

MONTANA

BOARD OF INVESTMENTS

REGULAR BOARD MEETING
April 10, 2024

COMMITTEE MEETINGS

A. Audit Committee – Mark Barry, Chair

Committee Members – Peterson, Bennett, Trost, Iverson

9:30 AM

1. Public Comment – *Public Comment on issues with Committee Jurisdiction*
2. Approval of February 28, 2024, Committee Minutes
3. Executive Director Comments
4. Audit Checklist

B. Loan Committee – Jeff Meredith, Chair

Committee Members – Barry, Kober, Bennett, Younkin

10:00 AM

1. Public Comment – *Public Comment on issues with Committee Jurisdiction*
2. Approval of February 28, 2024, Committee Meeting Minutes
3. Executive Director Comments
4. INTERCAP Loan Requests - **Decisions**

C. Human Resource Committee – Maggie Peterson, Chair

Committee Members – Meredith, Kober, Trost, Younkin

10:30 AM

1. Public Comment – *Public Comment on issues with Committee Jurisdiction*
2. Executive Director Comments
3. **CLOSED SESSION ***
4. Exempt Staffing and Compensation Recommendations for FY25 – **Decision**

* **CLOSED SESSION** – *This portion of the meeting relates to matters of individual privacy. The Committee Chair may determine that the demand of individual privacy clearly exceeds the merit of public disclosure. As such, this portion of the meeting may be closed.*

Tab 1 CALL TO ORDER – Jack Prothero, Chairman

11:30 AM

- A. Notice of Video Recording of Meeting
- B. Roll Call
- C. Public Comment – *Public Comment on issues with Board Jurisdiction*
- D. Approval of the February 28, 2024, Meeting Minutes
- E. Administrative Business
 1. Audit Committee Report
 2. Loan Committee Report
 3. Human Resource Committee Report
- F. Comments from TRS and PERS Board Members
- G. Comments from Board Legislative Liaisons

Tab 2 EXECUTIVE DIRECTOR REPORTS – Dan Villa

11:45 PM

- A. Member Requests from Prior Meeting
- B. Monthly Snapshot
- C. Benchmarks Used by the Board

LUNCH	12:00 PM
Tab 3 CAPITAL MARKET ASSUMPTIONS – RVK, Inc.	1:00 PM
Tab 4 INVESTMENT POLICY STATEMENT – John Romasko	1:45 PM
BREAK 2:00 PM	
Tab 5 DOMESTIC EQUITY ASSET CLASS REVIEW – Jason Brent and Steve Strong	2:15 PM
RECAP OF STAFF TO DO LIST AND ADJOURNMENT – Jack Prothero, Chairman	3:00 PM

MONTANA

BOARD OF INVESTMENTS

REGULAR BOARD MEETING MINUTES

FEBRUARY 28, 2024

Meeting recordings are posted at <https://leg.mt.gov/lsd/>
(timestamps may differ)

Call to Order

The Board of Investment's meeting was called to order by Board Chairman Jack Prothero at 10:59 a.m. on Wednesday, February 28, 2024.

Attendance

Board Members Present: Jack Prothero, Tim Kober, Mark Barry, Cindy Younkin, Maggie Peterson, Dwaine Iverson, Porter Bennett

Board Members Absent: Jeff Meredith

Legislative Liaisons Present: None

Legislative Liaisons Absent: Senator Jeremy Trebas

Board Staff Present: Brenda Thomas, Dan Villa, Dan Whyte, Dan Zarling, Doug Hill, Eron Krpan, Ethan Hurley, Jason Brent, John Carpenter, John Romasko, Jon Putnam, Julie Feldman, Ian Horwood, Kirsten Haswell, Matt Hoffman, Peggy MacEwen, Peggy Saarela, Polly Boutin, Roberta Diaz, Sam Holman, Savannah Morgan, Sheli Jacoby, Steve Strong, Tammy Lindgren, Thomas Winkler, Tim House

Interested Parties Present: Becky Gratsinger – RVK, Paige Blaser – RVK, Joepeth Ebisa – With Intelligence, Herb Kulow

Due to the meeting proceeding earlier than anticipated, some items on the agenda were moved to comply with notice requirements.

Tab 3 MONTANA LOAN PROGRAM (00:43)

A. Commercial and Residential Portfolios Report

Doug Hill briefed the Board and answered questions.

Tab 1 CALL TO ORDER (14:29)

A. Notice of Video Recording (14:40)

Chairman Prothero advised of audio and video recording of the meeting.

B. Roll Call (15:00)

The roll was taken. Eight Board members were present, forming a quorum.

C. Public Comment (16:35)

Chairman Prothero asked for public comment. None was given.

D. Approval of Minutes (16:57)

December 12, 2023, Regular Board Meeting Minutes

Member Barry motioned to approve. Member Iverson seconded the motion, which passed unanimously.

December 21, 2023, Special Meeting Minutes

Member Younkin motioned to approve. Member Iverson seconded the motion, which passed unanimously.

E. Administrative Business

1. Audit Committee Report (18:07)

Committee Chair Barry briefed the Board.

2. Loan Committee Report (01:13:37)

Committee Chair Jeff Meredith was absent. Board Chair Prothero acted as Chair for the Loan Committee and briefed the Board.

Chair Prothero called for a motion to approve the INTERCAP loan request from the City of Billings for \$14,690,000 to finance costs associated with remodeling, improving, and equipping the new Law and Justice/City Hall building. Member Younkin motioned to approve. Member Bennett seconded the motion, which passed unanimously.

Chair Prothero called for a motion to approve the INTERCAP loan requests from the Department of Natural Resources and Conservation (DNRC). In total there are five requests from the DNRC for various revolving loan programs, totaling \$6,370,000. Member Bennett motioned to approve. Member Younkin seconded the motion, which passed unanimously.

F. Comments from Pension Board Members

Member Peterson and Member Trost briefed the Board. (28:23)

G. Comments from Board Legislative Liaisons

Senator Jeremy Trebas was absent.

Tab 2 Executive Director Reports (32:09)

A. Member Requests from Prior Meeting

There were no Board member requests from the prior meeting.

B. Monthly Snapshot

Executive Director Villa briefed the Board.

C. Disaster Recovery and Emergency Preparedness

Executive Director Villa briefed the Board.

D. Board Member Ethics Training

Executive Director Villa briefed the Board.

E. Outreach Efforts – In-State and INTERCAP Programs

Executive Director Villa briefed the Board.

Tab 4 BOND PROGRAM (50:08)

A. INTERCAP

Louise Welsh briefed the Board and answered questions.

Tab 5 SHORT TERM INVESTMENT POOL (00:11)

Kirsten Haswell and Sam Holman briefed the Board and answered questions.

Tab 6 RVK (33:11)

Becky Gratsinger briefed the Board and answered questions.

Tab 7 INVESTMENT UPDATE

CIO Update (01:16:22)

Jon Putnam briefed the Board.

Real Estate (01:43:04)

Ethan Hurley briefed the Board.

Real Assets (01:56:05)

Ethan Hurley briefed the Board.

Macro Attribution (02:00:24)

Eron Krpan briefed the Board.

Non-Core Fixed Income, Domestic Equity, and International Equity (02:02:00)

Jason Brent briefed the Board.

Private Investments (02:16:18)

Thomas Winkler and Ian Horwood briefed the Board.

Core Fixed Income (02:26:31)

John Romasko briefed the Board.

RECAP OF STAFF TO DO LIST AND ADJOURNMENT (02:30:07)

Chairman Prothero adjourned the meeting at 3:34 p.m.

MONTANA BOARD OF INVESTMENTS

APPROVE: _____

Jack Prothero, Chair

ATTEST: _____

Dan Villa, Executive Director

DATE: _____

MONTANA

BOARD OF INVESTMENTS

To: Members of the Board
From: Dan Villa, Executive Director
Date: April 10, 2024
Re: Executive Director Report

- A. Member Requests from Prior Meeting
- B. Monthly Snapshot – *attached*
- C. Benchmarks Used by the Board – *attached*



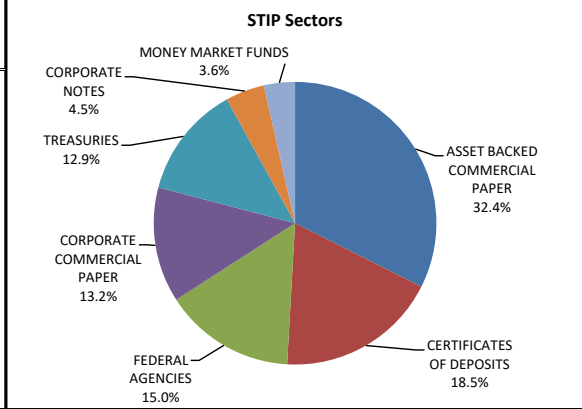
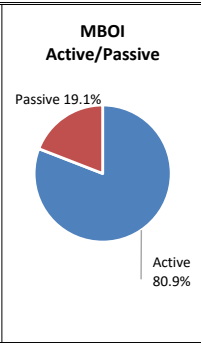
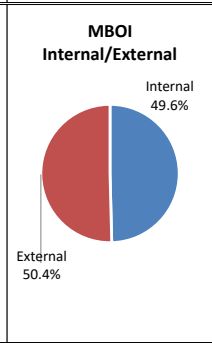
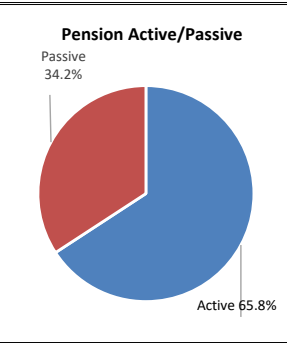
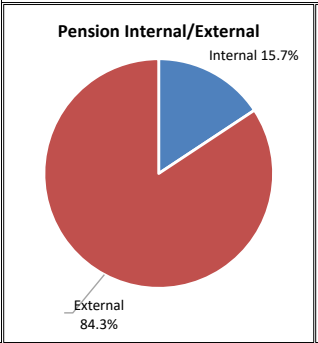
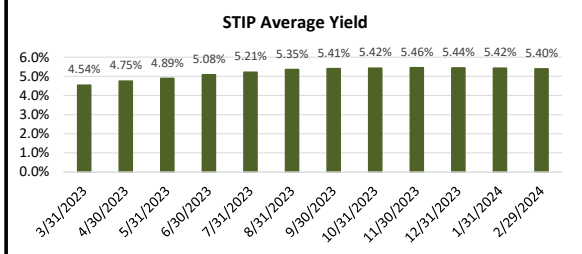
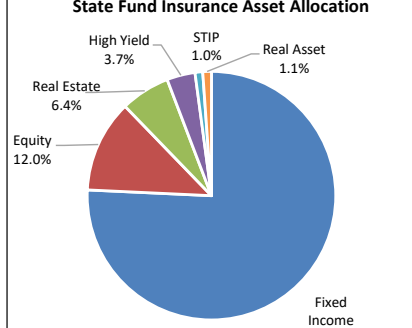
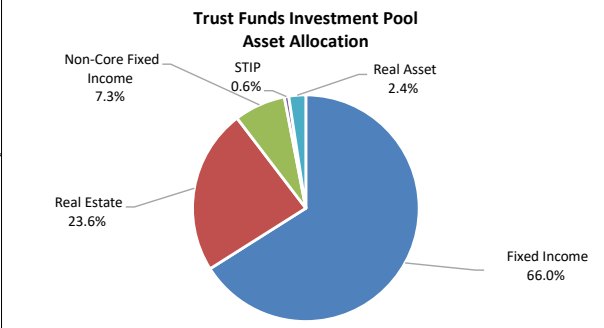
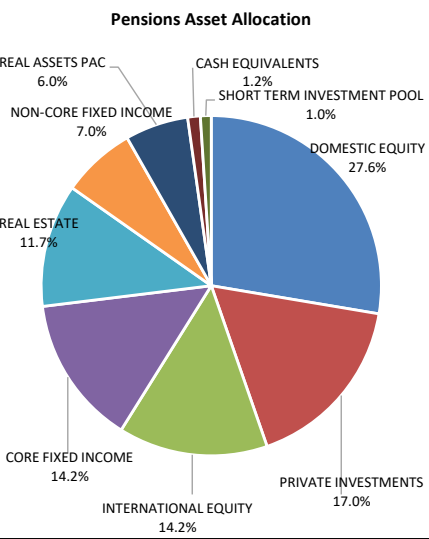
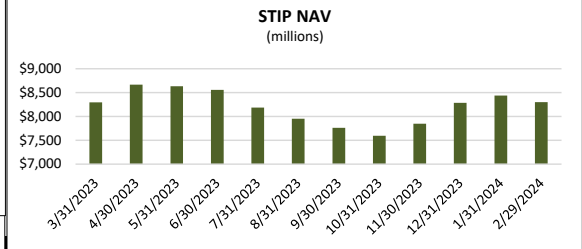
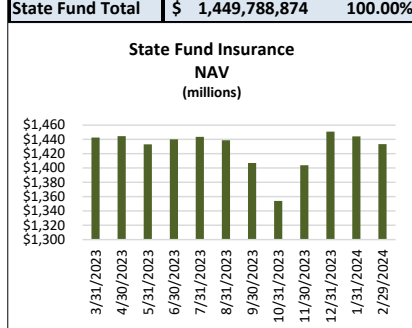
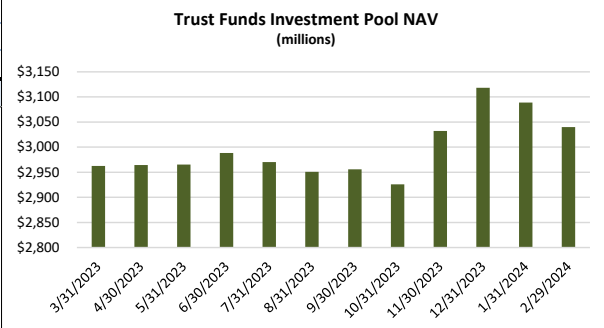
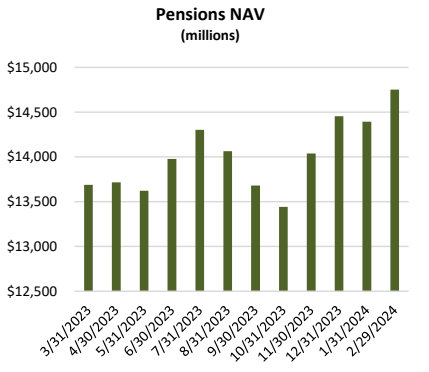
MBOI Snapshot
Asset Management View
2/29/2024 Unaudited
Assets Under Management \$27,540,966,057

Pensions	NAV	%
DOMESTIC EQUITY	\$ 4,078,490,409	27.6%
PRIVATE INVESTMENTS	\$ 2,512,012,317	17.0%
INTERNATIONAL EQUITY	\$ 2,095,662,261	14.2%
CORE FIXED INCOME	\$ 2,090,025,285	14.2%
REAL ESTATE	\$ 1,725,589,269	11.7%
NON-CORE FIXED INCOME	\$ 1,034,120,581	7.0%
REAL ASSETS PAC	\$ 886,701,554	6.0%
CASH EQUIVALENTS	\$ 177,017,820	1.2%
SHORT TERM INVESTMENT	\$ 151,199,454	1.0%
Pensions Total	\$ 14,750,818,950	100.0%

TFIP	NAV	%
Fixed Income	\$ 2,007,270,405	66.03%
Real Estate	\$ 716,990,234	23.59%
Non-Core Fixed Income	\$ 222,949,459	7.33%
Real Asset	\$ 73,537,639	2.42%
STIP	\$ 19,184,580	0.63%
Total	\$ 3,039,932,317	100.00%

State Fund	NAV	%
Fixed Income	\$ 1,098,061,322	75.74%
Equity	\$ 174,380,323	12.03%
Real Estate	\$ 93,261,623	6.43%
High Yield	\$ 53,298,892	3.68%
Real Asset	\$ 16,286,145	1.12%
STIP	\$ 14,500,570	1.00%
State Fund Total	\$ 1,449,788,874	100.00%

Other Fixed Income & Pending	\$ (22,411,564)	
STIP*	NAV	%
ASSET BACKED COMMERCIAL PAPER	\$2,696,834,512	32.40%
CERTIFICATES OF DEPOSITS	\$1,539,321,409	18.50%
FEDERAL AGENCIES	\$1,248,434,017	15.00%
CORPORATE COMMERCIAL PAPER	\$1,096,540,691	13.18%
TREASURIES	\$1,074,505,738	12.91%
CORPORATE NOTES	\$371,530,169	4.46%
MONEY MARKET FUNDS	\$295,670,943	3.55%
STIP Total	\$8,322,837,479	100.00%



Definition of NAV: Net Asset Value is the total value of the account including assets held, adjusted for payables, receivables and liabilities

(1) Other Holdings column on page two represents the value of securities, receivables, payables and liabilities that comprise the Net Asset Value for the asset owner.

*Difference of \$216,514,121 is attributable the portion of STIP held within CAPP (\$175,452,197) and TFIP (\$19,110,178) as a cash investment and distributions held over month end (\$21,951,746). Such value is represented in the NAV for the CAPP and STIP columns.

MBOI Snapshot
Asset Ownership View
2/29/2024 Unaudited



	CAPP Holdings	CAPP %	STIP Holdings*	STIP %	TFIP Holdings	TFIP%	Other Holdings ¹	Other %	Total Net Asset Value
Total Funds \$(000)	\$14,599,619	53.01%	\$8,106,323	29.43%	\$3,039,937	11.04%	\$1,795,086	6.52%	\$27,540,966
Pensions	CAPP	%	STIP	%	TFIP	%	Other	%	Total
FIREFIGHTERS RETIREMENT	\$ 664,816	98.97%	\$ 6,898	1.03%	\$ -	0.00%	\$ -	0.00%	\$ 671,714
GAME WARDENS RETIREMENT	\$ 337,942	99.00%	\$ 3,406	1.00%	\$ -	0.00%	\$ -	0.00%	\$ 341,348
HIGHWAY PATROL RETIREMENT	\$ 218,684	99.00%	\$ 2,203	1.00%	\$ -	0.00%	\$ -	0.00%	\$ 220,886
JUDGES RETIREMENT	\$ 134,546	99.00%	\$ 1,357	1.00%	\$ -	0.00%	\$ -	0.00%	\$ 135,903
POLICE OFFICERS RETIREMENT	\$ 598,617	98.97%	\$ 6,239	1.03%	\$ -	0.00%	\$ -	0.00%	\$ 604,856
PUBLIC EMPLOYEES RETIREMENT	\$ 7,061,138	98.98%	\$ 72,523	1.02%	\$ -	0.00%	\$ -	0.00%	\$ 7,133,661
SHERIFFS RETIREMENT	\$ 543,470	98.97%	\$ 5,645	1.03%	\$ -	0.00%	\$ -	0.00%	\$ 549,115
TEACHERS RETIREMENT	\$ 4,989,602	98.96%	\$ 52,417	1.04%	\$ -	0.00%	\$ -	0.00%	\$ 5,042,019
VOL FIREFIGHTERS RETIREMENT	\$ 50,804	99.00%	\$ 512	1.00%	\$ -	0.00%	\$ -	0.00%	\$ 51,317
Total	\$ 14,599,619	98.97%	\$ 151,199	1.03%	\$ -	0.00%	\$ -	0.00%	\$ 14,750,819
Trust Funds	CAPP	%	STIP	%	TFIP	%	Other	%	Total
ABANDONED MINE RECLAMATION	\$ -	0.00%	\$ 7,715	99.57%	\$ -	0.00%	\$ 33	0.43%	\$ 7,748
BARKER HUGHESVILLE ST RESPONSE	\$ -	0.00%	\$ 1,475	16.11%	\$ 7,646	83.53%	\$ 33	0.36%	\$ 9,154
BELT WATER TREATMENT PLANT	\$ -	0.00%	\$ 4,818	17.88%	\$ 22,025	81.76%	\$ 97	0.36%	\$ 26,939
BUTTE AREA ONE REST	\$ -	0.00%	\$ 828	14.25%	\$ 4,962	85.40%	\$ 21	0.36%	\$ 5,810
BUTTE AREA REDEVELOP AUTHORITY	\$ -	0.00%	\$ 1,431	10.99%	\$ 11,548	88.66%	\$ 46	0.35%	\$ 13,024
CLARK FORK REST	\$ -	0.00%	\$ 4,021	15.84%	\$ 21,280	83.81%	\$ 91	0.36%	\$ 25,392
CLARK FORK SITE RESP ACTION	\$ -	0.00%	\$ 3,295	6.67%	\$ 45,901	92.97%	\$ 173	0.35%	\$ 49,369
COAL TAX PARK TRUST FUND	\$ -	0.00%	\$ 2,016	6.65%	\$ 28,208	93.00%	\$ 106	0.35%	\$ 30,330
CULTURAL TRUST FUND	\$ -	0.00%	\$ 526	3.20%	\$ 15,840	96.45%	\$ 57	0.35%	\$ 16,423
DEBT AND LIABILITY FREE ACCOUNT	\$ -	0.00%	\$ 190,537	99.58%	\$ -	0.00%	\$ 812	0.42%	\$ 191,349
E HELENA GREENWAY TRAIL MAINT	\$ -	0.00%	\$ 291	29.92%	\$ 677	69.71%	\$ 4	0.37%	\$ 971
EAST HELENA COMPENSATION FUND	\$ -	0.00%	\$ 1,048	56.46%	\$ 801	43.15%	\$ 7	0.39%	\$ 1,857
ENDOWMENT FOR CHILDREN	\$ -	0.00%	\$ 86	6.08%	\$ 1,326	93.57%	\$ 5	0.35%	\$ 1,417
FLYING J CECRA FACILITIES FUND	\$ -	0.00%	\$ 437	16.45%	\$ 2,210	83.19%	\$ 9	0.36%	\$ 2,657
FWP MITIGATION TRUST	\$ -	0.00%	\$ 3,325	31.28%	\$ 6,789	63.87%	\$ 515	4.85%	\$ 10,630
HAROLD HAMM ENDOWMENT	\$ -	0.00%	\$ 8	14.96%	\$ 43	84.68%	\$ 0	0.36%	\$ 51
INVASIVE SPECIES TRUST FUND	\$ -	0.00%	\$ 395	12.19%	\$ 2,835	87.45%	\$ 11	0.35%	\$ 3,242
LIBBY ASBESTOS SITE STATE COST	\$ -	0.00%	\$ 963	19.23%	\$ 4,024	80.41%	\$ 18	0.36%	\$ 5,005
LUTTRELL PIT - OPER & MAINT	\$ -	0.00%	\$ 268	13.68%	\$ 1,682	85.97%	\$ 7	0.36%	\$ 1,956
MONTANA HIST AND CIVICS ENDOW	\$ -	0.00%	\$ 1,413	99.57%	\$ -	0.00%	\$ 6	0.43%	\$ 1,419
MONTANA HISTORICAL SOCIETY	\$ -	0.00%	\$ 974	23.66%	\$ 3,128	75.98%	\$ 15	0.36%	\$ 4,117
MONTANA STATE LIBRARY TRUST	\$ -	0.00%	\$ 135	9.89%	\$ 1,222	89.76%	\$ 5	0.35%	\$ 1,361
MT HOUSING INFRASTRUCTURE	\$ -	0.00%	\$ 84,104	78.98%	\$ -	0.00%	\$ 22,384	21.02%	\$ 106,488
MT POLE SUPERFUND SETTLEMENT	\$ -	0.00%	\$ 3,669	19.51%	\$ 15,064	80.12%	\$ 69	0.37%	\$ 18,802
NOXIOUS WEED MGMT TRUST FUND	\$ -	0.00%	\$ -	0.00%	\$ 10,174	99.66%	\$ 35	0.34%	\$ 10,209
OLDER MONTANANS TRUST FUND	\$ -	0.00%	\$ 15	4.63%	\$ 305	95.02%	\$ 1	0.35%	\$ 321
POTTER TRUST FUND	\$ -	0.00%	\$ 37	14.75%	\$ 212	84.90%	\$ 1	0.36%	\$ 250
PUBLIC SCHOOL TRUST	\$ -	0.00%	\$ 9,587	1.07%	\$ 883,074	98.59%	\$ 3,071	0.34%	\$ 895,732
REAL PROPERTY TRUST FUND	\$ -	0.00%	\$ 356	5.01%	\$ 6,726	94.64%	\$ 25	0.35%	\$ 7,107
RESOURCE INDEMNITY TRUST FUND	\$ -	0.00%	\$ 23	0.02%	\$ 104,436	99.63%	\$ 361	0.34%	\$ 104,820
SMELETER HILL UPLANDS REST FUND	\$ -	0.00%	\$ 1,246	14.78%	\$ 7,156	84.86%	\$ 30	0.36%	\$ 8,433
STREAMSIDE TAILINGS OU FUND	\$ -	0.00%	\$ 2,010	12.28%	\$ 14,293	87.36%	\$ 58	0.36%	\$ 16,361
TOBACCO TRUST FUND	\$ -	0.00%	\$ 1,960	0.67%	\$ 290,474	98.99%	\$ 1,012	0.34%	\$ 293,446
UPPER BLACKFT RESP ACT & REST	\$ -	0.00%	\$ 979	91.81%	\$ 83	7.77%	\$ 4	0.42%	\$ 1,066
UPPER CLRK FK RIVER BASIN RES	\$ -	0.00%	\$ 356	1.63%	\$ 21,395	98.02%	\$ 75	0.35%	\$ 21,826
UPPER CLRK FK RIVER BASIN REST	\$ -	0.00%	\$ 3,567	5.35%	\$ 62,840	94.30%	\$ 232	0.35%	\$ 66,639
WILDLIFE HABITAT TRUST FUND	\$ -	0.00%	\$ 1,129	7.00%	\$ 14,945	92.65%	\$ 56	0.35%	\$ 16,131
WORK FORCE HOUSING	\$ -	0.00%	\$ 11,973	99.35%	\$ -	0.00%	\$ 78	0.65%	\$ 12,051
YELLOWSTONE PIPELINE CLEANUPFD	\$ -	0.00%	\$ 1,919	32.17%	\$ 4,025	67.46%	\$ 22	0.37%	\$ 5,966
ZORTMAN/LANDUSKY LT WATER	\$ -	0.00%	\$ 16,799	99.57%	\$ -	0.00%	\$ 72	0.43%	\$ 16,871
ZORTMANLANDUSKY LT WATER TRUST	\$ -	0.00%	\$ 21,849	99.57%	\$ -	0.00%	\$ 93	0.43%	\$ 21,942
Total	\$ -	0.00%	\$ 387,581	19.05%	\$ 1,617,349	79.49%	\$ 29,752	1.46%	\$ 2,034,682
Coal Severance	CAPP	%	STIP	%	TFIP	%	Other	%	Total
BIG SKY ECONOMIC DEV FUND	\$ -	0.00%	\$ 5,532	3.89%	\$ 136,100	95.77%	\$ 487	0.34%	\$ 142,118
COAL SEVERANCE TAX PERM FUND	\$ -	0.00%	\$ 2,075	0.38%	\$ 328,614	60.21%	\$ 215,078	39.41%	\$ 545,767
CONSERVATION DISTRICT FUND	\$ -	0.00%	\$ 6,988	52.26%	\$ 6,350	47.49%	\$ 34	0.25%	\$ 13,372
MONTANA COAL ENDOWMENT FUND	\$ -	0.00%	\$ 3,069	1.14%	\$ 264,083	98.51%	\$ 926	0.35%	\$ 268,078
MT COAL ENDOWMENT REGIONAL WAT	\$ -	0.00%	\$ 1,192	1.28%	\$ 91,401	98.37%	\$ 321	0.35%	\$ 92,913
SCHOOL FACILITIES FUND	\$ -	0.00%	\$ 3,722	1.80%	\$ 202,856	97.86%	\$ 714	0.34%	\$ 207,293
Total	\$ -	0.00%	\$ 22,578	1.78%	\$ 1,029,404	81.08%	\$ 217,559	17.14%	\$ 1,269,541
Operating Funds	CAPP	%	STIP	%	TFIP	%	Other	%	Total
FWP GENERAL LICENSE ACCOUNT	\$ -	0.00%	\$ 54,729	62.48%	\$ 29,424	33.59%	\$ 3,445	3.93%	\$ 87,598
MONTANA LOCAL GOVERNMENTS	\$ -	0.00%	\$ 1,764,231	99.56%	\$ -	0.00%	\$ 7,784	0.44%	\$ 1,772,015
MONTANA STATE AGENCIES	\$ -	0.00%	\$ 2,732,152	99.57%	\$ -	0.00%	\$ 11,676	0.43%	\$ 2,743,828
MONTANA STATE UNIVERSITY	\$ -	0.00%	\$ 308,409	84.21%	\$ 56,306	15.37%	\$ 1,532	0.42%	\$ 366,247
MONTANA TECH	\$ -	0.00%	\$ 8,454	94.61%	\$ 444	4.97%	\$ 38	0.42%	\$ 8,936
STATE TREASURER'S FUND	\$ -	0.00%	\$ 2,333,358	88.36%	\$ 222,989	8.44%	\$ 84,393	3.20%	\$ 2,640,741
UNIVERSITY OF MONTANA	\$ -	0.00%	\$ 82,260	70.76%	\$ 28,663	24.66%	\$ 5,330	4.58%	\$ 116,253
Total	\$ -	0.00%	\$ 7,283,593	94.16%	\$ 337,827	4.37%	\$ 114,198	1.48%	\$ 7,735,618
Insurance Reserves	CAPP	%	STIP	%	TFIP	%	Other	%	Total
HAIL INSURANCE INVESTMENTS	\$ -	0.00%	\$ 3,131	51.76%	\$ 2,894	47.85%	\$ 23	0.39%	\$ 6,048
MONTANA STATE FUND	\$ -	0.00%	\$ 14,428	1.01%	\$ -	0.00%	\$ 1,419,075	98.99%	\$ 1,433,503
MUS GROUP INSURANCE	\$ -	0.00%	\$ 87,871	85.64%	\$ 12,443	12.13%	\$ 2,290	2.23%	\$ 102,604
MUS WORKERS COMPENSATION	\$ -	0.00%	\$ 9,642	70.93%	\$ 3,897	28.67%	\$ 55	0.41%	\$ 13,593
PERS-DCRP LT DISABILITY PLAN	\$ -	0.00%	\$ 750	7.65%	\$ -	0.00%	\$ 9,053	92.35%	\$ 9,804
STATE EMPLOYEE GROUP BENEFITS	\$ -	0.00%	\$ 144,119	78.62%	\$ 36,123	19.71%	\$ 3,074	1.68%	\$ 183,316
SUBSEQUENT INJURY TRUST FUND	\$ -	0.00%	\$ 1,432	99.57%	\$ -	0.00%	\$ 6	0.43%	\$ 1,438
Total	\$ -	0.00%	\$ 261,372	14.93%	\$ 55,356	3.16%	\$ 1,433,577	81.90%	\$ 1,750,305

Short Term Investment Pool			
Account	# Accounts	Total Market Value	%
Total State	368	6,552,890,202	78.7%
Total Local	195	1,769,947,277	21.3%
Total STIP	563	\$ 8,322,837,479	100.0%
STIP Reserve		\$ 80,210,412	
Prior month average STIP Yield		5.3964%	

Intercap Statistics	
Loans Outstanding	\$ 67,634,623
Bonds Outstanding	\$ 70,706,869
Number of Borrowers	121
Loan Rate	5.75%

MONTANA

BOARD OF INVESTMENTS

TO: Members of the Board
FROM: Jon Putnam, Chief Investment Officer
DATE: April 10, 2024
RE: Asset Class Benchmark Review

Benchmarks are selected based on seven factors endorsed by the CFA Institute. An optimal benchmark is: **S**pecified in advance, **A**ppropriate, **M**easurable, **U**nambiguous, **R**eflective of the investment, **A**ccountable, and **I**vestable. These factors can be remembered with the acronym **SAMURAI**.

BOI's public equity benchmarks (Domestic & International) conform to all seven factors. Investors can invest in these benchmarks at relatively low cost and obtain the return offered by the passive benchmark.

BOI's public fixed income benchmarks (Core, Non-Core & Cash) conform to most of the seven factors. However, it is impossible to fully replicate the fixed-income benchmarks. The benchmarks are not investable, but they provide a reasonable approximation of fixed income risk and return characteristics and are a valid point of reference to gauge success.

BOI's illiquid asset class benchmarks (Private Investments, Real Estate & Real Assets) face several inherent challenges in conforming to the seven factors. The main hurdle is the lack of a transparent index that accurately represents the various private markets. Private market indices tend to suffer from a lack of constituent disclosure, an inability to capture all market opportunities, and lagged data. Additional challenges include extended investment time horizons, existence of lock-up periods, less liquid fund structures, and opaque fund information. A few of the more notable challenges are explained in greater detail below:

- **J-Curve Effect** – Performance of illiquid asset classes can send deceptive signals, as return patterns typically follow a trajectory referred to as a “J- Curve.” This return pattern stems from the fact that capital is called for investment over several years and the timing of cash flows is uncertain. The J-Curve produces negative returns in the early years, as capital calls and manager fees comprise most of the cash flows, followed by increasing returns as investments mature. This can create the perception that investments are generating returns that significantly trail the public markets in the early years and substantially exceed public markets in the later years.

- **Lagged Valuations** – Asset prices for illiquid investments are typically estimated quarterly resulting in a significant return lag and reduced volatility relative to public markets. Within illiquid and private asset classes, there is limited or selective data available from managers as well as the underlying investments.

The above-mentioned obstacles limit the utility of benchmarks for illiquid asset classes – especially when evaluated over short time horizons. Given the obstacles, it is clear there is no perfect benchmark for illiquid asset classes. All benchmarks have some shortcomings with respect to the SAMURAI standard. However, staff have selected benchmarks that provide a reasonable approximation of the risk and return characteristics of the assets over the long term.

At the May board meeting, staff will recommend a change to the benchmark methodology for Real Assets when we review all BOI Investment Policy Statements. Staff will propose changing the Real Asset benchmark to a weighted average based on the value of the commodity, infrastructure, and TIPS holdings rather than an equal split between the three sub-asset class indices.

Since creating the Real Assets Asset Class in November of 2020, staff added significant exposure to infrastructure as planned. In addition, TIPS were less beneficial in a higher inflation environment than expected and staff have reduced exposure. A weighted average benchmark would be a better representation of the risk in the Real Asset portfolio.

BOI's current asset class benchmarks are in the table below. Staff recognize the tradeoffs and shortcomings of some of the benchmarks. Nevertheless, staff believe the current benchmarks are consistent with industry best practice. The selected benchmarks provide useful information regarding asset class performance and BOI's progress toward long-term goals. Staff supplement this information with many other metrics to gain a full understanding of the performance of the portfolio and its underlying holdings.

Asset Class	Benchmark
Domestic Equity	MSCI USA Investable Market Index (IMI)
International Equity	MSCI All Country World Index (ACWI) ex USA InvestableMarket Index (IMI)
Core Fixed Income	Bloomberg US Aggregate Bond Index
Non-Core Fixed Income	Bloomberg US High Yield 2% Issuer Cap Index
Private Investments	Weighted average of Private Equity and Private Credit
Equity	MSCI USA Small Cap Index
Credit	S&P/LSTA 100 Leveraged Loan Index
Real Assets	Weight of 1/3 each of the Commodity, Infrastructure, and TIPS Index
Commodity	MSCI All Country World Index (ACWI) CommodityProducers
Infrastructure	MSCI All Country World Index (ACWI) Infrastructure Index
TIPS portfolio	Bloomberg US Treasury Inflation ProtectedSecurities (TIPS) Index
Real Estate	National Council of Real Estate Investment Fiduciaries (NCREIF) Fund Index - Open End Diversified Core Equity (ODCE) Index
Pension Plans	Blend of the asset class benchmarks weighted by the midpoint of the asset allocation range
Trust Funds Investment Pool (TFIP)	Weighted average of the Bloomberg US Aggregate Bond Index, NCREIF-ODCE Index and the Bloomberg US High Yield 2% Issuer Cap Index
State Fund Investment Pool (SFIP)	Weighted average of the Bloomberg US Aggregate Bond Index, S&P 500 Index, MSCI ACWI ex US Index and the NCREIF-ODCE Index
Short-Term Investment Pool (STIP)	Federal Reserve US Treasury Constant Maturity 1-Month Index

April 10, 2024



Capital Market Assumptions

Montana Board of Investments



Capital Market Assumptions

An input into MBOI's annual asset allocation study

- We will be conducting an asset allocation study later this year.
 - As part of that process, we will meet with MBOI staff to review asset allocation and range structures to discuss with the Board.
- Capital Market Assumptions (CMAs) are one input in the asset allocation process, but there are several other factors such as:
 - Portfolio purpose (e.g., retirement plan, insurance pool, trust fund pool), constraints, and asset classes included
 - asset class minimum and maximums
 - return goals
 - risk tolerance, including expected down market performance over varying time periods
 - liquidity requirements
- This presentation reviews RVK's process for creating CMAs and the resulting 2024 assumption set of expected return, risk, and correlations.
- Typically, CMAs don't vary significantly year-over-year due to the long horizon date.

Capital Market Assumptions

- *Philosophy*
- *Historical Perspective*
- *Key 2024 Observations*
- *Assumption Set*
- *Capital Market Line*
- *Correlation*
- *Assumption Components*



Capital Market Assumptions

Philosophy

- Each year, RVK's general consulting and research teams collaborate to review the capital market environment and update long-term, forward-looking capital market assumptions (CMAs) for each asset class utilized by our clients.
- The forecast horizon is for long-term periods, typically 10 years or more.
- The components we estimate include:
 - Return
 - Risk (volatility of returns)
 - Correlation (relationship of asset class returns with all other asset classes)
- Return assumptions are generally index-based, net of fees, and assume no investment manager alpha.
- Annual updates are typically gradual and incorporate historical performance, current valuations, as well as the overall economic environment.

What does it mean to get CMAs “right”?

Relative accuracy is more important...

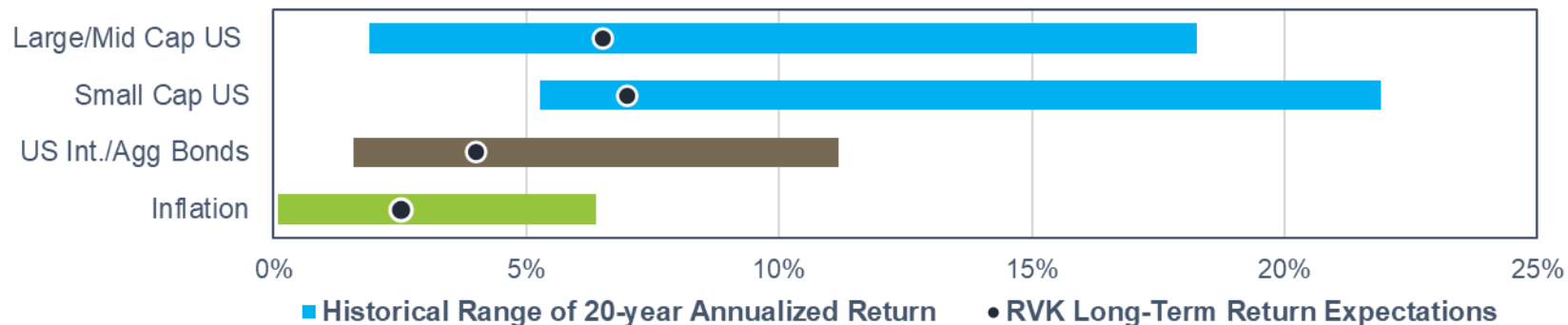
- **Relative Accuracy:** Assumptions capture the relative relationships between asset classes, which are vitally important to trade-off decisions when modeling.
 - Having some assumptions that are spot on, and others that are far off, will produce unbalanced and poorly diversified portfolios.

...but “absolute” accuracy matters too – though perhaps not as much

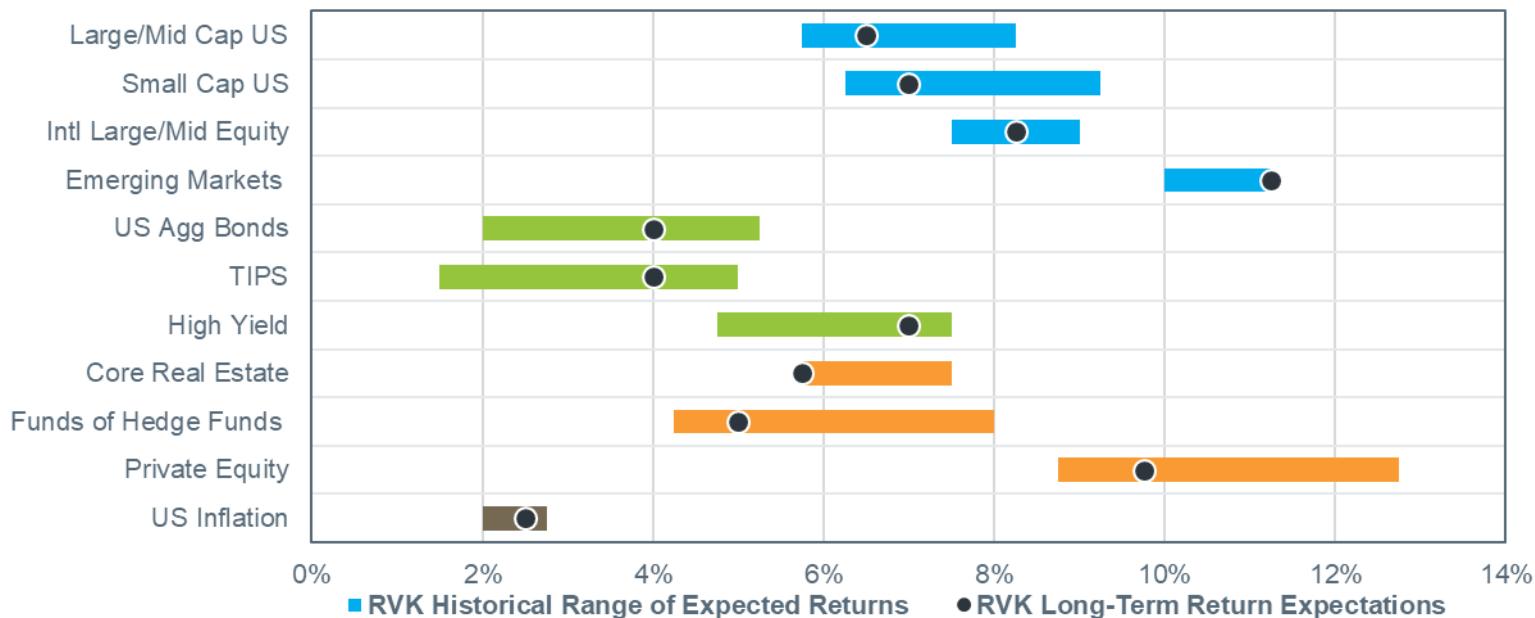
- **Absolute Accuracy:** Assumptions reflect the absolute values actually experienced in future long-term market environments.
 - Having assumptions that are too high or too low across the board can cause a Fund to believe it can distribute more than it can afford or restrict spending more than necessary.

Historical Perspective of Expected Returns

RVK Long-Term Expected Returns vs. Historical Range of Returns¹



2024 Expected Returns vs. RVK Historical Range of Expected Returns²

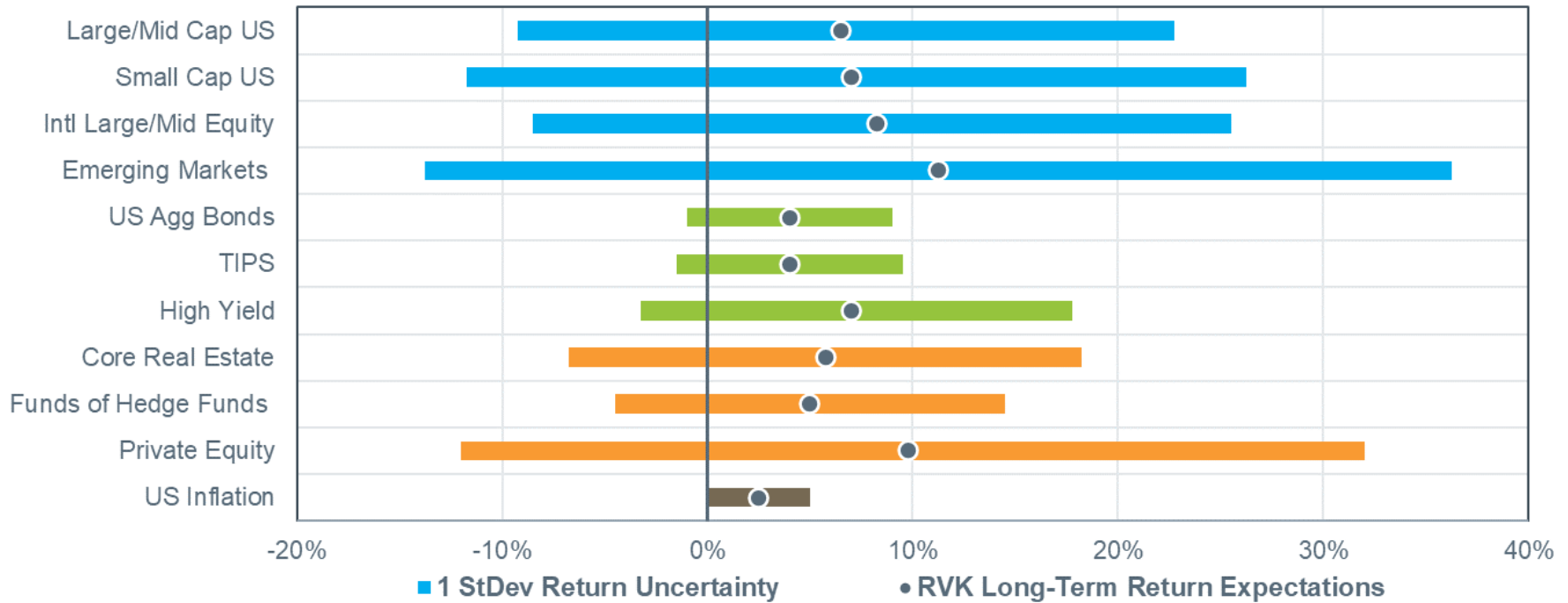


¹ Historical range shows the minimum and maximum 20-year annualized return for a given asset class based on monthly rolling 20-year annualized return series starting from Jan 1926. Large/Mid Cap US is represented by SBBI US Large Stock; Small Cap US by SBBI US Small Stock; US Int./Agg Bonds by SBBI US Intermediate Government Jan 1926 – December 1999 and Barclays US Aggregate Bond Index thereafter; US Inflation by SBBI US Inflation.

² Data shown includes 2006 through 2024 Capital Market Assumptions for selected asset classes.

Range of Potential Outcomes for Expected Returns

RVK 2024 Long-Term Return Expectations and Uncertainty of Returns Distribution



* StDev return uncertainty is based on RVK 2024 CMA risk assumption for each asset class.

Themes for 2024 Capital Market Assumptions

Inflation

Past and future inflation levels are studied and considered given market conditions, break-even indications, sovereign intervention, and inflation component pricing behavior. *RVK's 2024 inflation assumption remained constant compared to 2023. This reflects short- to medium-term inflationary pressures while also accounting for longer-term deflationary factors such as deficits, debt, demographics, automation and globalization.*

Mean-reversion

Mean reversion is considered for asset classes that demonstrated weak/strong performance over the last year (or longer). *Equity return assumptions were decreased, given elevated valuation levels following strong 2023 returns.*

Increased yields

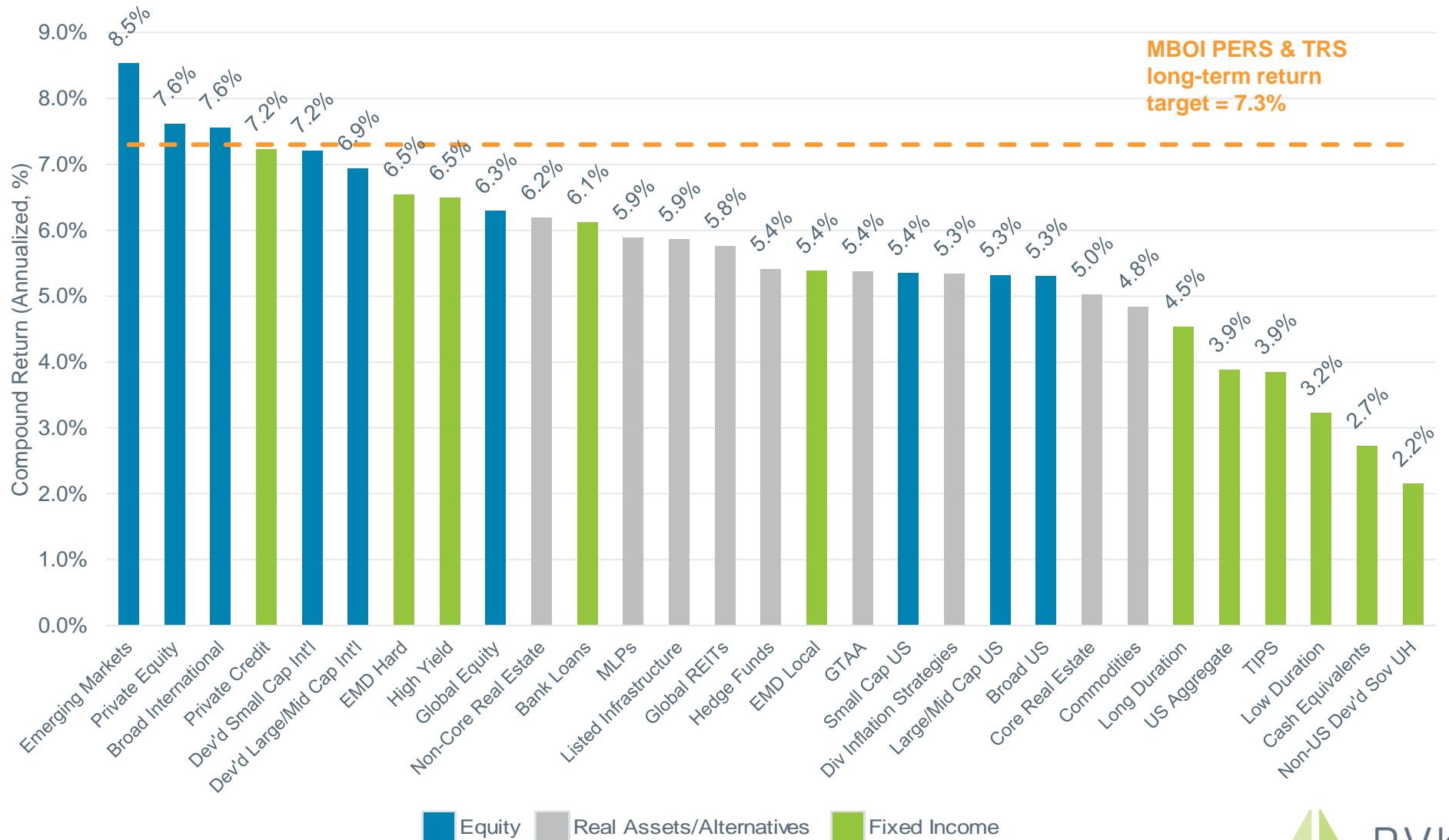
Yield history, current environment, and prospective environments are considered. *The majority of domestic fixed income return assumptions were held constant, reflecting elevated current yields – but with the expectation that the inverted yield curve will not persist indefinitely.*

RVK 2024 Assumptions vs 2023

Asset Class	Benchmark	2023			2024			Change		
		Nominal Return (Arith.)	Risk (St. Dev.)	Nominal Return (Geo.)	Nominal Return (Arith.)	Risk (St. Dev.)	Nominal Return (Geo.)	Nominal Return (Arith.)	Risk (St. Dev.)	Nominal Return (Geo.)
Large/Mid Cap US Equity	S&P 500 (Cap Weighted)	6.75%	16.00%	5.57%	6.50%	16.00%	5.32%	-0.25%	0.00%	-0.25%
Small Cap US Equity	Russell 2000	7.25%	19.00%	5.61%	7.00%	19.00%	5.35%	-0.25%	0.00%	-0.25%
Broad US Equity	Russell 3000	6.80%	16.10%	5.61%	6.50%	16.10%	5.30%	-0.30%	0.00%	-0.30%
Devd Large/Mid Cap Int'l Equity	MSCI EAFE (Gross)	8.50%	17.00%	7.19%	8.25%	17.00%	6.94%	-0.25%	0.00%	-0.25%
Devd Small Cap Int'l Equity	MSCI EAFE Small Cap (Gross)	9.25%	20.00%	7.46%	9.00%	20.00%	7.21%	-0.25%	0.00%	-0.25%
Emerging Markets Equity	MSCI Emerging Markets (Gross)	11.25%	25.00%	8.54%	11.25%	25.00%	8.54%	0.00%	0.00%	0.00%
Broad International Equity	MSCI ACW Ex US IMI (Gross)	9.35%	18.70%	7.79%	9.15%	18.85%	7.56%	-0.20%	0.15%	-0.23%
Global Equity	MSCI ACW IMI (Gross)	7.85%	16.40%	6.62%	7.55%	16.60%	6.29%	-0.30%	0.20%	-0.33%
US Aggregate Fixed Income	Bloomberg US Aggregate Bond	4.00%	5.00%	3.88%	4.00%	5.00%	3.88%	0.00%	0.00%	0.00%
Non-US Devd Sov'n Fixed Income UH	Citi Non-US World Govt Bond	2.25%	8.50%	1.90%	2.50%	8.50%	2.15%	0.25%	0.00%	0.25%
Emerging Markets Debt Hard Currency	JPM EMBI Global Diversified	7.50%	10.00%	7.04%	7.00%	10.00%	6.54%	-0.50%	0.00%	-0.50%
Emerging Markets Debt Local Currency	JPM GBI EM Global Diversified	6.50%	11.50%	5.88%	6.00%	11.50%	5.38%	-0.50%	0.00%	-0.50%
TIPS	Bloomberg US Treasury: US TIPS	4.00%	5.50%	3.85%	4.00%	5.50%	3.85%	0.00%	0.00%	0.00%
Low Duration Fixed Income	Bloomberg US Govt/Cred: 1-3 Year	3.25%	2.50%	3.22%	3.25%	2.50%	3.22%	0.00%	0.00%	0.00%
Long Duration Fixed Income	Bloomberg US Govt/Cred: LT Bond	5.00%	10.00%	4.53%	5.00%	10.00%	4.53%	0.00%	0.00%	0.00%
High Yield	Bloomberg US Corp: High Yield	7.25%	10.50%	6.74%	7.00%	10.50%	6.49%	-0.25%	0.00%	-0.25%
Bank Loans	CS Leveraged Loan	6.50%	8.50%	6.16%	6.50%	9.00%	6.12%	0.00%	0.50%	-0.04%
Core Real Estate	NCREIF ODCE (Gross) (AWA)	5.75%	12.50%	5.02%	5.75%	12.50%	5.02%	0.00%	0.00%	0.00%
Global REITs	MSCI World Real Estate (Gross)	7.75%	21.00%	5.76%	7.75%	21.00%	5.76%	0.00%	0.00%	0.00%
MLPs	Alerian MLP	8.25%	23.00%	5.89%	8.25%	23.00%	5.89%	0.00%	0.00%	0.00%
Funds of Hedge Funds	HFRI Fund of Funds Composite	5.00%	9.50%	4.57%	5.00%	9.50%	4.57%	0.00%	0.00%	0.00%
Multi-Strategy Hedge Funds	HFRI RV Multi-Strat	5.75%	8.50%	5.41%	5.75%	8.50%	5.41%	0.00%	0.00%	0.00%
GTAA	Custom GTAA Index	6.00%	9.00%	5.62%	5.75%	9.00%	5.37%	-0.25%	0.00%	-0.25%
Private Credit	Cambridge Private Credit Index	8.00%	13.00%	7.23%	8.00%	13.00%	7.23%	0.00%	0.00%	0.00%
Senior Secured Direct Lending	--	7.00%	9.00%	6.62%	7.00%	9.50%	6.58%	0.00%	0.50%	-0.04%
Private Equity	Cambridge US Private Equity	10.00%	22.00%	7.86%	9.75%	22.00%	7.61%	-0.25%	0.00%	-0.25%
Commodities	Bloomberg Commodity	6.00%	17.50%	4.58%	6.25%	17.50%	4.84%	0.25%	0.00%	0.25%
Diversified Inflation Strategies	Custom DIS Index	5.90%	11.60%	5.27%	6.00%	11.85%	5.34%	0.10%	0.25%	0.07%
US Inflation	Consumer Price Index	2.50%	2.50%	2.47%	2.50%	2.50%	2.47%	0.00%	0.00%	0.00%
Cash Equivalents	BofA ML 3 Mo US T-Bill	2.50%	2.00%	2.48%	2.75%	2.00%	2.73%	0.25%	0.00%	0.25%

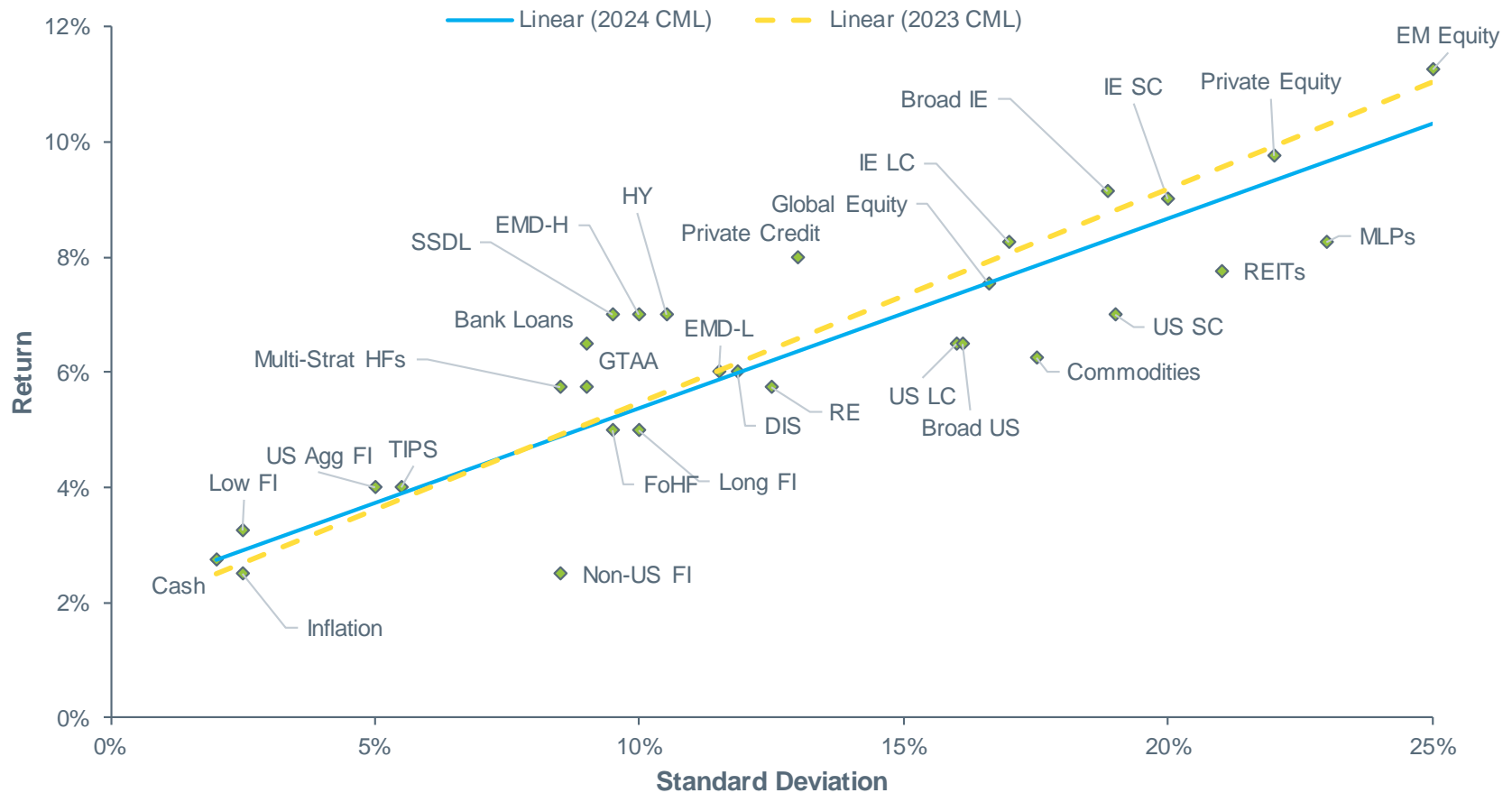
RVK 2024 Expected Geometric Returns

- It is important to note that the asset allocation exercise is not to select only asset classes that individually meet a portfolio's long-term return target.
- In the modeling process each asset class is considered for its contribution to the portfolio through the multiple lenses of expected return, risk, and correlation.



Capital Market Line

- The capital market line represents the return and risk attributes of each asset class and reflects the discipline that return and risk are related and asset classes should be triangulated as an assumption set.
- Note that the return and risk relationships resulting from our 2024 process represent lower return potential for similar risk levels – the Capital Market Line has moved downward.



Correlation

- Correlation is a quantitative measure of the degree to which asset classes move relative to each other. Correlation values can fall between 1.00 and -1.00.
- Diversification opportunities exist because the returns of different asset classes do not always move in the same direction at the same time, or with the same magnitude.

MBOI 2024 Correlation Matrix

	Broad US Equity	Broad International Equity	US Agg Fixed Income	TIPS	High Yield Fixed Income	Private Credit	Convertibles	Core Real Estate	Private Core Infrastructure	Private Equity	Commodities	Cash Equivalents
Broad US Equity	1.00	0.85	0.24	0.21	0.67	0.71	0.83	0.28	0.08	0.76	0.36	0.01
Broad International Equity	0.85	1.00	0.18	0.27	0.73	0.81	0.77	0.29	0.10	0.74	0.50	-0.06
US Agg Fixed Income	0.24	0.18	1.00	0.78	0.34	-0.14	0.21	0.01	-0.10	-0.05	0.00	0.29
TIPS	0.21	0.27	0.78	1.00	0.39	0.08	0.25	0.21	-0.17	0.19	0.26	0.04
High Yield Fixed Income	0.67	0.73	0.34	0.39	1.00	0.70	0.71	0.15	0.03	0.61	0.38	-0.03
Private Credit	0.71	0.81	-0.14	0.08	0.70	1.00	0.69	0.38	0.09	0.83	0.52	-0.11
Convertibles	0.83	0.77	0.21	0.25	0.71	0.69	1.00	0.21	0.09	0.73	0.37	-0.05
Core Real Estate	0.28	0.29	0.01	0.21	0.15	0.38	0.21	1.00	0.22	0.54	0.29	0.01
Private Core Infrastructure	0.08	0.10	-0.10	-0.17	0.03	0.09	0.09	0.22	1.00	0.07	-0.05	-0.22
Private Equity	0.76	0.74	-0.05	0.19	0.61	0.83	0.73	0.54	0.07	1.00	0.51	-0.18
Commodities	0.36	0.50	0.00	0.26	0.38	0.52	0.37	0.29	-0.05	0.51	1.00	-0.02
Cash Equivalents	0.01	-0.06	0.29	0.04	-0.03	-0.11	-0.05	0.01	-0.22	-0.18	-0.02	1.00

Summary of Expected Return Methodology

- Asset class return expectation building processes - simplified.

Building Block Methodology	Income	+	Inflation	+	Real Growth	+	Valuation Change
Cash Equivalents	Income + Expected interest rate changes						
Fixed Income	Income + OAS change + Expected interest rate changes (and duration impact)						
TIPS	Real Income + Inflation						
Public Equity	Income + Inflation + Real GDP/earnings growth +/- Currency Effect +/- Valuation						
Core Real Estate	Income + Inflation +/- Valuation – Manager Fees						
Hedge Funds	Income (collateral return, cash) + Beta return + Alpha return (net)						
Commodities	Collateral return (cash assumption) + Spot return (inflation assumption) + Roll return						
Spread Methodology	Beta assumption	+	Illiquidity premium				
Private Credit	Bank loan assumption + Return premium						
Private Equity	US Large/Mid cap equity assumption + Return premium						
Asset Blend Methodology							
GTAA	30% global equity + 25% US Agg fixed income + 5% int'l developed fixed income + 10% EMD (local) + 10% TIPS + 10% high yield + 10% commodities						
Diversified Inflation Strategies	1/3 TIPS + 1/3 commodities + 1/3 global REITs						

While the above factors generally inform the direction and magnitude of the capital market assumptions, RVK also considers qualitative, triangulation, and other factors as needed, when arriving at final assumption values.

Capital Market Assumptions



Capital Market Assumptions

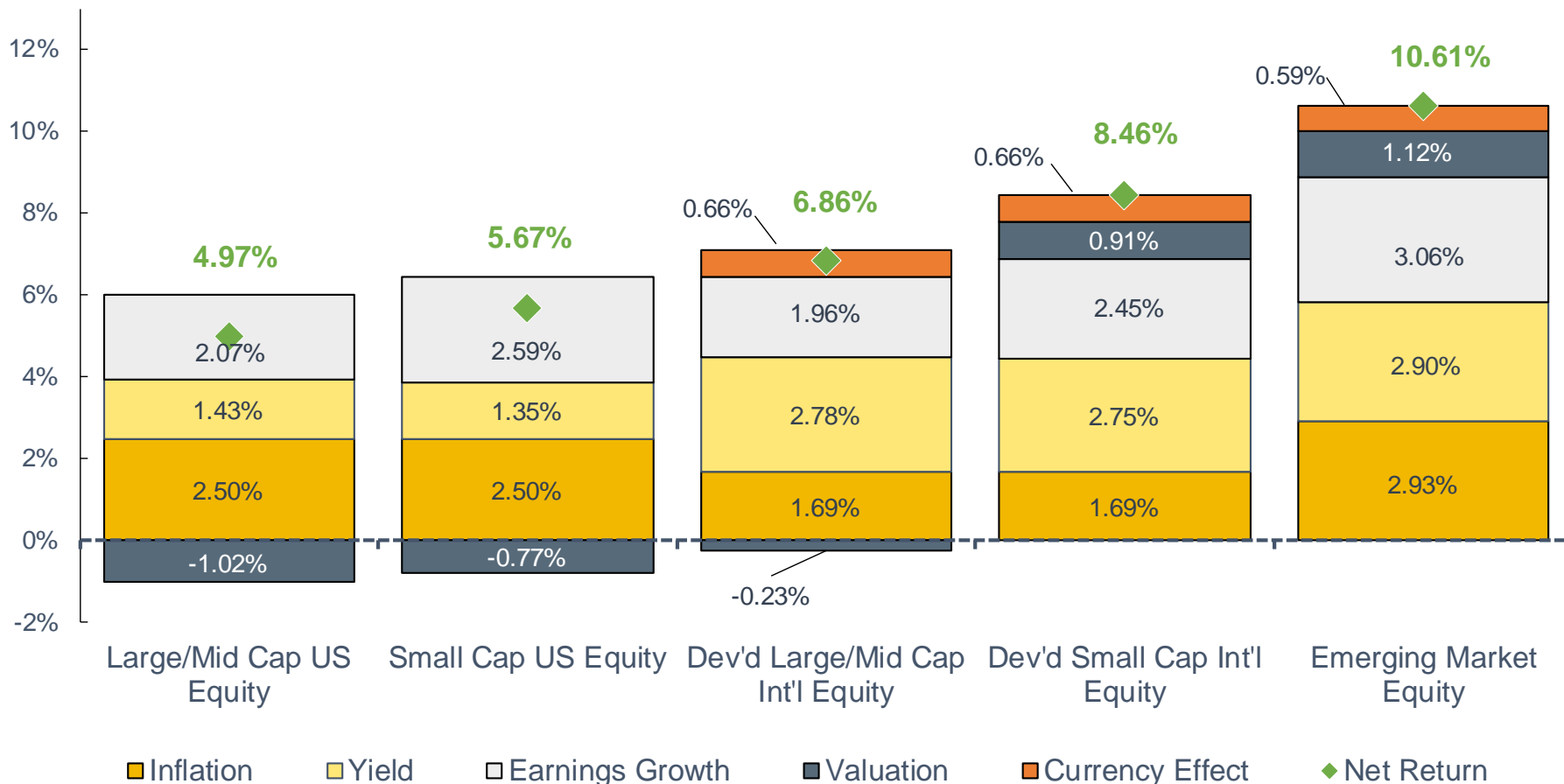
A review of key asset classes

- The following pages provide a view into the process of developing key asset class assumptions.
- There are many more asset classes and assumption construction components that are detailed in our related white paper.
- When clients have bespoke asset class construction that differ from our primary assumptions, we are happy to create custom assumptions that are then tested to ensure they will function well as part of a capital market line.

RVK Return Methodology for Equities

- Quantifying the equity building blocks is one step in the process.

2024 Decomposition of the Building Blocks for Public Equity Asset Classes

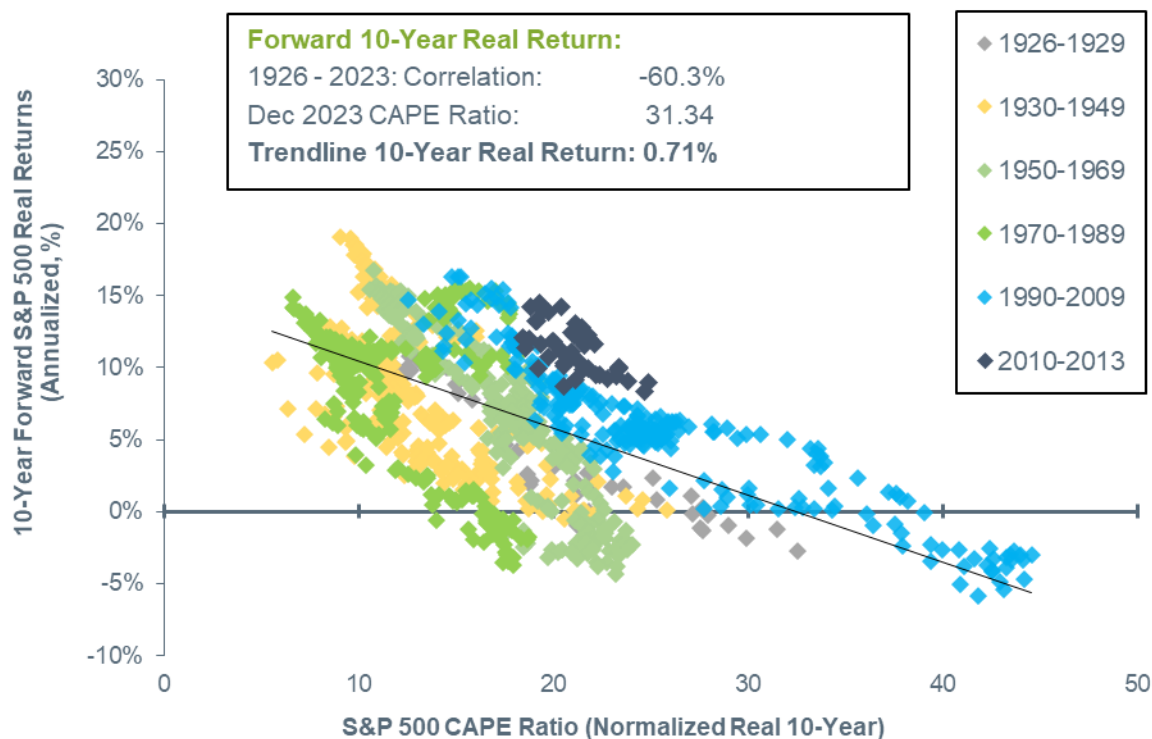


Source: FactSet (2024). Data as of December 31, 2023.

Public Equity – US

Public Equity: US									
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
Large/Mid Cap US	6.75%	16.00%	5.57%	6.50%	16.00%	5.32%	-0.25%	--	-0.25%
Small Cap US	7.25%	19.00%	5.61%	7.00%	19.00%	5.35%	-0.25%	--	-0.25%
Broad US Equity	6.80%	16.10%	5.61%	6.50%	16.10%	5.30%	-0.30%	--	-0.30%

Relationship between Valuations and Forward 10 Year Returns



- US equity return forecasts all decreased relative to 2023.
- The decrease was driven by elevated valuations, as domestic equities rallied in 2023 supported by strong consumer spending, AI developments and prospects of near-term monetary easing.
- Year-end LC US valuation, as represented by the Shiller CAPE ranked in the 93rd percentile of historical values going back to 1926.
- Thus, return assumptions remain lower than historical averages.

RVK Broad US Equity assumption is a combination of 94.6% Large/Mid Cap US Equity and 5.4% Small Cap US Equity.

Source: RVK, based on data from FactSet (2024). December 2023 CAPE ratio uses the S&P 500 earnings estimate for the Q4 2023.

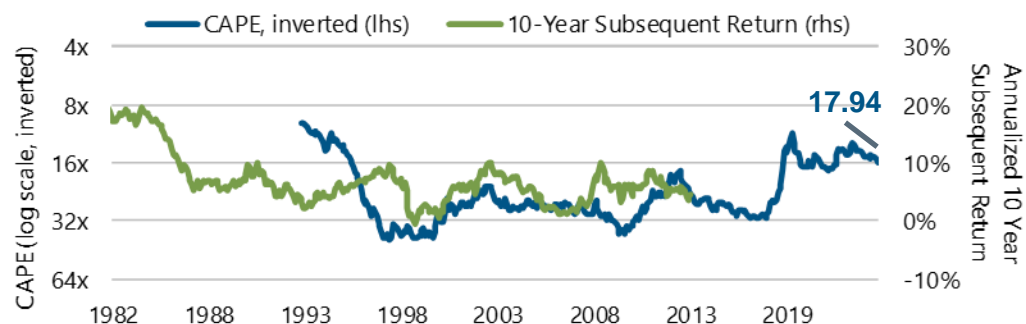
Public Equity – International

Public Equity: International

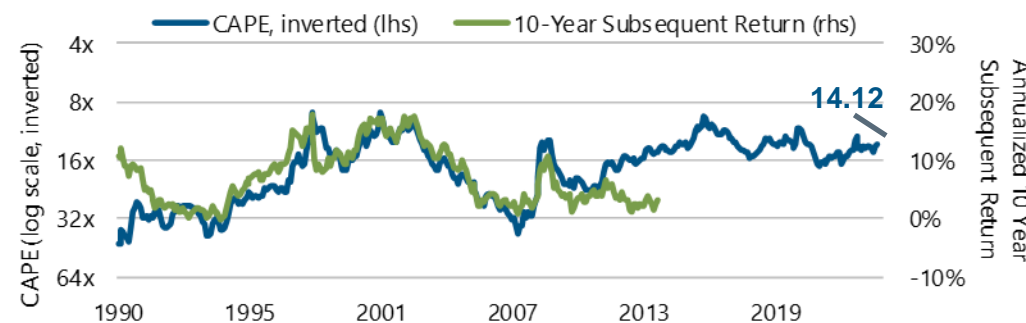
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
Intl Large/Mid Equity	8.50%	17.00%	7.19%	8.25%	17.00%	6.94%	-0.25%	--	-0.25%
Intl Dev'd Small Cap	9.25%	20.00%	7.46%	9.00%	20.00%	7.21%	-0.25%	--	-0.25%
Emerging Markets	11.25%	25.00%	8.54%	11.25%	25.00%	8.54%	--	--	--
Broad International	9.35%	18.70%	7.79%	9.15%	18.85%	7.56%	-0.20%	+0.15%	-0.23%

Valuations: Cyclically-adjusted P/E

EAFE valuations



Emerging markets valuations



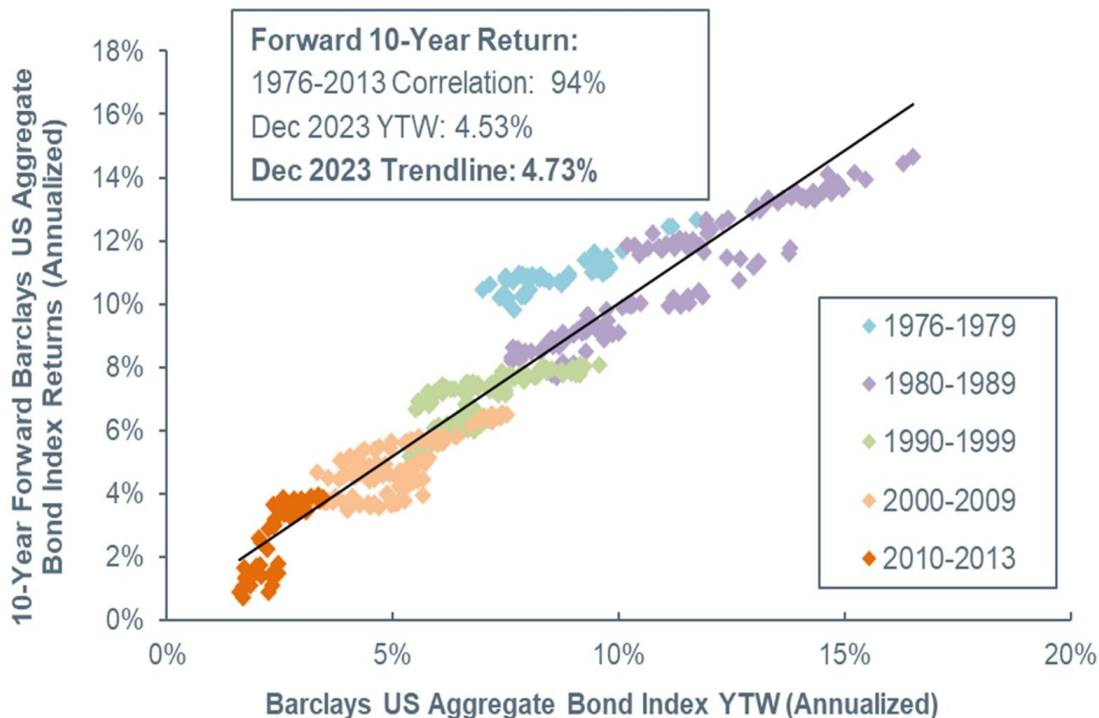
- Developed international equity assumptions decreased primarily due to lower real growth/earnings expectations and increased valuations in 2023, just like with domestic equities.
- International developed inflation expectations remain below US expectations. However, all non-US valuations remain better than their US counterparts.
- No change to the emerging markets equity assumptions.

RVK Broad International Equity is a mix of 62.0% Dev'd Large/Mid Cap Int'l Equity, 9.9% Dev'd Small Cap Int'l Equity, and 28.1% Emerging Markets Equity. Source: Research Affiliates (RA); EAFE valuations represented by MSCI EAFE CAPE calculations by RA since December 1982; EM represented by MSCI EM CAPE calculations by RA since Jan 1990. Data as of December 31, 2023.

Fixed Income

Fixed Income									
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
US Aggregate	4.00%	5.00%	3.88%	4.00%	5.00%	3.88%	--	--	--
Non-US Dev. Sovereign	2.25%	8.50%	1.90%	2.50%	8.50%	2.15%	+0.25%	--	+0.25%
Low Duration	3.25%	2.50%	3.22%	3.25%	2.50%	3.22%	--	--	--
Long Duration	5.00%	10.00%	4.53%	5.00%	10.00%	4.53%	--	--	--
TIPS	4.00%	5.50%	3.85%	4.00%	5.50%	3.85%	--	--	--

Relationship between YTW and Forward 10 Year Returns



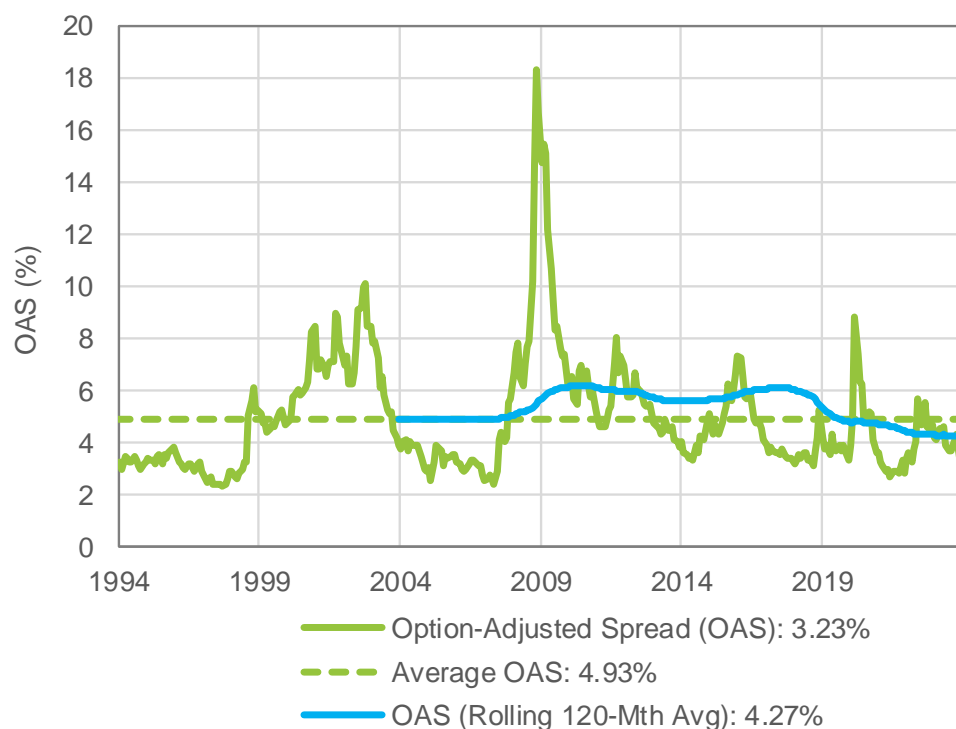
- Starting yields have historically been a reasonable starting point when forecasting future bond returns.
- Domestic bond return assumptions remained stable as our 2023 assumptions already reflected higher starting yields, and an expectation that the yield curve inversion corrects over time.
- Changes in spreads and durations were mostly nominal and thus did not generally have material impacts on the return forecasts.

Source: FactSet (2024).

Fixed Income – Spread Assets

Fixed Income: Spread Sectors									
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
High Yield	7.25%	10.50%	6.74%	7.00%	10.50%	6.49%	-0.25%	--	-0.25%
Emerging Markets Debt (HC)	7.50%	10.00%	7.04%	7.00%	10.00%	6.54%	-0.50%	--	-0.50%
Emerging Markets Debt (LC)	6.50%	11.50%	5.88%	6.00%	11.50%	5.38%	-0.50%	--	-0.50%
Bank Loans	6.50%	8.50%	6.16%	6.50%	9.00%	6.12%	--	+0.50%	-0.04%

BB US Corporate High Yield Index Option-Adjusted Spread (OAS)

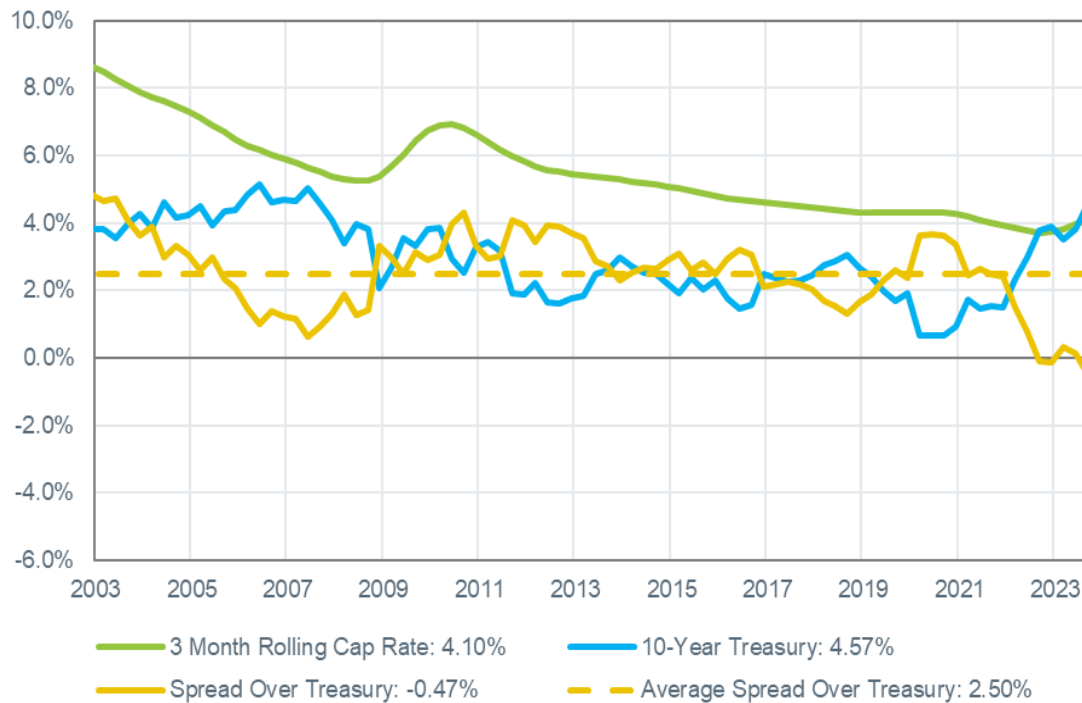


- Bank loans return assumption was kept constant as tightening spreads were offset by higher starting yields.
- Bank loans risk assumption increased reflecting a decline in quality over time.
- Decrease in starting yields as well as tightening spreads led to lower expected long-term returns for emerging market debt (both HC and LC) and high yield.

Real Estate

Real Estate									
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
Core Real Estate	5.75%	12.50%	5.02%	5.75%	12.50%	5.02%	--	--	--
Global REITs	7.75%	21.00%	5.76%	7.75%	21.00%	5.76%	--	--	--

Cap Rates and Spread to Treasuries



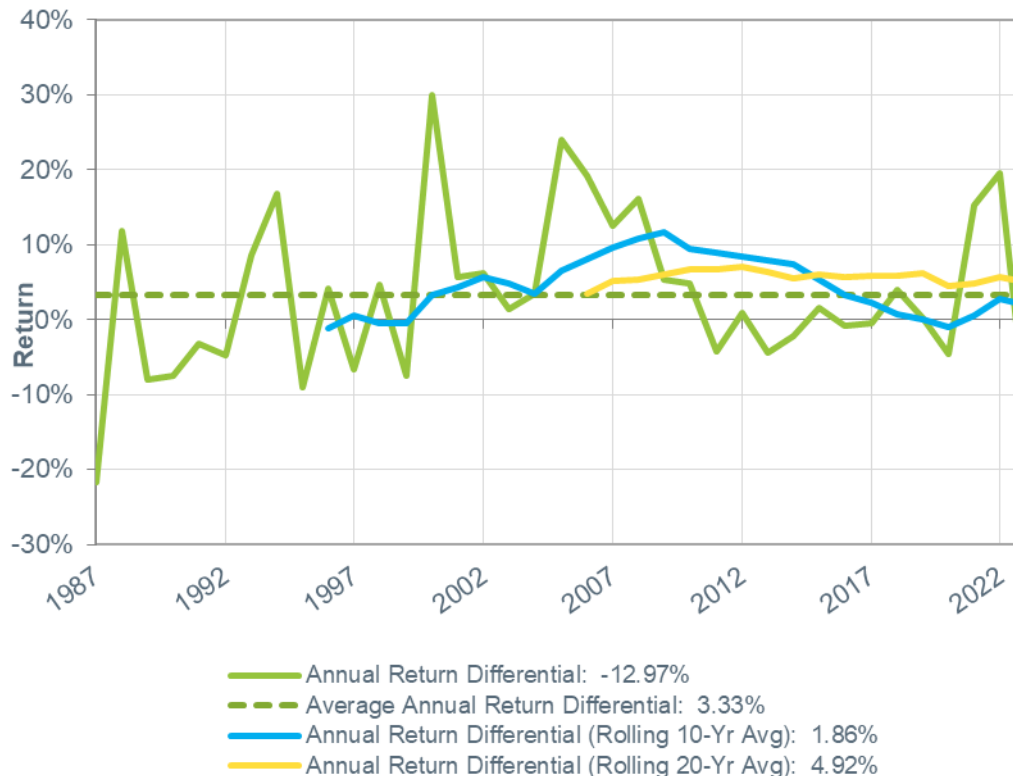
- Cap rates increased slightly during 2023.
- However, on a relative basis – with Treasury rates materially increased – income yields for core real estate assets are relatively less attractive.
- Core real estate’s return assumption remained unchanged.
- Global REITs assumption remained unchanged as valuations and yields did not significantly change.

Source: NCREIF and FactSet (2024). Data as of September 30, 2023.

Private Equity

Private Equity									
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
Private Equity	10.00%	22.00%	7.86%	9.75%	22.00%	7.61%	-0.25%	--	-0.25%

**Annual Return Differential:
Cambridge US Private Equity Index vs. S&P 500 Index**



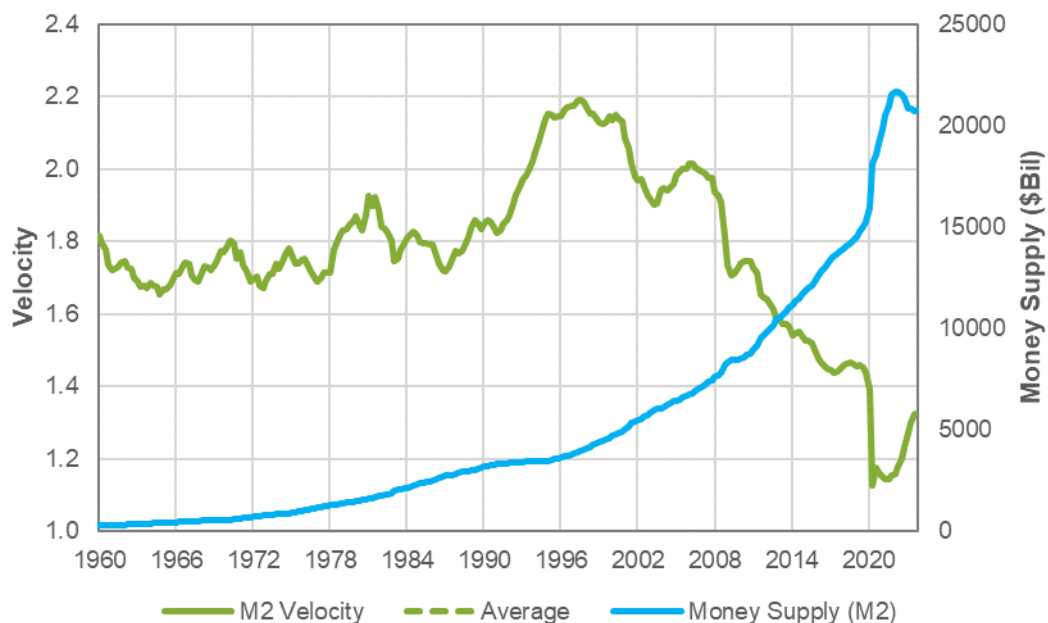
- Our spread assumption remained constant at 225 basis points (geometric) above Large/Mid Cap US Equities.
- This spread differential is similar to the historical spread differential.
- The PE return decrease was due to the decrease in the underlying public market return forecast. The Large/Mid Cap US Equity assumption was decreased by 0.25% diminishing yield and growth expectations as well as valuations.

Source: Cambridge Associates LLC and FactSet (2024). Data as of June 30, 2023. Cambridge index is pooled horizon internal rates of return, net of fees, expenses, and carried interest.

US Inflation & Cash Equivalents

US Inflation & Cash Equivalents									
Asset Class	2023			2024			One Year Adjustment		
	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)	Nominal Return	Risk (StDev)	Nominal Return (Geo.)
US Inflation	2.50%	2.50%	2.47%	2.50%	2.50%	2.47%	--	--	--
Cash Equivalents	2.50%	2.00%	2.48%	2.75%	2.00%	2.73%	+0.25%	--	+0.25%

Supply and Velocity of Money



- The inflation assumption remained constant, balancing between the uncertainty of near-term inflationary pressures and long-term deflationary factors.
- The cash assumption was increased to reflect increased yields.

As of December 29, 2023	5-Year	7-Year	10-Year	20-Year	30-Year
Treasury Yield	3.84%	3.88%	3.88%	4.20%	4.03%
TIPS Yield	1.72%	1.72%	1.72%	1.82%	1.90%
Implied Expected Inflation	2.12%	2.16%	2.16%	2.38%	2.13%

Next Steps



Applying Capital Market Assumptions: Modeling

Next Steps

- We will discuss our assumptions, asset allocation models, and stress testing with MBOI staff in August.
 - This is an iterative process with the ability to model “what if” scenarios if change is considered.
- As with any asset allocation study, it is important to consider the efficiency of current portfolio construction and the impact of possible change as well as implementation considerations.
- A successful asset allocation process does not always result in portfolio construction change; it can result in re-underwriting the current structure if still optimal.

PORTLAND

BOISE

CHICAGO

NEW YORK

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MONTANA

BOARD OF INVESTMENTS

TO: Members of the Board
FROM: Jon Putnam, Chief Investment Officer
John Romasko, Director of Fixed Income
DATE: April 10, 2024
RE: Proposed Old Fund Liability Defeasance Fund

Old Fund Liability Defeasance Fund
New Separately Managed Account

This account will be established under the Governor's Office of Budget and Program Planning and will be funded through the Debt and Liability Free Account. The fund will be expendable with proceeds to pay for the claim costs and expenses of the Old Fund Liability.

A significant portion of the fund is expected to be invested in U.S. Treasury or Agency securities with maturities approximating the projected liabilities of the Old Fund in addition to STIP to provide liquidity and flexibility around uncertain expenditures. The fund may be invested in TFIP if the additional yield from TFIP, over the long term, outweighs its expected volatility.

MONTANA

BOARD OF INVESTMENTS

BOARD ADOPTED POLICY

POLICY NUMBER: 40.953

EFFECTIVE DATE: TBD

TITLE: Old Fund Liability Defeasance Fund
Investment Policy Statement

SUPERSEDES: NEW

BOARD ADOPTION: TBD

REVIEWED: April 10, 2024

I. Introduction

- A. The purpose of this policy is to provide a framework for the Old Fund Liability Defeasance Fund under the guidance of the Board.
- B. All Separately Managed Accounts are governed by the Separately Managed Accounts Investment Policy Statement, Policy 40.900.
- C. The Old Fund Liability Defeasance Fund was established by the Governor's Office to effectively defease the estimated remaining liabilities of the State's Old Fund.
- D. The fund will be funded by a transfer of money from the State Debt and Liability Free Account. Earnings of the fund will be retained by the fund.
- E. The Fund is expendable. Funds in the Account are statutorily appropriated to the Governor's Office.
- F. The Board will have full discretion to manage the Old Fund Liability Defeasance Fund portfolio consistent with this policy. Compliance with the following guidelines for permitted investments and other restrictions is the sole responsibility of the Staff. Any exceptions or compliance violations are to be reported to the Board at the next scheduled quarterly Board meeting.
- G. If at any time, due to market fluctuations or any other circumstances, any of the guidelines are not maintained, Staff will use its best efforts to conform to these limits in a timely manner, while considering current market conditions and the associated costs of rebalancing. At the Board's next regularly scheduled quarterly meeting, the CIO shall inform the Board of any situations where the allocations were outside the limits and either inform the Board of the actions that were taken to return the portfolio back within guidelines or a plan to do so.

II. Purpose

- A. The purpose of this policy statement is to:
 1. Establish the investment objectives and performance standards of the Old Fund Liability Defeasance Fund; and
 2. Provide diversified investment exposure within the guidelines in a prudent and cost-effective manner.

III. Investment Objectives

- A. Strategic - The objective of the Old Fund Liability Defeasance Fund portfolio is to attain above benchmark total return within the parameters of this policy with an emphasis on investment income and preservation of principal.
- B. Performance - Success in achieving this objective will be measured by comparing the risk and return of the fund to the securities owned, weighted proportionately to the portfolio's holdings, over a five (5) year rolling average.

Adopted: TBD

Revised: NEW

Reviewed: April 10, 2024

C. Time Horizon - The Old Fund Liability Defeasance Fund is an expendable account. The Board expects to meet or exceed all objectives over the long-term investment horizon. Over shorter periods, the anticipated market volatility, and specific actions, including risk mitigation efforts by the Board may lead to unfavorable, but expected deviation from these objectives.

IV. Permitted Investments

A. The Old Fund Liability Defeasance Fund may only invest in the following:

1. STIP or any cash vehicle at the Custodial Bank;
2. U.S. Treasury obligations;
3. Direct obligations of the U.S. Agencies;
4. Fully collateralized, interest-bearing Demand Deposit Accounts at Montana domiciled banks and credit unions; or
5. Trust Funds Investment Pool.

B. Direct obligations of U.S. agencies shall consist of only the discount notes, notes, and debentures of the agencies and does not include mortgage pass-through obligations. Coupons may be fixed or floating rate.

NEW

Authority: Montana Constitution, Article VIII, Section 13
Section 2-15-1808, MCA
Section 17-1-113, MCA
Sections 17-6-201 through 17-6-205, MCA
Section 17-6-214
Section 17-7-502
Section 39-71-915
Section 39-71-2320
Section 39-71-2351

Montana Domestic Equities Asset Class Review

Presented by:

Jason Brent, CFA, CAIA, Director of Public Market Investments
Steve Strong, Senior Investment Analyst

Date:

April 10, 2024

Domestic Equities

Contents

- Domestic Equities Asset Class Overview 3
- Investment Vehicle Characteristics 5
- CAPP Asset Class Structure 6
- CAPP Exposure By Investment Vehicle Type 7
- CAPP Exposure By Market Cap 8
- Sources of Tracking Error 9
- Due Diligence & Ongoing Research 10
- Recent Initiatives 11
- Ownership Breakdown & Net Performance 12
- Summary 13

Domestic Equities

- Montana Public Retirement Plans Investment Policy:
 - *Approved Pension Plan Allocation Range of 23%–35%*
 - *Domestic equity securities and derivatives held in separate accounts, commingled funds, limited partnerships, or LLCs*
 - *Exchange-Traded Funds (ETFs)*
 - *Percentage in small cap equities shall not exceed +10% above the benchmark weight in small caps*
 - *Percentage in passive/indexed strategies shall be greater than 45%*
 - *Asset class benchmark is the MSCI USA Investable Market Index*

Domestic Equities

- Montana State Fund
 - *Equity Allocation Range (domestic plus international) of 0%–15%*
 - *Permitted investments:*
 - *Public equity securities and derivatives held in separate accounts, commingled funds, limited partnerships, or LLCs*
 - *Exchange-Traded Funds (ETFs)*
 - *Domestic Equity benchmark is the S&P 500 Index*
- Defined Contribution Retirement Plan Disability Fund (DCRP)
 - *Domestic Equity Allocation Range of 30%–50%*
 - *Permitted investments:*
 - *Passive funds designed to track the broad market index*
 - *Domestic Equity benchmark is the S&P 1500 Index*

Domestic Equities

Investment Vehicle Characteristics

- Separately-managed accounts (SMAs)
 - *Lowest cost option*
 - *Better securities lending arrangement vs. commingled funds*
 - *More frequent data access vs. commingled funds*
- Commingled funds
 - *Cost-effective means to access benefits of scale*
 - *Securities lending revenue split with the manager*
- Exchange-Traded Funds (ETFs)
 - *Investment vehicle that trades like a stock on an exchange*
 - *Quicker access to liquidity than SMAs or commingled funds*

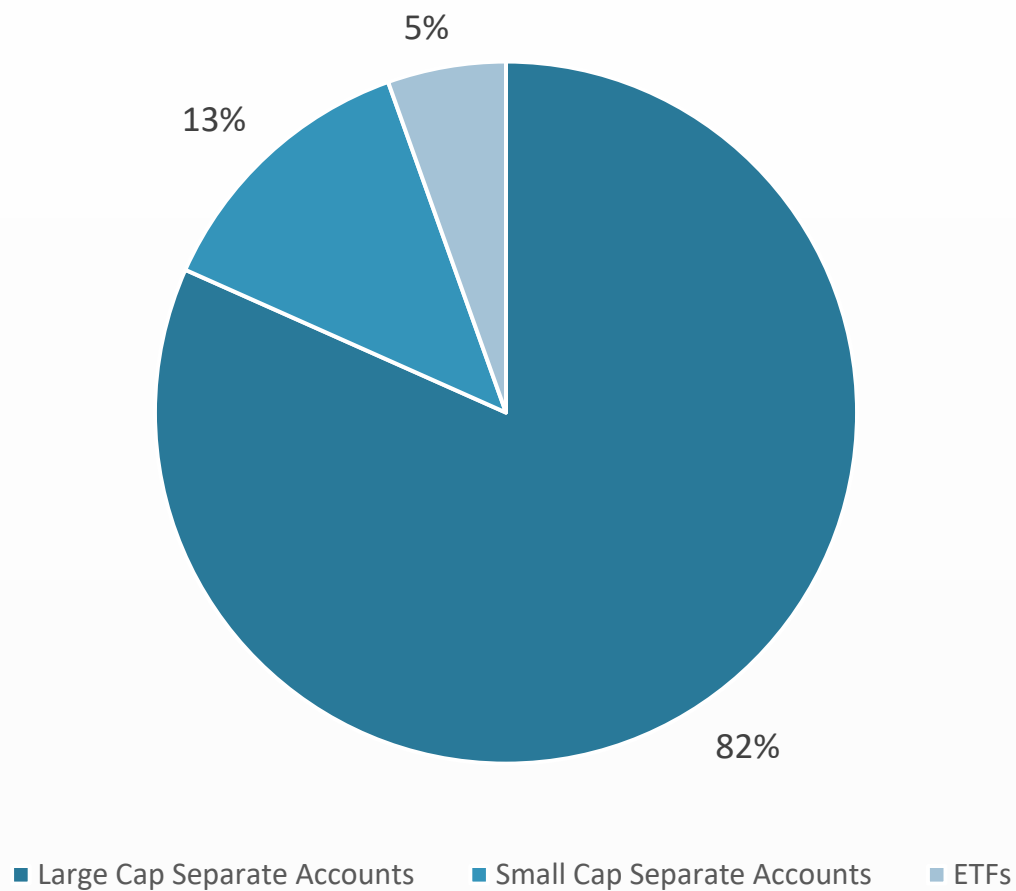
Domestic Equities

CAPP Asset Class Structure

- 100% passive/indexed investments
 - *“Passive”= investment vehicle that aims to track the performance of an index*
 - *Indexes have different rules/methodologies to determine index eligibility*
 - *Indexes are not static*
- Index Funds
 - *Separately-managed accounts (large and small caps)*
- Exchange-Traded Funds (ETFs)
 - *All-cap, large-cap, and small-cap ETFs*

Domestic Equities

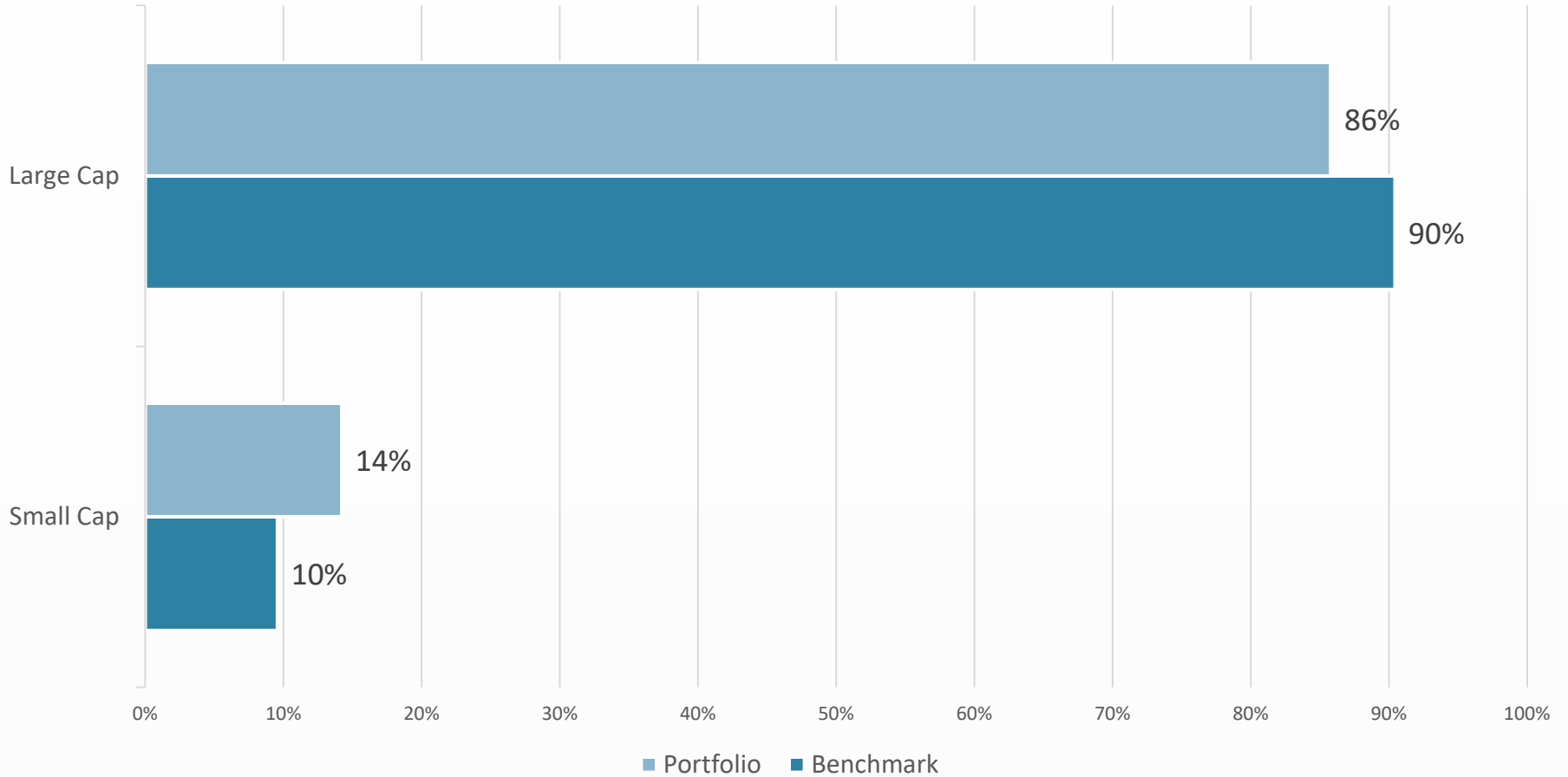
CAPP Exposure By Investment Vehicle Type



As of 12/31/2023

Domestic Equities

CAPP Exposure By Market Cap



As of 12/31/2023

Domestic Equities

Sources of Tracking Error

- Tracking error
 - *Measures the difference between an investment's returns and those of its benchmark*
- Manager tracking error
 - *Management fees*
 - *Securities lending*
 - *Securities litigation*
 - *Securities mis-weights*
- Allocation tracking error
 - *Active risk from over- or underweight to small caps*

Domestic Equities

Due Diligence & Ongoing Research

- Same manager evaluation framework as with active managers
 - *Investment guidelines, manager scorecards, quarterly review process, quantitative analysis, and onsite visits*
- Tools
 - *FactSet*
 - *Bloomberg*
 - *Trading platform puts brokers in competition for ETF trades, ensuring best execution*
 - *eVestment*
 - *Manager online trading platforms*
 - *Facilitates contributions and redemptions from our separately-managed accounts and index funds*

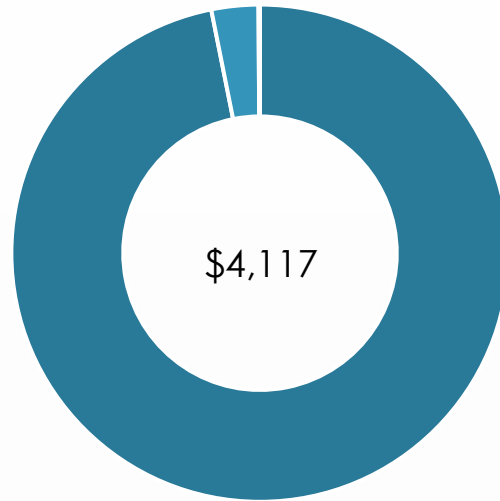
Domestic Equities

Recent Initiatives

- Transitioned small-cap index fund into separate account from a commingled vehicle
- ETFs
 - *Switched large-cap ETF to a lower-cost alternative*
 - *Switched small-cap ETF to a higher-quality, lower-cost alternative*
 - *Added an all-cap ETF*
 - *Implemented ETF trading procedures that put brokers in competition to ensure best execution*

Domestic Equities

Ownership Breakdown & Net Performance



■ Pension ■ State Fund ■ DC Disability

Performance	1 Year	1 Year Benchmark	5 Year	5 Year Benchmark	10 Year	10 Year Benchmark
Pension	25.70%	26.25%	15.25%	15.36%	11.16%	11.71%
State Fund	26.28%	26.29%	15.66%	15.69%	12.03%	12.03%
DC Disability	26.16%	26.06%	15.10%	15.05%	NA	NA

* Dollar values are in \$1,000,000

As of 12/31/2023

Domestic Equities

Summary

- Domestic Equities=100% passive/indexed
 - *Goal is to track the performance of an index*
 - *Several factors contribute to differences in portfolio returns vs. an index (“Tracking Error”)*
 - *100% separately-managed accounts in CAPP*
 - *Different methodologies by different index providers for determining index eligibility*
 - *Indexes aren’t static*
- Large cap vs. small cap exposures
- Due diligence process the same as with active managers
- Recent initiatives

2024 Board of Investments Calendar

JANUARY						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

FEBRUARY						
S	M	T	W	T	F	S
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4	5	6	7	8	9	10
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18	19	20	21	22	23	24
25	26	27	28	29		

MARCH						
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					1	2
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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

APRIL						
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28	29	30				

MAY						
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JUNE						
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23	24	25	26	27	28	29
30						

JULY						
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7	8	9	10	11	12	13
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21	22	23	24	25	26	27
28	29	30	31			

AUGUST						
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25	26	27	28	29	30	31

SEPTEMBER						
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22	23	24	25	26	27	28
29	30					

OCTOBER						
S	M	T	W	T	F	S
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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

NOVEMBER						
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24	25	26	27	28	29	30

DECEMBER						
S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

[Board Materials Due](#)
[Board Packet Mailing](#)
[Board Meeting Dates](#)

BOI WORK AND EDUCATION PLAN

2024

2025 (dates TBD)

February 28-29

Education:

Outreach Efforts for the Board - In-State Loan and INTERCAP Programs
Short Term Investment Pool

Reports:

Ethics Policy
Disaster Recovery and Emergency Preparedness
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Financial Audit Report

April 10

Education:

Domestic Equity Asset Class Review
RVK Annual Capital Market Assumptions

Reports:

Benchmarks Used by the Board

May 22-23

Education:

MT Buildings (Board as Landlord/Tenant Holdings)
Investment Policy Statement Review
Real Estate Asset Class Review

Reports:

Budget Status FYTD
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

HR: Staffing Level Review
HR: Exempt Staff Compensation Review

August 28-29

Education:

Core Fixed Income Asset Class Review
Budget Proposal for FY24-25

Reports:

Proxy Voting
Budget Status Prior FY
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

October 9

Education:

Separate Accounts Investment Review
First Reading - Asset Allocation Range Recommendation

Reports:

CEM, Inc Cost Reporting Analysis

Committee Meetings:

HR: Exempt Staff Performance Review
Audit: SOC I, Type 2 Report

November 20-21

Education:

2025 Legislative Session
Adoption - Asset Allocation Range Approval

Reports:

Policy 217
LPAC
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Annual Report and Financial Statements

February

Education:

Cash Management of State Monies
Custodial Banking Relationship and Continuity

Reports:

Ethics Policy
Disaster Recovery and Emergency Preparedness
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Financial Compliance Audit Report

April

Education:

International Equities Asset Class Review
RVK Annual Capital Market Assumptions

Reports:

Benchmarks Used by the Board

May

Education:

State Government Customer Relationships
Investment Policy Statement Review
Real Assets Asset Class Review

Reports:

Budget Status FYTD
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

HR: Staffing Level Review
HR: Exempt Staff Performance and Compensation Review

August

Education:

Trust Funds Investment Review
Non-Core Fixed Income Asset Class Review

Reports:

Budget Status Prior FY
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

October

Education:

Private Investments Asset Class Review
First Reading - Asset Allocation Range Recommendation

Reports:

Securities Lending

Committee Meetings:

HR: Exempt Staff Performance Review
Audit: SOC I, Type 2 Report

November

Education:

MPERA and TRS Relationship
Adoption - Asset Allocation Range Approval

Reports:

Policy 217
LPAC
Quarterly Reports
In-State Loan Reports
INTERCAP Reports

Committee Meetings:

Audit: Annual Report and Financial Statements

BOI TERMINOLOGY

ACTIVE MANAGEMENT (typically with respect to stocks)

Investment method which involves hiring a manager to research securities and actively make investment decisions to buy and sell securities in an effort to outperform an assigned index, rather than purchasing a portfolio of securities that would simply replicate the index holdings (*'passive'* investing).

ACTUARIAL ASSUMED RATE (pension concept)

The investment return rate used by actuaries that enables them to project the investment growth of retirement system assets into the future (typically perpetual).

ACTUARIAL FUNDING STATUS (pension concept)

A measurement made by actuaries to measure a pension system's financial soundness (ratio of actuarial liabilities to the actuarial value of the assets available to pay the liabilities).

ALPHA (investment term)

Return on an investment portfolio in excess of the market return or benchmark return; generally used in the context of *'active'* management (as passive management, by definition, does not seek excess returns, or *'alpha'*).

ALTERNATIVE INVESTMENTS

A wide range of investments, other than traditional assets such as publicly traded stocks and bonds. The most common nontraditional or alternative investments are private equity, real estate, commodities, and hedge funds.

ARBITRAGE (bond program)

A structural or systematic difference between investment types which may allow profiting from the *'difference,'* i.e., arbitrage. The most common context for the use of *'arbitrage'* at the BOI is the federal law that prevents *'arbitrage,'* i.e., the profiting of investing tax-exempt securities (e.g., INTERCAP) into taxable yields investments (such as U.S. Treasuries).

ASSET ALLOCATION AND ASSET ALLOCATION RANGE (general investment principle)

The Board's invested assets are divided or allocated into various asset classes such as stocks and bonds, each with its own characteristics, with the objective of attaining an optimal mix of risk and return. The total expected return of a portfolio is primarily determined by the mix or allocation to its underlying assets classes. Given the importance of *'asset allocation,'* the BOI Board sets the asset allocation *'range'* for each broad investment type or asset class.

ASSET-BACKED SECURITY

Bonds or notes backed by loan paper or accounts receivable originated by banks, credit card companies, or other providers of credit. Not mortgages.

AVERAGE LIFE (fixed income, particularly bonds)

The average time period the debt is expected to be outstanding. This is typically the maturity date for a traditional bond structure; however, it will be shorter for bonds having a sinking fund or amortizing payment structure.

BANKER'S ACCEPTANCE

A short-term credit investment which is created by a non-financial firm and whose payment is guaranteed by a bank. Often used in importing and exporting, and as a discount money market fund investment.

BARCLAY'S AGGREGATE INDEX (fixed income)

A composite of outstanding bond issues, including corporate, structured, and government bonds whose overall investment features such as return and investment type are tracked over many years. This is the most common benchmark used for comparing the performance of a portfolio that invests in U.S. investment grade fixed income securities. Formerly known as the Lehman Aggregate bond index.

BASIS POINTS (investment jargon)

A basis point is 1/100th of a percentage. Ten basis points is one tenth of a percent, typically written as 10 bps.

BENCHMARK (standard investment concept)

The concept of employing a particular independent or market investment return as a measurement to judge an investment portfolio's return; typically chosen investment benchmarks have the following attributes: they are investible, quantifiable, chosen in advance, easily understandable, and have a long history; common examples are the S & P 500 Index and the Barclay's Aggregate Index.

BETA (investment jargon)

A measure of the risk (or volatility) of a security or a portfolio in comparison to the market as a whole. If the stock or portfolio moves identically to that market, its beta value is 1; if its price volatility (or movement) is greater than that market's price volatility, it is said to have beta greater than 1.

CAP, AS IN LARGE 'CAP' (generally for stocks, e.g., public equities)

'Cap' is short for capitalization, as a reference to the market value of a publicly-traded company. The current stock price times the total shares outstanding of the company equals its market capitalization or market 'cap'; often used contextually such as 'large-cap,' 'mid-cap,' and 'small-cap' for different sized public companies.

CERTIFICATE OF DEPOSIT (CD):

A short-or medium-term, interest-bearing deposit obligation offered by banks and savings and loans. These may include "Yankee CDs" which are CDs issued by foreign banks or their U.S. affiliates in the U.S. which are denominated in U.S. dollars

CLAWBACK (private equity)

A clause in the agreement between the general partner and the limited partners of a private equity fund. The clawback gives limited partners the right to reclaim a portion of distributions to a general partner for profitable investments based on significant losses from later investments in a portfolio which ultimately resulted in the general partner receiving more distributions than it was legally entitled to.

COMMERCIAL PAPER

An unsecured obligation issued by a corporation or bank to finance its short-term credit needs, such as accounts receivable and inventory. Maturities typically range from two (2) to two hundred seventy (270) days. Commercial paper is available in a wide range of denominations, can be either discounted or interest-bearing, and usually a limited or nonexistent secondary market. Commercial paper is usually issued by companies with high credit ratings, meaning that the investment is almost always relatively low risk.

CORE (context varies for equity, fixed income, real estate)

In equity and fixed income, 'core' refers to investments that are generally always found in the portfolio and normally expect to hold for a very long time e.g. 'core' holdings of the largest U.S. companies, or U.S. treasuries; in real estate, 'core' generally refers to the best quality of real estate holdings such as prime commercial property in major metropolitan cities that have low leverage and low levels of vacancy.

CORPORATE NOTE

A type of unsecured debt issued by a corporation that may be longer-term than Commercial Paper, but shorter-term than a typical Corporate Bond.

CORRELATION (common statistical concept)

A measure of how two or more investment values or two asset classes move relative to each other during the same time period. A central concept in portfolio construction is to seek investments whose values do not move *together* at the same time, i.e., are uncorrelated. A correlation of 1 means that two or more investments 'move' precisely together.

CREDIT ENHANCEMENT (bond program)

At BOI, the term generally refers to credit support or a bond or loan guarantee. For example, the Board's INTERCAP bonds are 'enhanced' by the BOI's performance guarantee bringing down the yearly interest rate.

CUSTOM BENCHMARK (or sometimes custom index)

A way to measure investment performance using a tailor-made measurement versus a generic industry-standard benchmark. At the BOI, total pension performance is measured against the Board's 'custom index' or 'custom benchmark' which is a weighted blend of all the underlying asset class benchmarks used to measure the asset class returns.

DERIVATIVES (investment jargon)

Investment securities whose performance itself depends (or is 'derived') from another underlying investment return. Examples include stock options, puts/calls, and forward currency contracts whose returns are based on the underlying stock or currency.

DEVELOPED MARKETS (equity)

Countries having a long period of stable industrialization; or are the most economically developed.

DISCOUNT (fixed income, generally)

Used most often with respect to bonds, the price paid that is less than face (or 'par') value. A \$1 million face-value of a bond purchased for less than a million is bought at a 'discount.' Described as the difference between a bond's current market price and its face or redemption value.

DIVERSIFICATION (standard investment concept)

The concept of spreading risk by putting assets in several investment categories, each having different attributes with respect to type, expected return, risk, and correlation, to best protect against the risk of loss.

DURATION (bonds)

Almost exclusively used when discussing fixed income bonds, a measurement of how sensitive a bond's change in price is to a change in general market interest rates, expressed in years (specifically calculated as a weighted average term to maturity of the bond's cash flows). The greater the duration of a bond, the greater the volatility of price for changes in market interest rates.

EFFICIENCY (usually when discussing various stock markets)

Used to describe markets where it is very difficult to achieve return in excess of that of the overall market from individual stock selection. When information is widely available on a company and its securities are traded regularly the market is considered 'efficient.'

EMERGING MARKETS (most often for public equities)

Certain international securities markets that are typically small, new, have low turnover, and are located in countries where below-average income prevails and is developing in response to the spread of capitalism.

ENHANCED (pertaining to stocks)

Generally linked with 'index' as in enhanced index, an indexed investment management style that has been modified to include the portfolio manager's idea of how to outperform the index by omitting some stocks in the index and overweighting others in a limited manner designed to enhance returns but at minimal risk.

EXCESS RETURNS (standard investment concept)

Returns are 'excess' if they are more than the market or more than the benchmark they are measured against.

EXEMPT STAFF VS. CLASSIFIED STAFF (specific to Montana state government)

"Exempt" refers to the Board's eleven employees who, under state law, do not fall under the state's standard employment rules (the 'classified' staff).

FIDUCIARY (from the Latin verb, fidere, to trust)

The concept of trust and watchfulness; a fiduciary is charged with the responsibility of investing the money wisely for the beneficiary's benefit. Board members are the ultimate 'fiduciaries' for the Board's assets and are obligated to be a good agent.

FTE (state government jargon)

An acronym in state government: "full time equivalent" as in full time employee. The concept is a slot or position, not the actual individuals. The BOI is currently authorized for 32 FTE's.

FUND OF FUNDS (private equity)

A concept used in alternative investments referring to using an investment manager to invest in **other** managers or funds, as opposed to making direct investments in funds.

GAAP/GASB (accounting terminology)

GAAP...Generally Accepted Accounting Principles; Montana state law uses GAAP accounting principles unless specifically allowed otherwise. GASB...Government Accounting Standards Board, the board that sets GAAP standards for U.S. governments (FASB...Financial Accounting Standards Board, the entity for commercial and business accounting standards).

GENERAL OBLIGATION (municipal finance term)

Used to describe the promise that a government makes to bond holders, backed by taxing and further borrowing power, it is generally considered the highest level of commitment to bondholders. At the local government level, general obligation bonds typically require a vote of the residents.

GENERAL PARTNER VS. LIMITED PARTNER (private equity)

In private equity, the general partner is responsible for the operations of the partnership and makes the actual underlying investment decisions; the limited partner is the investor, and therefore has limited liability for investment decisions; the BOI is the 'limited' partner in its private equity fund investments (and real estate funds as well).

GROWTH (as to style public equities)

An investment style that more heavily invests in companies whose earnings are expected to grow at an above average rate to the market. A growth stock usually does not pay a dividend, as the company would prefer to reinvest retained earnings in capital projects to grow the company (vs. 'value,' which considers buying established companies they feel are trading at bargain prices to the fundamental analysis of the company's financial statements and internal competitive factors).

INDENTURE (bond and loan programs)

The central document describing the contract between investors and the borrower or user of the proceeds. The Board's INTERCAP program is structured around a bond indenture.

HEDGE FUND (as defined by Investopedia)

An aggressively managed portfolio of investments that uses advanced investment strategies such as *leverage*, long, short and *derivative* positions in both domestic and international markets with the goal of generating high returns (either in an absolute sense or over a specified market *benchmark*).

HURDLE RATE (private equity)

a minimum return per annum that must be generated for limited partners of a private equity fund before the general partner can begin receiving a percentage of profits from investments.

INDEX (investment concept)

Typically, a single measure of a broadly-based group of investments that can be used to judge or be compared to the return performance of an individual investment or manager.

INDEXING (investment concept)

Typically refers to investing in a portfolio to match a broad range of investments that are set within a pre-determined grouping, such as the S&P 500, so as to match its performance; such investing is generally labeled 'passive' or indexed investing; or buying shares in an Index Fund.

IN-STATE LOAN PROGRAM (Montana-specific)

Programs that are funded by the state's coal severance tax monies.

INTERNAL SERVICE VS. ENTERPRISE FUND (state accounting concept)

Within Montana state government: a program whose funding is dependent on **mandatory participation** by another state government program is labeled an 'internal' service fund; a program whose funding is dependent on voluntary participation is labeled an enterprise fund. At BOI, the investment program is an internal service fund because participation is not voluntary; the Board's bond and loan programs, because their use is voluntary, are accounted for as an enterprise.

INVESTMENT GRADE (bonds)

Bond ratings from Moody's, Standard and Poor's, and Fitch high enough to be considered secure enough for most investors (bonds rated AAA – BBB). Below investment-grade bonds (below BBB) are generally considered to have a more speculative outlook and carry more risk of default.

IRR (private equity)

A measure of investment performance, short for 'internal rate of return,' expressed as a percentage (the 'internal rate of return' number, or discount rate) that mathematically will equalize the total future cash flows of an investment to the initial cash outflow of the investment, the concept accounts for the time value of money.

LEVERAGE (investment concept)

As an investment concept, a way to increase a return on an investment through a combination of one's own money and by borrowing additional money to enhance such an investment; high 'leverage' is also associated with high risk.

LINK DEPOSIT

The Link Deposit program can provide a financial institution a long-term fixed rate funding source "linked" to a specific loan. The State of Montana provides the financial institution funding in the form of a deposit through the Montana Board of Investments using coal tax funds.

MASTER LIMITED PARTNERSHIP

An investment structure that combines the tax benefits of a limited partnership with the liquidity of a common stock. While an MLP has a partnership structure, it issues shares that trade on an exchange like common stock. MLPs are often broadly associated with energy companies operating in midstream services.

MEAN VARIANCE OPTIMIZATION MODEL ('Modern Portfolio Theory')

A theory that it is possible to construct a portfolio to maximize the return for the least amount of risk or volatility. This theory is based on various asset types and their level of expected return, risk (volatility) and their correlation with each other or how the asset values move with each other. The central idea of the model is to blend investments so that in total, they provide both the best expected return and optimal amount of diversification to minimize deep performance swings (volatility); a central tenant is that long term historical returns are indicative of future returns.

MEZZANINE FINANCE (private equity)

Subordinated debt with an equity 'kicker' or ability to share in the equity value of the company. It is typically lower quality because it is generally subordinated to debt provided by senior lenders such as banks, thus is considered higher risk.

MULTIPLE (as in "multiple" of invested capital, private equity)

The ratio of total cash returned over the life of the investment plus the investment's residual value over the total cash expended in making the investment. A multiple of 2 means, regardless of the total investment time period, that total cash returned was twice the cash invested.

130/30 STRATEGY (public equities)

Also called 'partial long short,' this strategy involves the establishment of a short position in select stocks while taking the proceeds of those shorts and buying additional long positions in stocks. The net effect is an overall market position that is 100% long, but the active decisions on individual stock selections are amplified by this ability to short. If the stock selections are successful, the strategy enables the portfolio to profit more than if a stock had simply not been owned, as with traditional long-only portfolios.

OPPORTUNISTIC (real estate)

In real estate, a euphemism for the most risky real estate investments, typically distressed, raw land, newly developed buildings or other high risk investments in the real estate sector, (versus, 'core,' which are the best quality fully leased commercial properties).

OVERWEIGHT OR UNDERWEIGHT (investment concept)

Generally, the level of holdings of a certain type of investment that is above or below either a benchmark's weight (portion of total investment), or the percentage held of a particular asset class compared to the Board's asset allocation policy weight. Also used to describe an external investment manager's decision to have more (or less) of a particular investment than the percentage or weighting found in the benchmark.

P/E RATIO (equity)

The price of a publicly traded stock divided by its estimated or actual earnings is the price/earnings or P/E ratio. This can also be calculated for a stock index or portfolio of stocks. Over the last 100 years, the S&P 500 has had an overall P/E ratio of about 15, or a total index price of about 15 times the annual earnings of its underlying companies.

PACING STUDY (private equity)

An analysis of the likely timing and amount of the drawdown of committed but yet uninvested monies and the estimated distributions or returns from the funds held in an alternative investment portfolio, generally used to judge the future size of the portfolio and its potential liquidity needs, i.e., cash funding demands.

PAR (fixed income)

The initial principal amount designated by the issuer of the bond, or face value of a bond.

PASSIVE

For investments, generally not materially participating in an investment decision, meaning an investment portfolio whose returns follows that of a broad market index, such as an investable stock index, i.e. the S & P 500.

PASSIVE MANAGEMENT OR PASSIVE INVESTMENT (most often in public equities, but not exclusively)

An investment style where a fund's portfolio mirrors a market index, such as the S&P 500, with limited selection decisions by the manager, resulting in market returns. Passive management is the opposite of active management in which a fund's manager attempts to beat the market with various investment strategies and buy/sell decisions of a portfolio of securities to enhance returns.

PASSIVE WEIGHT (generally equities)

The percentage of a stock held in a particular index portfolio, or percentage of an overall asset class that is held in passive portfolios.

POLICY PORTFOLIO

A fixed-target asset allocation, as opposed to asset allocation ranges, which theoretically allows gauging whether deviations from the target portfolio had a positive or negative impact on overall performance.

PORTABLE ALPHA (public equities)

An investment strategy which involves the active selection of securities while neutralizing overall beta or market risk. This often involves the use of derivative investments such as futures to replicate the market return, either taking a short or long position, while then selecting securities which are expected to add return in an absolute sense or in addition to the market return. As an example, this strategy can be found with certain hedge funds where a market exposure is shorted while individual securities such as specific stocks are purchased that are expected to outperform the general market. The concept of portable applies when the ability to generate positive alpha can be overlaid or ported onto a portfolio. This is not a strategy employed by any of MBOI's existing managers.

PREMIUM (fixed income)

Most often the amount paid over the stated face amount (often called 'par') of a bond, but also used in other contexts, typically paying more (the premium) than a market price (as in a take-over bid for a company).

PRIVATE ANNUAL WAGE

The private annual wage is determined annually by the Montana Department of Labor & Industry using the average annual employment divided by the total wages.

PROXY (publicly traded companies)

An agent legally authorized to act on behalf of another party. Shareholders not attending a company's annual meeting may choose to vote their shares by proxy by allowing someone else to cast votes on their behalf, but the word 'proxy' is used more frequently colloquially as a 'close approximation.'

PRUDENT EXPERT, PRUDENT PERSON (a central fiduciary concept)

These legal terms have long histories of court-determined standards of care, deriving originally under English common law. The BOI is empowered to operate under the 'prudent expert rule,' which states that the Board shall manage a portfolio:

- a) *with the care, skill, prudence, and diligence, under the circumstances then prevailing, that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims;*
- b) *diversify the holdings of each fund within the unified investment program to minimize the risk of loss and to maximize the rate of return unless, under the circumstances, it is clearly prudent not to do so; and*
- c) *discharge the duties solely in the interest of and for the benefit of the funds forming the unified investment program.*

At an 'expert' level; there is more room for accepting risk under the prudent expert rule than the prudent person rule.

REBALANCING (general investment term)

The process of realigning the weightings of the portfolio of assets. Rebalancing involves periodically buying or selling assets in the portfolio to maintain the original desired level of asset allocation and/or to stay within predetermined asset category range; it is part of a disciplined investment approach within modern portfolio theory.

REPURCHASE AGREEMENT

A contract in which the seller of securities, such as Treasury Bills, agrees to buy them back at a specified time and price. May also be called "Repo" or "Buyback." Typically used as a short-term form of collateralized borrowing by a bank or securities dealer.

RESOLUTION (government term)

Generally, a formal and written action by a governmental (or corporate) body that has long term significance and requiring a vote of the governing body. BOI uses 'resolutions' generally only for its most significant and long term actions and/or policies.

REVERSE REPURCHASE AGREEMENT

A purchase of securities with an agreement to resell them at a higher price at a specific future date. The investor essentially borrows money and allows its securities to be held as collateral. Reverse Repurchase Agreements occur most often in government securities or other securities that are highly valued and thus considered a good form of collateral.

SECURITIES LENDING (general investment)

Investments that are temporally borrowed by other investors for a fee; the BOI allows most of its publicly traded investments to be loaned for additional marginal income.

STANDARD DEVIATION (common statistical concept)

A specific statistic that measures the dispersion of returns from the mean over a specific time period to determine the "historical volatility" of returns for a stock, or portfolio, or asset class; more specifically a single unit (i.e., one standard deviation) of dispersion that accounts for approximately 66% of all data around a mean using a 'normal' (or 'uniform' or 'bell-shaped' curve; as opposed to a skewed or asymmetrical) distribution. The standard deviation is used as a gauge for the amount of expected future volatility.

SABHRS (accounting jargon)

Montana state government's State Accounting, Budgeting and Human Resource System; the State's central information management system. BOI investment and other financial data must tie and be reported on this system, which is the official book of record and includes the state's financial statements.

STYLE DRIFT (often in reference to public equity managers, but applicable to other managers, too)

As the name implies, a divergence from an investor's professed investment bias or style or objective.

TRANCHE

A division or portion of a pool or whole; specifically: an issue of bonds derived from a pooling of like obligations (such as securitized mortgage debt) that is differentiated from other issues especially by maturity or rate of return.

TRACKING ERROR (statistical concept in investments)

A measurement of the standard deviation of a portfolio's return versus the return of the benchmark it was attempting to outperform. The concept is often used when discussing investment managers. For example, some styles are expected to have high 'tracking errors,' (e.g., deep 'value' investors who buy companies that may be dogs for years), versus passive managers, whose stock volatility is expected to be very close to their benchmark. Tracking error can either be intentional or unintentional; it can also be regarded as an accepted deviation or contrary to the management agreement. High *unexpected* tracking error is generally a serious concern to be examined and understood.

UNDERWRITER (bond program)

In investments, the agent who buys investments to be resold to the public; at BOI, the investment firms that buy the Board's bonds to be resold to the public.

UNIFIED INVESTMENT PROGRAM (Montana Constitution)

The Program in the State's constitution requiring a central investment program which the legislature has assigned to the BOI.

VALUE (as to style when discussing public equities)

An investment style that focuses on buying established companies that investors believe are undervalued and trading at bargain prices to the fundamental analysis of the company's financial statements and internal competitive factors.

VENTURE CAPITAL (private equity)

A higher-risk/high-return type of investing in startup firms and small businesses with perceived long-term growth potential. Sometimes these are already existing business ventures with limited operating history that need additional management expertise and access to capital. (For start-ups, 'seed capital,' or 'angel investor' are terms differentiating this even higher risk type of investment.)

VOLATILITY (investment jargon)

A statistical measure of the dispersion of returns for a given security or market index. Volatility is typically measured by using the standard deviation of returns from the security or market index. Commonly, the higher the volatility, the riskier the security.

YIELD (general investment, but most often within fixed income)

The amount returned to the investor above the original investment generally expressed as a percentage. Yield can be thought of as the expected return from the combination of interest and price accrual or amortization to maturity (in the case of a bond trading at a discount or premium to par).

YIELD CURVE (fixed income)

A line that plots the prevailing interest rates at a given time for bonds ranging in maturity from as short as three months out to 30 years. When plotted across these various maturities (typically 2, 5, 7, 10 and 30 years), the resultant line is shaped like a curve with generally low interest rates (the yield) for shorter maturities and gradually higher interest rates for longer maturities, because generally investors demand higher interest rates for longer term investments. The yield curve for U.S. Treasury debt is the most common when referring to the prevailing level of interest rates.

MONTANA BOARD OF INVESTMENTS

ACRONYM INDEX

ACH.....	Automated Clearing House
ADV.....	Uniform Application for Investment Adviser Registration and Report by Exempt Reporting Advisor
AUM.....	Assets Under Management
ADR.....	American Depository Receipts
AOF.....	All Other Funds
ARC.....	Actuarially Required Contribution
BOI.....	Board of Investments
CAPP.....	Consolidated Asset Pension Pool
CFA.....	Chartered Financial Analyst
EM.....	Emerging Market
FOIA.....	Freedom of Information Act
FWP.....	Fish Wildlife and Parks
FX.....	Foreign Exchange
IPS.....	Investment Policy Statement
IRP.....	Intermediary Relending Program
LDI.....	Liability-Driven Investing
MBOH.....	Montana Board of Housing
MBOI.....	Montana Board of Investments
MDEP.....	Montana Domestic Equity Pool
MLP.....	Master Limited Partnership
MFFA.....	Montana Facility Finance Authority
MPEP.....	Montana Private Equity Pool
MPT.....	Modern Portfolio Theory
MSTA.....	Montana Science and Technology Alliance
MTIP.....	Montana International Pool

MTRP Montana Real Estate Pool

MTSBA Montana School Boards Association

MVO Mean-Variance Optimization

NAV Net Asset Value

PERS Public Employees' Retirement System

PFL Partnership Focus List

QZAB Qualified Zone Academy Bonds

QSCB Qualified School Construction Bonds

RFBP Retirement Funds Bond Pool

RFP Request for Proposal

SABHRS Statewide Accounting Budgeting and Human Resource System

SLQT Securities Lending Quality Trust

SOC1 Service Organization Controls 1 (Audit)

SSBCI State Small Business Credit Initiative

STIP Short Term Investment Pool

TFBP Trust Funds Bond Pool

TFIP Trust Funds Investment Pool

TIF Tax Increment Financing

TIFD Tax Increment Financing District

TRS Teachers' Retirement System

TUCS Trust Universe Comparison Service

UIP Unified Investment Program

VIX Volatility Index

ASSET CLASS ACRONYMS

DEPAC	Domestic Equity Pension Asset Class
IEPAC	International Equity Pension Asset Class
PEPAC	Private Equity Pension Asset Class
NRPAC	National Resources Pension Asset Class
REPAC	Real Estate Pension Asset Class
TIPAC	TIPS Pension Asset Class
BFPAC.....	Broad Fixed Income Pension Asset Class
USPAC	UST/AGY Pension Asset Class
IGPAC	Investment Grade Corp Pension Asset Class
MBPAC.....	MBS Pension Asset Class
HYPAC	High Yield Pension Asset Class
DSPAC	Diversified Strategies Pension Asset Class
CPAC.....	Cash Pension Asset Class