and © Yardeni Research, and United Nations.

# Or Tornado?

## China's population is likely to fall below a billion people before 2100

### China's population is likely to fall below a billion people before 2100

Number of people, by variant



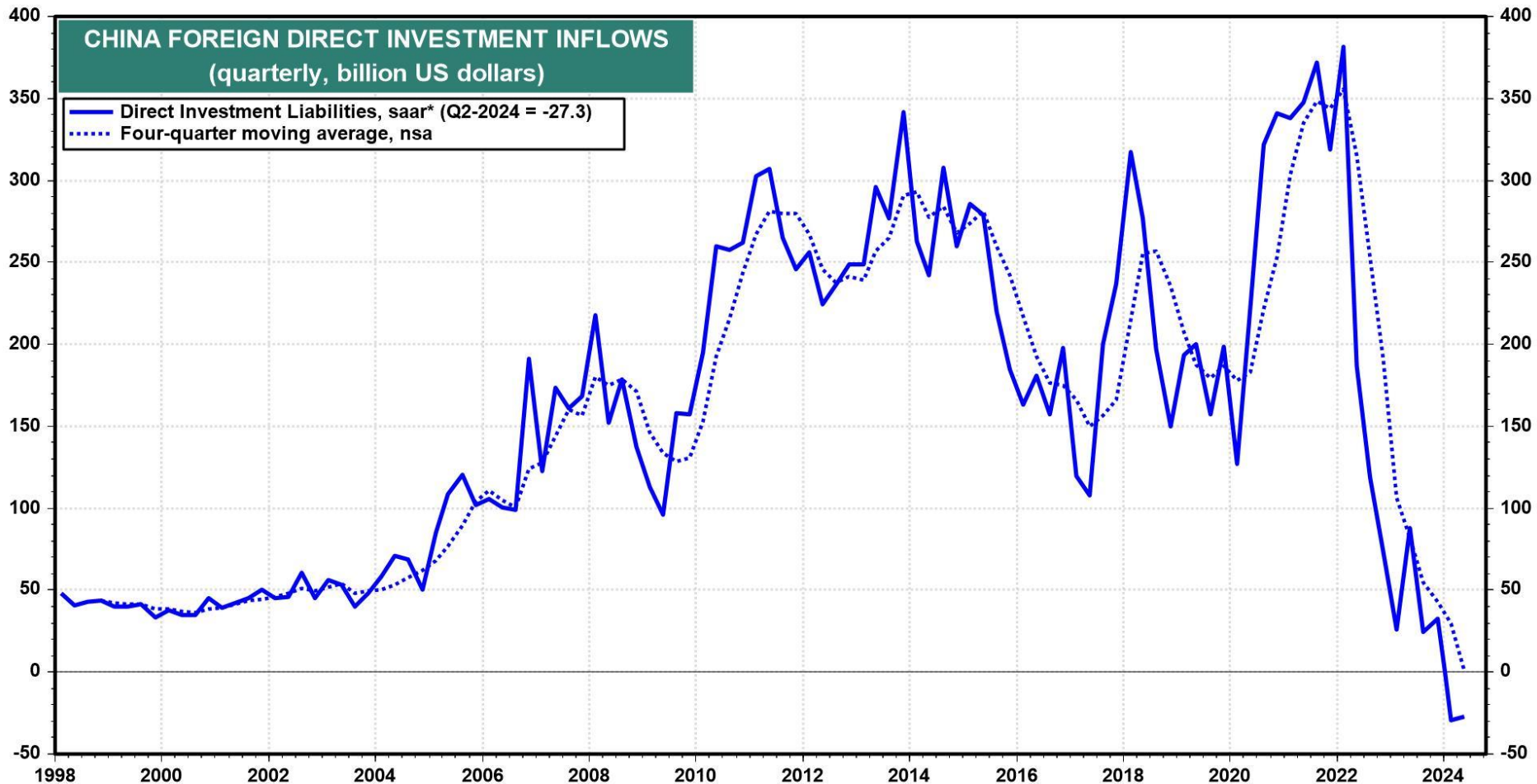
Note: May differ from national census figures. The medium variant is the middle-of-the-road estimate provided by the UN; high and low variant scenarios involve total fertility being 0.5 births above or below the medium scenario, respectively.

Source: UN Population Division's World Population Prospects: The 2022 Revision.

PEW RESEARCH CENTER

Source: <https://www.pewresearch.org/short-reads/2022/12/05/key-facts-about-chinas-declining-population>

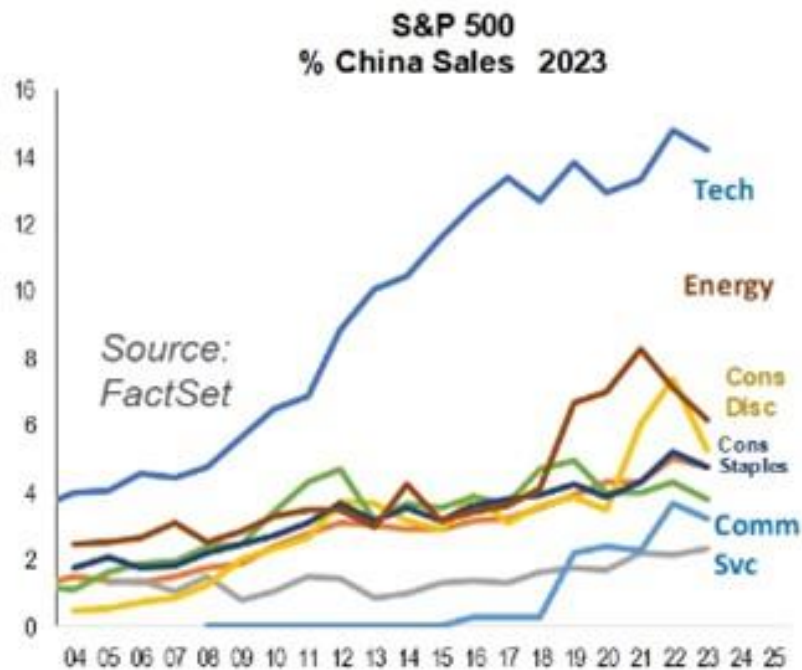
# China – Foreign Investors Departing



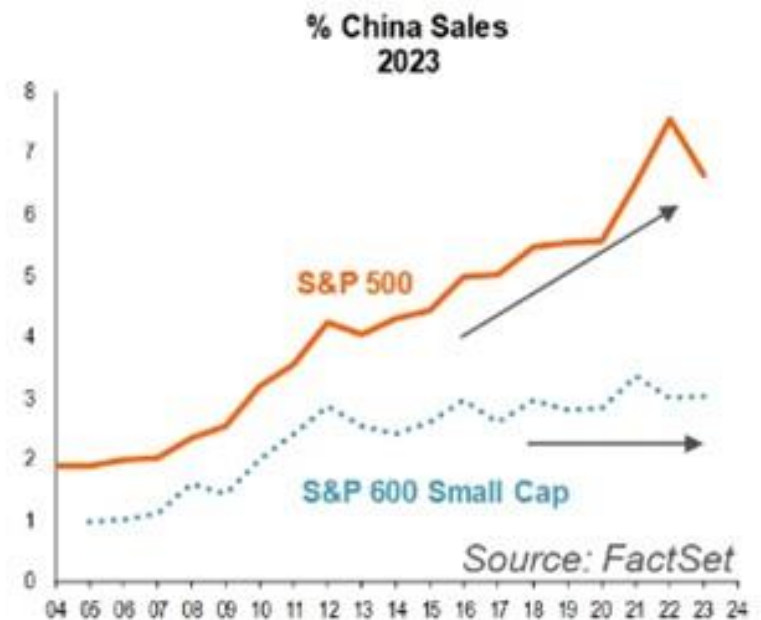
Source: LSEG Datastream and © Yardeni Research, and China State Administration of Foreign Exchange.

\* Seasonally adjusted by Yardeni Research.

# Economic Ties Persist



Source: Piper Sandler



# China Exposure Analysis: Index Exposure Revenue by Country

Country	MSCI AC	MSCI AC	MSCI	
	World IMI	World ex CN IMI	World	S&P 500
United States	45.0	46.2	48.8	58.5
Mainland China	8.4	6.7	7.2	7.5
Japan	4.9	5.0	4.7	2.6
United Kingdom	3.1	3.1	3.2	2.2
Canada	2.9	3.0	3.1	1.8
India	2.9	3.0	1.5	1.5
Germany	2.6	2.6	2.8	2.3
Taiwan	2.0	2.0	1.8	2.1
Australia	1.8	1.8	1.8	0.9
France	1.7	1.7	1.9	1.4
Memo: Hong Kong	0.5	0.5	0.5	0.2

Some reduction in exposure to China by excluding from index but meaningful exposure remains.

Source: MSCI, S&P Global, FactSet

# China Exposure Analysis: Top 25 Contributors to China Revenue Exposure

Company	Country	ACWI IMI ex CN/HK Wgt	China Revenue Exposure	% Contribution to Total
Apple Inc.	United States	3.97	17.8	10.6
NVIDIA Corporation	United States	3.95	16.6	9.8
Microsoft Corporation	United States	3.45	11.2	5.8
Broadcom Inc.	United States	0.94	31.5	4.4
Tesla, Inc.	United States	0.74	22.0	2.4
Meta Platforms Inc Class A	United States	1.48	9.9	2.2
QUALCOMM Incorporated	United States	0.22	61.2	2.0
Taiwan Semiconductor Manufacturing Co., Ltd.	Taiwan	0.93	12.4	1.7
BHP Group Ltd	Australia	0.17	60.9	1.6
Amazon.com, Inc.	United States	2.06	4.1	1.3
ASML Holding NV	Netherlands	0.32	25.8	1.2
Chevron Corporation	United States	0.31	25.2	1.2
Visa Inc. Class A	United States	0.54	13.9	1.1
Rio Tinto plc	United Kingdom	0.09	56.1	0.7
Applied Materials, Inc.	United States	0.18	26.8	0.7
Lam Research Corporation	United States	0.11	41.2	0.7
KLA Corporation	United States	0.11	41.7	0.7
Advanced Micro Devices, Inc.	United States	0.30	14.7	0.7
Texas Instruments Incorporated	United States	0.21	18.8	0.6
Eli Lilly and Company	United States	0.87	4.4	0.6
Merck & Co., Inc.	United States	0.33	11.1	0.5
Tokyo Electron Ltd.	Japan	0.08	43.4	0.5
AstraZeneca PLC	United Kingdom	0.28	12.5	0.5
Alphabet Inc. Class A	United States	1.12	3.1	0.5
Marvell Technology, Inc.	United States	0.08	42.1	0.5
Totals		22.87	15.4	52.5
Memo: China Contribution to ACWI IMI		2.58	86.8	26.6

Top 4 contribute more than  
China as a whole

# China Exposure Analysis:

## Top 25 Contributors to China Supply Chain Exposure

Company	Country	ACWI IMI ex CN/HK Wgt	China Supply Chain Exposure	% Contribution to Total
Apple Inc.	United States	3.97	15.8	9.0
Microsoft Corporation	United States	3.45	10.8	5.4
NVIDIA Corporation	United States	3.95	9.2	5.3
Tesla, Inc.	United States	0.74	46.8	5.0
Amazon.com, Inc.	United States	2.06	9.5	2.8
Meta Platforms Inc Class A	United States	1.48	11.4	2.5
Taiwan Semiconductor Manufacturing Co., Ltd.	Taiwan	0.93	11.3	1.5
Alphabet Inc. Class A	United States	1.12	9.3	1.5
Alphabet Inc. Class C	United States	1.00	9.3	1.3
Broadcom Inc.	United States	0.94	9.6	1.3
Eli Lilly and Company	United States	0.87	9.7	1.2
Procter & Gamble Company	United States	0.49	16.0	1.1
Johnson & Johnson	United States	0.47	15.6	1.0
Walmart Inc.	United States	0.43	14.8	0.9
Amphenol Corporation Class A	United States	0.10	57.9	0.8
Eaton Corp. Plc	United States	0.17	32.9	0.8
Home Depot, Inc.	United States	0.49	11.0	0.8
QUALCOMM Incorporated	United States	0.22	21.9	0.7
Caterpillar Inc.	United States	0.23	21.6	0.7
Hon Hai Precision Industry Co., Ltd.	Taiwan	0.10	49.5	0.7
Samsung Electronics Co., Ltd.	Korea	0.25	18.7	0.7
Coca-Cola Company	United States	0.34	13.3	0.6
Schneider Electric SE	France	0.18	25.8	0.6
Merck & Co., Inc.	United States	0.33	13.2	0.6
GE Aerospace	United States	0.25	17.2	0.6
Totals		24.57	13.4	47.5
Memo: China Contribution to ACWI IMI		2.58	65.5	19.9

Top 4 contribute more than China as a whole



# Changes in Country Weights

Grouping: Country Of Exposure	ACWI Weight (%)	ACWI Ex China Weight (%)	Diff. (%)
USA	63.5%	65.1%	1.6%
Japan	5.7%	5.8%	0.1%
United Kingdom	3.4%	3.5%	0.1%
Canada	2.7%	2.8%	0.1%
China	2.4%	0.0%	-2.4%
France	2.4%	2.4%	0.1%
India	2.2%	2.3%	0.1%
Taiwan	2.1%	2.2%	0.1%
Switzerland	2.1%	2.1%	0.1%
Germany	1.9%	1.9%	0.0%

# Changes in Sector Weights

<b>Grouping: GICS Sector</b>	<b>ACWI Weight (%)</b>	<b>ACWI Ex China Weight (%)</b>	<b>Diff. (%)</b>
Total	100.0%	100.0%	0.00%
Information Technology	24.4%	24.9%	0.46%
Financials	15.4%	15.4%	-0.04%
Industrials	11.3%	11.4%	0.14%
Health Care	10.7%	10.9%	0.16%
Consumer Discretionary	10.7%	10.3%	-0.42%
Telecommunication Services	7.4%	7.0%	-0.36%
Consumer Staples	6.1%	6.1%	0.04%
Materials	4.4%	4.4%	0.01%
Energy	4.4%	4.4%	0.01%
Real Estate	2.6%	2.6%	0.00%
Utilities	2.5%	2.5%	-0.01%

# Forward Looking Returns

## 10 Year Assumptions

	Global Equity	Global Equity ex-China	Emerging Markets	Emerging Markets ex-China
Expected Return	4.85%	4.83%	5.50%	5.50%
Expected Risk	17.05%	16.93%	26.00%	27.50%

Source: Wilshire Advisors

## 20 Year Assumptions

	Emerging Markets	Emerging Markets ex-China
Expected Return	8.90%	9.00%
Expected Risk	22.00%	22.00%

Source: Meketa

# US/China Relations – Select Recent Events

- 2018
  - US institutes multiple rounds of new tariffs on China; China retaliates
- 2019
  - US increases tariffs from 10% to 25%; China retaliates
  - US labels China a “currency manipulator;” effectively adds additional taxes to imported Chinese goods; designation removed in 2020
- 2020
  - China and US both expel certain journalists; restrictions eased in 2021
  - US orders China to close its consulate in Houston; China retaliates by ordering the closure of the US consulate in Chungdu
- 2021
  - US (both Trump and Biden administrations) declares that China is committing genocide against Uyghurs
  - Biden administration maintains Trump administration tariffs
  - NATO declares China a “security challenge”
- 2022
  - US Commerce Department restricts certain exports to China related to advanced computing chips
- 2023
  - US shoots down suspected Chinese spy balloon over continental United States
- 2024
  - Executive Order prohibiting US investors from investing in certain technologies in China

# US/China Relations – Ongoing Issues

- China/Russia “no limits friendship”
- Technology competition – AI, quantum computing
- Claims over sovereignty related to the South China Sea
- US/China/Taiwan relations
- Cyberattacks attributed to China – e.g., Volt Typhoon

# Implementation and Next Steps

- Propose restricting portfolio and benchmark exposures to foreign adversaries
  - RBA to Board for November meeting, included in IAC materials
- Open Implementation Questions
  - Public Markets
    - Will take time to research and implement
    - Exceptions for indirect ownership where exposure is limited?
    - Derivatives exposure?
  - Private Markets
    - Existing exposure will take time to roll off
    - Side letters for future commitments where possible?
  - Defined Contribution Plans

**Approve Policy Related to Certain Foreign Investments.****Requested Action**

The Board authorizes the Chief Investment Officer (CIO) to pursue a policy related to current and future investments in countries designated as foreign adversaries by the Office of the Secretary of Commerce. This policy may include restricting some or all of such investments, and the relevant benchmarks used by VRS for such investments, in the designated countries. The Board further determines that such a policy is consistent with VRS' fiduciary duty.

**Description/Background**

The U.S Department of the Treasury's Office of Foreign Assets Control (OFAC) is the primary federal agency that administers and enforces economic sanctions imposed by the United States on foreign countries, entities, and individuals. The list of sanctions currently in effect is located in the Code of Federal Regulations, 31 C.F.R. subtitle V, Ch. V. Government pension plans are required to comply with sanctions administered by OFAC.

VRS' internal investment programs have put in place screening and training procedures to enable VRS staff to identify and avoid transactions that potentially involve the target of U.S. sanctions. Additionally, VRS confirms with its outside investment managers that they are aware of the need to comply with OFAC sanctions.

In addition to the OFAC, the Office of the Secretary of Commerce also promulgates regulations governing commerce with foreign countries. Specifically, 15 C.F.R. Part 791 imposes limitations on the acquisition, importation, and other transactions related to information and communication technology or services designed, developed, manufactured, or supplied by persons owned by, controlled by, or subject to the jurisdiction or direction of foreign adversaries. Currently, there are OFAC sanctions in place to some extent against each country listed as a foreign adversary of the United State in 15 C.F.R. § 791.4, as well as against numerous other foreign countries, entities, and individuals not listed in 15 C.F.R. § 791.4.

VRS has minimal exposure to investments involving the governments of countries listed as foreign adversaries in 15 C.F.R. § 791.4. While 15 C.F.R. Part 790 does not impose sanctions in the same form as OFAC sanctions, the restrictions imposed on international commerce with the countries designated by the Office of the Secretary of Commerce, as well as the potential for the imposition of additional commerce-related restrictions in the future, may serve to increase the level of risk for investments in such countries.

The Board has the duty to act solely in the best interest of its more than 830,000 plan members, retirees, and beneficiaries. To meet its fiduciary duty, VRS carefully analyzes economic factors and assesses monetary risk to achieve the highest level of return for a given level of risk over the long term. Further, risk management is a primary objective for the investment staff, and investment results will be reviewed in the context of risk-adjusted returns. As delineated in the VRS Defined Benefit Plan Investment Policy Statement adopted by the Board, the CIO is responsible for obtaining and/or developing appropriate systems, models, tools, and reports necessary to monitor the risks of the fund and effectively communicate such risks on a regular basis to the Board. In accordance with the Policy

Statement, given the potential for increased investment risk, the Board authorizes the CIO to pursue a policy related to current and future investments in countries designated as foreign adversaries by the Office of the Secretary of Commerce. This policy may include restricting of some or all of such investments, and the relevant benchmarks used by VRS for such investments, in the designated countries. The Board further determines that such a policy is consistent with VRS' fiduciary duty.

The CIO and staff will develop an implementation plan for the policy and periodically provide updates to the Board of actions taken under the policy.

The Investment Advisory Committee reviewed the policy described herein and recommends its approval to the entire Board.

**Rationale for Requested Action**

The approval of the policy will better position the VRS Trust Fund to achieve its investment objectives to achieve the highest level of return for a given level of risk over the long term.

**Authority for Requested Action**

The Board is authorized to approve these recommendations pursuant to the provisions of *Code of Virginia* §§ 51.1-124.22 and -124.30.

The above action is approved.

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A. Scott Andrews, Chair  
VRS Board of Trustees

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Date



# Scenario Analysis

Chung Ma

Managing Director

Rory Badura

Senior Actuary

November 6, 2024



# Agenda

- Data and Methodology
- Narratives
- Summary Statistics
- Deeper Dive into Possible Outcomes



# Possible Scenarios

- Baseline (base case)
- Global Recession
- Stagflation
- Productivity Boost



# Data Sources

- VRS 20-year forward returns and asset class volatilities and correlations.
- Bloomberg API for selected historical returns to benchmark indices.
- Aswath Damodaran NYU Stern for macroeconomic histories.
- FRED (Federal Reserve Bank of St. Louis) for macroeconomic and interest rate histories.
- Robert Shiller online data
  - Long-term stock, bond, rates, consumption data.
  - US Stock Market 1871-present.

# Methodology

- Scenarios are alternative, yet plausible, views that deviate from our base case scenario.
- These alternative views may reenact historical events or present an entirely new view.
- For historical events such as Stagflation or Recession, we study the historical record for similar events, adjusting forward returns for both magnitude as well as duration to “square” the new scenario so that it is roughly in line with historical experience.
- For new scenarios such as Productivity Boost, we study historical macro experiences like growth, capital expenditures, labor productivity and so on to frame our scenario view in such a way as to be at least consistent with the historical experience.
- Forward returns are then recast in line with the scenario, concentrating primarily on Public Equity and Fixed Income returns because these have the longest historical record (and account for roughly half the VRS asset allocation). We may also make subjective adjustments to Credit, Real Assets, and Private Equity but generally these are small with shorter duration.
- We weight asset class returns up to the Fund return for the next 19 years and use a Monte Carlo model to generate a sample of 10,000 forward return “paths”.
- Cumulative Annual Returns, Contribution Rates, Funded Status and our Liquidity measure are then re-evaluated on the basis of the scenarios’ impacts on the amortization of the unfunded liability.

# Scenario Narratives

- **Baseline: Recovery** – Fed policy shifts to accommodative as inflation slows to target levels. Begin to see real growth surprises which enable continued earnings growth and sustained profit margins. Sentiment remains strong contributing to positive flows into risk assets as cash rates begin to decline. Economic indicators shift to expansionary territory as the economy transitions to a new growth cycle without having experienced a recession.
- **Global Recession** – Growth expectations retract and sustained higher nominal rates (e.g. mortgages) begin to impact housing sales and valuations despite low inventories. Downward momentum in inflationary pressures stalls on heightened geopolitical tensions and antagonistic trade policy. Household balance sheets erode and show signs of stress while real incomes continue to fall off. Delinquencies rise, particularly on credit cards and auto loans, and credit stress stretches across the global economy. The Fed’s ability to stimulate growth and arrest downward momentum is constrained by elevated inflation and limited fiscal space. Real economic growth is hit hard with risk assets experiencing a prolonged sell off given lack of policy support.

# Scenario Narratives (cont.)

- **Stagflation** – We begin by drawing from the 1969-1988 experience, extrapolating inflation rates from this period and working with real returns (to the S&P using Shiller), assuming the first couple of years of inflationary pressures are behind us. While nominal returns are relatively high for equity, real returns reflect much slower growth and are negative for years 1-5 in this scenario, implying that this period of stagflation is front loaded and then tapers off and reverts to the baseline thereafter. Private equity is tied to equity and CS rate-sensitive exposure is affected adversely.
- **Productivity Boost** – Increase in productivity across the economy spurred by technological advancements and capital investment help to drive higher real growth. Corporate profitability remains elevated leading to sustained higher valuations and equity returns. Central banks move to a more neutral stance as productivity gains fuel ongoing growth with muted inflationary impacts given more efficient production. Stability in monetary and trading policies drives a more synchronized global economy with emerging markets benefiting from a calm developed market rate environment and reduced geopolitical tensions.

# Summary

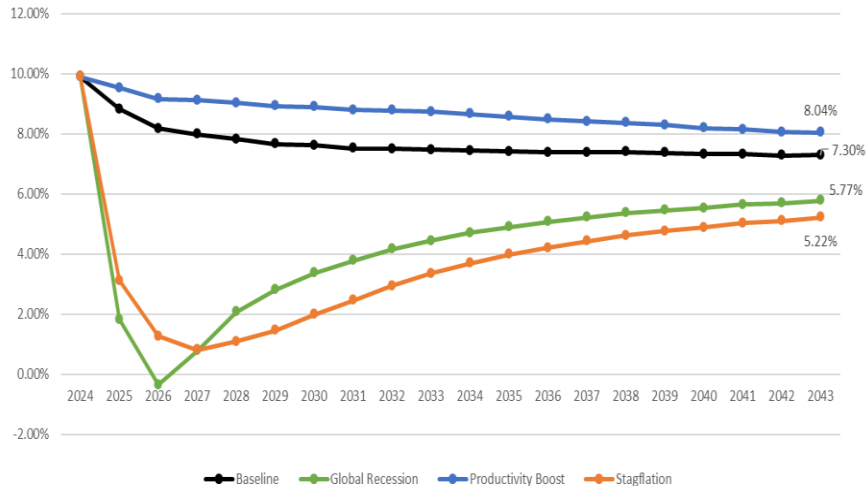
- Cumulative returns
- Liquidity measure
- Contribution rates
- Funded Status



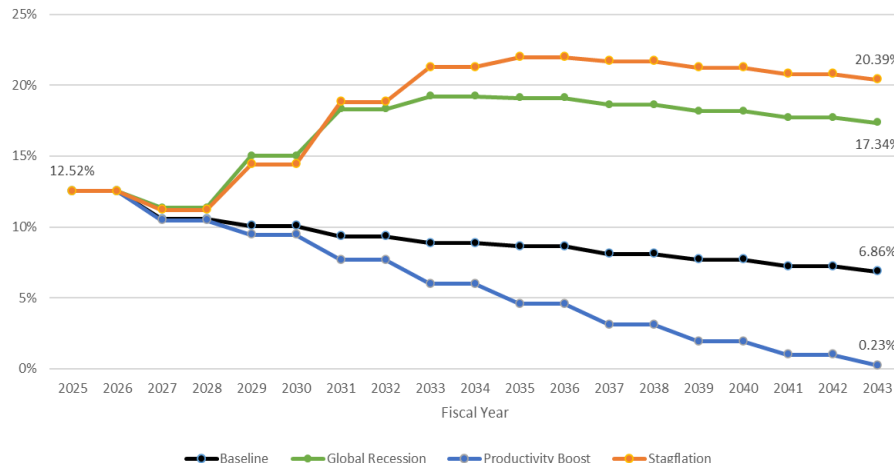


# Scenarios – Median Path (State Plan)

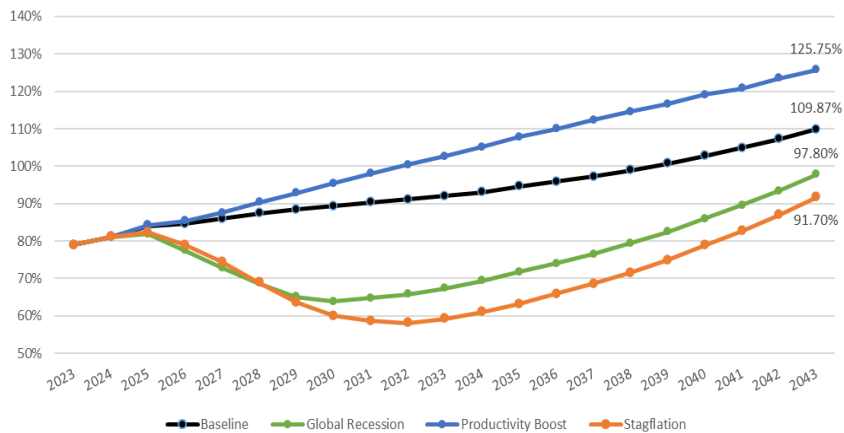
Comparison of Cumulative Returns at Median



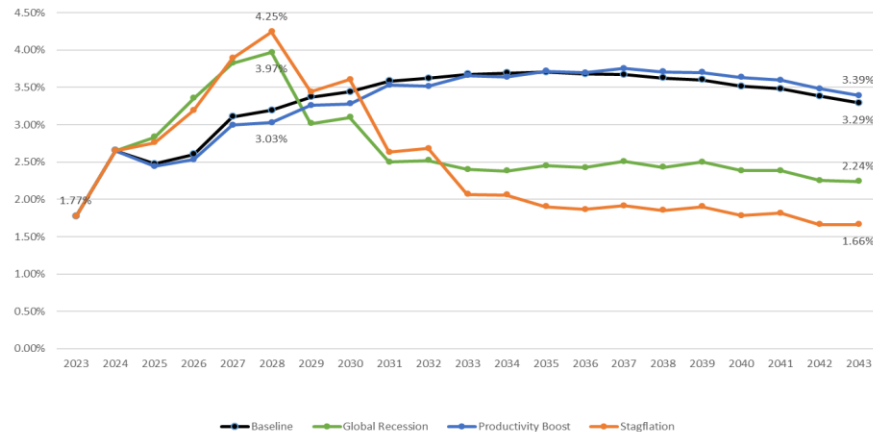
Comparison of Estimated Median Employer Contribution Rates State Plan



Comparison of Estimated Funded Status State Plan Median

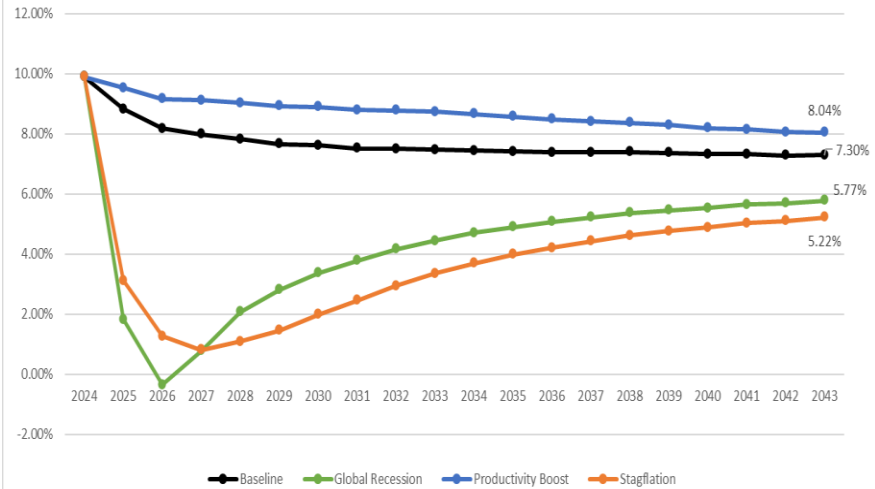


Comparison of Liquidity Measure at Median

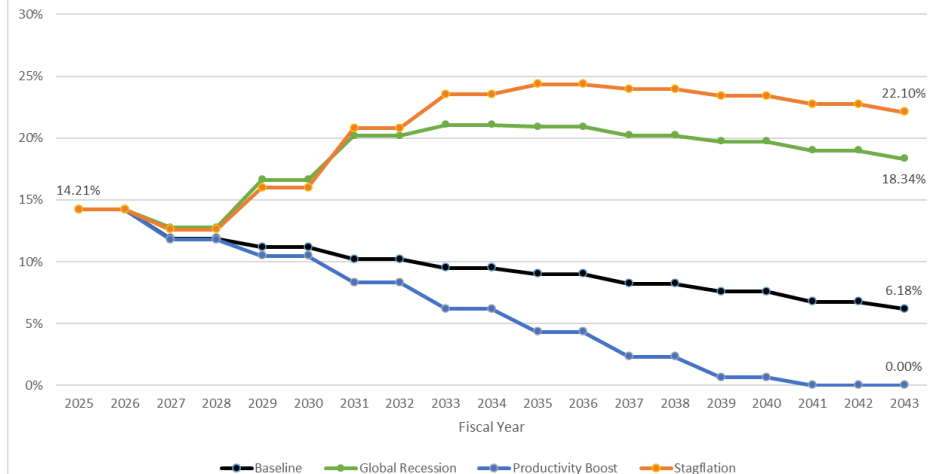


# Scenarios – Median Path (Teacher Plan)

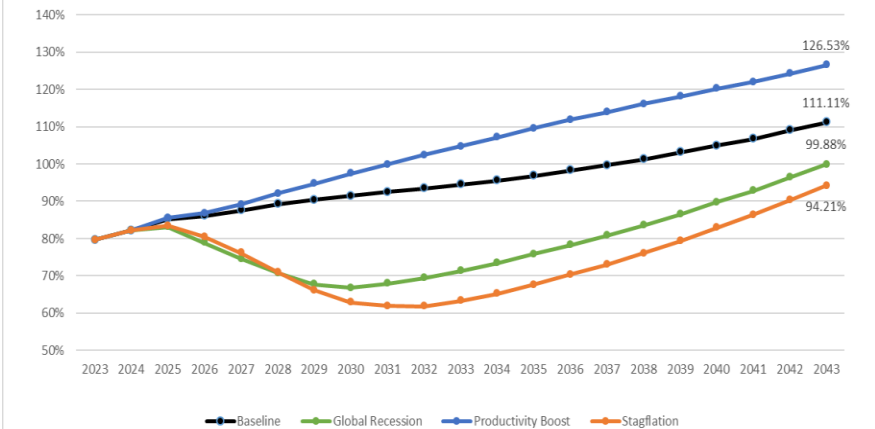
Comparison of Cumulative Returns at Median



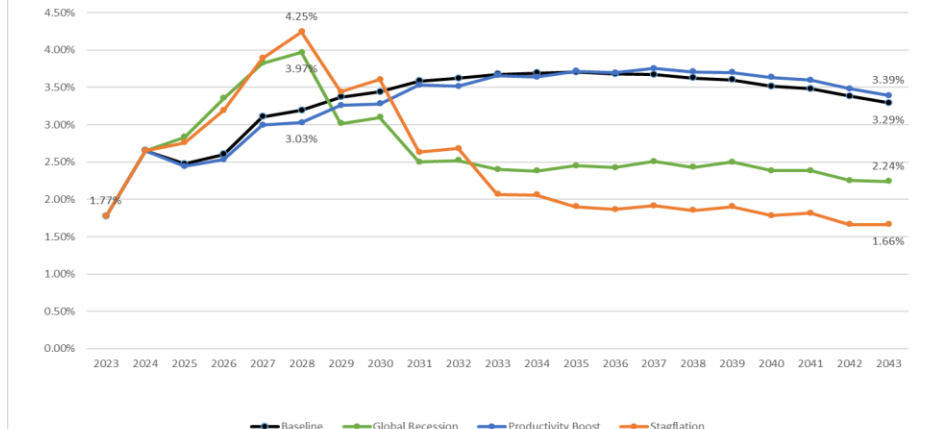
Comparison of Estimated Median Employer Contribution Rates Teacher Plan



Comparison of Estimated Funded Status Teacher Plan Median



Comparison of Liquidity Measure at Median



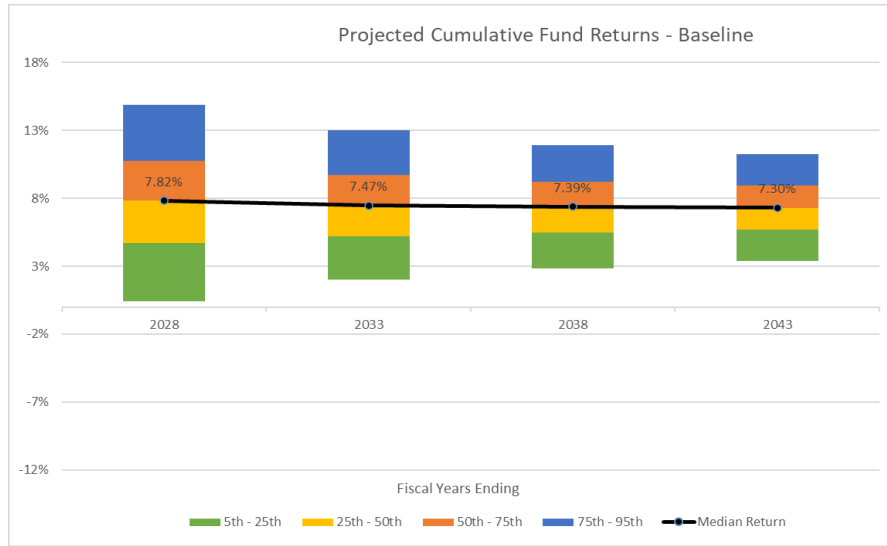
# Confidence Bands

- State Plan
- Comparison of valuation measures under different economic scenarios

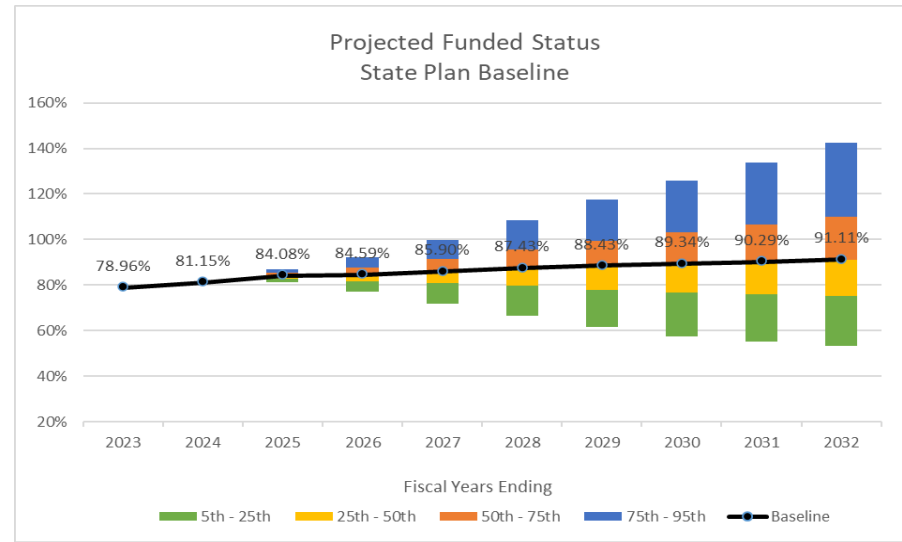


# Baseline – State Plan

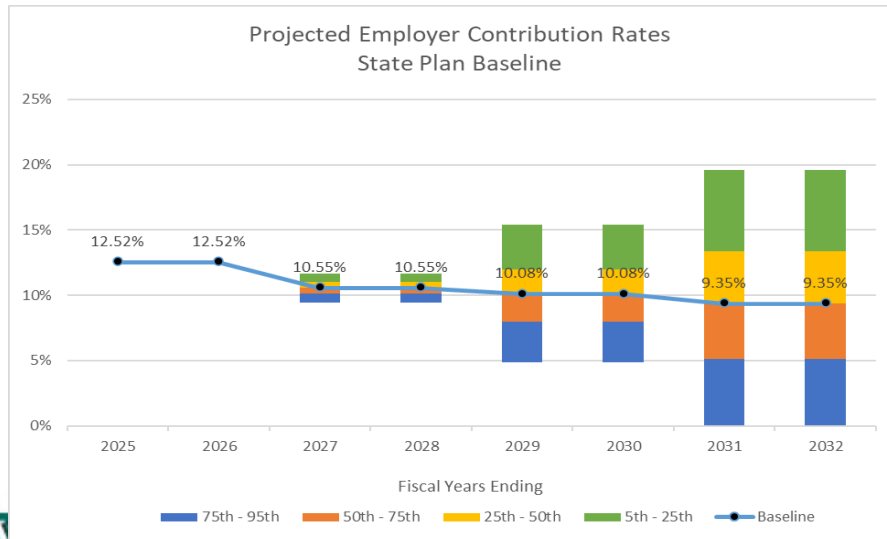
## Rates of Return



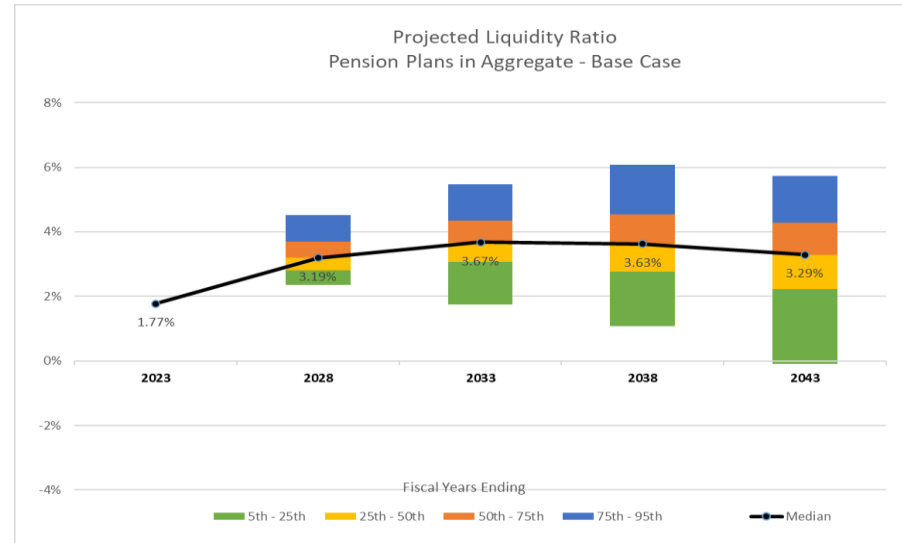
## Funded Status – Actuarial Asset Basis



## Contribution Rates

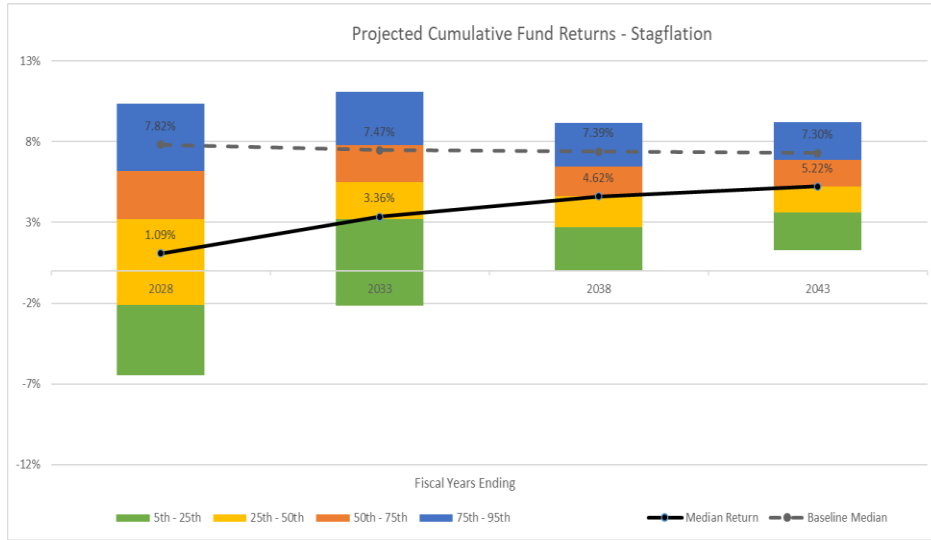


## Liquidity

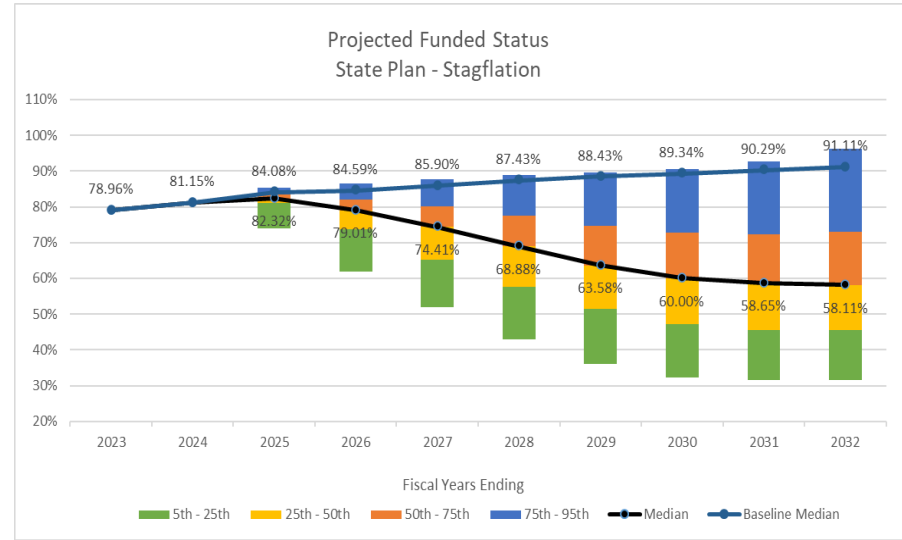


# Stagflation – State Plan

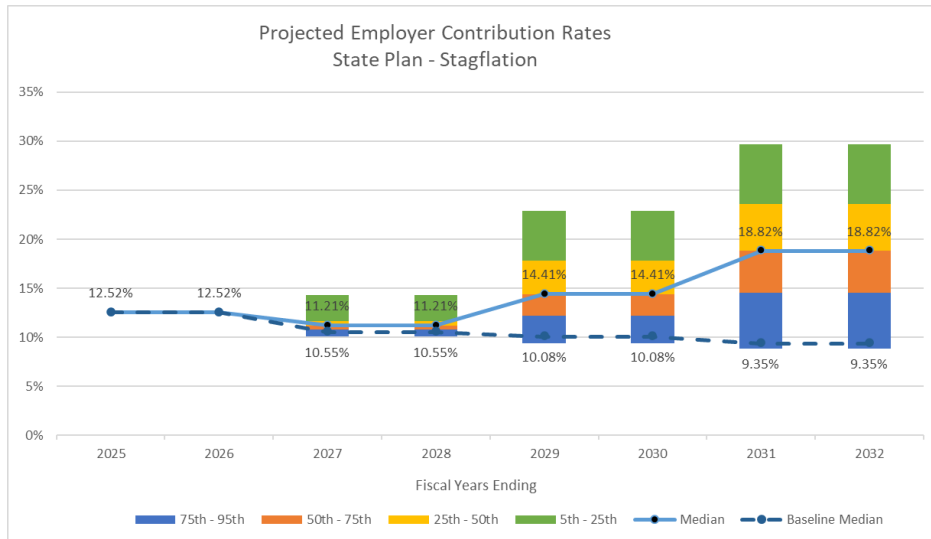
## Rates of Return



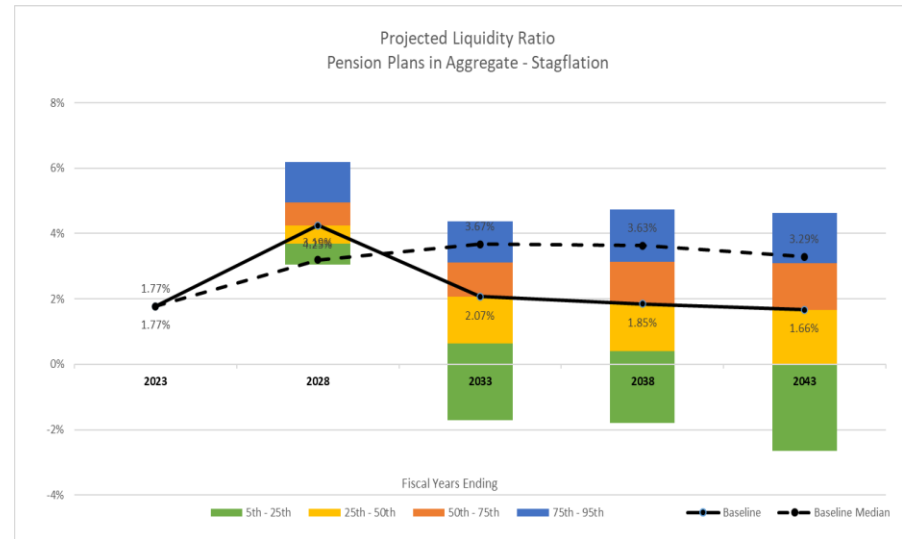
## Funded Status – Actuarial Asset Basis



## Contribution Rates

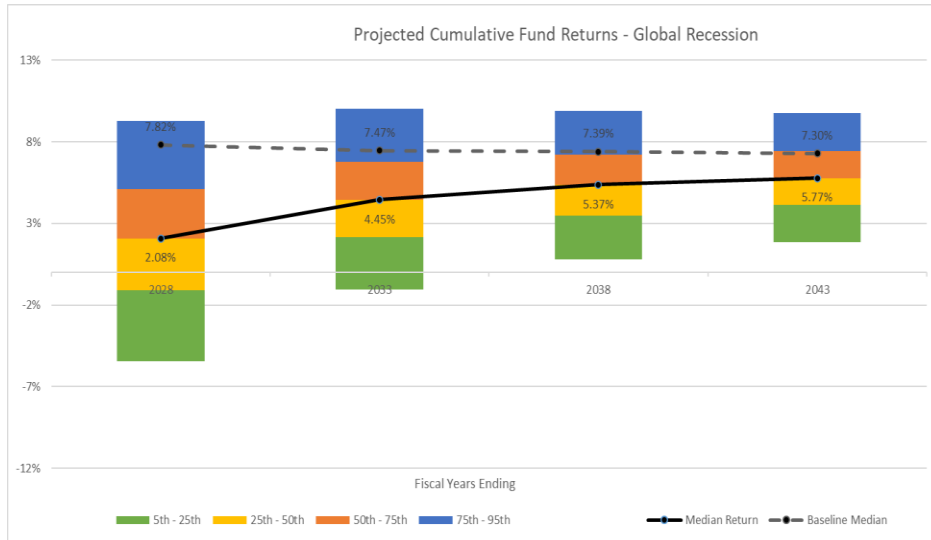


## Liquidity

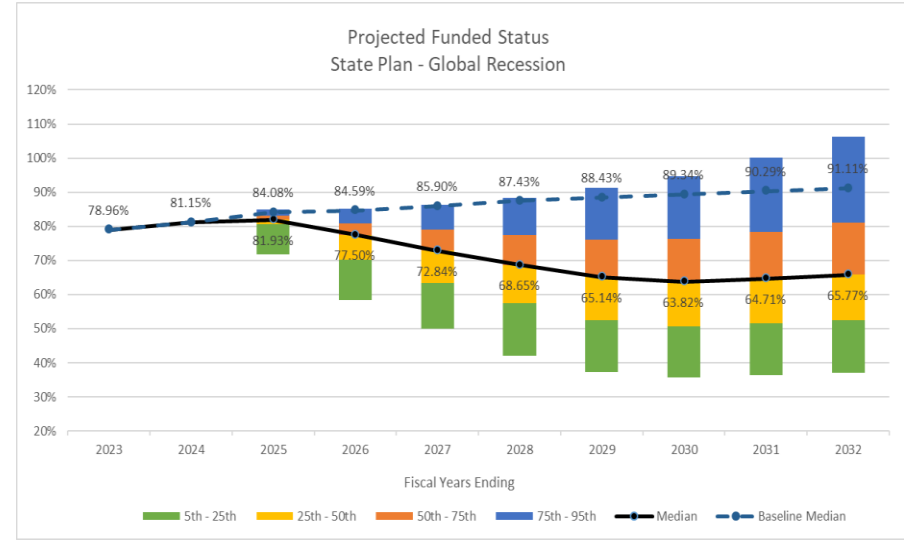


# Global Recession – State Plan

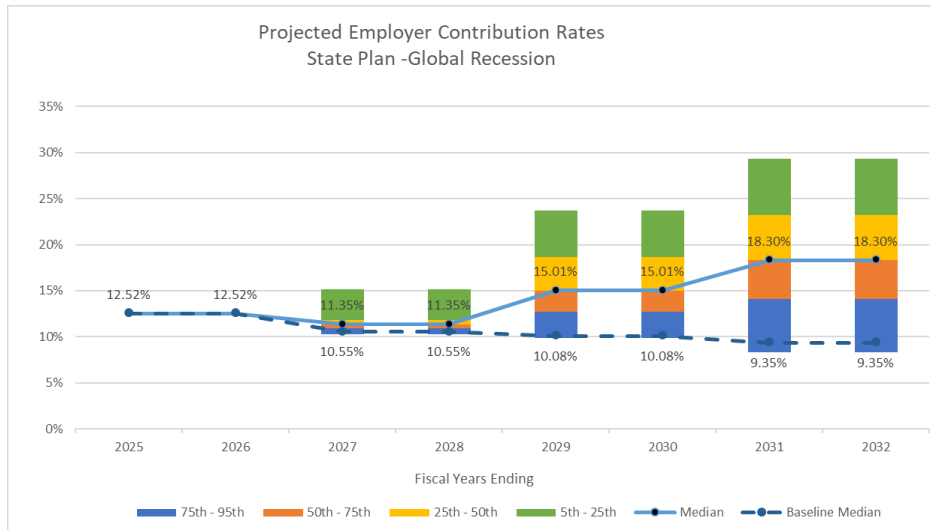
## Rates of Return



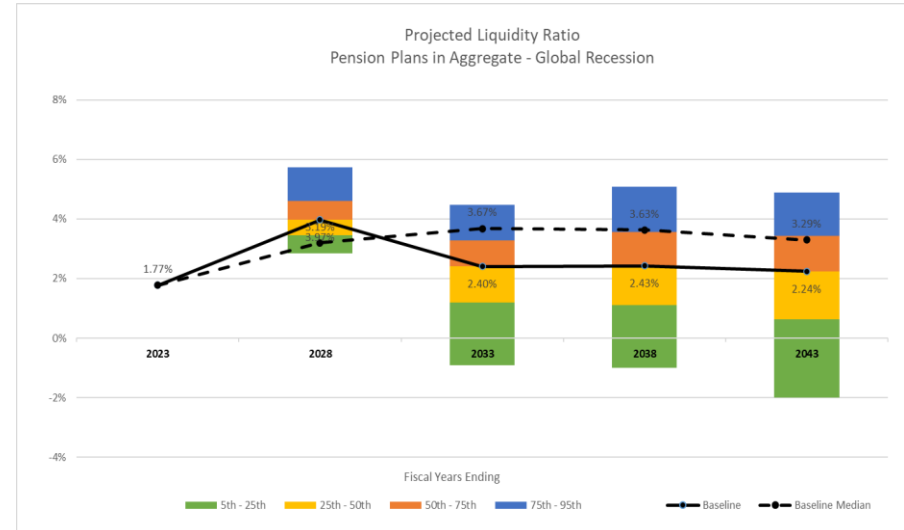
## Funded Status – Actuarial Asset Basis



## Contribution Rates

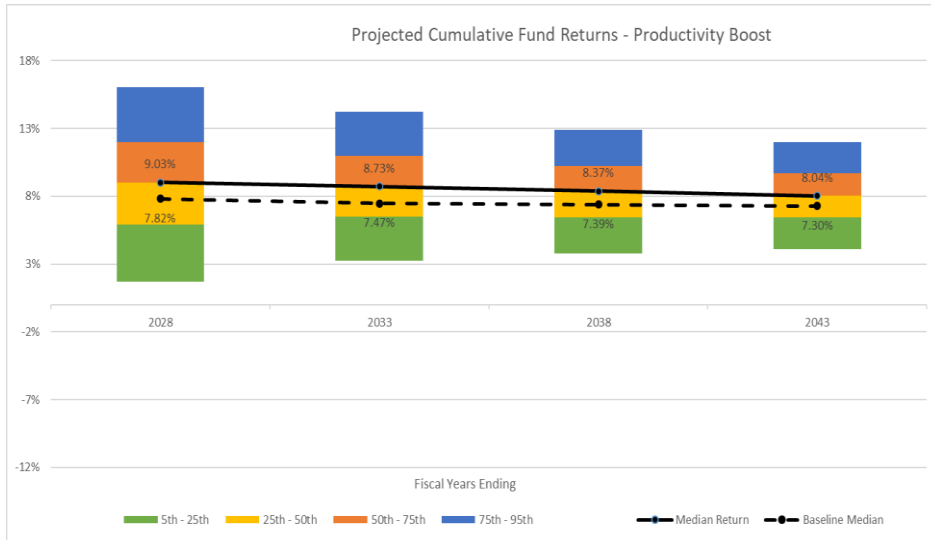


## Liquidity

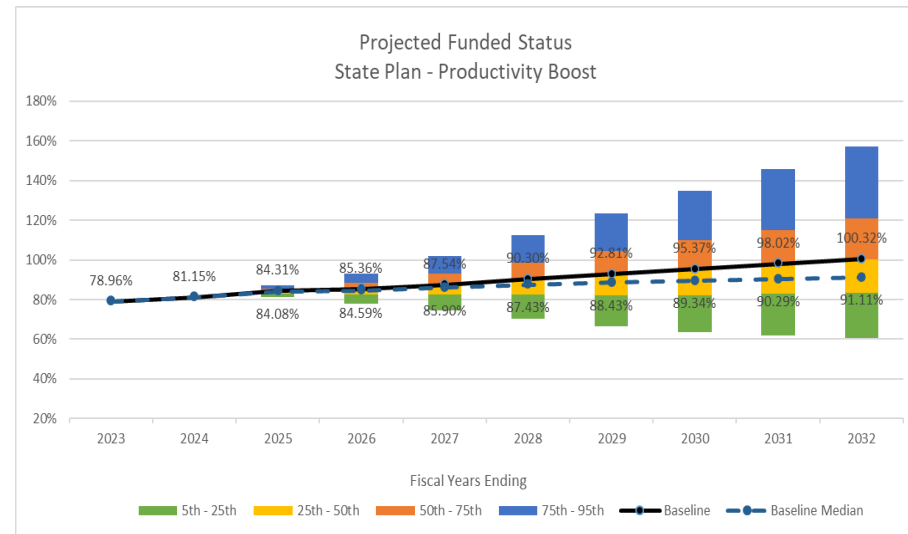


# Productivity Boost – State Plan

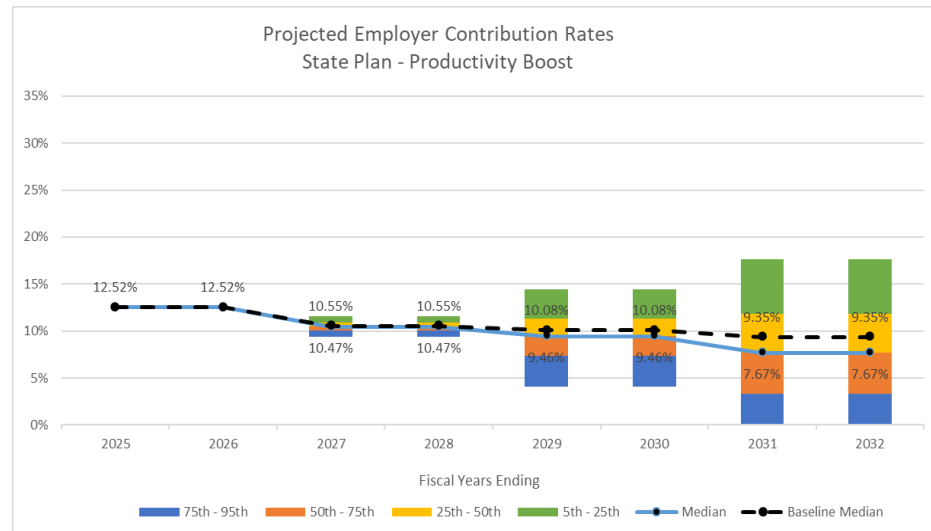
## Rates of Return



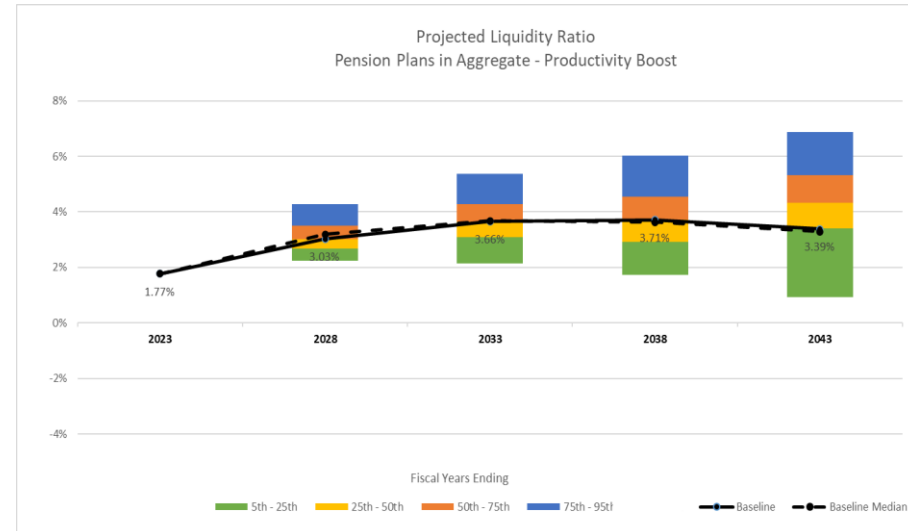
## Funded Status – Actuarial Asset Basis



## Contribution Rates



## Liquidity



# Discussion







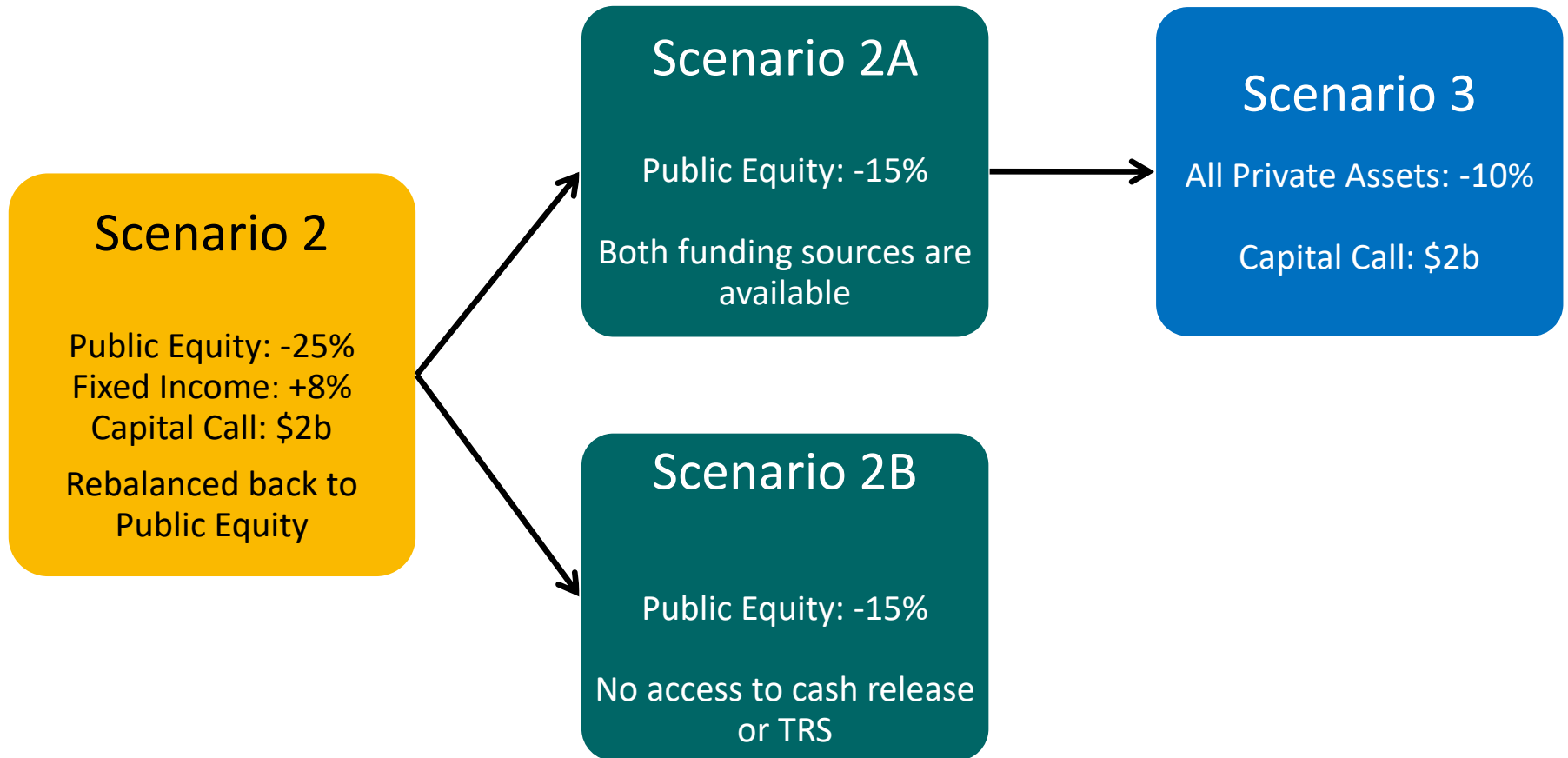
# Case Study: Market Drawdown Battle Planning

Portfolio Solutions Group

# Market Drawdown Battleplan: Part 2

- Pick up from Scenario 2 from last meeting
- Scenario 2 recap:
  - 25% Equity drawdown; Fixed Income up 8%
  - \$2b capital call and \$330mm benefit payment to fund
  - Sold bonds, spent cash, added leverage to fund capital call and equity exposure
- Extension of Scenario 2: A & B
  - Assume an additional 15% equity drawdown
  - What are margin requirements?
  - What are our options? Rebalance?
  - What happens if we lose our funding channels?
- Scenario 3:
  - Pick up from 2A
  - Private Assets begin marking lower
  - Additional \$2b capital call for Private Credit (Total of \$4b over Scenarios 2 and 3)
  - Denominator effects

# Today's Scenarios



# VRS Portfolio: Historical Monthly Drawdowns

	<b>3/31/2020</b>	<b>9/30/2022</b>	<b>10/31/2008</b>	<b>11/30/2008</b>	<b>Fall 2008</b>
<b>Public Equity</b>	-14.6%	-8.4%	-18.5%	-7.0%	-24.2%
<b>Fixed Income</b>	-2.2%	-4.6%	-3.4%	2.2%	-1.2%
<b>Credit Strategies</b>	-8.4%	-1.9%	-11.9%	-4.3%	-15.8%
<b>Real Assets</b>	-0.6%	1.7%	-7.9%	-5.3%	-12.8%
<b>Private Equity</b>	3.5%	-3.8%	-0.2%	0.0%	-0.3%
<b>PIP</b>	2.2%	-1.2%	N/A	N/A	N/A
<b>Dstrat</b>	-12.7%	-7.4%	N/A	N/A	N/A
<b>RBI</b>	-5.5%	-0.6%	N/A	N/A	N/A
<b>Total Fund</b>	-6.9%	-4.0%	-12.3%	-4.1%	-15.9%

# Scenario 2: Downside Shock

	Policy Wgt	Port Wgt	Active Wgt	Return Shock	New Port Wgt	New Active Wgt
<b>Public Equity</b>	33.0%	33.4%	0.4%	-25.0%	27.0%	-6.0%
<b>Fixed Income</b>	16.0%	15.1%	-0.9%	8.0%	17.6%	1.6%
<b>Credit Strategies</b>	14.0%	15.1%	1.1%	0.0%	16.2%	2.2%
<b>Real Assets</b>	14.0%	12.4%	-1.6%	0.0%	13.3%	-0.7%
<b>Private Equity</b>	16.0%	16.4%	0.4%	0.0%	17.6%	1.6%
<b>PIP</b>	2.0%	2.1%	0.1%	0.0%	2.2%	0.2%
<b>Diversifying Strategies</b>	4.0%	3.4%	-0.6%	0.0%	3.6%	-0.4%
<b>EMP</b>	0.0%	0.9%	0.9%	0.0%	0.9%	0.9%
<b>Cash</b>	2.0%	2.0%	0.0%	0.0%	2.1%	0.1%
<b>Leverage</b>	-1.0%	-0.6%	0.4%	0.0%	-0.6%	0.4%

# Sell bonds, spend cash, add leverage to fund capital call and equity exposure

	<b>New Active Wgt</b>	<b>Trades</b>	<b>Post Trade Wgt</b>	<b>Post Trade Act Wgt</b>
<b>Public Equity</b>	-6.0%	2.5%	29.6%	-3.4%
<b>Fixed Income</b>	1.6%	-1.5%	16.2%	0.2%
<b>Credit Strategies</b>	2.2%	0.0%	18.1%	4.1%
<b>Real Assets</b>	-0.7%	0.0%	13.4%	-0.6%
<b>Private Equity</b>	1.6%	0.0%	17.7%	1.7%
<b>PIP</b>	0.2%	0.0%	2.2%	0.2%
<b>Diversifying Strategies</b>	-0.4%	0.0%	3.6%	-0.4%
<b>EMP</b>	0.9%	0.0%	0.9%	0.9%
<b>Cash</b>	0.1%	1.2%	1.1%	-0.9%
<b>Leverage</b>	0.4%	-2.2%	-2.9%	-1.9%
<b>Equities</b>		2.5%		
Physical		1.0%		
Synthetic		1.5%		
<b>Leverage</b>		-2.2%		
Cash Release		-1.0%		
Synthetic Funding		-1.2%		

# Extension to Scenario 2

- Following Rebalance:
  - Leverage: 3%
  - Percent of fund that is synthetic: 2.1%
  - Remaining cash release capacity: 1%
- Double Dip
  - Equities decline another 15%, Bonds remain unchanged
  - No large capital calls but need to make benefit payments (\$330mm)

# Scenario 2A: Double Dip

	<b>Policy Wgt</b>	<b>Port Wgt</b>	<b>Active Wgt</b>	<b>Return Shock</b>	<b>New Port Wgt</b>	<b>New Active Wgt</b>
<b>Public Equity</b>	33.0%	29.6%	-3.4%	<b>-15.0%</b>	26.4%	-6.6%
<b>Fixed Income</b>	16.0%	16.2%	0.2%	0.0%	16.9%	0.9%
<b>Credit Strategies</b>	14.0%	18.1%	4.1%	0.0%	19.0%	5.0%
<b>Real Assets</b>	14.0%	13.4%	-0.6%	0.0%	14.0%	0.0%
<b>Private Equity</b>	16.0%	17.7%	1.7%	0.0%	18.5%	2.5%
<b>PIP</b>	2.0%	2.2%	0.2%	0.0%	2.3%	0.3%
<b>Diversifying Strategies</b>	4.0%	3.6%	-0.4%	0.0%	3.8%	-0.2%
<b>EMP</b>	0.0%	0.9%	0.9%	0.0%	1.0%	1.0%
<b>Cash</b>	2.0%	1.1%	-0.9%	0.0%	1.1%	-0.9%
<b>Leverage</b>	-1.0%	-2.9%	-1.9%	0.0%	-3.0%	-2.0%



# Sell bonds, tap cash release, add synthetic exposure

	<b>New Active Wgt</b>	<b>Trades</b>	<b>Post Trade Wgt</b>	<b>Post Trade Act Wgt</b>
<b>Public Equity</b>	-6.6%	3.5%	30.3%	-2.7%
<b>Fixed Income</b>	0.9%	-1.0%	16.0%	0.0%
<b>Credit Strategies</b>	5.0%	0.0%	19.0%	5.0%
<b>Real Assets</b>	0.0%	0.0%	14.1%	0.1%
<b>Private Equity</b>	2.5%	0.0%	18.5%	2.5%
<b>PIP</b>	0.3%	0.0%	2.3%	0.3%
<b>Diversifying Strategies</b>	-0.2%	0.0%	3.8%	-0.2%
<b>EMP</b>	1.0%	0.0%	1.0%	1.0%
<b>Cash</b>	-0.9%	0.5%	1.0%	-1.0%
<b>Leverage</b>	-2.0%	-3.0%	-6.0%	-5.0%
<b>Equities</b>		3.5%		
Physical		1.0%		
Synthetic		2.5%		
<b>Leverage</b>		-3.0%		
Cash Release		-1.0%		
Synthetic Funding		-2.0%		

# Scenario 2A: Summary

- Reduced equity underweight from -6.6% to -2.7%
- Exhausted cash release capacity
- Synthetic positions represent 4.7% of the fund now
- Increased overall leverage from 3% to 6%

# Scenario 2B: Double Dip with Dealer/Bank Stress

	<b>New Active Wgt</b>	<b>Trades</b>	<b>Post Trade Wgt</b>	<b>Post Trade Act Wgt</b>
<b>Public Equity</b>	-6.6%	4.0%	31.1%	-1.9%
<b>Fixed Income</b>	0.9%	-3.0%	14.1%	-1.9%
<b>Credit Strategies</b>	5.0%	0.0%	19.3%	5.3%
<b>Real Assets</b>	0.0%	0.0%	14.2%	0.2%
<b>Private Equity</b>	2.5%	0.0%	18.8%	2.8%
<b>PIP</b>	0.3%	0.0%	2.4%	0.4%
<b>Diversifying Strategies</b>	-0.2%	0.0%	3.9%	-0.1%
<b>EMP</b>	1.0%	0.0%	1.0%	1.0%
<b>Cash</b>	-0.9%	0.6%	1.1%	-0.9%
<b>Leverage</b>	-2.0%	-2.8%	-5.9%	-4.9%
<b>Equities</b>		4.0%		
Physical		-1.0%		
Synthetic		5.0%		
<b>Leverage</b>		-2.8%		
Cash Release		1.2%		
Synthetic Funding		-4.0%		

# Scenario 2B: Summary

- Lost access to cash release and must repay this financing source
- Sell 3 % of Fixed Income, now 2% underweight
- Sell 1 % of physical equities
- Buy 5 % of new synthetic equities in futures
- Now at max 6% policy leverage
- Equity underweight reduced from -6.6% to -1.9%
- New synthetic exposure will have more basis (150-300 basis points)
- Running 7.3% of the plan (23% of Public Equity) in synthetic form

# Scenario 3

- Picks up from Scenario 2A: a few months have passed...
- Assumes all Private Assets mark 10% lower
- Additional \$2b capital call for Private Credit
- Benefit payment of \$300mm
- Plan is 50 bps over-levered

# Scenario 3: Private Assets begin markdowns

	Policy		Active	Return	New Port	New
	Wgt	Port Wgt	Wgt	Shock	Wgt	Active
						Wgt
<b>Public Equity</b>	33.0%	30.3%	-2.7%	0.0%	32.0%	-1.0%
<b>Fixed Income</b>	16.0%	16.0%	0.0%	0.0%	16.9%	0.9%
<b>Credit Strategies</b>	14.0%	19.0%	5.0%	-10.0%	18.1%	4.1%
<b>Real Assets</b>	14.0%	14.1%	0.1%	-10.0%	13.4%	-0.6%
<b>Private Equity</b>	16.0%	18.5%	2.5%	-10.0%	17.6%	1.6%
<b>PIP</b>	2.0%	2.3%	0.3%	-10.0%	2.2%	0.2%
<b>Diversifying Strategies</b>	4.0%	3.8%	-0.2%	0.0%	4.0%	0.0%
<b>EMP</b>	0.0%	1.0%	1.0%	0.0%	1.0%	1.0%
<b>Cash</b>	2.0%	1.0%	-1.0%	0.0%	1.1%	-0.9%
<b>Leverage</b>	-1.0%	-6.0%	-5.0%	0.0%	-6.3%	-5.3%

# Sell FI to fund capital calls, Reduce Synthetic Equity exposure to get leverage in bounds

	<b>New Active Wgt</b>	<b>Trades</b>	<b>Post Trade Wgt</b>	<b>Post Trade Act Wgt</b>
<b>Public Equity</b>	-1.0%	-0.5%	31.6%	-1.4%
<b>Fixed Income</b>	0.9%	-2.5%	14.4%	-1.6%
<b>Credit Strategies</b>	4.1%	0.0%	20.2%	6.2%
<b>Real Assets</b>	-0.6%	0.0%	13.4%	-0.6%
<b>Private Equity</b>	1.6%	0.0%	17.7%	1.7%
<b>PIP</b>	0.2%	0.0%	2.2%	0.2%
<b>Diversifying Strategies</b>	0.0%	0.0%	4.0%	0.0%
<b>EMP</b>	1.0%	0.0%	1.0%	1.0%
<b>Cash</b>	-0.9%	2.6%	1.3%	-0.7%
<b>Leverage</b>	-5.3%	0.4%	-6.0%	-5.0%
<b>Equities</b>		-0.5%		
Physical		0.0%		
Synthetic		-0.5%		
<b>Leverage</b>		0.4%		
Cash Release		0.0%		
Synthetic Funding		0.4%		

# Key objectives and trade-offs

- Risk of being underweight Public Equities in a potential rally
- Loss of active management opportunities when using synthetics
- Loss of cash release capacity when selling or reallocating within Fixed Income
- Uncertainty around private asset valuations
- How much dry powder to hold in reserve to meet future capital calls?



# Q&A

# Asset Allocation Update

Chung Ma  
Managing Director

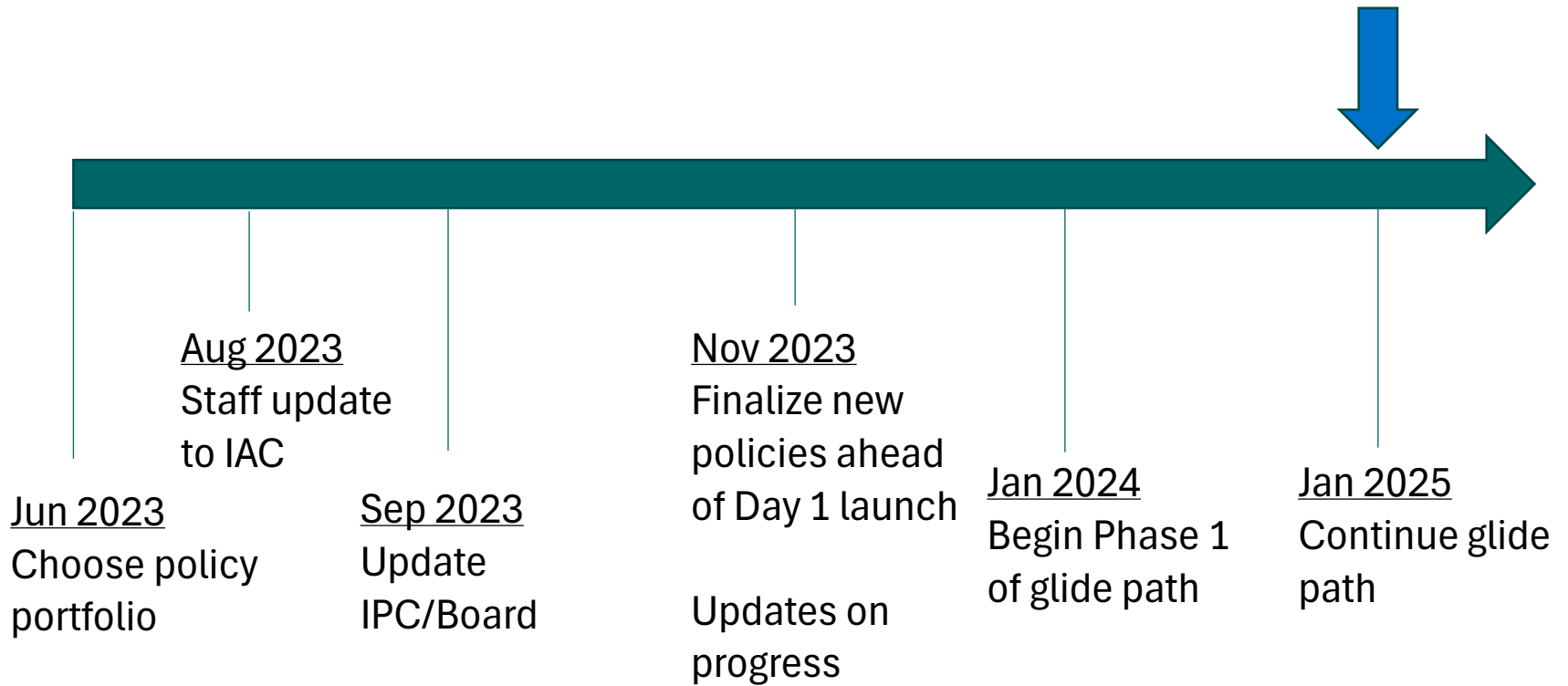
November 6, 2024



# Agenda

- Roadmap
- Expected glide path
- Looking forward

# Roadmap



# Expected Glide Path

<u>Program</u>	<u>Current</u>	<u>Jan 2025</u>	<u>LT SAA*</u>	<u>Change</u>
Public Equity	33	33	32	0
Private Equity	16	16	15	0
Real Assets	14	14	15	0
Credit Strategies	14	15	16	1
Diversifying Strategies	4	4	6	0
Private Investment Partnerships	2	2	1	0
Fixed Income	16	16	16	0
Cash	2	2	2	0
Leverage	-1	-2	-3	-1
Total	100	100	100	

\* Long term strategic asset allocation

# Looking Forward

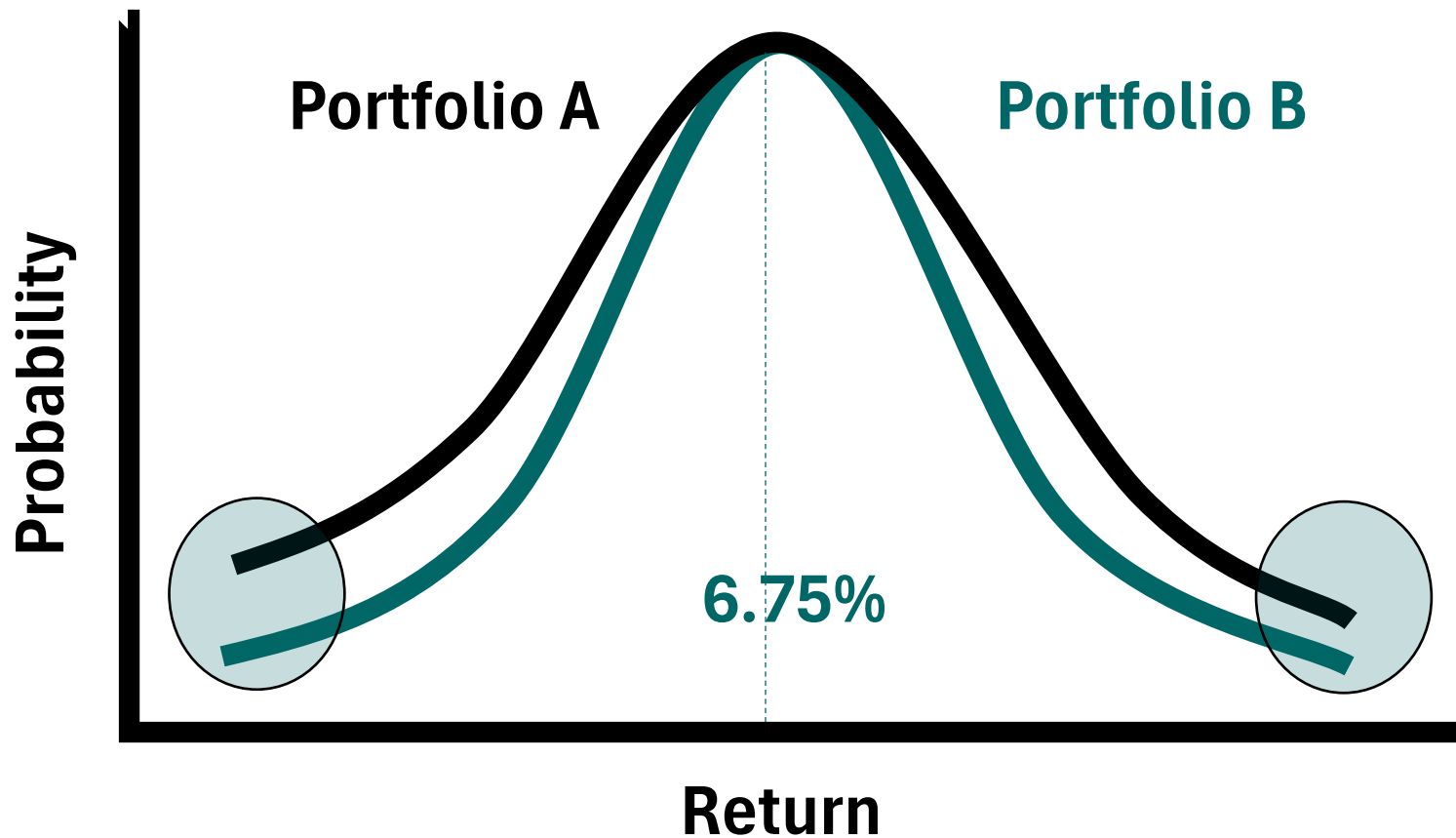
- **Increase benchmark leverage** by an additional 1% in January 2025, reaching a total of 2% within the strategic asset allocation
- **Deploy leverage strategically** based on prevailing market conditions and emerging investment opportunities
- **Expand funding sources** to enhance portfolio flexibility
- **Integrate data-driven evaluations** to optimize funding source selection
- **Strengthen the risk management framework** through regular stress testing and scenario analysis

# Appendix



# Portfolio Preferences

## Illustrative





# Private Assets Program Reviews

K.C. Howell  
Managing Director



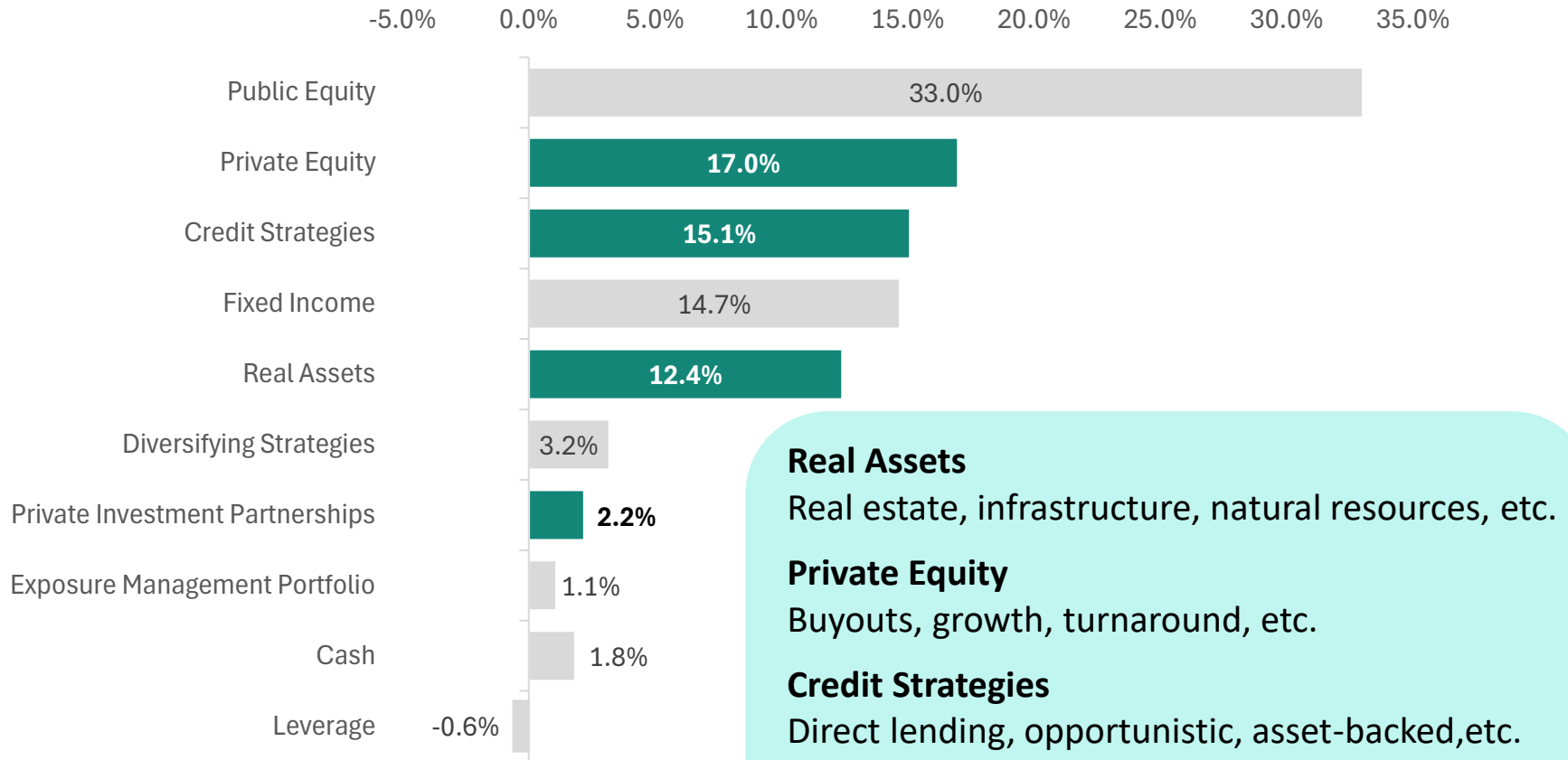
# Agenda:

## Private Assets Program Reviews

- Overview (K.C. Howell, Managing Director) 5 min
- Real Assets (Walker Noland, Program Director) 30 min
- Private Equity (John Alouf, Program Director) 30 min
- Credit Strategies (Steve Woodall, Program Director) 30 min
- Private Investment Partnerships (PIP) (Steve Woodall, Program Director)

# Overview:

## What does VRS classify as Private Assets?



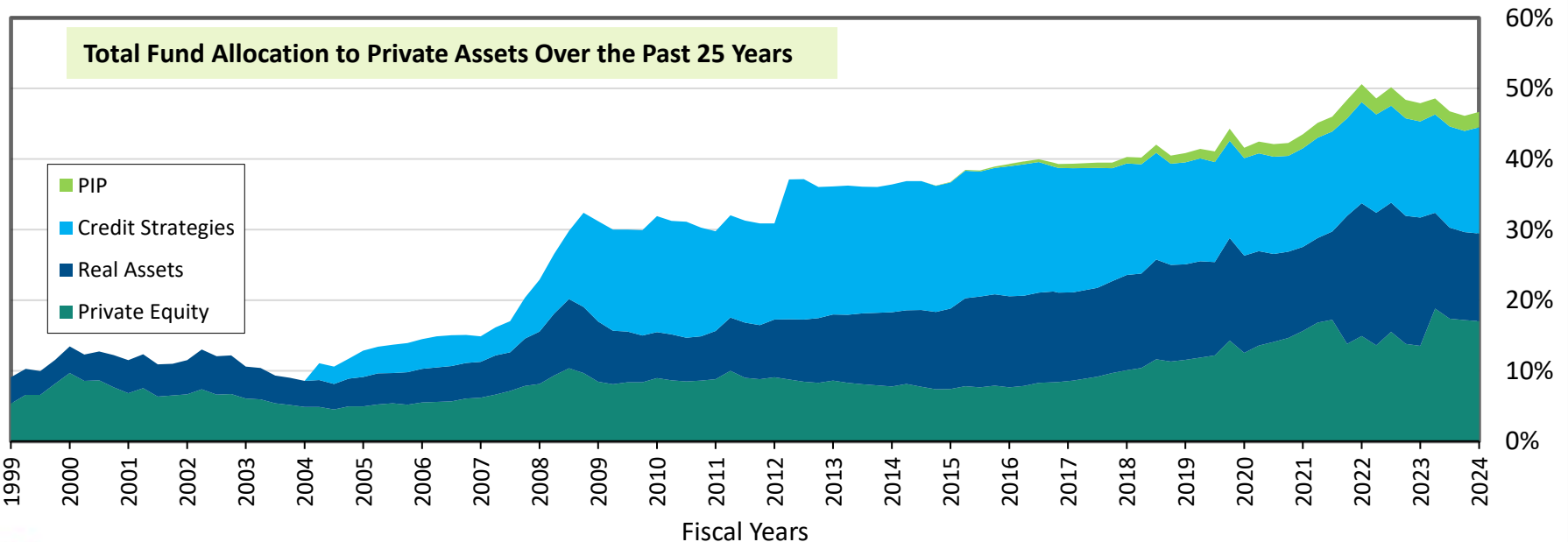
**Private Market Assets: 46.7%**

Market values as of 6/30/24; source: BNY data

# Overview:

## Why Does VRS Invest In Private Assets?

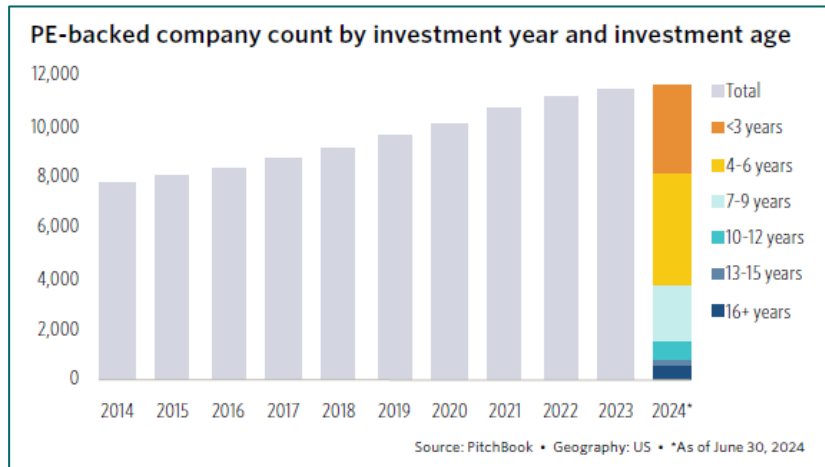
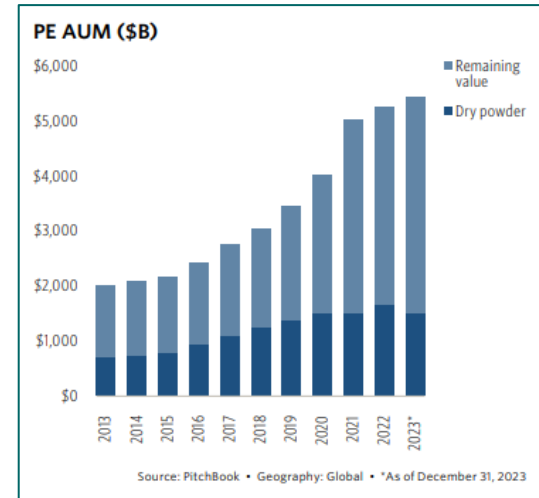
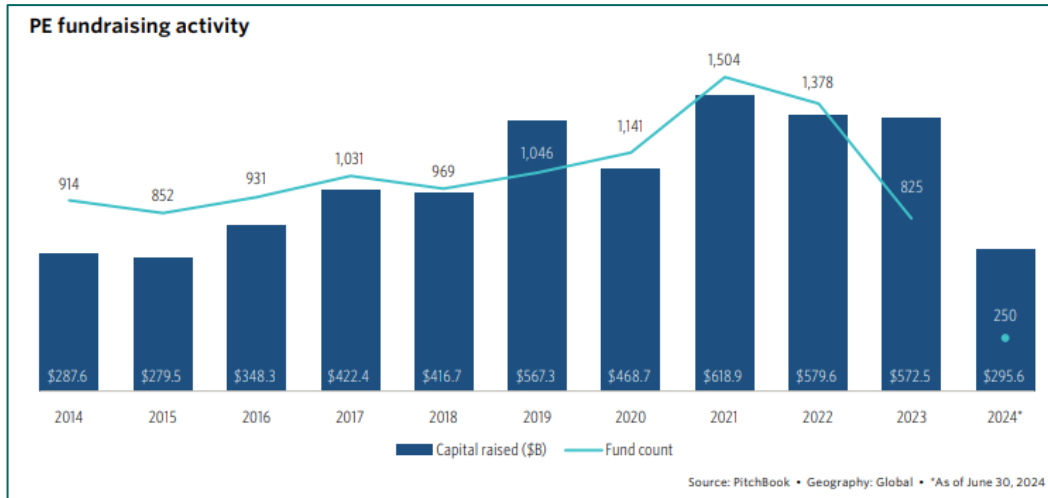
- Enhance absolute & relative returns
- Capture illiquidity premium
- Reduced risk via diversification
- Market migration from public to private



Market values as of 6/30/24; source: BNY data

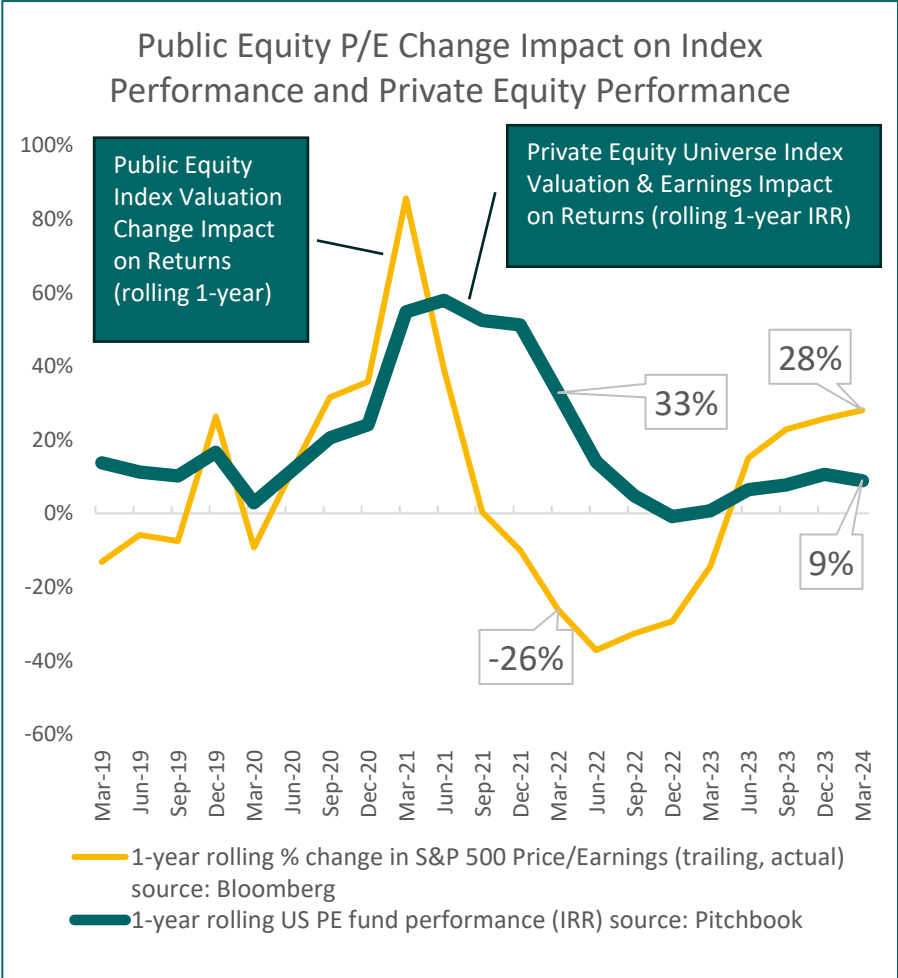
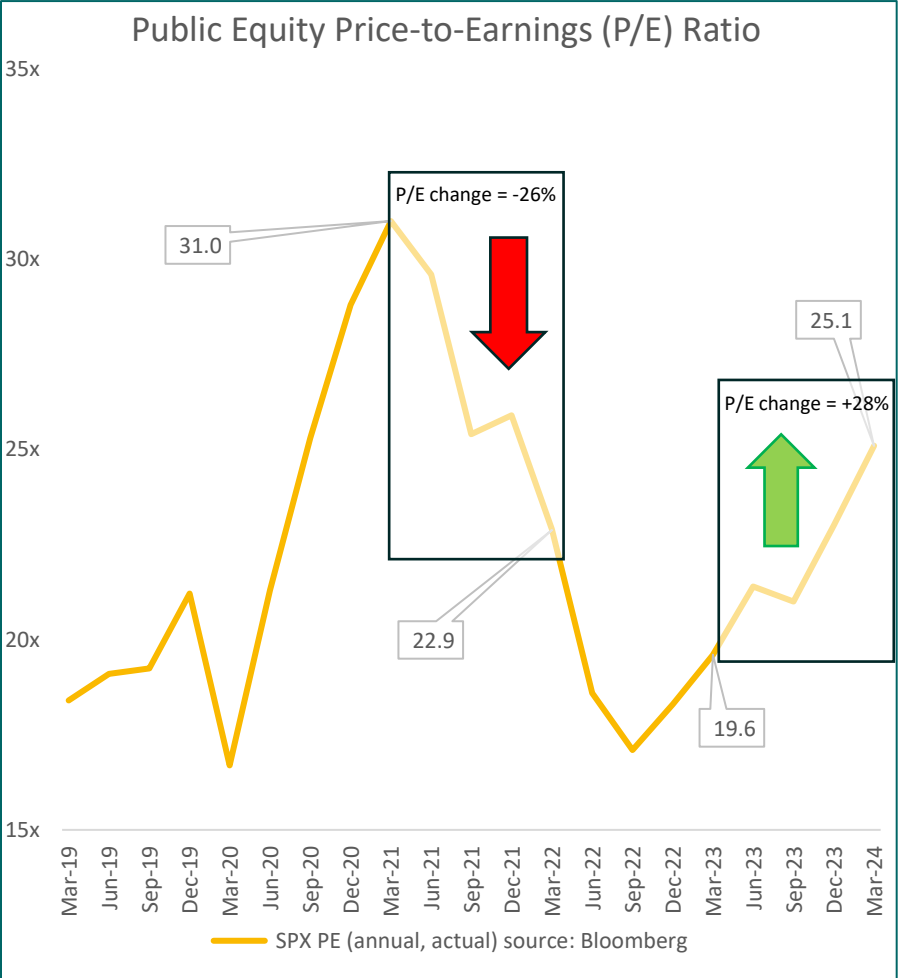
# Private Equity Perspectives

## Fundraising, Dry Powder & Hold Times



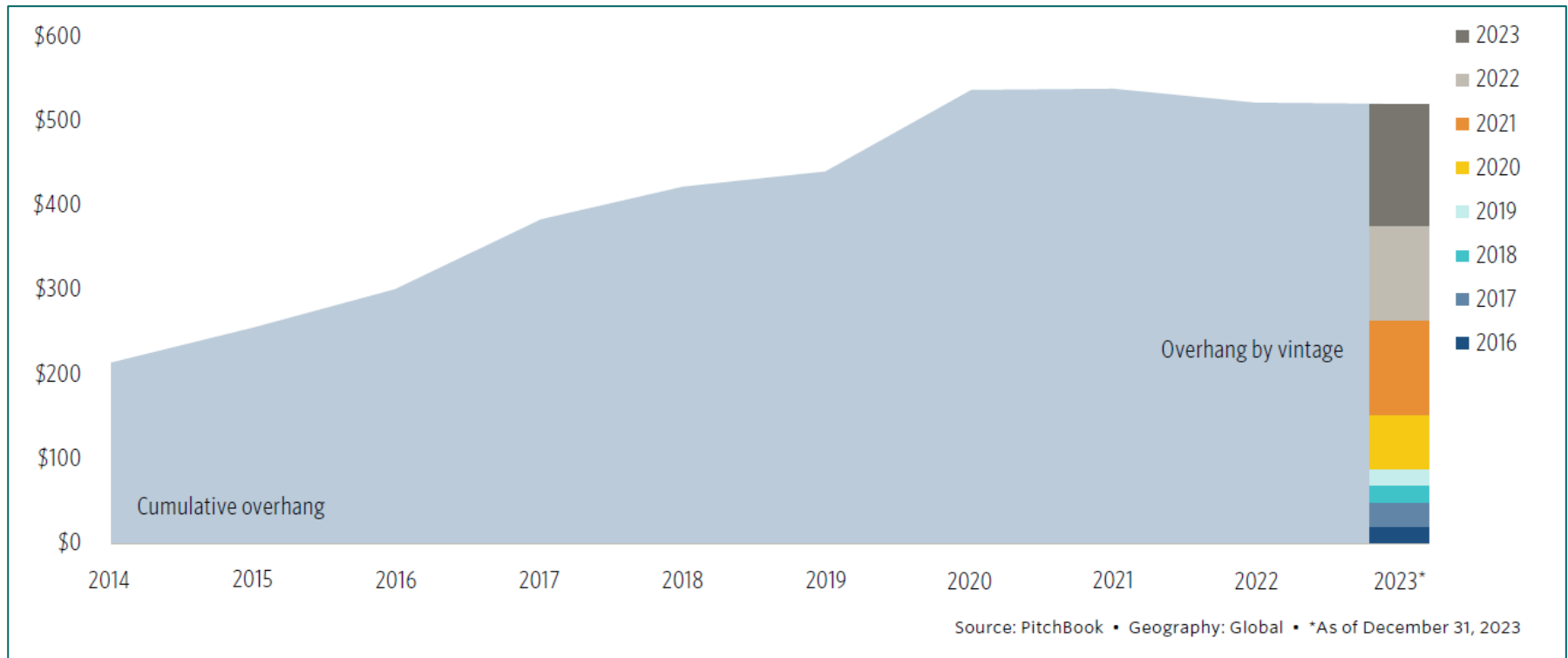
# Private Equity Perspectives

## Valuation Evaluation



# Private Credit Perspectives

## Dry Powder (\$b) by Vintage

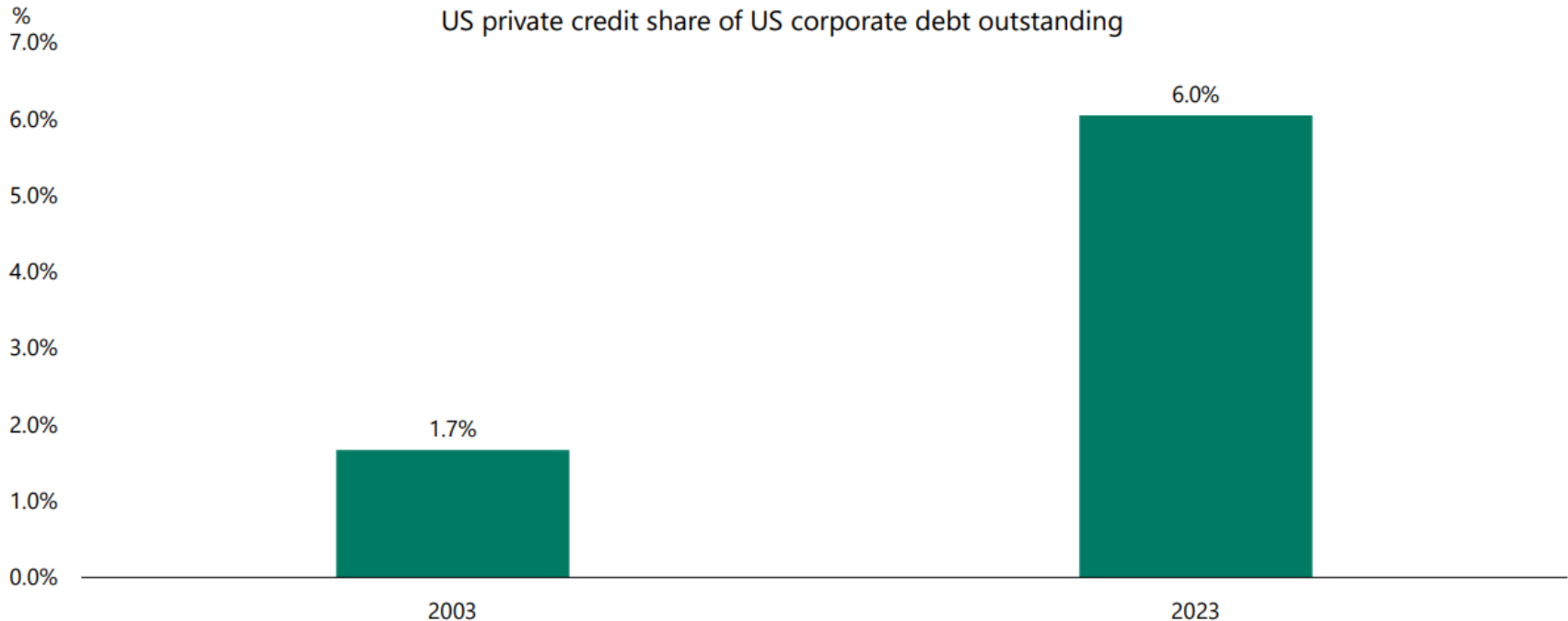


# Private Credit Perspectives

## Growth Opportunities as Market Evolves

APOLLO

### Private credit share of US corporate debt outstanding

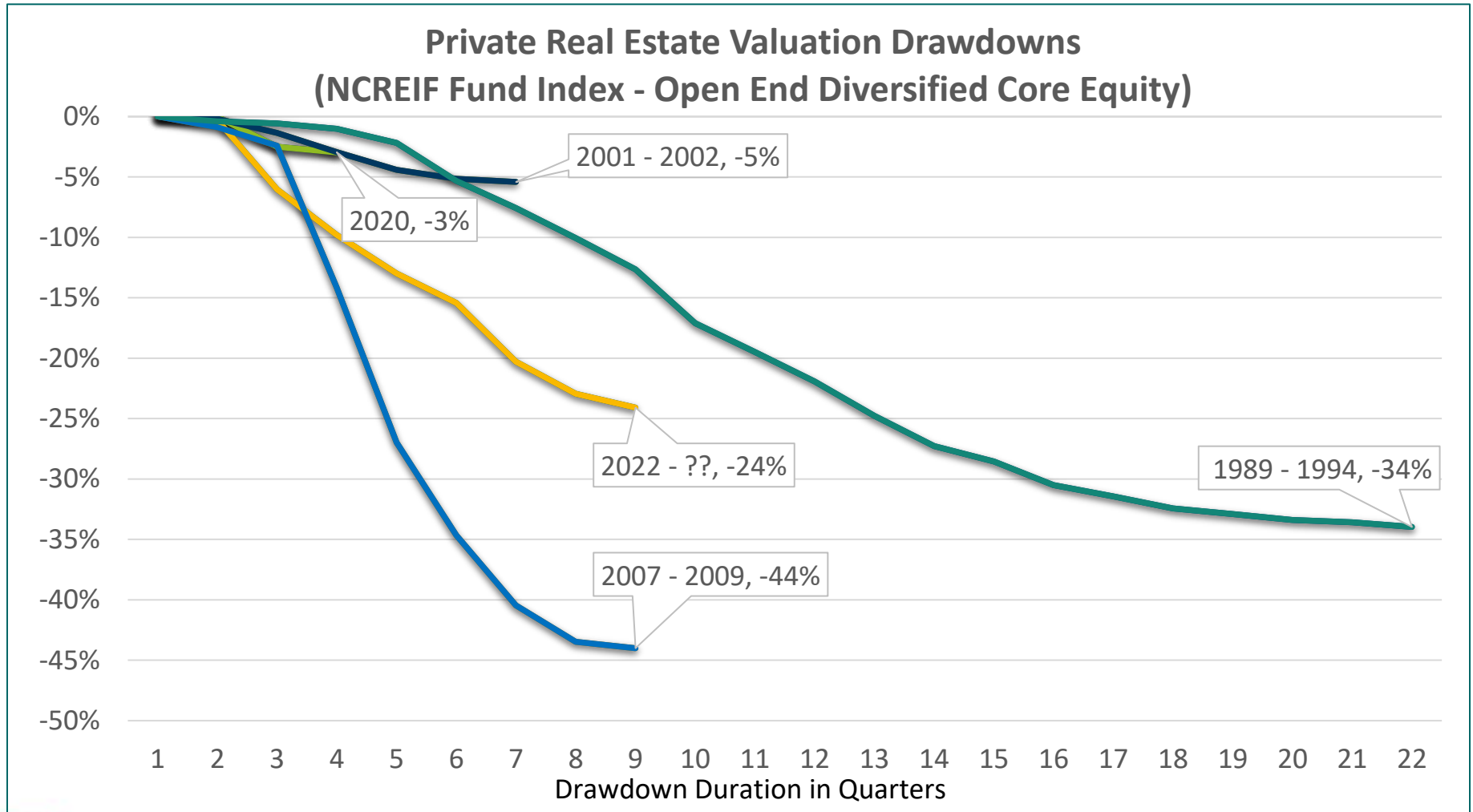


Note: US debt outstanding includes US IG and HY corporate bond market value outstanding, leveraged loans market value outstanding, US private credit AUM and US bank lending to corporates. Source: Preqin, ICE BofA, PitchBook LCD, FRB, Bloomberg, Apollo Chief Economist



# Real Assets Perspectives

## Is the storm passing?

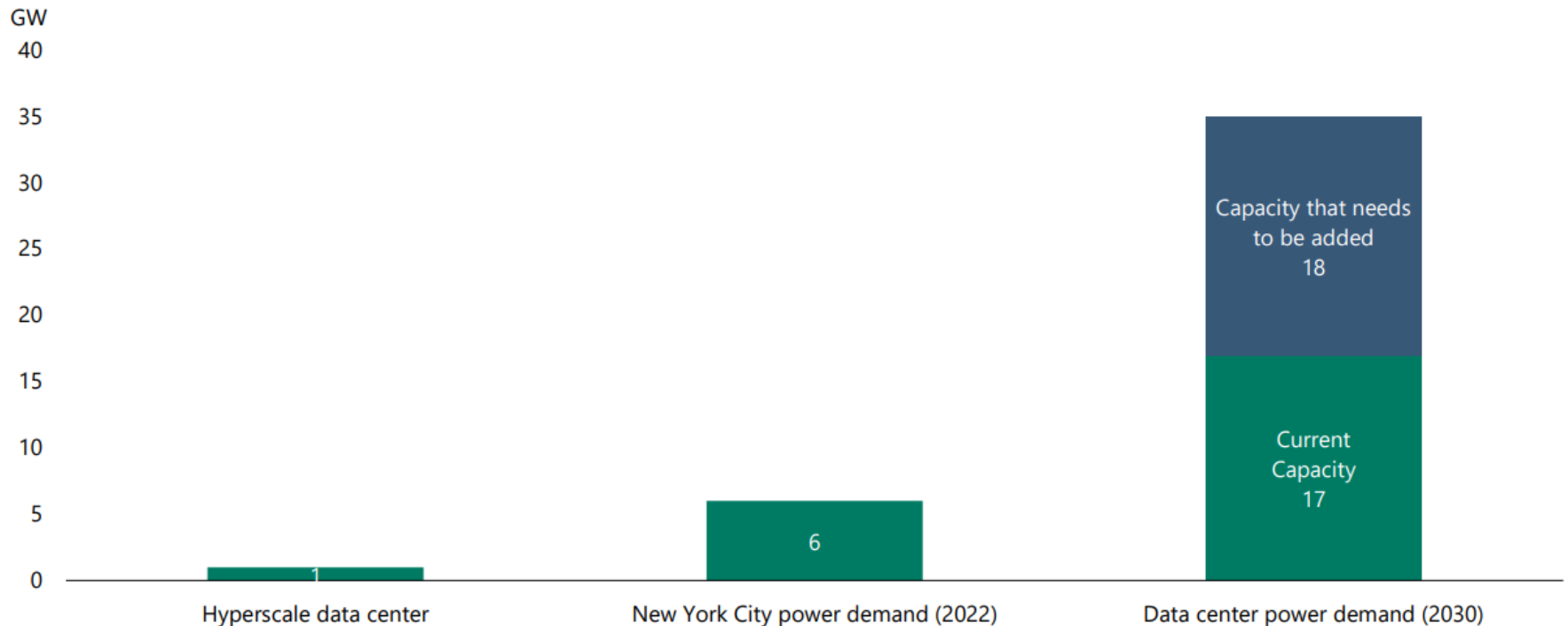


# Real Assets Perspectives

## Infrastructure remains strong

APOLLO

### US data center energy demand: Need to add three NYCs to the power grid by 2030



Note: Current capacity as of 2022, [Why invest in the data center economy | McKinsey, Systems - NYC Mayor's Office of Climate and Environmental Justice, Data Center Power: Fueling the Digital Revolution, US data center power consumption to double by 2030 - DCD](#). Source: NYISO 2022, McKinsey, Nextgen, datacenterknowledge.com, Apollo Chief Economist

# Real Assets

Walker Noland  
Program Director, Real Assets



# Agenda:

## Real Assets Annual Review Topics

- Overview
- Markets
- Exposures
- Results
- Co-investments
- Managers
- Looking Forward

# Overview: Team Members

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
<b>Walker Noland</b>	<b>Program Director</b>	<b>MBA</b>	<b>CFA</b>	<b>24</b>	<b>14</b>
Tom Coleman	Senior Portfolio Manager	BS	CFA, CAIA	24	13
Warren Chang	Portfolio Manager	MBA, MS	CFA	27	9
Jummai Sarki-Hurd	Portfolio Manager	MBA, MS	-	18	11
Lee Buchanan	Investment Officer	BA	-	8	<1
Kenneth Fleming	Investment Analyst	BBA	-	1	<1
Cecilia Jones	Portfolio Assistant	BA	-	<1	<1

# Overview: Objectives

- **Diversification – historically low correlation to global equities as shown below**
- **Competitive Returns – strong historical returns**
- **Cash Flow – investments tend to distribute cash quarterly**
- **Inflation Linkages – varies by sector & asset type, but some ability to pass through inflation**

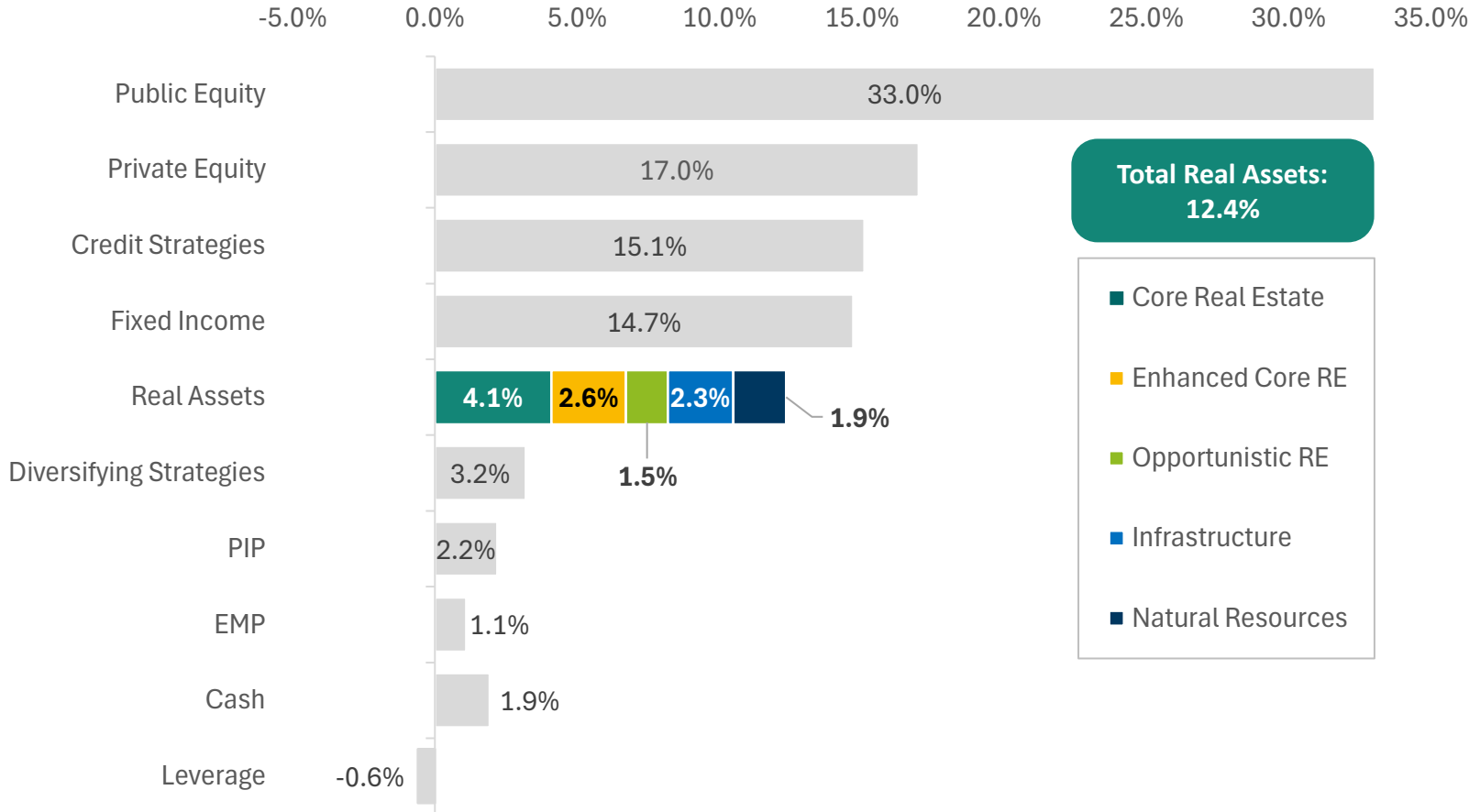
## Correlations

	Global REITs	U.S. Commercial Real Estate	Timberland	Farmland	Energy (ex. Gold & Equities)	Mining Equities (ex. Gold & Silver)	Gold	Infra-structure Equities	Global Equities	IG Corp Bonds	CPI
Global REITs	1.00										
Commercial Real Estate	0.37	1.00									
Timberland	0.04	(0.09)	1.00								
Farmland	0.27	0.07	0.27	1.00							
Energy Equities	0.50	0.15	0.34	0.21	1.00						
Mining Equities	0.62	0.20	0.26	0.19	0.74	1.00					
Gold	0.19	(0.04)	0.13	0.39	0.06	0.28	1.00				
Infrastructure Equities	0.84	0.34	0.13	0.39	0.67	0.71	0.23	1.00			
Global Equities	0.77	0.27	0.24	0.16	0.61	0.73	0.16	0.85	1.00		
IG Corp Bonds	0.10	(0.14)	0.20	(0.14)	(0.25)	(0.21)	0.43	0.14	(0.06)	1.00	
U.S. CPI	0.09	0.16	0.33	0.11	0.24	0.20	0.13	0.14	0.09	(0.21)	1.00

Source: Bloomberg (public markets data). NCREIF (private markets data).

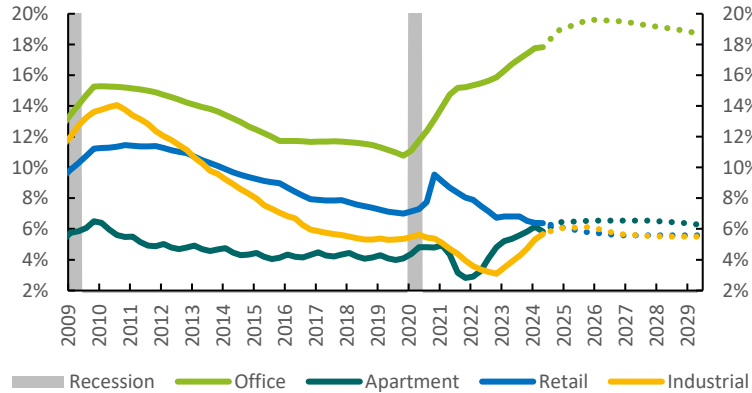
Notes: Private Commercial Real Estate returns de-smoothed. Correlations based on quarterly data, except Timberland and Farmland, which are based on annual data since those assets are generally appraised only once per year.

# Overview: Asset Allocation – 6/30/24



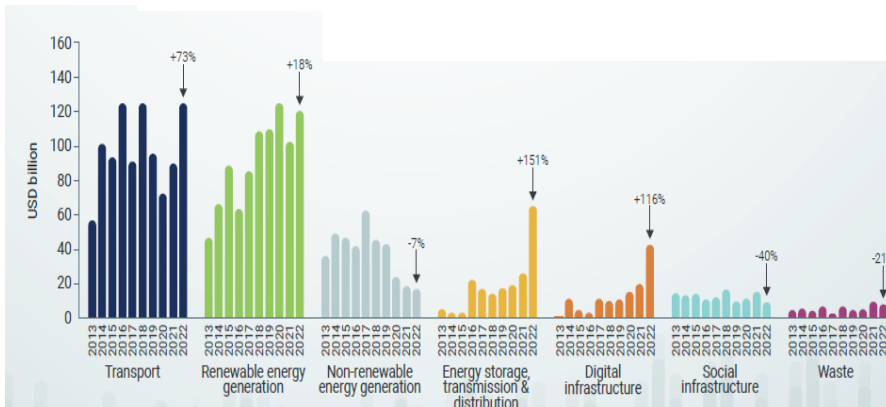
# Markets: Fundamentals

**Property Vacancy Rates – Top 50 U.S. Markets**



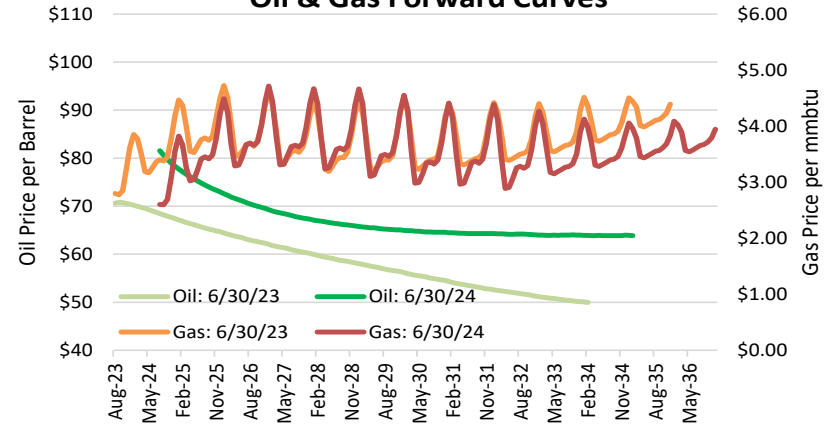
Source: Green Street, Federal Reserve Bank of St. Louis as of June 2024

**Private Investment in Infrastructure Projects by Sector**  
(USD billion and % growth in 2022)



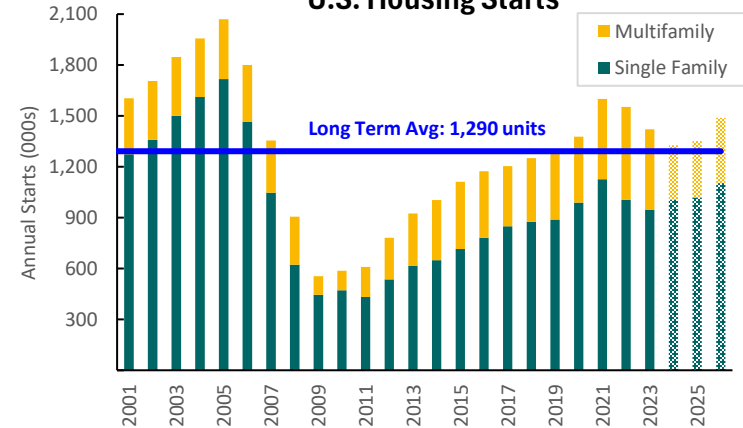
Source: GI Hub Infrastructure Insights 2024

**Oil & Gas Forward Curves**



Source: Bloomberg

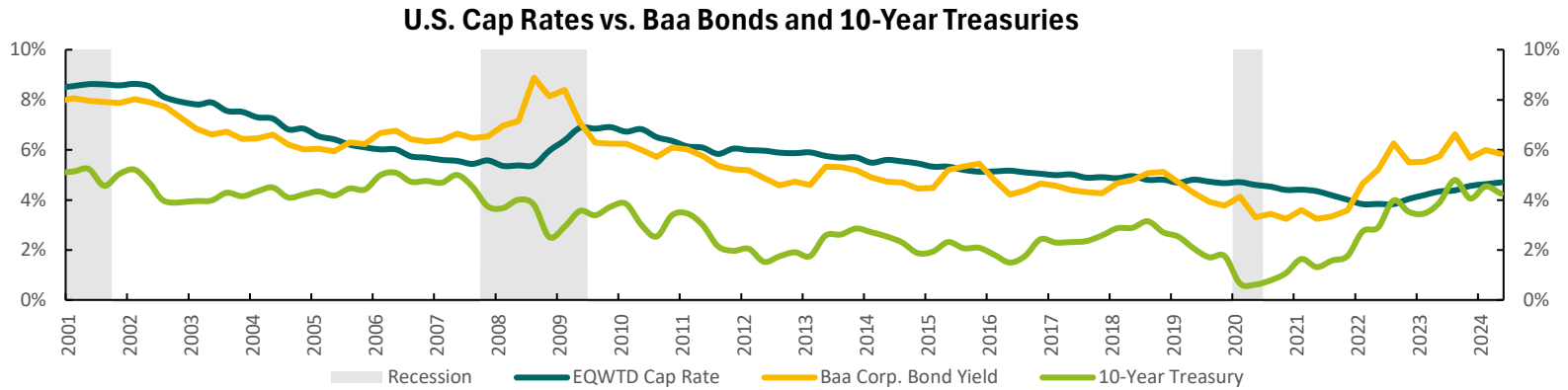
**U.S. Housing Starts**



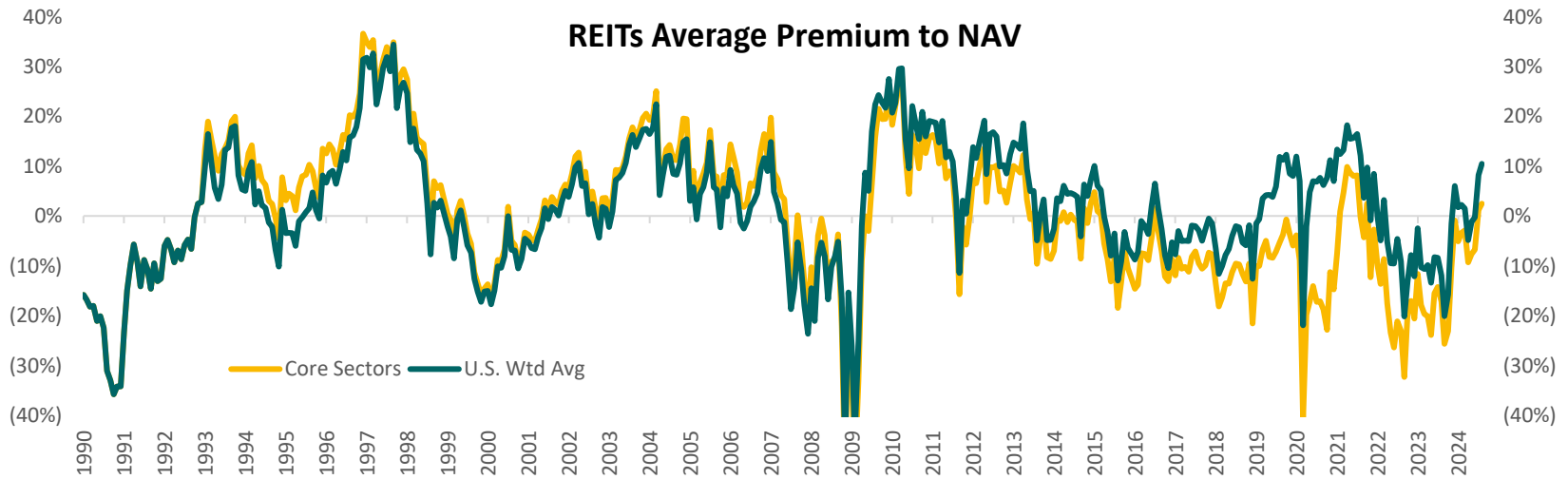
Sources: U.S. Census Bureau and U.S. Department of Housing and Urban Development, NAHB Forecast as of July 2024



# Markets: U.S. Cap Rates & REIT NAV Premiums



Sources: NCREIF All Properties Appraised Cap Rates, Moody's, Board of Governors of the Federal Reserve System

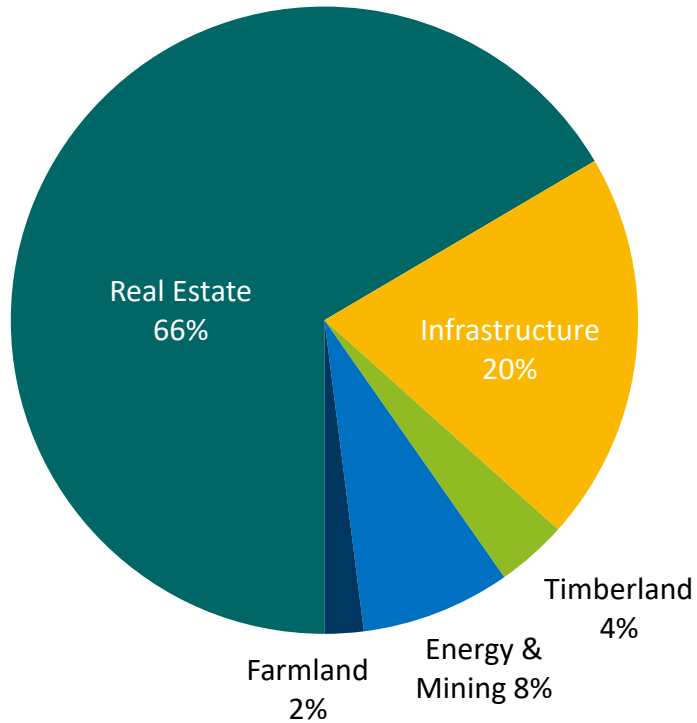


Sources: Green Street Advisors

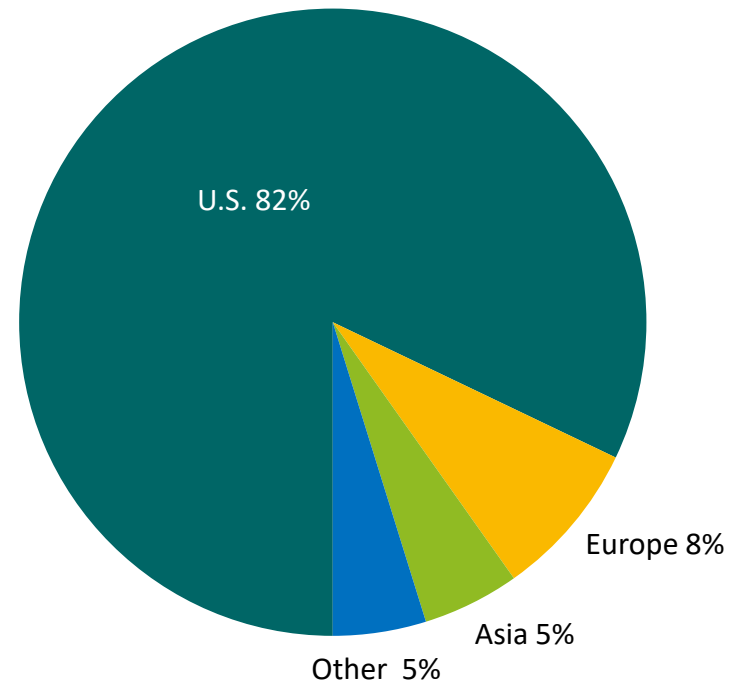
# Exposures: Sectors & Geography – 6/30/24

Current Market Value: \$14.1 Billion

Sectors

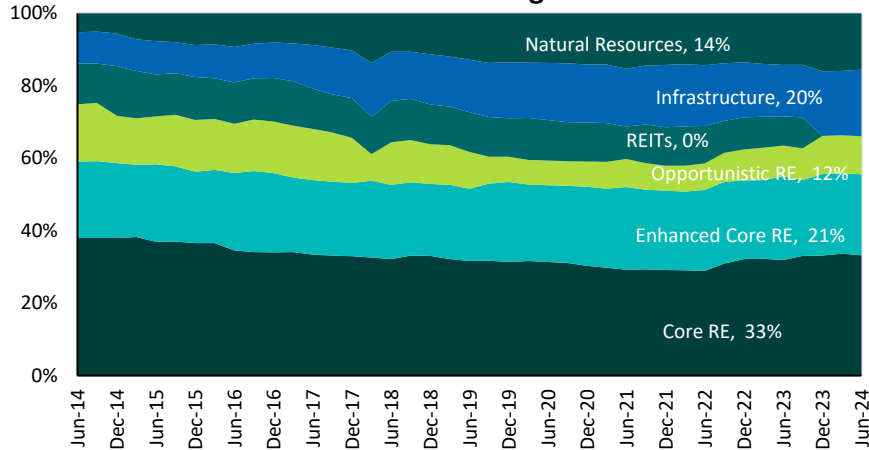


Geography

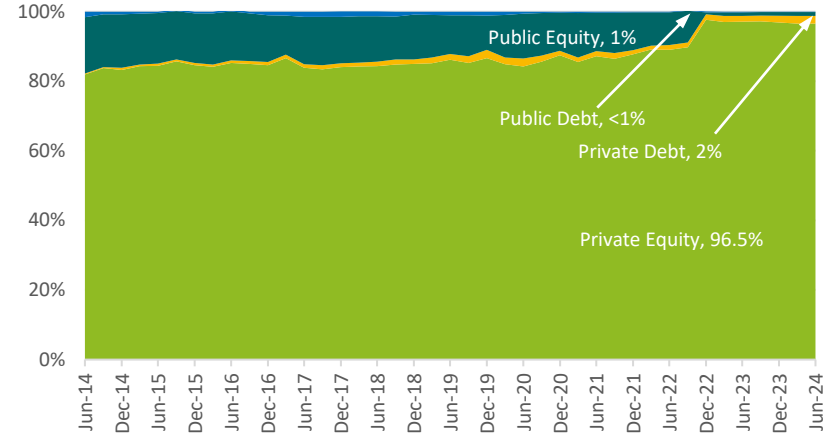


# Exposures: Risk Metrics – 6/30/24

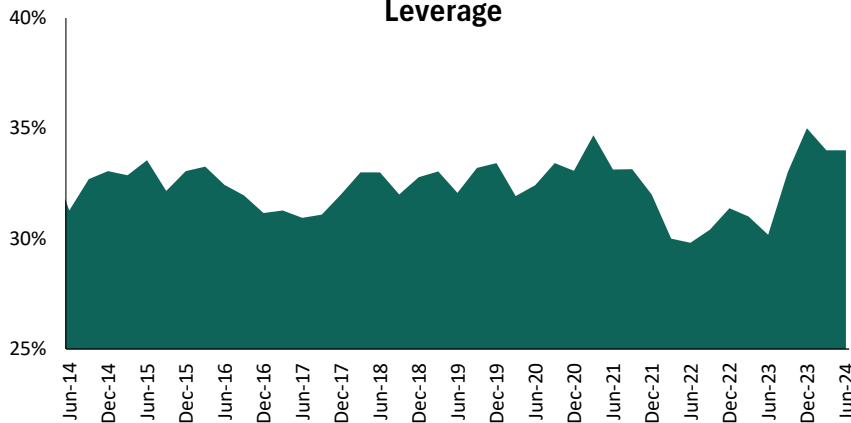
**Risk/Sector Categories**



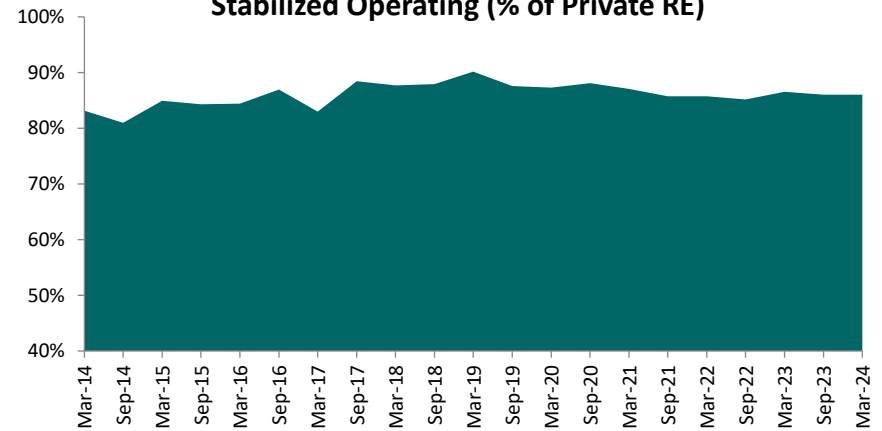
**Four Quadrants**



**Leverage**

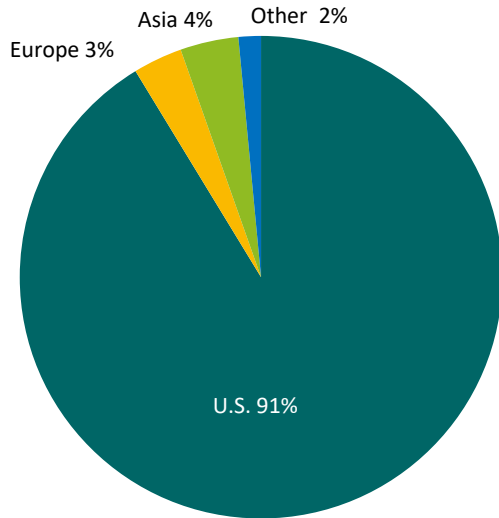


**Stabilized Operating (% of Private RE)**

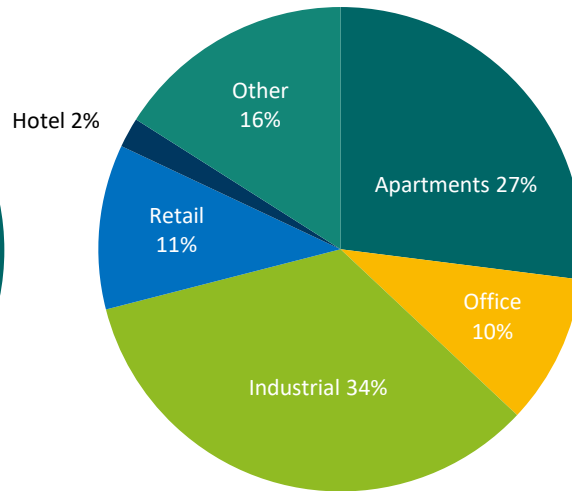


# Exposures: Real Estate – 6/30/24

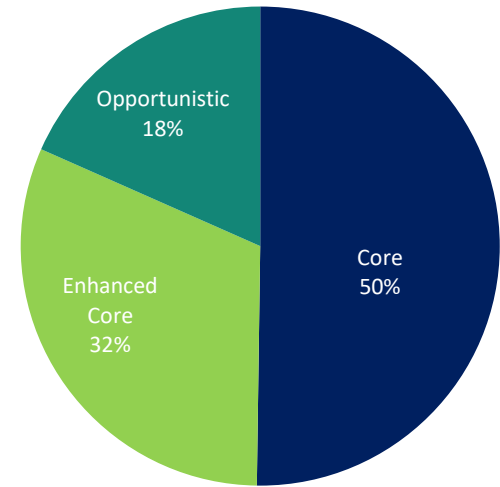
**Geography**



**Property Type**



**Category**

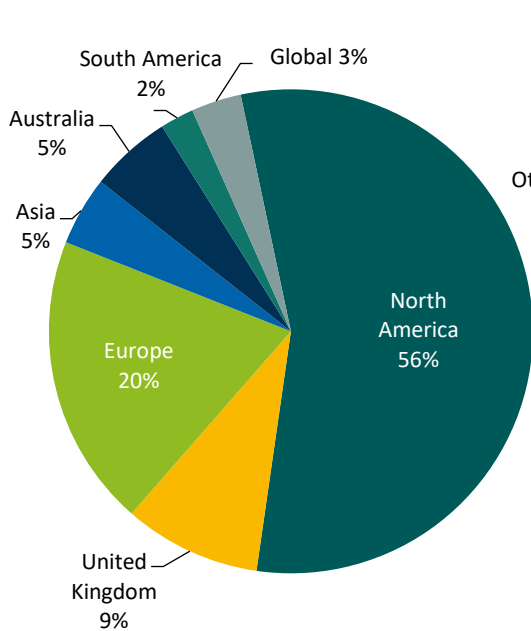


Market	# Accts.	Market Value (\$MM)	Market Value %	Unfunded Commitment/Allocation (\$MM)
Private	65	9,372	100	2,774

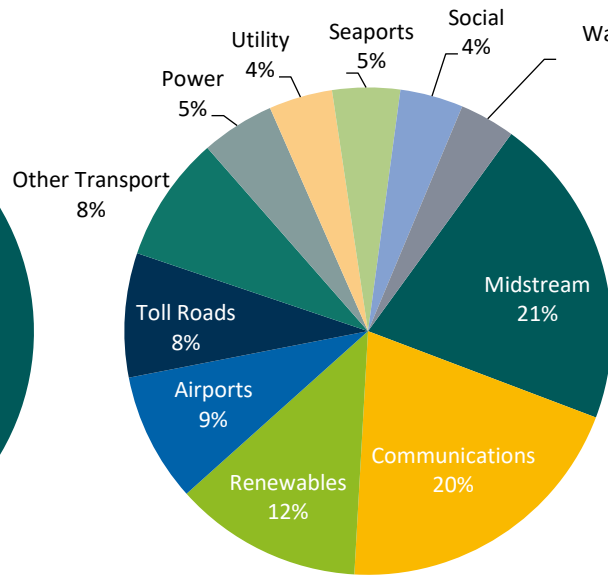
Source: BNY Mellon

# Exposures: Infrastructure – 6/30/24

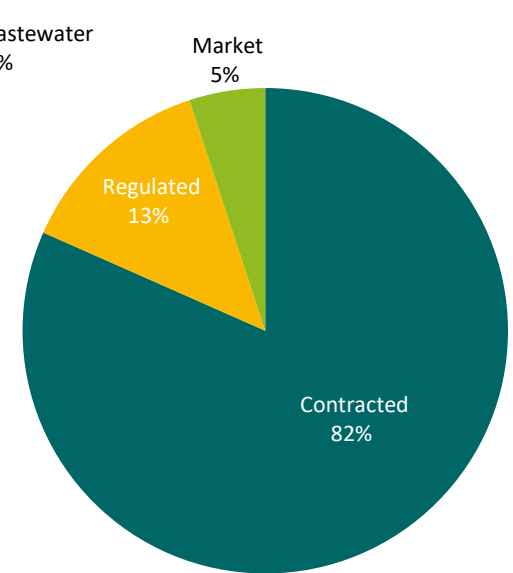
**Geography**



**Sector**



**Revenue Source**

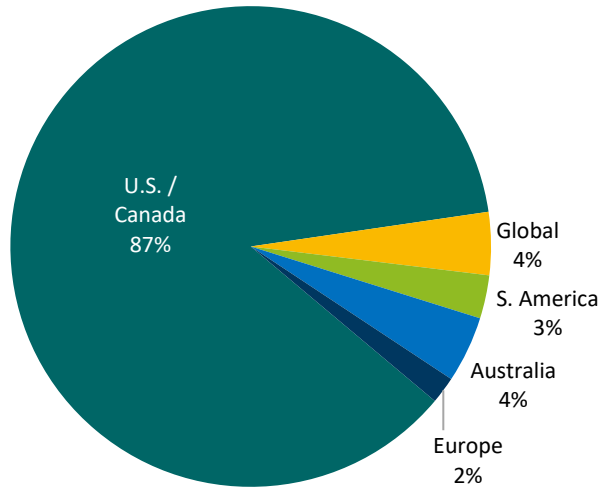


Market	# Accts.	Market Value (\$MM)	Market Value %	Unfunded Commitment/Allocation (\$MM)
Private	37	2,819	100	1,527

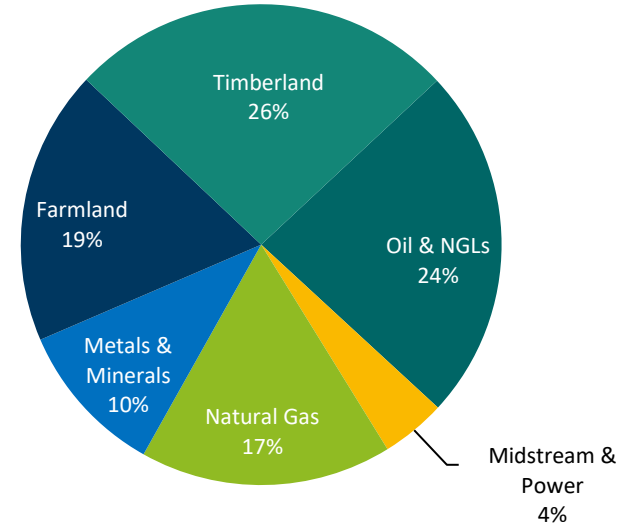
Source: BNY Mellon

# Exposures: Natural Resources – 6/30/24

Geography



Sector



Market	# Accts.	Market Value (\$MM)	Market Value %	Unfunded Commitment/Allocation (\$MM)
Private	29	1,889	96	945
Public	1	69	4	25
<b>Total</b>	<b>30</b>	<b>1,958</b>	<b>100</b>	<b>970</b>

Source: BNY Mellon

# Results:

## Portfolio Returns – 6/30/24

	10 Year	5 year	3 Year	1 Year	MV (\$MM)
<b>Total Real Assets</b>	<b>8.2</b>	<b>6.1</b>	<b>6.2</b>	<b>-3.2</b>	<b>14,149</b>
Strategic Benchmark	6.1	3.8	3.4	-5.8	
Excess Return	2.1	2.3	2.8	2.6	
<b>Private Real Estate</b>	<b>8.9</b>	<b>6.6</b>	<b>7.2</b>	<b>-5.7</b>	<b>9,372</b>
Benchmark	5.8	2.6	2.5	-12.0	
Excess Return	3.1	4.0	4.7	6.3	
<b>Infrastructure</b>	<b>10.4</b>	<b>8.4</b>	<b>9.0</b>	<b>4.0</b>	<b>2,819</b>
Benchmark	6.8	8.2	9.6	7.5	
Excess Return	3.6	0.2	-0.6	-3.5	
<b>Natural Resources</b>	<b>5.2</b>	<b>6.6</b>	<b>8.4</b>	<b>-1.3</b>	<b>1,958</b>
Benchmark	6.8	8.2	9.6	7.5	
Excess Return	-1.6	-1.6	-1.2	-8.8	

Source: BNY Mellon

# Results: FY 2024

## Headwinds/Tailwinds

- + **Tailwinds:** Diversity of the Real Assets portfolio  
On a relative basis, positioning within Private Real Estate (geographic and property type) was a strong tailwind again this year
- **Headwinds:** Higher interest rates continued to pressure private market valuations  
Few transactions, few distributions

### Largest Absolute Return Contribution:

	% Contribution	% of Program
Infrastructure	0.8%	20%
Timberland	0.1%	4%
Energy and Mining	-0.1%	8%
Farmland	-0.2%	2%
Opportunistic RE	-0.6%	12%
Core RE	-1.2%	33%
Enhanced Core RE	-1.9%	21%
<b>Total Real Assets</b>	<b>-3.2%</b>	<b>100%</b>

### Largest Relative Return Contribution:

	% Contribution	% of Program
Core RE	2.8%	33%
Opportunistic RE	0.9%	12%
Enhanced Core RE	0.7%	21%
Timberland	-0.1%	4%
Infrastructure	-0.7%	20%
Energy and Mining	-0.6%	8%
Farmland	-0.4%	2%
<b>Total Real Assets</b>	<b>2.6%</b>	<b>100%</b>

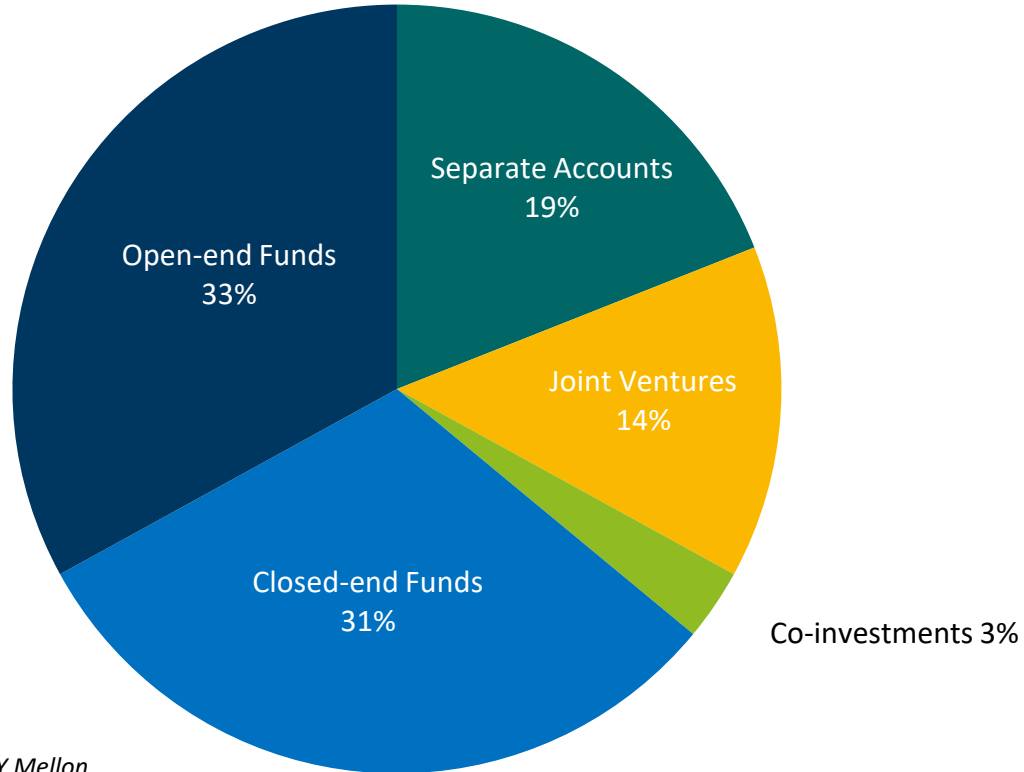
Note: Exact figures vary due to rounding.



# Co-investments: Real Assets Approach

- Objective is to invest additional funds alongside existing managers to fine tune portfolio exposures and sector allocations with incremental capital, generally with lower (or no) fees
- Target investment size of +/- \$25MM per co-investment
- Real Assets team member responsible for manager relationship runs point on co-investment activity from that manager. Deal teams formed as needed
- VRS staff makes the go/no-go call on investments in consultation with CIO and Director of Private Markets. Investment authority sits with CIO
- Manager remains fiduciary
- Continual evaluation of co-investment processes across Private Assets for more consistency within VRS

# Co-investments: Structure – 6/30/24



Source: BNY Mellon

Sector	Fiscal Year 2024 Commitments
Private RE	Three Co-investments – \$96 Million
Infrastructure	One Co-investment – \$25 Million

# Managers: Top 10 Investment Managers

Manager	# of Mandates	% of Program
PGIM	3	12.7%
Blackstone	14	8.7%
Morgan Stanley	3	7.2%
Clarion Partners	1	6.4%
Industry Funds Mgmt.	3	5.2%
Pantheon Ventures	4	4.5%
Carson Companies	4	4.1%
JP Morgan	2	3.7%
Pritzker Realty Group*	2	3.7%
Global Infrastructure Partners	5	3.4%

\*DIME (Diverse Investment Management Engagement) firm

# Managers: Diverse Investment Management Engagement (DIME)

Resources		
Townsend	Pantheon	Aksia
<ul style="list-style-type: none"> <li>• Real Estate</li> <li>• Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure</li> <li>• Natural Resources</li> </ul>	<ul style="list-style-type: none"> <li>• Infrastructure</li> <li>• Natural Resources</li> </ul>

**33 interactions with 26 potential DIME managers in the 12 months ending 6/30/2024**

Manager	Sector	Vintage	Comm./Alloc. (\$MM)
Artemis RE Partners Fund III	Real Estate	2018	75
Artemis RE Partners Fund IV	Real Estate	2021	125
Artemis Income & Growth Sidecar	Real Estate	2020	75
Capri/EGM JV	Real Estate	2014	300
Grain Infra	Infrastructure	2012	75
Pritzker JV	Real Estate	2012	232
Pritzker JV II	Real Estate	2015	200
Sheridan Production Partners III	Natural Resources	2014	72
		<b>Total</b>	<b>1,154</b>

# Looking Forward

- Continue active portfolio management – especially given ongoing uncertainty with market conditions
- Focus on objectives & risk
- Prudent work in continuing to close the underweight to our targeted allocation. Staff being creative to find opportunities in the current market environment

# Private Equity

John Alouf  
Program Director



# Agenda:

## Private Equity Annual Review Topics

- Overview
- Markets
- Exposures
- Results
- Managers
- Co-investments
- Looking Forward

# Overview: Team Members

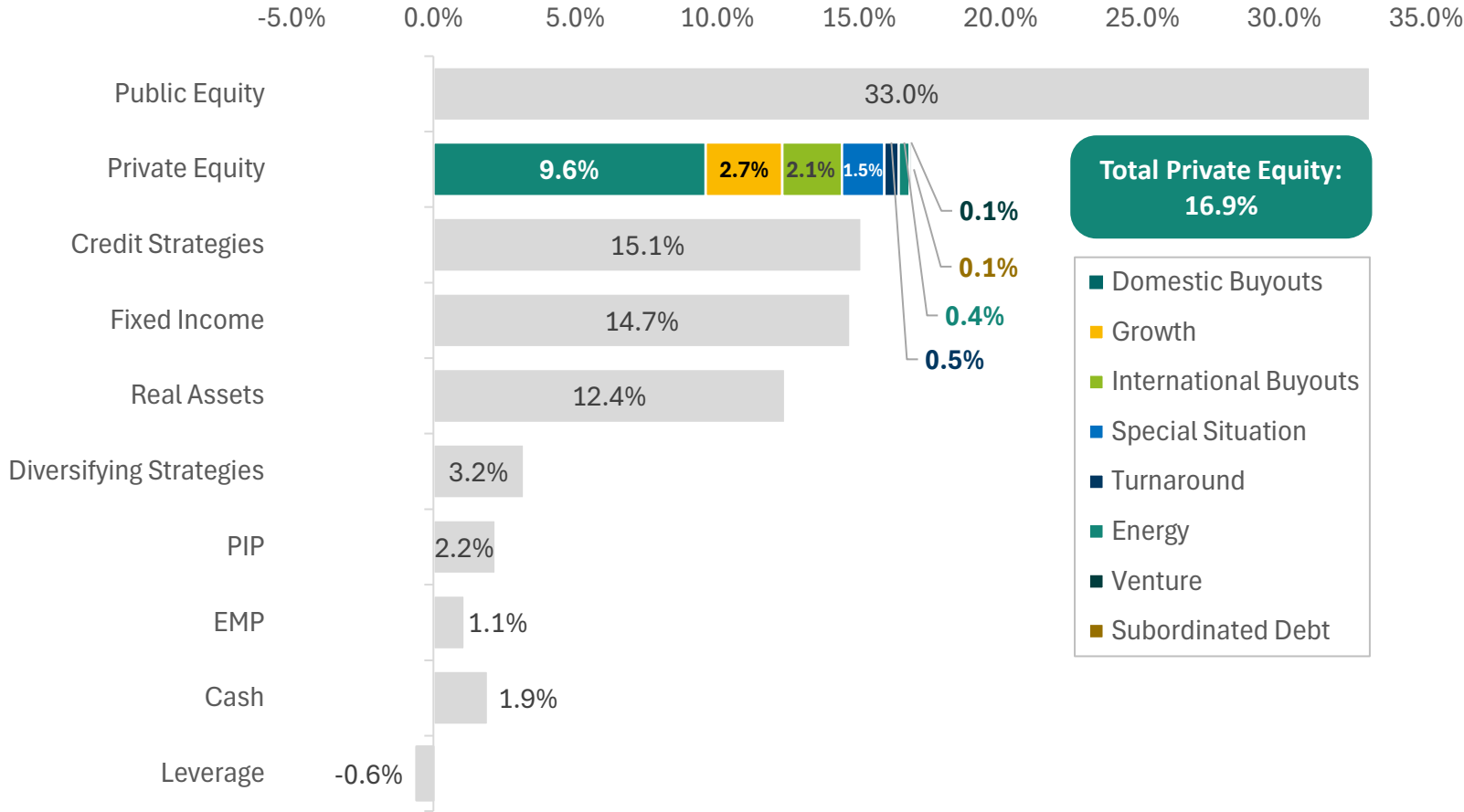
Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
<b>John Alouf</b>	<b>Director</b>	<b>MBA</b>	<b>CFA</b>	<b>30</b>	<b>24</b>
Jay Gentry	Portfolio Manager	BBA	CFA, CPA	30	30
Peter Murphy	Senior Portfolio Manager	BBA	CFA	24	13
Rob Voeks	Senior Portfolio Manager	PhD		27	10
De'Von Jones	Senior Investment Officer	BBA	CFA	14	5
Viet Tran	Senior Investment Analyst	MS		4	3
Cecilia Jones	Portfolio Assistant	BA		<1	<1



# Overview: Philosophy

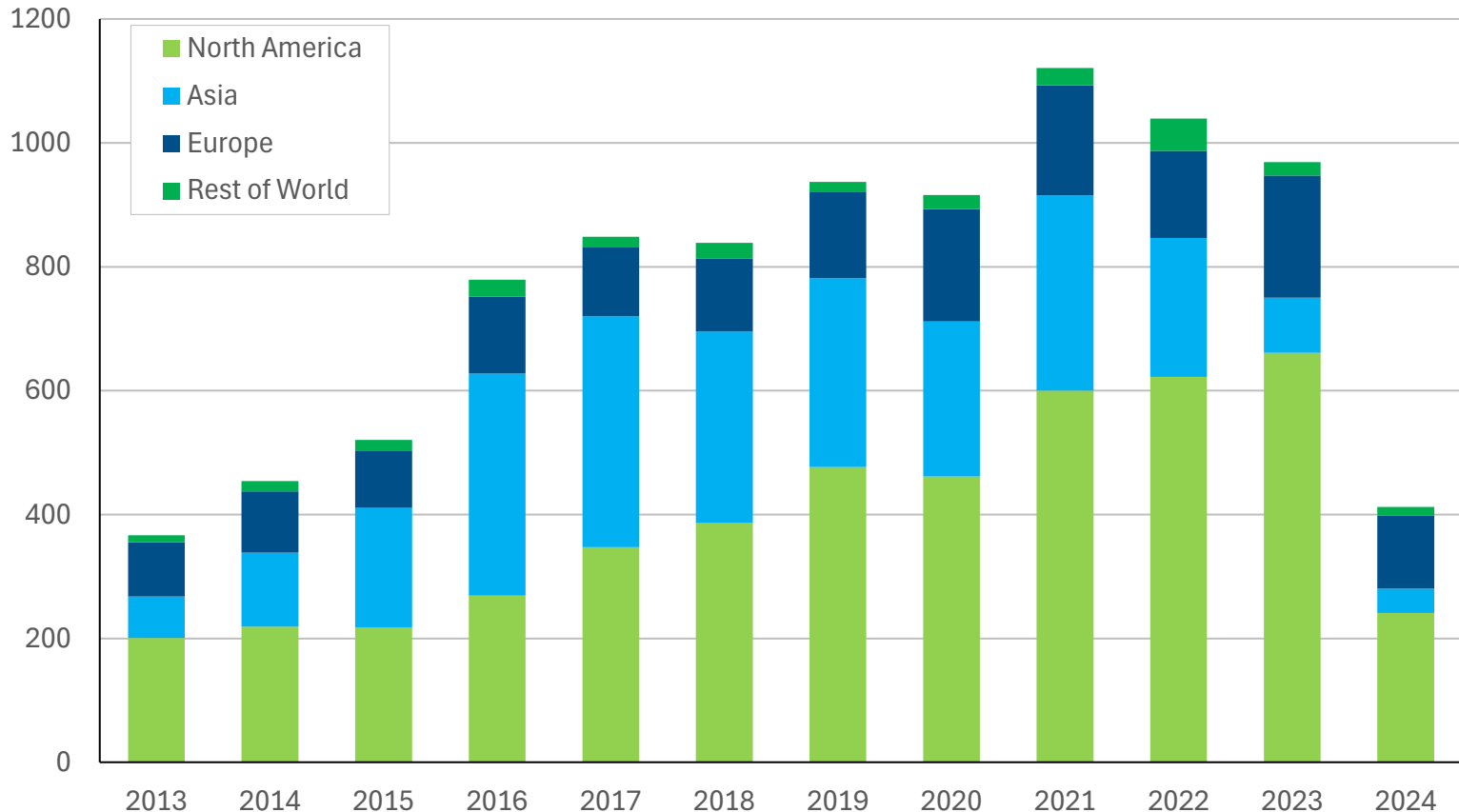
- Private equity is an active ownership strategy. The allocation is expected to achieve a meaningful long term return premium over the public equity market.
- Allocate capital to managers & strategies in which we have a high degree of confidence, not necessarily to the asset class.
- Disciplined annual commitments helps dampen the impact of market peaks.

# Overview: Asset Allocation – 6/30/24



# Markets:

## Global Private Equity Fundraising (\$B)

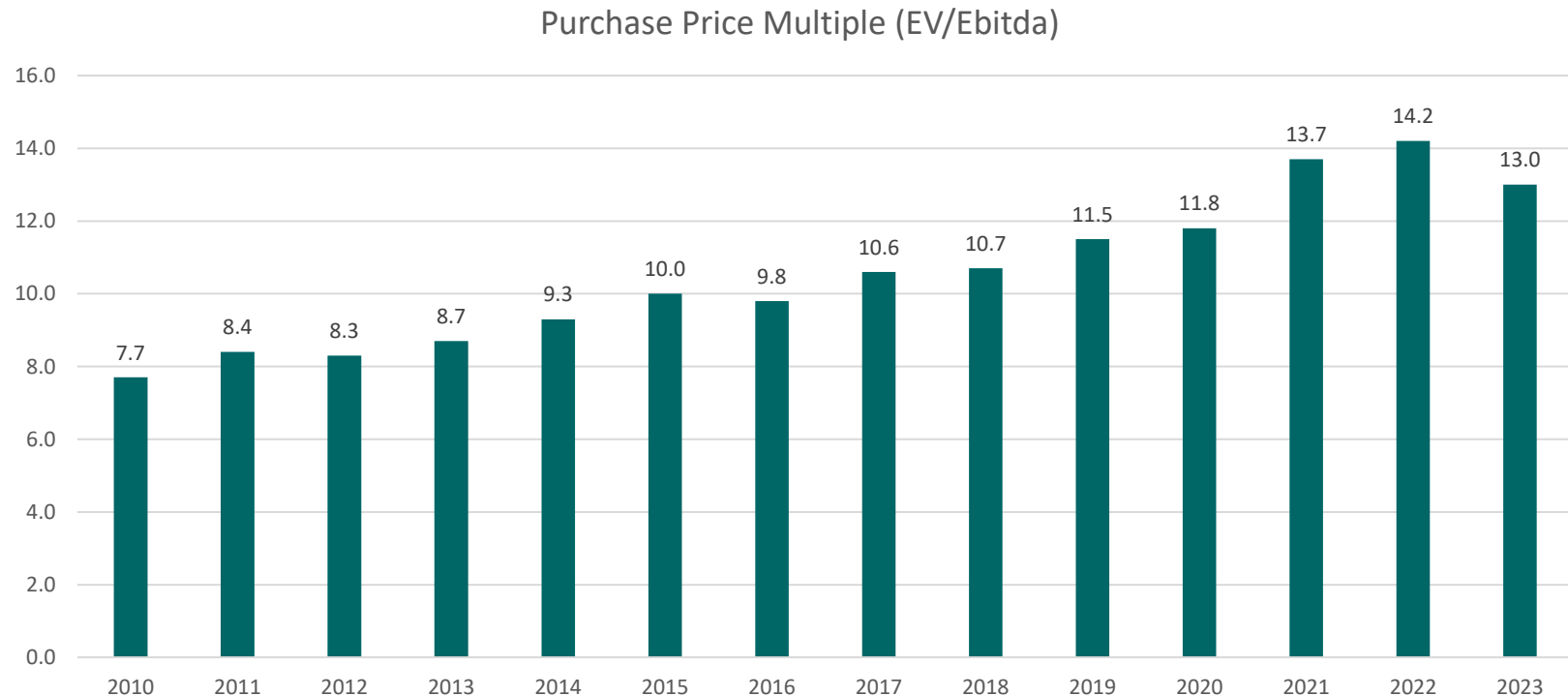


Source: Preqin.

Note: 2024 is through the first six months of the year.

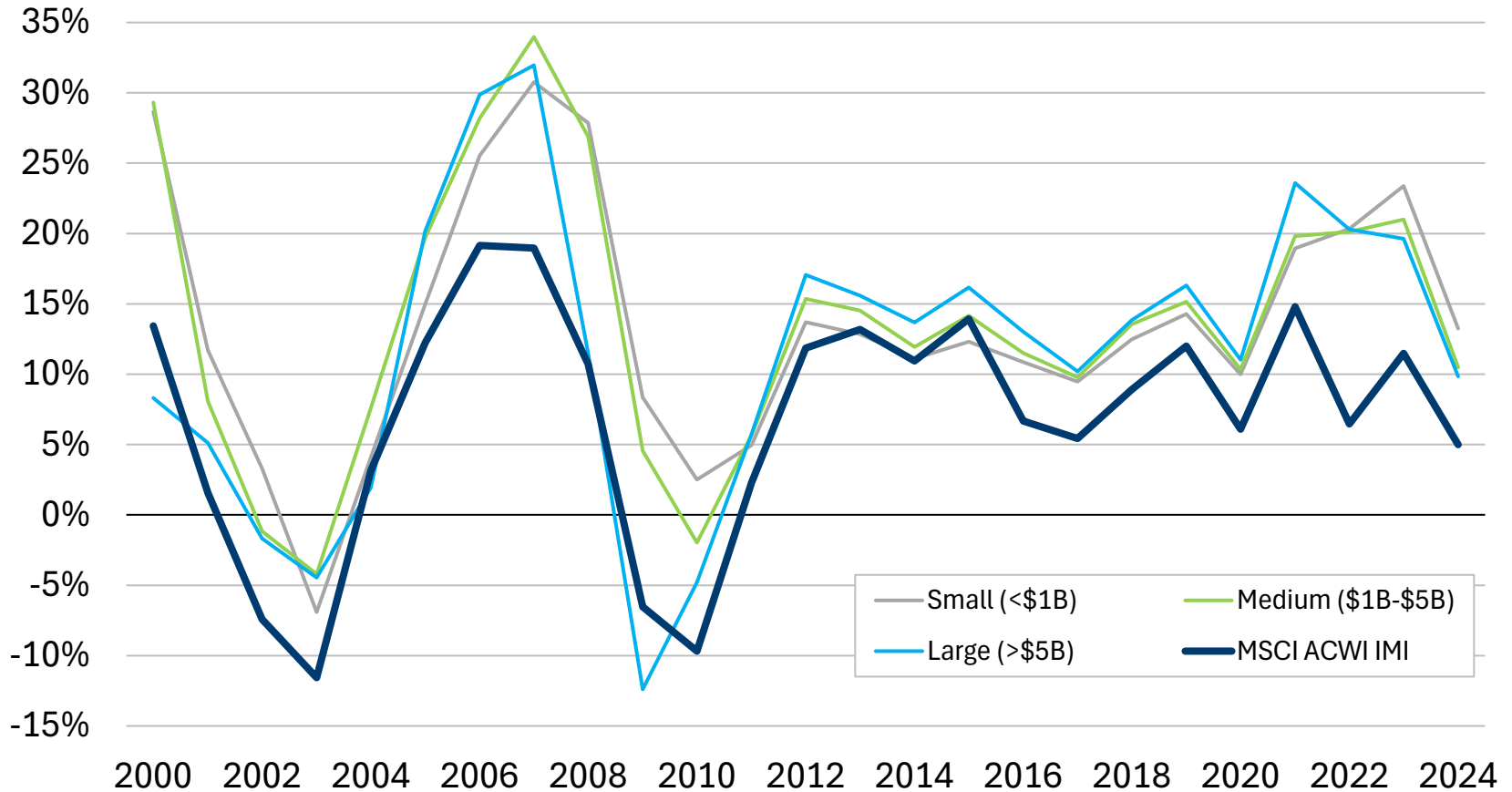
# Markets:

## North America Buyout Statistics



Source: Hamilton Lane, Bloomberg (Jan 2024)

# Markets: Rolling 3-Year Returns By Fund Size



Source: PrivateIQ/Burgiss – Global Private Equity and MSCI information.

Note: Rolling 3-year returns end 6/30 of each year.

# Markets:

## Existing Investments & Liquidity

### ▪ Existing Investments

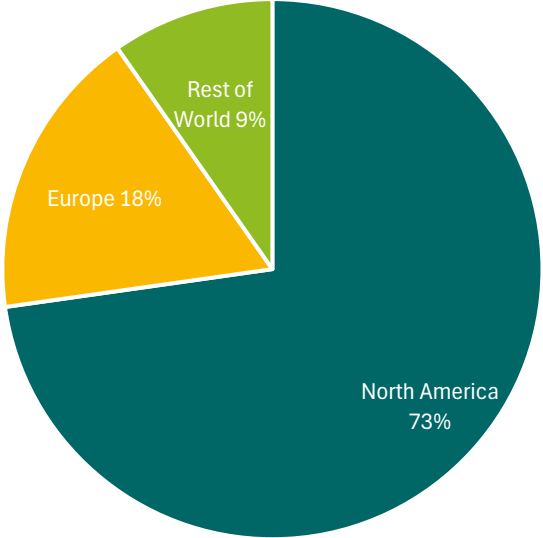
- Valuation reset largely complete
- Majority of companies meeting underwriting expectations
- Attractive go forward returns

### ▪ Liquidity

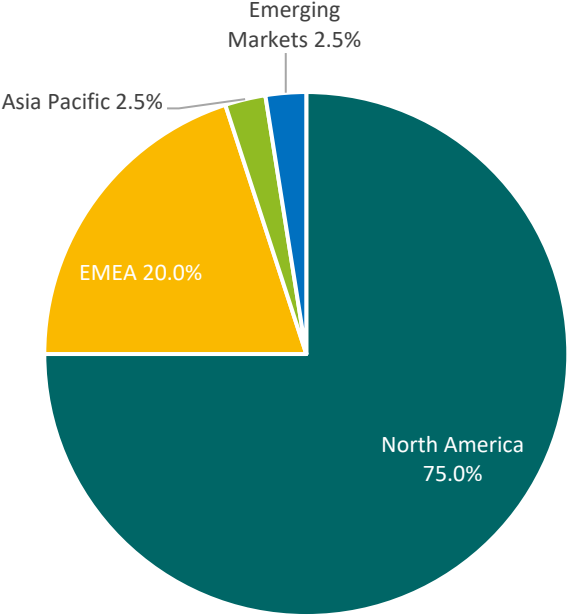
- Increasing
- Premier assets are the most actionable

# Exposures: VRS vs. Benchmark

**VRS Private Equity**

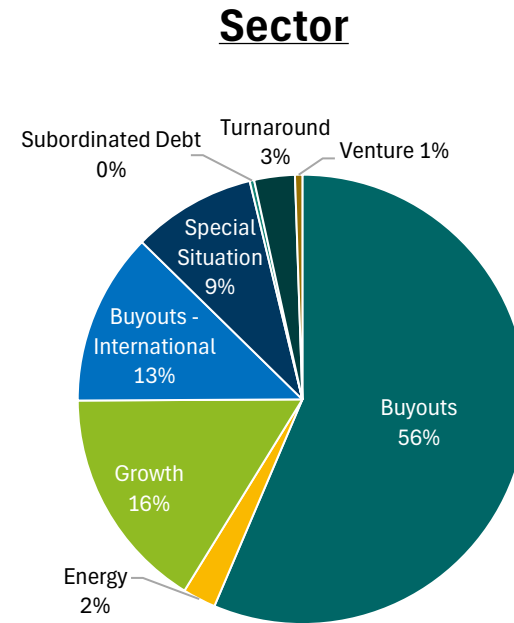
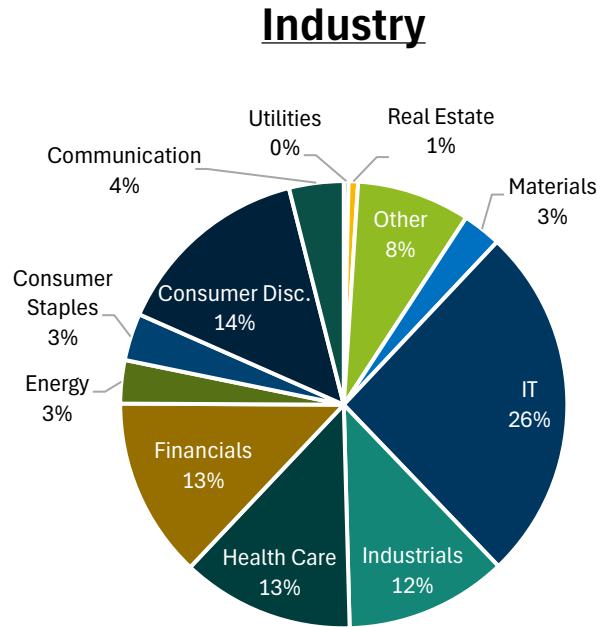


**Custom MSCI ACWI IMI**



Information based on 6/30/2024 manager information.

# Exposures: Position Weighting

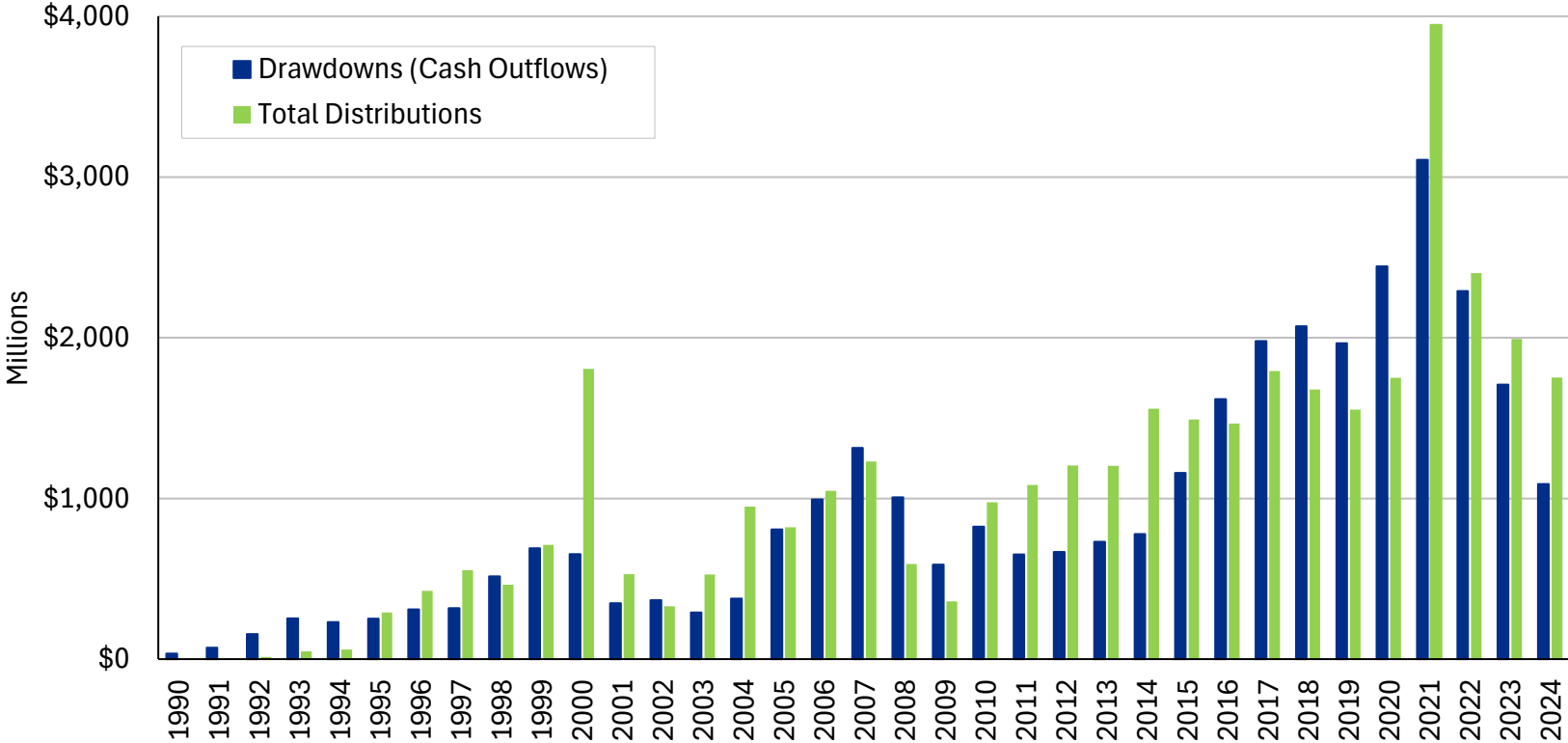


Industry chart based on 6/30/2024 manager information. Sector chart based on 6/30/2024 BNY Mellon information.



# Results:

## Annual Cash Flows (\$MM)



Since inception net cash flow to VRS of \$3.9 billion

Note: 2024 is through the first eight months of the year.

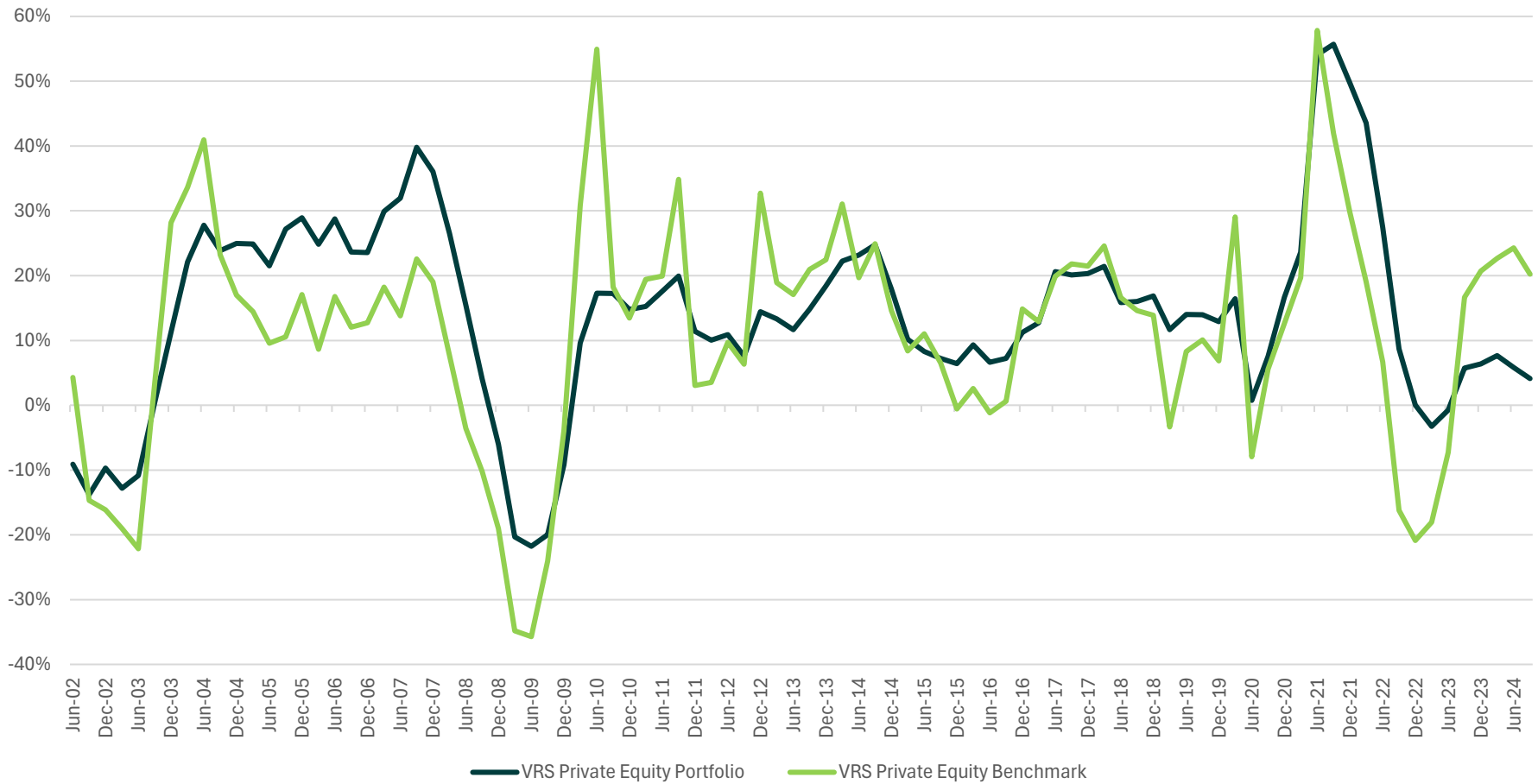
# Results:

## Time-Weighted Performance – 6/30/24

	10 Year	5 year	3 Year	1 Year	MV (\$MM)
Total Private Equity	14.3	15.8	10.2	5.8	<b>19,362</b>
Strategic Benchmark*	11.5	12.3	7.1	24.3	
<b>Excess Return</b>	<b>2.8</b>	<b>3.5</b>	<b>3.1</b>	<b>-18.5</b>	
Buyouts	16.9	17.0	10.9	7.5	10,919
Energy	-1.1	1.2	17.8	4.3	463
Growth	21.3	22.4	7.2	6.6	3,121
Int'l Buyout	11.6	13.5	5.7	-1.0	2,404
Special Situations	14.0	14.5	13.3	5.0	1,721
Sub Debt	13.4	12.1	12.2	7.7	62
Turnaround	11.0	14.2	13.9	4.9	566
Venture	11.2	17.3	12.0	-5.6	102

Note: \*Benchmark: Russell 3000 + 250 basis points through 6/30/2013; MSCI ACWI 50% hedged + 250 basis points through 6/30/2020; MSCI ACWI IMI through 12/31/2023; MSCI ACWI IMI Special Weighted (75% North America, 20% Europe, and 5% Asia and Emerging Markets) thereafter. Strategic benchmark is lagged three months to match the delay in private equity reporting.

# Results: Rolling One-Year Returns



# Results:

## Headwinds/Tailwinds

### ▪ Tailwinds

- Portfolio company operating performance
- Companies with recurring revenue
- Public to Private opportunities
- Overallocated LPs

### ▪ Headwinds

- Macro backdrop (inflation, cost of debt, geopolitical factors)
- IPO exits are limited
- Buyer/seller disconnect
- Strong public equity returns

# Results:

## VRS Relative IRR By Vintage Year

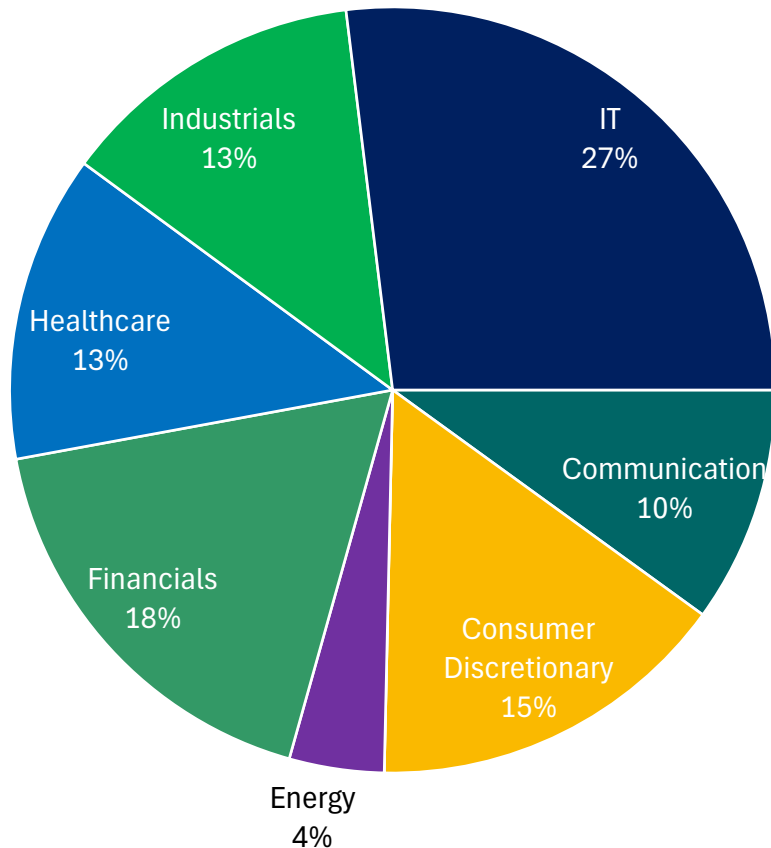


- Floating bars represent quartile return spreads by vintage year. Line in floating bar is the median return.
- VRS vintage year returns marked by “—”.

Source: Private I/Burgiss – Global Private Equity.  
 Note: As of 3/31/2024.



# Co-investments: Portfolio Exposures By Sectors



Note: As of 3/31/2024.

- 74 investments totaling \$1.97 billion cost since April 2013
- Investments made with 25 existing GPs
- Size range: \$7-58 million (\$27 million average size)

# Co-investments: VRS Co-investment Program

- Dedicated professional to manage the initiative with support from the remaining private equity staff
- Anticipated annual commitments of \$250-350 million
- Target investment size of \$25-75 million per investment
- VRS has reviewed approximately 241 potential opportunities and has made 74 investments
- Increased company allocations typically with no fees or carry

Focused on sourcing & executing opportunities alongside high conviction GPs in which VRS has a commitment

# Managers: Top Ten Investment Managers

Manager	Exposure
GCM Grosvenor	8.9%
VRS Co-Investments	8.7%
Hellman & Friedman	6.0%
TA Associates	5.5%
General Atlantic	3.9%
Apax Partners	3.8%
Bain Capital	3.6%
CVC	3.5%
GTCR	3.5%
Veritas	3.4%
<b>Total</b>	<b>50.8%</b>

*Note: As of 3/31/2024; figures may not sum due to rounding.*



# Diverse Investment Management Engagement (DIME)

- Nine existing in-house relationships
  - Asia Alternatives
  - Clearlake
  - ICV
  - MBK Partners
  - Siris
  - Sycamore
  - TSG
  - Veritas
  - Vista Equity
  
- 29 potential manager meetings in FY 2024
  
- Five relationships through GCM Grosvenor
  
- Quarterly reports from GCM Grosvenor

# Looking Forward

- Maintain modeled commitment pace
- Review strategic separate accounts
- Co-investments on pace
- Selectively add new managers

# Credit Strategies

Steve Woodall  
Program Director



# Agenda:

## Credit Strategies Annual Review Topics

- Overview
- Markets
- Exposures
- Results
- Co-investments
- Managers
- Looking Forward

# Overview: Team Members

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
<b>Steve Woodall</b>	<b>Program Director</b>	<b>MBA</b>	<b>CFA, CAIA</b>	<b>20</b>	<b>19</b>
Perry Corsello	Portfolio Manager	MBA	CFA	27	13
Erica Billingslea	Senior Investment Officer	MA		12	12
Matt Bennett	Investment Officer	MBA		16	16
Kevin Bliss	Investment Officer	Bcom		10	3
Shawn Rabalais	Investment Analyst	MSc	CFA II Candidate	1	< 1
Kelly Baker	Portfolio Assistant	AAS		14	9

# Overview:

## Credit Strategies

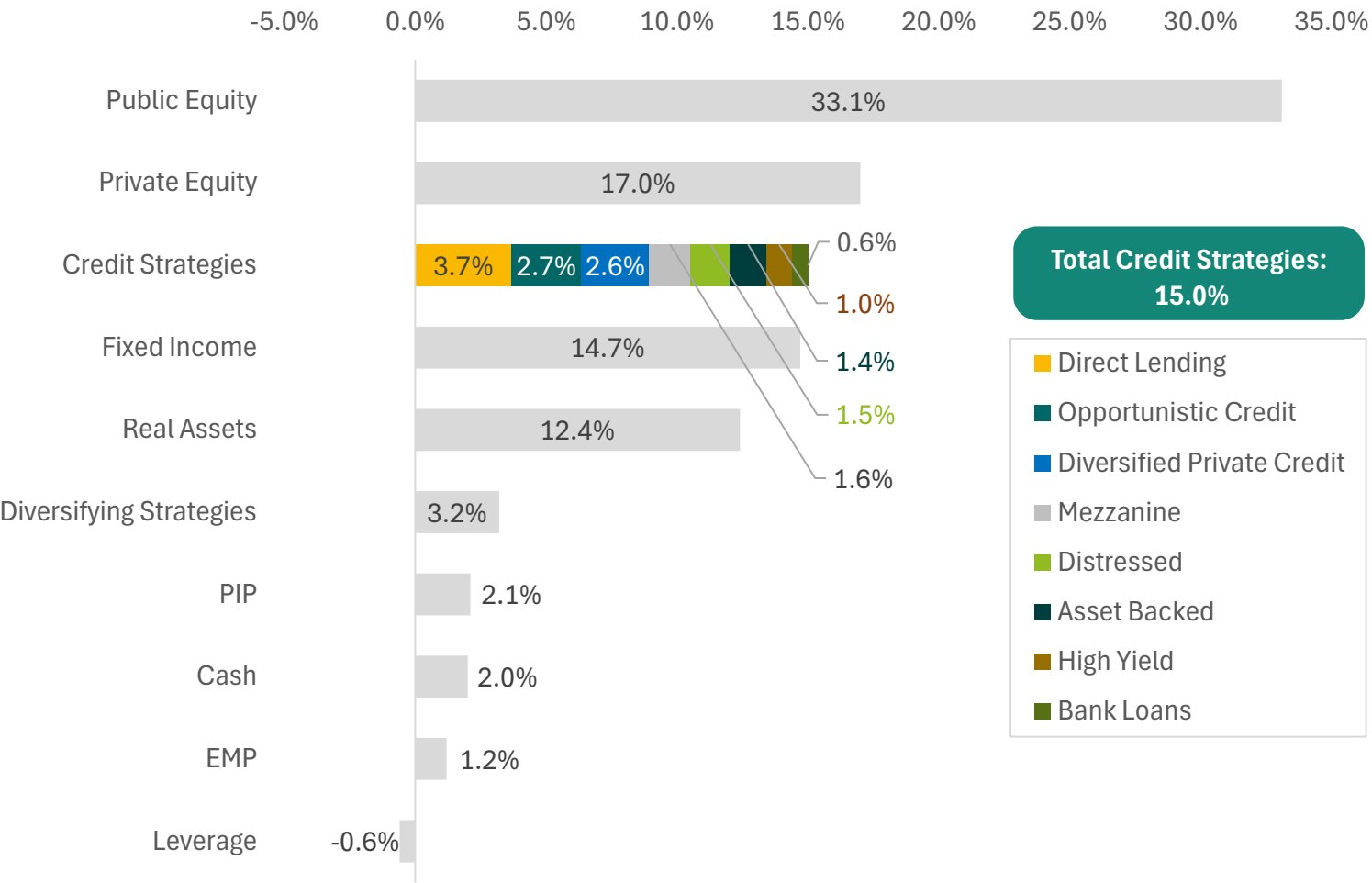
### Primary Focus

- Income generation and attractive total returns from investments in privately-originated debt and opportunistic credit strategies

### Program Objective

- Generate an attractive risk adjusted return relative to the program benchmark (a 50/50 blend of senior secured term loans and high yield bonds)

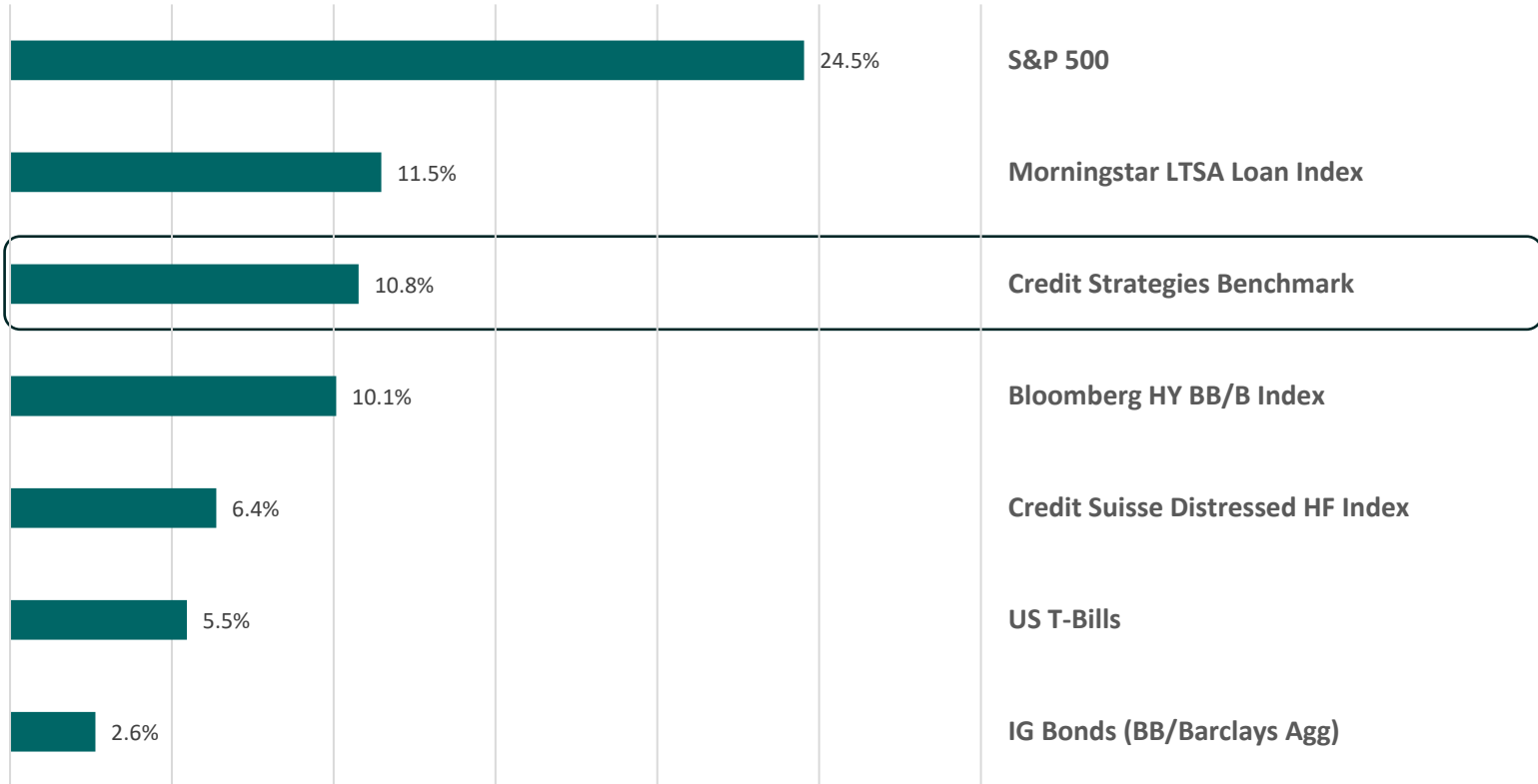
# Overview: Asset Allocation - 6/30/24



**Total Credit Strategies:  
15.0%**

- Direct Lending
- Opportunistic Credit
- Diversified Private Credit
- Mezzanine
- Distressed
- Asset Backed
- High Yield
- Bank Loans

# Markets: FY24 Index Returns

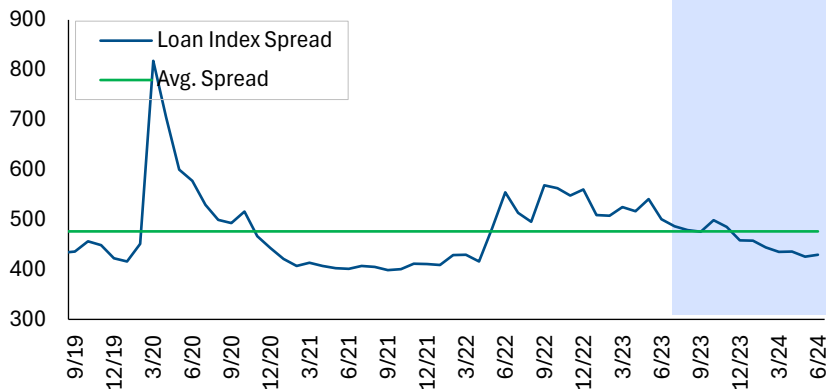


Source: VRS, Bloomberg, Credit Suisse

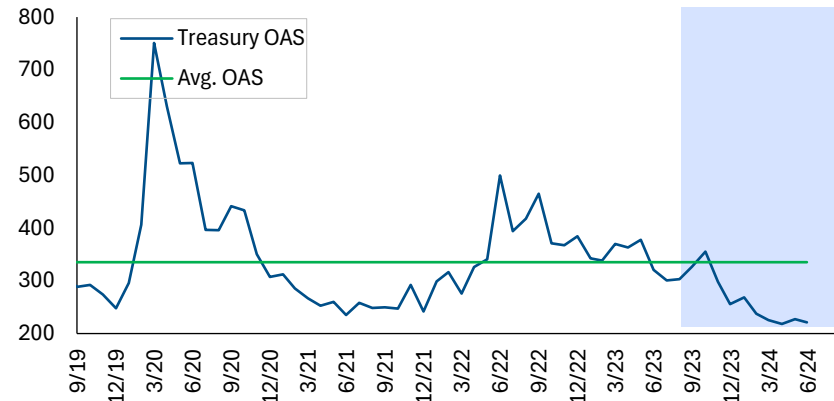


# Markets: Index Spreads and Yields

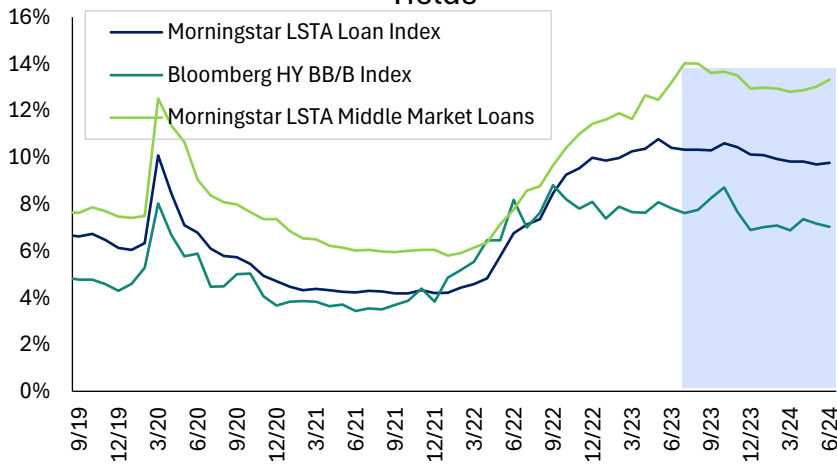
Morningstar LSTA Loan Index Spread



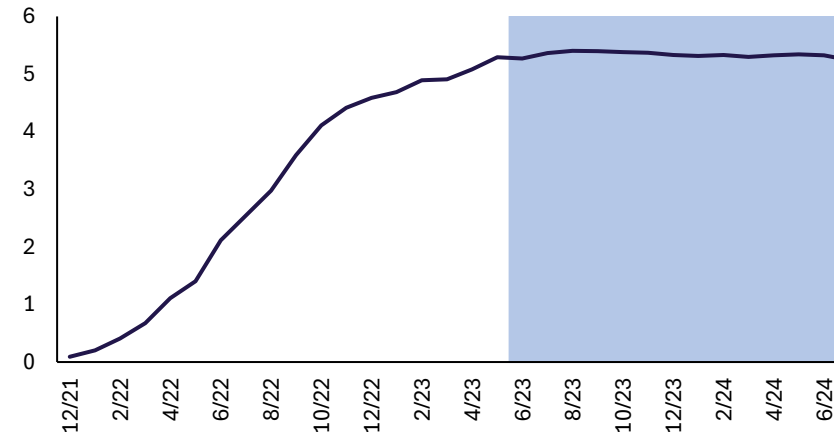
Bloomberg HY BB/B Index Spread



Yields

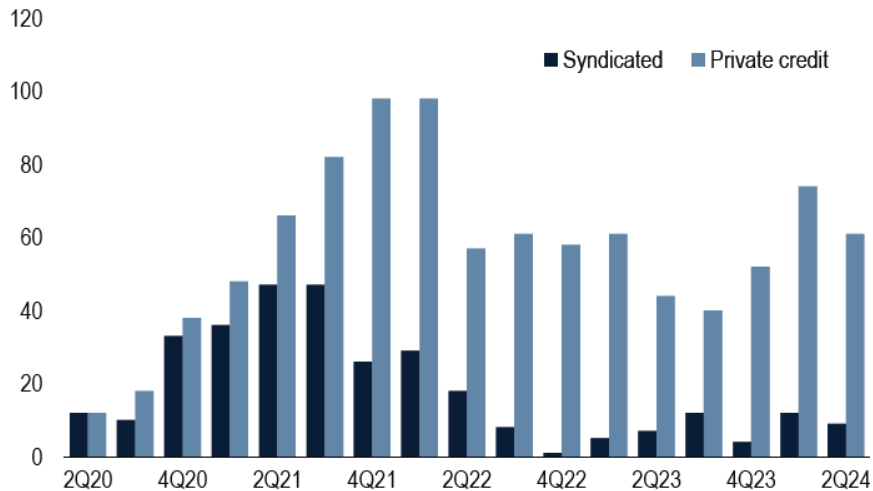


SOFR 3-month



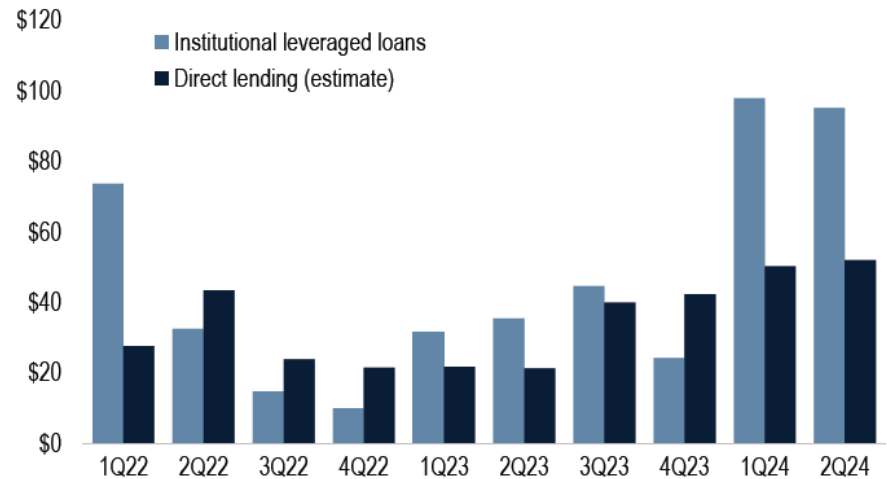
# Markets: Private vs Public Credit Markets

Count of LBOs financed in BSL and private credit market



Source: PitchBook | LCD • Data through June 30, 2024  
Private credit count is based on transactions covered by LCD News.

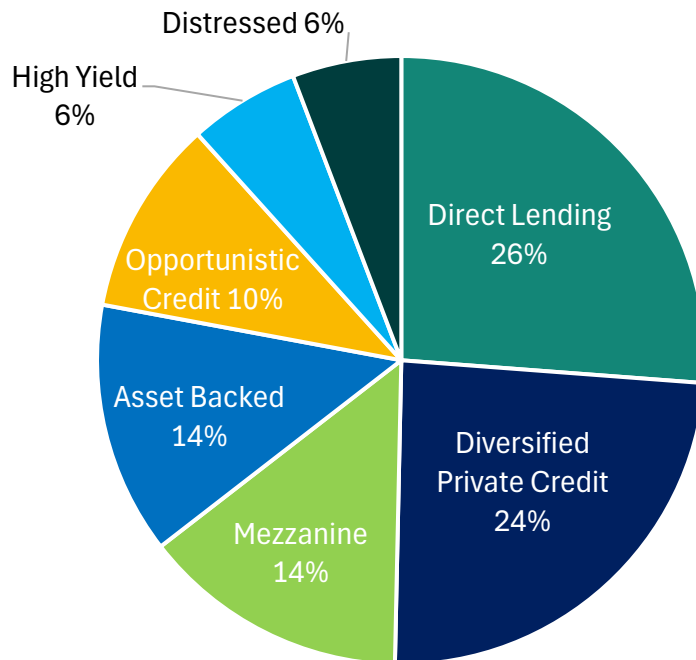
New-issue volume for PE-backed borrowers (\$B)



Source: PitchBook | LCD • Data through June 30, 2024  
Direct lending analysis is based on transactions covered by LCD News

# Markets: Update – Program Opportunities

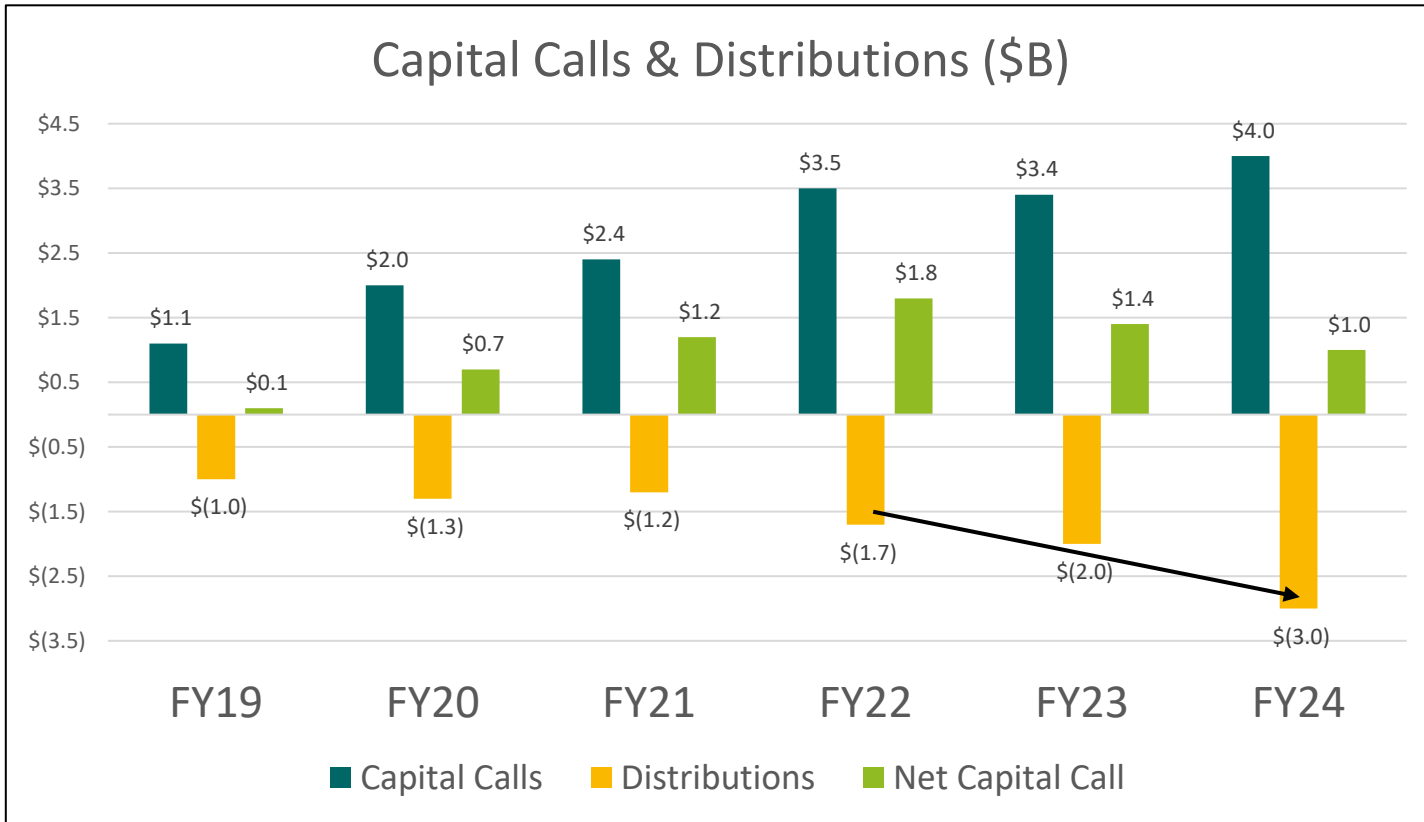
FY24 Capital Calls (\$3.4bn)



## Private Credit Yields:

Strategy	6/30/23	6/30/24
Direct Lending	11-13%	10-12%
Mezzanine	13-15%	12-14%
Opportunistic	12-16%	11-15%

# Exposures: Program Activity



	<u>FY19</u>	<u>FY20</u>	<u>FY21</u>	<u>FY22</u>	<u>FY23</u>	<u>FY24</u>
% Liquid:	51%	39%	32%	23%	10%	11%

# Exposures:

## Change in Sub Strategy Exposures

Sub Strategies	% Allocation 6/30/23	% Allocation 6/30/24	Change
Asset Backed	8.7%	9.3%	+0.6%
Bank Loans	5.0%	4.1%	-0.9%
Direct Lending	24.4%	24.5%	+0.1%
Distressed	11.2%	9.9%	-1.3%
Diversified Private Credit	14.3%	17.3%	+3.0%
High Yield	5.8%	6.5%	+0.7%
Investment Grade	2.9%	0%	-2.9%
Mezzanine	9.5%	10.6%	+1.1%
Opportunistic Credit	18.2%	17.8%	-0.4%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>0.0%</b>

# Results:

## Total Credit Strategies – 6/30/24

	10 Year	5 Year	3 Year	1 Year	MV (\$MM)
Total Credit Strategies	6.1	7.3	6.2	11.7	<b>17,178</b>
Strategic Benchmark	4.8	5.0	4.2	10.8	
Excess Return	<b>1.2</b>	<b>2.4</b>	<b>2.0</b>	<b>0.9</b>	
Asset Backed	6.3	5.9	6.5	7.4	1,593
Bank Loan	4.3	4.6	5.7	12.5	701
Distressed	8.0	10.0	10.6	10.3	1,702
High Yield	4.7	4.4	2.5	11.3	1,125
Mezzanine	11.7	11.3	11.3	13.3	1,813
Direct Lending	6.9	7.7	8.6	11.2	4,199
Diversified Private Credit	-	-	10.1	13.6	2,987
Opportunistic Credit	5.8	7.3	5.3	12.4	3,058

Source: BNY Mellon

# Results: FY 2024

## Headwinds/Tailwinds

- + Strong absolute performance across all strategy categories. Returns were primarily driven by high levels of income assisted by valuation improvements as spreads tightened during the fiscal year.
- While 6 of 8 strategy categories outperformed during FY24, Distressed and Asset Backed each underperformed—by 0.5% and 3.3% respectively. In regard to Asset Backed, returns within portfolio finance and real estate credit investments underperformed the benchmark.

### Absolute Return Contribution:

	% Return	% Contribution	% of Program
Direct Lending	11.2%	2.7%	24.4%
Diversified PC	13.6%	2.4%	17.4%
Opportunistic Credit	12.4%	2.2%	17.8%
Mezzanine	13.3%	1.4%	10.6%
Distressed	10.3%	1.0%	9.9%
High Yield	11.3%	0.7%	6.5%
Asset Backed	7.4%	0.7%	9.3%
Bank Loan	12.5%	0.5%	4.1%
<b>CS Return</b>		<b>11.7%</b>	<b>100%</b>

### Relative Return Contribution:

	% Contribution
Diversified PC	0.5%
Opportunistic Credit	0.3%
Mezzanine	0.3%
Direct Lending	0.1%
Bank Loan	0.1%
High Yield	0.0%
Distressed	-0.05%
Asset Backed	-0.31%
<b>CS Excess</b>	<b>0.91%</b>

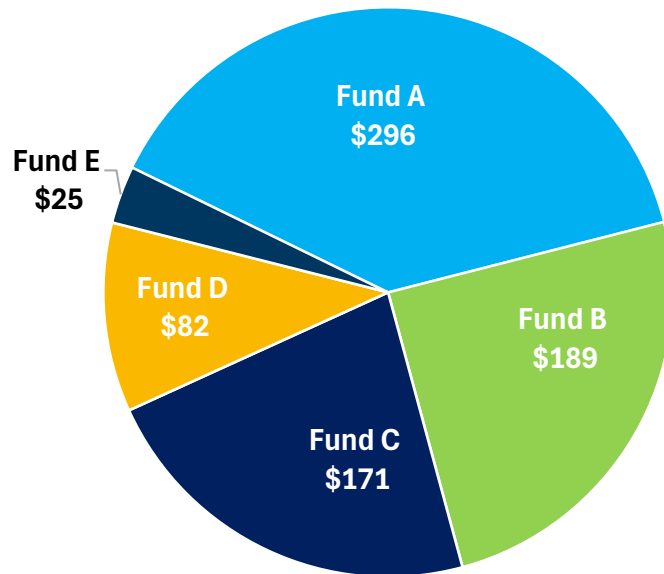
# Co-investments: Credit Strategies Approach

- Objective is to invest additional funds alongside existing strategies through a lower fee arrangement
- Separate accounts
- The manager remains fiduciary
- VRS reviews and approves all potential investments prior to moving forward



# Co-investment: Exposures and Performance

June 30, 2024 (\$763mm)



- 60 investments totaling \$871 million of cost since April 2019
- Investments made alongside 6 existing GP relationships
- Size range: \$7-35 million (\$14.5 million average size)

6/30/24 Performance (%):	ITD	5 Year	3 Year	1 Year
CS Co-Investment	9.18	9.66	12.72	15.30
CS Benchmark	5.33	4.97	4.18	10.77
Excess Return	3.85	4.69	8.54	4.53

# Managers: Top 10 Investment Managers

Manager	Mandates	# Mandates	% Program
Ares	Asset-Backed, Distressed, Mezzanine, Direct Lending, Opportunistic	12	11.6%
Beach Point Capital	Bank Loans, Distressed, Opportunistic	5	8.6%
HPS	Direct Lending, Mezzanine	4	7.3%
Oak Hill Advisors	Bank Loans, Diversified Private Credit	2	6.2%
BlackRock	Direct Lending	1	5.6%
Carlyle	Diversified Private Credit	1	5.6%
Solus	Bank Loans, Opportunistic	3	4.6%
Sixth Street	Distressed, Opportunistic	5	4.3%
JP Morgan	High Yield	1	4.3%
Varde Capital	Asset-Backed, Diversified Private Credit	2	3.3%

# Managers: DIME Investments

- 25 potential manager meetings/calls/reviews in FY 2024
- Quarterly reports from Aon Hewitt on DIME managers in the asset class
- Aksia relationship has provided more exposure to smaller credit managers
- Five relationships via Aksia-managed account

# Looking Ahead:

- The evolution of the CS program towards private markets has positioned it well to take advantage of changes in the broader credit markets. CS has maintained a consistent deployment of capital, allowing the program to take advantage of opportunities to lend with stronger covenants and at higher yields.
- Today there are compelling investment opportunities in private credit, the expected returns of which exceed the actuarial return of the total fund as well as the asset class benchmark over a multi-year time frame.
- We remain focused on strategies that deliver high contractual returns while having structural downside protection.

# Private Investment Partnerships

Steve Woodall  
Program Director



# Agenda:

## PIP Annual Review Topics

- Overview
- Exposures
- Results
- Looking Forward

# Overview: Team Members

Professional	Position	Highest Degree	Professional Certifications	Investment Experience	VRS Tenure
<b>Steve Woodall</b>	<b>Program Director</b>	<b>MBA</b>	<b>CFA, CAIA</b>	<b>20</b>	<b>19</b>
Erica Billingslea	Investment Officer	MA		12	12
Matt Bennett	Investment Officer	MBA		16	16
Kelly Baker	Portfolio Assistant	AAS		14	9

# Overview:

## Private Investment Partnerships

- A diversified investment platform dedicated to private and illiquid investments that invests across private equity, real assets, and credit strategies.
- Portfolios that emphasize opportunistic asset allocation, co-investments and reduced investment management fees/carry
- A close relationship between partner organizations that allows for expanded access and an elevated level of inclusion

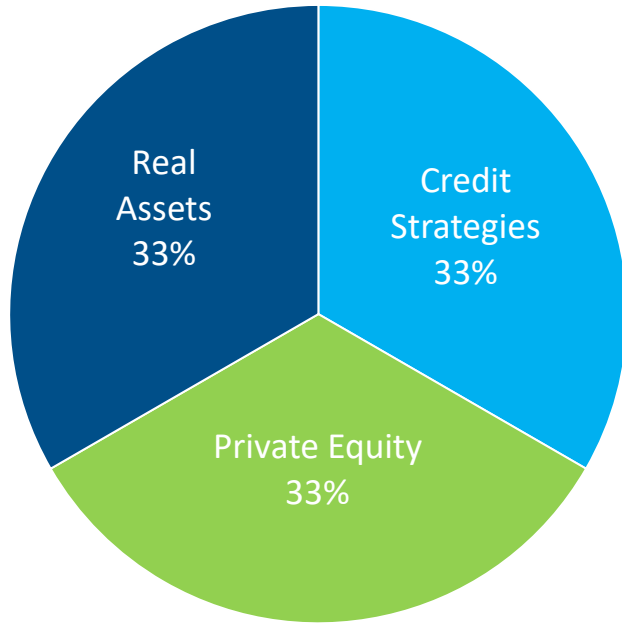


# Exposures: Portfolio Update

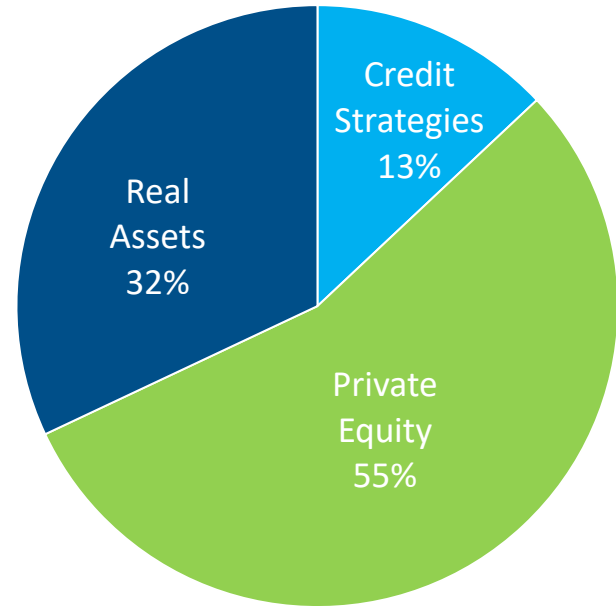
- Asset allocation
- Commitments

# Exposures: Asset Allocation

**Benchmark – June 30, 2024**



**PIP Actual – June 30, 2024**



# Exposures: Strategy Mix FY24

	6/30/23	6/30/24	Change %
Private Equity	59%	55%	-4%
Real Assets	18%	18%	-
Real Estate	11%	14%	+3%
Credit	12%	13%	+1%
<b>Total (MM)</b>	<b>\$2,862</b>	<b>\$2,583</b>	<b>-\$279</b>

# Exposures: Commitments (\$mm)

	<b>Commitment Amount</b>	<b>Total Funded</b>	<b>Total Unfunded</b>
<b>6/30/2023:</b>	2750	1,841.2	908.8
<b>6/30/2024:</b>	2750	1,853.6	896.4
<b>Change (\$mm):</b>	-	<b>+12.4</b>	<b>-12.4</b>

# Results: Performance – 6/30/24

	<b>Inception (2015)</b>	<b>5 Year</b>	<b>3 Year</b>	<b>1 Year</b>
Total PIP	<b>8.53</b>	<b>9.57</b>	<b>8.87</b>	<b>8.24</b>
Benchmark	7.50	7.61	5.49	8.71
<b>Excess Return</b>	<b>1.03</b>	<b>1.96</b>	<b>3.38</b>	<b>-0.47</b>

Source: BNY Mellon; 6/30/24 market value and performance are lagged and based on 3/31/24 market values that are adjusted for interim cashflows.