

Investment Committee
Monday, October 23, 2023, 9:00 a.m.

Virtual Only

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AGENDA

- I. **CALL TO ORDER AND ACCEPTANCE OF AGENDA - *(Committee Action)***
 - II. **ACCEPTANCE OF MINUTES (September 8, 2023) - *(Committee Action)***
 - III. **PUBLIC MARKETS FUNDS MANAGEMENT (60 minutes) - *(Information)*** - Mr. Chin, Mr. Posch, Mr. Dukart
- (Break)
- IV. **INTERNAL DIRECT INVESTMENT STRATEGY INTRO (60 minutes) - *(Information)*** – Mr. Anderson
 - V. **PRIVATE MARKETS POOL HARMONIZATION¹ (30 minutes) – *(Committee Action)*** - Mr. Moss, Mr. Zietlow
 - VI. **DISCUSSION**
 - VII. **ADJOURNMENT**

¹ Executive Session pursuant to N.D.C.C. 44-04-19.2, and 44-04-18.4 (1), and 44-04-19.1 to discuss confidential commercial information and contract negotiating strategy.

**STATE INVESTMENT BOARD
INVESTMENT COMMITTEE MEETING
MINUTES OF THE
September 8, 2023, MEETING**

MEMBERS PRESENT: Thomas Beadle, State Treasurer, Chair
Joseph Heringer, Trust Lands Commissioner, Vice Chair
Scott Anderson, CIO
Eric Chin, Deputy CIO
Dr. Prodosh Simlai, External Representative
Dr. Ruilin Tian, External Representative

STAFF PRESENT: Derek Dukart, Investment Officer
Jennifer Ferderer, Fiscal Investment Admin Assistant
Missy Kopp, Executive Assistant
George Moss, Sr. Investment Officer
Jan Murtha, Executive Director
Matt Posch, Sr. Investment Officer
Ryan Skor, CFO/COO
Nitin Vaidya, Chief Risk Officer
Jason Yu, Risk Officer
Lance Zietlow, Sr. Investment Officer

GUESTS: Alexander Browning, Callan
Members of the public

CALL TO ORDER:

Treasurer Beadle called the State Investment Board (SIB) Investment Committee (IC) meeting to order at 9:04 a.m. on Friday, September 8, 2023. The meeting was held virtually.

The following Investment Committee members were present representing a quorum, Mr. Anderson, Treasurer Beadle, Mr. Chin, Commissioner Heringer, Dr. Simlai, and Dr. Tian.

AGENDA:

The agenda was considered for the September 8, 2023, meeting.

IT WAS MOVED BY MR. CHIN AND SECONDED BY DR. RUILIN AND CARRIED BY A VOICE VOTE TO APPROVE THE AGENDA FOR THE SEPTEMBER 8, 2023, MEETING AS DISTRIBUTED.

AYES: COMMISSIONER HERINGER, MR. ANDERSON, MR. CHIN, DR. TIAN DR. SIMLAI, AND TREASURER BEADLE

NAYS: NONE

MOTION CARRIED

MINUTES:

The minutes were considered for the August 11, 2023, meeting.

IT WAS MOVED BY DR. SIMLAI AND SECONDED BY MR. ANDERSON AND CARRIED BY A VOICE VOTE TO APPROVE THE MINUTES FOR THE AUGUST 11, 2023, MEETING AS DISTRIBUTED.

**AYES: DR. SIMLAI, COMMISSIONER HERINGER, MR. CHIN, DR. TIAN MR. ANDERSON,
AND TREASURER BEADLE**

NAYS: NONE

MOTION CARRIED

INVESTMENT PERFORMANCE REVIEW

Mr. Anderson provided information regarding benchmark indices and summary of returns as of August 30, 2023. A discussion of inflation was had regarding whether it has peaked, how the S&P has tracked expectations, the Fitch downgrade, and the impact from credit spreads. The Bloomberg Aggregate bond index is 5%, which is the best guess for future bond return. Information was given on PERS Performance compared to peers over 10 years. PERS has consistently been performing just under the top quartile which illustrates consistent returns over time.

Mr. Anderson reviewed the performance of PERS, TFFR, the Legacy Fund, and WSI breaking down each section to include the ten-year average return, asset allocations, and performance percentages.

Mr. Anderson reviewed the PERS ten-year average returns for the fund, policy, and equities and fixed income, noting a projected benefit of \$854 million. Information was given regarding having a diverse and resilient asset allocation through rebalancing. Mr. Anderson gave information relating to the PERS performance, worth \$3.9 billion, and how the benchmarking with and without the corridor treatment affected performance. PERS performance was compared to peers over a ten-year period and PERS coming in just under the top quartile.

Mr. Anderson reviewed the TFFR ten-year average returns for the fund, policy, and equities and fixed income, noting a projected benefit of \$642 million. Information regarding asset allocation was given: a diverse asset allocation has served well, and more infrastructure may be coming. This would allow the agency to receive more frequent data to help with rebalancing. Information was given on TFFR Performance as of June 30, 2023. Mr. Anderson noted 6.7% year to date and an expected 5-year return of 6.8%. Similar to PERS performance, TFFR performs in the consistently in top or upper middle quartile.

Mr. Anderson gave information on the ten-year average returns for both the fund and the policy, noting good active returns with a projected benefit of \$840 million. A discussion was had regarding legacy asset allocation. It was noted the asset allocation will become more diversified which should produce more return per risk. As of June 30, 2023, the Legacy fund is worth \$9.004 billion with \$487 million distributed as earnings.

Mr. Anderson gave information on the ten-year average returns for the fund, policy, and equities and fixed income, noting a projected benefit of \$485 million and strong active returns. Information was shared regarding the lack of diversification because it is an insurance fund. Information about WSI's performance as of June 30, 2023, the fund is worth \$2.1 million with a 4.0% year to date and an expected 3.4%. Active returns have been strong, and portfolio has met expectations on an asset allocation basis. Mr. Anderson shared that public and domestic equities and domestic fixed have done well and international has been at least median; however, real estate and cash have below median performance, and cash has not had good performance over time. Staff analyzing and will share findings at a later date.

The Committee recessed at 10:36 a.m. and reconvened at 10:47 a.m.

PRIVATE EQUITY COMMITMENT

IT WAS MOVED BY MR. ANDERSON AND SECONDED BY DR. SIMLAI AND CARRIED BY A ROLL CALL VOTE TO ENTER INTO EXECUTIVE SESSION TO DISCUSS CONFIDENTIAL COMMERCIAL INFORMATION AND CONTRACT NEGOTIATING STRATEGY PURSUANT TO NDCC 44-04-18.4(1), 44-04-19.1(9), AND 44-04-19.2.

AYES: COMMISSIONER HERINGER, MR. ANDERSON, DR. SIMLAI, MR. CHIN, DR. TIAN, AND TREASURER BEADLE

NAYS: NONE

MOTION CARRIED

The executive session started at 10:50 a.m. and ended at 11:34 a.m. and was attended by Committee members, Mr. Browning, Mr. Dukart, Ms. Ferderer, Ms. Kopp, Mr. Moss, Ms. Murtha, Mr. Posch, Mr. Skor, Mr. Vaidya, Mr. Yu, and Mr. Zietlow.

PROXY VOTING POLICY

Mr. Chin provided an update on staff's continued work on the proxy process and proxy policies. Staff delegates proxy rights to managers and asks managers to vote proxies for the exclusive benefit of the beneficiaries. Managers have different proxy voting policies and can implement different policies for different clients. Managers typically utilize proxy advisors such as Glass Lewis or ISS who, collectively, control 97% of the proxy advisory market in America. Staff is reviewing the different policy options and may select or customize policies to consistently implement across managers. Mr. Chin reviewed the proxy voting process, the different policy options offered by Glass Lewis and ISS, and the next steps on choosing a policy that best aligns with the needs of North Dakota. Items to be considered when selecting a policy include evaluation of existing policy options to determine if a pre-defined policy or a customized policy best suits the needs of the agency, evaluate the cost of implementation, and consider moving the proxy voting process internal.

DISCUSSION

At the last Investment Committee, Mr. Anderson and his team presented an Investment Operations implementation plan. In today's meeting, Mr. Anderson provided an update stating staff has decided not to do a request for proposal for a consultant, but rather work internally on the implementation plan which will save time and cost.

With no further business to come before the Investment Committee, Treasurer Beadle adjourned the meeting at 12:05 p.m.

Prepared by:

Jennifer Ferderer, Assistant to the Board

AFM PERFORMANCE & STRATEGY UPDATE

AFM Team
October 23, 2023

PUBLIC EQUITY



Retirement & Investment

EQUITY MARKETS – U.S.

Performance of Russell 1000 and Russell 2000

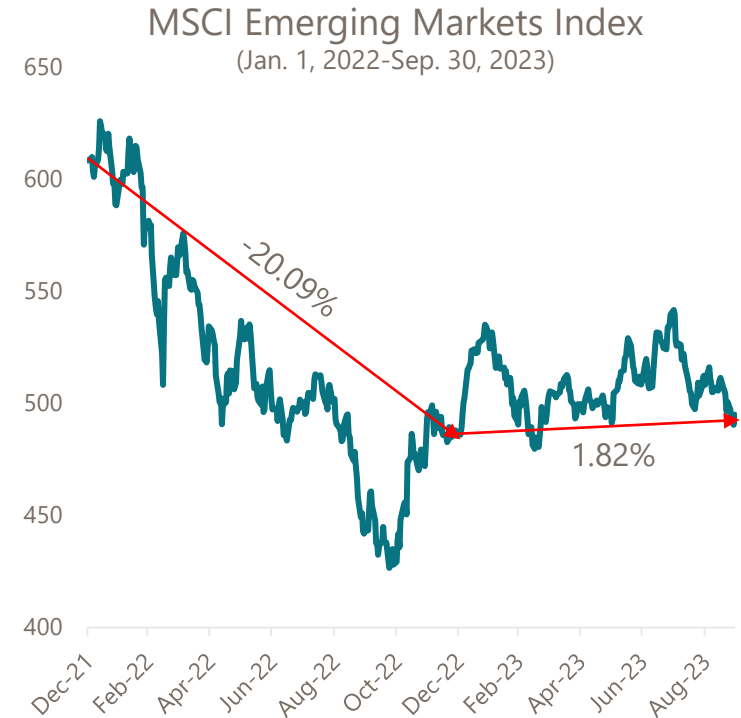
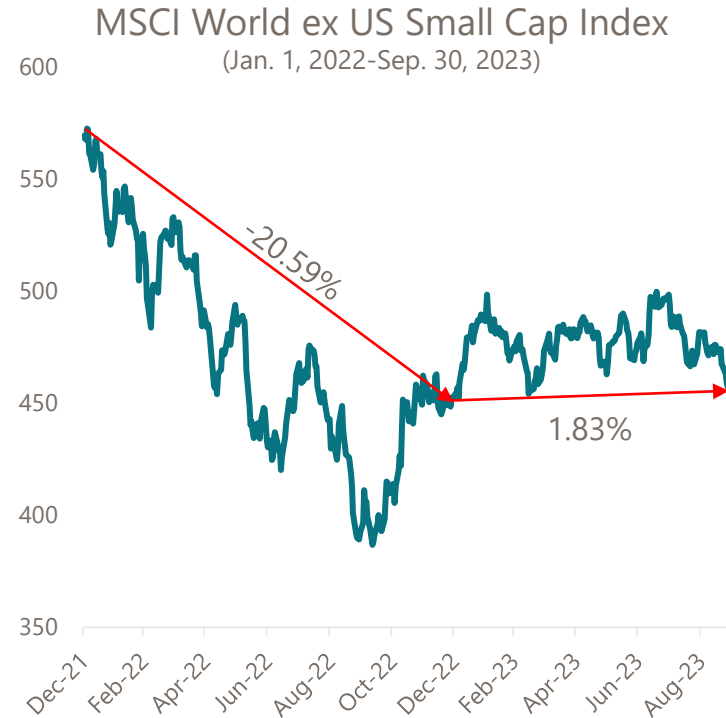
(Jan. 1, 2022-Sep. 30, 2023)



U.S. Markets

- In 2022, the Russell 1000 and Russell 2000 experienced the worst performing year since 2008
- Fed hikes along with rising recessionary concerns drove underperformance
- In 2023 U.S. stocks have rebounded, driven by the strong recovery in large cap stocks
- The recovery in small caps was muted

EQUITY MARKETS – INTERNATIONAL

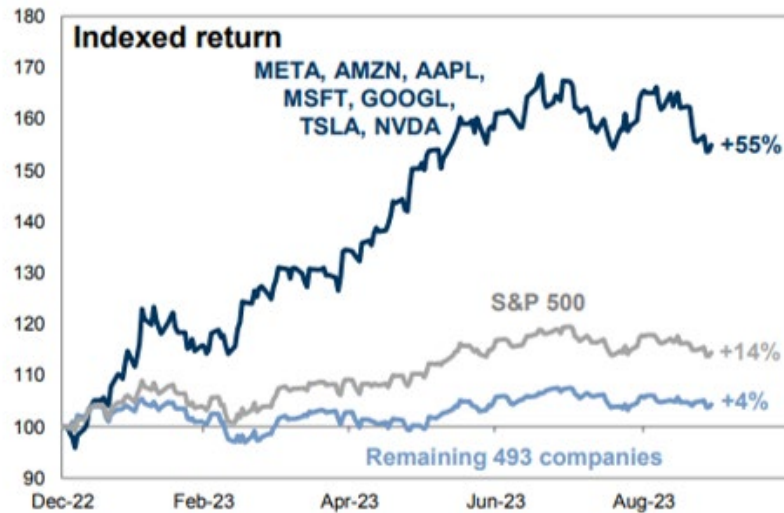


International Equity Markets

- In 2022, international equity markets experienced similar declines
- In 2023, like the U.S., large caps led the rebound
- The recovery in small caps and emerging markets was muted

EQUITY MARKETS – MEGA CAP STOCKS

Exhibit 2: Mega-cap tech has outperformed the remainder of the S&P 500 by 51 pp YTD
as of September 28, 2023



Source: FactSet, Goldman Sachs Global Investment Research

Exhibit 9: Just ~30% of Stocks Have Outperformed the S&P 500 YTD and Only About Half of the Stocks in the Index Are Up on the Year



Source: Compustat, Morgan Stanley Research.

- The U.S. equity market recovery has been driven by mega-cap tech stocks
- The “Magnificent Seven” was up 55% while the rest of the stocks in the S&P in aggregate were up just 4%
- There has been significant dispersion in performance across stocks in the large cap space

EQUITY MANAGER PERFORMANCE

	1 YR PORTFOLIO RETURN	1 YR POLICY RETURN	1 YR ACTIVE RETURN	5 YR PORTFOLIO RETURN	5 YR POLICY RETURN	5 YR ACTIVE RETURN	5 YR TRACKING ERROR	5 YR INFORMATION RATIO
PERS PUBLIC EQUITY	16.97%	16.22%	0.75%	7.95%	7.89%	0.06%	1.39%	0.05
Domestic Equity	19.63%	18.36%	1.27%	11.66%	10.81%	0.85%	2.46%	0.35
Large Cap - Russell 1000	20.49%	19.36%	1.13%	13.28%	11.92%	1.36%	2.17%	0.63
LA Capital Large Cap Growth	25.89%	19.36%	6.53%	15.57%	11.92%	3.65%	5.81%	0.63
LA Capital 60% Large Cap/40% Large Cap Active Extension	20.02%	19.36%	0.65%	12.82%	11.92%	0.89%	1.87%	0.48
NTAM - Quant Enhanced	17.88%	19.36%	-1.48%	10.85%	11.92%	-1.08%	2.79%	-0.39
Parametric/Clifton Group Enhanced	19.20%	19.36%	-0.16%	11.93%	11.92%	0.01%	1.53%	0.00
Small Cap - Russell 2000	15.10%	12.31%	2.79%	5.78%	4.21%	1.57%	6.45%	0.24
Atlanta Capital Small Cap Equity Fund	15.91%	12.31%	3.61%	9.09%	4.21%	4.88%	8.91%	0.55
Riverbridge Small Cap Growth (5 year is since 11/2020)	17.75%	12.31%	5.44%	0.30%	9.40%	-9.10%	12.08%	-0.75
Sycamore Small Cap Value (5 year is since 11/2020)	12.16%	12.31%	-0.14%	14.75%	9.40%	5.35%	9.82%	0.55
International Equity	13.69%	12.47%	1.22%	4.23%	3.38%	0.85%	2.35%	0.36
**Total Intl All Cap - MSCI ACWI ex-US IMI								
William Blair International Leaders	16.97%	12.47%	4.50%	5.62%	3.38%	2.23%	7.82%	0.29
Arrowstreet International Equity (5 year is since 01/2022)	17.26%	12.47%	4.79%	2.71%	-6.09%	8.79%	5.37%	1.64
**Total Dev. Intl Small Cap - MSCI World ex-US Small								
DFA Intl. Small Cap Value Portfolio	15.25%	10.05%	5.20%	2.19%	1.83%	0.36%	5.41%	0.07
Wellington International Small Cap Opportunities	11.62%	10.05%	1.58%	-0.36%	1.83%	-2.19%	4.07%	-0.54
Emerging Markets - MSCI EM	-1.87%	1.75%	-3.62%	1.00%	0.93%	0.06%	3.82%	0.02
Axiom Emerging Markets Equity Fund	-6.07%	1.75%	-7.82%	-0.37%	0.93%	-1.31%	4.66%	-0.28
DFA Emerging Markets Small Cap Portfolio	9.15%	1.75%	7.40%	4.43%	0.93%	3.50%	7.46%	0.47

**Intl All Cap & Small Cap composites are new with no material history
Performance calculated for the period ending June 30, 2023

EQUITY PORTFOLIO CURRENT ALLOCATION

EQUITY PORTFOLIO – CURRENT ALLOCATION

Contribution to Excess Return (Historical)

Total **0.9%**



Investment Name	Weight	Excess Return	Contribution
LA Capital 60% Large Cap/40% L	22.18%	3.2%	0.8%
Arrowstreet International Equi	9.78%	4.7%	0.5%
NTGI ENHANCED INDE-SL	8.56%	3.8%	0.3%
Parametric/Clifton Group Enhan	8.62%	2.1%	0.2%
NTAM R1000 Index	10.97%	1.5%	0.2%
Sycamore Small Cap Value	2.82%	3.6%	0.1%
Atlanta Capital Small Cap Equi	2.87%	1.8%	0.1%
LA Capital Large Cap Growth	1.69%	3.1%	0.1%
DFA Intl. Small Cap Value Port	0.94%	3.0%	0.0%
NTAM R2000 Index	0.66%	0.7%	0.0%
Wellington International Small	0.01%	-5.5%	0.0%
NTAM - MSCI World ex-US Index	2.03%	-1.0%	0.0%
State St MSCI exUS Small	1.42%	-3.6%	0.0%
MSCI Emerging Markets ex China Net Return USD	2.36%	-2.6%	-0.1%
DFA Emerging Markets Core Equity I	3.37%	-3.6%	-0.1%
MSCI China Net Total Return USD	0.99%	-20.8%	-0.2%
State St MSCI World exUS	12.55%	-1.8%	-0.2%
Riverbridge Small Cap Growth	2.83%	-8.8%	-0.2%
William Blair International Le	5.37%	-8.2%	-0.4%

Contribution to Tracking Error (Historical)

Total **1.2%**



Investment Name	Weight	Tracking Error	Contribution
LA Capital 60% Large Cap/40% L	22.18%	4.8%	0.6%
NTGI ENHANCED INDE-SL	8.56%	4.6%	0.2%
NTAM R1000 Index	10.97%	3.9%	0.2%
Parametric/Clifton Group Enhan	8.62%	4.4%	0.1%
Arrowstreet International Equi	9.78%	7.5%	0.1%
State St MSCI World exUS	12.55%	5.6%	0.1%
LA Capital Large Cap Growth	1.69%	4.8%	0.0%
Atlanta Capital Small Cap Equi	2.87%	7.5%	0.0%
Sycamore Small Cap Value	2.82%	9.0%	0.0%
NTAM - MSCI World ex-US Index	2.03%	5.9%	0.0%
William Blair International Le	5.37%	6.7%	0.0%
DFA Intl. Small Cap Value Port	0.94%	8.2%	0.0%
Wellington International Small	0.01%	7.4%	0.0%
MSCI Emerging Markets ex China Net Return USD	2.36%	8.5%	0.0%
State St MSCI exUS Small	1.42%	5.7%	0.0%
DFA Emerging Markets Core Equity I	3.37%	10.6%	0.0%
NTAM R2000 Index	0.66%	9.8%	0.0%
MSCI China Net Total Return USD	0.99%	29.4%	0.0%
Riverbridge Small Cap Growth	2.83%	11.4%	0.1%

Note: Representative portfolio is the PERS Public Equity Portfolio using portfolio weights as of Oct. 1, 2023. The benchmark is the PERS Public Equity Policy Benchmark

EQUITY PORTFOLIO – CURRENT ALLOCATION

Contribution to Information Ratio (Historical)

Total **0.60**



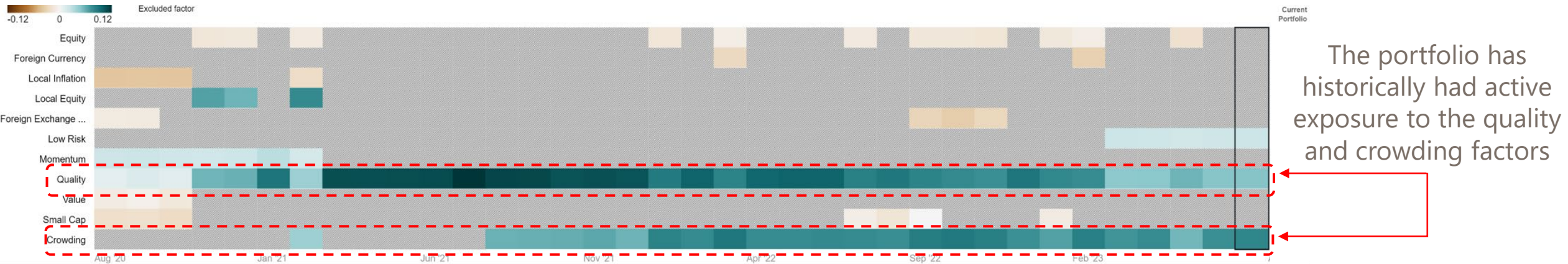
Investment Name	Weight	Information Ratio	Contribution
LA Capital 60% Large Cap/40% L	22.18%	0.61	0.54
Arrowstreet International Equi	9.78%	0.56	0.34
NTGI ENHANCED INDE-SL	8.56%	0.77	0.25
Parametric/Clifton Group Enhan	8.62%	0.48	0.15
NTAM R1000 Index	10.97%	0.39	0.14
Sycamore Small Cap Value	2.82%	0.39	0.08
LA Capital Large Cap Growth	1.69%	0.58	0.04
Atlanta Capital Small Cap Equi	2.87%	0.20	0.04
DFA Intl. Small Cap Value Port	0.94%	0.38	0.02
NTAM R2000 Index	0.66%	0.15	0.01
Wellington International Small	0.01%	-0.64	0.00
NTAM - MSCI World ex-US Index	2.03%	-0.11	-0.01
State St MSCI exUS Small	1.42%	-0.54	-0.04
MSCI Emerging Markets ex China Net Return USD	2.36%	-0.27	-0.05
DFA Emerging Markets Core Equity I	3.37%	-0.32	-0.09
MSCI China Net Total Return USD	0.99%	-0.61	-0.15
State St MSCI World exUS	12.55%	-0.28	-0.16
Riverbridge Small Cap Growth	2.83%	-0.68	-0.18
William Blair International Le	5.37%	-1.09	-0.32

Internal use only
For NDRI

Note: Representative portfolio is the PERS Public Equity Portfolio using portfolio weights as of Oct. 1, 2023. The benchmark is the PERS Public Equity Policy Benchmark

EQUITY PORTFOLIO – FACTOR EXPOSURE

Active Factor Exposure (Factors the portfolio is exposed to over time, 3 year)



The portfolio has historically had active exposure to the quality and crowding factors

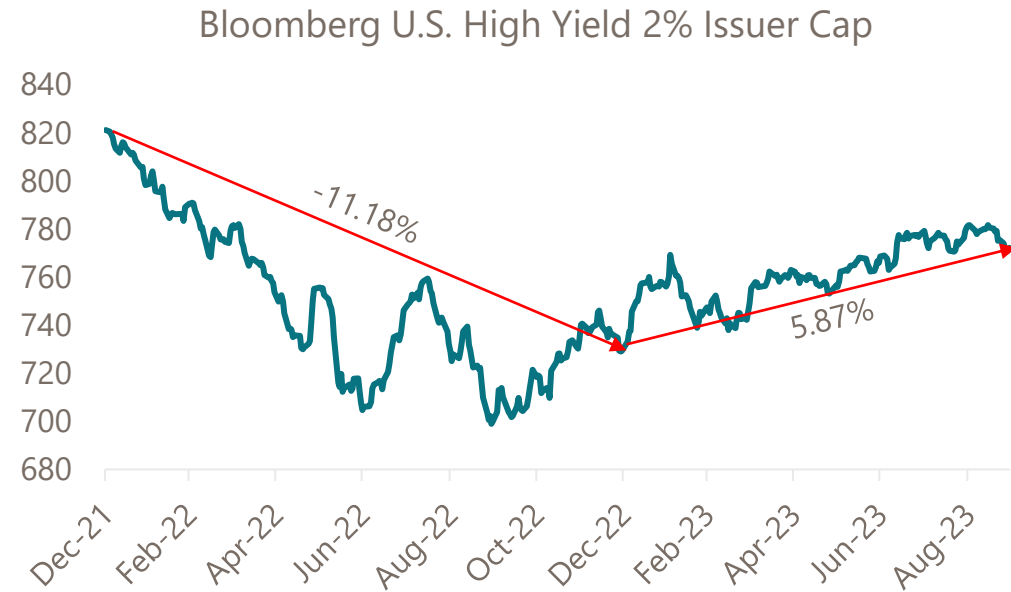
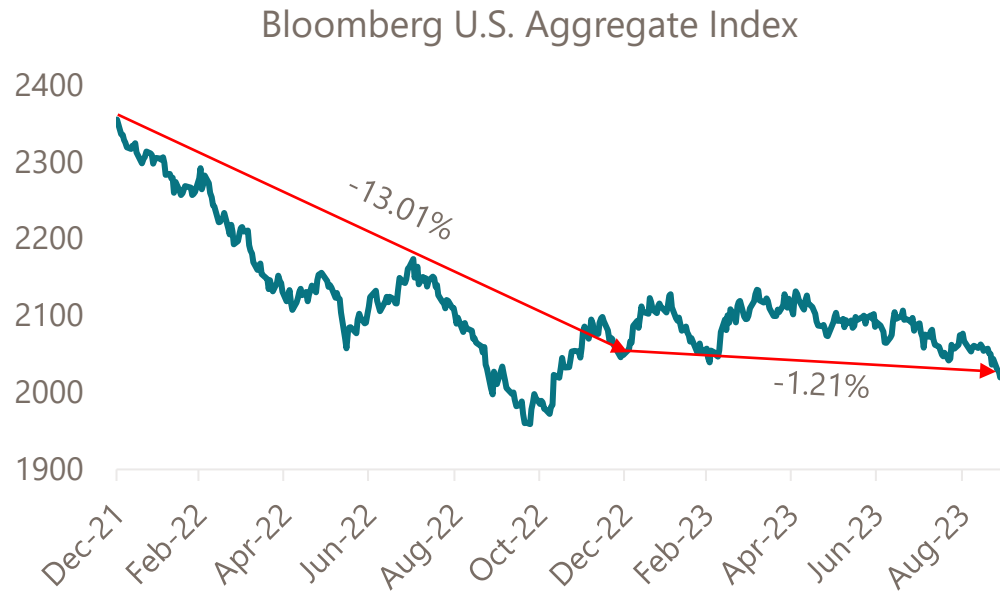
Note: Representative portfolio is the PERS Public Equity Portfolio using portfolio weights as of Oct. 1, 2023. The benchmark is the PERS Public Equity Policy Benchmark

PUBLIC FIXED INCOME



Retirement & Investment

FIXED INCOME MARKETS – U.S.

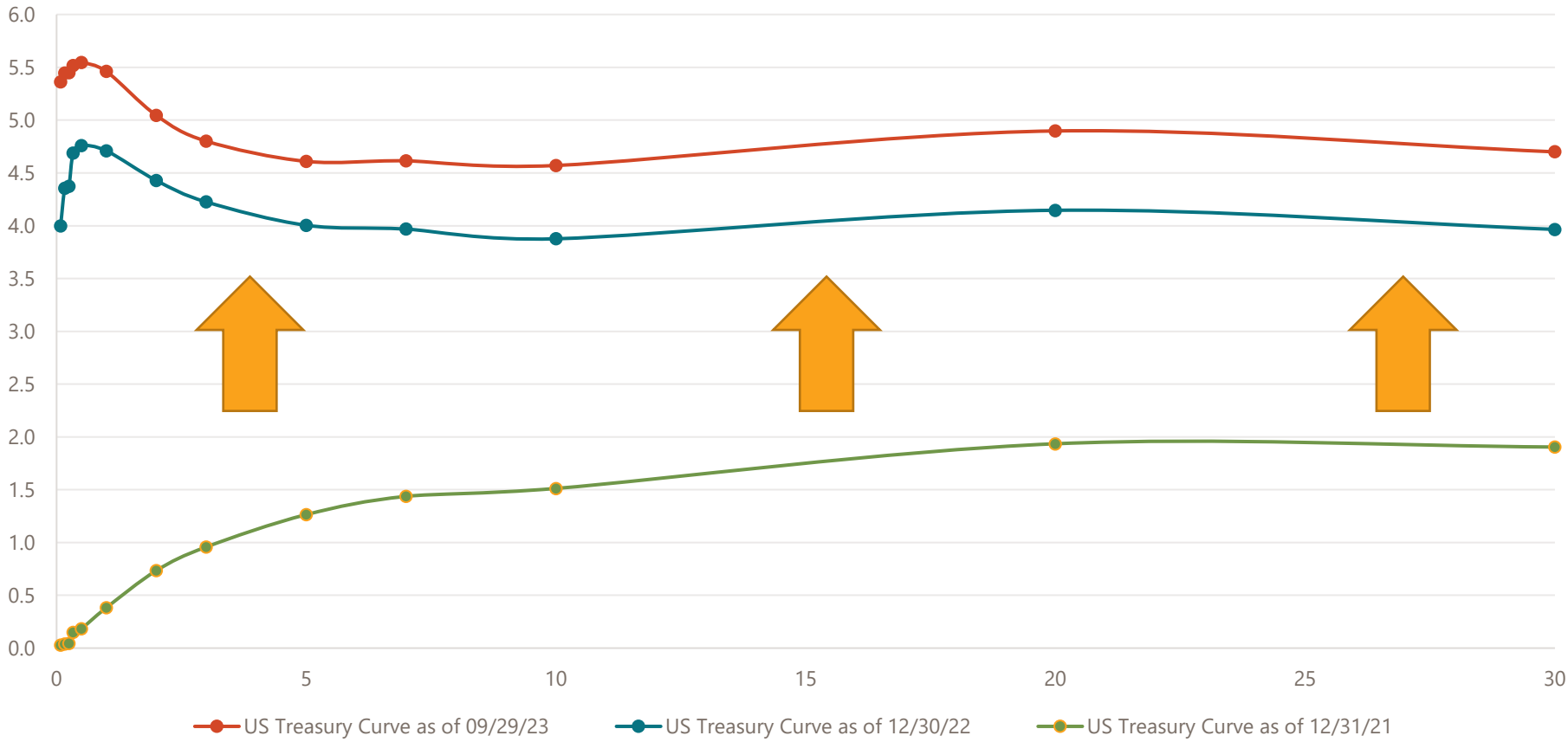


Fixed Income Markets

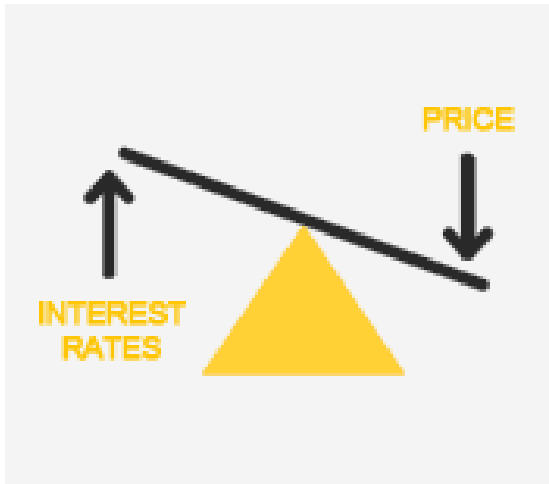
- Like U.S. equities amid the rising rate environment, fixed income markets were challenged
- Both investment grade and high yield experienced double-digit declines in 2022
- Only high yield is generating positive returns in 2023

FIXED INCOME – US TREASURY YIELD CURVE

US Treasury Yield Curve



US Yield curve has shifted up by over 300 bps across the entire curve since Jan. 2022



FIXED INCOME MANAGER PERFORMANCE

	1 YR PORTFOLIO RETURN	1 YR POLICY RETURN	1 YR ACTIVE RETURN	5 YR PORTFOLIO RETURN	5 YR POLICY RETURN	5 YR ACTIVE RETURN	5 YR TRACKING ERROR	5 YR INFORMATION RATIO
PERS FIXED INCOME	1.70%	2.05%	-0.34%	2.61%	1.62%	0.99%	1.77%	0.56
INVESTMENT GRADE FIXED INCOME	-0.74%	-0.94%	0.20%	1.32%	0.77%	0.55%	1.51%	0.36
Bloomberg Aggregate								
PRUDENTIAL CORE FIXED INCOME	-0.06%	-0.94%	0.87%	1.08%	0.77%	0.32%	1.68%	0.19
PIMCO CORE PLUS	-0.57%	-0.94%	0.36%	1.16%	0.77%	0.39%	1.19%	0.33
PIMCO DISCO II	5.07%	-0.94%	6.01%	4.79%	0.77%	4.03%	6.08%	0.66
MANULIFE TOTAL RETURN BOND FUND	1.18%	-0.94%	2.12%	2.41%	0.77%	1.65%	5.61%	0.29
BELOW IG FIXED INCOME	7.36%	9.07%	-1.71%	5.67%	3.34%	2.33%	6.35%	0.37
Bloomberg High Yield 2% Issuer Constrained								
ARES ND CREDIT STRATEGIES	7.65%	9.07%	-1.43%	7.91%	3.34%	4.57%	10.96%	0.42
CERBERUS ND PRIVATE CREDIT FUND	7.76%	9.07%	-1.31%	8.74%	3.34%	5.40%	9.33%	0.58
LOOMIS SAYLES HIGH YIELD	7.42%	9.07%	-1.65%	2.18%	3.34%	-1.16%	1.21%	-0.96
PIMCO BRAVO II (AUM ~ \$2mm)	-35.44%	9.07%	-44.51%	-7.07%	3.34%	-10.41%	20.58%	-0.51
LEGACY FUND FIXED INCOME	1.32%	-0.94%	2.26%	2.08%	0.77%	1.32%	2.24%	0.59
INVESTMENT GRADE FIXED INCOME	1.32%	-0.94%	2.26%	2.08%	0.77%	1.32%	2.24%	0.59
Bloomberg Aggregate								
WESTERN ASSET CORE FIXED INCOME	-0.64%	-0.94%	0.30%	0.80%	0.77%	0.03%	2.36%	0.01
PRUDENTIAL CORE FIXED INCOME (Formerly Core Plus)	-0.06%	-0.94%	0.87%	1.08%	0.77%	0.32%	1.68%	0.19
ALLSPRING US CORPORATE PLUS	2.97%	-0.94%	3.91%	2.98%	0.77%	2.21%	5.86%	0.38

Performance calculated for the period ending June 30, 2023

IG FIXED INCOME PORTFOLIO CURRENT ALLOCATION

IG FIXED INCOME PORTFOLIO – CURRENT ALLOCATION

Contribution to Excess Return (Historical)

Total **0.9%**



Investment Name	Weight	Excess Return	Contribution
Manulife Total Return Bond Fun	9.03%	5.1%	0.5%
PIMCO DISCO II	4.45%	8.0%	0.4%
PIMCO Core Plus Constrained (f	23.03%	0.5%	0.1%
Prudential Core Fixed Income	23.48%	0.4%	0.1%
Allspring US Corporate Plus	3.98%	1.9%	0.1%
State Street Credit Index	2.97%	0.1%	0.0%
State Street Govt Index	9.88%	-0.7%	-0.1%
Western U.S. Core Fixed Income	23.18%	-0.5%	-0.1%

Contribution to Tracking Error (Historical)

Total **1.0%**



Investment Name	Weight	Tracking Error	Contribution
Manulife Total Return Bond Fun	9.03%	4.2%	0.2%
PIMCO Core Plus Constrained (f	23.03%	1.2%	0.2%
Prudential Core Fixed Income	23.48%	1.0%	0.2%
PIMCO DISCO II	4.45%	6.3%	0.1%
Western U.S. Core Fixed Income	23.18%	1.5%	0.1%
Allspring US Corporate Plus	3.98%	3.3%	0.0%
State Street Govt Index	9.88%	1.7%	0.0%
State Street Credit Index	2.97%	2.1%	0.0%

Note: Representative portfolio is the PERS IG Fixed Income Portfolio using portfolio weights as of Oct. 1, 2023. The benchmark is the PERS IG Fixed Income Policy Benchmark

IG FIXED INCOME PORTFOLIO CURRENT ALLOCATION

Contribution to Information Ratio (Historical)

Total **0.94**



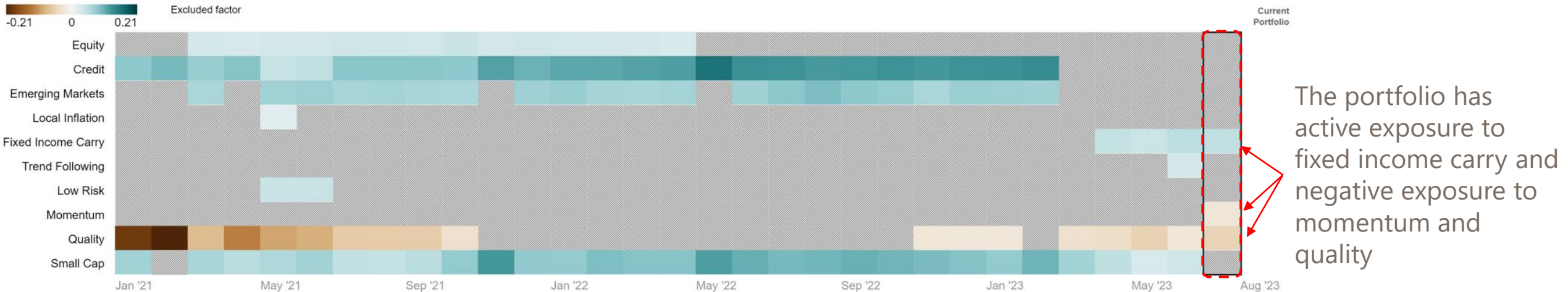
Investment Name	Weight	Information Ratio		Contribution
Manulife Total Return Bond Fun	9.03%	1.21		0.46
PIMCO DISCO II	4.45%	1.26		0.35
PIMCO Core Plus Constrained (f	23.03%	0.40		0.11
Prudential Core Fixed Income	23.48%	0.42		0.09
Allspring US Corporate Plus	3.98%	0.64		0.08
State Street Credit Index	2.97%	0.11		0.01
State Street Govt Index	9.88%	-0.44		-0.07
Western U.S. Core Fixed Income	23.18%	-0.26		-0.09

Internal use only
For NDPIO

Note: Representative portfolio is the PERS IG Fixed Income Portfolio using portfolio weights as of Oct. 1, 2023. The benchmark is the PERS IG Fixed Income Policy Benchmark

IG FIXED INCOME PORTFOLIO – FACTOR EXPOSURE

Active Factor Exposure (Factors the portfolio is exposed to over time, 3 year)



The portfolio has active exposure to fixed income carry and negative exposure to momentum and quality

EQUITY 2.0 UPDATE



Retirement & Investment

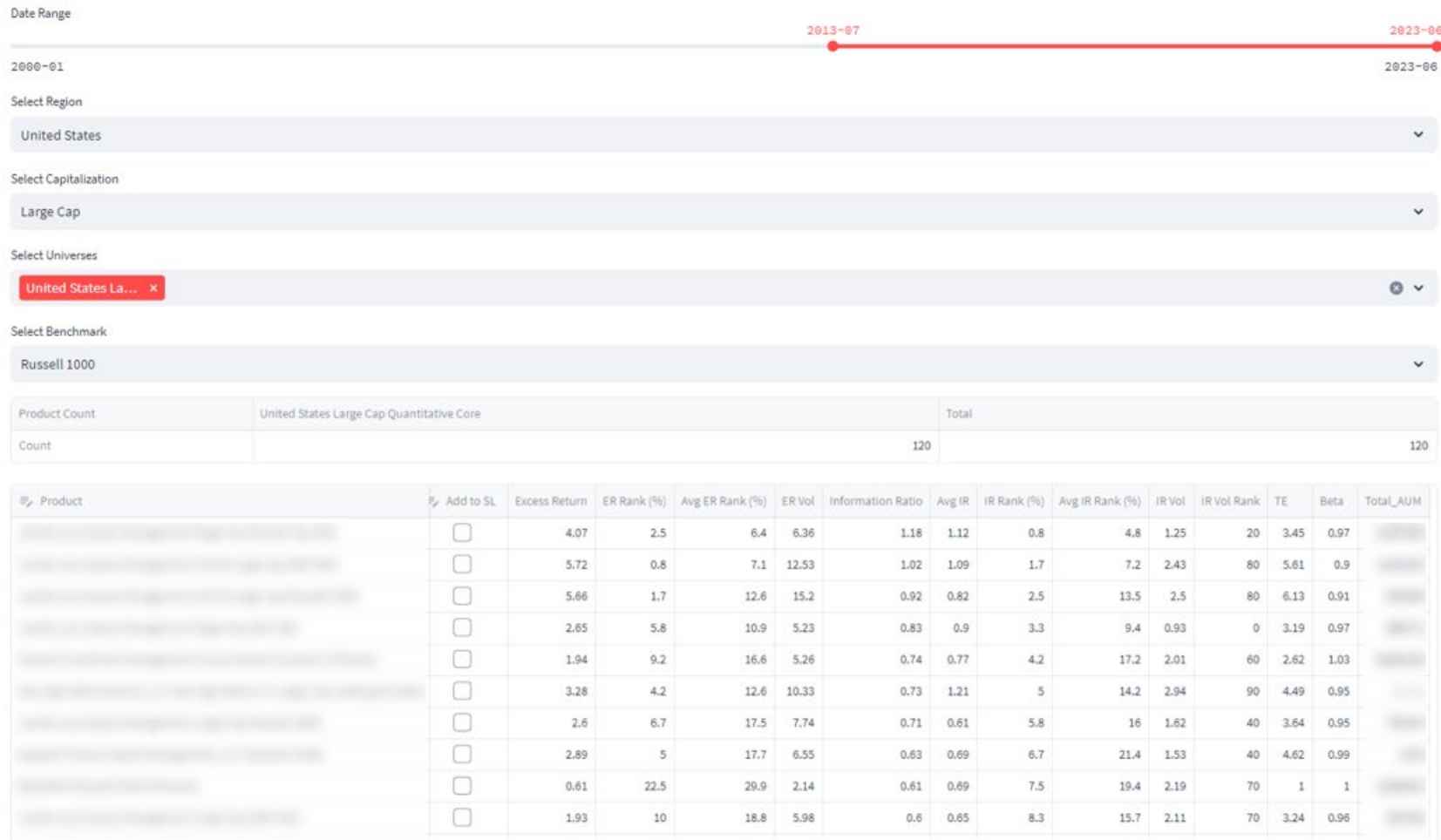
EQUITY 2.0 UPDATE

Overview

- The AFM Team has built and implemented new analytics to screen and evaluate managers
 1. “The Tool” proprietary analytics system to screen and analyze managers
 2. Venn By Two Sigma: returns based portfolio analytics system that employs a factor-based approach to portfolio analysis
- The Team has screened equity managers across strategies, region and sub asset classes
- Created a short list of U.S. candidate managers for preliminary investment review
- Conducting initial due diligence calls with U.S. candidate managers
- Developing optimization tools

EQUITY 2.0 – THE TOOL V1.0

Universe Analysis

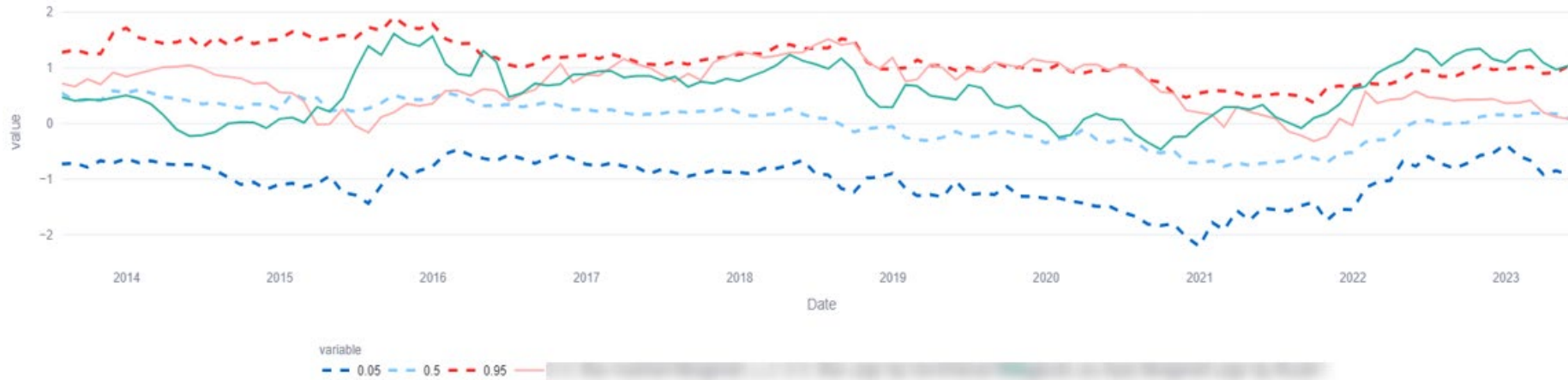


“The Tool”

- Internally built analytics tool
- Invaluable for conducting initial screens on investment managers
- Calculates returns based statistics across multiple time frames
- Can build customized peer groups and strategy groups, which allows for comparison of these groups against an individual manager

EQUITY 2.0 – THE TOOL V1.0

Rolling 3 Year Information Ratio (Russell 1000 vs 10 Year Cohort)



Evaluate how a manager has performed on a rolling basis against the relevant strategy group

Excess Drawdown vs Russell 1000



Evaluate a specific characteristic about a manager's performance

EQUITY 2.0 – THE TOOL: SUB STRATEGY SCREENS

Product	Excess Return	ER Rank (%)	Avg ER Rank (%)	ER Vol	Information Ratio	Avg IR	IR Rank (%)	Avg IR Rank (%)	IR Vol	IR Vol Rank	TE	Beta	Total_AUM	Total_Firm_AUM	Preferred_Benchmark	Current_#_of_Holdings	Active_Share
	2.44	2.9	13.6	2.77	1.39	1.43	0.7	5.5	1.87	70	1.76	1.05			S&P 500		
	1.18	15.8	27.8	1.33	0.99	0.90	1.4	8.8	1.08	20	1.19	0.99			S&P 500	283	0.253
	4.00	0.7	11.4	7.87	0.84	0.75	2.9	16.6	1.68	60	4.79	1.14			S&P 500	30	0.683
	1.27	15.1	34.7	4.87	0.73	0.67	3.6	30.6	3.17	100	1.75	1.01			S&P 500	87	0.5436
	1.30	14.4	31.1	2.05	0.72	0.49	4.7	21.9	1.05	10	1.80	0.98			S&P 500	131	0.4639
	1.54	11.5	25.6	4.08	0.68	0.61	5.8	22.1	1.67	60	2.27	1.01			S&P 500	51	0.6252
	1.31	13.3	26.8	2.91	0.65	0.60	6.5	20.9	1.47	50	2.02	1.02			S&P 500	69	0.6539
	1.83	7.2	22.8	4.88	0.6	0.60	7.9	20.1	1.7	60	3.04	1.01			Russell 1000		
	1.56	10.8	32.2	4.18	0.53	0.38	10.1	31.0	1.49	50	2.95	1.01			S&P 500		0.7041
	1.08	17.3	27.4	3.78	0.52	0.61	11.5	21.8	1.9	70	2.07	0.99			S&P 500	66	0.56
	2.11	5.0	27.6	6.52	0.47	0.35	12.6	29.7	1.15	20	4.46	0.98			S&P 500	28	0.8216
	0.66	25.2	33.2	1.71	0.42	0.48	15.8	22.8	1.01	10	1.56	1.01			Russell 1000	200	0.4573
	2.16	4.3	13.9	4.06	0.86	1.04	2.2	9.8	2.26	90	2.51	0.96			S&P 500	41	0.5992
	0.86	19.8	37.0	2.84	0.72	0.48	4.7	29.8	2.04	80	1.21	1.00			S&P 500	169	0.3537
	0.69	24.1	40.3	2.22	0.63	0.33	7.2	33.9	1.74	60	1.10	1.00			S&P 500	248	0.2724
	2.57	2.2	10.4	5.15	0.57	0.77	8.6	13.0	1.23	30	4.53	1.11			S&P 500	68	0.5677
	1.70	8.6	21.0	4.63	0.53	0.57	10.1	21.1	1.47	40	3.21	0.96			S&P 500		
	1.80	7.9	24.7	5.81	0.53	0.58	10.1	24.4	2.07	80	3.37	1.00			S&P 500	61	0.5494
	2.10	5.8	28.5	6.52	0.47	0.34	12.6	30.5	1.15	20	4.46	0.98			S&P 500		
	2.35	3.6	26.8	6.38	0.45	0.36	13.7	30.8	1.37	40	5.23	1.18			Russell 1000		
	0.88	18.7	32.7	2.7	0.43	0.40	14.7	27.8	1.42	40	2.05	0.97			S&P 500	53	0.628
	1.59	10.1	28.6	4.2	0.43	0.35	14.7	29.6	1.12	20	3.74	1.03			S&P 500	43	0.6404
	1.09	16.5	34.6	9.67	0.34	0.58	16.5	36.0	3.57	100	3.16	0.99			S&P 500	45	0.687549
	1.40	12.2	19.6	4.15	0.3	0.47	17.3	23.2	1.14	20	4.60	0.87			S&P 500	29	0.7464
	1.89	6.5	24.0	12.56	0.29	0.49	18	28.0	2.08	80	6.49	0.98			S&P 500	42	0.6585

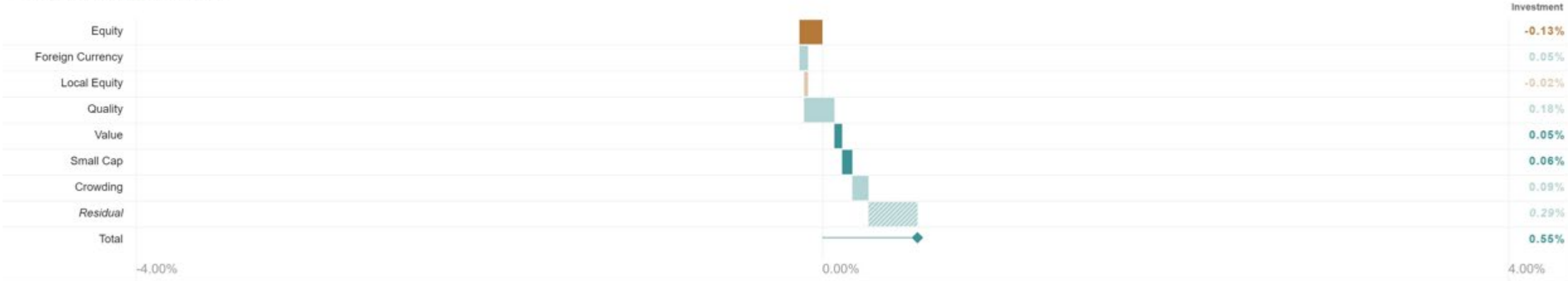
“The Tool” provides comprehensive returns-based statistics and allows the Team to generate exhaustive ranked lists of public managers by strategy and asset class

EQUITY 2.0 – VENN

Active Factor Contributions to Return

What amount of annualized return is driven by each factor?

■ Negative
 ■ Positive
■ Insignificant value
 ■ Residual
 ◆ Total



Two Sigma's factor selection methodology excluded 11 insignificant factors.

Venn provides a lens into the factor exposures of an investment manager

EQUITY 2.0 – VENN

Residual Correlations

Correlations across up to 20 of the largest investments in the selected portfolio or strategy.



Use Residual: ON



7 smaller investments were omitted

Venn calculates excess return correlations and residual correlations between managers

EQUITY 2.0 – NEXT STEPS

Next Steps

1. Continue due diligence on candidate managers in the U.S. and international markets
2. Identify top candidates in each sub strategy and geographic region
3. Develop optimization tools to provide insights into how managers interact with each other in a portfolio
4. Identify optimal mix and weights of managers
5. Propose Equity 2.0 portfolio to Investment Committee
6. Implementation (i.e., contract negotiations, transitions, onboarding)

APPENDIX

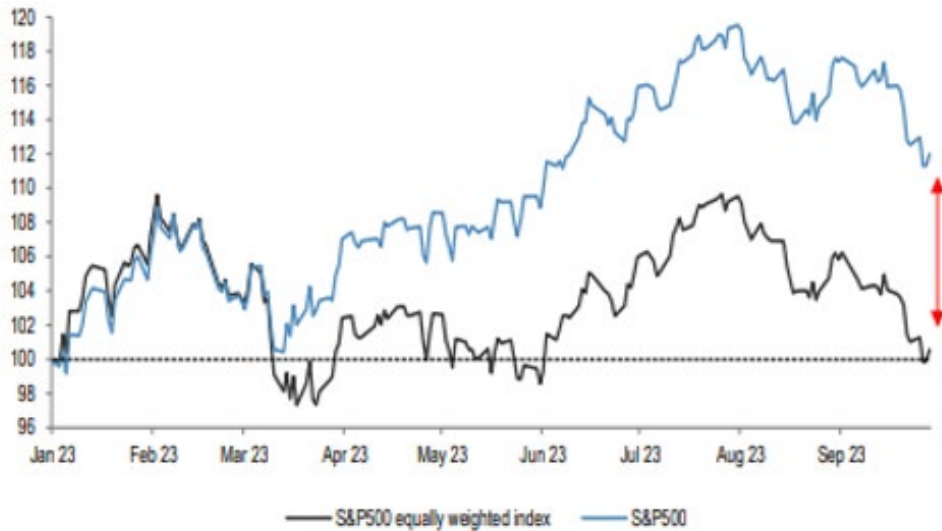
PERFORMANCE – BENCHMARK INDICES

Summary of Returns					
September 30, 2023					
Benchmark Indices					10 Yr
(% change, annualized)	YTD	1 Yr	5 Yr	10 Yr	Volatility
Russell 1000	13.0%	21.2%	9.6%	11.6%	17.9%
Russell 2000	2.5%	8.9%	2.4%	6.6%	22.4%
S&P 500	13.1%	21.6%	9.9%	11.9%	17.7%
MSCI ACWI IMI Net	9.4%	20.2%	6.1%	7.4%	14.2%
MSCI World ex US	6.7%	24.0%	3.4%	3.8%	14.3%
MSCI Emerging Markets	1.8%	11.7%	0.6%	2.1%	15.6%
Bloomberg Aggregate	-1.2%	0.6%	0.1%	1.1%	4.4%
Bloomberg Gov/Credit	-0.9%	0.9%	0.4%	1.3%	4.8%
Bloomberg US High Yield	5.9%	10.3%	3.0%	4.2%	5.1%

Source: Bloomberg

EQUITY MARKETS – LARGER COMPANIES

S&P500 equally weighted index and S&P500



Source: Bloomberg Finance L.P.

Exhibit 7: Equal Weight Vs. Cap Weight Sector Performance Summary

YTD Equal Weight and Cap Weight Sector Performance

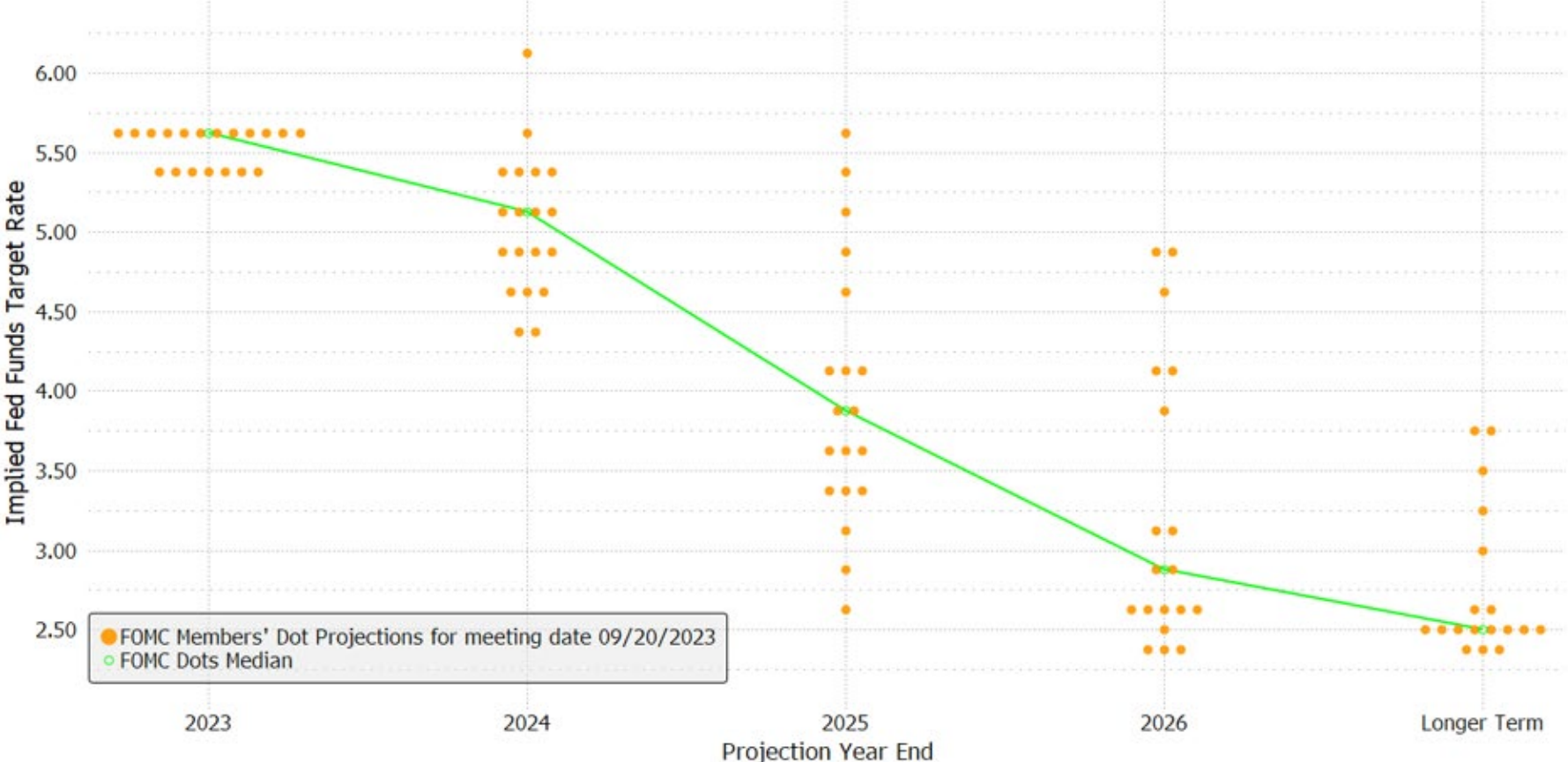
Sector	Equal Weight	Cap Weight	Equal Weight Vs. Cap Weight
Industrials	7.6%	3.6%	3.9%
Energy	4.1%	2.0%	2.2%
Utilities	-8.4%	-10.3%	1.8%
Real Estate	-5.9%	-6.5%	0.6%
Healthcare	-4.5%	-4.3%	-0.2%
Materials	-3.0%	0.9%	-3.8%
Staples	-10.0%	-4.7%	-5.4%
Financials	-8.8%	-1.5%	-7.3%
Tech	15.7%	33.9%	-18.2%
Discretionary	7.0%	26.0%	-19.1%
Comm Services	7.7%	39.4%	-31.8%

Source: Bloomberg, Morgan Stanley Research.

- Larger companies have generally outperformed across sectors
- Notably, larger companies in the Tech and Communication Services sectors significantly outperformed

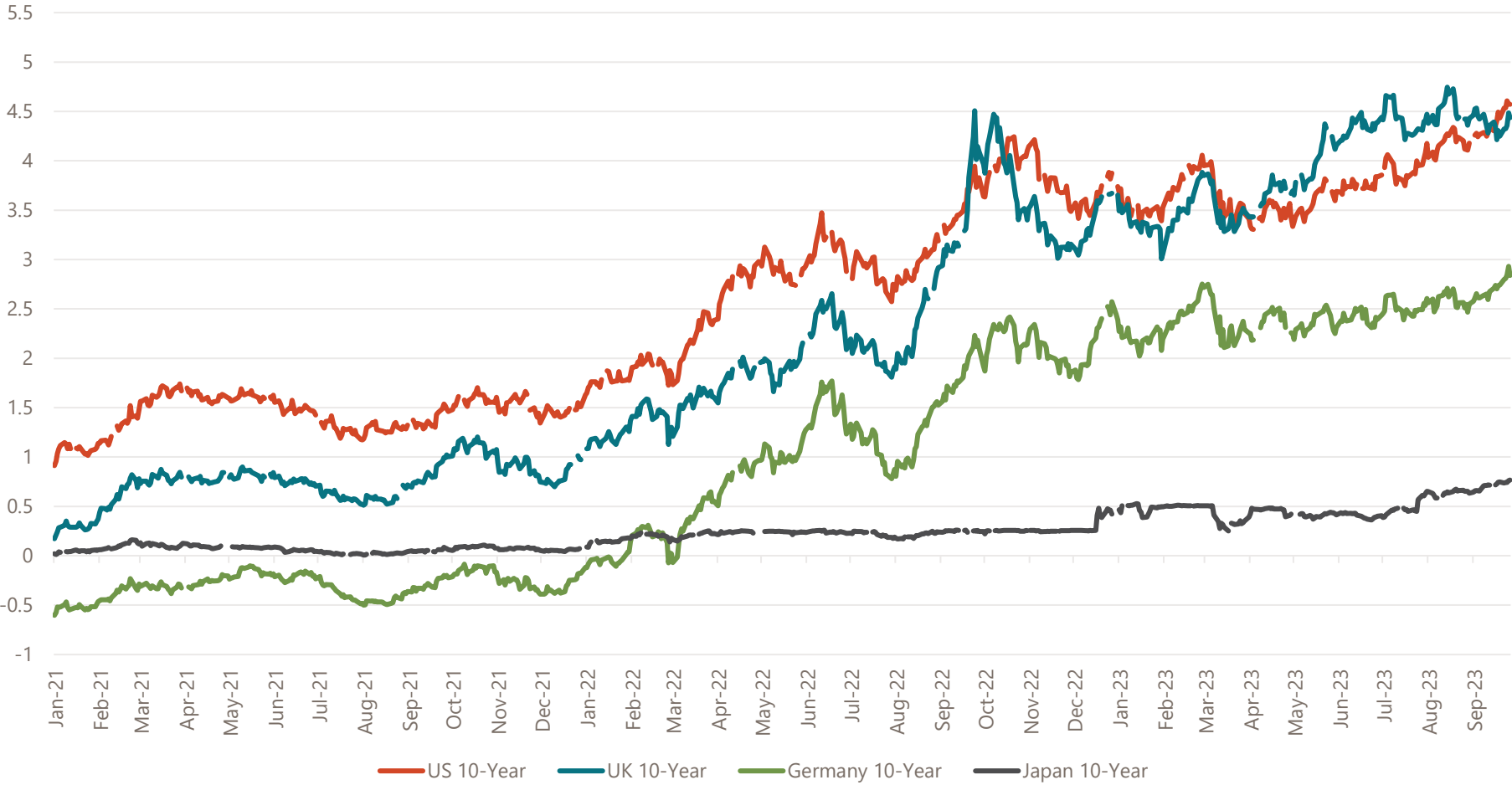
FIXED INCOME – FOMC DOT PLOT

Are Rate Hikes Over?
How Long is Higher for Longer?



FIXED INCOME – YIELDS RISING GLOBALLY

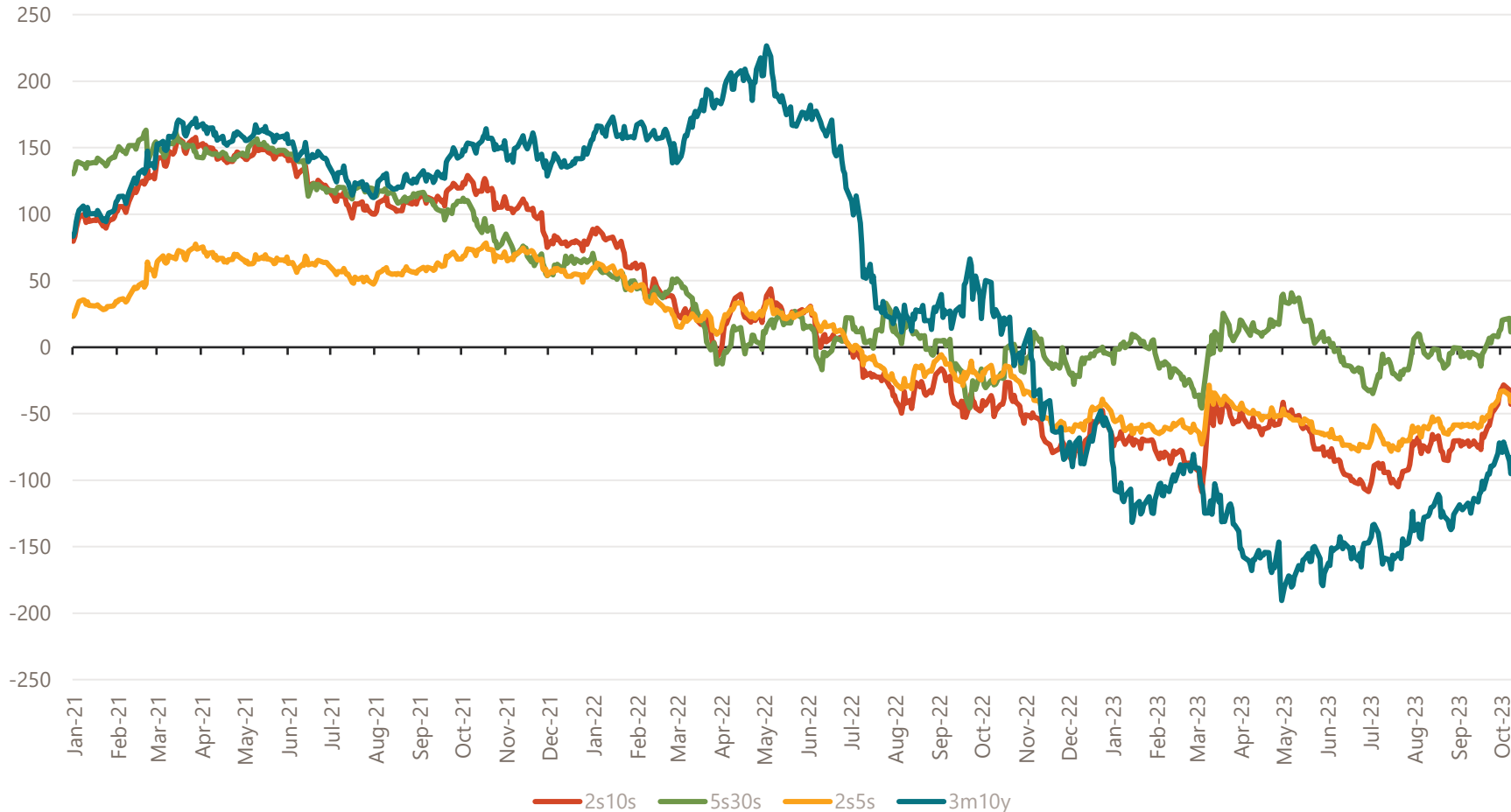
Yields On 10-Year Sovereigns



Yields have been rising across the globe, not just in U.S. markets

FIXED INCOME – US YIELD CURVE INVERSION

U.S. Treasury Spreads (Jan. 2021 through Sept. 2023)



- 2s10s first became negative in April of 2022
- All four yield curves were inverted in October of 2022
- Recently the curve has “bear steepened” (long-end rising, rather than short-end falling)
- Led to record drawdown of long-duration treasuries

INTERNAL DIRECT INVESTMENT STRATEGY

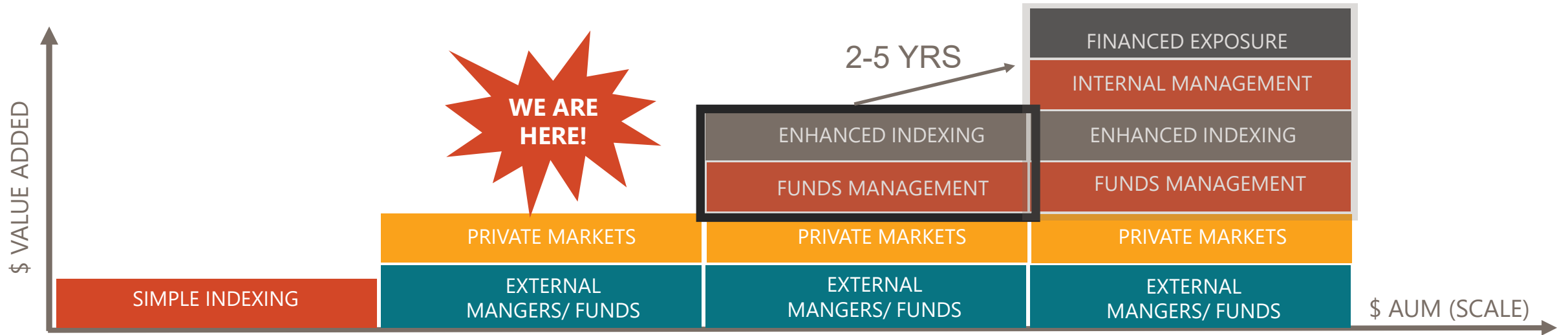
Scott M Anderson, CFA – Chief Investment Officer

October 26, 2023

NORTH
Dakota
Be Legendary.

Retirement & Investment

ENHANCE CAPABILITY TO INCREASE VALUE ADDED



INITIAL OPPORTUNITY SUMMARY

OPPORTUNITY	
ENHANCED INDEXING STRATEGIES	<ul style="list-style-type: none">• Enhanced indexing; multi-asset capability; leverages expertise with index information; same active return for a lower active risk and cost than external managers for simple mandates
ENHANCED LIQUIDITY MANAGEMENT	<ul style="list-style-type: none">• Overlay of cash generates additional return and enables more available cash• Buying and selling of liquidity
ENHANCED REBALANCING	<ul style="list-style-type: none">• Rebalancing of exposures in shorter time frames• Rebalancing thru internal portfolios rather than managers – reducing transaction costs
EXPOSURE MANAGEMENT	<ul style="list-style-type: none">• Separate manager active return from manager policy return to optimize cost and active return• Manage exposures to manage risks and generate returns
OPTIMAL IMPLEMENTATION	<ul style="list-style-type: none">• Choose optimal instrument to implement policy exposures reduces cost, increases revenues, manages risk

OBJECTIVE AND STRATEGY

OBJECTIVE:

- To enhance fund after cost return for risk at a prudent level of risk for the funds in our care.

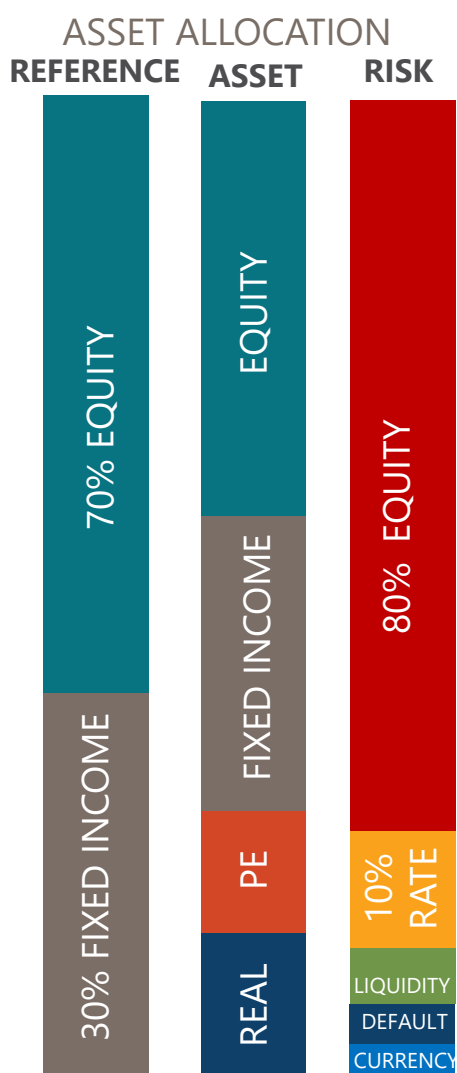
STRATEGY:

- Enable more advanced and effective funds implementation of asset allocation exposures, management of liquidity, and fund operations like rebalancing by directly buying and selling the most effective instruments.
- Achieve a lower cost of implementing less complex investment mandates at a lower risk with internal resources, external rule providers and more custom implementations.
- Bootstrap operational capabilities and skills by incrementally adding internal mandates and partnering with external experts.

WHY?

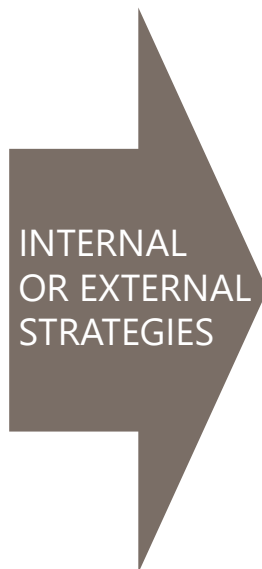
- The internal direct investment capability adds additional information and skills at the security level, complements external manager capabilities, unlocks new strategies, and adds agility to the investment process.

CORE INVESTMENT FRAMEWORK



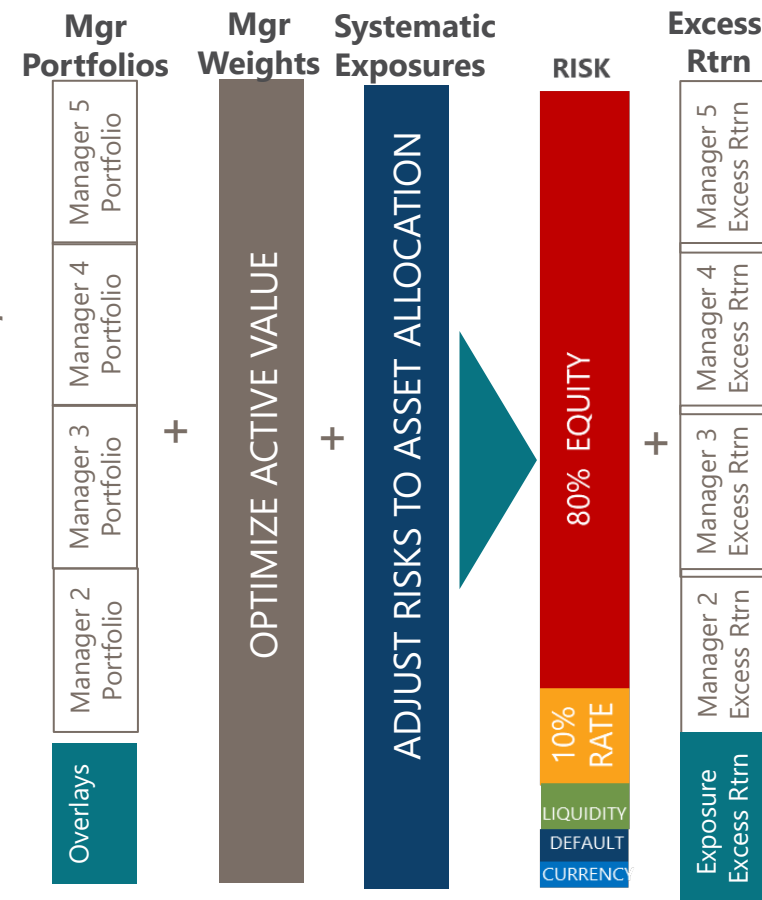
Maintain Fidelity to Asset Allocation Return and Risk Requirements While Enhancing Return Per Risk After Cost At a Prudent Level of Risk

Illustration



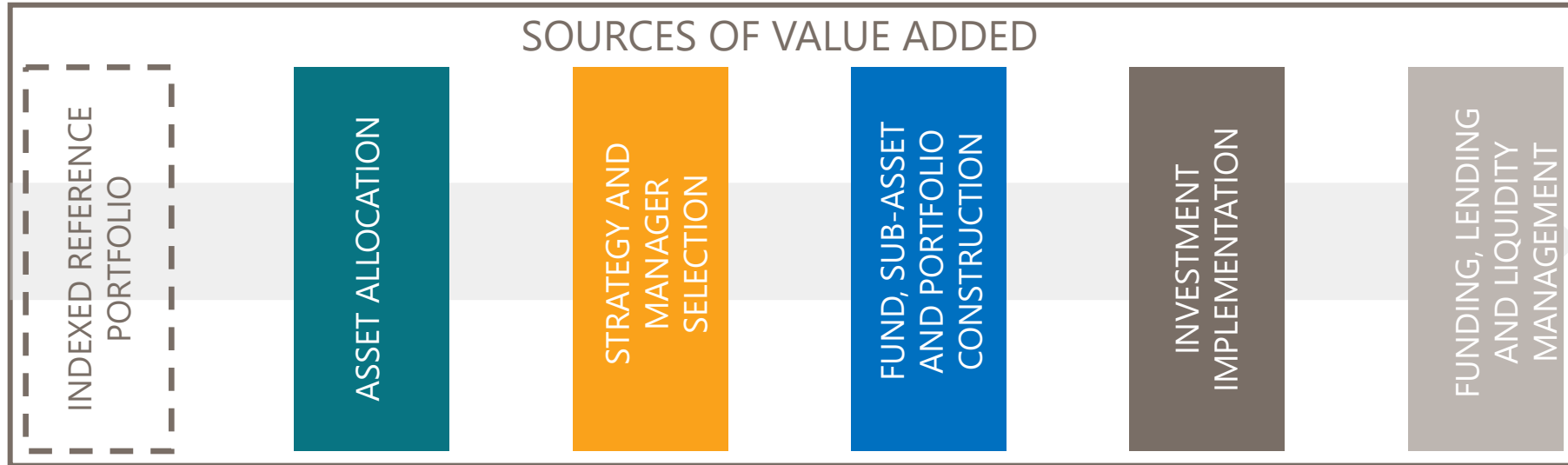
- Find and underwrite the best investment strategies on an active return per risk after cost basis
- Adjust manager weights to optimize total active return per risk after cost
- Adjust fund exposures to achieve targeted asset allocation systematic risks

Applies to internal or external strategies



SOURCES OF VALUE ADDED

Illustration



A minimum efficient allocation of 60% World Index and 40% Domestic Fixed Income

Enable more advanced asset allocations that are risked based and more precise of risks being bought and sold. **Also builds a foundation for more effective asset allocation implementations.**

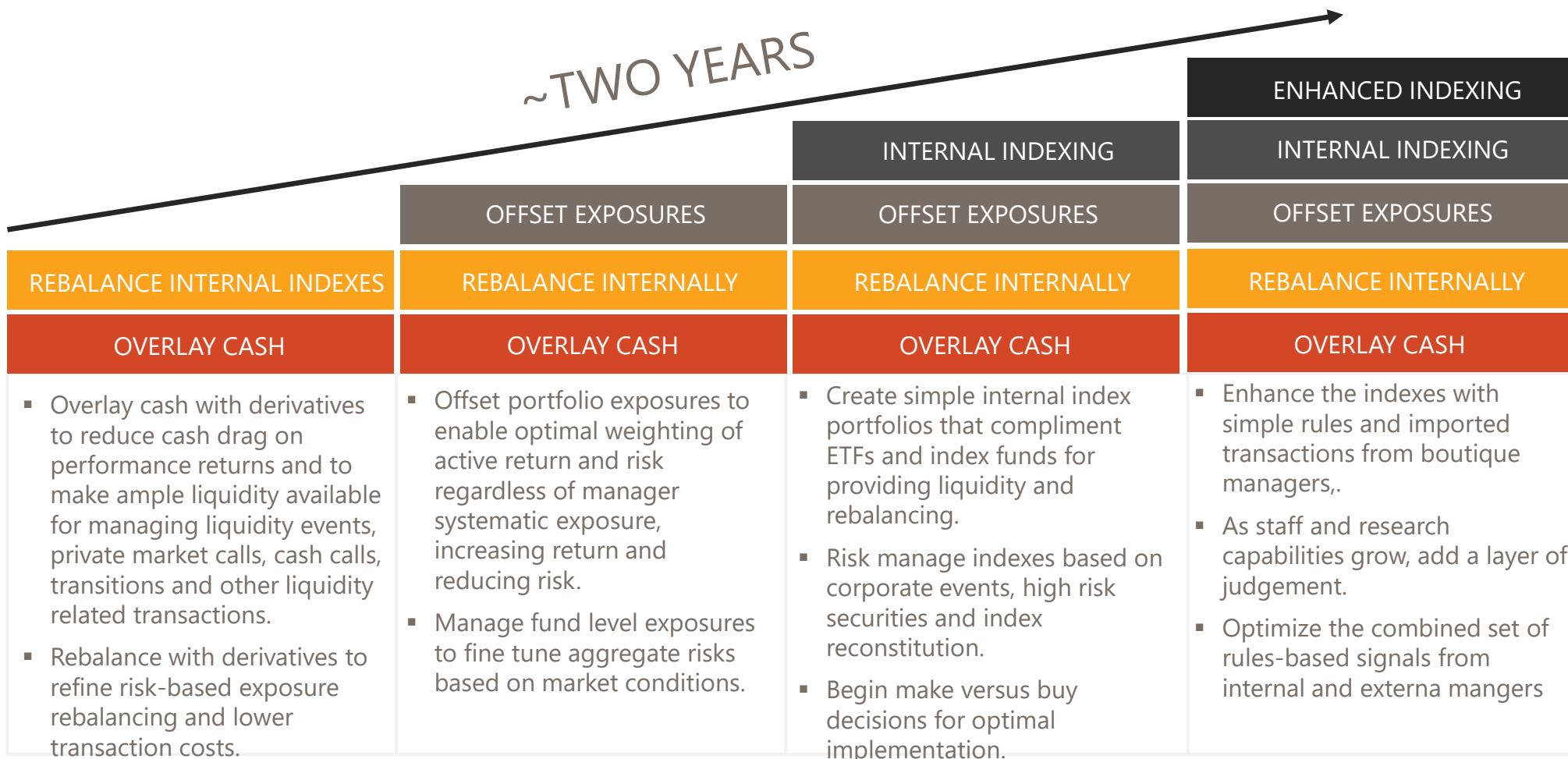
Enables selection of the best managers regardless of systematic risk with a few constraints on time horizon, liquidity risk and implementation cost. **Systematic risks can be adjusted with internal direct portfolios.**

Optimal systematic and idiosyncratic return per risk at an appropriate risk, manage dynamically as an option. **Rebalancing thru indexes and internal portfolios reduces cost, increases agility and enables more dynamic optimization.**

Choose make versus buy and optimize cost of management, fees, incentives, implementation, operations and exposures. **The internal portfolios enable a range of make decisions.**

Find best return and costs for security lending, cash management, transaction finance and liquidity risk management. **An internal capability enables identify the best cost of liquidity and the lowest cost of buying and selling that liquidity.**

SEQUENCE OF CAPABILITY



OVERLAY CASH AND REBALANCE

Public Equity

External Managers
Internal Managers
Index Funds

Public Fixed Income

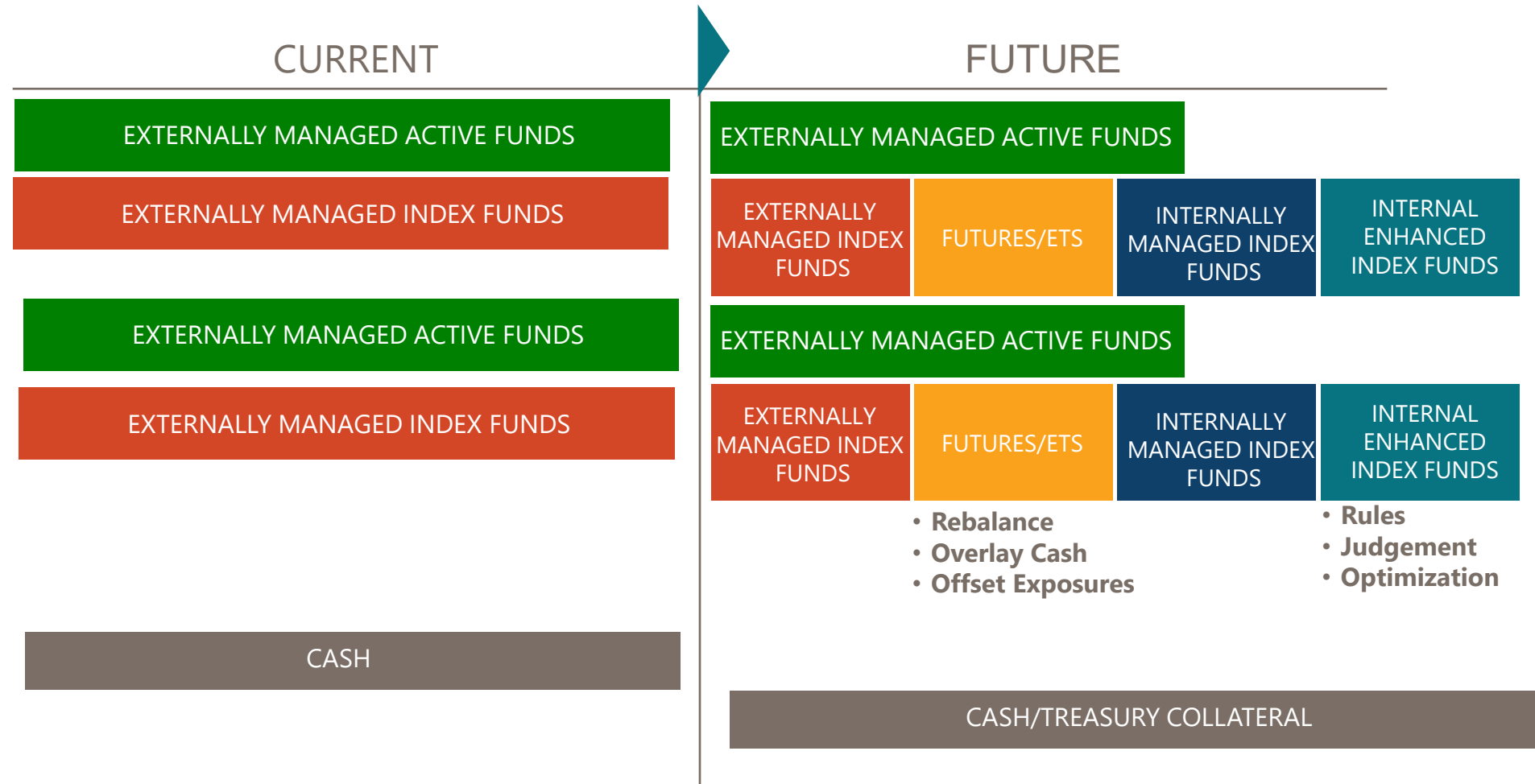
External Managers
Internal Managers
Index Funds

Private Markets

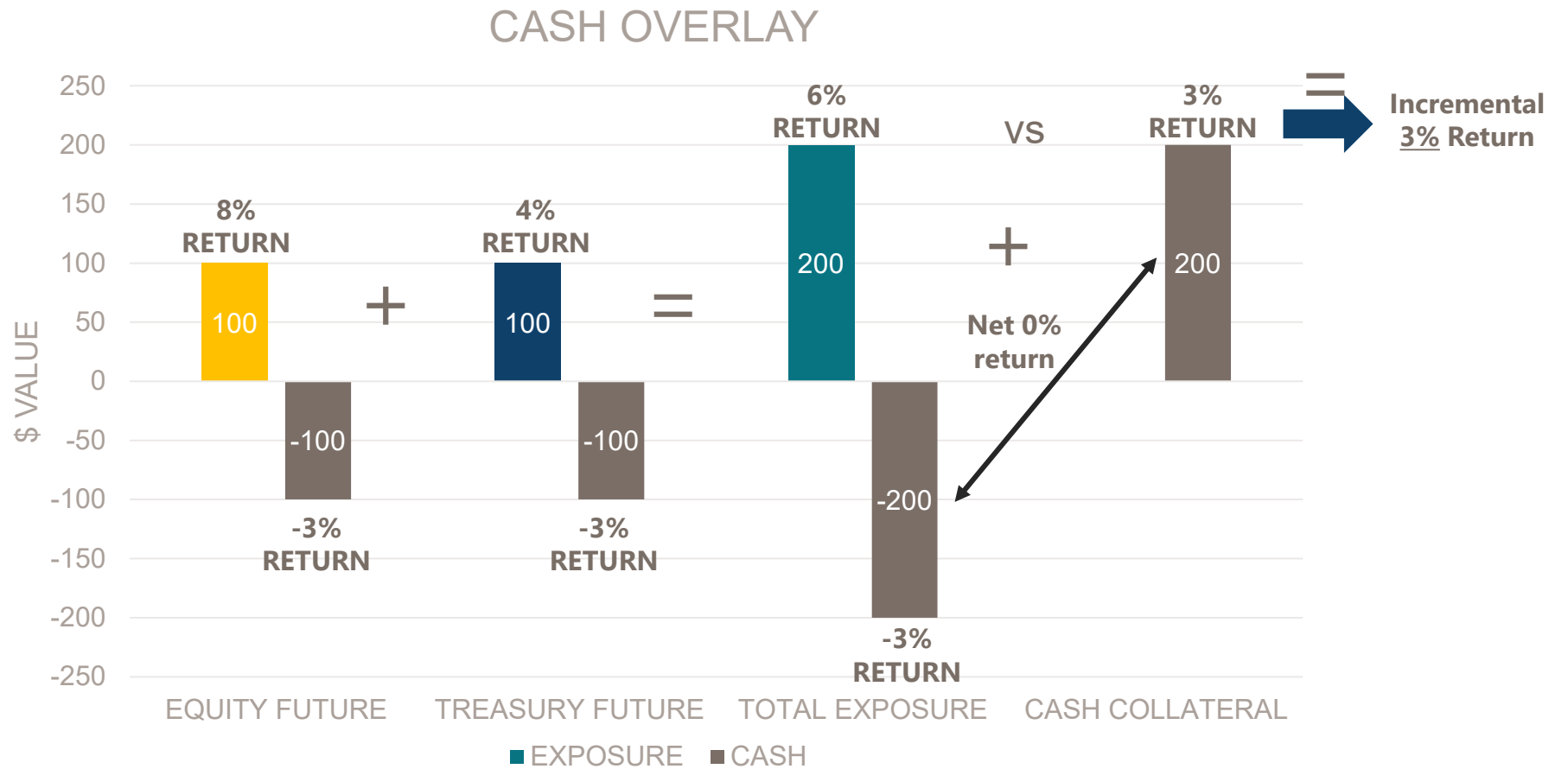
Private Equity
Private Debt
Real Assets

Liquidity Portfolios

Overlay Portfolios



OVERLAY CASH WITH FUTURES



REBALANCE

ILLUSTRATION

RUSSELL 1000 MANAGERS

RUSSELL 1000 FUTURES

MANAGER 2

MANAGER 3

MANAGER 4

RUSSELL 1000 WEIGHTS

RUSSELL 2000 MANAGERS

RUSSELL 2000 FUTURES

MANAGER 2

MANAGER 3

RUSSELL 2000 WEIGHTS

WEIGHTS BEFORE WEIGHTS AFTER

17%	14.0%	
10%	10.0%	
4%	4.0%	
23%	23.0%	
<hr/>		
54	51.0%	=
<hr/>		
3%	6.0%	
1%	1.0%	
2%	2.0%	
<hr/>		
6%	9.0%	=

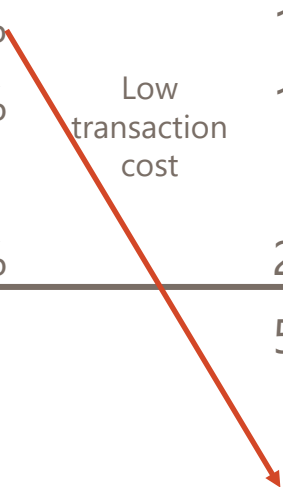
POLICY BENCHMARK WEIGHT

**Sum of manager weights
by sub-asset class equals
sub-asset class weight**

51.0%

9.0%

Low transaction cost



OFFSET EXPOSURES

	WEIGHTS BEFORE	WEIGHTS AFTER	POLICY BENCHMARK WEIGHT
RUSSELL 1000 MANAGERS			
RUSSELL 1000 FUTURES	3.0%	12.0%	
MANAGER 2	4.0%	2.0%	
MANAGER 3	23.0%	19.0%	
MANAGER 4	21.0%	18.0%	
RUSSELL 1000 WEIGHTS	51.0%	51.0%	51.0%
RUSSELL 2000 MANAGERS			
RUSSELL 2000 FUTURES	1.0%	-12.0%	
MANAGER 2	2.0%	10.0%	
MANAGER 3	6.0%	11.0%	
RUSSELL 2000 WEIGHTS	9.0%	9.0%	9.0%



Allocate to the best managers with the best weighting regardless of manager benchmark/asset class universe

Suboptimal manager weights

INTEGRATED INDEX FUND MANAGEMENT

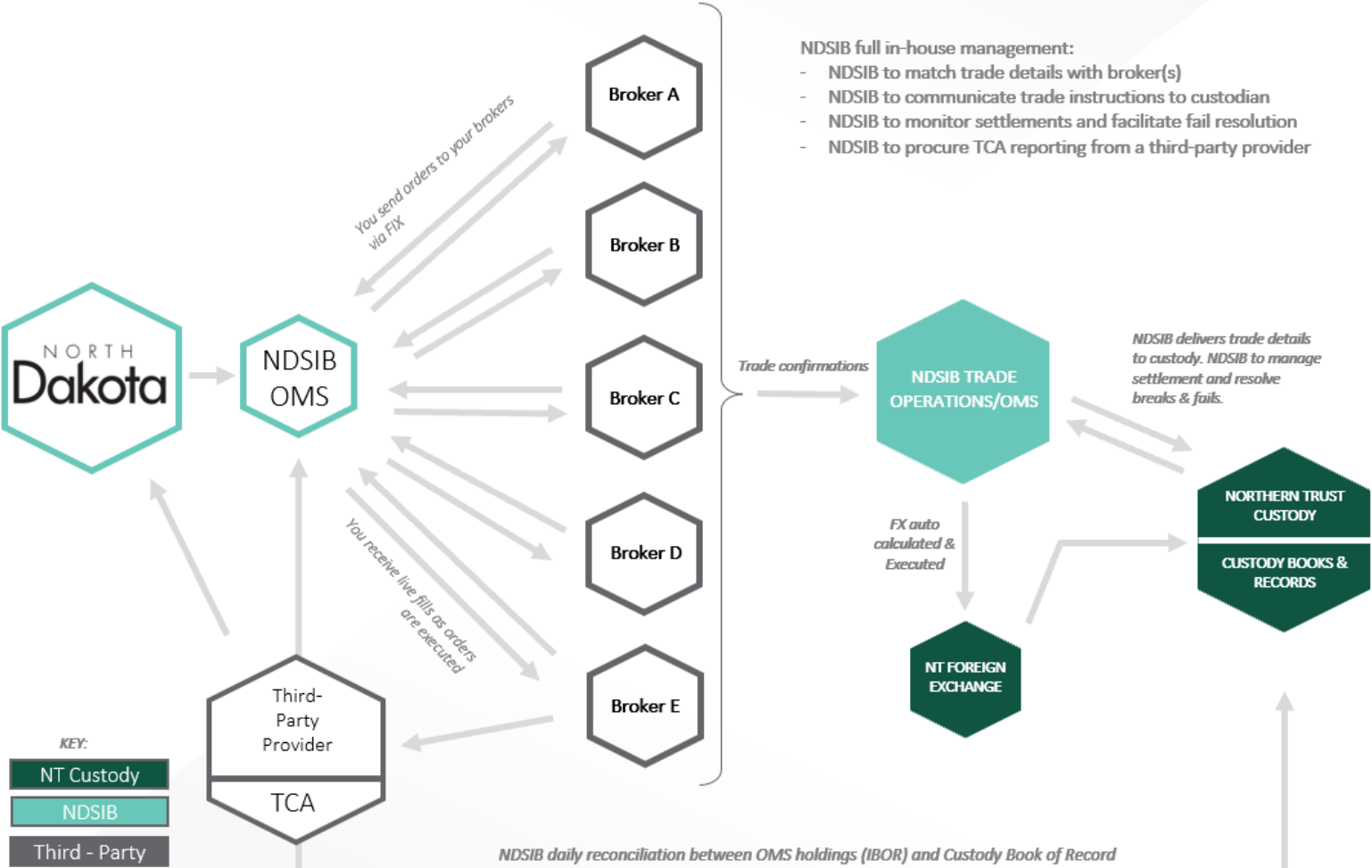


← OPTIMIZE AFTER COST RETURN/RISK AND RISK →

- Optimize instrument type and manage liquidity/roll cost
- Identify physical/ETF/Future trade-offs (lending, liquidity spread, liquidity, etc.)
- Overlay cash collateral to enhance returns
- Manage optimal collateral
- Construct index to optimize cost
- Manage security lending and internal borrowing
- Construct to liquidity requirements
- Use as a platform for transitions
- Optimize with ETFs and futures indexes
- Manage cash and optimize liquidity risk
- Apply simple rules regarding what securities not to hold
- Apply simple rules to create signal driven dynamic exposures
- Apply simple rules regarding index constitution, tracking error and corporate events
- Hold manager invested assets and by agreement replicated holdings
- Receive rules from manager by agreement
- Assemble several micro strategies from boutique managers in a long/short overlay

OPERATING MODEL

Northern Trust as Custodian Only



Illustration

TALENT MANAGEMENT

5 INVESTMENT PROFESSIONALS¹:

2 X SENIOR PORTFOLIO MANAGERS

3 X INVESTMENT ANALYSTS

+

2 X INVESTMENT OPS PROFESSIONALS

TALENT MANAGEMENT:

- ADEQUATE CLASSIFICATION OF ROLES
- INCENTIVE COMPENSATION FUNDED ON A CONTINUING BASIS (Ex: OHIO, WISCONSIN, SOUTH DAKOTA, NORTH CAROLINA)

THE STRATEGY AND STRUCTURE WOULD EVOLVE
WITH THE SIZE OF THE PROGRAM

1. The cost of staff is estimated to be approximately 10% of the total net cost savings.
2. Positive Client Fund feedback.
3. Supports greater control over investment strategies.

CONFIDENTIAL MATERIALS WILL BE SHARED DIRECTLY
WITH COMMITTEE MEMBERS VIA SECURE LINK.