MINNESOTA STATE BOARD OF INVESTMENT

MINNESOTA STATE BOARD
OF INVESTMENT
MEETING
August 26, 2020

Governor Tim Walz

State Auditor Julie Blaha

Secretary of State Steve Simon

Attorney General Keith Ellison

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STATE BOARD OF INVESTMENT MEETING

AGENDA

August 26, 2020

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AGENDA
STATE BOARD OF INVESTMENT
MEETING

Teleconference
Wednesday, August 26, 2020
10:00 a.m.

Leader (Speaker) Dial In: 1-866-751-0140

Participant (Listener) Dial In: 1-866-726-7736

Conference ID: 1251889

REPORTS

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Approval of
May 28, 2020
and
May 29, 2020
SBI Board
Meeting Minutes

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STATE BOARD OF INVESTMENT

MEETING MINUTES

May 28, 2020

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Minutes
State Board of Investment
May 28, 2020

Notice of Meeting
The State Board of Investment (SBI) met at 10:06 a.m. Thursday, May 28, 2020 via Teleconference. It was determined that an in-person meeting was not practical due to the current health pandemic and on-going peace time emergency declared under Chapter 12 of the Minnesota Statutes. As is permitted under the Open Meeting Law in these conditions, this meeting of the State Board of Investment is being conducted over the phone and attendance and all votes conducted with a roll call.

Call to Order
State Auditor Julie Blaha called the meeting to order. State Auditor Julie Blaha and Secretary of State Steve Simon were present. Governor Tim Walz and Attorney General Ellison were absent.

State Auditor Blaha stated the State Board of Investment did not have quorum present to conduct the meeting and directed the Executive Director to post a notice of the recessed meeting for 5:00 p.m. Friday, May 29, 2020.

Recess of Meeting
The meeting recessed at 10:10 a.m.

Respectfully submitted,

Mansco Perry III

Mansco Perry III
Executive Director and
Chief Investment Officer

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STATE BOARD OF INVESTMENT

MEETING MINUTES

May 29, 2020

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Minutes
State Board of Investment Meeting
May 29, 2020

Notice of Meeting
The State Board of Investment (SBI) met at 5:14 p.m. Friday, May 29, 2020 via Teleconference. It was determined that an in-person meeting was not practical due to the current health pandemic and on-going peace time emergency declared under Chapter 12 of the Minnesota Statutes. As is permitted under the Open Meeting Law in these conditions, this meeting of the State Board of Investment is being conducted over the phone and attendance and all votes conducted with a roll call.

Call to Order
Governor Tim Walz, Chairperson of the SBI, called the meeting to order. Governor Tim Walz, State Auditor Julie Blaha, Secretary of State Steve Simon, and Attorney General Keith Ellison were present.

Approval of Minutes
The minutes of the February 26, 2020 SBI meeting were approved unanimously by roll call vote.

Executive Director's Report
Mr. Perry referred members to the March 31, 2020 Performance Report in Tab A of the meeting materials. Mr. Perry informed the Board that the Combined Funds fiscal year to date return as of today (5/29/2020) was flat versus the -6.2% fiscal year to date return as of March 31, 2020. The meeting materials show that as of March 31, 2020, the SBI was responsible for managing $91.5 billion of assets. On a ten-year period ending March 31, 2020, the Combined Funds outperformed its Composite Index (Combined Funds 8.0% vs Combined Funds-Composite Index 7.8%) and had provided a real rate of return of 3.6% above inflation over the last 20 year period (Combined Funds 5.6% vs CPI-U 2.1%).

Mr. Perry referred members to Tab B of the meeting materials for the Administrative Report, which included the administrative budget, the travel report for the fiscal year to date through March 31, 2020 and the Iran and Sudan summary. Mr. Perry thanked the Governor for signing the 2020 Pension Bill, which included language for additional flexibility in the private markets allocation.

SBI Administrative Committee Report
Mr. Perry referred members to Tab C of the meeting materials for the SBI Administrative Committee Report. The Committee met on May 8 and May 15, 2020, to review the Executive Director's FY21 Work Plan, the Budget Plan for FY21 and FY22, the Continuing Fiduciary Education Plan, and the Review of the Executive Director's FY20 Evaluation and Salary process as presented in the Administrative Committee Report. The Administrative Committee recommends, and the Investment Advisory Council (IAC) concurs, that the Board approve the following recommendations. Attorney General Ellison moved approval of the recommendation, which reads: **"The Committee recommends that the SBI adopt the Continuing Fiduciary Education Plan."** The motion passed unanimously by roll call vote.

State Auditor Blaha moved approval of the following recommendations as listed in the Administrative Report, which reads: "**The Committee recommends that the SBI approve the FY21 Executive Director's Work Plan. Further, the Committee recommends that the Work Plan serve as a basis for the Executive Director's performance evaluation for FY21.**

The Committee recommends that the SBI approve the FY21, and FY22 Administrative Budget Plan, as presented to the Committee and subject to any legislative appropriation changes; and that the Executive Director have the flexibility to reallocate funds between budget categories if the Executive Director deems necessary.

The Committee recommends that the SBI adopt the following performance evaluation and salary process for the SBI Executive Director:

- **Evaluations by each Board member should be completed by October 1.**

- **The evaluations will be primarily based on the results of the Executive Director's Work Plan for the fiscal year ending the previous June 30.**

- **The SBI Deputies/Board designees will develop an appropriate evaluation form for use by each member.**

- **As Chair of the Board, the Governor (or his/her Board designee) will coordinate distribution of the evaluation forms. Board members will forward completed evaluations to the Executive Director. Board members should also send a copy of the Overall Evaluation (summary page 1) to the Governor or the Governor's designee. Board members are encouraged to meet individually with the Executive Director to review their own evaluation.**

- **Upon satisfactory performance evaluations from a majority of responding Board Members, the Executive Director's annual salary adjustment will be determined with consideration of any Cost-of-Living Adjustment (COLA)/Across the Board (ATB)/General Salary Increases and/or any Performance-Based Salary Increases contained in the Managerial Plan for a Fiscal Year as approved by the Legislature to the extent that it is within the Executive Director's salary range, as indicated on the Evaluation Form by a majority of evaluations. The adjustment shall be effective January 1 of the next calendar year.**

- **The Governor (or his/her Board designee) will provide a letter to the Executive Director confirming the status of the Executive Director's evaluation results by November 1."** The motion passed unanimously by roll call vote.

IAC Membership Review Committee Report

Mr. Perry delivered the IAC Membership Review Committee Report outlined in Tab D of the meeting materials. Secretary of State Simon moved approval of the recommendation which reads: "**The Committee recommends that the Board reappoint the following as members of the Investment Advisory Council, with terms expiring in January 2024: Ms. Kim Faust, Ms. Susanna Gibbons, Mr. Morris Goodwin Jr., Ms. Carol Peterfeso, and Mr. Shawn**

Wischmeier. The Committee also recommends that the Board appoint the following applicant to the Investment Advisory Council, with a term expiring in January 2023: Ms. Ellen Brownell." The motion passed unanimously by roll call vote.

Private Markets Program Report and Commitments for Consideration
Mr. Martin, Chairperson of the Investment Advisory Council, delivered the Private Markets Program Report and reviewed two private markets proposals listed in Tab E of the meeting materials. Mr. Martin stated that the following two recommendations are with existing managers with whom the SBI has done extensive due diligence: Oaktree Opportunities Fund XI and TCW TALF Opportunities Fund. State Auditor Blaha moved approval of the two recommendations which reads: **"The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $300 million, or 20% of Oaktree Opportunities Fund XI, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Oaktree upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Oaktree or reduction or termination of the commitment.**

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $100 million, or 20% of TCW TALF Opportunities Fund, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by TCW upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on TCW or reduction or termination of the commitment." The motion passed unanimously by roll call vote.

SBI Executive Director Comments and Discussion Report
Mr. Perry referred members to Tab F of the meeting materials for the SBI Executive Director Comments and Discussion Report. With the support of the IAC and SBI consultants, Mr. Perry requested that the Board approve two resolutions.

The first resolution addresses the Board's ESG initiatives to evaluate options that will reduce the SBI's investments to long-term carbon risk exposure. Mr. Perry worked with Meketa Investment Group to review the risk associated with removing publicly traded investments in thermal coal extraction and production companies from the Combined Funds public market portfolio. The results showed that removal of such companies as authorized investments created manageable tracking error with respect to the benchmarks and would be prudent under the circumstances applicable to the thermal coal industry. Mr. Perry requested approval of the resolution concerning the reduction of investments associated with thermal coal production, and authorizing the Executive Director to implement a procedure and process consistent with the state's fiduciary duties to remove companies deriving 25% or more revenue from the Combined Funds public markets portfolio. Attorney General Ellison moved approval of the resolution concerning reduction of investments with thermal coal production. The motion passed unanimously by roll call vote. (See **Attachment A** – SBI Resolution Concerning Reduction of Investments Associated with Thermal Coal Production.) As part of this effort, Mr. Perry also informed the Board that he has directed his staff to transform the State Cash accounts portfolio to a fossil fuel free portfolio within the next year.

The second resolution, Mr. Perry stated, would incorporate portfolio modifications to improve the management of the Combined Funds portfolio. The first adjustment is to increase the fixed income allocation to better manage the liquidity and protection of the portfolio. The second adjustment is to provide greater flexibility in the management of the private markets portfolio by using risk management vehicles with the use of cash and currency overlay strategies within the unallocated portion of the portfolio. State Auditor Blaha moved approval of the resolution concerning management of the Combined Fund asset allocation. The motion passed unanimously by roll call vote. (See **Attachment B** – SBI Resolution Concerning Management of Combined Funds Asset Allocation and Liquidity.)

Reports
Mr. Perry directed members to the remainder of the reports that included the Public Markets, Non-Retirement and Participant Directed Investment Programs Report in Tab G; the Market Environment Report prepared by AON in Tab H; the Capital Markets Outlook & Risk Metrics Report prepared by Meketa in Tab I; and the SBI's Comprehensive Performance Report in Tab J.

Other Items
Governor Walz recognized a member of the public who requested to speak before the Board: Ms. Eileen O'Grady with the Private Equity Stakeholder Project.

Adjournment of Meeting
State Auditor Blaha moved approval to adjourn the meeting. The motion passed by roll call vote.

The meeting adjourned at 5:38 p.m.

Respectfully submitted,

Mansco Perry III

Mansco Perry III
Executive Director and
Chief Investment Officer

ATTACHMENT A

MINNESOTA STATE BOARD OF INVESTMENT

RESOLUTION OF THE MINNESOTA STATE BOARD OF INVESTMENT CONCERNING REDUCTION OF INVESTMENTS ASSOCIATED WITH THERMAL COAL PRODUCTION

WHEREAS, on February 26, 2020, the State Board of Investment ("MSBI") adopted a resolution regarding Environmental, Social, and Governance ("ESG") initiatives to advance the MSBI's consideration of ESG risks and opportunities in its investment portfolio;

WHEREAS, the resolution called upon the MSBI Executive Director to, among other things, evaluate options for reducing the MSBI's long-term carbon risk exposure;

WHEREAS, the MSBI Executive Director has, with the assistance of MSBI staff and the Board's investment consultant, Meketa Investment Group, reviewed the risks associated with publicly traded investments in thermal coal extraction and production companies;

WHEREAS, such review demonstrates that companies which derive a substantial portion of revenue from thermal coal extraction and production face material declining market values and risks of stranded assets due to demand for more cost effective and efficient forms of energy production;

WHEREAS, the MSBI Executive Director has determined that removing such companies as authorized investments creates a manageable tracking error with respect to the MSBI's benchmark indices and would be prudent under the circumstances applicable to the thermal coal industry; and

WHEREAS, a number of other institutional public pension plans such as the California State Teachers Retirement System, California Public Employees Retirement System, New York City Pension System, and San Francisco Employees' Retirement System have previously removed such companies from their lists of authorized investments;

THEREFORE, the MSBI Executive Director requests that the Board authorize the MSBI Executive Director to take appropriate action.

NOW THEREFORE BE IT RESOLVED THAT the MSBI Executive Director be authorized to take the following actions:

1. The MSBI Executive Director shall implement a procedure, consistent with all applicable fiduciary duties, to remove publicly traded companies which derive 25% or more of their revenue from the extraction and/or production of thermal coal as authorized investments in the MSBI's Combined Funds investment

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portfolio. By the next regularly scheduled Board meeting, the MSBI Executive Director shall identify such companies in the Combined Funds portfolio and provide instruction to the MSBI's investment managers to remove identified companies. MSBI's investment managers must remove identified companies from the Combined Funds investment portfolio in a prudent and expeditious manner, but no later than December 31, 2020;

2. The MSBI Executive Director shall, beginning with the Board's regularly scheduled third-quarter 2020 meeting and continuing each quarter thereafter, report to the Board on the status of any action authorized by this resolution; and

3. The MSBI Executive Director is authorized to make contractual or investment guideline changes, and take such further action he deems necessary to implement the resolution.

Adopted this 29th day
of May, 2020

DATE: MAY 29, 2020

BY: Mansco Perry III

Mansco Perry III
Executive Director and Chief Investment Officer
Minnesota State Board of Investment

ATTACHMENT B

MINNESOTA STATE BOARD OF INVESTMENT

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RESOLUTION OF THE MINNESOTA STATE BOARD OF INVESTMENT CONCERNING MANAGEMENT OF COMBINED FUNDS ASSET ALLOCATION AND LIQUIDITY

WHEREAS, the Minnesota State Board of Investment (MSBI) places the highest importance on ensuring sufficient portfolio liquidity to meet ongoing benefit payment obligations;

WHEREAS, the MSBI considers the makeup of both the fixed income portfolio and the total portfolio in attempting to achieve attractive rates of return at acceptable levels of risk;

WHEREAS, the MSBI recognizes the importance of monitoring portfolio illiquidity in the form of invested private markets value and unfunded commitments;

WHEREAS, the MSBI recognizes the efficiencies in the form of cost savings and timeliness inherent in utilizing an overlay strategy in lieu of instructing retained investment managers to conduct rebalancing transactions on a regular basis;

WHEREAS, the MSBI recognizes that the unusual financial market conditions stemming from the ongoing COVID-19 crisis have highlighted the need for improved flexibility in terms of investment strategy implementation and liquidity management; and

WHEREAS, the Executive Director has, with the assistance of MSBI staff and its general consultants, determined that changes to the asset allocation policy of the Combined Funds portfolio are prudent in response to financial market conditions;

THEREFORE, the MSBI Executive Director requests that the Board authorize the MSBI Executive Director to take appropriate actions.

NOW THEREFORE BE IT RESOLVED that the MSBI Executive Director be authorized to take the following actions:

1. The Fixed Income Program shall be restructured to include a 20% combined Cash plus Short Duration Treasury Ladder allocation; a 40% Treasury Protection allocation; and a combined 40% Core/Core-plus and Return Seeking Bond allocation and the Executive Director shall develop and implement a Total Fixed Income Program Benchmark comprised of an appropriate benchmark for each of the three segments;

2. The Total Combined Funds allocation to the Fixed Income Program shall be modified to 25%, which will be comprised of the current 20% allocation to Core Bonds and Treasuries, the current 2% allocation to Cash, and a transfer of 3% from Public Equities;

3. The current policy for the upper limit for Private Markets Market Value plus Unfunded Commitments shall be temporarily increased to a maximum of 45% from 35% currently, and MSBI staff must present a proposed new permanent recommendation for the management of Unfunded Commitments by the end of Fiscal Year 2021. The temporary policy also will maintain the current target Market Value level of 25%, but would allow the portfolio to hold private market investments up to the current statutory maximum Market Value level of 35%;

4. The Executive Director is authorized to conduct further study and to take such steps as necessary to implement the policy changes outlined above as well as the following additional investment strategy considerations:

   a. the segregation of the Unallocated Investment funds associated with the Private Markets/Alternatives Program from the dedicated Public Equities Program, including the development of an investment strategy using physical securities and/or a combination an overlay program fully collateralized by cash;

   b. the use of cash overlay strategies to facilitate rebalancing and enhance portfolio liquidity; and

   c. the use of a currency overlay strategy to more effectively manage the portfolio's non-dollar exposure;

5. The MSBI Executive Director is authorized to make contractual or investment guideline changes, and take such further action he deems necessary to implement the resolution; and

6. The Executive Director shall bring to the Investment Advisory Council and Board recommendations for any additional managers and vendors necessary to expeditiously implement these strategies.

Adopted this 29th day
of May, 2020

DATE: May 29, 2020

BY: Mansco Perry III

Mansco Perry III
Executive Director and Chief Investment Officer
Minnesota State Board of Investment

TAB A

Quarterly Performance Summary

June 30, 2020

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Performance Summary

June 30, 2020

Description of SBI Investment Programs

The Minnesota State Board of Investment is responsible for the investment management of various retirement funds, trust funds and cash accounts.

Combined Funds

The Combined Funds represent the assets for both the active and retired public employees in the statewide retirement systems, the biggest of which are the Public Employees Retirement Association (PERA), the Teachers Retirement Association (TRA), and the Minnesota State Retirement System (MSRS). The SBI commingles the assets of these plans into the Combined Funds to capture investment efficiencies. All assets in the Combined Funds are managed externally by investment management firms retained by contract.

Fire Plans + Other Retirement Plans

Fire Plans and Other Retirement Plans include assets from volunteer fire relief plans and other public retirement plans with authority to invest with the SBI, if they so choose. Fire Plans that are not eligible to be consolidated with Public Employees Retirement Association (PERA) or elect not to be administered by PERA may invest their assets with the SBI using the same asset pools as the Combined Funds. The Statewide Volunteer Firefighter Retirement Plan is administered by PERA and has its own investment vehicle called the Volunteer Firefighter Account.

Participant Directed Investment Program

The Participant Directed Investment Program (PDIP) provides investment vehicles for a variety of retirement or other tax-advantaged savings plans. Investment goals among the PDIP's many participants are varied. In order to meet the variety of goals, participants may allocate their investments among one or more accounts that are appropriate for their needs within statutory requirements and rules established by the participating organizations.

Non-Retirement

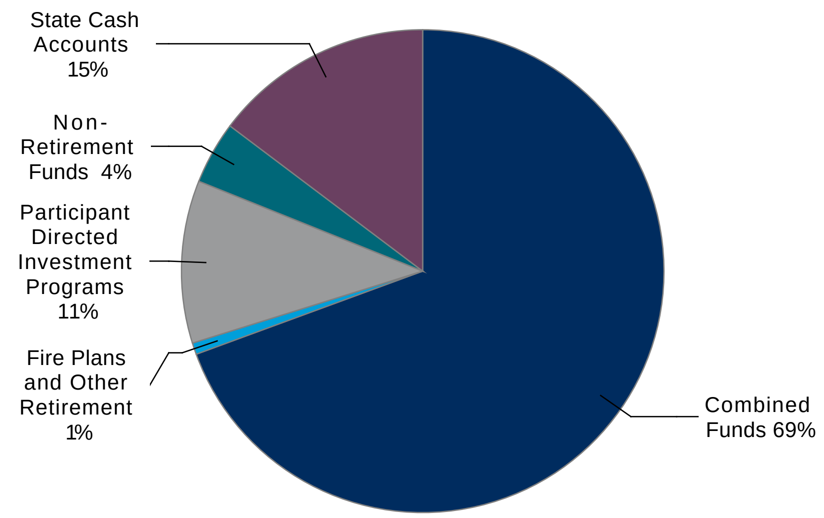
The Non-Retirement Funds are funds established by the State of Minnesota and other government entities for various purposes which include the benefit of public schools, the environment, other post-employment benefits, workers compensation insurance, and other purposes.

State Cash

The State Cash accounts are cash balances of state government funds including the State General Fund. Most accounts are invested by SBI staff through a short-term pooled fund referred to as the Treasurer's Cash Pool. It contains the cash balances of special or dedicated accounts necessary for the operation of certain State agencies and non-dedicated cash in the State Treasury. Because of special legal restrictions, a small number of cash accounts cannot be commingled.

Funds Under Management

	$ Millions
COMBINED FUNDS	$71,053
FIRE PLANS + OTHER RETIREMENT	792
PARTICIPANT DIRECTED INVESTMENT PROGRAMS	11,154
State Deferred Compensation Plan	7,717
Health Care Savings Plan	1,299
Unclassified Employees Retirement Plan	331
Hennepin County Supplemental Retirement Plan	160
PERA Defined Contribution Plan	78
Minnesota College Savings Plan	1,557
Minnesota Achieve a Better Life Experience	12
NON-RETIREMENT FUNDS	4,298
Assigned Risk Plan	308
Permanent School Fund	1,621
Environmental Trust Fund	1,289
Closed Landfill Investment Fund	103
Miscellaneous Trust Funds	279
Other Postemployment Benefits Accounts	699
STATE CASH ACCOUNTS	15,074
Invested Treasurer's Cash	14,982
Other State Cash Accounts	92
TOTAL SBI AUM	102,372



Note: Differentials within column amounts may occur due to rounding

Combined Funds Long Term Objectives

Comparison to Objective

Match or Exceed Composite Index (10 yr.)

Outperform a composite market index weighted in a manner that reflects the long-term asset allocation of the Combined Funds over the latest 10 year period.

	10 Year
COMBINED FUNDS	9.7%
COMBINED FUNDS - COMPOSITE INDEX	9.5
Excess	0.2

Provide Real Return (20 yr.)

Provide returns that are 3-5 percentage points greater than inflation over the latest 20 year period.

	20 Year
COMBINED FUNDS	6.3%
CPI-U	2.0
Excess	4.3

Note:

Throughout this report performance is calculated net of investment management fees, differentials within column amounts may occur due to rounding, and returns for all periods greater than one year are annualized.

STATE STREET

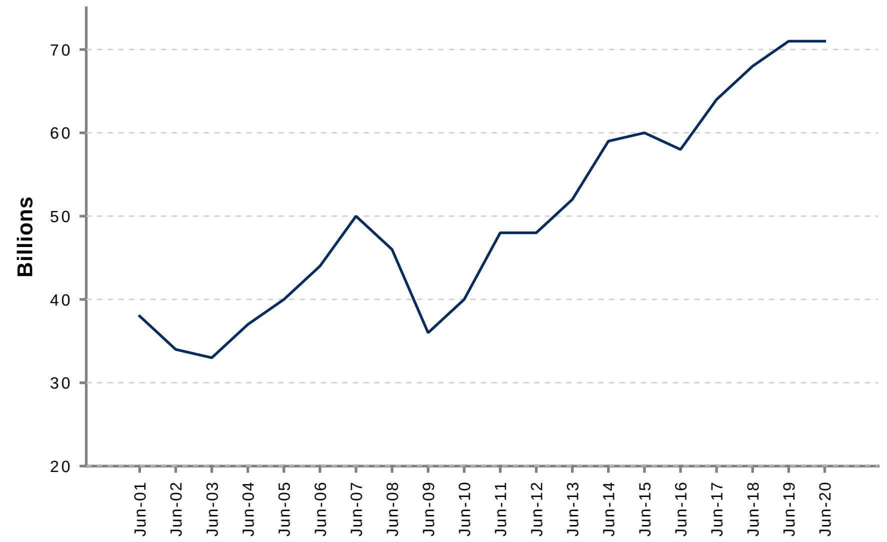
Combined Funds Summary

Combined Funds Change in Market Value ($Millions)

	One Quarter
COMBINED FUNDS	
Beginning Market Value	$64,559
Net Contributions	-620
Investment Return	7,114
Ending Market Value	71,053

The change in market value of the Combined Funds since the end of last quarter is due to net contributions and investment returns.

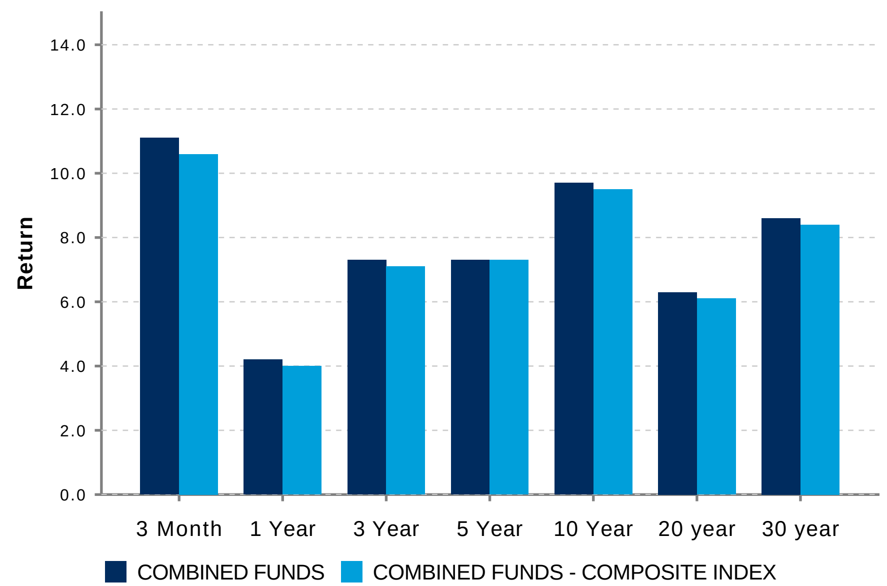
Asset Growth



Performance (Net of Fees)

The Combined Funds' performance is evaluated relative to a composite of public market index and private market investment returns. The Composite performance is calculated by multiplying the beginning of month Composite weights and the monthly returns of the asset class benchmarks.

	Qtr	FYTD	1 Yr	3 Yr	5 Yr	10 Yr	20 Yr	30 Yr
COMBINED FUNDS	11.1%	4.2%	4.2%	7.3%	7.3%	9.7%	6.3%	8.6%
COMBINED FUNDS - COMPOSITE INDEX	10.6	4.0	4.0	7.1	7.3	9.5	6.1	8.4
Excess	0.5	0.2	0.2	0.2	-0.0	0.2	0.2	0.2

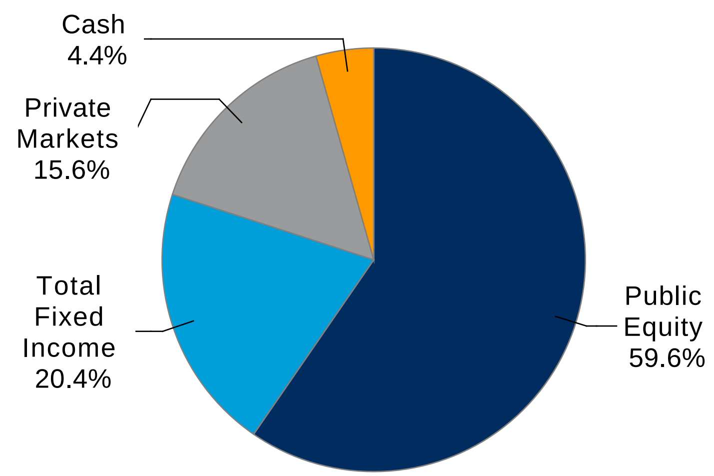


Combined Funds Summary

Asset Mix

The Combined Funds actual asset mix relative to the Strategic Asset Allocation Policy Target is shown below. Any uninvested portion of the Private Markets allocation is held in Public Equity.

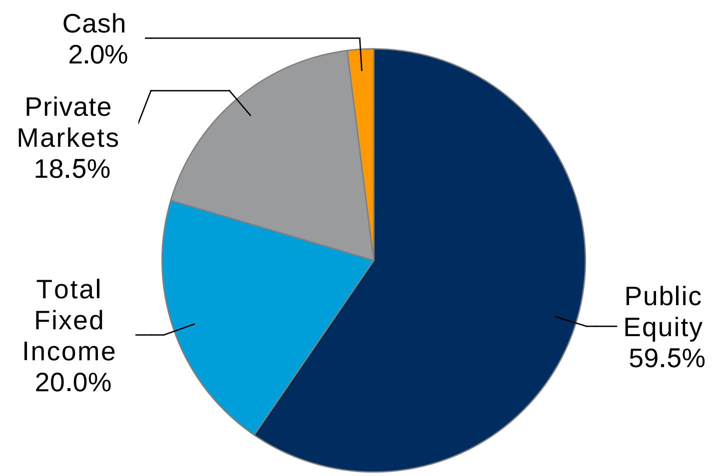
	(Millions)	Actual Mix	Policy Target
Public Equity	$42,351	59.6%	53.0%
Total Fixed Income	14,463	20.4	20.0
Private Markets	11,104	15.6	25.0
Cash	3,135	4.4	2.0
TOTAL	71,053	100.0	



Composite Index Comparison

The Combined Funds Composite is set as the Strategic Asset Allocation Policy Target with the uninvested portion of Private Markets allocated to Public Equity. Asset class weights for Public Equity and Private Markets are reset at the start of each month. The Combined Funds Composite weighting shown below is as of the first day of the quarter.

	Policy Weight	Market Index
Public Equity	59.5%	Public Equity Benchmark
Total Fixed Income	20.0	Total Fixed Income Benchmark
Private Markets	18.5	Private Markets
Cash	2.0	3 Month T-Bills



STATE STREET

Minnesota State Board of Investment
Quarter Ending June 30, 2020
Combined Funds

Combined Funds Asset Class Performance Summary

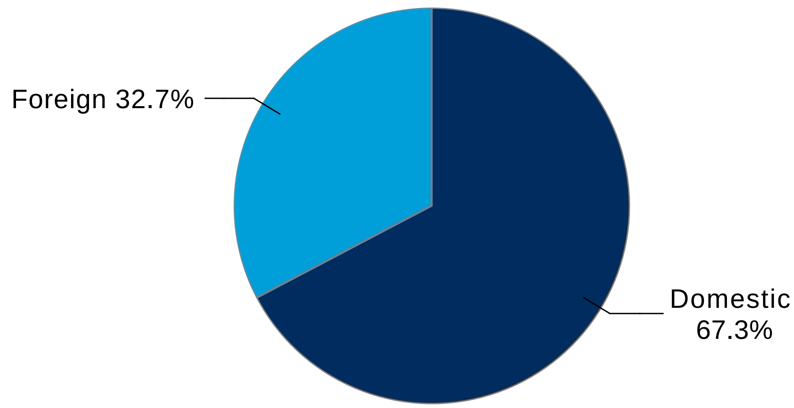
Public Equity

The Combined Funds Public Equity includes Domestic Equity and International Equity.

The Public Equity benchmark is 60.3% Russell 1000, 6.7% Russell 2000, 24.75% MSCI World ex US (net), and 8.25% MSCI EM (net).

The Russell 1000 and Russell 2000 measure the performance of the 1000 largest and 2000 next largest U.S. companies based on total market capitalization.

The MSCI World ex US index is composed of large and mid cap companies that capture approximately 85% of the total market capitalization in 22 of the 23 developed markets. The MSCI Emerging Markets index is composed of large and mid cap companies that capture approximately 85% of the total market capitalization across 24 Emerging Markets countries.



	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Public Equity	20.8%	2.7%	2.7%	7.1%	7.5%	11.4%	5.3%	8.8%
Public Equity Benchmark	20.2	2.4	2.4	7.0				
Excess	0.7	0.3	0.3	0.1				
Domestic Equity	22.8	6.2	6.2	9.9	9.7	13.7	5.9	9.4
Domestic Equity Benchmark	22.2	6.0	6.0	9.9	9.9	13.7	6.0	9.6
Excess	0.6	0.1	0.1	0.1	-0.3	-0.0	-0.1	-0.2
International Equity	16.7	-4.2	-4.2	1.3	2.5	5.4	3.8	
International Equity Benchmark	16.1	-4.8	-4.8	1.1	2.3	5.0	3.4	
Excess	0.7	0.6	0.6	0.2	0.2	0.4	0.4	

Note:

Prior to 6/30/16 the returns of Domestic and International Equity were not reported as a total Public Equity return. For additional information regarding historical asset class performance and benchmarks, please refer to the Combined Funds Performance Report.

Combined Funds Asset Class Performance Summary

Fixed Income

The Combined Funds Fixed Income program includes Core Bonds and Treasuries. The Combined Funds performance for these asset classes is shown here.

The Core Bonds benchmark is the Bloomberg Barclays U.S. Aggregate Index. This index reflects the performance of the broad bond market for investment grade (Baa or higher) bonds, U.S. Treasury and agency securities, and mortgage obligations with maturities greater than one year.

The Treasuries benchmark is the Bloomberg Barclays Treasury 5+ Years Index.

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Total Fixed Income	2.9%	13.0%	13.0%	7.4%	5.7%	5.0%	5.8%	6.6%
Total Fixed Income Benchmark	1.7	13.0	13.0					
Excess	1.2	0.1	0.1					
Core Bonds	5.5	9.2	9.2	5.8	4.8	4.5	5.5	6.4
Core Bonds Benchmark	2.9	8.7	8.7	5.3	4.3	3.8	5.1	6.0
Excess	2.6	0.5	0.5	0.4	0.5	0.7	0.4	0.4
Treasuries	0.3	16.7	16.7					
BBG BARC 5Y + Us Tsy Idx	0.6	17.2	17.2					
Excess	-0.3	-0.5	-0.5					

Cash

The Combined Funds Cash performance is shown here. Cash is held by the Combined Funds to meet the liquidity needs of the retirement systems to pay benefits.

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Cash	0.1%	1.5%	1.5%	1.8%	1.3%	0.8%	2.0%	3.5%
US 3-Month Treasury Bill	0.0	1.6	1.6	1.8	1.2	0.6	1.7	2.8

Note:

Prior to 3/31/2020 the returns of Core Bonds and Treasuries were not reported as a total Fixed Income return. For additional information regarding historical asset class performance and benchmarks, please refer to the Combined Funds Performance Report.

Combined Funds Asset Class Performance Summary

Private Markets

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 year	30 year
Private Markets	-9.0%	-2.6%	-2.6%	7.3%	8.2%	10.6%	11.1%	13.2%	11.9%
Private Equity	-7.3%	3.6%	3.6%	12.3%	12.6%	13.5%	11.7%	15.3%	
Private Credit	-6.9	0.4	0.4	7.6	10.6	11.9	11.4		
Resources	-19.6	-25.4	-25.4	-7.8	-5.7	1.4	12.6	12.6	
Real Estate	-3.9	3.5	3.5	8.2	8.1	11.4	8.5	9.4	

Private Markets

The time-weighted rates of return for the Private Markets portfolio are shown here. Private Markets included Private Equity, Private Credit, Resources, and Real Estate. Some of the existing investments are relatively immature and returns may not be indicative of future results.

Private Equity Investments

The objectives of the Private Equity portfolio, which may include leveraged buyouts, growth equity, venture capital and special situations, are to achieve attractive returns and to provide overall portfolio diversification to the total plan.

Private Credit Investments

The objectives of the Private Credit portfolio, which may include mezzanine debt, direct lending, and other forms of non-investment grade fixed income instruments, are to achieve a high total return over a full market cycle and to provide some degree of downside protection and typically provide current income in the form of a coupon. In certain situations, investments in the Private Credit portfolio also provide an equity component of return in the form of warrants or re-organized equity.

Resource Investments

The objectives of the Resources portfolio, which may include energy, infrastructure, and other hard assets, are to provide protection against the risks associated with inflation and to provide overall portfolio diversification to the total plan.

Real Estate Investments

The objectives of the Real Estate portfolio, which may include core and non-core real estate investments, are to achieve attractive returns, preserve capital, provide protection against risks associated with inflation, and provide overall portfolio diversification to the total plan.

The SBI also monitors Private Markets performance using money-weighted return metrics such as Internal Rate of Return and Multiple of Invested Capital. For money-weighted return metrics please refer to the Combined Funds Performance Report.

SBI Combined Funds Strategic Allocation Category Framework

	6/30/20 ($ millions)	6/30/20 Weights	Category Ranges	
Growth - Appreciation				
Public Equity	$ 42,350.64	59.6%		
Private Equity	$ 6,538.46	9.2%		
Non-Core Real Assets	$ 2,347.95	3.3%		
Distressed/Opportunistic	$ 1,041.99	1.5%		
	$ 52,279.04	**73.6%**	*50%*	*75%*
Growth - Income-oriented				
Core Fixed Income	$ 7,273.38	10.2%		
Private Credit	$ 759.22	1.1%		
Return-Seeking Fixed Income		0.0%		
	$ 8,032.60	**11.3%**	*15%*	*30%*
Real Assets				
Core Real Estate		0.0%		
Real Assets	$ 398.91	0.6%		
	$ 398.91	**0.6%**	*0%*	*10%*
Inflation Protection				
TIPS		0.0%		
Commodities		0.0%		
		0.0%	*0%*	*10%*
Protection				
U.S. Treasuries	$ 7,189.39	10.1%		
	$ 7,189.39	**10.1%**	*5%*	*20%*
Liquidity				
Cash	$ 3,135.05	4.4%		
	$ 3,135.05	**4.4%**	*0%*	*5%*
Opportunity				
Opportunity		**0.0%**	*0%*	*10%*
Total	**$ 71,052.86**	**100.0%**		
Illiquid Asset Exposure	**$ 11,086.52**	**15.6%**	*0%*	*30%*

Volatility Equivalent Benchmark Comparison

Periods Ending 6/30/2020

As of (Date):	6/30/2020							
	1-year	*3-year*	*5-year*	*10-year*	*15-year*	*20-year*	*25-year*	*30-year*
SBI Combined Funds Return	**4.2%**	**7.3%**	**7.3%**	**9.7%**	**7.6%**	**6.3%**	**8.2%**	**8.6%**
Volatility Equivalent Benchmark Return			**5.9%**	**7.2%**	**5.9%**	**5.0%**	**6.5%**	**7.2%**
Value Added			**1.4%**	**2.5%**	**1.7%**	**1.3%**	**1.7%**	**1.4%**

Standard Deviation: Benchmark = Combined Funds			**8.8%**	**8.3%**	**9.4%**	**9.5%**	**9.6%**	**9.4%**
Benchmark Stock Weight			**61%**	**60%**	**58%**	**60%**	**62%**	**62%**
Benchmark Bond Weight			**39%**	**40%**	**42%**	**40%**	**38%**	**38%**

The Volatility Equivalent Benchmark stock and bond weights are adjusted to equal the standard deviation of the SBI Combined Funds portfolio. Then a return is calculated.

Combined Funds Summary

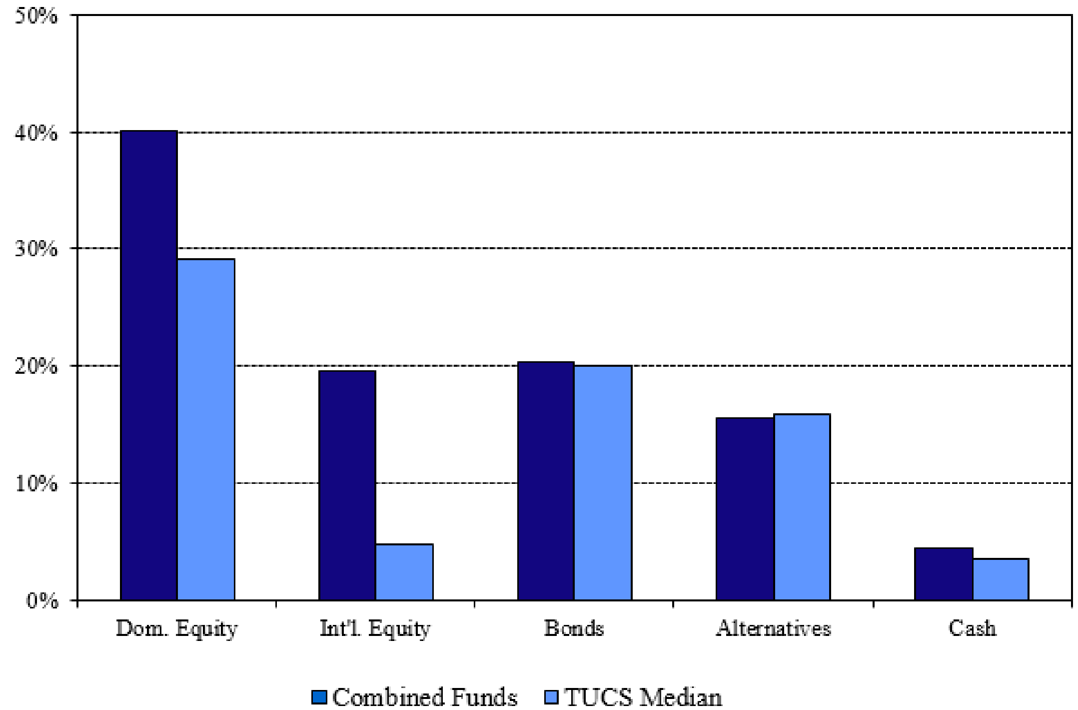
Asset Mix Compared to Other Pension Funds

The comparison universe used by the SBI is the Trust Universe Comparison Service (TUCS). Only funds with assets over $1 billion are included in the comparisons shown in this section.

Comparisons of the Combined Funds' asset mix to the median allocation to stocks, bonds and other assets of the public and corporate funds in TUCS over $1 billion are shown below:

Combined Funds Asset Mix

	($Millions)	Actual Mix
Public Equity	42,351	59.6
Total Fixed Income	14,463	20.4
Private Markets	11,104	15.6
Cash	3,135	4.4
TOTAL	71,053	100.0



	Domestic Equity	International Equity	Bonds	Alternatives	Cash
Combined Funds	40.1%	19.5%	20.4%	15.6%	4.4%
Median in TUCS	29.1%	4.8%	20.0%	15.9%	3.5%

Combined Funds Summary

Performance Compared to Other Pension Funds

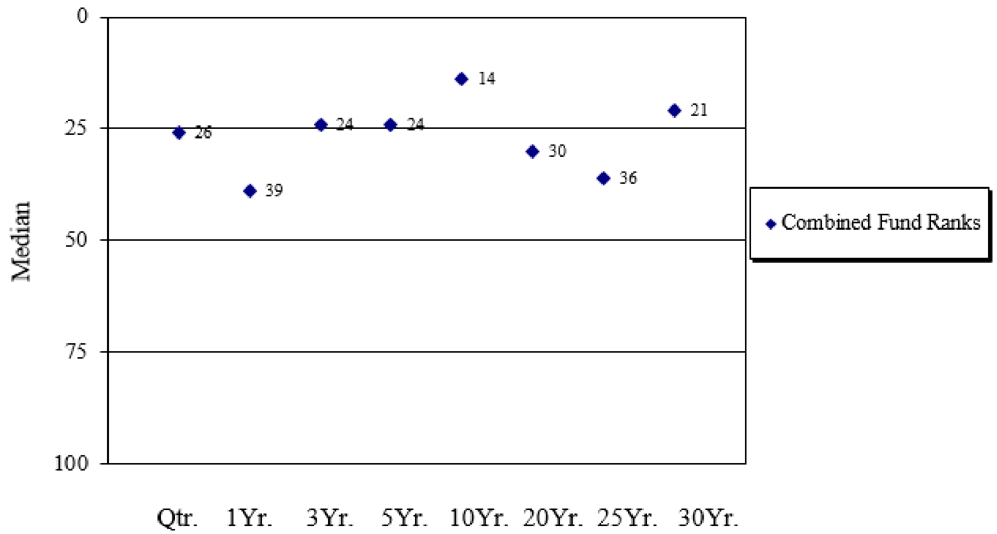
While the SBI is concerned with how its returns compare to other pension investors, universe comparisons should be used with great care. There are several reasons why such comparisons will provide an "apples to oranges" look at performance:

- Differing Allocations. Asset allocation will have a dominant effect on return. The allocation to stocks among the funds in TUCS typically ranges from 20-90%, a very wide range for meaningful comparison. In addition, it appears that many funds do not include alternative asset holdings in their reports to TUCS. This further distorts comparisons among funds.

- Differing Goals/Liabilities. Each pension fund structures its portfolio to meet its own liabilities and risk tolerance. This will result in different asset mix choices. Since asset mix will largely determine investment results, a universe ranking is not relevant to a discussion of how well a plan sponsor is meeting its long-term liabilities.

With these considerations in mind, the performance of the Combined Funds compared to other public and corporate pension funds in Trust Universe Comparison Service (TUCS) are shown below.

The SBI's returns are ranked against public and corporate plans with over $1 billion in assets. All funds in TUCS report their returns gross of fees.



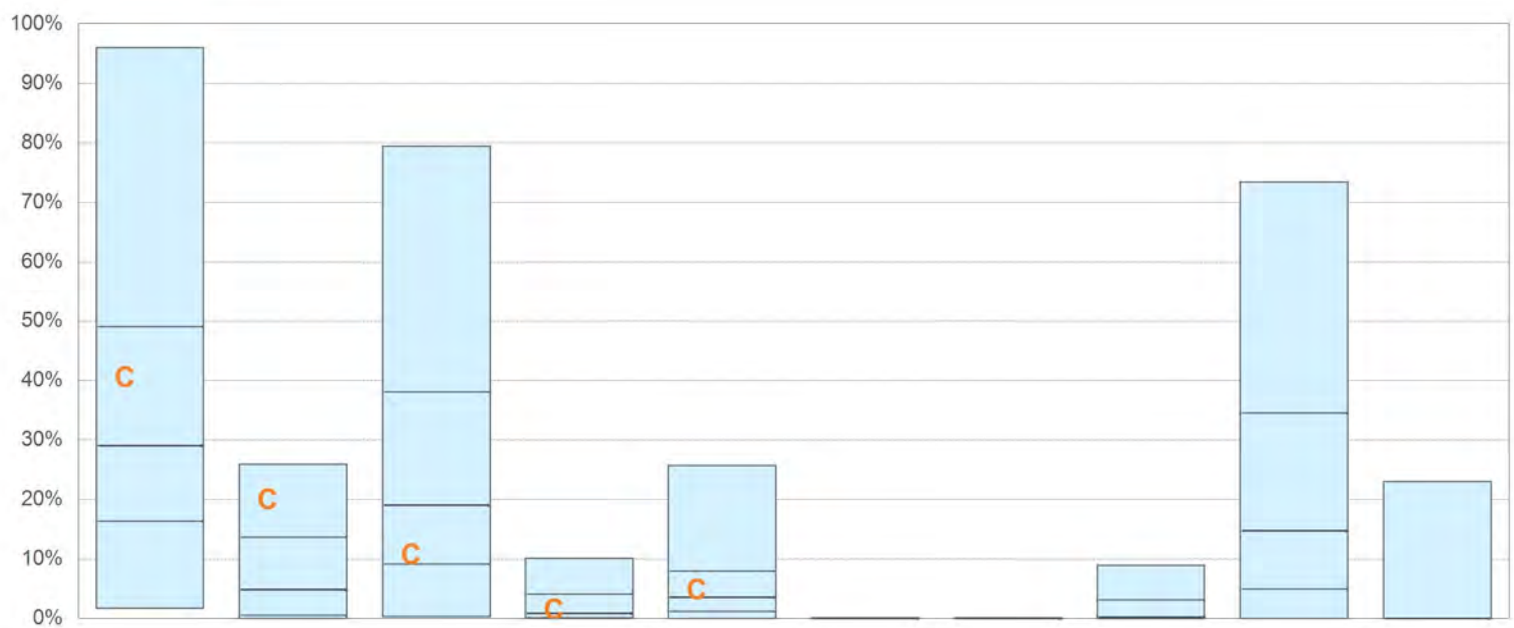
Periods Ended 06/30/2020

	Qtr	1 Yr	3 Yrs	5 Yrs	10 Yrs	20 Yrs	25 Yrs	30 Yrs
Combined Funds Percentile Rank in TUCS	26th	39th	24th	24th	14th	30th	36th	21st

STATE STREET

Wilshire

Minnesota State Board of Investments
Asset Allocation of Master Trusts - Plans > $1 Billion
Quarter Ending June 30, 2020

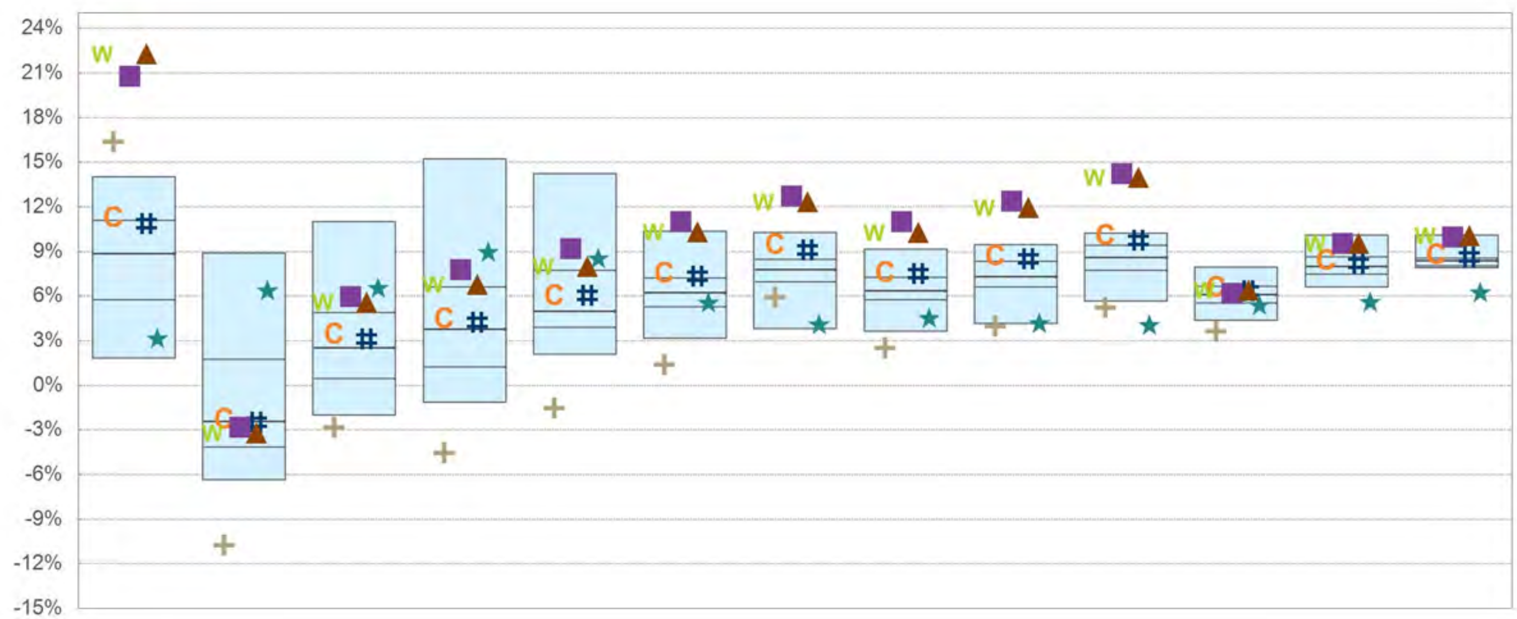


Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	96.02	25.92	79.48	10.10	25.71	0.11	0.14	8.91	73.39	23.02
25th	49.11	13.66	38.07	4.13	8.01	0.00	0.00	3.17	34.58	0.00
50th	29.05	4.84	19.07	0.90	3.52	0.00	0.00	0.17	14.71	0.00
75th	16.41	0.53	9.13	0.06	1.16	0.00	0.00	0.00	4.92	0.00
95th	1.75	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C Combined Funds	40.09 (30)	19.51 (11)	10.24 (73)	0.00 (100)	4.32 (42)			1.47 (33)		2.39 (12)

Minnesota State Board of Investments
Performance Comparison

Total Returns of Master Trusts - Plans > $1 Billion

Cumulative Periods Ending : June 30, 2020

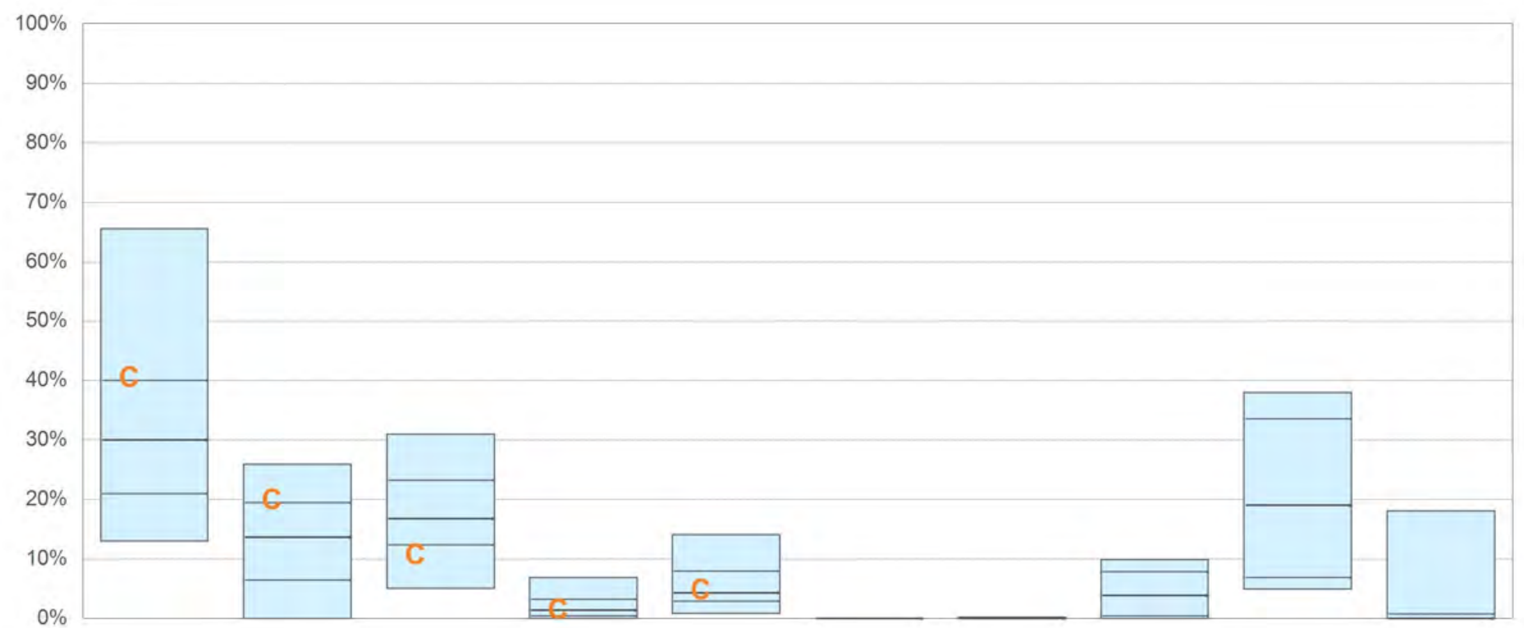


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
5th	14.04	8.91	11.01	15.21	14.25	10.35	10.28	9.17	9.47	10.24	7.93	10.10	10.10
25th	11.10	1.77	4.91	6.63	7.74	7.22	8.46	7.26	8.32	9.40	6.67	8.63	8.54
50th	8.85	-2.44	2.54	3.78	4.97	6.23	7.78	6.35	7.32	8.61	6.10	7.99	8.36
75th	5.74	-4.16	0.46	1.23	3.89	5.29	6.95	5.74	6.63	7.74	5.55	7.46	8.03
95th	1.82	-6.35	-2.01	-1.14	2.10	3.15	3.80	3.65	4.16	5.66	4.39	6.63	7.91
No. Of Obs	151	145	137	131	121	119	118	118	117	113	86	60	26

C Combined Funds	11.10 (26)	-2.47 (52)	3.25 (39)	4.29 (39)	5.84 (37)	7.36 (24)	9.28 (11)	7.37 (24)	8.51 (20)	9.87 (14)	6.40 (30)	8.21 (36)	8.61 (21)
# SBI Combined Funds Ind	10.60 (30)	-2.75 (58)	2.88 (47)	3.98 (46)	5.78 (39)	7.07 (27)	8.85 (15)	7.26 (25)	8.27 (26)	9.51 (22)	6.08 (50)	7.95 (50)	8.36 (50)
W SBI Domestic Equity Ta	22.03 (1)	-3.48 (65)	5.31 (23)	6.53 (25)	7.75 (24)	10.04 (6)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)	6.15 (46)	9.28 (13)	9.81 (9)
★ SBI Fixed Income Targe	2.90 (93)	6.14 (12)	6.33 (14)	8.74 (17)	8.30 (17)	5.32 (74)	3.88 (94)	4.30 (91)	3.96 (95)	3.82 (96)	5.14 (86)	5.36 (99)	6.02 (100)
■ S&P 500	20.54 (1)	-3.08 (62)	5.71 (17)	7.50 (19)	8.95 (16)	10.73 (2)	12.48 (1)	10.73 (1)	12.13 (1)	13.99 (1)	5.91 (58)	9.27 (13)	9.73 (9)
+ MSCI World Ex US (N)	16.12 (3)	-11.00 (99)	-3.06 (98)	-4.80 (99)	-1.80 (99)	1.13 (99)	5.65 (90)	2.26 (97)	3.71 (95)	4.97 (95)	3.40 (99)		
▲ Russell 3000	22.03 (1)	-3.48 (65)	5.31 (23)	6.53 (25)	7.75 (24)	10.04 (6)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)	6.15 (46)	9.28 (13)	9.81 (9)

Minnesota State Board of Investments
Asset Allocation of Master Trusts - Public : Plans > $10 Billion

Quarter Ending June 30, 2020



Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	65.59	25.92	30.99	6.87	14.09	0.05	0.20	9.92	37.97	18.07
25th	40.09	19.51	23.22	3.19	7.94	0.00	0.00	7.91	33.59	0.73
50th	29.99	13.70	16.77	1.44	4.32	0.00	0.00	3.92	19.07	0.00
75th	20.97	6.49	12.33	0.42	2.93	0.00	0.00	0.41	6.85	0.00
95th	12.99	0.00	5.11	0.00	0.86	0.00	0.00	0.00	5.00	0.00
C Combined Funds	40.09 (25)	19.51 (25)	10.24 (83)	0.00 (100)	4.32 (50)			1.47 (58)		2.39 (15)

Wilshire

Minnesota State Board of Investments
Performance Comparison

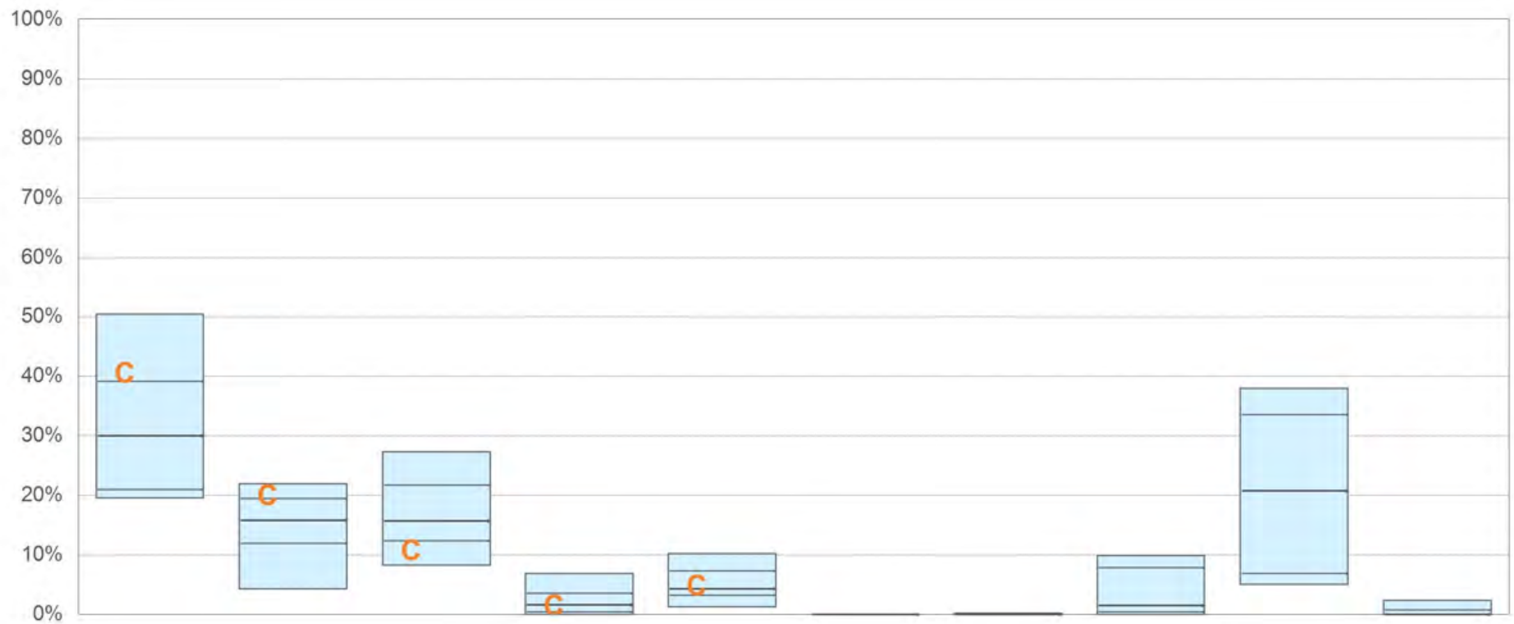
Total Returns of Master Trusts - Public : Plans > $10 Billion

Cumulative Periods Ending : June 30, 2020

Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
5th	12.29	1.92	5.58	7.39	8.02	8.22	9.28	7.66	8.60	9.87	6.71	8.46	8.54
25th	9.88	-2.23	2.54	3.78	5.43	6.77	8.12	6.84	7.92	9.28	6.27	8.03	8.47
50th	7.78	-3.45	1.58	2.37	4.23	5.90	7.62	6.34	7.45	8.70	5.98	7.67	8.16
75th	5.50	-4.27	0.00	0.80	3.65	5.28	7.08	5.76	6.77	7.81	5.55	7.48	8.01
95th	3.08	-5.73	-2.56	-1.14	2.84	4.35	6.06	4.98	6.06	7.45	5.06	6.96	7.95
No. Of Obs	39	39	39	38	37	37	37	37	37	35	32	26	16

	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
C Combined Funds	11.10 (13)	-2.47 (35)	3.25 (17)	4.29 (15)	5.84 (15)	7.36 (13)	9.28 (5)	7.37 (13)	8.51 (10)	9.87 (5)	6.40 (15)	8.21 (13)	8.61 (1)
# SBI Combined Funds Ind	10.60 (17)	-2.75 (40)	2.88 (20)	3.98 (17)	5.78 (15)	7.07 (13)	8.85 (10)	7.26 (15)	8.27 (17)	9.51 (14)	6.08 (43)	7.95 (33)	8.36 (37)
W SBI Domestic Equity Ta	22.03 (1)	-3.48 (50)	5.31 (8)	6.53 (8)	7.75 (8)	10.04 (1)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)	6.15 (37)	9.28 (1)	9.81 (1)
★ SBI Fixed Income Targe	2.90 (99)	6.14 (1)	6.33 (1)	8.74 (1)	8.30 (1)	5.32 (72)	3.88 (99)	4.30 (99)	3.96 (99)	3.82 (100)	5.14 (92)	5.36 (100)	6.02 (100)
■ S&P 500	20.54 (1)	-3.08 (45)	5.71 (1)	7.50 (1)	8.95 (1)	10.73 (1)	12.48 (1)	10.73 (1)	12.13 (1)	13.99 (1)	5.91 (56)	9.27 (1)	9.73 (1)
+ MSCI Wld Ex US (Net)	15.34 (1)	-11.49 (99)	-4.53 (99)	-5.42 (99)	-2.12 (99)	0.84 (99)	5.21 (99)	2.01 (99)	3.77 (99)	5.43 (100)	2.98 (100)	4.68 (100)	4.67 (100)
▲ Russell 3000	22.03 (1)	-3.48 (50)	5.31 (8)	6.53 (8)	7.75 (8)	10.04 (1)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)	6.15 (37)	9.28 (1)	9.81 (1)

Minnesota State Board of Investments
Asset Allocation of Master Trusts - Public : Plans > $20 Billion
Quarter Ending June 30, 2020



Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	50.49	22.00	27.37	6.87	10.20	0.02	0.20	9.92	37.97	2.39
25th	39.21	19.52	21.70	3.60	7.29	0.00	0.00	7.91	33.59	0.73
50th	29.99	15.85	15.68	1.65	4.32	0.00	0.00	1.47	20.73	0.00
75th	20.97	11.99	12.33	0.42	3.23	0.00	0.00	0.41	6.85	0.00
95th	19.60	4.35	8.26	0.00	1.29	0.00	0.00	0.00	5.02	0.00
C Combined Funds	40.09 (18)	19.51 (31)	10.24 (91)	0.00 (100)	4.32 (50)			1.47 (50)		2.39 (5)

Wilshire

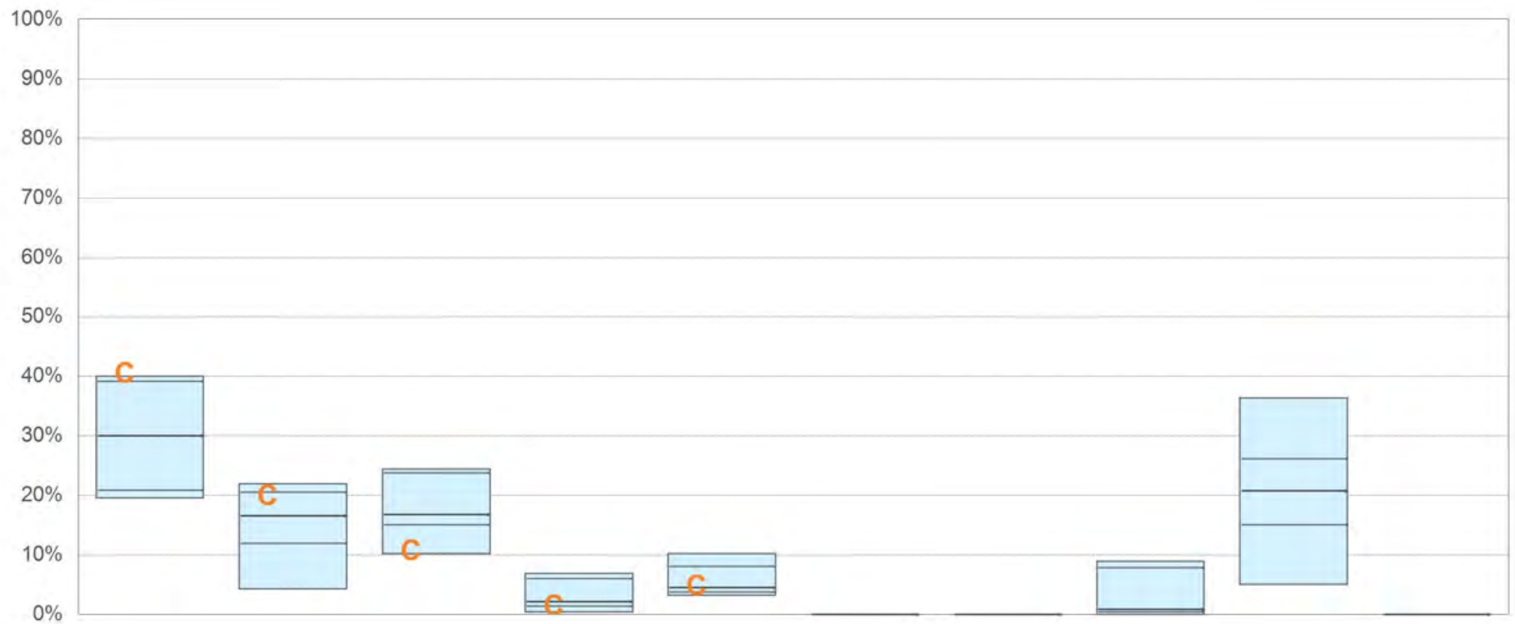
Minnesota State Board of Investments
Performance Comparison

Total Returns of Master Trusts - Public : Plans > $20 Billion

Cumulative Periods Ending : June 30, 2020

Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
5th	12.29	1.92	5.58	7.39	8.02	8.10	9.04	7.66	8.53	9.65	6.71	8.39	8.54
25th	9.87	-2.19	3.09	4.02	5.77	6.91	8.31	7.04	8.22	9.42	6.36	8.09	8.48
50th	7.43	-3.25	1.75	2.69	4.23	6.17	7.85	6.43	7.53	8.81	6.22	7.93	8.26
75th	5.50	-4.27	-0.25	0.78	3.66	5.40	7.13	5.96	7.04	7.89	5.72	7.50	8.13
95th	3.08	-5.73	-1.32	-0.67	2.90	4.71	6.32	5.33	6.06	6.42	5.03	7.04	8.03
No. Of Obs	25	25	25	24	24	24	24	24	24	23	20	16	11
C Combined Funds	11.10 (9)	-2.47 (45)	3.25 (21)	4.29 (20)	5.84 (20)	7.36 (15)	9.28 (1)	7.37 (15)	8.51 (10)	9.87 (1)	6.40 (18)	8.21 (15)	8.61 (1)
# SBI Combined Funds Ind	10.60 (17)	-2.75 (45)	2.88 (25)	3.98 (25)	5.78 (20)	7.07 (15)	8.85 (10)	7.26 (15)	8.27 (20)	9.51 (15)	6.08 (50)	7.95 (43)	8.36 (41)
W SBI Domestic Equity Ta	22.03 (1)	-3.48 (54)	5.31 (5)	6.53 (10)	7.75 (10)	10.04 (1)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)	6.15 (50)	9.28 (1)	9.81 (1)
★ SBI Fixed Income Targe	2.90 (99)	6.14 (1)	6.33 (1)	8.74 (1)	8.30 (1)	5.32 (75)	3.88 (99)	4.30 (99)	3.96 (99)	3.82 (100)	5.14 (87)	5.36 (100)	6.02 (100)
S&P 500	20.54 (1)	-3.08 (45)	5.71 (1)	7.50 (1)	8.95 (1)	10.73 (1)	12.48 (1)	10.73 (1)	12.13 (1)	13.99 (1)	5.91 (65)	9.27 (1)	9.73 (1)
+ MSCI World Ex US (N)	16.12 (1)	-11.00 (99)	-3.06 (99)	-4.80 (99)	-1.80 (99)	1.13 (99)	5.65 (99)	2.26 (99)	3.71 (99)	4.97 (100)	3.40 (100)		
Russell 3000	22.03 (1)	-3.48 (54)	5.31 (5)	6.53 (10)	7.75 (10)	10.04 (1)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)	6.15 (50)	9.28 (1)	9.81 (1)

Minnesota State Board of Investments
Asset Allocation of Master Trusts - Public : Plans > $50 Billion
Quarter Ending June 30, 2020

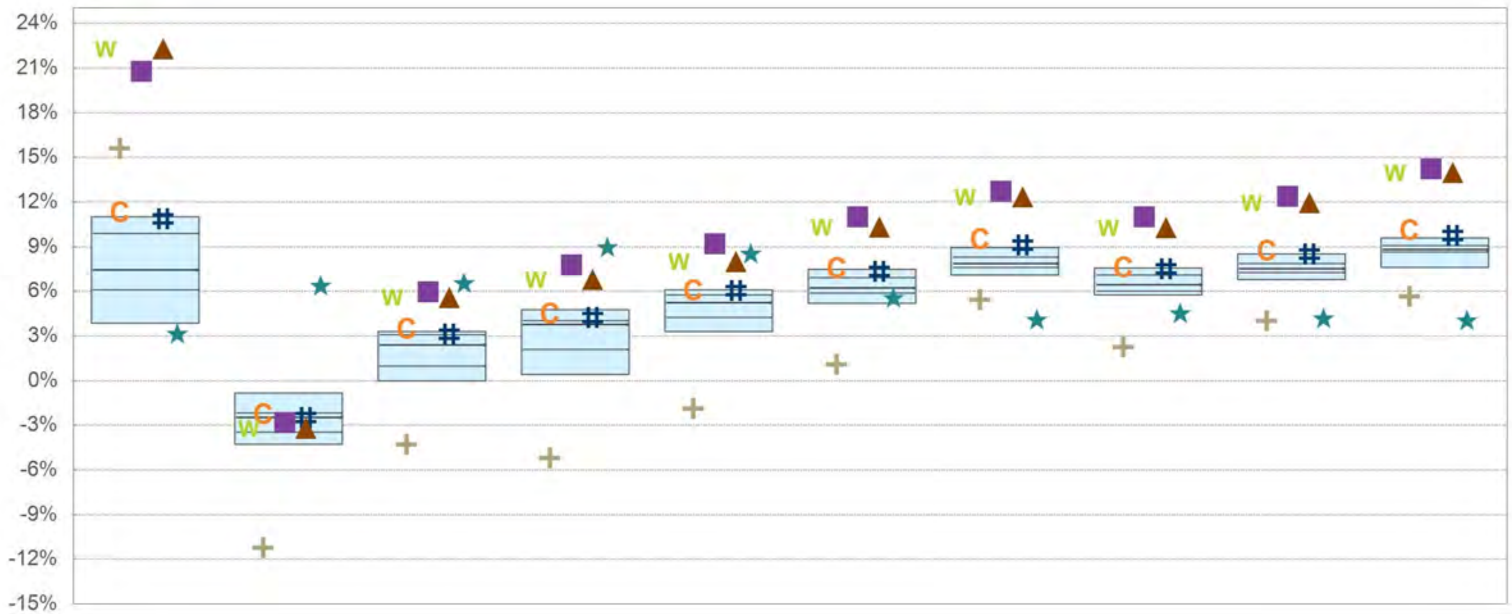


Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	40.09	22.00	24.43	6.87	10.20	0.01	-	8.91	36.35	-
25th	39.21	20.52	23.77	6.05	8.12	0.00	-	7.91	26.13	-
50th	29.99	16.58	16.77	2.16	4.55	0.00	-	0.82	20.73	-
75th	20.86	11.99	15.05	1.35	3.77	0.00	-	0.46	15.02	-
95th	19.60	4.35	10.24	0.48	3.23	0.00	-	0.00	5.02	-
C Combined Funds	40.09 (5)	19.51 (41)	10.24 (99)	0.00 (100)	4.32 (58)			1.47 (41)		2.39 (1)

Minnesota State Board of Investments
Performance Comparison

Total Returns of Master Trusts - Public : Plans > $50 Billion

Cumulative Periods Ending : June 30, 2020



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	11.02	-0.84	3.30	4.77	6.08	7.47	8.95	7.57	8.51	9.58
25th	9.87	-2.19	3.09	4.02	5.77	6.91	8.31	7.07	7.85	9.09
50th	7.43	-2.46	2.41	3.78	5.22	6.23	7.87	6.43	7.53	8.83
75th	6.08	-3.45	0.97	2.11	4.23	5.90	7.60	6.03	7.27	8.64
95th	3.84	-4.27	0.00	0.41	3.30	5.18	7.09	5.76	6.77	7.60
No. Of Obs	14	14	14	14	14	14	14	14	14	14

C Combined Funds	11.10 (1)	-2.47 (58)	3.25 (15)	4.29 (15)	5.84 (15)	7.36 (15)	9.28 (1)	7.37 (15)	8.51 (5)	9.87 (1)
# SBI Combined Funds Ind	10.60 (5)	-2.75 (58)	2.88 (25)	3.98 (25)	5.78 (15)	7.07 (15)	8.85 (5)	7.26 (15)	8.27 (15)	9.51 (5)
W SBI Domestic Equity Ta	22.03 (1)	-3.48 (75)	5.31 (1)	6.53 (1)	7.75 (1)	10.04 (1)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)
★ SBI Fixed Income Targe	2.90 (100)	6.14 (1)	6.33 (1)	8.74 (1)	8.30 (1)	5.32 (91)	3.88 (100)	4.30 (100)	3.96 (100)	3.82 (100)
■ S&P 500	20.54 (1)	-3.08 (58)	5.71 (1)	7.50 (1)	8.95 (1)	10.73 (1)	12.48 (1)	10.73 (1)	12.13 (1)	13.99 (1)
+ MSCI Wld Ex US (Net)	15.34 (1)	-11.49 (100)	-4.53 (100)	-5.42 (100)	-2.12 (100)	0.84 (100)	5.21 (100)	2.01 (100)	3.77 (100)	5.43 (100)
▲ Russell 3000	22.03 (1)	-3.48 (75)	5.31 (1)	6.53 (1)	7.75 (1)	10.04 (1)	12.10 (1)	10.03 (1)	11.68 (1)	13.72 (1)

TAB B

Executive Director's Administrative Report

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EXECUTIVE DIRECTOR'S ADMINISTRATIVE REPORT

DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Mansco Perry III

1. Reports on Budget and Travel

A report on the SBI's administrative budget for the fiscal year to date through June 30, 2020 is included as **Attachment A**.

2. Sudan Update

Each quarter, staff provides a report to the Board on steps taken to implement *Minnesota Statutes*, section 11A.243 that requires SBI actions concerning companies with operations in Sudan. Staff receives periodic reports from the Vigeo Eiris Conflict Risk Network (CRN) about the status of companies with operations in Sudan.

The SBI is restricted from purchasing stock in the companies designated as highest offenders by the CRN. Accordingly, staff updates the list of restricted stocks and notifies investment managers that they may not purchase shares in companies on the restricted list. Staff receives monthly reports from the SBI's custodian bank concerning SBI holdings of companies on the CRN list and writes letters as required by law.

According to the law, if after 90 days following the SBI's communication, a company continues to have active business operations in Sudan, the SBI must divest holdings of the company according to the following schedule:

- at least 50% shall be sold within nine months after the company appeared on the scrutinized list; and

- 100% shall be sold within fifteen months after the company appeared on the list.

In the second quarter, there were no restricted companies on the SBI divestment list, therefore no restricted shares to sell.

On June 16, 2020, staff sent a letter to each international equity manager and domestic equity manager containing the most recent restricted list and the list of stocks to be divested in compliance with Minnesota law.

3. Iran Update

Each quarter, staff provides a report to the Board on steps taken to implement *Minnesota Statutes*, section 11A.244 that requires SBI actions concerning companies with operations in Iran.

SBI receives information on companies with Iran operations from Institutional Shareholder Services, Inc. (ISS). Staff receives monthly reports from the SBI's custodian bank concerning SBI holdings of companies on the restricted list and writes letters as required by the law.

According to the law, if after 90 days following the SBI's communication a company continues to have scrutinized business operations, the SBI must divest all publicly traded securities of the company according to the following schedule:

- at least 50% shall be sold within nine months after the company appeared on the scrutinized list; and

- 100% within fifteen months after the company appeared on the scrutinized list.

In the second quarter, there were no restricted companies on the SBI divestment list, therefore no restricted shares to sell.

On June 16, 2020, staff sent a letter to each international equity manager, domestic equity manager and fixed income manager containing the most recent restricted list and the list of companies to be divested in compliance with Minnesota law.

4. Litigation Update

SBI legal counsel will give a verbal update on the status of any litigation at the meeting.

ATTACHMENT A

STATE BOARD OF INVESTMENT
FISCAL YEAR 2020 ADMINISTRATIVE BUDGET REPORT
FISCAL YEAR TO DATE THROUGH JUNE 30, 2020

ITEM	FISCAL YEAR 2020 BUDGET	FISCAL YEAR 2020 6/30/2020
PERSONNEL SERVICES		
FULL TIME EMPLOYEES	$ 5,559,000	$ 4,404,727
PART TIME EMPLOYEES	0	0
MISCELLANEOUS PAYROLL	125,000	29,315
SUBTOTAL	**$ 5,684,000**	**$ 4,434,042**
STATE OPERATIONS		
RENTS & LEASES	285,000	280,586
REPAIRS/ALTERATIONS/MAINTENANCE	20,000	13,661
PRINTING & BINDING	12,000	7,300
PROFESSIONAL/TECHNICAL SERVICES	260,000	127,146
COMPUTER SYSTEMS SERVICES	120,000	122,668
COMMUNICATIONS	25,000	16,762
TRAVEL, IN-STATE	1,000	675
TRAVEL, OUT-STATE	125,000	66,578
SUPPLIES	30,000	37,741
EQUIPMENT	60,000	47,677
EMPLOYEE DEVELOPMENT	125,000	99,061
OTHER OPERATING COSTS	125,000	113,562
INDIRECT COSTS	300,000	290,202
SUBTOTAL	**$ 1,488,000**	**$ 1,223,618**
TOTAL ADMINISTRATIVE BUDGET	**$ 7,172,000**	**$ 5,657,661**

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TAB C

Update on Resolution Concerning Reduction of Investments Associated with Thermal Coal Production

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EXECUTIVE DIRECTOR'S REPORT

DATE: August 19, 2020

TO: Members, State Board of Investment
Members, Investment Advisory Council

FROM: SBI Staff

SUBJECT: Update on Resolution Concerning Reduction of Investments Associated with Thermal Coal Production

At its May 29, 2020 meeting, the Board approved a resolution requiring removal from the Combined Funds authorized investments list any publicly traded company deriving more than 25% of its revenue from thermal coal production (exploration/mining). See **Attachment A** for a copy of the SBI Resolution Concerning Reduction of Investments Associated with Thermal Coal Production.

SBI staff have worked with thermal coal screening software in coordination with Meketa Investment Group to identify companies that will be restricted under the resolution. SBI staff have identified more than 40 companies which meet our criteria and will provide external managers with a list of restricted companies with direction that managers not hold or purchase additional securities in those companies. Of the identified companies, there are ten companies in the Combined Funds portfolio as of June 30 that will be removed from the portfolio no later than December 31, 2020. The SBI will provide managers with an updated list on an annual basis. The SBI staff will make similar changes to the authorized investments in the SBI's Non-Retirement portfolio.

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MINNESOTA STATE BOARD OF INVESTMENT

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RESOLUTION OF THE MINNESOTA STATE BOARD OF INVESTMENT CONCERNING REDUCTION OF INVESTMENTS ASSOCIATED WITH THERMAL COAL PRODUCTION

WHEREAS, on February 26, 2020, the State Board of Investment ("MSBI") adopted a resolution regarding Environmental, Social, and Governance ("ESG") initiatives to advance the MSBI's consideration of ESG risks and opportunities in its investment portfolio;

WHEREAS, the resolution called upon the MSBI Executive Director to, among other things, evaluate options for reducing the MSBI's long-term carbon risk exposure;

WHEREAS, the MSBI Executive Director has, with the assistance of MSBI staff and the Board's investment consultant, Meketa Investment Group, reviewed the risks associated with publicly traded investments in thermal coal extraction and production companies;

WHEREAS, such review demonstrates that companies which derive a substantial portion of revenue from thermal coal extraction and production face material declining market values and risks of stranded assets due to demand for more cost effective and efficient forms of energy production;

WHEREAS, the MSBI Executive Director has determined that removing such companies as authorized investments creates a manageable tracking error with respect to the MSBI's benchmark indices and would be prudent under the circumstances applicable to the thermal coal industry; and

WHEREAS, a number of other institutional public pension plans such as the California State Teachers Retirement System, California Public Employees Retirement System, New York City Pension System, and San Francisco Employees' Retirement System have previously removed such companies from their lists of authorized investments;

THEREFORE, the MSBI Executive Director requests that the Board authorize the MSBI Executive Director to take appropriate action.

NOW THEREFORE BE IT RESOLVED THAT the MSBI Executive Director be authorized to take the following actions:

1. The MSBI Executive Director shall implement a procedure, consistent with all applicable fiduciary duties, to remove publicly traded companies which derive 25% or more of their revenue from the extraction and/or production of thermal coal as authorized investments in the MSBI's Combined Funds investment

portfolio. By the next regularly scheduled Board meeting, the MSBI Executive Director shall identify such companies in the Combined Funds portfolio and provide instruction to the MSBI's investment managers to remove identified companies. MSBI's investment managers must remove identified companies from the Combined Funds investment portfolio in a prudent and expeditious manner, but no later than December 31, 2020;

2. The MSBI Executive Director shall, beginning with the Board's regularly scheduled third-quarter 2020 meeting and continuing each quarter thereafter, report to the Board on the status of any action authorized by this resolution; and

3. The MSBI Executive Director is authorized to make contractual or investment guideline changes, and take such further action he deems necessary to implement the resolution.

Adopted this 29th day
of May, 2020

DATE: May 29, 2020

BY: Mansco Perry III

Mansco Perry III
Executive Director and Chief Investment Officer
Minnesota State Board of Investment

TAB D

Response to Resolution Concerning Management of Combined Funds Asset Allocation and Liquidity

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INVESTMENT ADVISORY COUNCIL REPORT

DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Response to Resolution Concerning Management of Combined Funds Asset Allocation and Liquidity

At the May 29, 2020 meeting of the Minnesota State Board of Investment (MSBI), the Board adopted a Resolution Concerning the Management of the Combined Funds Asset Allocation and Liquidity ("Resolution"). The Investment Advisory Council reviewed Staff's response to the Resolution at its August 17, 2020 meeting and endorses the Staff's response including their implementation plan and recommendation to retain appropriate investment managers.

Following are the actions the Board authorized the MSBI Executive Director to take in the Board's Resolution accompanied with a summary of the Staff's implementation plan for each action. (Please note that the description of each Action item may have been slightly altered from the original resolution for purposes of clarity.)

A copy of the Resolution appears as **Attachment A** on **page 11** of this tab.

Action 1:

The Fixed Income Program shall be restructured to include a 20% combined Cash plus Short Duration Treasury Ladder allocation; a combined 40% Core/Core-plus and Return Seeking Bond allocation and a 40% Treasury Protection allocation. The Executive Director shall develop and implement a Total Fixed Income Program Benchmark and appropriate benchmarks for each of the three segments.

Implementation Plan

Short Duration Treasury Ladder

The new allocation to the Short Duration Treasury Ladder portfolio is intended to supplement the Combined Funds' Cash allocation to ensure that we have sufficient liquidity to meet ongoing pension benefit payments and other obligations. The portfolio will be structured to maintain up to 18 months of benefit payments in a high-quality laddered maturity portfolio, with portfolio maturities regularly swept into cash to provide liquidity for scheduled benefit payments. The liquidity cushion provided by the Short Duration Treasury Ladder portfolio will allow for increased flexibility and efficiency in the timing of sales of long-term investments and should help the portfolio better navigate periods of market dislocation, such as we observed in March 2020, in Q4 2018 and during the 2008-09 GFC period. At the same time, employing a laddered portfolio structure is anticipated to provide a modest return advantage over holding the excess liquidity in cash/STIF as a result of the term premium investors receive for extending maturity beyond overnight liquidity. The Short Duration Treasury Ladder portfolio will be managed by current MSBI Treasury portfolio managers. We anticipate that the benchmark will be reflective of the portfolio's composition.

Return-Seeking Fixed Income

The Core Fixed Income allocation will be restructured to include both Core/Core plus and Return Seeking Fixed Income managers will be structured to mitigate interest rate risk with a greater focus on generating returns. The MSBI's Core Fixed Income Program has been very successful, generating consistent excess returns above its benchmark, the Bloomberg Barclays Aggregate Index. However, with the addition of the Treasury Protection allocation in 2017 and the new Short Term Treasury Ladder portfolio, coupled with a steady increase in the Treasury sector weighting within the Bloomberg Barclays Aggregate itself due to increased Treasury issuance, both the allocation to U.S. Treasuries within the Total Fixed Income Program and the portfolio's overall interest rate risk have increased over time. At the same time, the Program's larger allocation to Treasuries, while beneficial as a risk-off and deflation hedge, has resulted in reduced long-run portfolio expected returns, particularly as interest rates have declined to historically low levels.

As a result, we believe that it is appropriate to both increase the active risk budget for the portfolio's current core bond managers and to introduce new allocations to opportunistic fixed income sectors by adding additional strategies and managers to the total portfolio. The twin goals of these changes are: 1) to mitigate interest rate risk through a greater emphasis on sectors with less sensitivity to changes in prevailing interest rates; and 2) to provide an opportunity to enhance the overall performance of the total fixed income portfolio.

As part of its ongoing due diligence into asset allocation topics, Staff has conducted extensive research on the opportunistic sectors of the fixed income market. Leveraging additional research and long-run capital markets assumptions from the Board's general consultant, Staff conducted a series of portfolio optimization studies to determine the specific market sectors with the most potential for both enhanced returns and diversification relative to the Bloomberg Barclays Aggregate Index and Bloomberg Barclays Treasury 5+ Year Index. Based on this analysis, we plan to introduce new mandates within the high yield corporate bond, securitized credit, emerging markets debt, and opportunistic multi-asset strategies to round out the fixed income manager roster. We believe this approach will enable the Fixed Income Program to provide a balanced contribution to overall total fund performance. The table below summarizes the long-term return and risk assumptions staff used in its analysis.

Long-Term Capital Markets Assumptions as of Q2 2020

Asset Class	Expected Return	Expected Volatility	Implied Sharpe Ratio
Cash	0.5%	1.0%	--
Core U.S. Fixed Income	1.8%	4.0%	0.33
Long Duration U.S. Gov't	1.4%	9.0%	0.10
High Yield Corporate	5.0%	12.0%	0.38
High Yield Bank Loans	4.9%	7.0%	0.63
Structured Credit	4.5%	6.0%	0.67
Emerging Markets Debt (Blended)	4.7%	12.7%	0.33
Multi-Asset Credit	5.4%	9.5%	0.52

Source: AON Q2 2020 Capital Markets Assumptions, eVestment, SBI Staff calculations

Staff is recommending the addition of six new Return Seeking Fixed Income managers at this time. Detailed information regarding each of these managers is presented in Appendix A.

Treasury Protection Portfolio

The primary role of the Treasury Protection portfolio is to provide a hedge against an equity drawdown and to protect the portfolio against deflation. However, we recognize that as interest rates globally have declined to historically low levels, it is prudent that we be cognizant of the adverse impact that a potential rise in interest rates – whether due to a normalization in the level of global growth, the reemergence of inflation, or both – could have on rate sensitive bonds including longer-maturity Treasuries.

Following a review of the Treasury Protection portfolio's investment policy, Staff believes that the portfolio's investment policy and current strategy benchmark, Bloomberg Barclays Treasury 5+ Year Index, remain appropriate given current market conditions. However, Staff believes that, should prevailing interest rates decline further and approach or breach the zero-bound, it may become appropriate to adjust the portfolio's target duration (interest rate exposure) and term structure (maturity profile) in order to reflect the prospect of diminished marginal effectiveness of Treasury duration as a risk-off hedge.

Total Fixed Income Program Policy Benchmark

To reflect the changing composition of the Fixed Income Program, Total Fixed Income Program benchmark will be a weighted mix of the benchmarks used for each of the three segments of the portfolio. As noted in the above section, the benchmark for the Treasury Protection allocation will remain as the Bloomberg Treasury 5+ Year Index. Both the Core/Core-plus and Return Seeking Bond allocation and the Cash plus Short Duration Treasury Ladder will be benchmarked against custom blended benchmarks designed to reflect the underlying strategy mix of each sub-asset class. The proposed new Fixed Income Program benchmark is summarized below:

Sub-Asset Class	Benchmark	Benchmark Weighting
Treasury Protection Portfolio	Bloomberg Barclays Treasury 5+ Year Index	40%
Core/Core-Plus Bonds and Return Seeking Bonds	Custom Blended Benchmark*	40%
Cash + Short Duration Treasury Ladder	Custom Blended Benchmark*	20%
Total Portfolio	**Weighted Benchmark**	**100%**

** Sub-asset class benchmarks will be reflective of the weighted average of the portfolio's underlying strategies utilized within each sub-asset class*

Action 2:

The Total Combined Funds allocation to the Fixed Income Program shall be modified to 25%, comprised of the current 20% allocation to Core Bonds and Treasuries, the current 2% allocation to Cash, and a transfer of 3% from Public Equities. The resulting Public Equities allocation will be reduced from 53% to 50%. Additionally, the Public Equity Program will undergo several modifications described below.

Implementation Plan

As outlined above, the Fixed Income Program will be modified by the transfer of the Cash allocation (2% of the Total Combined Funds) to the Fixed Income Program and the establishment of the Short Term Treasury Ladder portfolio to provide liquidity. In addition, the Fixed Income target allocation will be increased by a further three (3) percentage points, funded from a transfer from Public Equities, resulting in a total Fixed Income Program target allocation of 25%.

In conjunction with the reduction in the Public Equity target allocation from 53% to 50%, the composition of the Public Equity Program will be updated as follows:

<u>Uninvested Portion of the Private Markets allocation</u>

The portfolio allocation representing the Uninvested Portion of the Private Markets allocation, currently invested in the Public Equity portfolio, will be shifted to a separate portfolio with its own policy benchmark. Currently, these dollars are effectively commingled within the Public Equity portfolio. Operationally, this approach causes some difficulty in managing the Combined Funds allocation vis-à-vis the policy targets as the difference in valuations between the Public Equity and Private Markets portfolios is constantly changing, requiring more frequent portfolio rebalancing activity.

As an illustration, below is the Combined Funds policy allocation as of June 30, 2020 (reflects the new allocation targets). The portfolio's total allocation to Public Equity of 59% represents the combination of the Public Equity asset class target of 50% *plus* an amount equal to the Uninvested Portion of the Private Markets allocation of 9% (Private Markets policy target of 25% less Private Markets actual invested market value of 16% = 9%).

	Policy Target	Actual	Adj. for Uninvested Private Mkts
Public Equity	50%	59%	9%
Fixed Income	25%	25%	
Private Markets	25%	16%	-9%
	100%	100%	

Under the proposed modification, the 9% of Public Equities representing the Uninvested Portion of the Private Markets allocation would be transferred into a separate portfolio and would be managed separately. The resulting policy allocation would be as follows:

	Policy Target	Actual	Adj. for Uninvested Private Mkts
Public Equity	50%	50%	0%
Fixed Income	25%	25%	
Private Markets	25%	25%	0%
Invested		*16%*	
Univested Portion		*9%*	
	100%	100%	

The specifics of the portfolio implementation plan for the Uninvested Portion of the Private Markets allocation are addressed in Action 4, paragraphs (a) and (b).

Public Equity Policy Benchmark

The composition of the Public Equity Program will be modified to reestablish a market-capitalization weighted allocation within domestic equities between Large Cap and Small Cap stocks, and within International Equities between developed markets and emerging markets. The resulting Total Public Equity Program benchmark will be a mix of the appropriate broad market U.S., International Developed and Emerging Market benchmarks, as summarized below:

Index	Sub-Asset Class	Current Benchmark	Proposed Benchmark
Domestic Equity			
Russell 3000	All Cap US Equity		67.0%
Russell 1000	Large Cap US Equity	60.3%	
Russell 2000	Small Cap US Equity	6.7%	
Total Domestic Equity		67.0%	67.0%
International Equity			
MSCI ACWI ex US (net)	Int'l Developed + Emerging Mkts		33.0%
MSCI World ex US (net)	International Developed Mkts	24.75%	
MSCI EM (net)	Emerging Markets	8.25%	
Total International Equity		33.0%	33.0%

Total Public Equity Benchmark (Proposed):

67% Russell 3000 Index and 33% MSCI ACWI ex US Index (net)

Concurrent with these changes, we plan to make several changes designed to improve the performance results of the active portion of the Public Equity program. First, we plan to modify mandate assignments and benchmarks for several current managers in order to better align with the managers' strengths. Additionally, we plan to adjust the active-vs.-passive mix for each sub-asset class within public equities to optimize the distribution of our active risk budget.

As part of this structural change, we plan to hire three global equity managers. Staff has been following the global equity space for some time and believes that the opportunistic, "go anywhere" approach of global mandates can provide managers with the freedom to seek out and invest in a portfolio of best ideas to drive investment returns over time. Moreover, Staff supports the notion that organizing investment mandates by geographic boundaries is out-of-step with the increasingly globalized nature of business and consumer demand for goods and services. The new global mandates will be benchmarked against the MSCI ACWI Index (net). At the policy benchmark level, Staff expects that the new global mandates will be reflective of the overall public equity asset class. As a result, the proposed policy benchmark does not include an explicit weighting to the MSCI ACWI Index (net) at this time.

Detailed information regarding the three global equity managers can be found in Appendix B.

Action 3:

The current policy for the upper limit for Private Markets Market Value plus Unfunded Commitments shall be temporarily increased to a maximum of 45% from 35% currently, and MSBI staff must present a proposed new permanent recommendation for the management of Unfunded Commitments by the end of Fiscal Year 2021. The temporary policy also will maintain the current target Market Value level of 25%, and will allow the portfolio to hold private market investments up to the current statutory maximum Market Value level of 35%.

Implementation Plan

In the early 1990's, the MSBI began to recognize the need to account for the fact that when the organization makes private market commitments, it is critical to closely monitor both the market value of invested and appreciated capital, and the level of affiliated unfunded commitments. The affiliated unfunded commitments represent a future obligation and have a significant impact on total portfolio liquidity. It should be acknowledged that growing from our current Private Markets allocation of ~16% to our target allocation of 25% may take a significant period of time and is largely dependent on the growth or decline of other portfolio assets as well as the MSBI Private Markets commitment pace. Increasing from the current allocation to the target allocation will require that the organization sustain a level of unfunded commitments in addition to its invested market value target. Managing this task is one of the most difficult aspects of portfolio management that a plan sponsor faces, given the impact on total portfolio liquidity.

Growing and ultimately maintaining our Private Markets allocation requires appropriate latitude regarding future commitments. Once a target market value level is achieved, it is critical to maintain a level of unfunded commitments that will ensure appropriate levels of invested market value going forward, as the portfolio experiences capital calls, distributions, and changes in unrealized market value. The temporary policy constrains Private Markets market value plus unfunded commitments to a maximum of 45% of the total portfolio. Staff is considering and will recommend a sum certain as part of the permanent policy recommendation in FY21; it is anticipated that the 45% constraint may need to be increased to allow for appropriate levels of unfunded commitments to grow the portfolio from current to target levels. However, Staff recognizes the necessity that the growth in the market value and unfunded commitments of the Private Markets program be managed so as not to impair the viability of the other assets in the portfolio.

Action 4:

The Executive Director is authorized to conduct further study and to take such steps as necessary to implement the policy changes outlined above as well as the following additional investment strategy considerations which will allow enhanced risk management of the investment program and improve operational efficiencies:

a. the segregation of the Uninvested Portion of the Private Markets/Alternatives Program from the dedicated Public Equities Program, including the development of an investment strategy using physical securities and/or an overlay program fully collateralized by cash. For clarity, the uninvested amount referenced equals the amount by which the actual value of the Private Markets allocation lags the target Private Markets allocation;

b. the use of cash overlay strategies to facilitate rebalancing and enhance portfolio liquidity; and

c. the use of a currency overlay strategy to more effectively manage the portfolio's non-dollar exposure.

Implementation Plan

Uninvested Portion of the Private Markets Allocation

Currently, the Uninvested Portion of the Private Markets allocation is invested the Public Equity portfolio and the assets are effectively commingled with the dedicated Public Equity allocation. (In the past, the Uninvested Portion of the Private Markets allocation had been invested in the Fixed Income portfolio.) Operationally, the commingled approach causes some difficulty in managing the Combined Funds allocation vis-à-vis the policy targets. The valuation delta between the Public Equity and Private Markets portfolios is constantly in transition, thereby requiring more frequent portfolio rebalancing activity. We believe that the most prudent approach is to manage the uninvested private market dollars separately by segregating these assets from the dedicated asset class program.

The new segregated portfolio representing the uninvested private market dollars would consist of a combination of physical assets and a fully collateralized by cash overlay program (discussed immediately below). Such an approach would reduce the transitions necessary to fund commitment drawdowns. While the overlay may utilize both equity and interest rate derivatives to replicate desired market exposures, at this time Staff believes that the physical portion of this portfolio should be invested in public equities.

Cash Overlay

Staff is recommending the SBI retain a Cash Overlay Manager. As noted directly above, the initial mandate for this manager will be to equitize a portion of the uninvested private market dollars held in cash for liquidity purposes. A second phase for this manager will be to work closely with Staff to implement a broader use of cash overlay strategies (fully collateralized) to facilitate rebalancing the dedicated Public Equity and Fixed Income portfolios back to policy target, with the potential of reducing transition costs associated with the movement of the physical assets. **Detailed information regarding the Cash Overlay Program and Manager is included in Appendix C.**

Currency Overlay

Staff is recommending the SBI retain a Currency Overlay Manager to reinstitute a currency overlay strategy in conjunction with our international assets. This strategy is intended primarily for use within Public Equities, but may be applied to other asset classes which may have non-dollar exposure in the future. The strategy is intended to be used primarily as a risk management tool for purposes of hedging the SBI's non-dollar exposure. After the implementation of this strategy, Staff will explore the utilization of active currency strategies for purposes of providing additional returns to the Combined Funds. **Detailed information regarding the Currency Overlay Program and Manager is included in Appendix D.**

<u>Action 5:</u>

The MSBI Executive Director is authorized to make contractual or investment guideline changes, and take such further action he deems necessary to implement the resolution.

Implementation Plan

In order to implement the above actions, we will utilize current managers and hire new managers. In the case of current managers, there will be modifications made to the manager contracts, guidelines, and benchmarks to align with changes to manager strategy assignments. Manager benchmarks will be changed to the appropriate benchmark that reflects the manager's updated mandate. Asset class benchmarks will reflect the appropriate mixture of broad market indices best representing the mixture of assets within the asset class as determined by Staff.

A note about Benchmarks:

Both the Executive Director and Staff have come to believe that the framework which the SBI has historically used to construct policy benchmarks for the purposes of performance evaluation for the overall portfolio and its component pieces should be reassessed. Specifically, we believe that our performance evaluation metrics may inadvertently place too much focus on short-term performance results. Staff plans to bring forward for discussion a menu of policy benchmark concepts and evaluation parameters intended to increase focus on longer-term performance results and to better assess portfolio performance relative to its strategic goals. The Executive Director intends to conduct this discussion with the Board and IAC at a future meeting and seek final resolution by the end of Fiscal Year 2021.

<u>Action 6:</u>

The Executive Director shall bring to the Investment Advisory Council and Board recommendations for any additional managers and vendors necessary to expeditiously implement these strategies.

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's Response to the Resolution Concerning Management of Combined Funds Asset Allocation and Liquidity including its proposed implementation plan including the recommendation to retain the managers listed in paragraphs a) through d) below, and that the SBI authorize the Executive Director, with assistance from SBI's legal counsel, to negotiate fees and execute a contract with each firm.

a) **the following six Return Seeking Fixed Income investment managers for the Fixed Income portfolio:**

- ***Ashmore Investment Management – Emerging Markets Debt***
- ***Kohlberg, Kravis, and Roberts – High Yield Debt***
- ***Oaktree Capital – High Yield Debt***
- ***Payden & Rygel – Multi-Asset Credit***
- ***Prudential Global Investment Management – Multi-Asset Credit***
- ***TCW Group – Securitized Credit***

b) the following three Global Equity investment managers for the Public Equity portfolio:

- ***Ariel Investments, LLC***
- ***Baillie Gifford & Co***
- ***Martin Currie Inc.***

c) The following Cash Overlay Manager:

- ***NISA Investment Advisors, LLC***

d) The following Currency Overlay Manager:

- ***Record Currency Management***

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ATTACHMENT A

MINNESOTA STATE BOARD OF INVESTMENT

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RESOLUTION OF THE MINNESOTA STATE BOARD OF INVESTMENT CONCERNING MANAGEMENT OF COMBINED FUNDS ASSET ALLOCATION AND LIQUIDITY

WHEREAS, the Minnesota State Board of Investment (MSBI) places the highest importance on ensuring sufficient portfolio liquidity to meet ongoing benefit payment obligations;

WHEREAS, the MSBI considers the makeup of both the fixed income portfolio and the total portfolio in attempting to achieve attractive rates of return at acceptable levels of risk;

WHEREAS, the MSBI recognizes the importance of monitoring portfolio illiquidity in the form of invested private markets value and unfunded commitments;

WHEREAS, the MSBI recognizes the efficiencies in the form of cost savings and timeliness inherent in utilizing an overlay strategy in lieu of instructing retained investment managers to conduct rebalancing transactions on a regular basis;

WHEREAS, the MSBI recognizes that the unusual financial market conditions stemming from the ongoing COVID-19 crisis have highlighted the need for improved flexibility in terms of investment strategy implementation and liquidity management; and

WHEREAS, the Executive Director has, with the assistance of MSBI staff and its general consultants, determined that changes to the asset allocation policy of the Combined Funds portfolio are prudent in response to financial market conditions;

THEREFORE, the MSBI Executive Director requests that the Board authorize the MSBI Executive Director to take appropriate actions.

NOW THEREFORE BE IT RESOLVED that the MSBI Executive Director be authorized to take the following actions:

1. The Fixed Income Program shall be restructured to include a 20% combined Cash plus Short Duration Treasury Ladder allocation; a 40% Treasury Protection allocation; and a combined 40% Core/Core-plus and Return Seeking Bond allocation and the Executive Director shall develop and implement a Total Fixed Income Program Benchmark comprised of an appropriate benchmark for each of the three segments;

2. The Total Combined Funds allocation to the Fixed Income Program shall be modified to 25%, which will be comprised of the current 20% allocation to Core Bonds and Treasuries, the current 2% allocation to Cash, and a transfer of 3% from Public Equities;

3. The current policy for the upper limit for Private Markets Market Value plus Unfunded Commitments shall be temporarily increased to a maximum of 45% from 35% currently, and MSBI staff must present a proposed new permanent recommendation for the management of Unfunded Commitments by the end of Fiscal Year 2021. The temporary policy also will maintain the current target Market Value level of 25%, but would allow the portfolio to hold private market investments up to the current statutory maximum Market Value level of 35%;

4. The Executive Director is authorized to conduct further study and to take such steps as necessary to implement the policy changes outlined above as well as the following additional investment strategy considerations:

   a. the segregation of the Unallocated Investment funds associated with the Private Markets/Alternatives Program from the dedicated Public Equities Program, including the development of an investment strategy using physical securities and/or a combination an overlay program fully collateralized by cash;

   b. the use of cash overlay strategies to facilitate rebalancing and enhance portfolio liquidity; and

   c. the use of a currency overlay strategy to more effectively manage the portfolio's non-dollar exposure;

5. The MSBI Executive Director is authorized to make contractual or investment guideline changes, and take such further action he deems necessary to implement the resolution; and

6. The Executive Director shall bring to the Investment Advisory Council and Board recommendations for any additional managers and vendors necessary to expeditiously implement these strategies.

Adopted this 29th day
of May, 2020

DATE: May 29, 2020

BY: Mansco Perry III

Mansco Perry III
Executive Director and Chief Investment Officer
Minnesota State Board of Investment

APPENDIX A

Fixed Income Manager Recommendations

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Table of Contents

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Manager:	Ashmore Investment Management
Strategy:	EM Blended Debt Strategy
Benchmark:	50% JPM EMBI Global, 50% JPM GBI-EM Global
Role in SBI Portfolio:	Return-Seeking Fixed Income, Emerging Market Debt

Organization

Ashmore is an Emerging Markets asset manager that began in 1992 within a division of Australia and New Zealand Banking Group called ANZ Emerging Markets Fund Management Limited (EMFM). In 1999, EMFM's senior management led a management buyout of the business and upon completion became Ashmore Investment Management Limited (AIML). Ashmore Group plc, the parent company of Ashmore, listed on the London Stock Exchange in October 2006. Ashmore's sole business is investment management and the firm has no affiliation with other outside firms. The common stock has 35 million shares outstanding and 265 institutional owners as of 3/31/20; 36% of the stock is held by insiders, almost entirely by CEO and founder Mark Coombs (35%).

Headquartered in London, Ashmore has 310 employees globally and oversees approximately $76.8 billion in assets as of March 31, 2020. Ashmore has a presence in China, Columbia, India, Indonesia, Ireland, Japan, Peru, Saudi Arabia, Singapore, UAE, United Kingdom and the United States. The firm has been investing in Emerging Markets for over 25 years, beginning with its External Debt Hard Currency strategy (November 1992). Ashmore launched the EM Blended Debt strategy in July 2003, and with the increased availability of investable local currency markets, began its EM Local Currency Bonds strategy in September 2005. Ashmore's dedicated EM Corporate Debt strategy commenced in November 2007.

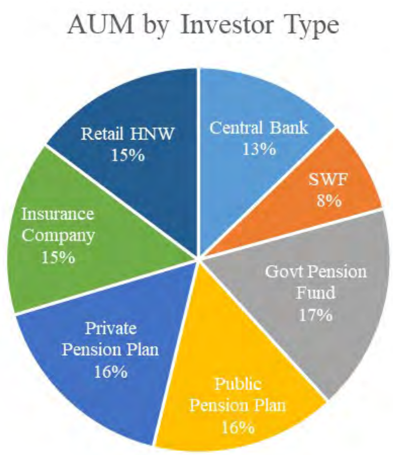
Assets

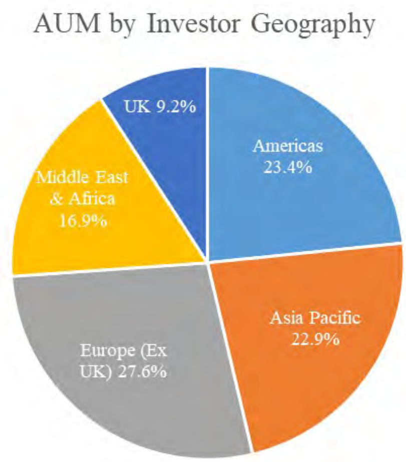
Ashmore manages $76.8 Billion in AUM as of 3/31/2020 across eight themes that offer global emerging markets or regional/country sub-themes:

Asset Class	AUM (US$ Billions)
External Debt	$15.9
Local Currency Debt	$17.7
Corporate Debt	$8.7
Blended Debt	$21.5
Equities	$3.4
Overlay/Liquidity	$7.9
Alternatives	$1.4
Multi-Asset	$0.3
Total	**$76.8**

Overall, Ashmore has over 1000 non-retail accounts, including 300 tax-exempt accounts which in total exceed $40 billion. There are 17 accounts in the Blended Debt Total Return strategy totaling $11 billion in assets as of March 31, 2020, including an offshore SICAV fund with $3.3 billion in assets as of 3/31/20. The largest tax exempt institutional separate account in the Blended Debt

Total Return strategy is a non-US Government sponsored pension plan, followed by four public pension plans, all with account balances exceeding $500mm. Ashmore's clients are primarily institutions, and are well diversified by investor type and geography:





Strategy Profile

The Blended Debt strategy was founded in 2007 based on the firm's experience that no one EMD theme consistently outperforms year after year, and that tactical rotation between U.S. dollar-denominated external government debt, hard currency corporate debt and local currency sovereign debt offers the widest opportunity to add value for client portfolios. To support trading and sector rotation, additional emphasis is placed on liquidity through adherence to minimum credit quality ratings for corporate debt and a focus on establishing meaningful position sizes in the most liquid issues within a particular sovereign or corporate credit. Over time, the team seeks to diversify sources of value across macro/theme allocation (40%), country/credit selection (40%) and currency allocation (20%). The portfolio typically holds 300-500 securities.

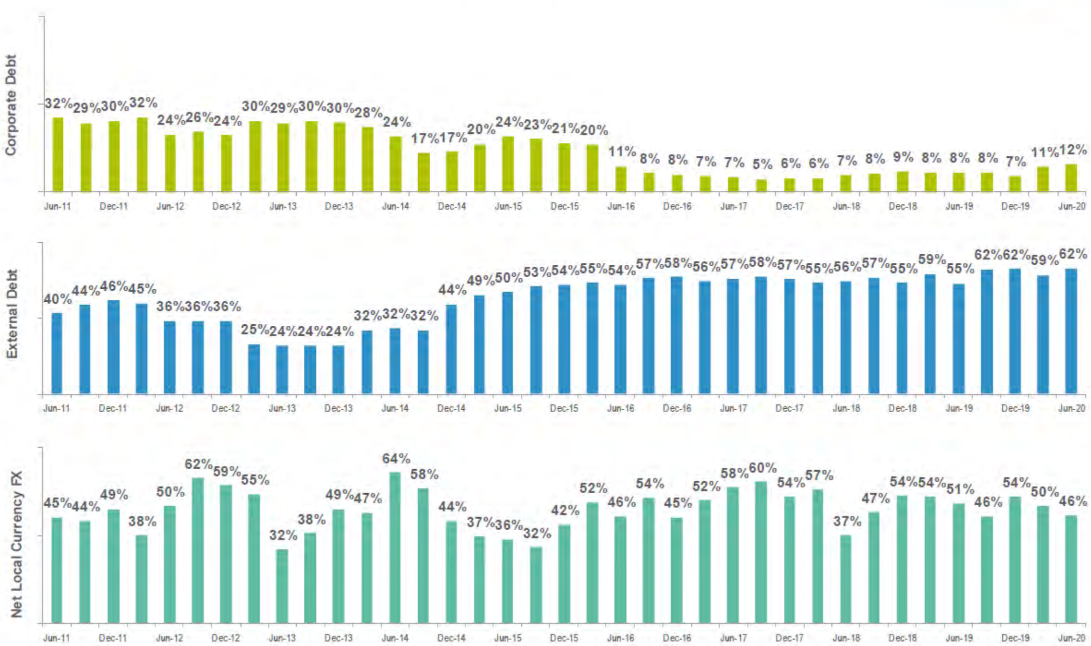
EM Blended Debt Strategy Characteristics as of 3/31/20

Portfolio Characteristics		
Credit Quality	Portfolio	Benchmark
Modified Duration	6.34	5.22
Yield to Maturity	6.34%	3.94%
Avg Life	11.4	8.14
Avg Quality	BB	BBB

Credit Quality	Portfolio	Benchmark	Diff
AA	3.2	7.2	-4.0
A	9.7	21.0	-11.3
BBB	33.5	37.3	-3.8
BB	21.3	20.2	1.1
B	19.3	11.6	7.7
CCC	6.6	1.3	5.3
Below/NR	6.4	1.4	5.0
Total	100.0	100.0	

Data as of 3/31/20 Data reflects EM Blended Debt Composite or Representative account. Source: Ashmore

Ashmore EM Blended Debt Strategy Historical Allocation



Data reflects Ashmore SICAV EM Total Return Fund as of January 2020. Source: Ashmore

Team

Ashmore manages portfolios on a collective basis with the Fixed Income and Asset Allocation Investment Committee (IC) having ultimate responsibility for all Emerging Market Debt mandates. The composition of the IC is shown in the table below.

Name	Title	Years of Investment Experience	Years with Firm	Education
Mark Coombs	Chairman of Fixed Income Investment Committee	28	36	MA (Hons) Law, Cambridge University
Ricardo Xavier	Deputy Chair of FI Investment Committee, Head of Local Currency	17	28	Business Administration, FAAP, Sao Paulo, Brazil
Jan Dehn	Global Head of Research, FI Investment Committee Member	15	26	DPhil Economics, Oxford; Quantitative Development Economics Warwick
Herbert Saller	Head of External Debt, FI Investment Committee Member	18	31	Business Management, University of Munich
Robin Forrest	Head of Corporate Debt, FI Investment Committee Member	14	27	BA Hons. Russian & French from Merton College, Oxford University
Fernando Assad	Head of Multi Asset, FI Investment Committee Member	13	20	BA in Economics from American Int'l Univ. London, CFA Charterholder

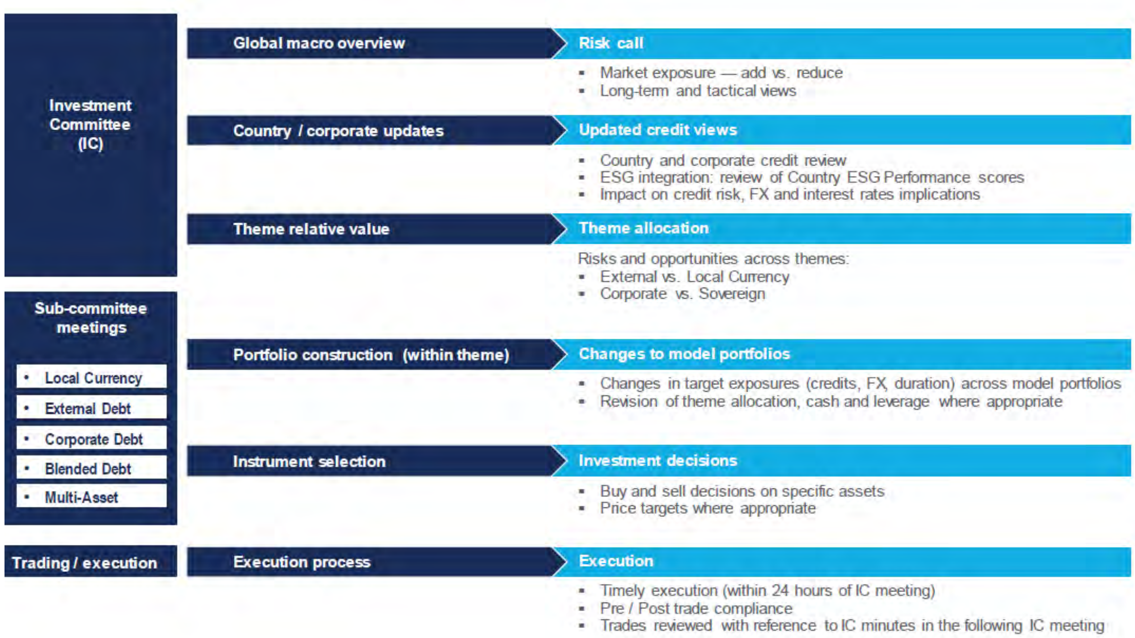
All Ashmore portfolios are managed collectively by the investment team. Of the firm's 98 investment professionals, 33 Emerging Markets portfolio managers are based in London, while 34 others provide "on the ground" insights from local offices in Columbia, India, Indonesia, Peru, Saudi Arabia, Singapore and UAE. The team-based approach reinforces the idea that no one individual is critical to portfolio results and investment decisions. In Staff's opinion, CIO and

Deputy CIO have complementary skill sets, with Mark Coombs credit background and focus on relative value, and Ricardo Xavier's expertise within local currency. Portfolio managers within Ashmore have the dual role of implementing the themes and relative value risk calls of the Investment Committee into client portfolios, as well as traveling and providing analyst expertise in macro, external debt, local currency or corporate debt sectors and issuers.

Investment Process

Ashmore is a value driven, top-down, macro focused manager with significant expertise gained from over 25 years in Emerging Markets investing. Ashmore's Fixed Income and Asset Allocation Investment Committee (IC) is the decision making body for all global EMD portfolios, and all trades must be approved by the committee. At the weekly IC meeting, the team discusses their Global macro overview and risk calls relating to overall market exposure, updated credit views on countries and corporate credits, as well as ESG integration and country ESG performance scores. With the inputs of macro and policy data, strategist presentations and IC discussion, the team builds the firm's overall 'risk call' – an outlook for duration, credit and FX risks – which guides exposure levels and overall risk positioning in fixed income portfolios. Ashmore's process explicitly avoids placing too much emphasis on getting the timing of its market calls perfectly right. This built-in allowance to be early gives the team latitude to position against market consensus and implement its value-based strategies.

At the strategy sub-committee meetings, portfolio managers focus on portfolio construction within their respective strategy sleeves. During the blended debt strategy meeting, the team engages in an open discussion regarding: 1) how much overall market risk to add; 2) the desired split between hard currency and local currency; and 3) the relative attractiveness of corporate debt versus sovereign debt. Importantly, all potential investments must be tradable, and therefore liquidity considerations are imbedded in the portfolio construction process.

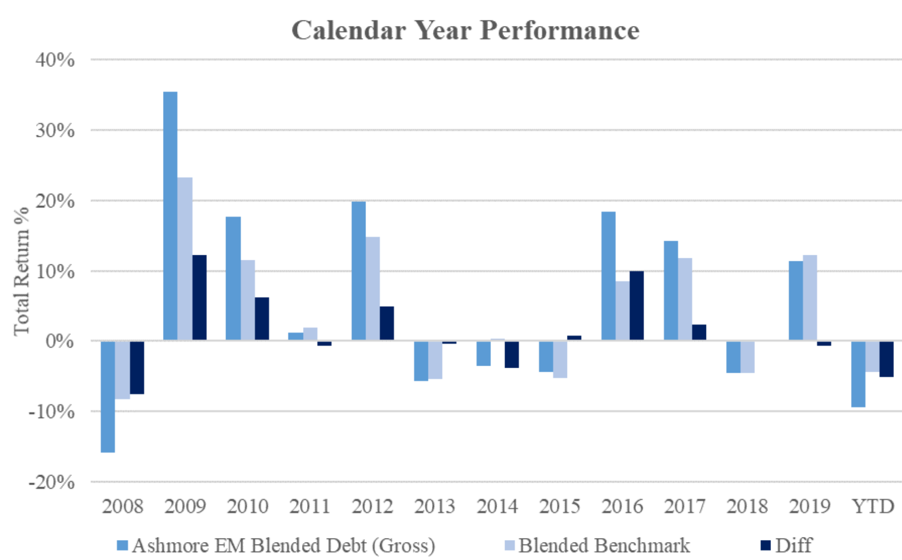


ESG Considerations

Ashmore has been a signatory of the UN Principles for Responsible Investment (UNPRI) since 2013 and is a signatory of the United Nations Global Compact. ESG factors are fully integrated into the firm's risk assessment for each country and corporate issuer analyzed in the firm's credit process. Ashmore implements a unified approach to integrating ESG performance by issuers across all of its global public markets strategies, including sovereigns, corporate debt and equities. The team performs a performance assessment of ESG factors and adopt a unified scoring system for each issuer. Ashmore produces a Sustainability Report and provides the firm's UN PRI scoring results in the company's Annual Report. Ashmore plc is a constituent of the FTSE4Good Index.

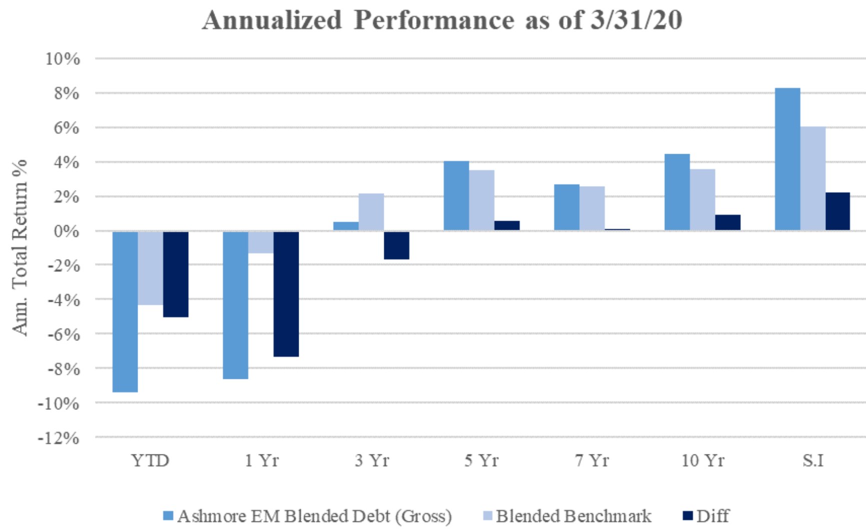
Performance

Ashmore's value driven philosophy/strategy is evident in their search for fundamental mispricing, and the team implements this strategy by adding positions during periods of overreaction and dislocation. The "Ashmore cycle" is to add credit exposure early and meaningfully during these periods, an approach which can lead to temporary underperformance while the market searches for a bottom. However, as the cycle turns, historically the team's fully established credit overweight has subsequently benefitted from a strong outperformance cycle, typically lasting 1-2 years or more.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD
Ashmore EM Blended Debt (Gross)	-15.8%	35.5%	17.7%	1.3%	19.8%	-5.7%	-3.4%	-4.4%	18.4%	14.2%	-4.5%	11.5%	-9.4%
Blended Benchmark	-8.2%	23.2%	11.5%	1.9%	14.8%	-5.4%	0.3%	-5.2%	8.5%	11.8%	-4.5%	12.2%	-4.3%
Value Added	-7.6%	12.3%	6.2%	-0.6%	5.0%	-0.3%	-3.8%	0.8%	10.0%	2.4%	0.0%	-0.7%	-5.0%

YTD as of 6/30/20 Source: Ashmore, eVestment
Benchmark comparison vs. Blended Benchmark of 50% EMBI GD; 25% ELMI+; 25% GBI-EM GD



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	10 Yr	S.I.
Ashmore EM Blended Debt (Gross)	-9.4%	-8.6%	0.5%	4.0%	2.7%	4.5%	8.3%
Blended Benchmark	-4.3%	-1.3%	2.2%	3.5%	2.6%	3.6%	6.0%
Value Added	-5.0%	-7.3%	-1.7%	0.5%	0.1%	0.9%	2.2%

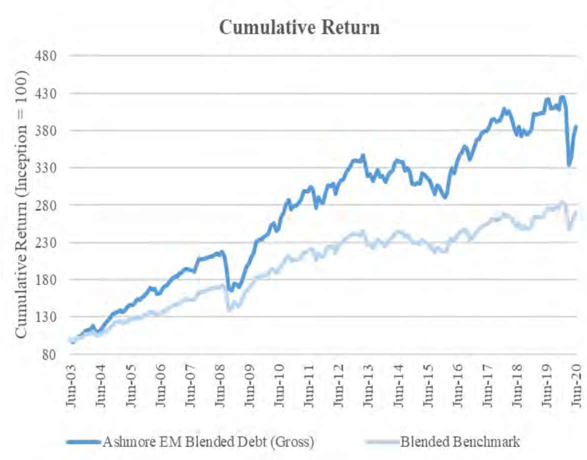
YTD as of 6/30/20 Source: Ashmore, eVestment
Benchmark comparison vs. Blended Benchmark of 50% EMBI GD; 25% ELMI+; 25% GBI-EM GD

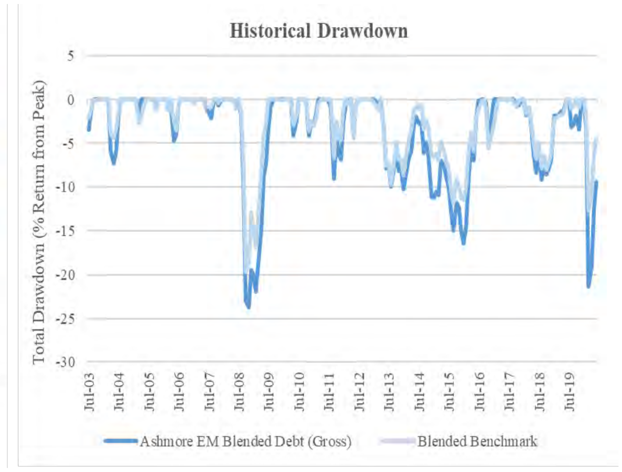
eVestment Performance and Risk Peer Universe Ranking as of 6/30/20

eVestment Peer Universe Ranking (as of 6/30/20)	YTD		1 Year		3 Year		5 Year		7 Year		10 Year		Since Inc.	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
Ashmore EM Blended Debt (Gross)	-9.4	97	-8.6	97	0.5	89	4.0	55	2.7	59	4.4	47	8.2	27
Benchmark	-5.0	61	-1.2	57	2.2	60	3.7	61	2.4	64	3.7	63	6.4	62
Value Added	-4.4		-7.5		-1.6		0.3		0.2		0.7		1.9	

Return Statistics with eVestment Peer Universe Ranking (as of 6/30/20)	1 Year	3 Year	5 Year	7 Year	10 Year	Since Inception	Since Inc. Peer Rank
Excess Return	-7.46	-1.64	0.29	0.24	0.71	1.87	27
Standard Deviation	22.80	14.32	12.65	11.44	11.09	10.97	81
Portfolio Beta	1.50	1.33	1.22	1.14	1.09	1.05	18
Tracking Error	8.07	4.76	4.05	3.76	3.39	3.64	1
Information Ratio	-0.93	-0.34	0.07	0.06	0.21	0.51	1
Sharpe Ratio	-0.45	-0.08	0.23	0.16	0.35	0.63	45
Sortino Ratio	-0.52	-0.10	0.29	0.21	0.47	0.87	45
Upside Market Capture	124.55	112.18	115.38	107.67	105.85	107.99	9
Downside Market Capture	141.68	121.89	113.08	105.29	100.69	94.79	73

Returns are gross of fees
Benchmark comparison vs. 50% JPM EMBI Global / 50% JPM GBI-EM Global
Universe: eVestment Global EM Fixed Income   Source: eVestment





YTD as of 6/30/20 Source: Ashmore, eVestment
Benchmark comparison vs. Blended Benchmark of 50% EMBI GD; 25% ELMI+; 25% GBI-EM GD

Recommendation

SBI Staff recommends the addition of Ashmore's Emerging Markets Blended Debt strategy to the return seeking portion of the fixed income portfolio. Ashmore's consistent investment process and deep, strong and stable investment team has produced a 25-year track record of successfully investing in Emerging Markets. Their top-down focus, extensive local market presence and investor mix which includes numerous sovereign wealth funds and central banks stands out within the universe of EMD managers Staff has reviewed. As demonstrated by their historical positioning and performance record, the Blended Debt strategy gives Ashmore the maximum possible opportunity set to seek out and find value across EM. To be sure, Ashmore is a high conviction manager and the strategy requires investors to have a long-term investment horizon and the ability to withstand short-term volatility during periods of dislocation such as we experienced during the COVID-19 crisis in March 2020. However, with the higher tracking error comes the potential for outsized returns.

Manager:	KKR (Kohlberg, Kravis, Roberts)
Strategy:	KKR High Yield Bond Strategy
Benchmark:	ICE BofA US High Yield Cash Pay Constrained Index
Role in SBI Portfolio:	Return-Seeking Fixed Income, High Yield Corporate Bond

Organization

KKR is a global investment firm founded in 1976 by Jerome Kohlberg, Henry Kravis and George Roberts. The firm was initially founded with a focus on private equity investments. Throughout the 1990's, KKR remained an active private equity investor: while expanding into new asset categories, industries and geographies. As of March 31, 2020, KKR has $207 billion in AUM across multiple asset classes and employs 470 investment professionals.

In 2004 KKR expanded into credit in order to take advantage of the differentiated network of capabilities within KKR. The creation of KKR Credit allowed KKR to find and invest in the most attractive risk-adjusted ideas across below-investment grade credit. KKR Credit manages a number of investment funds, structured finance vehicles, and separately managed accounts that invest capital in syndicated bank loans, high yield bonds, direct lending, private opportunistic credit and special situations.

KKR is a publicly traded company that trades on the New York Stock Exchange. Current and former employees of KKR own approximately 34% of KKR through the ownership or control of units of KKR Holdings L.P.

Assets

KKR Credit manages over $67 billion in assets across a group of credit strategies.

KKR Credit AUM by Strategy		
	AUM ($bn)	AUM (%)
US Leveraged Credit	$26.3	39%
European Leveraged Credit	$9.8	15%
US Revolving Credit	$1.4	2%
European Revolving Credit	$0.4	1%
Direct Lending	$17.5	26%
Private Opportunistic Credit	$6.4	9%
Special Situations	$5.9	9%
Total	***$67.6***	***100%***

Data as of 3/31/20 Source: KKR

KKR's High Yield strategy sits within the US Leveraged Credit group. US Leveraged Credit is the largest component of KKR Credit. Included in this group are the Bank Loan, High Yield and Revolving Credit strategies.

Leveraged Credit AUM by Assets				
	US		European	
	AUM ($bn)	AUM (%)	AUM ($bn)	AUM (%)
Bank Loans	$20.9	75%	$8.7	84%
High Yield	$5.1	18%	$0.6	6%
Revolving Credit	$1.4	5%	$0.4	4%
Other	$0.3	1%	$0.6	5%
Total	***$27.7***	***100%***	***$10.3***	***100%***

Data as of 3/31/20 Source: KKR

Strategy Profile

The KKR High Yield Strategy focuses on income generating high yield bonds with a significant focus on principal protection. The strategy utilizes KKR's extensive credit research to find the best risk adjusted returns. KKR builds their high yield portfolio from the bottom up and relies heavily on security selection to generate alpha. Although most of the alpha is expected to come from the bottom-up process, there is a macro overlay to the strategy. The focus is predominately on the U.S., however a portion of the portfolio may at times include Europe.

KKR High Yield Bond Strategy Characteristics as of 3/31/20

Portfolio Statistics (as of 3/31/20)	Portfolio*	Benchmark
Eff. Duration	4.25	4.26
Eff. Convexity	-0.09	-0.04
Current Yield	6.66	7.32
Option-Adjusted Spread	735	860
Wtd Avg Life	4.95	6.01
Avg Quality (S&P)	B	B
# Holdings	230	986

Credit Quality (as of 3/31/20)	Portfolio	Benchmark
BBB	0.8	0.1
BB	23.1	41.8
B	54.8	42.8
CCC	18.5	14.4
Below/NR	1.4	0.9
Cash + Derivatives	1.5	0.0
Other	100.0	100.0

Currency Exposure (as of 3/31/20)	Portfolio*	Benchmark
USD	95.7	100.0
GBP	3.1	0.0
EUR	1.2	0.0

Country (as of 3/31/20)	Portfolio	Benchmark
United States	88.5	85.9
Canada	3.8	4.6
United Kingdom	2.3	2.0
Netherlands	2.0	1.3
Switzerland	1.4	0.0
Luxembourg	1.1	1.2
Belgium	0.7	0.1
Israel	0.2	0.0
Other**	0.0	4.9
Other	100.0	100.0

Yield Curve (as of 3/31/20)	Portfolio	Benchmark
0-1 Year	19.7	13.1
1-3 Years	27.0	29.9
3-5 Years	39.5	35.7
5-7 Years	11.1	15.7
7-10 Years	0.9	5.6
10-15 Years	0.0	0.0
15-20 Years	0.0	0.0
20+ Years	0.0	0.0
N/A	1.8	0.1
Total	100.0	100.0

Source: KKR High Yield Bond Composite or Representative Account in the Composite as marked by an asterisk (*)
***Other includes Developed European Countries, Cayman Islands, Bermuda and Australia*

The portfolio is well diversified and includes on average 200 to 300 investments. Most core positions are sized around 0.5% to 1.0% range, with some high conviction positions sized up to 3% of the total portfolio.

Top 5 Overweights (as of 3/31/20)			
Overweights	Portfolio	Benchmark	Active
Cemex Materials LLC	2.2	0	2.2
Carriage Services Inc	1.4	0	1.4
Consolidated Energy Finance	1.4	0	1.4
Station Casinos	1.5	0.1	1.4
Kar Auction Services	1.4	0.1	1.3

Top 5 Underweights (as of 3/31/20)			
Overweights	Portfolio	Benchmark	Active
KraftHeinz	0	1.5	-1.5
Bausch Health Cos	0	1.4	-1.4
Dish DBS	0	0.9	-0.9
Springleaf Finance	0	0.8	-0.8
HCA	0.4	1.1	-0.7

Source: KKR High Yield Bond Composite or Representative Account in the Composite as marked by an asterisk (*)

Team

KKR Credit has approximately 130 investment professionals. The leveraged credit team, which focuses on leveraged loans, high yield bonds, opportunistic credit and CLO's is led by Chris Sheldon. Chris joined KKR in 2004 and is a Partner of KKR. Prior to his role at KKR, he worked in Wells Fargo's High Yield Securities Group.

The leveraged credit team consists of 40 sector focused analysts. The analysts are charged with evaluating credits in their respective industries. As such, they look up and down the capital structure and across comparable companies in order to identify the most attractive risk-adjusted returns. The analysts typically cover one to three industry sectors and overall thirty to forty companies. The leveraged credit investment professionals are based in San Francisco and Dublin.

In addition to the dedicated analysts, the credit team can leverage the full resources of KKR including its private equity professionals, KKR Capstone operating experts, the KKR Capital Markets professionals, its portfolio company management teams and its Senior Advisor network.

Investment Process

KKR's process utilizes their deep experience in credit and private equity underwriting. Their strategy is based on intensive credit analysis, capital preservation and active portfolio management. KKR will only invest in a credit once it has undergone deep due diligence. A key focus when underwriting the credit is understanding the risk and focusing on the necessary downside protection. Any investment the analyst deems as creditworthy must be approved by the KKR Credit U.S. Leveraged Credit Investment Committee, which formally approves or removes credits from KKR's approved credit lists. The Investment Committee meets twice a week to vote on new ideas, to discuss upcoming positions and to determine the exit of current position.

Once a bond is in the portfolio, the assigned analyst re-underwrites each position quarterly. The Portfolio Management Committee meets quarterly to review each investment. During the PMC meeting each analyst presents an updated report on each of their investments. In addition to reviewing financial projections, relative value charts and industry team recommendations, the analyst also presents a comparison of actual results versus KKR projections.

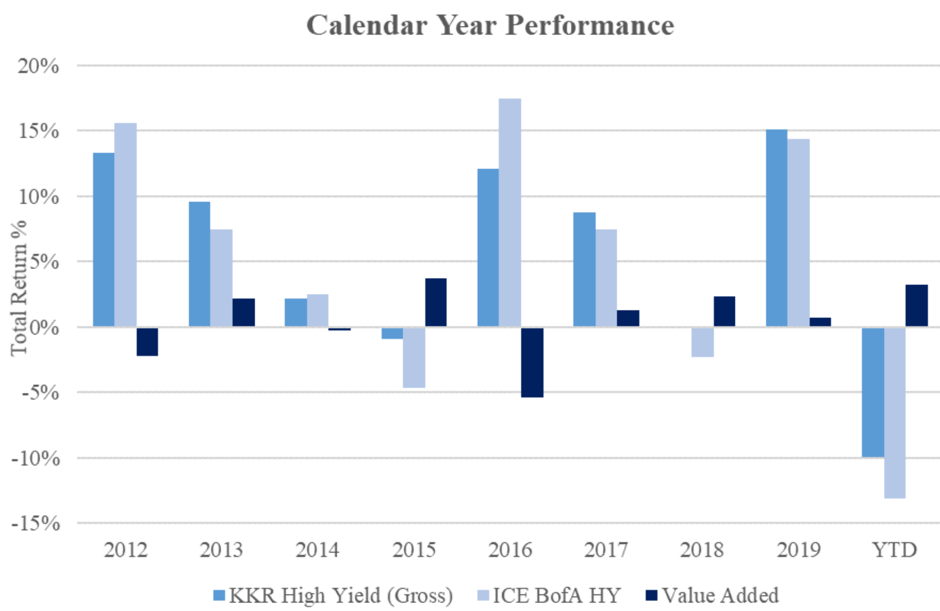
ESG

KKR became a signatory of the UN-supported Principles for Responsible Investment in 2009. Over the past decade they have established themselves as a credible leader in driving and protecting value through thoughtful Environmental, Social and Governance ("ESG") management.

The KKR Credit team has fully incorporated ESG into their research process. All credits are evaluated based on potential ESG risks. KKR maintains an ESG checklist, which specifically flags potential environmental, social or governance issues. The checklist has scoring component which is intended to help highlight any key risks or opportunities. KKR believes their primary risk mitigate on ESG issues is to reject any investment proposal that they believe has material ESG risks.

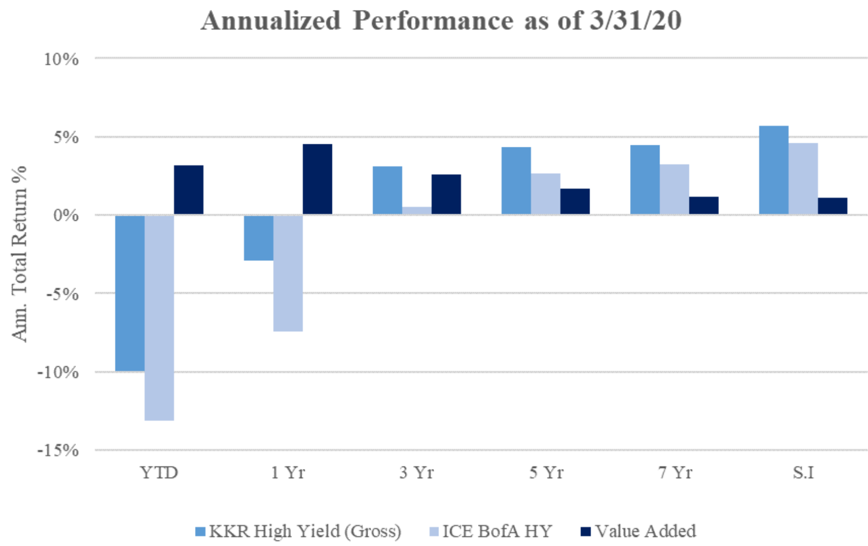
Performance

KKR considers themselves value investors who are focused on generating alpha by buying securities below their intrinsic value and by avoiding capital loss. The high yield portfolio is built from the bottom-up without bias for ratings or seniority. Because they are focused on value, the strategy may tend to have weaker relative performance in times when the market is rising sharply.



	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD
KKR High Yield (Gross)	13.3%	9.6%	2.2%	-0.9%	12.1%	8.8%	0.1%	15.1%	-9.9%
ICE BofA HY	15.6%	7.4%	2.5%	-4.6%	17.5%	7.5%	-2.3%	14.4%	-13.1%
Value Added	-2.2%	2.1%	-0.3%	3.7%	-5.4%	1.3%	2.3%	0.7%	3.2%

Data as of 3/31/20 Source: KKR



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	S.I.
KKR High Yield (Gross)	-9.9%	-2.9%	3.1%	4.3%	4.4%	5.7%
ICE BAML HY	-13.1%	-7.5%	0.5%	2.7%	3.3%	4.6%
Value Added	3.2%	4.6%	2.6%	1.7%	1.2%	1.1%

Data as of 3/31/20 Source: KKR

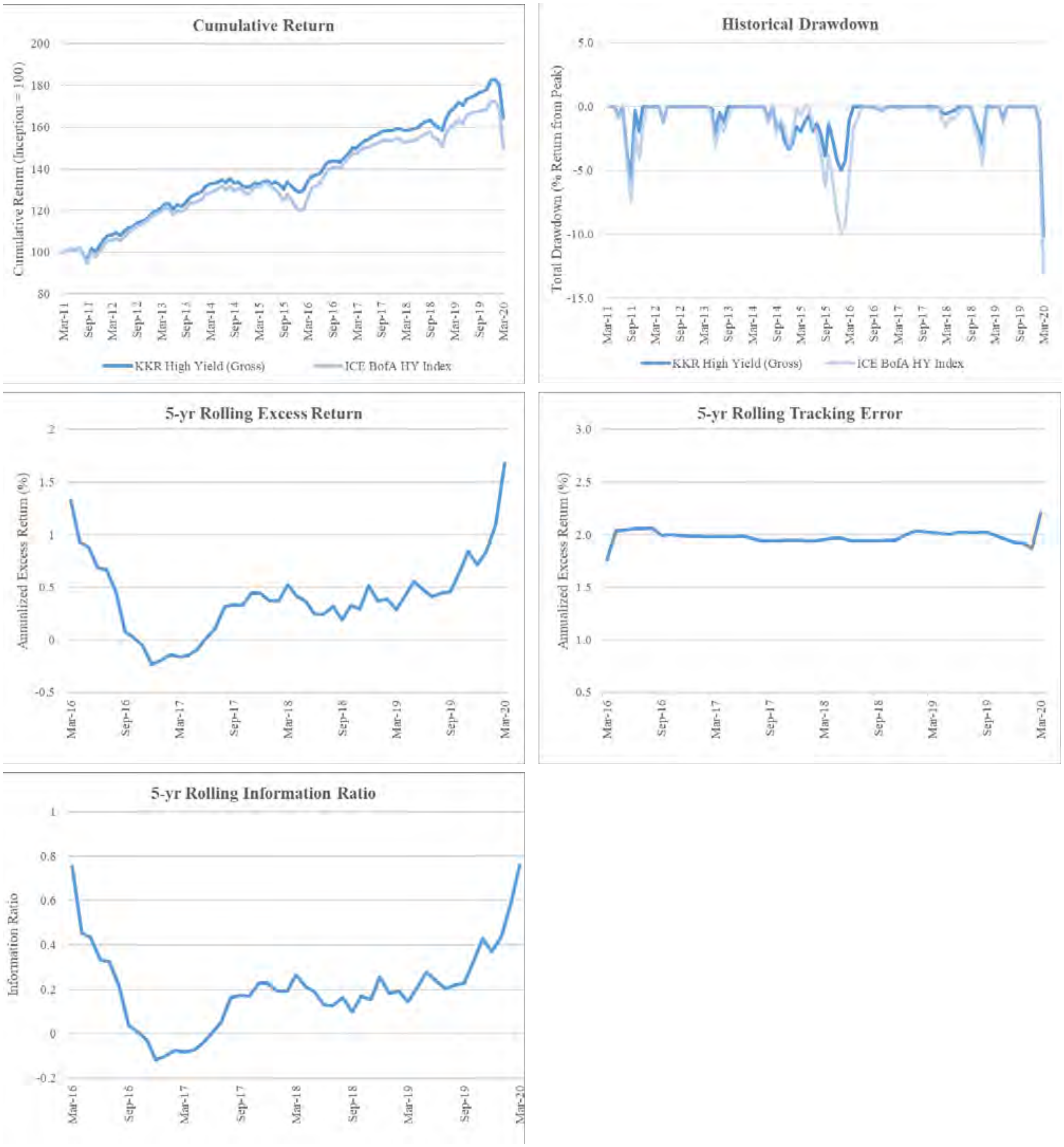
eVestment Performance and Risk Peer Universe Ranking as of 3/31/20

Return Statistics (as of March 31, 2020)	YTD		1 Year		3 Year		5 Year		7 Year		Since Inc.	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
KKR High Yield (Gross)	-9.9	19	-2.9	10	3.1	2	4.3	3	4.4	6	5.7	6
ICE BofA HY Index	-13.1	64	-7.5	69	0.6	68	2.7	55	3.3	61	4.6	58
Difference	3.2		4.6		2.5		1.7		1.2		1.1	

Return Statistics (as of March 31, 2020)	1 Year	3 Year	5 Year	7 Year	Since Inception	Since Inc. Rank
Excess Return	4.55	2.55	1.67	1.18	1.10	6
Standard Deviation	10.29	6.56	5.87	5.41	5.66	16
Portfolio Beta	0.80	0.79	0.75	0.76	0.79	83
Tracking Error	2.70	1.89	2.21	2.05	1.93	67
Information Ratio	1.69	1.35	0.76	0.58	0.57	10
Sharpe Ratio	-0.48	0.21	0.55	0.67	0.89	8
Sortino Ratio	-0.53	0.24	0.71	0.90	1.29	6
Upside Market Capture	115.41	101.17	87.88	88.18	89.90	73
Downside Market Capture	81.22	69.69	64.31	68.20	70.08	17

Returns as gross of fees   Market Beta vs. ICE BofA HY Index   Source: eVestment

Universe: eVestment US High Yield Fixed Income



Data as of 3/31/20. Source: KKR, eVestment, SBI Staff Calculations

Recommendation

The SBI is recommending the addition of the KKR High Yield strategy to the return seeking portion of the Fixed Income Portfolio. Building off of their decades of private equity expertise, KKR has built a reputable brand and platform in credit. With over 40 analysts dedicated to the strategy, coverage of issuers, underwriting and analysis is rigorous and places the team as top tier in the industry. In addition to the team, resources inside KKR such as private equity professionals, KKR Capstone operating experts, its portfolio company management teams and its Senior Advisor network allows the Leveraged Loan team to have insights and access to parts of the market that provide an edge to the strategy.

Security selection is a driving force behind KKR's performance. Over the history of their composite, KKR has generally been overweight the lower half of the credit sector (B and CCC). Other firms pursuing this type of strategy tend to do well in benign markets, but can perform poorly in a down market. However, KKR's process and underwriting has led to the selection of credit worthy companies that can withstand market volatility. KKR's superior security selection has allowed them to perform well in benign markets and to outperform in a down market. KKR's ability to perform well in multiple cycles make this an attractive strategy to the SBI's portfolio as it should allow the SBI to capture incremental returns in a good market while dampening drawdown in a bad market.

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Manager:	Payden & Rygel
Product:	Multi-Asset Credit (PMAC) Strategy
Benchmark:	1/3 ICE BofA High Yield, 1/3 S&P LSTA Leveraged Loan, 1/3 JPM EMBI Global
Role in SBI Portfolio:	Return-Seeking Fixed Income, Multi-Asset Credit

Organization

Payden & Rygel was founded in 1983 by Joan Payden & Sandra Rygel as a California C-Corporation focusing on investment management services. Today, Payden & Rygel remains a 100% employee-owned global investment advisor specializing in the active management of fixed income and equity portfolios. Headquartered in Los Angeles, CA, with satellite offices in Boston, London and Milan, the firm has 208 employees. Joan Payden, President and CEO, owns the majority of the outstanding voting shares (between 50-75%) in the firm. Brian Matthews, James Sarni, Mary Beth Syal and Scott Weiner each own between 5%-10% of the voting shares, and the remaining shareholders each hold less than 5% of the shares.

Assets

As of March 31, 2020, Payden & Rygel managed $114 billion in global fixed income and equity across more than 400 institutional relationships. The firms total fixed income AUM by product is shown below:

Strategy	AUM ($mm)
Low Duration	32,135
Enhanced Cash	26,924
Core Bond/Intermediate	22,798
Emerging Markets	10,781
Global Fixed Income	7,282
High Yield	3,325
*Unconstrained Bond	11,613
Municipal Bond	2,687

** The Unconstrained Bond category represents portfolios managed by the Payden Absolute Return team with a multi-sector, absolute return objective. Approximately half of these assets are invested in opportunistic strategies consistent with Payden's Multi Asset Credit (PMAC). The dedicated PMAC strategy was launched in January 2019 and has approximately $1 billion in assets as of 3/31/20.*

Strategy Profile

The Payden Multi Asset Credit (PMAC) strategy began as the embedded return seeking segment of its Absolute Return Income strategy, focusing on a return objective of 3-5%, gross of fees, annualized above reference rate over a 3-5 year period. The team aims to generate returns from three sources: Core income (80-90%), Tactical Trading (10-20% and hedging (0-5%).

PMAC Sector Ranges	
Sector	**Range**
Emerging Market Debt	10-40%
Leveraged Loans	10-40%
High Yield Corporate	20-50%
IG Corporates	0-15%
Securitized	20-50%
Govt Securities, Money Mkt	0-10%

The PMAC strategy is managed as a sub-strategy of Payden's absolute return bond strategy (PARI), with PMAC being focused on opportunistic sectors such as high yield bonds, emerging market debt and securitized credit. The PMAC strategy can be implemented either as an absolute return strategy vs. T-Bills or LIBOR, or with a blended benchmark weighted across the primary opportunistic credit sectors (e.g. high yield bonds, high yield bank loans, EMD). Within the strategy, the majority of market exposure, risk and resulting performance is gained using physical securities. Derivatives usage typically represents less than 10% of the risk exposures within the strategy. Like all of Payden's fixed income strategies, PMAC leverages the firm's top-down Investment Policy Committee, the bottom-up sector specialist teams and firm-wide risk management resources in the portfolio construction process.

PMAC Strategy Characteristics as of 3/31/20

PMAC Characteristics	
	Portfolio
Eff. Duration	1.70
Eff. Convexity	0.01
Yield	4.84
Option-Adjusted Spread	491
Wtd Avg Life	4.38
Avg Quality	BB+
# Issuers/# Holdings	181/294

Credit Quality		
	Portfolio	
	% Market	**Dur. Contrib.**
Govt	2.9	0.00
AAA	7.4	0.02
AA	5.6	0.03
A	8.9	0.30
BBB	25.7	0.72
BB	22.3	0.35
B	14.4	0.17
CCC	3.8	0.05
Below/NR	9.0	0.06

Data as of 3/31/20 Source: Payden & Rygel

Team

Payden's Absolute Return team oversees a range of opportunistic multi-asset products, including the Payden Absolute Return Investing (PARI) strategy which launched in 2008. Brian Matthews and Scott Weiner are leaders of the strategy, members of the Investment Policy Committee and have ultimate responsibility for decision making with regard to portfolio asset allocation and security selection. Key members of the Absolute Return Investing team are listed in the table below.

Name	Title	Years of Investment Experience	Years with Firm	Education
Brian W Matthews, CFA	CFO, Managing Director	38	34	BA, University of Notre Dame
Scott J Weiner, Ph.D	Managing Director	36	27	PhD, University of California San Francisco; AB Occidental College
Eric J Souders, CFA	Director	14	7	BA, California State University, Fullerton
Madyson A Cassidy, CFA	Vice President	6	6	BA, Occidental College
Taylor J Losi	Senior Associate	1	1	BA, Northwestern University

The Absolute Return team is supported by Payden's sector specialist research and portfolio strategist teams, as well as the firm's Risk and Compliance teams.

Investment Process

Payden & Rygel's overall philosophy starts with a belief that active management enhances long term portfolio returns. Portfolios are managed with an emphasis on risk control, downside protection, and ESG considerations. The top-down process begins with a monthly meeting of the firm's 10-member Investment Policy Committee (IPC). The IPC reviews the global macro environment, forming broad-based views on growth, inflation and other key factors. The IPC house view includes views on interest rates, specific sectors and an overall assessment of the market's current value proposition, which is then applied across the firm's investment strategies. The IPC also fulfills the role of "top cop", where analysts and sector strategists bring new investment ideas in front of policy members to uncover both fundamental investment merits or to identify unintended risks regarding inclusion in portfolios.

Bottom up security selection within PMAC begins with ideas generated from a team of 49 strategists, credit analysts and sector analysts, shared across fixed income strategy platform. As a key step in the process, the sector specialist teams continually identify the firm's best ideas from a broad multi-sector opportunity set and support the construction of a "core income stream" portfolio based on the team's long-term view and incorporating changes in the firm's house view and market conditions. The portfolio teams may use tactical trading exploit the team's highest conviction short-term and medium-term ideas, and hedging may be employed to mitigate market risks depending on evolving market conditions.

Importantly, Payden's dedicated Risk and Compliance teams perform in-depth scenario analysis and stress testing to identify potential risks in an effort to mitigate the downside effects of extreme market environments. The Risk and Compliance teams work closely with both the portfolio teams and the overall IPC to determine appropriate strategy adjustments, if any.

ESG

Payden & Rygel is committed to ESG practices and is an industry leader in ESG integration within its investment process and overall business model. The firm is a member of the PRI sub-sovereign working group on ESG materiality framework for state and local governments.

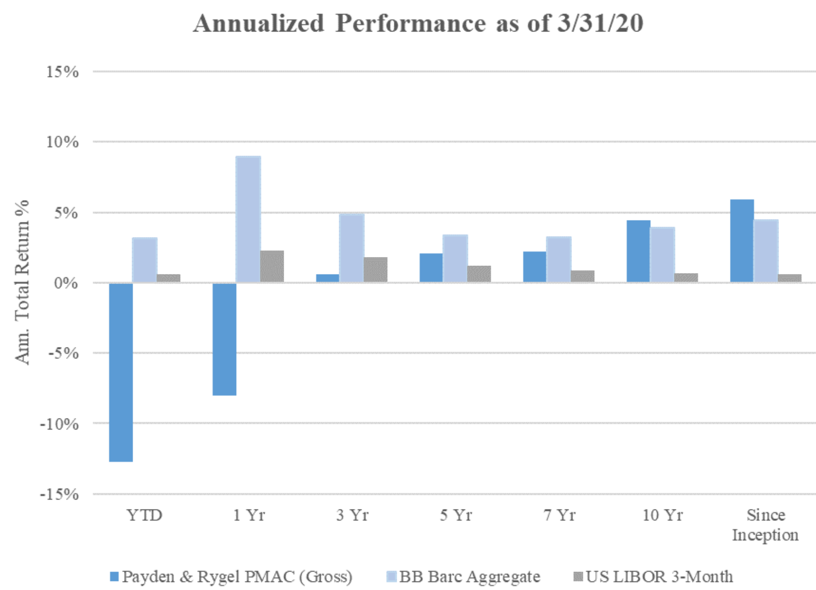
The firm is a signatory to Carbon Disclosure Project (CDP), and is a Municipal Impact Coalition and the PRI Sovereign and sub-sovereign working group. In addition, the firm is represented on the Sustainability Accounting Standards Board (SASB) Alliance and members of the firm are regular panel speakers at Principles for Responsible Investment (PRI) conferences.

From an investment process standpoint, ESG factors/weights are integrated into the security analysis process. The team uses MSCI ESG Research, Bloomberg and Aladdin data to support the ESG data integration efforts. Payden's sovereign debt sector team uses a country scorecard to assess each country's Governance and Social/Environmental and assign formal weights to these factors into a country's overall, forward looking score. In 2019, the team published *A Practical Guide to ESG Integration in Sovereign Debt*. This year, Payden implemented a firm-wide tobacco and related product exclusion policy within its investment process and, at the firm level, is taking steps to become carbon neutral (carbon audit + offset) by the end of 2020.

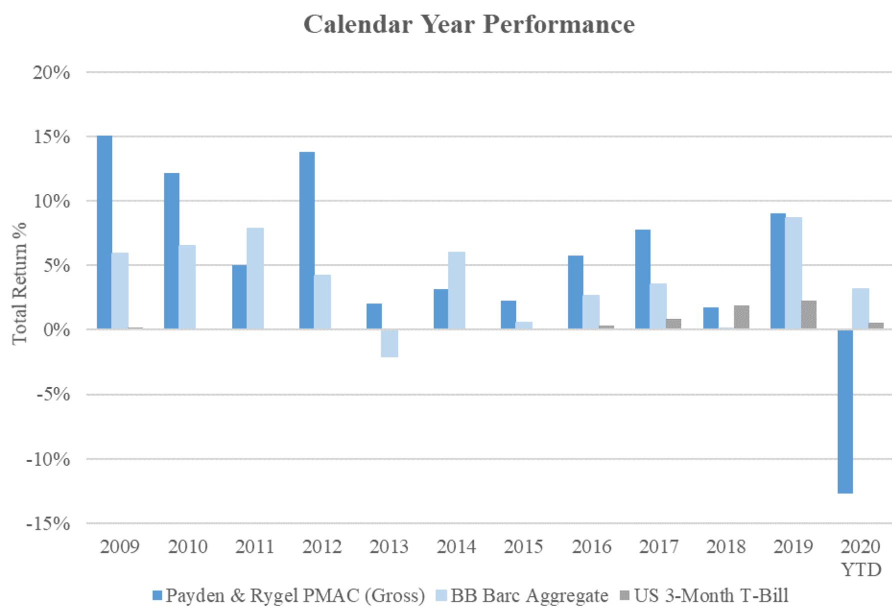
Payden and Rygel is also committed to equal opportunity employment. The firm is majority women-owned and many investment strategies and key areas of the firm are led by women. Payden emphasizes broader definitions of diversity such as the representation of minority cultures and backgrounds and is committed to equal opportunity employment through an active nondiscrimination policy.

Performance and Risk

The PMAC strategy was funded as a stand-alone strategy and composite in January 2019 to provide investors with a diversified, high yielding fixed income solution through the use of multiple global asset classes. The performance history prior to the strategy's official funding date represents a carve-out of the opportunistic portion of Payden's PARI absolute return strategy back to that strategy's inception date of October 31, 2008. Throughout the history of the overall PARI strategy and as reflected in the PMAC carve-out performance, the team has produced strong total return results, supported by positive sector allocation and good security selection. In addition, both strategies reflect a consistent emphasis on downside protection.



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	10 Yr	Since Inc.
Payden & Rygel PMAC (Gross)	-12.7%	-8.0%	0.6%	2.1%	2.2%	4.4%	5.9%
BB Barc Aggregate	3.1%	8.9%	4.8%	3.4%	3.2%	3.9%	4.5%
US 3-Month T-Bill	0.6%	2.3%	1.8%	1.2%	0.9%	0.6%	0.6%
Diff (PMAC vs. 3-Mth T-Bill)	-13.3%	-10.3%	-1.2%	0.9%	1.4%	3.8%	5.3%



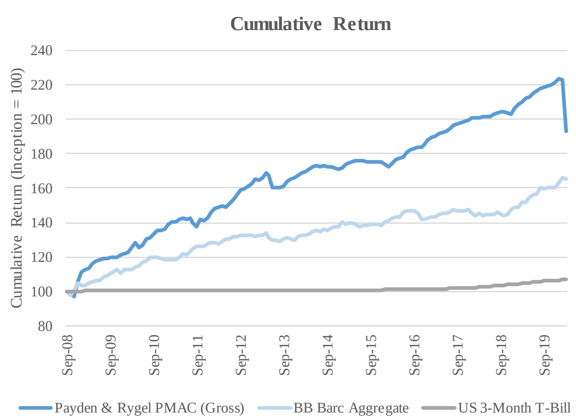
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD
Payden & Rygel PMAC (Gross)	15.1%	12.2%	5.0%	13.8%	2.0%	3.1%	2.3%	5.7%	7.8%	1.8%	9.1%	-12.7%
BB Barc Aggregate	5.9%	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	3.1%
US 3-Month T-Bill	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.3%	0.9%	1.9%	2.3%	0.6%
Diff (PMAC vs. 3-Mth T-Bill)	14.9%	12.0%	4.9%	13.7%	2.0%	3.1%	2.2%	5.4%	6.9%	-0.1%	6.8%	-13.3%

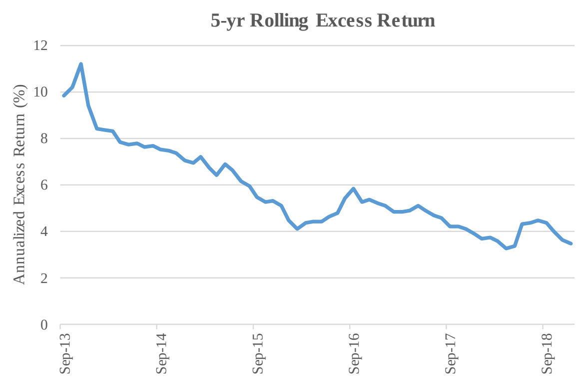
YTD as of 3/31/20 Source: Payden & Rygel, eVestment

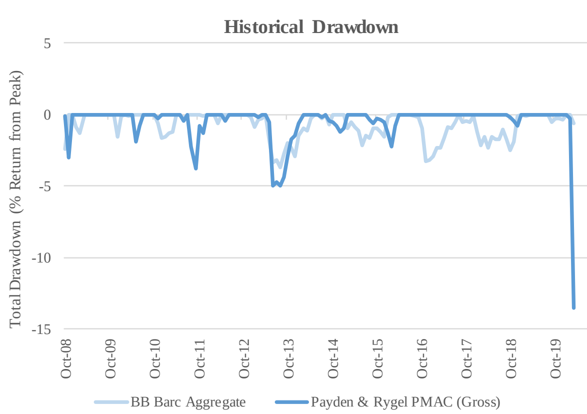
PMAC (Gross) Performance Statistics as of 3/31/2020

Ex-Post Risk Measurement	
Annualized Return	5.9%
Volatility	6.0%
Best 1y	23.9%
Worst 1y	-8.0%
Best 3m	16.1%
Worst 3m	-12.7%
Best 1m	8.7%
Worst 1m	-13.3%
Avg Downside (mth)	-1.1%
Downside Deviation (mth)	2.5%
Downside Deviation (ann)	8.6%
Sharpe Ratio	0.89
Sortino Ratio	0.62
% periods up	78%
% periods down	22%
Correlation w/ Bond Mkt	0.18

Source: Payden & Rygel







Data as of 3/31/20 Source: Payden & Rygel, eVestment, SBI Staff Calculations

Recommendation

SBI Staff recommends the addition of Payden & Rygel's Multi Asset Credit strategy to the return seeking portion of the fixed income portfolio. Payden has demonstrated the ability to consistently add value through a focused and highly consistent process, a seasoned and stable team and a significant commitment to fundamental credit research. In addition, Payden's employee-owned ownership structure aligns the team with client success by emphasizing long-term performance results. SBI staff also believes that feels that P&R's overall service-focused culture, commitment to risk management and explicit incorporation of ESG factors into its investment process are well aligned with the SBI's beliefs.

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Manager:	Prudential Global Investment Management **(**PGIM) Fixed Income
Strategy:	PGIM Fixed Income Strategic Credit
Benchmark:	1/3 ICE BAML High Yield, 1/3 S&P/LSTA Lev Loan, 1/3 JPM EMBI Global
Role in SBI Portfolio:	Return-Seeking Fixed Income, Multi-Asset Credit

Organization

Prudential Global Investment Management (PGIM) is the largest investment adviser within Prudential Financial Inc. and has been an SEC-registered investment adviser since December 1984. The firm has been managing proprietary fixed income portfolios since 1875 and institutional accounts since 1928. PGIM Fixed Income, the public fixed income asset management unit within PGIM, manages assets for institutional, retail and affiliated clients worldwide and has its global headquarters in Newark, New Jersey. The firm has a strong market presence with $868 billion in assets under management as of March 31, 2020, comprised of $348 billion in institutional assets, $174 billion in retail assets and $346 billion in proprietary insurance company assets. PGIM Fixed Income employs 304 Investment Professionals, including 126 investment managers/traders, 118 fundamental research analysts and 60 quantitative research and risk management analysts. Combined with sales, marketing, operations/technology and business staff, the company totals 949 employees.

Assets

As of March 31, 2020 PGIM Fixed Income managed $868 billion in assets across a broad range of strategies. PGIM's Multi-Sector team manages a broad range of fixed income offerings, from Core Bond to LIBOR-based Absolute Return strategies. The AUM breakdown for the Multi-Sector team's strategies are shown in the table below.

	Strategy / Composite Inception	Benchmark	Strategy AUM[3] ($ billions)
Multi Sector	Core Conservative (1989)	Bloomberg Barclays U.S. Aggregate	26.0
	Core (1991)	Bloomberg Barclays U.S. Aggregate	46.4
	Japan Core Bond[4] (2003)	Nomura-BPI Overall	9.2
	Global Core (2008)	Bloomberg Barclays Global Aggregate	5.4
	Core Plus (1996)	Bloomberg Barclays U.S. Aggregate	82.7
	Global Aggregate Plus[5] (2002)	Bloomberg Barclays Global Aggregate	17.7
	Absolute Return (2011)	ICE LIBOR 3-Month Average	3.4
	Multi-Asset Credit (2016)	ICE LIBOR 3-Month Average	1.0

Strategy Profile

Strategic Credit is the Multi-Sector team's newest benchmarked strategy, launched in June 2019. The strategy is based on the firm's well-established Absolute Return ("AR") strategy (2011) and its newer Multi-Asset Credit ("MAC") strategy. Like AR and MAC, Strategic Credit's investment process has a broad investable universe and seeks to maximize excess return from opportunities from dynamically rotating among diversified alpha sources. What makes PGIM's Strategic Credit different than AR or MAC is the strategy is built around a blended benchmark of 1/3 High Yield Bonds, 1/3 Bank Loans and 1/3 Emerging Markets Debt MD) rather than being an absolute-return, LIBOR-benchmarked strategy.

PGIM Fixed Income Strategic Credit Strategy Characteristics as of 3/31/20

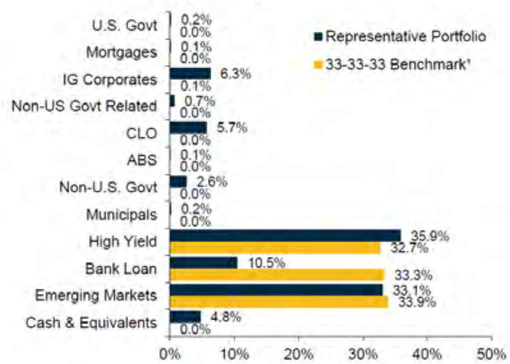
Representative Characteristics

Characteristics	Representative Portfolio	33-33-33 Benchmark
Effective Duration *(yrs)*	4.41	4.24
Effective Yield *(%)*[1]	8.83	8.6
Average Quality *(Moody's)*	Ba3	Ba3
Option Adjusted Spread *(bps)*	862	751
Number of Issuers	322	2064

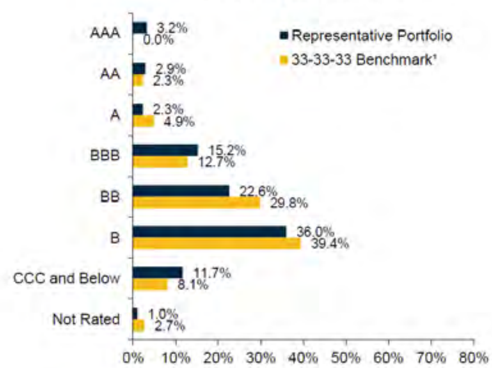
Corporate Industry Summary

Industry	Representative Portfolio	33-33-33 Benchmark[1]	Active Weight (%)
Finance	8.5	6.1	2.4
Industrial	43.7	58.9	-15.2
Utility	2.0	1.7	0.4
Non-Credit	32.8	33.3	-0.6

Sector Distribution[2]



Quality Distribution[3]



Data as of 3/31/20 Source: PGIM Fixed Income

Team

PGIM Fixed Income has a stable and experienced team, with senior management and sector team heads averaging 28 years of investment experience and 19 years with the firm. The firm has a focus on fundamental research with a deep and strong credit team of 118 fundamental research analysts covering a broad range of fixed income sectors. The investment team employs quantitative research and risk management groups to develop and implement proprietary models for relative value analysis, risk, stress testing and performance attribution.

Multi-sector fixed income portfolios at PGIM Fixed Income are managed by the Multi-Sector Team, led by senior portfolio managers Michael Collins, Richard Piccirillo and Gregory Peters. The senior PMs have ultimate responsibility for the overall risk allocations and day-to-day portfolio management of the strategy. With respect to the Strategic Credit strategy, Mr. Collins, Mr. Peters and Mr. Piccirillo work most closely with sector portfolio managers within the U.S. High Yield, Bank Loan and Emerging Markets fixed income sectors. The sector PMs work with their respective investment teams to make buy and sell decisions on a daily basis with oversight from the senior PMs. The leadership of the Multi-Sector Team is highlighted in the table below.

Name	Title	Years of Investment Experience	Years with Firm	Education
Michael Collins, CFA*	Managing Director and Senior Portfolio Manager	27	34	BS-Mathematics & Computer Science, MBS - Finance
Richard Piccirillo*	Managing Director and Senior Portfolio Manager	29	27	BBA – Finance; MBA Finance & Int'l Business
Gregory Peters*	Managing Director and Senior Portfolio Manager	26	6	BA – Finance, MBA – Finance
Lindsay Rosner, CFA	Vice President	14	8	BA – Public & International Affairs
Robert Tipp, CFA	Managing Director	36	29	BS – Business Administration; MBA

** denotes Senior PMs for the Strategic Credit strategy*

Investment Process

Consistent with all strategies managed by the Multi-Sector team, the investment philosophy behind Strategic Credit is founded in the belief that diversified portfolios, built through macroeconomic research, credit research, quantitative analysis and risk management can achieve consistent excess returns with high efficiency ratios. Allocations across sectors and at the sub-sector level are made within risk thresholds established by a risk budget created for each portfolio. The benchmark sleeves are not pro-rata slices of the underlying teams' portfolios, but tend to consist of best ideas in concentrated form than dedicated sleeves. Interest rate sensitivity, or duration, is kept within a tight band relative to the benchmark.

The team uses a three-step process to manage all multi-sector portfolios:

Develop Top Down Investment Themes: PGIM Fixed Income's Senior Investment Team prepares a formal Market Outlook each quarter, which includes a firm-wide assessment of economic, interest rate and sector scenarios. The Multi-Sector team leverages this information and other firm-wide resources to assess the current macroeconomic backdrop, which influences portfolio positioning and the overall level of active risk within the portfolio.

Risk Budgeting, Risk Allocation and Security Selection: The senior PMs establish portfolio risk exposures in sectors, industry and currency positions that reflect the firm's top-down Market Outlook. They meet weekly to develop strategy and positioning themes, and look at new opportunities and tactical shifts each day. The Senior PMs convey the desired portfolio strategy to sector specialists who implement security selection. The senior PMs are ultimately responsible for all investment decisions and portfolio positioning.

Monitor Portfolio vs. Benchmark daily: Risk management is fully integrated in the investment process. The senior PMs and a separate risk manager use proprietary risk systems to review the portfolio risk characteristics each day relative to its benchmark. Detailed performance attribution results are reviewed each month.

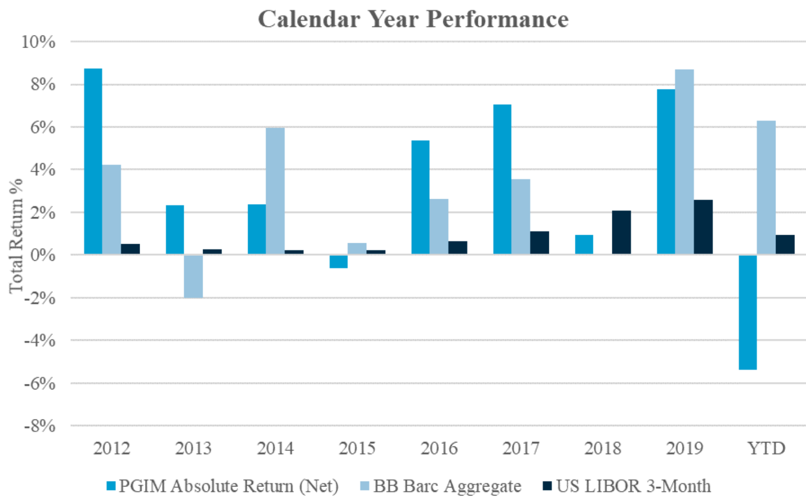
ESG

PGIM Fixed Income has been a signatory of the UN PRI since 2015, and scored equal to or above median in all modules of its 2019 PRI Assessment Report. The team is represented on PRI's Advisory Committee on Structured Products Workstream (ACSP), which was formed to identify how best to consider ESG factors within structured products investments. PGIM believes that ESG risk and opportunity assessment should be integrated into the credit process. With support from a dedicated ESG analyst, the credit analysts' own research is supplemented by external ESG providers such as Sustainalytics and MSCI, whose insights help highlight what might otherwise have been considered less impactful credit risks. PGIM's large size enables them to have regular engagement with companies, and they monitor on engagement via logs maintained by the assigned analyst. Lastly PFI has a long standing commitment to diversity and inclusion in the workplace. They have a '5 over 5' aspirational goal to increase diverse staffing representation by 5% globally by 2023 through a series of outcome oriented actions.

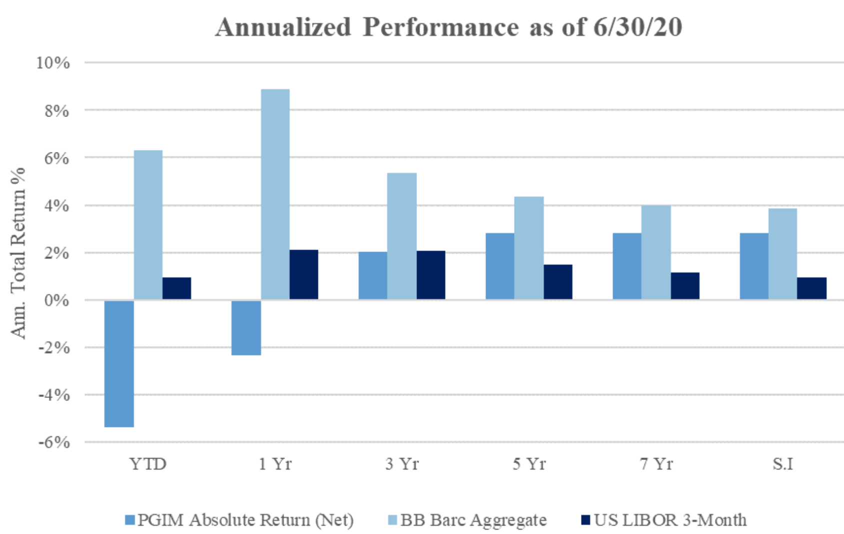
Performance and Risk

Given the relatively short track record of the Strategic Credit strategy, Staff evaluated Multi-Sector team's established strategies to assess the team's experience and performance managing opportunistic credit-focused strategies as well as the team's ability to manage risk across various market cycles. In particular, Staff focused on the Absolute Return strategy (launched April 2011) strategy as well as the Multi-Asset Credit (launched November 2016). The performance history of both strategies highlights PGIM's capabilities, both in terms of sector allocation as well as strong issue selection within sectors. Over the longer time periods, the total return performance and risk-adjusted performance of both strategies compares favorably both to the eVestment Global Unconstrained Fixed Income peer group as well as to the broader market as represented by the Bloomberg Barclays Aggregate Index. More recently, the performance of the Multi-Sector team's strategies was impacted by the extreme market dislocation in March 2020 related to the COVID-19 pandemic. Staff expects periods of underperformance, including temporary bouts of sharp downdowns, with highly opportunistic strategies such as PGIM's Multi-Sector strategies. Moreover, Staff believes that, as a long-term investor, short-term volatility can present attractive buying opportunities that can generate long-term value for the portfolio.

PGIM Fixed Income Absolute Return Strategy



	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD
PGIM Absolute Return (Net)	8.7%	2.3%	2.4%	-0.6%	5.4%	7.1%	1.0%	7.8%	-5.4%
BB Barclays Aggregate	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	6.3%
US LIBOR 3-Month	0.5%	0.3%	0.2%	0.2%	0.7%	1.1%	2.1%	2.6%	0.9%
Value Added (vs. 3Mth LIBOR)	8.2%	2.0%	2.1%	-0.8%	4.7%	5.9%	-1.1%	5.2%	-6.3%



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	S.I.
PGIM Absolute Return (Net)	-5.4%	-2.3%	2.0%	2.8%	2.8%	2.8%
BB Barclays Aggregate	6.3%	8.9%	5.4%	4.3%	4.0%	3.9%
US LIBOR 3-Month	0.9%	2.1%	2.1%	1.5%	1.1%	1.0%
Value Added (vs. 3-Mth LIBOR)	-6.3%	-4.4%	-0.1%	1.3%	1.7%	1.8%

YTD as of 6/30/20 Source: PGIM Fixed Income, eVestment, Bloomberg

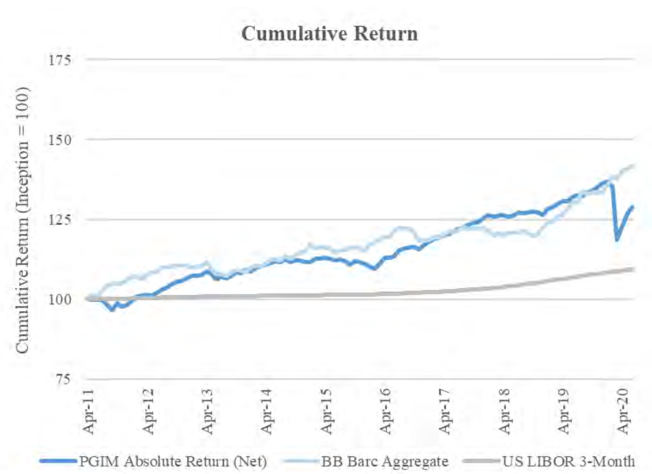
eVestment Performance and Risk Peer Universe Ranking as of 6/30/20

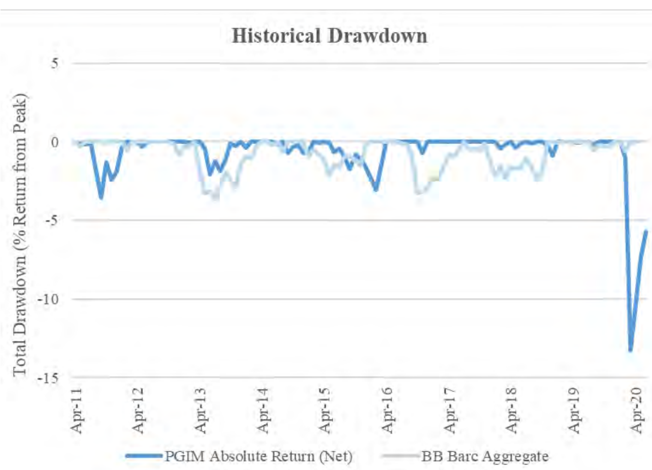
eVestment Peer Universe Ranking (as of 6/30/20)	YTD		1 Year		3 Year		5 Year		7 Year		Since Inc.	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
PGIM Absolute Return (Net)	-5.4	81	-2.3	82	2.0	51	2.8	42	2.8	34	2.9	36
BB Barc Aggregate	6.1	1	8.7	1	5.3	1	4.3	7	4.0	7	3.8	13
US LIBOR 3-Month	0.9	23	2.1	38	2.1	50	1.5	74	1.1	75	1.0	86
Value Added (vs. 3-Mth LIBOR)	-6.3		-4.4		-0.1		1.3		1.7		1.9	

Return Statistics with eVestment Peer Universe Ranking (as of 6/30/20)	1 Year	3 Year	5 Year	7 Year	Since Inception	Since Inc. Rank
Excess Return	-4.44	-0.05	1.34	1.66	1.85	33
Standard Deviation	14.08	8.05	6.42	5.51	5.08	47
Portfolio Beta	1.19	0.40	0.34	0.30	0.25	37
Sharpe Ratio	-0.28	0.04	0.26	0.36	0.43	46
Sortino Ratio	-0.31	0.04	0.30	0.41	0.50	47

Returns are net of fees Benchmark comparison vs. US LIBOR 3-Month Market Beta vs. BB Barclays Aggregate Index

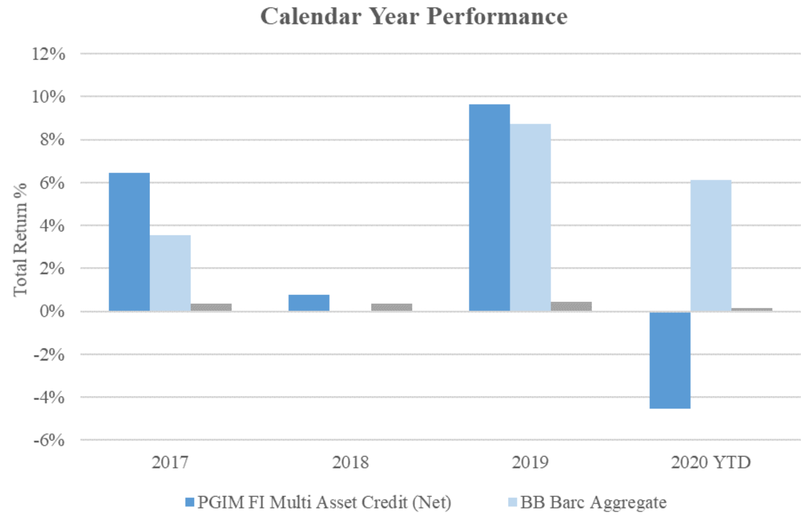
Universe: eVestment Global Unconstrained Fixed Income   Source: eVestment



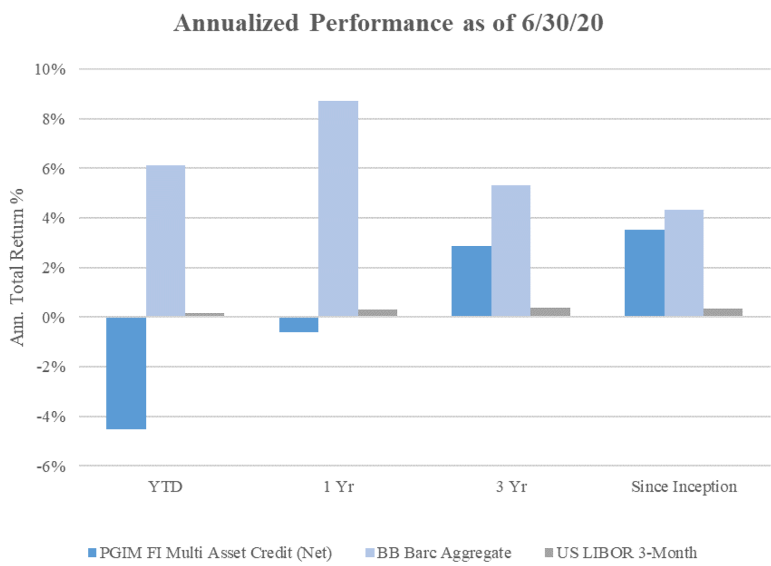


YTD as of 6/30/20 Source: PGIM Fixed Income, eVestment, Bloomberg

PGIM Fixed Income Multi-Asset Credit Strategy



	2017	2018	2019	2020 YTD
PGIM FI Multi Asset Credit (Net)	6.4%	0.8%	9.6%	-4.5%
BB Barclays Aggregate	3.5%	0.0%	8.7%	6.1%
US LIBOR 3-Month	0.4%	0.4%	0.4%	0.1%
Diff (PGIM MAC vs. 3-Mth LIBOR)	6.1%	0.4%	9.2%	-4.7%



	YTD	1 Yr	3 Yr	Since Inception
PGIM FI Multi Asset Credit (Net)	-4.5%	-0.6%	2.9%	3.5%
BB Barclays Aggregate	6.1%	8.7%	5.3%	4.3%
US LIBOR 3-Month	0.1%	0.3%	0.4%	0.4%
Diff (PGIM MAC vs. 3-Mth LIBOR)	-4.7%	-0.9%	2.5%	3.2%

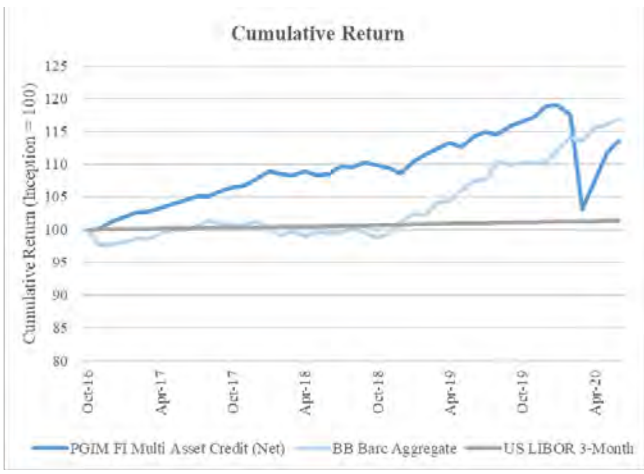
YTD as of 6/30/20 Source: PGIM Fixed Income, eVestment, Bloomberg

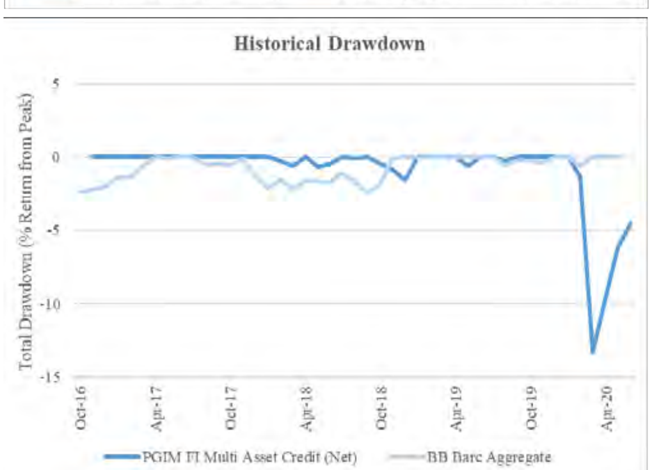
eVestment Performance and Risk Peer Universe Ranking as of 6/30/20

eVestment Peer Universe Ranking (as of 6/30/20)	YTD		1 Year		3 Year		Since Inc.	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
PGIM FI Multi Asset Credit (Net)	-4.5	77	-0.6	66	2.9	33	3.4	38
BB Barclays Aggregate	6.1	1	8.7	1	5.3	1	5.2	9
US LIBOR 3-Month	0.9	5	2.1	13	2.1	73	1.9	97
Value Added (vs. 3-Mth LIBOR)	-5.5		-2.7		0.8		1.4	

Return Statistics with eVestment Peer Universe Ranking (as of 3/31/20)	1 Year	3 Year	Since Inception	Since Inc. Peer Rank
Excess Return	-2.74	0.78	1.66	28
Standard Deviation	14.39	8.33	7.54	70
Portfolio Beta	1.13	0.34	0.28	49
Sharpe Ratio	-0.15	0.14	0.27	47
Sortino Ratio	-0.18	0.16	0.31	47

Returns are net of fees Benchmark comparison vs. US LIBOR 3-Month Market Beta vs. BB Barc Aggregate
Universe: eVestment Global Unconstrained Fixed Income Source: eVestment





YTD as of 6/30/20 Source: PGIM Fixed Income, eVestment, Bloomberg

Recommendation

PGIM's Multi-Sector team has demonstrated the ability to consistently add alpha over time through both sector rotation and issue selection. In particular, PGIM's strong bottom-up research effort has generated strong relative performance from security selection across a broad range of credit-oriented sectors, including the primary asset classes utilized within Strategic Credit. While the Strategic Credit strategy is new, it follows closely to the firm's Absolute Return strategy, which has produced strong results since its inception in 2011. Importantly, the Strategic Credit strategy is managed by the same experienced senior PM team that has generated strong results in the firm's Absolute Return, Core and Core Plus strategies.

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Manager: Oaktree Capital
Strategy: Oaktree U.S. High Yield Bond Strategy
Benchmark: ICE BofA US High Yield Cash Pay Constrained Index
Role in SBI Portfolio: Return-Seeking Fixed Income, High Yield Corporate Bond

Organization

Oaktree was formed in April 1995 and since inception has emphasized an opportunistic, value-oriented and risk-controlled approach to investments in real estate, distressed debt, corporate debt (including high yield debt and senior loans), control investing, convertible securities, listed equities, and multi-strategy solutions.

Headquartered in Los Angeles, California, Oaktree has over 950 employees across 18 cities globally and oversees approximately $121.9 billion in assets. Oaktree has offices in 18 cities worldwide, including Los Angeles, Houston, New York, Stamford, Amsterdam, Dubai, Dublin, Frankfurt, London, Luxembourg, Paris, Beijing, Hong Kong, Seoul, Shanghai, Singapore, Sydney and Tokyo.

On March 13, 2019, Brookfield Asset Management Inc. and Oaktree Capital Group announced that they had entered into an agreement to which Brookfield would acquire a majority interest in Oaktree's business. The transaction closed on September 30, 2019. Upon the closing of the transaction, Brookfield acquired an economic stake of approximately 61.2% of the Oaktree business and Oaktree's Class A common shares ceased to be publicly traded. Both Brookfield and Oaktree continue to operate their respective businesses independently, partnering to leverage their strengths, with each remaining under its prior brand and led by its prior management and investment teams. Howard Marks and Bruce Karsh will continue to have operating control of Oaktree as an independent entity for the foreseeable future.

Assets

Oaktree's AUM of $121.9 billion is stretched across 4 different asset classes including credit, private equity, real assets and listed equities. Oaktree's credit strategies are the largest portion of its AUM.

	Inception Year	AUM ($ millions)
Credit		
Distressed Debt	1988[1]	$19,738
High Yield Bonds	1986[1]	14,347
Senior Loans	2006	9,880
Private/Alternative Credit	2001	8,801
Multi-Strategy Credit	2017	3,454
Emerging Markets Debt	2012	2,542
Convertible Securities	1987[1]	1,942

As of 9/30/19 Source: Oaktree [1] *Predecessor firm*

Strategy Profile

The Oaktree High Yield strategy focuses on high yield bonds issued in North America. The strategy emphasizes creditworthy companies that are below investment grade. Oaktree seeks to achieve superior risk adjusted returns while minimizing credit loss and dampening volatility. Their High Yield strategy focuses on the mid- to upper-quality segment of the market, and tends to underweight the bottom tier of names. Because of the higher quality nature of the portfolio, Oaktree expects to earn solid results relative to the benchmark and peers in good times and outstanding relative results in bad times.

Oaktree U.S. High Yield Strategy Characteristics as of 3/31/20

Portfolio Statistics (as of 3/31/20)		
	Portfolio*	Benchmark
Eff. Duration	3.5	3.4
Eff. Convexity	-0.4	-0.3
Current Yield	6.6%	7.4%
Option-Adjusted Spread	632	693
Wtd Avg Life (yrs)	4.85	4.54
Avg Quality (S&P)	B+	B+
# Issuers/# Holdings	220/362	701/1615

Credit Quality (as of 3/31/20)		
	Portfolio	Benchmark
BBB	3.8%	0.0%
BB	42.4%	54.0%
B	43.1%	33.6%
CCC	8.2%	12.3%
Below/NR	2.5%	0.0%

Country of Risk (as of 3/31/20)		
	Portfolio	Benchmark
United States	90.0%	93.4%
Canada	4.9%	4.8%
Ireland	1.0%	0.0%
United Kingdom	1.0%	0.1%
Germany	0.8%	0.1%
Zambia	0.8%	0.5%
Netherlands	0.7%	0.0%
Brazil	0.5%	0.9%
France	0.3%	0.0%
Argentina	0.0%	0.0%

Maturity Profile (as of 3/31/20)		
	Portfolio	Benchmark
0-1 Yr	9.3%	9.3%
1-3 Yrs	34.9%	34.9%
3-5 Yrs	38.7%	38.7%
5-7 Yrs	12.7%	12.7%
7-10 Yrs	3.0%	3.0%
10-15 Yrs	1.3%	1.3%

The strategy is broadly diversified as Oaktree refrains from making concentrated bets in sectors or issuers. The average position size typically ranges from 0.5% to 1% and the strategy's issuer concentration limit is typically around 3%. As of March 31, 2020, the top 10 positions in the portfolio accounted for 16.8% of the portfolio.

Top 5 Overweights/Underweights (as of 3/31/20)	
Overweights	Underweights
Bausch Health Co Inc	HCA Healthcare Inc
Sprint Corp	Sprint Corp
Charter Communications	Netflix Inc
CommScope Holdings Inc	T-Mobile US Inc
Tenet Healthcare Corp	Community Health Systems Inc

Data as of 3/31/20 Source: Oaktree U.S. High Yield Composite or Representative Account in the Composite as marked by an asterisk (*)

Team

Oaktree's High Yield team is led by Sheldon Stone and David Rosenberg. Sheldon Stone has a long and established track record in High Yield. He is a Principal who co-founded Oaktree in 1995 after working in high yield alongside Howard Marks at TCW and Citibank. David Rosenberg is a Managing Director at Oaktree. He has been with the firm for 15 years and has over 18 years of professional experience.

The team includes ten senior research analysts who are supported by six research associates. The analysts are industry experts, each covering approximately 25 names in a few different industry groups. In addition to the research analysts, the team includes a Portfolio Advisor with an extensive legal background to provide knowledge on covenants and assist the analysts in their review and negotiation of covenants and restructurings. The High Yield team is supported by two traders. The members of the high yield team have been at Oaktree for an average of 13 years and have on average over 21 years of industry experience.

Investment Process

Oaktree builds High Yield portfolios from the bottom- up based on credit evaluation. Their credit evaluation involves the use of their proprietary Credit Scoring Matrix. The Matrix uses eight factors to evaluate the overall credit worthiness of an issuer: industry risks, company risks, management and ownership, historical and projected coverage ratios, capital structure, financial flexibility, expected recovery and covenants. Once all of the factors have been scored and the issuer's creditworthiness is determined, an overall evaluation of risk/reward and yield compensation is evaluated. The research analyst and portfolio managers meet on every credit to determine if an issue is attractive. Once the portfolio managers have approved the issue, the traders execute the trade.

Once the trade is executed, the research analyst is responsible for actively monitoring the bonds in their sector. Every investment is reviewed at least quarterly. All investments are ranked based on the analyst's continued review of the investment. Investments that are ranked low are monitored more frequently.

ESG

Throughout the life cycle of an investment, Oaktree incorporates environmental, social and governance ("ESG") topics into the investment, analysis, and decision-making process. Oaktree has a Socially Responsible Investing ("SRI") policy informed by the principles set forth in the U.N. Principles for Responsible Investment (the "UN PRI"). The Oaktree High Yield team has recently engaged the Center of Social and Sustainable Products, an independent ESG consultant, to systematically provide scores on their investments (0 to 10) based on MSCI proprietary research. Oaktree's ESG research process is summarized below:

- In considering a potential investment, they conduct an assessment of the issuer's ESG profile and the results of their analysis are factored into their investment decision.

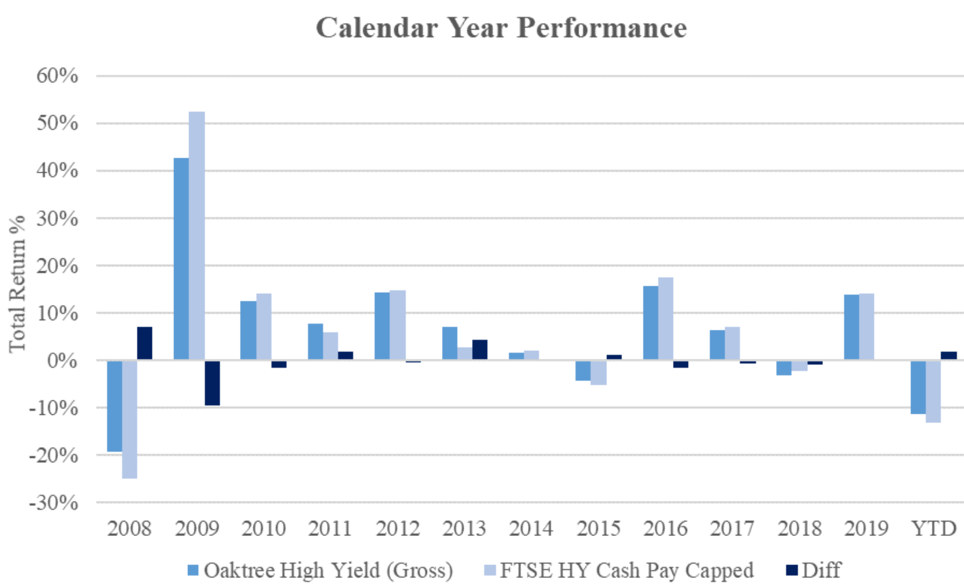
- They perform enhanced due-diligence before purchasing the bonds of companies that receive an ESG Score of zero or one from their consultant, or which otherwise raise ESG concerns. Oaktree will utilize proprietary ESG research from MSCI to determine the severity of the issues, assess their ability to influence change and engage management on deficiencies.

- All investments that have an ESG score of zero or one, or which otherwise raise ESG concerns, will be placed on their Watch List and formally reviewed on a quarterly basis by portfolio managers.

- They will continuously monitor the ESG performance of our investments and report any material ESG issues to the ESG Governance Committee for discussion, including any action taken in client funds and accounts.

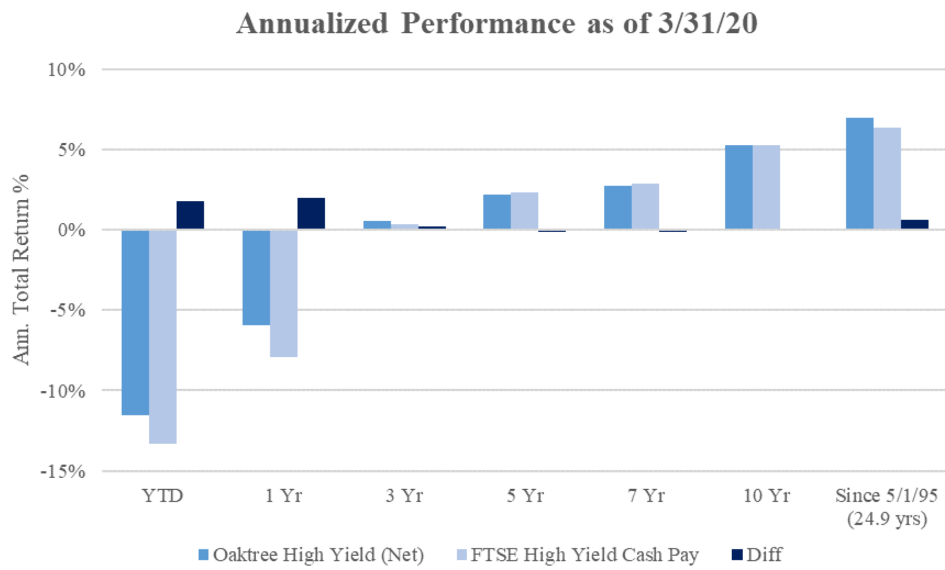
Performance

Oaktree is a high quality High Yield manager. Their portfolio tends to be skewed towards higher-rated bonds relative to their benchmark. Their efforts are concentrated on gauging credit risk and avoiding credit problems as opposed to reaching for yield. This approach is not well rewarded on a relative basis when there are few defaults or credit problems in the market. However, because of Oaktree's emphasis on quality and managing downside risk, the strategy can be expected to outperform when there is a downturn in the market.



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	YTD
Oaktree HY	-19.4%	42.7%	12.3%	7.6%	14.1%	7.1%	1.5%	-4.4%	15.5%	6.2%	-3.2%	13.9%	-11.5%
FTSE HY Cash Pay Capped	-25.0%	52.3%	13.9%	5.8%	14.7%	2.7%	1.9%	-5.4%	17.3%	6.9%	-2.3%	14.0%	-13.3%
Value Added	5.6%	-9.6%	-1.6%	1.8%	-0.5%	4.3%	-0.4%	1.0%	-1.8%	-0.7%	-0.9%	-0.2%	1.7%

Data as of 3/31/20. Source: Oaktree



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	10 Yr	Since 5/1/95 (24.9 yrs)
Oaktree HY (Gross)	-11.5%	-5.9%	0.5%	2.2%	2.7%	5.2%	7.0%
FTSE HY Cash Pay Capped	-13.3%	-7.9%	0.3%	2.3%	2.9%	5.2%	6.4%
Value Added	1.7%	2.0%	0.2%	-0.1%	-0.1%	0.0%	0.6%

Data as of 3/31/20. Source: Oaktree

eVestment Performance and Risk Peer Universe Ranking as of 3/31/20

Return Statistics with eVestment Peer Universe Ranking (as of 3/31/20)	1 Year	3 Year	5 Year	7 Year	10 Year	10 Year Peer Rank
Excess Return	1.70	0.09	-0.24	-0.21	-0.11	65
Standard Deviation	11.01	7.30	6.92	6.44	6.36	36
Portfolio Beta	0.87	0.89	0.90	0.92	0.91	71
Tracking Error	1.79	1.11	1.05	0.94	1.06	26
Information Ratio	0.95	0.08	-0.23	-0.22	-0.10	69
Sharpe Ratio	-0.73	-0.16	0.15	0.30	0.73	59
Sortino Ratio	-0.77	-0.19	0.20	0.39	1.05	52
Upside Market Capture	99.12	94.51	91.39	94.36	93.75	75
Downside Market Capture	90.04	94.01	93.29	95.92	91.90	36

eVestment Peer Universe Ranking (as of 3/31/20)	YTD		1 Year		3 Year		5 Year		7 Year		10 Year	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
Oaktree HY (Gross)	-11.5	38	-5.9	44	0.5	69	2.2	76	2.7	84	5.2	73
FTSE HY Cash Pay Capped	-13.1	64	-7.7	64	0.5	71	2.4	68	2.9	72	5.3	67
Value Added	1.6		1.8		0.0		-0.2		-0.2		-0.1	

Returns are gross of fees

Universe: eVestment US High Yield Fixed Income Source: eVestment

Data as of 3/31/20. Source: Oaktree, eVestment, Bloomberg

Recommendation

Staff is recommending the addition of the Oaktree High Yield strategy to the return seeking portion of the Fixed Income Portfolio. The Oaktree HY strategy is one of the longest running High Yield strategies in the industry. Sheldon Stone and his team have an incredible amount of history and experience in the market. Oaktree has a stable team that has managed High Yield through multiple credit cycles. Their credit scoring system is thorough and has allowed for superior underwriting which contributes to Oaktree's ability to invest in high quality, credit worthy issuers. The team's inclusion of a Portfolio Advisor, who focuses on documentation including covenants, is unique to the team and adds an extra layer of underwriting that is not typically seen in the industry. Oaktree is a large organization well known for their involvement in many aspects of the credit market. The High Yield team has access to many resources within the Oaktree organization that contributes not only superior underwriting, but also access to issuers.

Oaktree's strategy of focusing on high quality companies has at times led to underperformance. The underperformance is more evident in benign credit cycles. Throughout the history of their strategy, the Oaktree team has focused on credit quality and have never reached for yield despite the fact that this may lead to underperformance. The value of their underwriting and focus on high quality companies is evident in down markets. The bias towards higher quality issues should dampen the drawdown to the SBI portfolio in a down market making it an attractive strategy as the SBI expands its credit portfolio.

Manager: The TCW Group, Inc.
Strategy: Securitized Opportunities Strategy
Benchmark: U.S. LIBOR 3-Month
Role in SBI Portfolio: Return-Seeking Fixed Income, Securitized Credit

Organization

Founded in 1971 and based in Los Angeles, TCW manages equity, fixed income, and alternative assets on behalf of institutional and private clients. TCW's clients include corporate and public pension plans, financial institutions, insurance companies, endowments, and foundations in the U.S. as well as non-U.S. based entities including central banks, sovereign wealth funds, and private banks.

In 2001, Société Générale, one of the largest global banking franchises, acquired TCW. In 2010, TCW acquired Metropolitan West Asset Management LLC, a fixed income asset manager. In February 2013, TCW's then parent company, Société Générale, completed the sale of its ownership stake in TCW to the Carlyle Group and TCW management and employees. Following the buyout, The Carlyle Group held an approximately 60% stake in the firm through two of its private equity funds, with TCW management and employees owning the balance of approximately 40%. On December 27, 2017, Nippon Life completed its acquisition of 24.75% minority stake in TCW from Carlyle. The remaining portion of Carlyle's interest was transferred to another Carlyle long-dated private equity fund. As a result of the transaction, ownership in TCW by TCW management and employees increased to 44.07%, while Carlyle maintained a 31.18% interest in the firm.

Assets

As of March 31, 2020, TCW managed approximately $211.6 billion in assets across three different assets classes including Fixed Income, Equities and Alternative Investments. The largest portion of TCW's assets is in Fixed Income products. Over half of TCW's Fixed Income assets are in securitized products. The $104 Billion in securitized products run by TCW represent five dedicated securitized strategies and their multi asset strategies.

Strategy	AUM ($MM)
Fixed Income	**$196,035.4**
Core/Core Plus Fixed Income	$120,509.4
Mortgage-Backed Securities	$15,515.8
International/Global Fixed Income	$15,420.2
Long Duration	$11,860.7
Unconstrained/Strategic/Absolute	$10,046.8
Intermediate	$8,152.9
Investment Grade Credit	$5,731.6
Low Duration/Ultra Short/Cash	$3,442.5
High Yield/Bank Loans	$2,909.6
Opportunistic Core Plus Fixed Income	$1,954.3
U.S. Government & Government/Credit	$327.2
Other Fixed Income	$164.40

Source: All AUM data provided by TCW. Data as of 3/31/20

Strategy Profile

The TCW Securitized Opportunities strategy is an opportunistic, total return fixed income strategy that uses both agency and non-agency mortgage backed securities, commercial mortgage backed securities and asset-backed securities. The strategy is managed without a prescribed duration or credit limitation and may vary significantly over time.

The strategy focuses on bottom-up security selection across the securitization market. TCW applies a disciplined fundamental-based research effort to distinguish opportunities among security types in order to achieve a target of Libor + 500 bps over a full credit cycle. TCW looks for securitized products that can outperform over a wide range of prepayment, credit, volatility, home prices and interest rate environments.

TCW Securitized Opportunities Strategy Characteristics as of 3/31/20

Portfolio Statistics (as of 3/31/20)	Portfolio
Eff. Duration	1.59 years
Eff. Convexity	0.08 years
Current Yield	4.29%
Option-Adjusted Spread	360
Wtd Avg Life	5.63
Avg Quality (S&P)	A-
# Holdings	184 / 720

Credit Quality (as of 3/31/20)	Portfolio
Gov't	16.7%
AAA	31.1%
AA	5.3%
A	3.7%
BBB	12.5%
BB	5.1%
B	3.4%
CCC	10.2%
Below/NR	12.0%
Total	100.0%

Sector Weights (as of 3/31/20)	Portfolio
Non-Agency MBS	45.8
CMBS	27.5
ABS	17.8
Agency MBS	2.1
Cash & Other	6.7
Total	100.0

Yield Curve (as of 3/31/20)	
Maturity	Portfolio
0-1 Year	5.5%
1-3 Years	15.6%
3-5 Years	27.8%
5-7 Years	20.8%
7-10 Years	21.0%
10-15 Years	9.1%
15-20 Years	0.2%
20+ Years	0.0%
Total	100.0%

Data as of 3/31/20 Source: TCW

Team

TCW's Fixed Income team consists of both a Generalist team and a Specialist team. The Generalist portfolio managers are responsible for the macro view of the strategy. Generalist PMs have expertise in areas such as interest rate factors, monetary and fiscal policy, relative value across fixed income sectors, overall portfolio risk management, aggregate capital flows, benchmark weightings and risk factors and targeted asset allocation. The Generalist team consists of four portfolio managers; Tad Rivelle, Laird Landmann, Steve Kane, CFA and Bryan Whalen, CFA. The Specialist team focuses on specific asset classes within the fixed income market, e.g. Treasuries, Corporates, Asset-Backed, etc. The specialists are responsible for research and security selection within their asset class.

The Securitized products teams consists of 18 product specialists who focus on various areas of the securitized market. Scott Austin and Harrison Choi, co-heads of the Securitized Products Division manage the Securitized Opportunities Strategy. Scott joined TCW in 2006 and has extensive experience trading mortgage-backed securities. Harrison Choi also has extensive experience in securitized products. He has been with TCW for 13 years.

Investment Process

TCW uses a bottom up, security selection process to manage the Securitized Opportunities strategy. The specialist research analysts are responsible for the analysis of specific issues/credits that are being monitored or considered for investment. The specialist research analysts analyze securities utilizing scenario/prepayment analysis, OAS analysis, and cash flow reconstitution analysis. Their propriety technology provides them with research data that includes loan level data, default prepayment, and severity models, deal level tracking and servicer/originator reviews. All investment recommendations are thoroughly analyzed and subjected to "cross-examination" within the team. The suggestions and recommendations are then relayed from the research analysts to the Specialist Portfolio Managers for discussion and evaluation. Securities cannot be purchased for the strategy until they are approved by the Specialist Portfolio Managers. The Generalist PMs add input into the strategy as it relates to duration, yield curve and sector decisions.

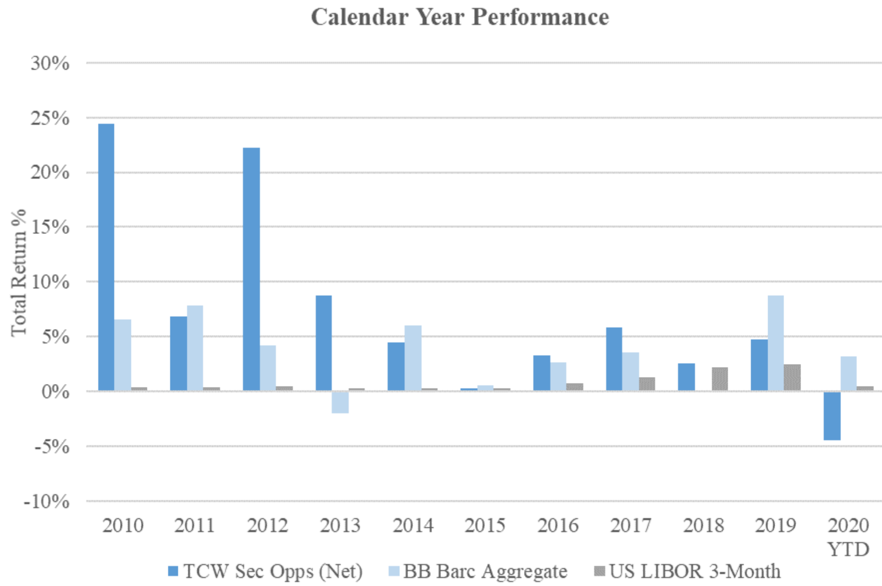
ESG

TCW believes ESG factors can have a significant positive impact on the companies and countries in which they invest, which in turn can improve the performance of portfolios. ESG factors are considered a key part of their investment process and are one aspect that contributes to their overall assessment of credit value and return potential. The credit team has developed an ESG scorecard for all of their credit holdings that allows for consistent application of the firm's ESG policy within a dynamic investment environment.

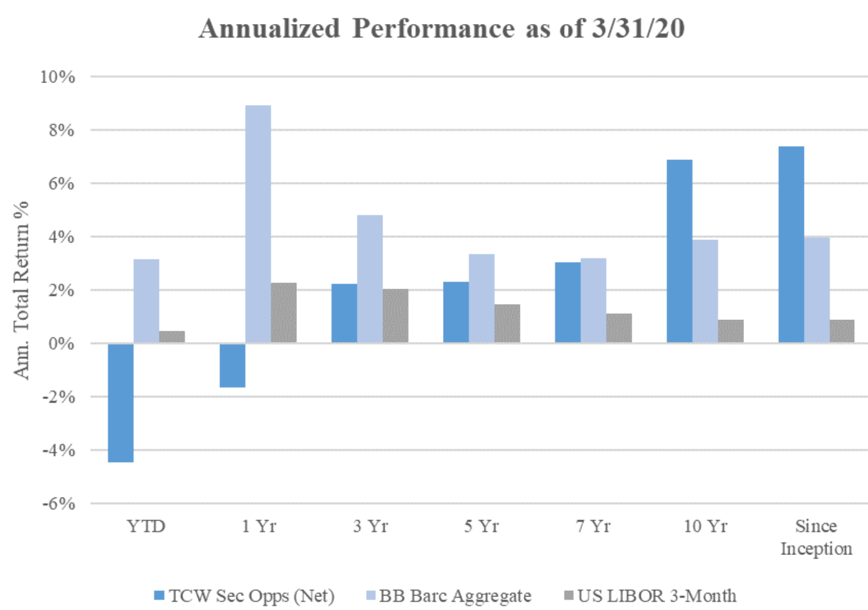
In January 2019, TCW became a signatory to the UN Principles for Responsible Investment (PRI) and is required to report ESG activity by 2021. In addition, the firm was selected to become a member of the PRI's Structured Products Advisory Committee, which advices PRI on its program to identify how ESG factors are considered in the investment decisions in structured products.

Performance/Risk

The strategy targets an annual return of +500 bps in excess of 3-month LIBOR over a full market cycle. Security selection is expected to provide the greatest source of alpha followed by sector rotation. The strategy is designed to perform the best in environments where there are temporary dislocations in the market. These dislocations can be exploited through TCW's disciplined research process and bottom-up security section.



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD
TCW Sec Opps (Net)	24.5%	6.9%	22.2%	8.7%	4.4%	0.3%	3.3%	5.8%	2.6%	4.7%	-4.5%
BB Barc Aggregate	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	8.7%	3.1%
US LIBOR 3-Month	0.3%	0.3%	0.5%	0.3%	0.2%	0.3%	0.7%	1.2%	2.2%	2.5%	0.5%
Diff (TCW/3ML)	24.1%	6.6%	21.8%	8.4%	4.2%	0.0%	2.6%	4.6%	0.3%	2.2%	-4.9%



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	10 Yr	Since Inception
TCW Sec Opps (Net)	-4.5%	-1.6%	2.2%	2.3%	3.0%	6.9%	7.4%
BB Barc Aggregate	3.1%	8.9%	4.8%	3.4%	3.2%	3.9%	4.0%
US LIBOR 3-Month	0.5%	2.3%	2.0%	1.5%	1.1%	0.9%	0.9%
Diff (TCW/3ML)	-4.9%	-3.9%	0.2%	0.8%	1.9%	6.0%	6.5%

YTD as of 3/31/20. Source: TCW, eVestment, Bloomberg

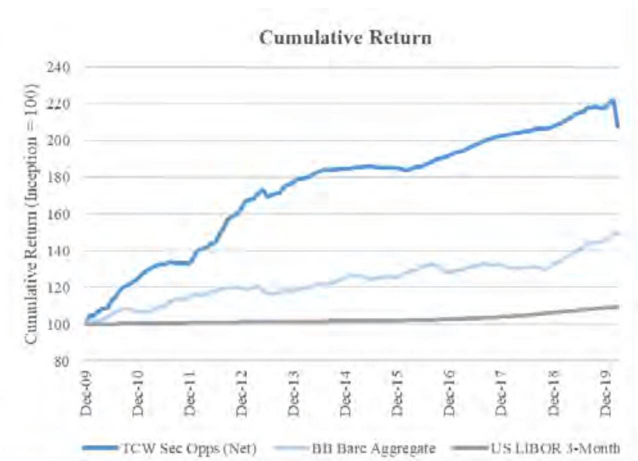
eVestment Performance and Risk Peer Universe Ranking as of 3/31/20

eVestment Peer Universe Ranking (as of 3/31/20)	YTD		1 Year		3 Year		5 Year		7 Year		10 Year	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
TCW Sec Opptys (Net)	-4.5	23	-1.6	23	2.2	27	2.3	55	3.0	63	6.9	19
BB Barc Aggregate	3.2	1	8.9	1	4.8	1	3.4	7	3.2	36	3.9	74
US LIBOR 3-Month	0.5	4	2.4	10	2.0	38	1.4	79	1.1	100	0.9	100
Value Added (TCW/3ML)	-5.0		-4.0		0.2		0.9		1.9		6.0	

Return Statistics with eVestment Peer Universe Ranking (as of 3/31/20)	1 Year	3 Year	5 Year	7 Year	10 Year	10 Year Peer Rank
Excess Return	-4.02	0.21	0.88	1.95	6.00	19
Standard Deviation	7.15	4.14	3.27	3.11	3.66	31
Portfolio Beta	1.09	0.50	0.30	0.28	0.29	56
Sharpe Ratio	-0.51	0.12	0.36	0.71	1.72	13
Sortino Ratio	-0.55	0.13	0.39	0.83	2.80	19

Returns are net of fees Benchmark comparison vs. US LIBOR 3-Month   Market Beta vs. BB Barclays Aggregate Index

Universe: eVestment US Securitized Fixed Income - Non-Traditional   Source: eVestment



Data as of 3/31/20 Source: TCW, eVestment, Bloomberg

Recommendation

TCW is a highly reputable fixed income manager with a long and successful track record. TCW has been involved in the securitized portion of the fixed income market over multiple credit cycles. Over half of their fixed income assets are in securitized products. The Securitized Opportunities Strategy is run by a large stable team that has extensive experience in securitized products. In addition to the team, TCW's long standing involvement in the securitized market has produced proprietary systems that contribute to the team's strong underwriting capabilities. These propriety systems not only contribute to analysis but also store large amounts of data that can help TCW move quickly in market dislocations.

The TCW Securitized Opportunities strategy aims to provide incremental return to the SBI's fixed income portfolio in addition to providing diversification benefits. The strategy focuses primarily on MBS, CMBS and ABS. The underlying exposure of these securities including residential mortgages, commercial real estate loans, student loans, and auto loans is largely consumer driven. This exposure to the consumer portion of the market helps to diversify the SBI's fixed income portfolio which is largely exposed to the corporate bond market. The SBI's fixed income portfolio has some exposure to the securitized portion of the fixed income market but the majority of this exposure is in very high quality Agency CMBS and RMBS. TCW's Securitized Opportunities strategy is heavily weighted towards non-agency RMBS and ABS. This portion of the securitization market has limited representation within the SBI's portfolio due to its limited exposure in benchmarks. TCW's Securitized Opportunities strategy would not only increase the SBI's exposure to the securitization market, but would also provide access to a portion of the fixed income market that is not currently represented in the SBI's portfolio.

The strategies exposure to floating rates bonds is generally over half of the portfolio. Floating rate bonds represented 75% of the strategy as of March 31, 2020. The floating rate nature of the strategy limits interest rate duration and helps to protect against rising interest rates.

The combination of strategy, team and organization makes this an attractive strategy to the SBI. The SBI is recommending the addition of TCW's Securitized Opportunities Strategy to the return seeking portion of the Fixed Income Portfolio.

APPENDIX B

Global Equity Manager Recommendations

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Manager name: Ariel Investments, LLC
Strategy name: Ariel Global
Benchmark: MSCI AC World Index
Role in SBI Portfolio: Active Global Equity, Value Emphasis

Organization

Ariel Investments is a minority owned boutique investment manager founded by John W. Rogers, Jr. in 1983. Mr. Rogers founded the firm after leaving William Blair & Company in Chicago. As co-CEO and CIO of Ariel, Mr. Rogers remains fully engaged in the day-to-day management of the firm alongside co-CEO Mellody Hobson. Together, Mr. Rogers and Ms. Hobson own a controlling interest in the firm (currently 73.8%). The remainder of the firm's equity is held by a combination of current and former employees and long-standing outside shareholders who helped finance the startup of the firm. In addition to its Chicago and New York investment offices, Ariel has offices in Sydney and Washington, D.C. The firm has over 100 employees, including 26 investment professionals across portfolio management, research and trading.

Assets

Ariel managed $10.2 billion in assets as of March 31, 2020. Ariel's client base is well-diversified and is fairly evenly split between corporate clients, public plans and its mutual fund business. Since launch in 2011, Ariel's International and Global products have grown steadily and now represent a substantial portion of the firm's overall assets under management. The firm's AUM by product and Top 5 accounts in the Ariel Global Product as of March 31, 2020 are highlighted below.

Strategy Assets	Assets ($MM)
Micro-Cap Value	7.4
Small Cap Deep Value	109.9
Small Cap Value	670.8
Small/Mid Cap Value	1,594.9
Mid Cap Value	1,450.5
Focused Value	144.3
International DM	2,046.8
International DM/EM	1,251.6
Global	2,897.6
Global Concentrated	0.4
Total AUM	***10,174.2***

Top 5 Accounts in Global Product		
Account	Client Type	Assets ($MM)
Virginia Retirement System	Public	894.8
Anonymous	Public-Insurance	626.2
The Boeing Company Employee Retirement Plans Master Trust	Corporate	582.2
Southern Company System Master Retirement Trust	Corporate	266.2
Employees' Retirement System of the City of Dallas	Public	92.0

Strategy Profile

Ariel's Global strategy is an actively managed global value strategy built around a fundamental bottom-up and contrarian investment approach led by portfolio manager and Global CIO Rupal Bhansali. The strategy is benchmarked to the MSCI ACWI Index and targets between 200-300 basis points of excess return, before fees, over a market cycle. The strategy typically holds approximately 70-90 stocks. The minimum company size threshold is typically limited to companies with a market capitalization of at least $1 billion. The portfolio is designed to deliver lower risk and high returns and tends to defend well during big drawdowns. Over time, security selection and sector allocation are expected to provide the primary sources of excess returns versus the benchmark. Country selection tends to be a fallout from security selection, rather than being explicitly determined by the investment process.

Ariel Global Strategy Characteristics as of 3/31/20

Portfolio Statistics (as of 3/31/20)	
	Portfolio
# of Holdings	66
Dividend Yield	3.7%
P/E (Trailing LTM)	14.9x
Current P/B	2.2x
ROE (Last 5 yrs)	22.1%
Earnings Growth (Last 5 yrs)	2.6%
Wtd Avg Market Cap. ($MM)	$239,800

Sector Allocation (as of 3/31/20)		
	Portfolio %	Benchmark
Health Care	28.4	13.3
Communication Services	22.3	9.3
Information Technology	15.3	18.8
Consumer Staples	10.0	8.8
Financials	9.8	14.5
Consumer Discretionary	8.3	10.8
Energy	2.3	3.7
Utilities	1.5	3.6
Industrials	1.2	9.6
Real Estate	0.9	3.2
Materials	0.0	4.4
Total	**100.0**	**100.0**

Top 10 Holdings (as of 3/31/20)	
Company	Portfolio %
Microsoft Corp.	9.8
Roche Holding AG	8.1
Gilead Sciences, Inc.	6.9
GlaxoSmithKline plc	5.7
Philip Morris Intl, Inc.	5.6
China Mobile Ltd.	5.5
Nintendo Co., Ltd.	3.8
Baidu, Inc.	3.7
Johnson & Johnson	3.7
Berkshire Hathaway Inc.	3.5
Total	**56.3**

Top 10 Country Allocations (as of 3/31/20)		
	Portfolio	Benchmark
United States	41.9	55.6
Japan	12.6	7.5
China	9.2	4.9
Switzerland	8.5	3.1
United Kingdom	6.0	4.3
Germany	3.9	2.4
France	3.5	3.1
Finland	1.7	0.3
South Korea	1.1	1.4
Thailand	1.0	0.3
Rest of World	10.6	17.2
Total	**100.0**	**100.0**

Data reflects Ariel Global Composite or Representative account as of 3/31/20. Source: Ariel, MSCI, Factset

Team

The global equity team consists of 11 investment professionals and is located in New York. The team is led by Rupal Bhansali, who has sole responsibility for the Global and International strategies, and Micky Jagirdar, who co-leads the Global Concentrated strategy. Ms. Bhansali joined Ariel in 2011 from Mackay Shields, where she was responsible for managing over $3.5 billion in non-U.S. strategies. Ms. Bhansali and Mr. Jagirdar are supported by a team of 8 research analysts, each with specific industry coverage responsibilities, and a senior trader. Over time, Ms. Bhansali has built out the team to include individuals with a range of educational and investment experience. On average, the team has over 19 years of investment experience.

Name	Responsibility	Years of Investment Experience	Years with Firm	Education
Rupal J. Bhansali	EVP, CIO & PM *Industry Coverage: Financials, Consumer & Industrals*	30	8	BCom, Accounting & Finance, Mcom, International Finance & Banking, University of Mumbai; MBA, Finance, University of Rochester
Micky Jagirdar	Head of Investments & Co-PM *Industry Coverage: Technology, Health Care & Autos*	19	8	BCom, Business & Economics, University of Mumbai; MBA, Baruch College
Brent Merlis	SVP, Head Trader	21	8	BS, Syracuse University
Krishna Chintalapalli	VP, Research Analyst *Industry Coverage: Telecommunications & Media*	15	4	Bachelor of Engineering, Information Technology, West Bengal University of Technology; MBA, Cornell University
John Rowley	Client PM, Research Analyst *Industry Coverage: Generalist, Utilities & Basic Resources*	26	1	BA, Economics, Yale University; MBA, The Wharton School of The University of Pennsylvania
Barry Cohen	Sr. Research Associate *Industry Coverage: Financials*	19	<1	BS, Boston University
Victor Kovalkov	Sr. Research Associate *Industry Coverage: Consumer & Industrials*	8	5	MBA, Baruch College; BS, HSE University, Moscow
Barney Rosen, MD	Sr. Research Associate *Industry Coverage: Health Care*	21	<1	MBA, Campbell University; Doctor of Medicine, New York Medical College
Kevin Buttigieg	Research Associate *Industry Coverage: Technology*	22	1	MBA, The Wharton School of The University of Pennsylvania; BA, Union College
David Kwon	Research Associate *Industry Coverage: Utilities and Basic Resources*	18	1	BS, Baruch College
Dong Zheng	*Research Associate* *Industry Coverage: Industrials & Technology*	11	3	BS, Cornell University

Investment Process

Ariel believes that investing in undervalued, high quality businesses with a patient, long-term time horizon is the optimal way to generate risk-adjusted returns on both an absolute and a relative return basis over a full market cycle. Their investment process is designed to achieve the twin objectives of higher returns and lower risk. In what the firm believes is a point of distinction relative to other value investors, Ariel's process is distinguished by a focus on capital preservation through the explicit elimination of low quality and risky businesses that are statistically cheap. Ariel's International and Global team employs a four-step investment decision making process, differentiated by the embedding of risk management at every step:

Step One (Negative Screening): Ariel seeks to reduce the risk of large investment losses by quantitatively and qualitatively identifying and eliminating those businesses that have the highest propensity to fail, become marginalized over time or are too risky to justify the returns generated. Ariel starts by examining the business, not the stock. At this stage, the process also typically screens out stocks with limited trading liquidity. In all, negative screening typically removes approximately 60% of the stocks in the universe.

Step Two (Bottom-up Research): Of the 40% of the universe that remains, Ariel typically finds that roughly half the stocks tend to be well understood by the market, and therefore efficiently priced. The team focuses its research effort on the other half of the universe that is more likely to be misunderstood and, therefore, mispriced.

Step Three (Team Validation): Stress tests are conducted and valuation risk is examined. A three-person team debates and critiques the thesis, reviews the financial forecasts and uses that information to assess several valuation scenarios such as base-case, best-case and worst-case. The team typically comprises the lead analyst who sponsors, defends, models, and validates the investment idea; the devil's advocate (usually with adjacent industry domain knowledge) who provides alternative viewpoints and criticism; and a fresh analyst who brings a new perspective. The goal of the debate is to establish whether the business model and economics are sustainable and to quantify the upside potential and downside risk of each prospective investment.

Step Four (Portfolio Construction): The portfolio is constructed by carefully weighing the risks and rewards of each investment opportunity as well as its contribution to diversification and overall portfolio characteristics. Attention is paid to liquidity, active risk contributions, risk profiles, and a holding's expected performance under various economic scenarios to develop both upside and downside scenarios. The resulting portfolio generally holds 70 to 90 stocks, with the latitude to own as few as 50 and as many as 150.

Negative screening — 1

Process	Risk management	Benefit
Screen on risk, not growth rate or valuation	Eliminate approximately 60% of high-risk stocks in universe	Position for downside protection

Bottom-up research — 2

Process	Risk management	Benefit
Lead analysts perform research	Assess the prospects and durability of a business franchise	Proprietary insights enable better stock picking

Team validation — 3

Process	Risk management	Benefit
Team debates and stress tests each idea	Incorporate macro and micro factors in scenario analyses; lead analyst presents balanced case versus a recommendation	Ideas vetted from multiple perspectives yield more informed final decisions by portfolio manager(s)

Portfolio construction — 4

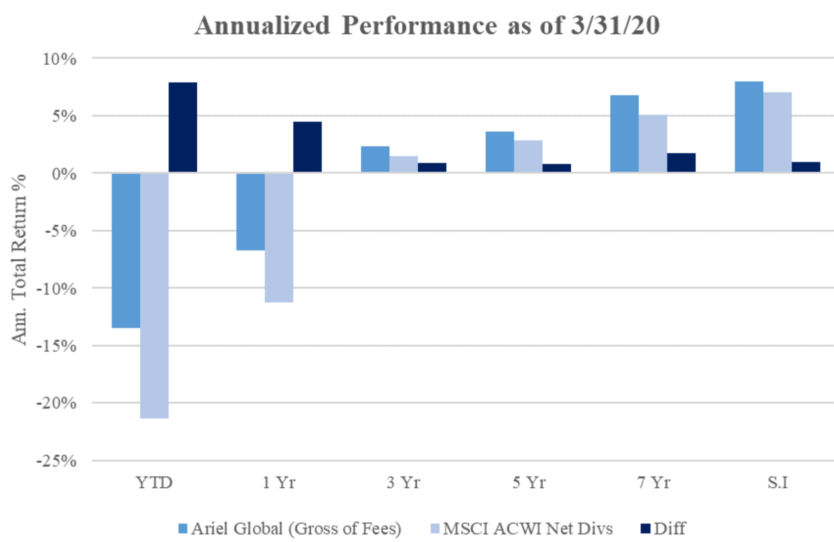
Process	Risk management	Benefit
Seek to own top decile of investment opportunities uncovered	Typically cap security position size at 5% at time of purchase, industry weights at the higher of 25% or 1.5x the benchmark*, hedge currency if practical and cost-efficient	Designed to generate superior long-term, risk-adjusted performance

ESG

Ariel's international and global strategies consider environmental, social and governance issues as part of the broader review of the material and relevant risks to an investment. Ariel's approach to ESG is grounded in inclusion and improvement via engagement and dialogue, rather than exclusion or elimination via screens or scores. Ariel integrates material and relevant ESG risk factors and exposure into their bottom-up fundamental research process using a combination of qualitative and quantitative analysis. With respect to quantitative analysis, the team may utilize data from various third party sources, databases, and company disclosures at both a company-specific level and benchmarked versus appropriate industry and/or geographic peers. The materiality of ESG factors varies by industry and geography and its impact on the investment thesis. There isn't a "one size fits all" approach but instead a case-by-case assessment of materiality and relevance, as determined by the research team. The International and Global team formalized their ESG process and consideration in April 2020.

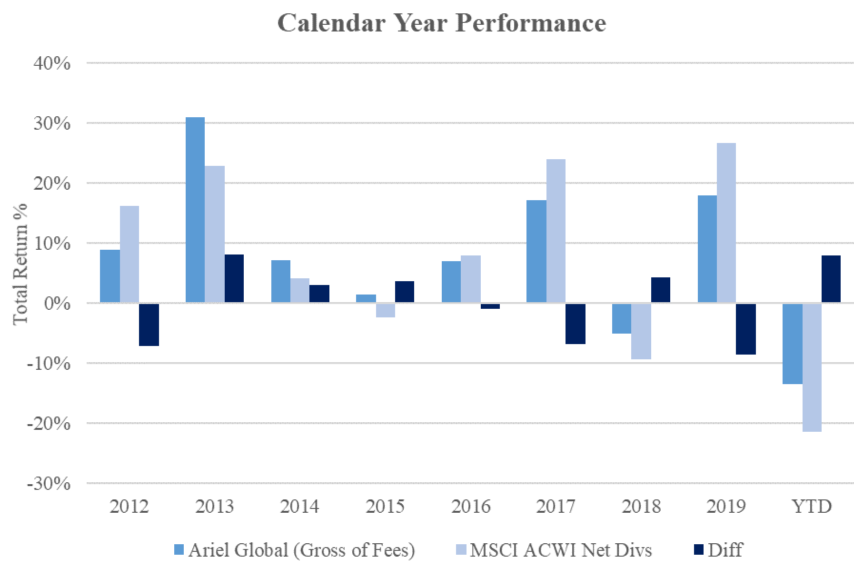
Performance

Ariel's performance since inception has been solid, generating 100 basis points of annualized alpha per year gross of fees. Calendar year performance has been mixed, with an equal number of up years (4 out of 8) and down years relative to the benchmark since inception. However, considering the strategy's value tilt and the significant underperformance of the value factor relative to growth over the last 10 years, the portfolio's results can be viewed as impressive. On a peer-relative basis, Ariel Global's performance has consistently ranked in the top half, often in the top third, of the Global All Cap Core peer group. In terms of quantitative risk analysis, the portfolio's low downside capture and beta statistics confirm the strategy has typically exhibited defensive qualities in risk-off markets.



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	S.I.
Ariel Global (Gross of Fees)	-13.4%	-6.7%	2.4%	3.6%	6.8%	8.0%
MSCI ACWI Net Divs	-21.4%	-11.3%	1.5%	2.9%	5.1%	7.0%
Value Added	7.9%	4.5%	0.9%	0.8%	1.7%	1.0%

Data as of 3/31/20 Source: Ariel Investments



	2012	2013	2014	2015	2016	2017	2018	2019	2020 YTD
Ariel Global (Gross of Fees)	8.9%	31.0%	7.2%	1.4%	7.0%	17.2%	-5.1%	18.0%	-13.4%
MSCI ACWI Net Divs	16.1%	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	26.6%	-21.4%
Value Added	-7.2%	8.2%	3.0%	3.7%	-0.9%	-6.8%	4.3%	-8.6%	7.9%

Data as of 3/31/20 Source: Ariel Investments

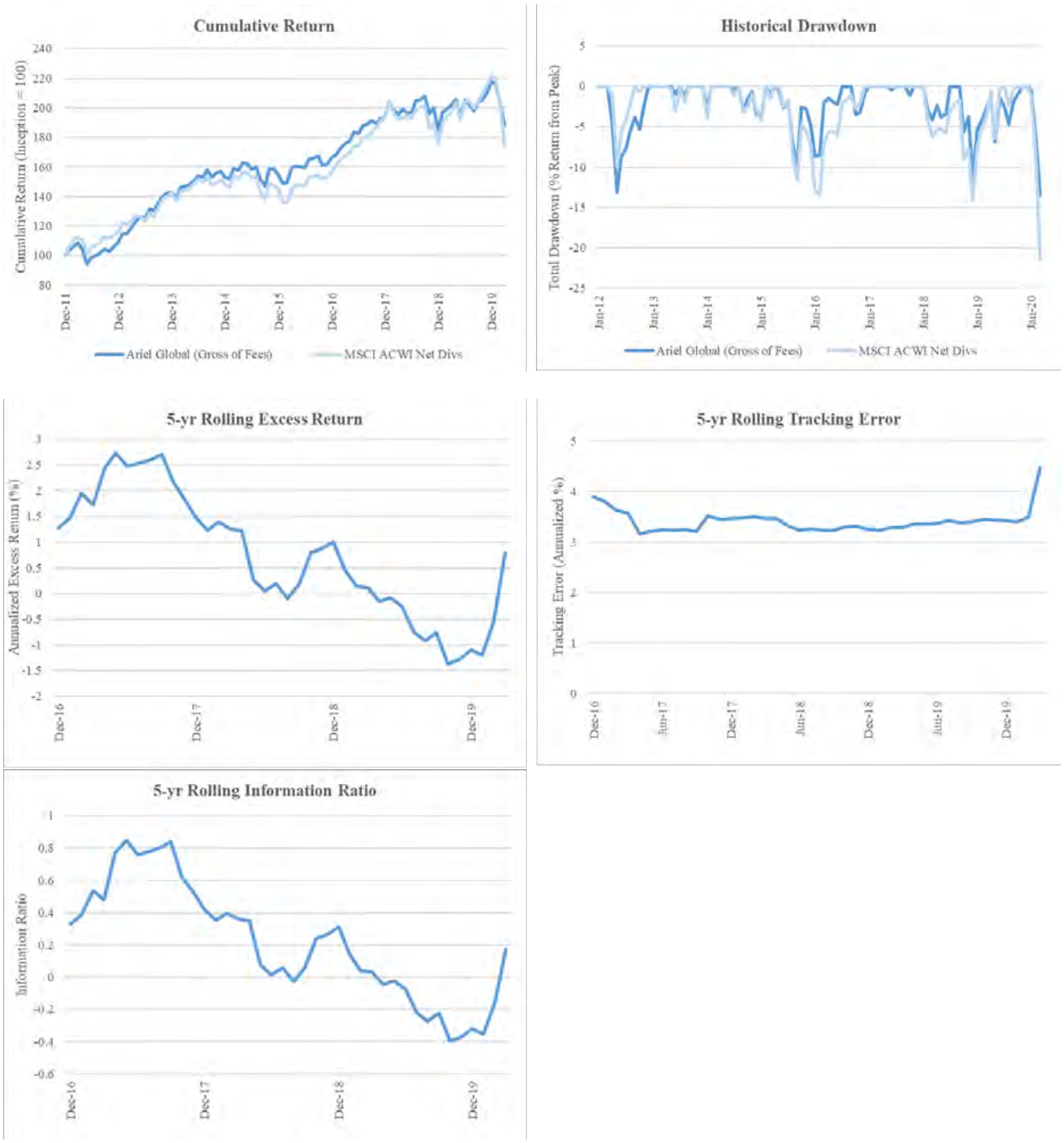
eVestment Performance and Risk Peer Universe Ranking as of 3/31/20

eVestment Peer Universe Ranking (as of 3/31/20)	YTD		1 Year		3 Year		5 Year		7 Year		Since Inc.	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
Ariel Global (Gross of Fees)	-13.4	1	-6.7	18	2.4	40	3.7	41	6.8	28	8.0	48
MSCI ACWI Index (Net Divs)	-21.4	55	-11.3	53	1.5	53	2.8	56	5.1	67	7.0	69
Value Added	7.9		4.5		0.9		0.8		1.7		1.0	

Return Statistics with eVestment Peer Universe Ranking (as of 3/31/20)	1 Year	3 Year	5 Year	7 Year	Since Inception	Since Inc. Peer Rank
Excess Return	4.52	0.89	0.81	1.72	0.98	48
Standard Deviation	14.50	12.15	11.63	10.89	11.18	9
Portfolio Beta	0.69	0.77	0.81	0.81	0.83	89
Tracking Error	7.49	5.34	4.48	4.24	4.42	64
Information Ratio	0.60	0.17	0.18	0.41	0.22	52
Sharpe Ratio	-0.60	0.05	0.22	0.55	0.65	31
Sortino Ratio	-0.75	0.07	0.31	0.83	0.97	25
Upside Market Capture	72.49	78.65	83.47	87.17	89.61	83
Downside Market Capture	77.21	80.31	81.75	77.11	82.61	14

Returns are gross of fees Benchmark comparison vs. MSCI ACWI Index (Net Divs)

Universe: eVestment Global All Cap Core Equity Source: eVestment



Data as of 3/31/20. Source: Ariel Investments, eVestment, SBI Staff Calculations All returns are presented gross of fees.

Recommendation

Staff is recommending the addition of Ariel's global equity strategy to the global portion of the public equity portfolio. Ariel was founded in 1983 and has an established track record of successfully investing in value-oriented equity strategies. Ariel's Global strategy, led by Rupal Bhansali and supported by a team of 10 investment professionals, has demonstrated solid performance since its launch in January 2012. Ariel's global investment approach seeks out quality companies with strong intrinsic value which they believe are undervalued by the market. Falling in-between a core and concentrated approach, Ariel's emphasis on value and downside risk has historically produced lower risk relative to peers both on an absolute and relative to benchmark) and has generated strong performance in risk-off markets.

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Manager name: Baillie Gifford & Co
Strategy name: Baillie Gifford Long Term Global Growth (LTGG)
Benchmark: MSCI AC World Index
Role in SBI Portfolio: Active Global Equity, Concentrated All Cap Growth

Organization

Baillie Gifford & Co was founded in Edinburgh in 1908 and is one of the UK's largest independent investment management firms. The firm's sole business is investment management. Baillie Gifford is 100% owned by the firm's 46 active partners. The partnership structure has not changed since its inception and they are committed to retaining this structure. With regards to ownership, as a private partnership the allocation of capital and profit shares is not disclosed externally, but reflects the contribution, length of service and level of responsibility of the individual partner. No partner has more than 10% share of the firm's capital. The firm provides investment advisory services to non-U.K clients via Baillie Gifford Overseas Limited, an SEC-registered investment advisor established in 1983 as a wholly owned subsidiary of Baillie Gifford & Co.

Baillie Gifford Investment Organization

Assets

Baillie Gifford manages $245.3 billion in assets as of March 31, 2020. Nearly all of Baillie Gifford's client base is institutional clients (retail makes up less than 1% of AUM).

Asset Class	AUM ($MM)
Equity	221,826
Balanced	11,335
Multi Asset	7,595
Fixed Income	4,509
Grand Total	**245,265**

As of March 31, 2020, Baillie Gifford managed a total of $39.7 billion in the LTGG strategy across 130 accounts. The number of accounts managed has increased steadily over the last 5 years.

Strategy Profile

Baillie Gifford Long Term Global Growth (LTGG) is a well-established, fundamental growth-oriented strategy that utilizes a concentrated investment style with a long-term horizon and a focus on higher growth businesses. Accordingly, portfolio turnover is low, averaging around 9% per year over the last five years. Baillie Gifford's investment approach is deliberately optimistic and emphasizes the potential upside from an investment rather than the avoidance of losses. As a concentrated strategy, LTGG portfolio holding sizes are based purely on the team's assessment of the magnitude of potential upside and the associated level of conviction. The portfolio may hold between 30 and 60 companies. The actual number of holdings, which has tended to be between 30 and 40 over the past decade, is driven by the number of intrinsically attractive opportunities available, rather than by geographical, sector or thematic considerations. As of March 31, 2020, the portfolio held 34 stocks.

Baillie Gifford LTGG Strategy Positioning as of 3/31/20

Portfolio Statistics (as of 3/31/20)	Portfolio
# of Holdings	34.0
Dividend Yield	0.4%
P/E (Trailing LTM)	78.31
Current P/B	6.64
Earnings Growth (Last 5-yr)	25.8%
Wtd Avg Market Cap. ($MM)	240,007
Median Market Cap ($MM)	96,620

Top 10 Holdings (as of 3/31/20)		
Company	Portfolio %	Benchmark %
Amazon	8.4	2.1
Tencent	7.3	0.7
Alibaba	6.9	0.8
Tesla	6.4	0.2
Illumina	6.1	0.1
Netflix	4.2	0.4
Facebook	4.1	1.0
NVIDIA	3.9	0.4
Kering	3.8	0.1
Meituan Dianping	3.3	--
Total	**54.4**	**5.8**

Sector Allocation (as of 3/31/20)		
	Portfolio %	Benchmark
Consumer Discret.	42.1	10.8
Comm.Services	22.6	9.3
Information Tech.	18.4	18.8
Health Care	12.7	13.3
Financials	2.7	14.5
Consumer Staples	1.0	8.8
Cash	0.5	0.0
Energy	0.0	3.7
Materials	0.0	4.4
Industrials	0.0	9.6
Utilities	0.0	3.6
Real Estate	0.0	3.2
Total	**100.0**	**100.0**

Key Country Allocations (as of 3/31/20)		
	Portfolio	Benchmark
United States	52.2	56.6
China	25.5	4.9
India	1.3	0.9
Hong Kong	1.4	1.1
France	6.5	3.1
Netherlands	4.5	1.2
Germany	2.3	2.4
Canada	2.1	2.7
Rest of World	3.7	27.1
Cash and Deposits	0.5	0.0

Portfolio Statistics represent Long-Term Global Growth Composite or Representative account as of 3/31/20.
Source: Baillie Gifford, MSCI, Factset

Team

The Long Term Global Growth (LTGG) team is a stable and experienced team of eight, all of whom are first and foremost research analysts. The four senior members of the team are all Partners in the firm. The two senior team members responsible for final decision-making for the strategy Mark Urquhart and Tom Slater. Both have spent their entire investment careers at Baillie Gifford. As of June 2020, Mark Urquhart has taken over as lead from fellow strategy founder James Anderson. Mr. Anderson remains on the team as a researcher and will continue to be an integral part of the team.

Name	Responsibility	Years of Investment Experience	Years with Firm	Education
Mark Urquhart*†	Investment management and analysis	24	24	BA, PhD
Tom Slater*†	Investment management and analysis	20	20	CFA, BSc
James Anderson*	Investment analysis	37	37	CFA, BSc
John MacDougall*	Investment analysis	20	20	CFA, BA
Linda Lin	Investment analysis	10	6	BA, MA
Michael Pye	Investment analysis	7	7	CFA, BA, Mlitt, PhD
Robert Wilson	Investment analysis	4	4	CFA, BA
Gemma Barkhuizen	Investment analysis	3	3	BA, MA

** Partner in the firm*

† LTGG Decision Maker

Baillie endeavors to hire graduate students right out of school to join their five year training program. While occasionally the firm does hire experienced investment professionals, including Linda Lin on the LTGG team, the majority of staff begins and spends their career at Baillie.

Investment Process

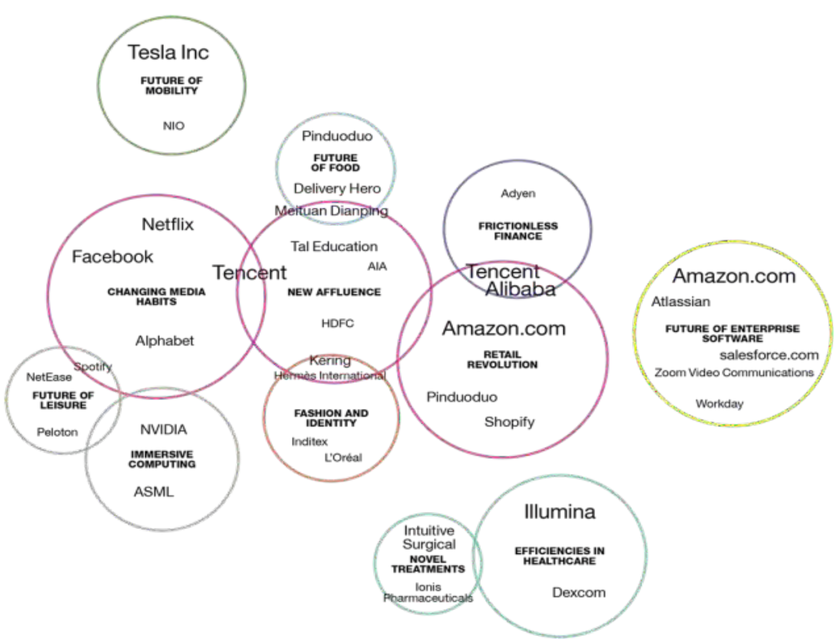
Baillie Gifford takes a global approach to stock selection, portfolio construction is purely stock driven, so no reference is made to benchmark indices in their investment process. The LTGG product is a purely stock-driven, unconstrained global equity strategy focused on investing in growth companies from around the world. Baillie believes that investing in companies with the scope to grow many multiples of their current size over the next decade will achieve investment success over the long term. They believe the discipline of having a formal investment process is essential. Their 10 Question Stock Research Framework is the heart of their investment process.

Industry Background	1	Is there room to at least double sales in the next five years?
	2	What happens over ten years and beyond?
Competitive Advantage	3	What is your competitive advantage?
	4	Is your business culture clearly differentiated? Is it adaptable?
	5	Why do your customers like you? How do you contribute to society?
Financial Strength	6	Are your returns worthwhile?
	7	Will they rise or fall?
Management Attitudes	8	How do you deploy capital?
Valuation	9	How could it be worth five times as much, or more?
	10	Why doesn't the market realize this?

Baillie Gifford expects to add value and generate 100% of alpha entirely through bottom up stock selection. Their investment style focuses on quality growth companies. Top down allocations such as currency, country and sector exposures are residual to the process. The end result of the portfolio construction process is a high conviction portfolio of global companies with exceptional growth prospects over a long-term investment horizon of 5-10 years. Initial holding sizes will typically be between 1% and 2%. However, over time the highest conviction positions can grow to represent up to 10% of the portfolio.

The universe for LTGG is listed global equity securities with a minimum market capitalization of $2B. Portfolio holding sizes are based purely on the magnitude of the potential upside and the associated level of conviction. The portfolio may hold between 30 and 60 companies. The actual number of holdings, which has tended to be between 30 and 40 over the past decade, is driven by the number of intrinsically attractive opportunities available, rather than by geographical, sector or thematic considerations. The below diagram represents Baillie's current view of stock concentrations in the LTGG model portfolio, grouped by the key growth driver(s) of each stock.

LTGG Stock Position Concentration by Theme (as of March 2020)



Source: Balllie Gifford

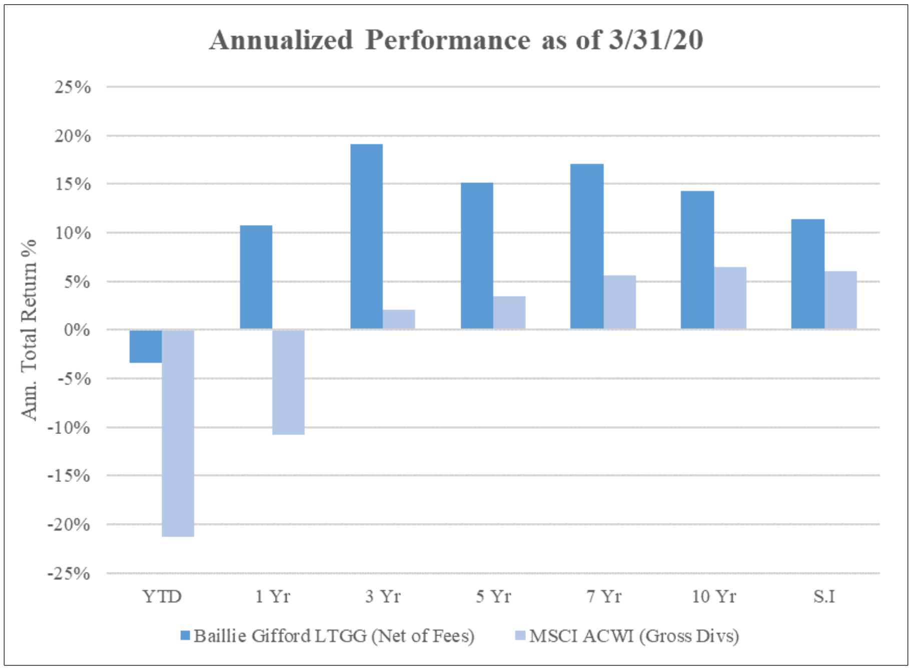
ESG

As long-term investors, Baillie Gifford makes ESG considerations an intrinsic part of the team's investment process. The firm has a dedicated Governance & Sustainability team of 24 staff. In 2019, this team had 383 such specific engagements with 281 companies. When it comes to measuring progress, they understand that engagement is an ongoing and constructive process, which rarely yields results overnight. Baillie Gifford focuses on in-house ESG research because they believe that this is where they can add value. The research brings a nuanced understanding of the portfolio holdings, a view on how the company is developing EST policies over time, and the measures in place to achieve this change. Ballie has an increased level of access to companies that comes with long-term holdings and a reputation as thoughtful, long-term investors. This allows a level of engagement that is not possible by external ESG research providers.

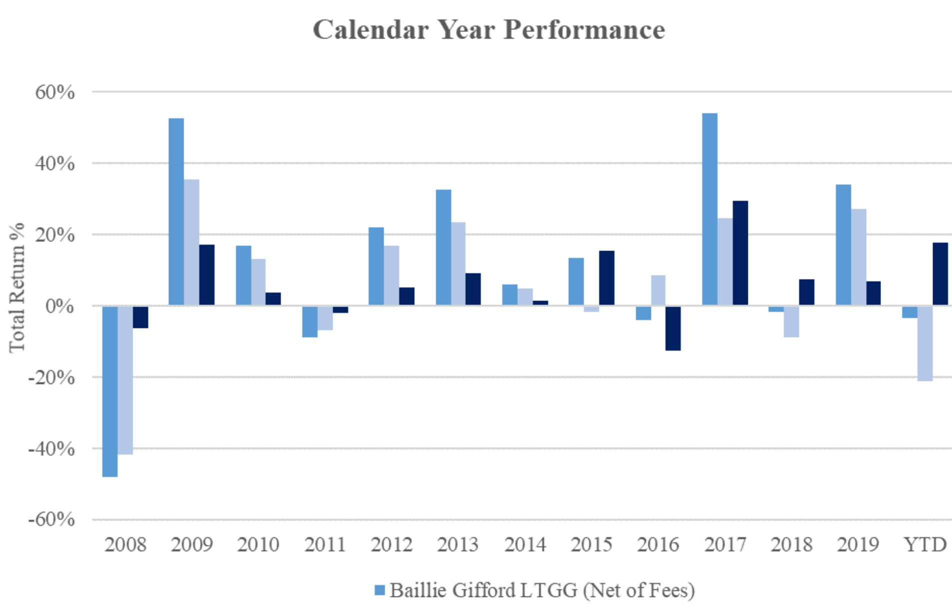
At the same time, Baillie believes that a positive and proactive approach to ESG can also be a competitive advantage for the companies in which they invest. Good governance can support better decision-making. Good social performance can create a more productive workforce. Good community relations can secure the social license to operate. Both good labor and good community relations can provide resilience in bad times and good environmental performance can lower operating costs, while securing access to long-term natural resources. Governance and sustainability issues they have frequently discussed with companies include: compensation, capital allocation decisions, board make-up, human capital management, ESG reporting, thinking around challenges and opportunities presented by climate change, as well as supply chain responsibilities, and attitude to the wide variety of internal and external stakeholders.

Performance

Baillie's long-term performance track record is impressive, with annual outperformance in 11 of 15 calendar years since inception and average annualized outperformance of 5.4% per year since inception after fees. Attribution analysis over the 5-year period ended March 31, 2020 highlights that over 90% of portfolio relative performance comes from issue selection. This is consistent with the team's goal. As a concentrated portfolio managed by a high conviction manager, the LTGG strategy has exhibited high tracking error relative to the benchmark (5-year annualized tracking error was 11.3% as of 3/31/20), making it one of the higher risk managers in its peer group.



	YTD	1 Yr	3 Yr	5 Yr	7 Yr	10 Yr	S.I
Baillie Gifford LTGG (Net of Fees)	-3.5%	10.7%	19.1%	15.2%	17.0%	14.2%	11.4%
MSCI ACWI (Gross Divs)	-21.3%	-10.8%	2.0%	3.4%	5.6%	6.4%	6.1%
Value Added	17.8%	21.5%	17.0%	11.7%	11.4%	7.8%	5.4%



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	YTD 2020
Baillie Gifford LTGG (Net of Fees)	-48.2%	52.7%	16.8%	-8.9%	21.9%	32.6%	6.1%	13.5%	-4.0%	54.1%	-1.6%	34.1%	-3.5%
MSCI ACWI (Gross Divs)	-41.9%	35.4%	13.2%	-6.9%	16.8%	23.4%	4.7%	-1.8%	8.5%	24.6%	-8.9%	27.3%	-21.3%
Diff	-6.3%	17.2%	3.6%	-2.0%	5.1%	9.2%	1.4%	15.3%	-12.5%	29.4%	7.3%	6.9%	17.8%

Data as of 3/31/20. Source: Baillie Gifford

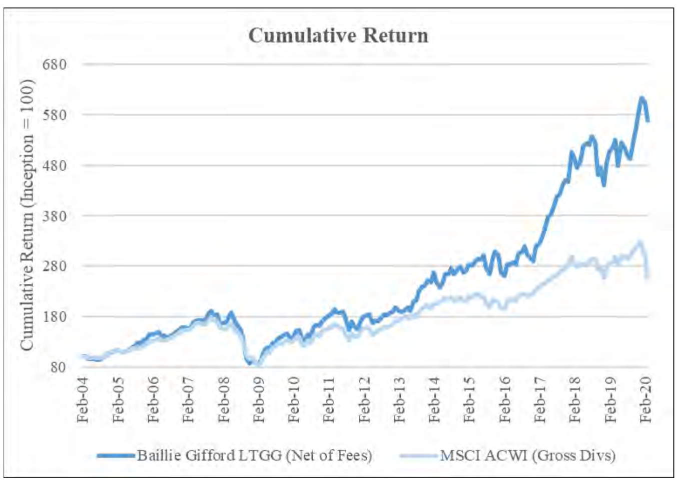
eVestment Performance and Risk Peer Universe Ranking as of 3/31/20

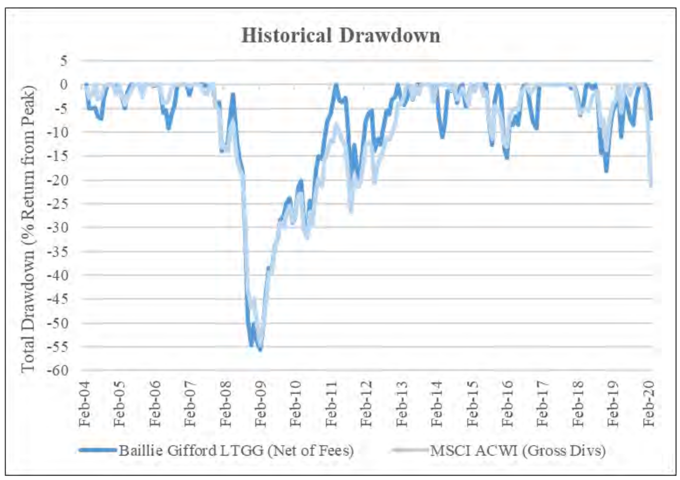
eVestment Peer Universe Ranking (as of 3/31/20)	YTD		1 Year		3 Year		5 Year		7 Year		10 Year		Since Inc.	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
Baillie Gifford LTGG (Net of Fees)	-3.5	1	10.7	1	19.1	3	15.2	3	17.0	2	14.2	3	11.4	1
MSCI ACWI Index (Gross Divs)	-21.3	92	-10.8	87	2.0	84	3.4	81	5.6	80	6.4	79	6.1	89
Value Added	17.8		21.5		17.1		11.8		11.4		7.8		5.3	

Return Statistics with eVestment Peer Universe Ranking (as of 3/31/20)	1 Year	3 Year	5 Year	7 Year	10 Year	Since Inception	Since Inc. Peer Rank
Excess Return	21.46	17.06	11.77	11.36	7.76	5.33	1
Standard Deviation	20.20	19.03	18.91	17.78	18.45	19.65	100
Portfolio Beta	0.78	1.02	1.11	1.11	1.11	1.14	1
Tracking Error	13.52	11.47	11.30	11.01	10.04	9.22	100
Information Ratio	1.59	1.49	1.04	1.03	0.77	0.58	14
Sharpe Ratio	0.43	0.91	0.74	0.91	0.74	0.51	1
Sortino Ratio	0.69	1.49	1.20	1.51	1.19	0.75	1
Upside Market Capture	139.08	173.95	162.86	149.82	133.41	127.60	1
Downside Market Capture	62.78	85.19	94.64	85.92	93.54	100.67	85

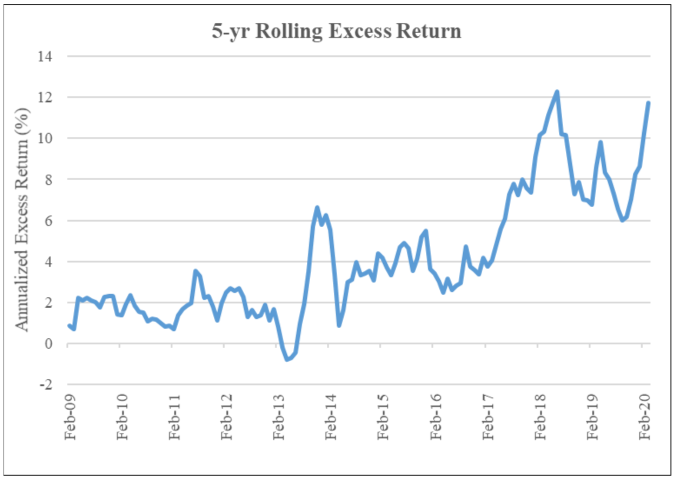
Returns are net of fees Benchmark comparison vs. MSCI ACWI Index (Gross Divs)

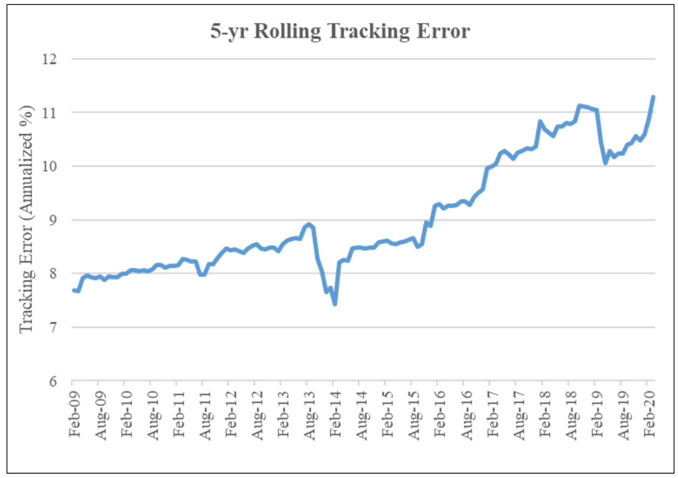
Universe: eVestment Global All Cap Growth Equity   Source: eVestment

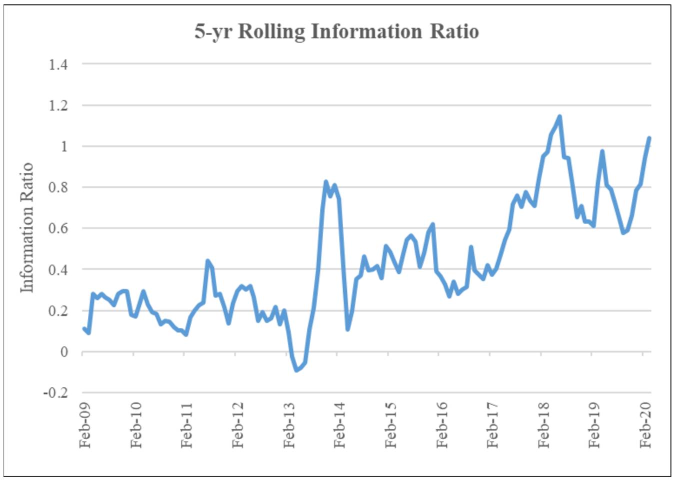




Data as of 3/31/20 Returns are net of fees. Source: Baillie Gifford, eVestment, SBI Staff Calculations







Data as of 3/31/20 Returns are net of fees. Source: Baillie Gifford, eVestment, SBI Staff Calculations

Recommendation

Staff is recommending the addition of Baillie Gifford's Long Term Global Growth (LTGG) global equity strategy to the global portion of the public equity portfolio. Baillie Gifford has a long history of strong investment management results managing international and global equity portfolios and remains one of the UK's largest private investment managers. The firm is a private unlimited liability partnership and is wholly-owned by the active Partners who all work full-time in the business. Baillie hires most of their staff out of graduate school and has a high retention rate for the rest of their career. As a concentrated strategy managed by a high convection manager with a long-term investment horizon, LTGG can be expected to exhibit higher tracking error volatility versus peers. In addition, LTGG's focus on high-growth companies means it may be more exposed to market beta in the short-term. Staff believes that for investors with a long-term investment horizon, LTGG has shown the ability to reward patient investors with exceptional performance results.

Manager name: Martin Currie
Strategy name: Global Long Term Unconstrained
Benchmark: MSCI AC World Index
Role in SBI Portfolio: Active Global Equity, Concentrated All Cap Growth

Organization

Martin Currie is a global equity specialist investment manager established in Edinburgh, Scotland in 1881. The firm currently totals 120 employees, including 46 investment professionals with offices in Edinburgh, London, Melbourne, New York and Singapore. In 2014, Martin Currie was acquired by Legg Mason Inc., a global asset management firm with US$730.8 billion in assets under management as of March 31, 2020. Legg Mason provides active asset management in many major investment centers throughout the world and is headquartered in Baltimore, Maryland. Martin Currie operates as a fully owned but independent investment manager within Legg Mason's affiliate manager program, which includes Martin Currie and eight other managers (e.g. Western Asset, Royce, Brandywine Global).

Martin Currie Inc. Organization Chart

In February 2020, Franklin Resources, Inc. entered into an agreement to acquire Martin Currie's parent firm, Legg Mason. Subject to the necessary regulatory approval, this transaction will close in September 2020. It is expected that Martin Currie will maintain its autonomy and its brand, and that the firm's investment teams, philosophy and processes will remain unchanged.

Assets

Martin Currie managed US$12,030.8 million in assets as of March 31, 2020.

Strategy	AUM (US$ MM)
Australia Only	5,342.5
Asia	2,029.3
Global Emerging Markets	2,859.3
Global / International	1,083.0
Balanced	331.7
Europe	211.6
North America	173.4
Total	**12,030.8**

The Global Long Term Unconstrained strategy (GLTU) is one of four strategies in Martin Currie's Long-Term Unconstrained (LTU) franchise, all of which are managed by the same team following the same consistent investment philosophy and process. The LTU franchise assets under management totaled just under US$1 billion as of March 31, 2020 across 14 total accounts (including separate accounts and pooled investment vehicles).

Long-Term Unconstrained Strategy	AUM (US$ MM)
Global (GLTU)	396.1*
International (ILTU)	350.3
U.S. (USLTU)	173.4
Europe (ELTU)	36.7
Total	**956.5**

**Note: A large Australian client will be funding the GLTU strategy in July 2020 with an initial US$600 million mandate.*

Strategy Profile

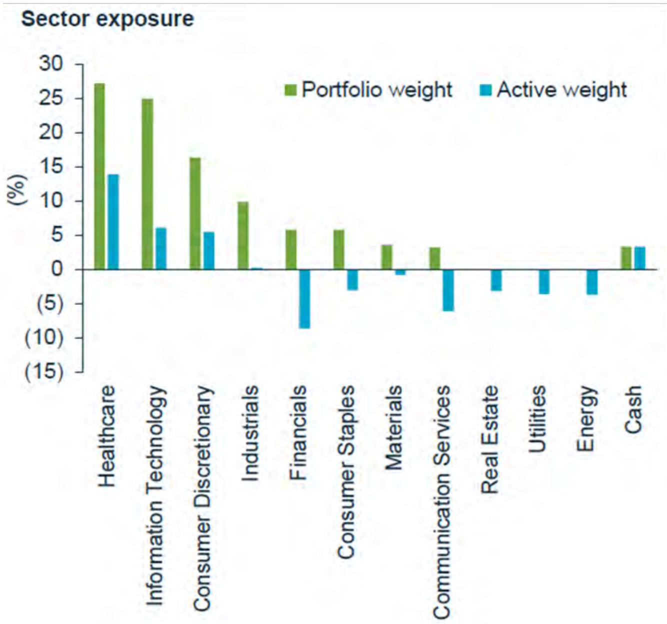
Global Long-Term Unconstrained (GLTU) was formally incepted in June 2016 as an outgrowth of the firm's well established global equity income business. The GLTU strategy seeks to build a portfolio of 20-40 sustainable quality growth stocks that can provide attractive long-term risk adjusted returns. The strategy is built around identifying quality growth companies, as defined by those with high and sustainable Return on Invested Capital (ROIC) that significantly exceeds the cost of capital. The strategy is benchmarked to the MSCI ACWI Index, which forms the core of the strategy's investable universe although the strategy may invest in non-index stocks. The GLTU team applies a minimum market capitalization of US$3 billion. Position sizes typically range between 2–5%, the weighting dependent on conviction in the business model, valuation, and correlation with other holdings. The guideline maximum position size is 10% of the portfolio. The expected annual turnover is less than 25%, reflecting strategy's genuinely long-term, unconstrained investment approach which has a five- to ten-year investment horizon. As of March 31, 2020, the portfolio held 32 stocks.

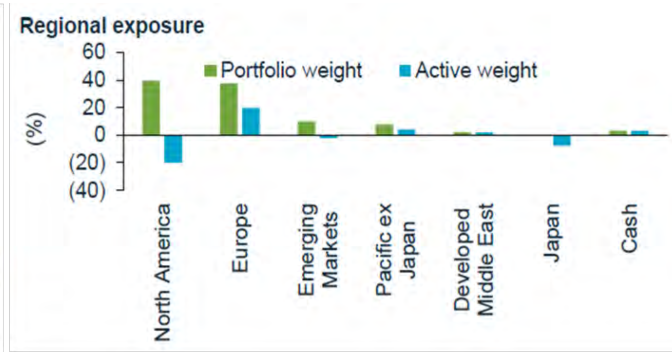
Martin Currie GLTU Strategy Positioning as of 3/31/20

Portfolio Statistics (as of 3/31/20)	Portfolio
# of Holdings	32
Dividend Yield	1.2%
P/E (Trailing LTM)	27.1x
Current P/B	6.6x
ROIC (Forecast Current Yr)	33.9%
Earnings Growth (Last 5 yrs)	12.9%
Wtd Avg Market Cap. ($MM)	$137,299

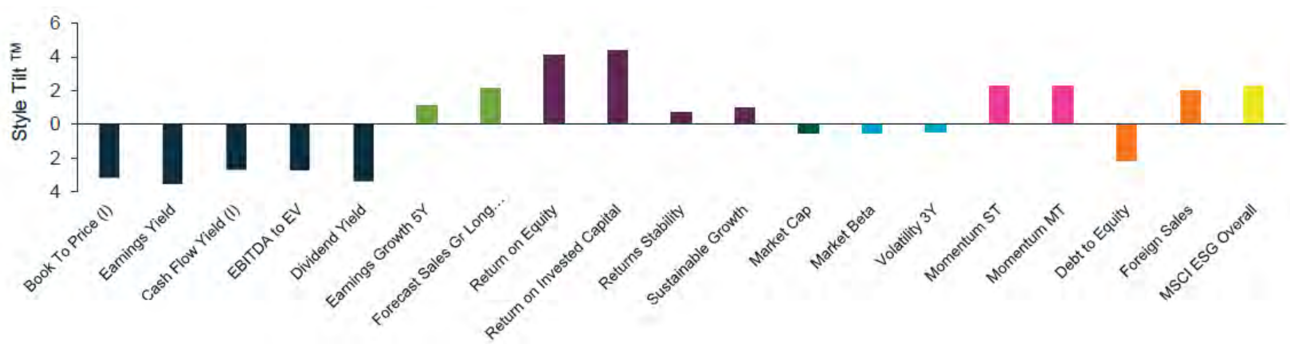
Top 10 Holdings (as of 3/31/20) Company	Portfolio %
Masimo	4.5
Microsoft	4.3
Coloplast	4.2
ResMed	4.0
CSL	3.9
Taiwan Semiconductor	3.9
Atlas Copco	3.7
Mastercard	3.7
Linde	3.6
AIA	3.6
Total	**39.4**

Data reflects Martin Currie GLTU Composite or Representative account as of 3/31/20. Source: Martin Currie, eVestment





Style Analysis vs. MSCI ACWI



Data reflects Martin Currie GLTU Composite or Representative account as of 3/31/20. Source: Martin Currie, eVestment, MSCI Barra One

Team

Zehrid Osmani leads the Long-Term Unconstrained team and is the lead portfolio manager on the GLTU strategy. Zehrid joined Martin Currie in May 2018 from BlackRock, where he had held a number of senior roles including as senior portfolio manager with responsibility for managing several pan-European equity funds with a specific focus on unconstrained, high-conviction, long-term portfolios. Prior to Blackrock, he managed equity portfolios at Scottish Widows Investment Partnership. Zehrid was hired to take over GLTU from long-time global portfolio manager and Global team head Tom Walker, who in 2015 announced his intention to retire at the end of 2018. Yulia Hofstede joined Martin Currie in March 2020 from BlackRock, where she worked with Zehrid and was a Director within the Fundamental Active Equities' Global team.

Zehrid and Yulia are supported by seven other investment professionals. The team each have specific sector research responsibilities and all share responsibility for stock research, idea generation and analysis. Each team member takes individual stock ideas and see them through each stage of the investment process. Portfolio construction is the responsibility of the portfolio managers (Osmani, Whitecross, Hughes, McNab, Hofstede). Over and above their sector-specific research and portfolio management responsibilities, each team member also has ownership for a component of the overall investment process. This approach is designed to drive excellence in the investment process and to foster continuous process improvement as well as professional development.

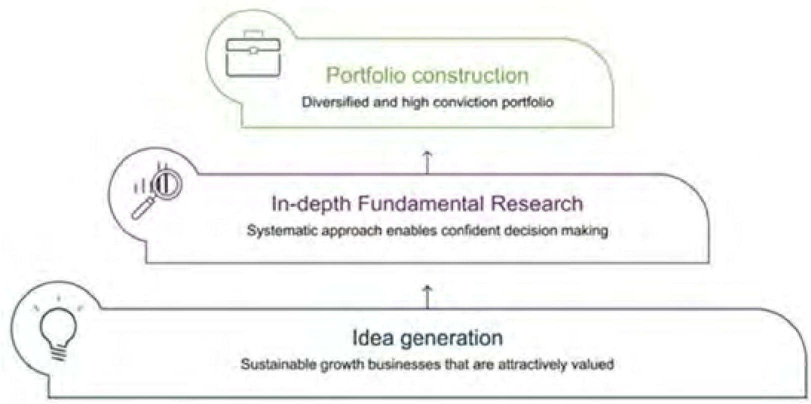
Name	Responsibility	Yrs of Investment Experience	Yrs with Firm	Education
Zehrid Osmani	Sector Focus: Technology, Media and Telecom, Financials *Process Accountability: Head of Team, Overall Investment Process, Portfolio Construction*	22	2	BA in Economics and Finance, University of Paris-La Sorbonne; Masters in International Finance, University of Glasgow
Ken Hughes	Sector Focus: Industrials, Materials, Energy, Utilities, Autos *Process Accountability: Research Process*	26	16	MA in Economics, University of Aberdeen; MA in European Economic Studies, College of Europe, Bruges; CFA® charterholder
Amanda Whitecross	Sector Focus: Consumer Staples, Consumer Discretionary *Process Accountability: Investment Process*	26	12	MA in Economics and Contemporary European Studies, University of Dundee; Institute of Investment Management and Research Diploma, University of Stirling
Yulia Hofstede	Sector Focus: Technology, Media and Telecoms, Financials *Process Accountability: Thematics*	11	<1	Dip (Hons.) in Economics, Financial University, Moscow; Executive education programme "Value investing (online): intelligent investment decision", Columbia Business School
Robbie McNab	Sector Focus: Consumer Staples, Consumer Discretionary *Process Accountability: Research Process*	12	12	MA in Economics, University of Glasgow CFA® Charterholder
Sam Cottrell	Sector Focus: Healthcare *Process Accountability: Data Analytics*	5	5	BA in Finance, Accounting & Mgmt, Nottingham University; MSc in Financial Engineering & Risk, Imperial College CFA® Charterholder
Roberto Venanzio	Sector Focus: Technology, Media and Telecoms, Financials *Process Accountability: Accounting*	4	4	BEng in Tech. & Int'l Business, Politecnico di Torino, Italy; BA in Accounting, Athlone Institute of Technology; MSc in Int'l Accounting & Finance, University of Strathclyde; Chartered Accountant (ICAS);CFA® Charterholder
Jonathan Regan	Sector Focus: Healthcare *Process Accountability: Data Analytics*	4	4	BA in Physics - University of Oxford; CFA® Charterholder
Zoe Hutchinson	Sector Focus: Industrials, Materials, Energy, Utilities, Autos *Process Accountability: Communication*	4	4	MA in Financial Economics, University of St Andrews; CFA® Charterholder

Investment Process

Martin Currie's investment philosophy is built upon the belief that the firm's proprietary fundamental research approach can identify long-term value-creating companies undervalued by the market. Additionally, Martin Currie believes:

- The market is myopic and fades returns of quality companies too fast
- Its proprietary fundamental research framework can identify these companies
- Value creating companies compound returns over the long-term

The team focuses on an investment universe comprising value-creating companies, defined as those that generate a high and sustainable ROIC, above their weighted average cost of capital (WACC).



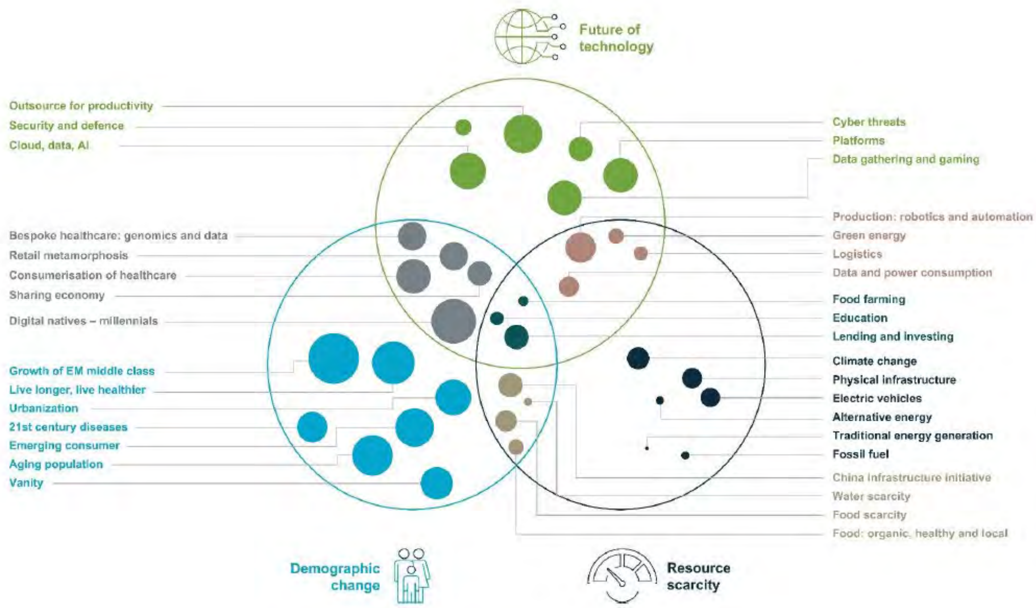
Idea generation – The entire GLTU team are involved in the research process, each having sector specific research responsibilities. The team screens global listed companies for those that have generated a Return on Invested Capital (ROIC) in excess of their Weighted Average Cost of Capital (WACC). In addition, the process also screens for: a market cap of > US$3 billion, low gearing and the level of goodwill on the balance sheet. This process generates an investible universe of approximately 500 stocks.

In-depth Fundamental Research – Stocks which have passed the identification process progress to a fundamental analysis, where the team uses eight criteria to examine the quality and sustainability of the business model – the most important factor being valuation. This checklist allows us to effectively eliminate weaker ideas early in the research process and generates a research pipeline of over 90 stocks per year.

Portfolio construction – Position sizes will typically be between 2–5%, the weighting dependent on conviction in the business model, valuation, and correlation with other holdings. Portfolio exposures are a direct result of stock selection – as an unconstrained strategy there are no limits on country or sector allocations. In building a diversified portfolio, the team instead considers the portfolio's overall exposure to geographic exposures, investment themes, end-user market exposures, industry lifecycles, and other risk factors in order to manage portfolio risk.

As a key input into the research and portfolio construction process, the team assesses each potential investment's exposure to the long-term investment themes which the team has identified as likely to drive growth over the medium- to long-term. Martin Currie believes that a company's theme exposures are crucial in understanding the future drivers of its growth. Currently, the team's thematic assessment has three overall mega trends - resource scarcity, the future of technology and demographic change.

GLTU Strategy Thematics Overview as of 3/31/20



ESG

Martin Currie's Global Long Term Unconstrained strategy scores companies for key ESG requirements. The rating is composed of two parts: Governance and Sustainability. With respect to Governance, the team takes a 'principles' rather than a rules-based approach due to the varying frameworks across the globe. This provides the opportunity to assess governance in the context of individual company circumstances and identify any particular areas of weakness. The team focuses on board quality, management quality, remuneration, capital allocation and culture.

In terms of Sustainability, the team strives to assess the extent to which companies have integrated sustainability into its business model and strategy. The focus for sustainability is in economic terms and the potential impact to a company's ability to generate long-term sustainable returns. Focus is placed on the specific factors which are material to the business: relevant environmental risks and social risks, and common factors including climate change, human capital, cyber security and tax.

Martin Currie's priorities for ESG activities in the upcoming year include: Engagement, Policy, and Reporting.

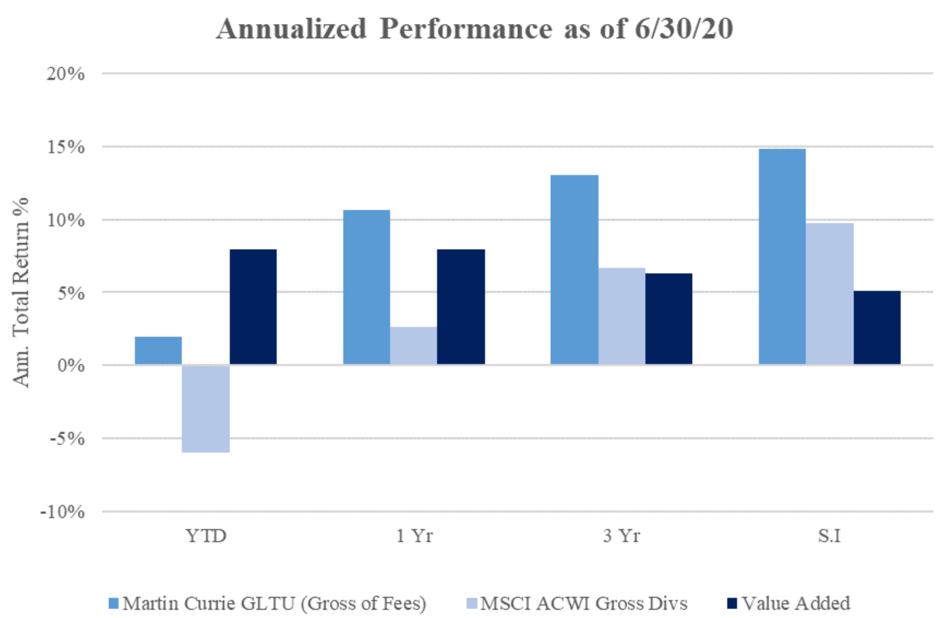
- Engagement - on board structure Martin Currie's focus is on diversity, both by gender but also by experience, tenure etc.; for climate their focus is on the awareness, management and mitigation of the impacts of climate change and a transition to a lower carbon economy; and on cyber security their focus is on the governance and disclosure around managing these risks.

- Policy –Martin Currie is actively involved in the UN Principles for Responsible Investment (PRI) and in the corporate reporting initiatives including the International Integrated Reporting Council and UK Financial Reporting Lab with the aim to improve corporate reporting on ESG issues.

- Reporting – Martin Currie reports extensively on ESG for clients and also aims to continue to evolve this. This reporting may include the carbon footprint but also water consumption, job creation, waste production etc. They are also examining how companies are contributing to the UN Sustainable Development Goals (SDGs) and the extent to which they can report on this.

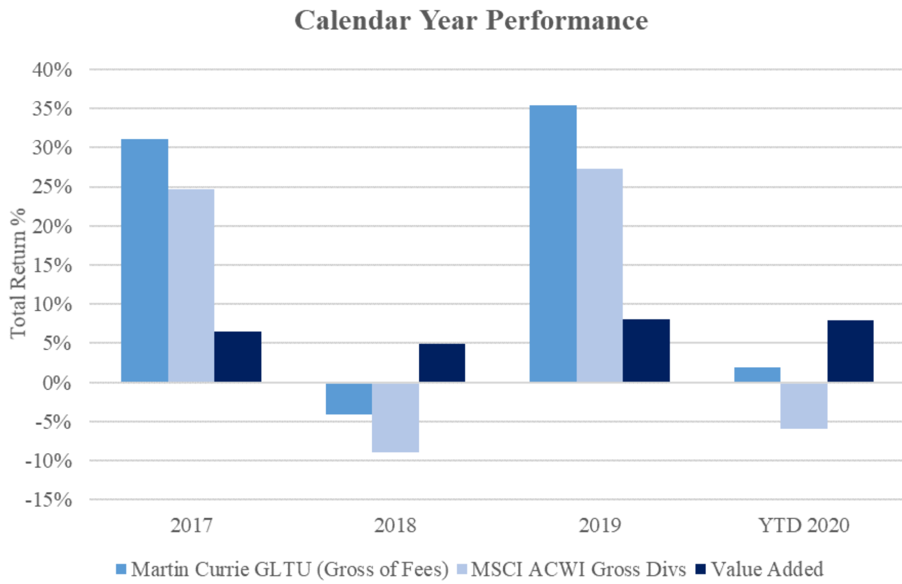
Performance and Risk

Since the product's inception in July 2016, Martin Currie GLTU's performance has been strong, generating over 500 basis points of annualized alpha before fees over the MSCI ACWI Index with consistent outperformance over the last three calendar years. Relative to peers in the Global All Cap Growth universe, GLTU's performance has been strong enough to place it in the top half of peers in terms of total return performance. Notably, GLTU achieved this performance despite an overweight to European names and an underweight to the U.S. and technology names in particular. In terms of quantitative risk analysis, the portfolio's strong sharpe ratio and lower-than-market beta reflect the high quality nature of the portfolio's holdings. The strong upside/downside capture profile also suggests that the portfolio's quality emphasis may provide downside protection in a classic flight-to-quality scenario relative to more cyclical names.



	YTD	1 Yr	3 Yr	S.I
Martin Currie GLTU (Gross of Fees)	2.0%	10.6%	13.0%	14.9%
MSCI ACWI Gross Divs	-6.0%	2.6%	6.7%	9.7%
Value Added	8.0%	8.0%	6.3%	5.1%

Data as of 6/30/20   Source: Martin Currie, eVestment



	2017	2018	2019	YTD 2020
Martin Currie GLTU (Gross of Fees)	31.1%	-4.1%	35.4%	2.0%
MSCI ACWI Gross Divs	24.6%	-8.9%	27.3%	-6.0%
Value Added	6.5%	4.9%	8.1%	8.0%

Data as of 6/30/20   Source: Martin Currie, eVestment

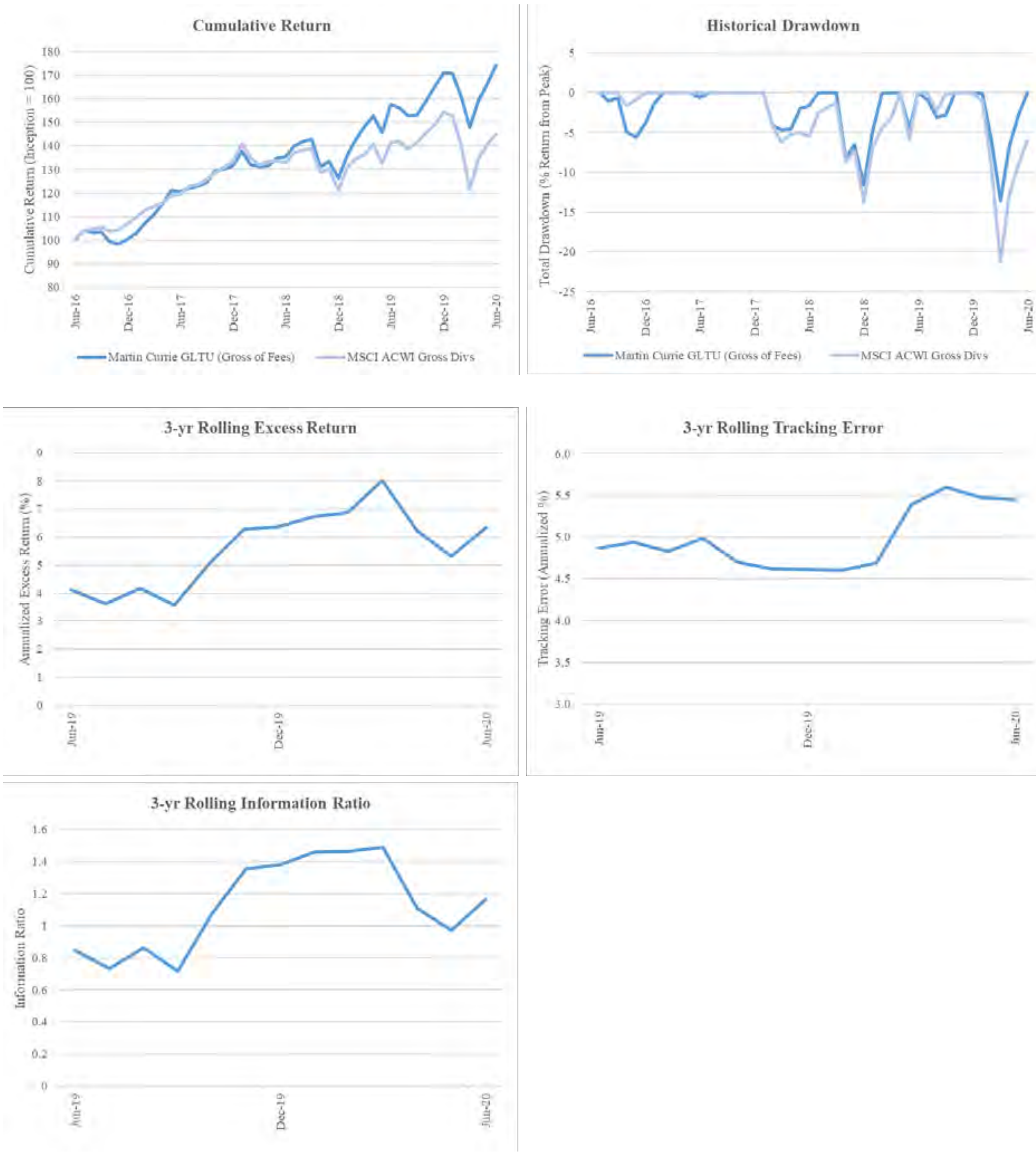
eVestment Performance and Risk Peer Universe Ranking as of 3/31/20

eVestment Peer Universe Ranking (as of 6/30/20)	YTD		1 Year		3 Year		Since Inception	
	Retn	Rank	Retn	Rank	Retn	Rank	Retn	Rank
Martin Currie GLTU (Gross)	1.96	61	10.62	59	13.04	48	14.88	47
MSCI ACWI Gross Divs	-5.99	90	2.64	86	6.70	84	9.75	79
Difference	7.94		7.98		6.34		5.13	

Return Statistics with eVestment Peer Universe Ranking (as of 6/30/20)	1 Year	3 Year	Since Inception	Since Inc. Rank
Excess Return	7.98	6.34	5.13	47
Standard Deviation	16.13	14.13	13.12	7
Portfolio Beta	0.72	0.82	0.85	96
Tracking Error	7.43	5.44	5.54	59
Information Ratio	1.07	1.17	0.93	51
Sharpe Ratio	0.56	0.80	1.03	20
Sortino Ratio	0.87	1.23	1.63	22
Upside Market Capture	91.50	105.23	108.67	65
Downside Market Capture	72.45	79.88	84.23	17

Returns are gross of fees. Source: eVestment   Benchmark: MSCI ACWI Gross Divs

Universe: eVestment Global All Cap Growth Equity



YTD as of 6/30/20   Returns are gross of fees. Source: Martin Currie, eVestment, SBI Staff Calculations

Recommendation

The SBI is recommending the addition of Martin Currie's Global Long Term Unconstrained equity strategy as part of the new global allocation within the public market program. While a relatively new strategy, GLTU is managed by a capable team led by Zehrid Osmani, who established a strong track record managing non-U.S. equities at predecessor firm Blackrock prior to joining Martin Currie. The GLTU team's strategy is highly defined and well-constructed, with a focus on in-depth, disciplined fundamental research and rigorous team debate to identify quality growth companies with the potential to drive strong returns for the SBI's investment portfolio.

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APPENDIX C

Cash Overlay Program
and
Manager
Recommendation

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DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Cash Overlay Program and Manager Recommendation

Staff has spent considerable time evaluating overlay strategies designed to achieve a variety of investment and operational objectives. After initial discussions with several prospective investment managers, Staff issued a Request for Information (RFI) and performed additional diligence on two such managers specializing in the design and implementation of overlay programs for institutional clients. Staff has included in the memo a manager review and recommendation on **page 5** to hire an overlay manager to implement and manage a cash overlay strategy for the SBI portfolio.

Objectives of an Overlay Program

Overlay strategies can take many different forms and may have differing objectives depending on an investor's unique needs, but generally speaking these strategies involve using synthetic instruments (including but not limited to index futures, total return swaps, interest rate swaps, options, and ETFs) to offset, augment or replace the exposures provided by the physical investment portfolio. Investors may implement overlay strategies to accomplish such objectives as hedging unwanted currency risk, managing duration of a fixed income portfolio, taking tactical style bets, portfolio rebalancing, or managing cash balances more efficiently.

With the cash overlay program, SBI Staff is currently focused on two objectives: more efficient cash management, and portfolio rebalancing. Staff anticipates implementing the cash overlay program in two phases to minimize operational risk. Note: Staff is also recommending implementation of a currency overlay program to better manage the currency risk embedded in the portfolio's international securities exposure. The currency overlay program is addressed in a separate memorandum in this report.

Phase One:
Phase One of implementation will focus on more efficient management of cash in the SBI portfolio and, in particular, the expected ongoing liquidity needs required to fund the portfolio's commitments to Private Markets. The current strategic target allocation to Private Markets is 25% while the current market value of the Private Markets portfolio is approximately 15.5% of the portfolio, resulting in a net Uninvested Portion of nearly $7 billion. By policy, the Uninvested Portion is invested in public equities. New private markets commitments are funded from cash. As the plan's cash balance becomes depleted, funds must be raised from elsewhere in the portfolio. This process generally involves the liquidation of physical securities (stocks or bonds), which incurs both explicit and implicit transaction costs (commissions, spreads, price impacts), and may

negatively impact the investment manager tasked with liquidating securities and providing cash. Staff believes that the implementation of a cash equitization overlay program can mitigate some of these concerns.

In Phase One, part of the Uninvested Portion currently invested in public equities would be liquidated, and an overlay portfolio would be implemented using liquid derivative instruments to replicate public equity exposure of the same nominal value. The cash proceeds would be held to fully collateralize the derivative positions. As cash is needed to fund net commitments in the Private Markets portfolio, the derivative positions can be easily and cost-effectively unwound to free up the cash collateral. This approach should generally result in lower transaction costs and quicker execution, and does not require managers of physical assets to alter their portfolios. Overall, the use of the overlay will also allow Staff to manage the portfolio's actual cash balance more tightly, which is expected to reduce performance drag and portfolio tracking error.

It is anticipated that this overlay portfolio would consist of index futures and/or total return swaps related to appropriate public equity indices, however the size and specific composition of the portfolio, and the benchmark against which it will be measured, will be determined in consultation with the overlay manager to best address concerns about cost, tracking error, and liquidity.

Phase Two:
Phase Two of the overlay implementation would seek to achieve the objective of more efficient portfolio rebalancing, while still facilitating cash securitization overlay as described in Phase One. Currently, portfolio rebalancing between and within asset classes is done as needed when the weight of one or more asset classes moves outside of its predetermined band around the strategic allocation target. Sell orders are given to managers in overweight areas of the portfolio, and proceeds are provided to managers in underweight areas of the portfolio. Sometimes, though not always, portfolio rebalancing trades are done in concert with a cash raise in order to meet the program's liquidity needs. These rebalancing trades involve asking managers of physical securities to liquidate positions, and as such can incur all the same transaction costs as described above in Phase One.

In Phase Two, the overlay portfolio would be expanded to include synthetic exposure to multiple asset classes (for example, domestic and international equity index futures, treasury futures, corporate fixed income total return swaps, etc.). By including these additional instruments, portfolio rebalancing can be achieved within the overlay portfolio instead of buying and selling physical positions within manager accounts. Synthetic exposures to overweight asset classes would be unwound or short positions taken, with offsetting positons established in underweight asset classes in order to bring overall portfolio weights within acceptable bands around strategic targets. As with Phase One, the specific details of implementation (size of overlay portfolio, which asset classes to include and which instruments to utilize) will be made in consultation with the overlay manager to address considerations such as cost, liquidity and tracking error.

Considerations and Limitations:
It is important to note that although Staff believes that successful implementation of an overlay portfolio will allow for more efficient portfolio management and will mitigate certain risks and costs, Staff is aware of the limitations and implications of such a program.

Notably, because the overall Combined Funds portfolio experiences net outflows to fund benefit payments, the need to raise additional cash cannot be avoided altogether. Staff will still need to liquidate physical investments from time to time to raise cash, and may need to engage in rebalancing trades between investment managers, although the Overlay program should reduce the frequency of this activity.

In addition, while one of the advantages of implementing an overlay program is reduced transaction and frictional costs associated with raising cash and portfolio rebalancing, it must be noted that the Overlay program will have its own costs. The overlay manager will charge a management fee based on the notional size of the overlay portfolio (typically between 3-6 basis points, depending on the size of the mandate). Moreover, while being highly liquid and efficient, the synthetic instruments used by the overlay manager will have their own costs, both explicit and implicit. In many cases the cost of using synthetic instruments will be lower than the cost of active management, but may be higher than the SBI's cost of passive management.

Finally, while a Phase Two implementation should allow for more efficient portfolio rebalancing, it is expected that notional value of the overlay portfolio would need to be larger in Phase Two than in Phase One to accomplish the portfolio rebalancing objective. The size of the program under Phase Two will need to strike a balance between being large enough to accomplish the goal of maintaining the portfolio's alignment to asset class targets while managing the incremental costs and implementation risks associated with the program.

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Review and Recommendation of Overlay Manager: NISA

Organization

NISA Investment Advisors, LLC was founded in 1994 and is based in St. Louis, Missouri. The Firm offers a variety services and strategies, including short and core duration fixed income, liability-driven investment, defined contribution, and derivative overlay, and works with a variety of institutional clients including large public and corporate retirement plans, insurance companies, and foundations and endowments.

The firm employs over 300 people, and is 100% owned by its employees. NISA believes independence is a key strength, and has no plans to affiliate with any other entity or to change its ownership structure, other than to expand ownership among employees.

Assets

As of June 30, 2020, NISA manages approximately $246 billion in physical assets, 95% of which are fixed income portfolios comprised mostly of U.S. Treasury and investment grade credit securities. NISA also manages $168 billion of notional value in separate account derivative overly portfolios. In total, NISA's combined physical and notional asset under management are $414 billion, managed on behalf of 212 institutional clients.

Team

The Senior Leadership Team of NISA is made up of CEO Jess Yawitz, Ph.D., President David Eichhorn, and Managing Directors Cheryl Hanson, Kenneth Lester, Anthony Pope, Bella Sanevich, and Gregory Yess. This group of senior leader averages over 25 years of experience, with the majority of that experience spent working together at NISA.

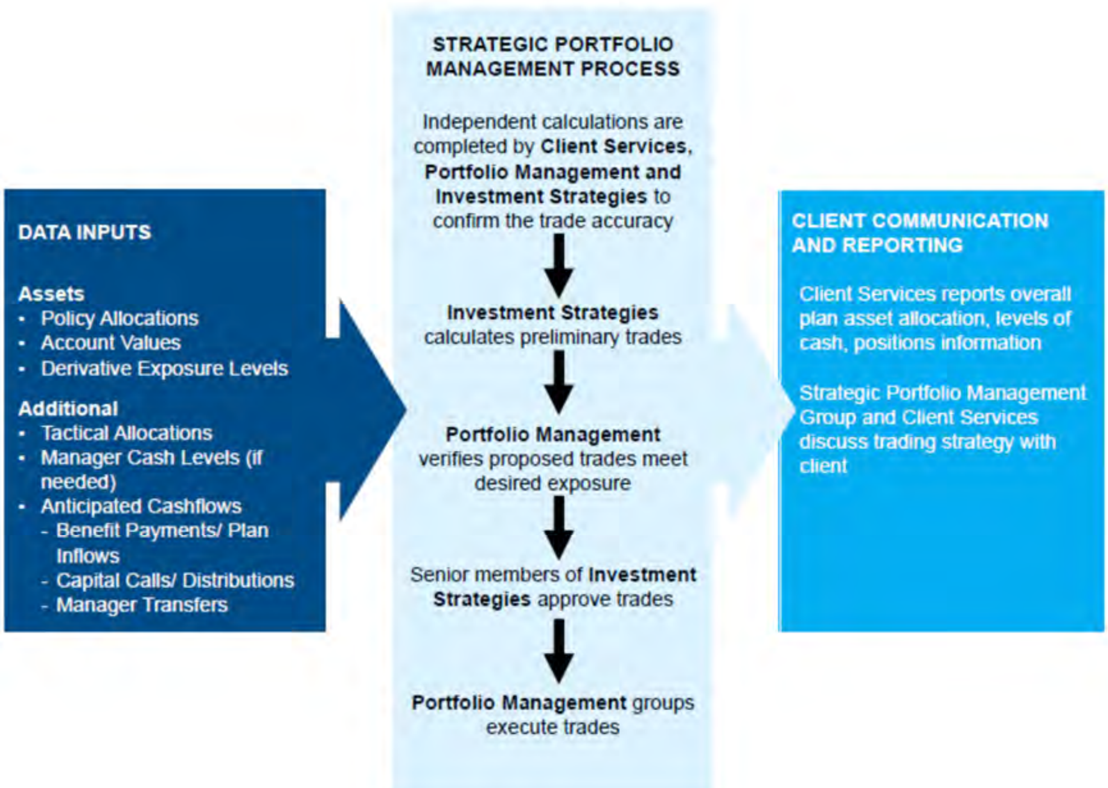
Senior Team

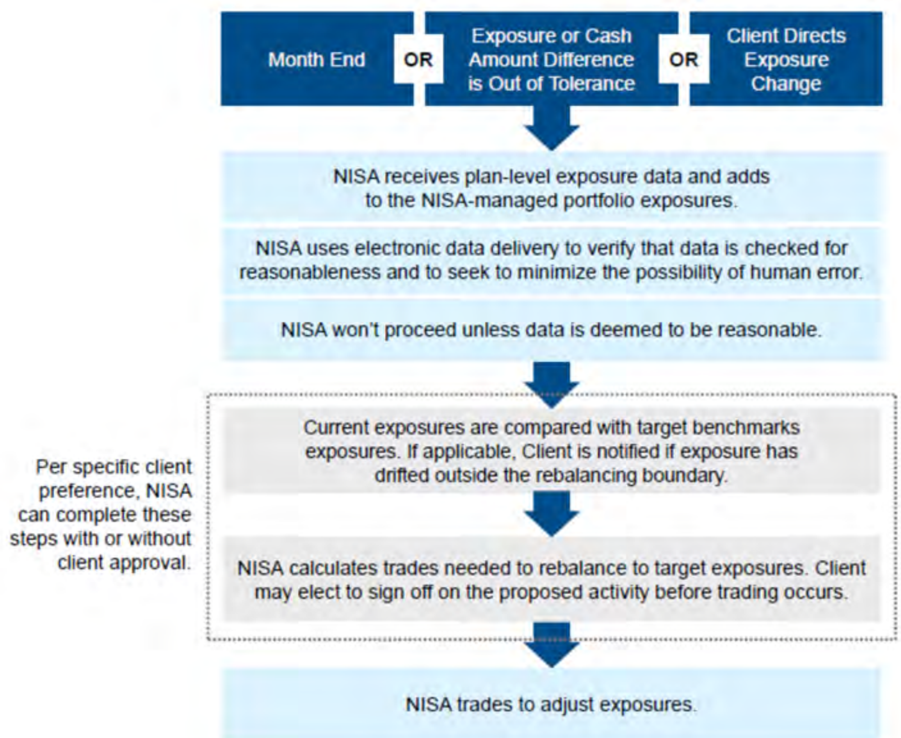
SENIOR LEADERSHIP		YEARS OF EXPERIENCE
Jess B. Yawitz, Ph.D. (I)	*Chairman and Chief Executive Officer*	45+
David G. Eichhorn, CFA (I,M)	*President and Head of Investment Strategies; Chair, Investment Committee*	20+
Cheryl L. Hanson, CPA (M)	*Managing Director, Client Services*	25+
Kenneth L. Lester (I,M)	*Managing Director, Portfolio Management; Vice Chair, Investment Committee*	30+
Anthony R. Pope, CFA (I,M)	*Managing Director, Portfolio Management; Vice Chair, Investment Committee*	20+
Bella L. F. Sanevich, Esq. (M)	*Managing Director, Corporate Governance and Legal*	25+
Gregory J. Yess, CPA (M)	*Managing Director, Client Services and Chief Operating Officer; Chair, Management Committee*	30+

The Senior Leadership team is supported by over 60 professionals on the Investment Strategies & Client Services team, which works with clients to asses return objectives, risk tolerance, and liquidity needs to design an optimal overlay approach. The Portfolio Management, Trading and Research team is made up of an additional 50+ professionals who implement the overlay strategy, including selecting the most effective instruments, executing trades, and monitoring compliance.

Process

Because each Overlay program is designed to suit a client's specific needs, the investment process may vary across programs. In general, NISA will receive a specified set of data inputs from the client and/or the client's custodian. NISA will then calculate what trades are necessary (if any) to adjust the client's exposures in accordance with the agreed upon program objectives. These trades are then verified and approved before execution. In some cases, clients may wish to approve any trades prior to execution, while other clients may wish to give NISA authority to execute trade within agreed upon guidelines. NISA will typically adjust the overlay portfolio at month-end, or when exposures move out of tolerance bands, or at client direction. This process is illustrated below:





ESG

NISA is committed to supporting clients that wish to implement Environmental, Social and Governance (ESG) or sustainability objectives within its mandates. Because restrictions or objectives applicable for one client may not be appropriate for others, NISA does not develop a recommended list of restricted securities for ESG or sustainability objectives. However, the firm does work directly with clients to develop restricted lists based on the client's internal ESG objectives. These restrictions are solely at the discretion of the client and shall be documented in the investment management agreement or guidelines. NISA may implement a client-provided restricted list, or may assist the client in the development of a restricted list based upon ESG considerations provided by the client.

Performance

Performance for both the NISA S&P 500 Futures Overlay Composite and the NISA S&P 500 Total Return Swap Overlay Composite are presented below:

NISA Investment Advisors, LLC
S&P 500 Futures Overlay Composite
As of 03/31/2020

Composite Inception Date: January 1, 2010
Composite Creation Date: January 1, 2020

Year	Total Returns Composite	Total Returns Benchmark	Excess Return	3-Year Standard Deviation Composite	3-Year Standard Deviation Benchmark	Dispersion	# of Portfolios	Composite Exposures	Firm Exposures
2020 YTD	-20.11%	-20.11%	0.00%	15.32%	15.32%	-	9	1,146	173,088
2019	28.33%	28.33%	0.00%	12.24%	12.23%	-	4	968	155,372
2018	-6.98%	-6.96%	-0.02%	11.11%	11.12%	-	5	1,019	131,158
2017	19.89%	19.88%	0.01%	10.23%	10.24%	-	2	287	111,016
2016	11.43%	11.47%	-0.04%	10.91%	10.93%	-	1	178	70,456
2015	0.84%	0.86%	-0.02%	10.73%	10.76%	-	1	282	55,997
2014	13.08%	13.19%	-0.11%	9.09%	9.13%	-	2	248	70,753
2013	31.37%	31.50%	-0.13%	12.09%	12.14%	-	3	329	60,258
2012	15.29%	15.43%	-0.15%	-	-	-	4	179	47,690
2011	1.68%	1.73%	-0.05%	-	-	-	1	18	41,570
11/01/10-12/31/10	-	-	-	-	-	-	-	-	46,374
01/01/10-10/31/10	7.49%	7.53%	-0.04%	-	-	-	1	14	45,690

Year	Annualized Total Returns Composite	Annualized Total Returns Benchmark	Excess Return	Tracking Error
1 Yr	-9.33%	-9.32%	-0.01%	0.02%
3 Yr	2.67%	2.67%	0.00%	0.02%
5 Yr	4.98%	4.99%	-0.01%	0.03%
7 Yr	8.14%	8.17%	-0.03%	0.04%
Since 11/01/10	9.10%	9.15%	-0.05%	0.05%

Performance is presented gross of fees. Past performance is not a guarantee of future performance. All dollar values are listed in USD millions.

NISA Investment Advisors, LLC
S&P 500 Total Return Swap Overlay Composite
As of 03/31/2020

Composite Inception Date: January 1, 2010
Composite Creation Date: January 1, 2020

Year	Total Returns Composite	Total Returns Benchmark	Excess Return	3-Year Standard Deviation Composite	3-Year Standard Deviation Benchmark	Dispersion	# of Portfolios	Composite Exposures	Firm Exposures
2020 YTD	-20.01%	-20.11%	0.10%	15.20%	15.32%	-	9	2,101	173,088
2019	28.18%	28.33%	-0.15%	12.12%	12.23%	-	7	2,668	155,372
2018	-6.69%	-6.96%	0.28%	11.00%	11.12%	-	5	1,733	131,158
2017	20.09%	19.88%	0.21%	10.05%	10.24%	-	7	2,802	111,016
2016	11.35%	11.47%	-0.12%	10.74%	10.93%	-	7	3,020	70,456
2015	0.91%	0.86%	0.05%	10.62%	10.76%	-	7	2,547	55,997
2014	13.09%	13.19%	-0.10%	9.10%	9.13%	-	7	3,954	70,753
2013	31.77%	31.50%	0.28%	12.10%	12.14%	-	7	4,197	60,258
2012	15.58%	15.43%	0.15%	15.30%	15.35%	-	7	3,019	47,690
2011	1.81%	1.73%	0.08%	-	-	-	6	2,195	41,570
2010	14.73%	14.67%	0.06%	-	-	-	8	2,685	46,374

Year	Annualized Total Returns Composite	Annualized Total Returns Benchmark	Excess Return	Tracking Error
1 Yr	-9.18%	-9.32%	0.15%	0.30%
3 Yr	2.80%	2.67%	0.12%	0.24%
5 Yr	5.07%	4.99%	0.08%	0.27%
7 Yr	8.24%	8.17%	0.07%	0.24%
10 Yr	9.45%	9.36%	0.09%	0.21%
Since Inception	9.76%	9.67%	0.09%	0.21%

Performance is presented gross of fees. Past performance is not a guarantee of future performance. All dollar values are listed in USD millions.

RECOMMENDATION:

After initial review of several potential providers of overlay services, Staff engaged in a more thorough review and diligence process with two firms specializing in overlay strategies, ultimately settling on one manager for recommendation. Based on the analysis presented above, Staff recommends hiring NISA to help design, implement and manage an Overlay Program within the SBI portfolio.

If this recommendation is accepted, Staff would begin the process of negotiating an agreement with NISA with the expectation that design and implementation of the overlay program would commence by the end of 2020.

APPENDIX D

Currency Overlay Program and Manager Recommendation

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DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Currency Overlay Program and Manager Recommendation

Staff believes that the currency exposure embedded in the Combined Funds international investments is a material source of short- to intermediate-term risk which can and should be actively managed. Staff believes that a dynamic, tactical approach to currency management can result in a reduction in equity portfolio volatility and has the potential to add value to the portfolio relative to an unhedged benchmark.

To support the goal of implementing an effective currency management strategy, Staff has spent considerable time evaluating currency overlay strategies. After initial discussions with several prospective investment managers, Staff issued a Request for Information (RFI) and performed additional diligence on an industry-leading manager specializing in the design and implementation of currency overlay programs for institutional clients; a manager with whom the SBI had a successful experience managing a currency overlay program from 1995-1999. Staff has included in the memo a manager review and recommendation on **page 6** to hire a currency overlay manager to implement and manage a currency overlay strategy for the SBI portfolio.

Background

The Combined Funds portfolio has material exposure to foreign currency risk, primarily via the portfolio's international equities allocation. As seen in Figure 1 below, as of June 30, 2020 the portfolio's exposure to international equities totaled nearly $13.9 billion, or 19.5% of the Total Combined Funds portfolio.

Figure 1. Combined Fund International Equity Exposure as of 6/30/20

Strategy	Market Value ($MM)	% of Combined Funds
Domestic Equity	$28,486	40.1%
International Equity	**$13,865**	**19.5%**
Private Markets	$11,105	15.6%
Fixed Income and Cash	$17,598	24.8%
Total Portfolio	$71,053	100.0%

The asset class target for the international equity program is currently a blend of 75% MSCI World ex USA Net Index and 25% MSCI Emerging Markets Net Index. Importantly, both indexes are unhedged and reported in U.S. dollar terms. An unhedged benchmark reflects the full impact of changes in the foreign exchange value of the dollar vis-à-vis the foreign currencies in which the index's foreign equity holdings are denominated. In contrast, a fully- or partially-hedged benchmark seeks to neutralize all or a portion of the impact of currency translation on returns, with the remaining return reflecting only the performance of the underlying equities.

Figure 2 below shows the results of a historical risk decomposition of the Combined Funds portfolio allocation using the portfolio's strategic asset allocation targets as of March 31, 2020. Over the period from June 1999 to March 2020, currency was the third largest contributor to portfolio risk after domestic equity and foreign underlying (local market) equity, contributing over 70 basis points of annual return volatility, or 7.2% of total portfolio risk.

*Figure 2. Historical Risk Decomposition of the Combined Funds Asset Allocation**

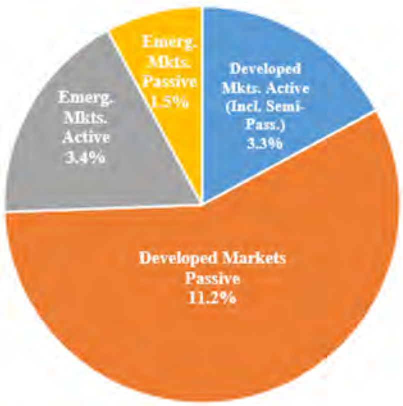
Portfolio Volatility Attribution (June 1999 - March 2020)			
		Contrib. to portfolio volatility	
Asset class	**Strategic allocation**	**Absolute terms per annum**	**% of total**
Domestic Equity	42.1%		63.8%
Foreign Equity	**20.7%**	2.7%	27.6%
Local Equity			
Currency Exposure		**0.7%**	**7.2%**
Private Markets, Fixed Income and Cash	37.2%	0.1%	1.4%
Total	100.0%	9.7%	100.0%

**Assumes static policy weights as of 3/31/20. Volatility based on asset class benchmarks and/or proxy return series.*
Source: Record Currency Management

SBI began investing internationally in 1992 and at the outset established that the SBI's international equity portfolio be judged against an unhedged benchmark. This decision was based on analysis of the expected diversification benefits from an allocation to unhedged international equities on a total fund basis. This decision has been reaffirmed periodically over time by Staff and the IAC/Board. After the most recent review, Staff notes that an unhedged policy benchmark remains most appropriate for the SBI's asset class target for international equities.

The SBI's current active international equity managers have the authority to hedge currencies opportunistically/tactically when they believe it will add value or protect from loss relative to their benchmark. The developed markets (DM) international passive portfolio and emerging markets (EM) passive portfolios, however, remain unhedged at all times. Over time, as the result of a purposeful shift away from active management in favor of passive management, the passive component of the international equity program has grown and now represents 65.3% of the overall international portfolio. As a result, nearly two-thirds of the SBI's currency exposure is currently unmanaged.

Combined Funds International Equity Exposure by Strategy as of 6/30/20



Combined Funds International Public Equity Exposure as of 6/30/20			
Strategy	Market Value ($MM)	% of Int'l Equities	% of Combined Funds
Developed Markets Active (Incl. Semi-Pass.)	$2,369	17.1%	3.3%
Developed Markets Passive	$7,949	57.3%	11.2%
Emerging Markets Active	$2,448	17.7%	3.4%
Emerging Markets Passive	$1,098	7.9%	1.5%
Total International Equity	**$13,865**	**100.0%**	**19.5%**

Staff believes it is important to acknowledge that:

1) Currencies are volatile and can have significant impacts on the returns of international assets when viewed from the perspective a U.S.-based investor such as the SBI;

2) Currently, nearly two-thirds of the SBI's total currency exposure is unmanaged, and;

3) Currency risk represents a significant component of the Combined Funds overall risk profile and should be taken into consideration as part of the overall management of the Combined Funds portfolio.

Objectives of a Currency Overlay Program

The primary objective of a currency overlay program is to explicitly manage the currency risk in the SBI's portfolio. Currency overlay services are typically provided by a third-party investment manager charged with analyzing the currency risks present in the client's underlying portfolio and determining which currencies should be hedged and by what percentage. This percentage, ranging from 0% (fully unhedged) to 100% (fully hedged), is referred to as a *hedge ratio*. Managers determine the desired hedge ratio for each currency in the portfolio subject to the overlay based on either 1) a fundamental valuation approach to determining a currency's "fair value" or "expected value", 2) a systematic approach using observed market price data and a series of rules which define when to initiate/close hedges, or 3) a combination of both.

In terms of implementation, most currency overlay managers utilize a combination of currency spot and forward transactions, collectively referred to as *foreign exchange* or simply *FX*, to construct and manage a portfolio of currency hedges. Managers may also supplement their strategy with currency swaps, futures, and options depending on market conditions. The currency market is the deepest, most liquid and most cost-effective trading market in the world. The world's major currencies trade on an over-the-counter, interbank market that operates on a 24-hour basis. According to the Bank for International Settlements' triennial FX market survey published in April 2019, average daily FX volumes were $6.6 trillion per day, including nearly $1 trillion in daily volume in FX forwards.

Staff believes the track record of fundamental approaches to currency valuation and currency management is not compelling. There is no consensus on what drives short-term currency movements and attempts to forecast currency fluctuations over even a medium-term investment horizon relevant for hedging (e.g. 1-2 years) have produced mixed results at best. Meanwhile, systematic approaches that do not rely on forecasting but rather seek to take advantage of certain structural features inherent in the currency markets (ultra-low cost trading, non-collateralized trading, fully customizable sizes and tenors) seem to offer the best opportunity to capture hedging benefit while minimizing opportunity cost of hedging unnecessarily during periods of dollar weakness.

With the currency overlay program, Staff is currently focused on two objectives: 1) introducing currency management in order to actively manage currency risk that is currently unmanaged, and 2) expanding the program to seek to maximize the potential value added from currency management. Staff anticipates implementing the currency overlay in a phased approach to minimize operational risk.

Phase One:

Phase One implementation will focus on applying a currency overlay to the Combined Funds passive developed markets portfolio. This portfolio is benchmarked to the MSCI World ex USA Net Index and represents approximately 50% of the total portfolio's currency risk. As shown in Figure 3 below, approximately 95% of the passive portfolio's currency exposure can be efficiently hedged using a currency overlay approach.

Figure 3. Benchmark Currency Risk and Hedgeability, MSCI World ex USA Index

MSCI World ex USA Index Currency Risk		
Currency	**Weight**	**Hedgeable ?**
Euro	29.2%	Yes
Japanese uen	23.1%	Yes
Pound sterling	12.8%	Yes
Swiss franc	9.4%	Yes
Canadian dollar	9.1%	Yes
Australian dollar	6.1%	Yes
Hong Kong dollar	3.1%	No - USD peg
Swedish krona	2.8%	Yes
Danish krone	2.1%	Yes
Singapore dollar	1.0%	*No - below materiality threshold*
Israeli shekel	0.6%	
Norwegian krone	0.5%	
New Zealand dollar	0.3%	
Total Hedgeable		**94.6%**

Source: Record Currency Management, MSCI. Data as of 6/30/20.

The benchmark for Phase One will be the portfolio's unhedged return from currency. Additionally, the effectiveness of the hedging program will be judged on its contribution to the total protected return (underlying equity + hedge return) of the international equity portfolio. The objectives of the currency overlay in Phase One are to achieve positive value added net of fees relative to an unhedged benchmark, and to reduce the realized volatility of the international equity program. Staff anticipates establishing a risk budget for the overlay including position/exposure limits, target volatility and maximum drawdown.

Phase Two:
Phase Two will expand the currency overlay program beyond the developed markets passive manager to include the emerging markets passive equity portfolio. While it is anticipated that the opportunities for hedging EM currencies will be less frequent than those for DM currencies, Staff plans to more fully evaluate this option with the assistance of the currency overlay manager, should one be retained. Also as part of Phase Two, Staff is expecting to expand the overlay program to include all or a portion of the active developed markets managers' portfolios. As a precursor to this aspect of Phase Two implementation, Staff plans to review each active DM equity manager's currency management process to determine whether currency management is integral to, or merely a byproduct of, the stock selection process. Staff will then make a judgement as to whether a manager's portfolio should be included or excluded from the overlay program.

Phase Three:
Phase Three would expand the currency overlay program to introduce the potential for cross-currency hedging strategies and would enable the manager to express active total return views on a currency outside of the restrictions of a 0% to 100% hedge ratio (net longs or net shorts would not be limited to exposures present in an underlying equity portfolio). Cross-currency hedging involves expressing a view in the portfolio on a cross-currency pair where the U.S. dollar is not one of the currencies being bought or sold, e.g. EURJPY or EURCHF. Staff will initiate discussions to review the expanded strategies contemplated under Phase Three prior to implementation.

Considerations and Limitations:

A systematic currency overlay tends to perform best in trending markets. Performance may be challenged in sideways, trendless markets. In a period of sustained dollar weakness, the manager may not find sufficient opportunities to justify the costs of the program. In addition, while a systematic approach is designed to effectively vary hedge ratio to capture hedging gains during periods of dollar strength and to minimize hedging during periods of dollar weakness, there is risk that this objective won't be achieved.

There is an explicit cost to run an overlay program based on the notional size of the actively hedged portfolio. In addition, while trading costs are very low for the types of financial instruments used to construct the hedges, there is a cost to transact and this can vary over time. Finally, there are operational and administrative costs involved in managing the program. Overall, Staff believes that the expected benefit from the program outweighs the expected costs.

**Review and Recommendation of Currency Overlay Manager:
Record Currency Management**

Organization

Record Currency Management Limited is an industry leading independent currency manager, founded in 1983 in London by Neil Record. Record's parent company, Record plc, is publicly listed on the London Stock Exchange. The firm provides currency management services, including passive hedging, currency overlay and active total return currency management and advisory services to clients worldwide.

Based in Windsor, UK, the firm employs 87 employees, and maintains offices in Windsor, Zurich and New York. As of June 30, 2020, 53% of the share capital in the firm (Record plc) was held by employees of the firm, including 45% held by Board Directors and 8% held by other employees of the firm. The firm's shares have been listed on the main market of the London Stock exchange since its IPO in 2007.

Assets

As of June 30, 2020, Record's total assets under management were US$63.3 billion, representing over 70 client relationships, including pension funds, foundations and institutions. The firm's pension fund relationships include 11 public plan clients. While Record's client base is global, the majority of the firm's clients are based in three regions: Europe ex-UK, North America, and the United Kingdom.

Team

At the overall firm level, Record Currency Management is led by an Executive Committee consisting of CEO Leslie Hill, CFO Steve Cullen, CIO Bob Noyen, Head of Portfolio Management Dmitri Tikhonov, Ph.D., COO Joel Sleigh, Head of Client Team Sally Francis-Cole and Head of Human Resources Kevin Ayles. Founder Neil Record provides strategic leadership to the firm as Chairman of the firm's Board of Directors.

The firm's investment process is overseen by a five-member Investment Committee (IC) chaired by CIO Bob Noyen. The senior members of the IC have worked together for over 20 years, and the committee members average over 30 years of industry experience.

Additionally, the three-person Investment Management Group (IMG), chaired by CIO Bob Noyen, is responsible for day-to-day portfolio management of all portfolios in the Currency Overlay Strategy. This team is supported by one of the largest independent currency specialist research teams in the world. A team of 15 research analysts conducts extensive fundamental and technical analysis across macroeconomic research, quantitative research and investment strategy. An additional 33 professionals provide direct support to the investment process, including trading, risk management, portfolio implementation, legal and operations, reporting and technology support.

Record Currency Management Senior Leadership Team

Name	Responsibility	Years of Investment Experience	Years with Firm	Education
Neil Record	Chairman Member, Investment Committee	43	37	MSc in Economics
Leslie Hill	CEO Member, Investment Committee	41	28	MBA
Bob Noyen*	Chief Investment Officer Chair, Investment Committee	36	21	MBA
Dmitri Tikhonov*	Head of Portfolio Management Member, Investment Committee	18	18	PhD in Mathematical Modelling
Andrey Rumyantsev‡	Head of Investment Strategy Member, Investment Committee	19	14	MBA
Joel Sleigh†	Chief Operating Officer	24	24	MSc in Statistics
Shaesta Wahedally†	Deputy Chief Operating Officer	23	23	BSc in Applied Statistics
James Mills†	Head of Portfolio Implementation	21	18	BSc in Mathematics
James Rockall†	Head of Trading	19	16	BSc in Economics
Matt Bushell†	Head of Operations	7	7	MMath in Mathematics
Sandeep Prashar†	Head of Front Office Risk Management	20	13	MSc in Accounting and Finance
Susan Varkey†	Head of Reporting	16	16	BSc in Physics

** Investment Management Group (IMG) member*
† Portfolio Management Group (PMG) member
‡ Dual membership - IMG and PMG

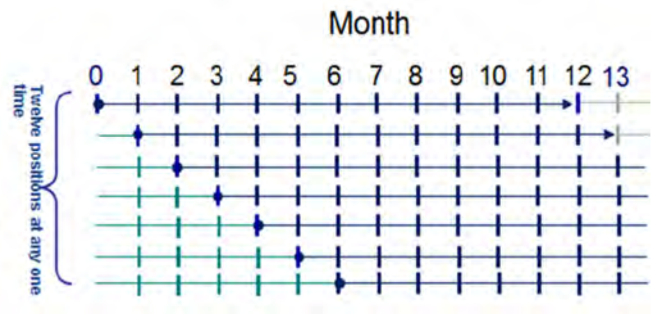
Investment Process

Record's Currency Overlay investment philosophy is underpinned by a belief in a robust, systematically driven investment process. Record's systematic process for Currency Overlay leverages the deep, liquid and ultra-low trading cost market for spot and forward currency transactions to build a matrix of option-like hedges that dynamically respond to changes in prevailing FX spot rates. The process seeks to create a fully dynamic hedge ratio that builds incrementally from 0% to 100% when the dollar is strong (underlying foreign investments are losing value from currency effect), and reduces hedging down to 0% during periods of dollar weakness (foreign investments gaining value from currency effect).

The Currency Overlay strategy is implemented through a number of equally-sized, independently-managed positions for each foreign currency exposure managed. For large exposures, such as the Euro or Japanese yen, there are typically twelve 12-month positions, each initiated and maturing at one-month intervals, as shown in Figure 1.

Each position represents a set of instructions controlling the sale or purchase of forward contracts of a fixed amount and maturity date, and each position is established with a reference protection level which corresponds to a specific protection level relative to the prevailing spot rate. The systematic process opens and closes positions at frequent intervals based on whether or not they are in the money. A position can either be open (hedge is on) or closed (hedge is off), depending on the prevailing spot rate relative to the protection level.

Figure 1. Position Matrix by Month

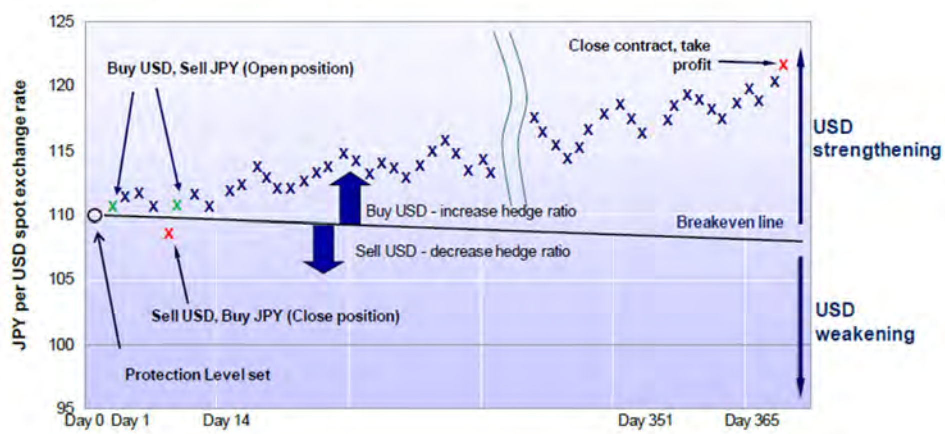


Source: Record Currency

Each established position, therefore is only opened as a forward contract if the dollar strengthens above the protection level. If the dollar subsequently weakens and falls below the protection level, the position is closed and remains closed until the dollar appreciates above the protection level once again. At the end of 12 months, the position is closed out and any net gain/loss realized.

In the case of a strengthening dollar, therefore, in-the-money positions are left on and as the dollar appreciates above additional protection levels, new long dollar hedges are established. In this way, the hedge ratio builds incrementally from 0% to 100%. In the reverse case, a weakening dollar causes positions to be closed out as the dollar weakens (and the foreign currency strengthens) through a series of protection levels, resulting in the hedge ratio falling to zero and thereby avoiding a potential hedging loss. As an example, Figure 2 illustrates a single dollar-yen position in isolation.

Figure 2. Life cycle of a single USDJPY position



Source: Record Currency

Record believes that it is equally important to deliver active risk management and value-generating discretionary intervention alongside the systematic processes. The Firm's Currency Overlay strategies are closely monitored by Investment Management Group (IMG), who have the discretion to intervene in the systematic process in accordance with client objectives and guidelines. The key role of the IMG is to provide this tactical oversight and conduct portfolio interventions, to determine the appropriate currencies to be managed, to crystallize unrealized gains and to control hedging costs in-line with client's risk budget and hedging goals.

Record takes a thorough, holistic approach to risk management that includes detailed processes across exposure risk management, compliance/operational risk management and counterparty risk management. Portfolio risk management and exposure management is overseen by the Investment Management Group (IMG) and the Portfolio Management Group (PMG) using a series of portfolio monitoring and scenario risk management tools. All portfolio trading is subject to dual-processing workflows which require approval by a secondary, independent portfolio team member. Compliance is monitored on both a pre- and post-trade basis. In terms of counterparty risk management, the firm maintains a rigorous Credit Risk Policy which establishes credit limits for each counterparty and governs management of mark-to-market exposure with each counterparty. All counterparties must be on the firm's Approved Counterparty List, which is governed by the firm's Risk Management Committee (RMC). In order to be included on the firm's approved list, counterparties must generally be highly rated and be party to a netting agreement. Record's RMC also considers a range of risk metrics including credit default swap spreads, regulatory regime, size, standing in a region and government support.

ESG

Record has an established ESG policy and has launched a number of initiatives related to integrating ESG factors into its business and investment process. The firm has been a signatory of the UN PRI since June 2018, and is a member of the group Swiss Sustainable Finance. In May 2018, Record signed-on to the FX Global Code, a set of global principles of good practice in the foreign exchange market, developed to provide a common set of guidelines to promote the integrity and effective functioning of the wholesale foreign exchange market.

With respect to climate, Record promotes Task Force on Climate-related Financial Disclosures (TCFD) principles and has begun some of its core reporting. The firm is committed to developing its strategy, governance and reporting efforts around investment and corporate climate risks. Additionally, the firm is part of a carbon offsetting program and has been certified as carbon neutral since July 2007.

Record has a Board Diversity Policy in addition to an anti-discrimination policy. Record's board is committed to diversity and will endeavor to ensure that minority gender on the board represents at least one-third of the total. The firm is also considering sign-on to the Women in Finance Charter (WIFC), a program committed to creating a more balanced and fair financial services industry by encouraging signatory firms to increase the number of women employed in senior management roles.

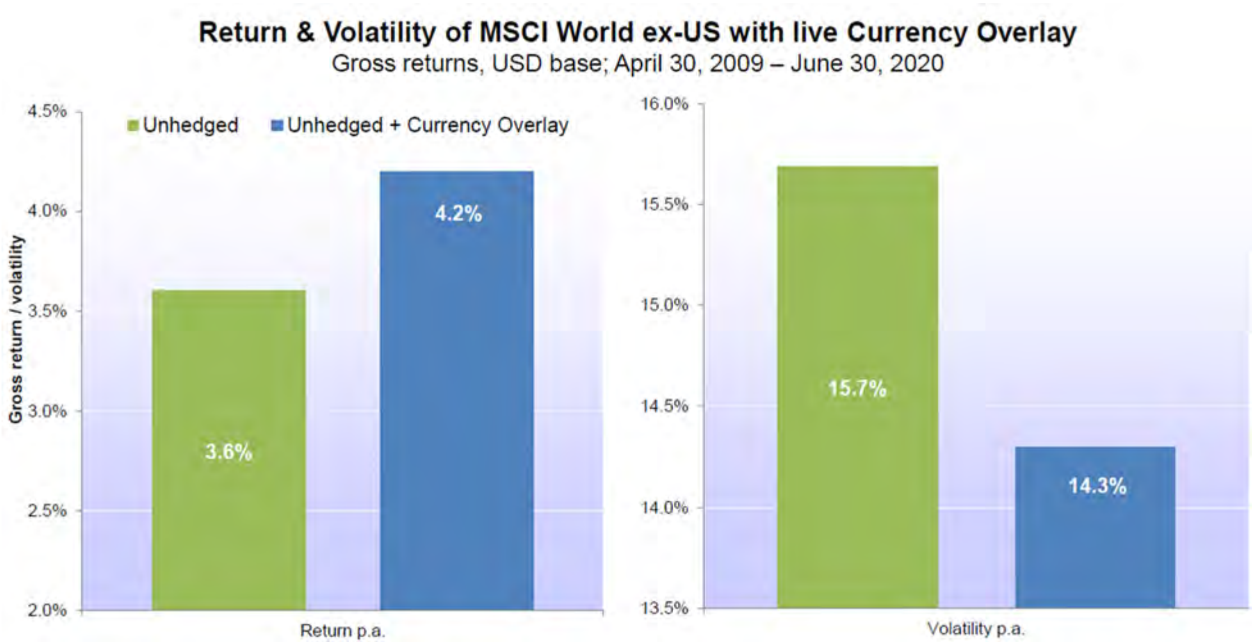
In 2020, the firm launched its FX counterparty active ESG engagement strategy. With this strategy, Record subjects all counterparty banks to a rigorous ESG screening. All institutions are rated for ESG standards using a series of quantitative and quantitative metrics. If a bank fails to meet the set benchmark, traders will prioritize other banks. The firm then actively engages with institutions to incentivize ESG progress and disclosure.

Performance

Currency overlay is a highly customized and client-specific strategy. Client-specific factors include the amount and distribution of underlying currency exposure in the client's portfolio, the desired maximum hedge ratio, and the client's risk budget for cash flows (realized gains and losses) and overall program value-at-risk. Currency overlay programs tend to perform best in trending markets, when trading costs are lowest. In a full implementation scenario, Record's Currency Overlay strategy seeks to generate 80-100 basis points of annual outperformance relative to the portfolio's unhedged return over a market cycle including periods of dollar strength, dollar weakness and periods of sideways movement.

Staff reviewed detailed performance results of a large U.S. state pension plan for the 2009-2020 period, as well as the summary performance data from the firm's GIPS-compliant composite performance data. For the sample U.S. plan Staff reviewed, Record's Currency Overlay strategy generated $283 million in cumulative hedging gains (gross of fees) over the life of the account (May 2009 to June 2020) on an average hedgeable asset base over that time of approximately $4.7 billion (calculated using year-end asset balance). This return experience is presented in Figure 3 below.

Figure 3. Representative U.S. Plan currency overlay return experience 2009-2020



Source: Record Currency Management. Currency overlay and currency returns calculated based on live performance of a U.S.-based client hedging currency exposure in their international equity portfolio.

Recommendation

Staff recommends hiring Record Currency to help design, implement and manage a Currency Overlay Program within the SBI portfolio. Record is an industry-leading independent currency manager with strong and stable organization and one of the most highly experienced investment teams focused on currency management in the world. Record's systematic process coupled with disciplined interventions to crystallize gains and control costs has a demonstrated history of adding value relative to an unhedged currency benchmark, including as a component of the SBI's portfolio from 1995-2000. If this recommendation is accepted, Staff would begin the process of negotiating an agreement with Record Currency with the expectation that program design would commence immediately with the goal of implementing the overlay program by the end of 2020.

TAB E

Private Markets Commitments for Consideration

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INVESTMENT ADVISORY COUNCIL REPORT

DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Private Markets Commitments for Consideration

Staff has reviewed the following action agenda item:

A. Status of SBI Current Private Markets Commitments
B. Consideration of new commitments

New Managers:

Distressed/Opportunistic	Canyon Capital	Canyon Distressed III	$125 Million

Existing Managers:

Private Credit	Merit Capital	Merit Capital VII	$100 Million
Private Equity	Asia Alternatives	MN Asia Investors	$200 Million
Private Equity	Dyal Capital	Dyal Capital V	$200 Million
Private Equity	Nordic Capital	Nordic Capital X	€150 Million
Private Equity	Thoma Bravo	Thoma Bravo XIV	$150 Million
Private Equity	Whitehorse	Whitehorse Liquidity IV	$100 Million

SBI action is required on item B.

A. Status of SBI Current Private Markets Commitments

Minnesota State Board of Investment

Combined Funds
June 30, 2020

Combined Funds Market Value	$71,052,860,443
Amount Available for Investment	**$6,658,756,194**

	Current Level	**Target Level** [1]	**Difference**
Market Value (MV)	$11,104,458,917	$17,763,215,111	$6,658,756,194
MV +Unfunded	$21,151,965,962	$31,973,787,199	$10,821,821,237

Asset Class	**Market Value**	**Unfunded Commitment**	**Total**
Private Equity	$6,538,456,020	$6,104,830,936	$12,643,286,956
Private Credit	$759,215,408	$1,065,562,587	$1,824,777,995
Real Assets	$1,701,535,740	$776,144,074	$2,477,679,814
Real Estate	$1,045,325,008	$1,208,761,034	$2,254,086,042
Distressed/Opportunistic	$1,041,991,388	$892,208,413	$1,934,199,801
Other [2]	$17,935,353		
Total	$11,104,458,917	$10,047,507,045	$21,151,965,962

Cash Flows
June 30, 2020

Calendar Year	**Capital Calls**	**Distributions**	**Net Invested**
2020 (6 months)	$1,399,696,721	($745,043,445)	$654,653,277
2019	$2,543,614,503	($2,080,037,860)	$463,576,642
2018	$1,992,000,341	($2,049,733,815)	($57,733,474)
2017	$2,021,595,780	($2,383,863,711)	($362,267,931)
2016	$1,874,320,138	($1,728,367,357)	$145,952,781

[1] There is no target level for MV + Unfunded. This amount represents the maximum allowed by policy

[2] Represents in-kind stock distributions from the liquidating portfolio managed by T.Rowe Price and cash accruals.

B. Consideration of New Investment Commitments

ACTION ITEMS:

1) **Investment with a new distressed/opportunistic manager, Canyon Capital Advisors ("Canyon") in Canyon Distressed Opportunity Fund III ("Fund III").**

Canyon is forming Canyon Distressed Opportunity Fund III to seek capital appreciation and current income by investing in value-oriented, event driven assets, with an emphasis on stressed and distressed debt instruments. Fund III may invest from the top to the bottom of the corporate capital structure in instruments including leveraged loans, Debtor-in-Possession (DIP) loans, revolving credit facilities, privately negotiated financings, high yield bonds, trade claims, convertibles, credit derivatives and equities, among others. The predominant geographic focuses of the Fund will be the United States, Europe, and Australia.

In addition to reviewing the attractiveness of the Distressed Opportunity Fund III investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

More information on Canyon Distressed Opportunity Fund III is included as **Attachment A beginning on page 9.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $125 million, or 20% of Canyon Distressed Opportunity Fund III, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Canyon upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Canyon or reduction or termination of the commitment.

2) **Investment with an existing private credit manager, Merit Capital ("Merit") in Merit Capital Fund VII ("Fund VII").**

Merit is establishing Fund VII to pursue direct privately-negotiated junior capital (subordinated debt and equity) investments in lower middle-market companies in the United States and Canada. Merit defines the lower middle-market as companies with sales of $20 to $200 million, and enterprise values of $25 to $150 million. The Firm will target established, profitable businesses in industries with significant barriers to entry such as manufacturing and specialty distribution, as opposed to retailing, service, and commodity distribution. Merit intends to be the lead investor in substantially all Fund VII investments, which gives Merit enhanced flexibility to develop the capital structure, set transaction terms, and obtain favorable pricing.

In addition to reviewing the attractiveness of the Merit Capital Fund VII investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

More information on Merit Capital Fund VII is included as **Attachment B beginning on page 13.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $100 million, or 20% of Merit Capital Fund VII, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Merit upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Merit or reduction or termination of the commitment.

3) Investment with an existing private equity manager, Asia Alternatives Management ("Asia Alternatives") in a separately managed account established for the benefit of the SBI ("MN Asia Investors, LP").

Asia Alternatives is forming Fund VI and related separately managed accounts to pursue investment opportunities with top-performing private equity managers and will hold a diversified portfolio of Asian private equity funds. Similar to Funds I-V, Fund VI will invest primarily in Greater China, Japan, South Korea, India, Southeast Asia and Australia. The Fund intends to be diversified across buyout, growth and expansion, venture capital and special situations (defined as distressed debt, real estate, corporate restructuring and/or structured transactions). In addition, Fund VI expects to allocate approximately 20-30% to pursue direct co-investments and secondary purchases of fund investments.

In addition to reviewing the attractiveness of the Asia Alternatives Capital Partners investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

The SBI intends to pursue a separately managed account with Asia Alternatives which will generally pursue substantially similar investments as Fund VI, subject to potential investment guidelines or restrictions agreed upon by the SBI and Asia Alternatives.

More information on Asia Alternatives Capital Partners is included as **Attachment C beginning on page 17.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a total commitment of up to $200 million to MN Asia Investors, LP, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Asia Alternatives upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Asia Alternatives or reduction or termination of the commitment.

4) Investment with an existing private equity manager, Dyal Capital Partners ("Dyal") in Dyal Capital Partners V ("Fund V").

Dyal is seeking investors to continue their strategy of making minority equity investments in established investment management companies. Fund V will aim to acquire minority interests in leading institutionalized private equity firms, which should continue to benefit from increased allocations to private equity funds by large institutional investors, such as public and corporate pension plans and sovereign wealth funds. Dyal believes that portfolio diversification is critical and will seek to assemble a portfolio of complimentary investments diversified by investment strategy, vintage years, and geography.

In addition to reviewing the attractiveness of the Dyal Capital Partners V investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

More information on Dyal Capital Partners V is included as **Attachment D beginning on page 21.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $200 million, or 20% of Dyal Capital Partners V, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Dyal upon this

approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Dyal or reduction or termination of the commitment.

5) Investment with an existing private equity manager, Nordic Capital ("Nordic") in Nordic Capital X ("Fund X").

Nordic is establishing Fund X to make growth buyouts primarily in the Northern Europe as well as Healthcare growth buyouts across Europe and in North America. Fund X will target robust, difficult to replicate businesses operating within non-cyclical and resilient sectors benefitting from long term secular drivers and strong downside protections throughout market cycles. Investments will be made primarily in three core sectors: Healthcare, Technology & Payments ("T&P"), and Financial Services, with some investments made opportunistically in Industrial Goods & Services.

In addition to reviewing the attractiveness of the Nordic Capital X investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

More information on Nordic Capital X is included as **Attachment E beginning on page 25.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to €150 million, or 20% of Nordic Capital X, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Nordic upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Nordic or reduction or termination of the commitment.

6) Investment with an existing private equity manager, Thoma Bravo in Thoma Bravo XIV ("Fund XIV").

Thoma Bravo is forming Fund XIV to make investments (generally expected to consist of control buyouts) in software and technology-enabled services companies in North America. Fund XIV continues Thoma Bravo's strategy of seeking to create value by transforming businesses in fragmented, consolidating industry sectors into larger, more profitable and more valuable businesses through rapid operational improvements, growth initiatives, and strategic and accretive add-on acquisitions. The application and infrastructure software and technology enabled services industry sectors on which Thoma Bravo focuses today are fragmented and consolidating, which lend themselves particularly well to this strategy.

In addition to reviewing the attractiveness of the Thoma Bravo XIV investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

More information on Thoma Bravo XIV is included as **Attachment F beginning on page 29.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $150 million, or 20% of Thoma Bravo XIV, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Thoma Bravo upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Thoma Bravo or reduction or termination of the commitment.

7) **Investment with an existing private equity manager, Whitehorse Liquidity Partners ("Whitehorse") in Whitehorse Liquidity Partners IV ("Fund IV").**

Whitehorse is seeking investors to continue their strategy of providing counterparties with flexible liquidity solutions for their private equity portfolios through the creation of preferred securities. Whitehorse believes their utilization of structures to accelerate liquidity on private equity portfolios and/or finance the acquisition of private equity portfolios provide attractive, risk-adjusted returns for its investors. The four different applications of its strategy are alternatives to a secondary sale, securitized secondaries, fund level solutions, and general partner balance sheet solutions.

In addition to reviewing the attractiveness of the Whitehorse Liquidity Partners IV investment offering, staff conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the fund.

More information on Whitehorse Liquidity Partners IV is included as **Attachment G beginning on page 33.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $100 million, or 20% of Whitehorse

Liquidity Partners IV, whichever is less, plus an additional amount not to exceed one percent of the total commitment for the payment of required charges at closing. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by Whitehorse upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on Whitehorse or reduction or termination of the commitment.

ATTACHMENT A

DISTRESSED/OPPORTUNISTIC MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Canyon Distressed Opportunity Fund III, L.P.
Type of Fund:	Distressed/Opportunistic
Target Fund Size:	$2 Billion
Fund Manager:	Canyon Capital Advisors LLC
Manager Contact:	Randy Ko 2000 Avenue of the Stars, 11th floor Los Angeles, CA 90067

II. Organization and Staff

Canyon Distressed Opportunity Fund III, L.P. ("The Fund," or "Fund III") is being formed by Canyon Capital Advisors ("Canyon," or "The Firm") to seek capital appreciation and current income by investing in value-oriented, event driven assets, with an emphasis on stressed and distressed debt instruments.

Founded in 1990, Canyon is a global value-oriented alternative asset manager that employs a variety of credit strategies across a broad spectrum of asset classes. Canyon is headquartered in the United States in Los Angeles, California. Canyon maintains offices in Hong Kong, London, New York, Seoul, Shanghai and Tokyo. Canyon emphasizes bottom-up fundamental credit analysis, leveraging its long history of accumulated experience and knowledge to conduct balance sheet analysis and due diligence. In addition to the Fund, the Canyon family of funds includes several other collective investment entities and managed accounts.

Canyon maintains broad-based contacts in the domestic and international debt and equity capital markets and extensive network within high yield, leveraged buy-out, venture capital, and special situation investment communities. Joshua Friedman and Mitchell Julis are the founding partners of Canyon Partners. Prior to forming Canyon Partners 29 years ago, Joshua and Mitchell worked together at Drexel Burnham Lambert. Messr. Friedman and Julis control Canyon Partners and are primarily responsible for the investment activities of the Fund as well as Canyon's research strategy and firm management. Canyon also draws on expertise and credit analysis skills of other senior Canyon professionals, as needed, for the benefit of the Fund. As of Oct, 2019, Canyon had over 220 full time employees, of whom over 75 are investment professionals.

III. Investment Strategy

Canyon Distressed Opportunity Fund will employ a multi-asset, multi-industry, and multi-geography approach, as the potential for disruptions across multiple areas requires a broad mandate encompassing corporate securities and structured products (both of which historically have been areas of expertise for Canyon).

The Fund may invest from the top to the bottom of the corporate capital structure in instruments including leveraged loans, Debtor-in-Possession (DIP) loans, revolving credit facilities, privately negotiated financings, high yield bonds, trade claims, convertibles, credit derivatives and equities, among others. Most equity holdings are likely to be associated with companies emerging from bankruptcies, reorganizations, restructurings, spin-offs, divestures, recapitalizations, or other transformative events. The predominant geographic focuses of the Fund will be the United States, Europe, and Australia. For the most part, the Fund will pursue non-control investment opportunities.

The Fund may invest in a range of structured products including non-agency and agency RMBS, CMBS, CLO tranches and ABS, among others. Other non-corporate investments may include municipal debt, sovereign debt, loans backed by real estate, and non-performing loan portfolios, among others.

Canyon's strategy is to combine "value-oriented" and "event-driven" investing. Canyon believes in employing a "bottom up" approach and focuses on rigorous research of business, credit and legal issues in order to determine values, analyze corporate events and special situations. This approach identifies securities which can be purchased at a price Canyon believes represents a discount to intrinsic value, and identifies catalysts which can unlock value.

"Value-oriented" investing is an investment strategy characterized by research directed at identifying gaps between the market valuations of financial instruments and the intrinsic values of the underlying assets or enterprises. These gaps are frequently created by business events, financial instruments, or discrete events that affect the valuation of a company or pool of assets. In such situations, Canyon performs extensive research to develop an opinion about the true nature and extent of the risks presented by those uncertainties. If they determine that a discount is sufficiently large and unwarranted, it may take a long position in such security.

"Event-driven" investing complements Canyon's value approach by identifying near- and intermediate-term catalysts that may affect investors' perceptions of securities. Generally, Canyon attempts to purchase a security at a discount from its intrinsic value in event-driven situations where: (i) diminution of value is limited by either the security's ranking in the capital structure or the underlying hard asset or going concern value; (ii) there is potential for significant capital appreciation and/or ongoing current income; and (iii) there is an identifiable catalyst that can result in price appreciation.

Canyon takes a "total return" approach to investing, looking carefully at a timeline of potential events that are likely to drive values. While intrinsic "cheapness" is a vital attribute of their prospective investments, it is often not itself sufficient to warrant investment. Canyon is mindful of catalysts that unlock the potential value of the enterprise or asset. These catalyst usually pertain to company specific matters and may involve refinancing, restructurings, mergers and acquisitions, asset purchases or divestitures or legal rulings. In other instances, catalysts may be more macroeconomic and involve changes in investors' perceptions towards certain asset classes due to legislative or regulatory actions or fiscal or monetary policies. By employing an event-driven, total return approach that includes consideration of holding periods, Canyon believes that it can increase the yield on many of its investments, and discover attractive investments that other value investors may overlook.

As part of its goal of generating attractive risk-adjusted returns for its investors, Canyon incorporates certain Environmental, Social, and/or Governance (ESG) considerations into its due diligence process across many of its investments activities. Canyon's thesis, anticipated holding period and position in the capital stack, among other factors influence how ESG issues may be factored into their due diligence. If certain ESG concerns or deficiencies are uncovered during their due diligence, they may then evaluate those concerns to determine whether it makes sense to proceed with the investment and if so, whether any steps can be taken to mitigate these risks. If an investment is made with identified ESG risks, the level of ongoing monitoring will depend in part on the nature and relative severity of the risk. Canyon has also implemented an ESG Committee that will periodically review Canyon's top 30 positions from an ESG perspective. Members of the ESG Committee includes staff from different departments and meet quarterly. The results of this review will be shared with the Chief Investment Officer and Investment Partners.

IV. Investment Performance

Previous fund performance as of December 31, 2019 is shown below:

Fund	**Vintage Year**	**Total Commitments**	**SBI Investment**	**Net IRR***	**Net MOIC***	**Net DPI***
Canyon Distressed Opportunity Fund I	2010	$521 million	-	11.4%	1.56x	1.55x
Canyon Distressed Opportunity Fund II	2016	$1.465 billion	-	-1.9x%	0.95x	0.40x

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net IRR and Net MOIC provided by Canyon Partners. Past performance is not indicative of future performance, and there can be no assurance that comparable results will be achieved in the future.

V. Investment Period and Term

The Investment Period will last for a period of four years from final closing, subject to an extension with approval of the Investor Advisory Committee.

The Fund will terminate six years from final closing, subject to a one-year extensions at the sole discretion of the general partner. Thereafter, any extensions require consent of the majority at the interest of investors.

This document is a summary of more detailed information provided in the Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM.

ATTACHMENT B

PRIVATE CREDIT MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Merit Capital Fund VII, L.P.
Type of Fund:	Private Credit
Target Fund Size:	$550 million
Fund Manager:	Merit Capital Partners VII, L.L.C.
Manager Contact:	Marc Walfish Managing Director 303 West Madison Street, Suite 2100 Chicago, IL 60606

II. Organization and Staff

Merit Capital (or the "Firm") is establishing Merit Capital Fund VII ("the Fund") for the purpose of making direct privately-negotiated junior capital (subordinated debt and equity) investments in lower middle-market companies in the United States and Canada.

Merit Capital is led by seven senior managers: Thomas F. Campion, Evan R. Gallinson, Van T. Lam, Daniel E. Pansing, Terrance M. Shipp, Marc J. Walfish and Benjamin W. Yarbrough. These investment professionals have an average over 25 years of experience in the mezzanine and private equity industries. Further, the vast majority of this experience has been earned working together. Marc Walfish, Terry Shipp and Tom Campion were all colleagues at Prudential Capital in the 1980s leading up to the founding of Merit and its predecessor funds in the early 1990s. William Blair & Company was an institutional principal in Funds I, II and III. It was not a principal in Fund IV, V or VI, and will not be a principal in Fund VII.

Merit Capital operates out of a single office in Chicago, Illinois. The investment team is made up of 11 individuals, each of whom is a generalist and focuses on deal sourcing, deal execution, and portfolio monitoring. In addition to the investment team there are three finance professionals and two administrative professionals.

III. Investment Strategy

Consistent with six prior funds, the Firm anticipates that the majority (approximately 65%) of the committed capital in Fund VII will be invested in the form of fixed rate subordinated debt, which in many cases will include equity participation at nominal additional cost, often by structuring in warrant participation. Fund VII is expected to also invest a meaningful (approximately 35%) amount of the committed capital in preferred stock and common stock. The resulting portfolio is expected to be made up of both mezzanine debt and direct equity investment intended to generate attractive current yields (8% to 10% on average for each portfolio company) combined with upside available through meaningful equity ownership positions. Fund VII is expected to invest in approximately 18 separate companies, with an average total investment of approximately $30 million per company.

The Firm focuses on transactions falling into two broad categories. The first and most significant segment involves investments completed in partnership with the existing owners and executives of companies. These recapitalization-oriented deals typically involve a meaningful financial reinvestment and management commitment by the existing management team in partnership with Merit. The firm believes that continuing shareholders are attracted to the lower risk they will face under Merit's favored capital structures (which use modest levels of senior debt, and the fact that their equity partner also holds the subordinated debt), relative to alternative transactions available in the traditional buyout market. In many of these cases the fund is the first institutional investor in the company.

The second broad category involves independent/fundless sponsor transactions. These transactions are often originated by small investor groups that pursue leveraged buyout transactions without committed capital from a traditional organized buyout fund. The groups often find deals "off the beaten path" and/or in situations where they can add value through particular industry knowledge or expertise. Success in these two areas can lead to very favorable returns, even after factoring in their compensation (often in the form of some combination of management fees and ownership). While these transactions can involve significant reinvestment by prior owners, Merit often teams with the independent/fundless sponsor to provide virtually all of the junior capital (subordinated debt and equity) required to complete the transaction.

As Merit pursues these recapitalization and independent/fundless sponsor transactions, it will follow an investment strategy guided by four principles:

Disciplined Investing: The team that will invest Fund VII has been together for over 25 years and has been responsible for the investment of prior funds across multiple market cycles. The Fund intends to focus on the relatively inefficient lower middle-market, which Merit defines as companies with sales of $20 to $200 million, and enterprise values of $25 to $150 million. The Firm will target established, profitable businesses in industries with significant barriers to entry such as manufacturing and specialty distribution, as opposed to retailing, service, and commodity distribution. The Fund does not intend to invest in certain industries such as real estate development or oil and gas exploration, nor in companies with perceived excessive business risk, such as high-technology companies, turnarounds or start-ups.

Established Origination Capabilities: The Firm has concentrated origination efforts on non-traditional channels where there is less competition, including: (i) direct origination of transactions with management (through relationships with company executives on their boards, attorneys, senior lenders, accountants and wealth managers, among others); (ii) independent/fundless sponsor transactions; and (iii) boutique M&A advisors (small business intermediaries who typically do not have the same level of resources to bear on a given transaction that one sees from traditional investment banks, thus offering opportunities to meaningfully fewer capital providers). The vast majority of Merit Capital's 91 platform investments to date have been sourced through these non-traditional channels. Additionally, to date only five investments have been made in support of traditional private equity fund transactions, the most recent of which closed in 2005.

Transaction Control: Merit intends to be the lead investor in substantially all Fund VII investments. This is consistent with the Firm's approach in prior funds. Serving as lead investor provides control of the transaction, which gives Merit enhanced flexibility to develop the capital structure, set transaction terms, and obtain favorable pricing which includes significant equity or other upside in each investment opportunity. Traditional mezzanine investors who invest alongside equity funds generally have less control of their transaction structures and pricing, and meaningfully less upside opportunity. Control of the transaction also allows Merit to establish a conservative capital structure. In prior funds Merit has used modest amounts of senior debt (less than 2.0x EBITDA on average, compared to an industry average of between 3.5x to 4x). In addition, Merit generally provides approximately 2.5x EBITA of subordinated debt, resulting in a total leverage level (~4.5x EBITDA) that is meaningfully lower than industry averages. Finally, transaction control allows Merit to obtain high levels of equity ownership. In Funds I-III, average equity ownership was approximately 30%, while Funds IV – VI have averaged over 60% equity ownership.

Active Portfolio Management: Merit believes that active and thorough portfolio management is essential to its strategy, especially given the high level of equity ownership in most transactions. The Firm believes that it must develop a close relationship with company management and be respected as an integral part of the strategic decision making process. At least one principal of Merit is or was a member of the Board of Directors in substantially all portfolio companies in prior funds. While not directly involved in day-to-day operations, Merit expects to assist management in number of key areas, such as recruitment and retention of management; refinancing of senior debt; evaluation of potential mergers, acquisitions and divestitures; and the approval of operating and capital budgets. Because Merit is generally not investing alongside an equity fund, the Firm is able to be integrally involved in the investment exit process, including decisions on timing and means of exit, as well as selecting and engaging investment bankers and negotiating with prospective purchases. Merit believes this proactive approach to the exit process should enhance realized returns.

Merit Capital strives to invest responsibly, with environmental, social and governance ("ESG") values incorporated into their decision making processes. Merit will typically review appropriate ESG factors as part of a due diligence review of each investment, prior to committing to that investment. These factors may include: environmental impacts; corporate governance; management structure and compensation; employee relations and diversity. As part of the approval process for each investment Merit will consider ESG concerns and opportunities identified during due diligence. In cases where one or more ESG items reflect risks that are beyond Merit's comfort level, the investment will typically be turned down, unless the Firm takes the view that those risks can be properly mitigated and addressed.

IV. Investment Performance

Previous fund performance as of March 31, 2020 are shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
William Blair Mezzanine Capital Fund	1993	$115 million	-	14.0%	1.8x	1.8x
William Blair Mezzanine Capital Fund II	1997	$190 million	-	11.9%	1.7x	1.7x
William Blair Mezzanine Capital Fund III	2000	$311 million	$60 million	15.4%	2.0x	2.0x
Merit Mezzanine Fund IV	2005	$455 million	$75 million	11.5%	2.0x	2.0x
Merit Mezzanine Fund V	2010	$613 million	$75 million	9.7%	1.5x	1.1x
Merit Mezzanine Fund VI	2016	$536 million	$100 million	13.2%	1.2x	0.2x

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net IRR and Net MOIC provided by the manager.

V. Investment Period and Term

The Fund will have a term of 10 years, subject to not more than three one-year extensions with the approval of the Advisory Committee or a majority of Limited Partner interests. The investment period will last 5 years.

This document is a summary of more detailed information provided in the Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM. Any capitalized terms used herein and not otherwise defined shall have the meaning attributed to them in the PPM.

ATTACHMENT C

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	MN Asia Investors, LP
Type of Fund:	Private Equity Separate Account
Target Fund Size:	\$1.8 billion (incl. AACP VI and Separate Accounts)
Fund Manager:	Asia Alternatives Management, LLC
Administrative Contact:	Melissa Ma One Embarcadero Center, 16th Floor San Francisco, CA 94111

II. Organization and Staff

Asia Alternatives Management LLC ("Asia Alternatives" or the "Firm") is forming Asia Alternatives Capital Partners VI ("AACP VI", "Fund VI" or the "Fund") and related separate accounts to pursue investment opportunities with top-performing private equity managers and will hold a diversified portfolio of Asian private equity funds. Like AACP Funds I-V, Fund VI will invest primarily in Greater China, Japan, South Korea, India, Southeast Asia and Australia. The Fund intends to be diversified across buyout, growth and expansion, venture capital and special situations (defined as distressed debt, real estate, corporate restructuring and/or structured transactions).

The Firm was founded in 2006 by Melissa Ma, Laure Wang and Rebecca Xu. Today Firm leadership is comprised of Ms. Ma and Ms. Xu, along with Principals William LaFayette and Akihiko Yasuda and Praneet Garg, and Principals Valerie Leung and Dan Dashiell, who collectively have over 130 years of on-the-ground experience in Asia and over 85 years collective experience investing in Asia private equity.

Currently, the Asia Alternatives Investment team is made up of 19 investment professionals with significant experience evaluating and investing in private equity funds and direct deals in Asia, including investment sourcing, due diligence, negotiation, research and monitoring, accounting and reporting, client service and risk management. The Investment Team is supported by an investment administration team of 36 people performing finance and accounting, investor relations and fund administration duties. The Firm's investment staff are largely based in offices in Hong Kong, Beijing and Shanghai, while the San Francisco office is focused primarily on client service, marketing and corporate financial reporting and governance.

III. Investment Strategy

Asia Alternatives will seek to invest the Fund across approximately 20-25 fund managers, who will form the core fund manager relationships for the Firm. Because the depth of proven private equity managers across Asia is relatively small, Asia Alternatives believes that concentrating the Fund's investments with proven, top-performing managers is necessary to help ensure overall attractive returns.

The Asia Alternatives Investment Team is organized by "buckets" of a combination of geography and sub-sector – for example China small-mid growth or Japan mid-large buyouts. The team produces "Bucket Reports" which are the basis for making a recommendation of risk premium for the bucket. The Bucket Reports are analyses that look at a series of macroeconomic updates (e.g. GDP, regulatory changes, currency, stock market, etc.) and private equity market specific factors (e.g., exits, leverage multiples, valuation levels, number of players, amount of money raised, etc.) as a basis for making risk premium recommendations. Every quarter the Investment Team re-underwrites its views and risk premiums based on recent developments.

The Investment team sets hurdles for (i) geographic risk, (ii) illiquidity risk and (iii) manager risk. The portfolio is constructed based on which buckets the Investment team analyzes and deems have the highest probability to deliver the risk premium hurdles set. Once the Investment team has picked which buckets to concentrate capital in, it screens managers "bottom up" and ranks managers for each bucket. The goal is to invest in the top 3-5 managers, as appropriate, for each of the most attractive buckets.

This investment process will result in a portfolio that has been thoughtfully constructed across three dimensions:

Strategy Type:
The Firm expects that approximately 90+% of the capital of AACP VI will be invested independent, Asia-based firms, with the remainder allocated to fund managers affiliated with U.S. or European private equity firms. These investments will generally be of the following types:

- 50-60% of the capital is expected to be invested with "core managers," who as a team have invested two or more prior iterations together.
- 5-15% of the capital is expected to be invested with first time or emerging managers who have strong potential to generate the top-performing funds among their peer group. A number of these managers are expected to be structured primaries.
- Finally, the Fund expects to invest approximately 20-30% in structured primaries. These are primary commitments in new firms where Asia Alternatives plays an anchor sponsor role and receives economic benefits for this sponsorship. The teams, however, are often experienced groups that have worked together for a prior employer.

- To further enhance returns, the Fund will also allocate approximately 20-30% to pursue direct co-investments and secondary purchases of fund investments. These direct co-investments and secondaries will primarily be with the Fund's existing managers or those fund managers who have strong potential to provide future fund investments.

Geography:
Asia Alternative's allocations for the Fund are based on a rigorous and systematic top-down bucket analysis of the key private equity markets in Asia coupled with a bottom-up screening of the current Asia fund manager universe to identify the most suitable opportunities. The process is centered around assessing the various levels of risk in each market and selecting managers who have historically and/or the Firm believes have the future potential to generate sufficient return to more than justify the risk associated with their chosen investment market and strategy.

Each quarter Asia Alternatives evaluates the attractiveness of each geographical region in Asia and each sub-asset class as a starting point of how to allocate capital within AACP VI. The Investment Team evaluates (i) the economic and business fundamentals of the country's economy, using criteria such as size and growth of GDP, policy and regulatory environment, business fundamentals, public market depth, and corporate governance; and (ii) attractiveness of the private equity environment, considering factors such as the level of buyout, growth and expansion, venture and special situation opportunities, overall quality and depth of fund managers, ability to exit and fundraising momentum.

AACP VI's projected geographic allocation is 45-55% Greater China, 20-40% Japan and South Korea, 15-25% India, and 10-15% Southeast Asia and Australia. Given the growing and dynamic nature of the Asia private equity landscape, these allocations may fluctuate as much as +/-10% during the life of the Fund.

Sub-Asset Class:
To overlay the geographic assessment, the Investment Team performs a separate analysis on the private equity sub-asset classes in Asia, which are buyout, expansion and growth, venture and special situations. The criteria used to evaluate each sub-asset class include investment themes, source of deals, drivers of return, skills required, exit options and country focus. Systematically reviewing sub-asset class in Asia along this framework results in an AACP VI portfolio that is expected to consist of 40-50% buyout opportunities, 25-35% in expansion and growth, 20-25% venture investments, and 5-15% in special situations funds which could include distressed debt, real estate, corporate restructuring and/or structured transactions.

Asia Alternatives believes that responsible corporate behavior with respect to environmental, social and governance ("ESG") factors can generally have a positive influence on long-term financial performance, recognizing that the relative importance of ESG factors varies across industries, geographies and time. In analyzing risks inherent in its portfolio investments, Asia Alternatives looks to identify, monitor, and mitigate ESG issues that are, or could become, material to long-term financial performance. Potential ESG risks and opportunities are appropriately considered as part of Asia Alternatives' overall investment process, including inquiries relating to the status of ESG policies at portfolio funds and reporting processes related to the same. Asia Alternatives became a signatory to the United Nations Principles for Responsible Investment in May 2019.

Asia Alternatives will also create customized separate accounts which will invest in whole or in part alongside Fund VI. It is anticipated that these separate accounts will generally comprise two pools of capital, one of which will invest alongside Fund VI in the same underlying assets, and one of which will invest more selectively, subject to investment guidelines or restrictions agreed to by both the Limited Partner and Asia Alternatives. This second pool may include primary fund commitments, secondary fund investments and direct co-investment opportunities.

IV. Investment Performance

Previous fund performance as of March 31, 2020 for Asia Alternatives funds are shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
AACP I	2007	$515 million	--	11.0%	1.8	1.7
AACP II	2008	$950 million	--	17.9%	2.4	1.8
AACP III	2012	$908 million	--	12.0%	1.6	0.9
AACP IV	2015	$948 million	--	10.5%	1.3	0.2
AACP V	2017	$1.52 billion	$100 million	(16.7)%	0.9	0.0

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Performance provided by Asia Alternatives Management.

VII. Investment Period and Term

The investment period will be five years from the final close of the Fund. The term will be ten years from the final closing of the fund, subject to automatic extensions to the later of (i) the 7th anniversary of the expiration of the investment period of the portfolio fund whose investment period is the last to expire, and (ii) the 7th anniversary of the date, during the Investment Period, that the last direct private equity investment was made (limited to a maximum of four years).

This document is a summary of more detailed information provided in the Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM and any supplemental thereto.

ATTACHMENT D

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Dyal Capital Partners V, L.P.
Type of Fund:	Private Equity
Target Fund Size:	$5 billion
Fund Manager:	Neuberger Berman
Manager Contact:	Carter Reynolds 1290 Avenue of Americas New York, NY 10104

II. Organization and Staff

Dyal Capital Partners ("Dyal" or "the firm") is sponsoring Dyal Capital Partners V (the "Fund" or "Fund V") to make minority equity investments in established investment management companies ("Partner Managers").

Dyal Capital Partners is part of the Neuberger Berman ("NB") Private Equity platform. Since its inception, NB Private Equity has managed over $90 billion of investor commitments across primary, secondary, co-investments, private debt and other direct investments. NB Private Equity has a global presence with over 130 investment professionals in offices in the U.S., Europe, Asia, and South America.

The Dyal Capital Partners team is composed of 55 professionals: 15 senior investment professionals, a 34-member Business Services Platform, and six professionals providing legal and finance support. The members of the investment team have extensive prior experience in asset management mergers and acquisitions, and have consummated 49 equity transactions across 45 partner managers, with 27 investments being in private equity firms across prior Dyal funds.

The Dyal team is headquartered in New York, and has raised over $17 billion in four prior private equity-structured funds. Dyal Capital Partners I and Dyal Capital Partners II followed a hedge fund-focused investment program, while Funds III and IV followed a private equity manager-focused investment program, which is consistent with the strategy intended for Fund V.

Neuberger Berman became a signatory to the United Nation Principles of Responsible Investing on June 29, 2012, and has reported to the PRI since 2014. In a 2019 PRI Assessment, Firm obtained the highest possible score for its overarching approach to Environmental, Social and Governance ("ESG") strategy and governance, as well as ESG integration across the four asset classes managed by the Firm.

III. Investment Strategy

Fund V focuses on acquiring minority interests in leading institutionalized private equity firms, which should continue to benefit from increased allocations to private equity funds by large institutional investors, such as public and corporate pension plans and sovereign wealth funds. Further, Dyal believes that portfolio diversification is critical and will seek to assemble a portfolio of complimentary investments diversified by investment strategy, vintage years, and geography.

Dyal believes that owners of private equity firms are increasingly attracted to taking on minority equity partners for a number of reasons. First, such a transaction can provide the private equity firm with permanent capital, which can be used to make larger commitments to their own funds or develop new products, as well as engage in acquisitions or geographic expansion. Second, selling a minority stake may allow management to reallocate ownership to the next generation of investment professionals. Third, certain firms may have existing financial shareholders that are seeking liquidity, or may be looking to spin a successful franchise out of a bank due to regulatory concerns. Lastly, taking on a minority partner can provide management with access to capital while avoiding an IPO and the costs and responsibilities of running a public company.

Dyal seeks to respond to all of these motivations, and has three distinct advantages in seeking to partner with high quality private equity firms: (i) a deep and experienced team, (ii) the ability to offer a true strategic partnership, and (iii) affiliation with a global asset management firm that does not, generally speaking, compete with Partner Managers.

The Firm anticipates that each Fund V investment in a private equity Partner Manager will benefit from three return components:

1. A share of management fees, which is very stable and predictable over the life of the funds,
2. A share of return of capital and gains on balance sheet investments made alongside the limited partners in the funds (i.e., the GP commitment), and
3. A share of carried interest, which is episodic and varies with fund returns.

Although every transaction is unique, Dyal generally seeks to acquire the right to these three income streams with respect to a Partner Manager's existing funds, as well as those it will raise in the future. The existing funds may be at different stages of their lives, and the predictability of the performance of balance sheet assets and the likelihood of carried interest payments varies according to the stage of the fund. Regardless of fund stage, the expected management fee income is much less variable and can be more accurately predicted. Dyal uses reasonable and conservative assumptions regarding the size and performance of funds that a Partner Manager may raise in the future, and evaluates several different scenarios (both good and bad) to assess the range of possible outcomes. Dyal's underwriting does not ascribe significant terminal value or exit multiple to the manager; rather, Dyal expects to generate attractive returns solely from cash flow.

Dyal's focus is on "institutionalized" firms that are positioned for sustained earnings stability with potential upside growth. These firms have the resources to retain large, sophisticated investors and build lasting businesses. Institutionalized firms dedicate substantial resources to non-investment functions, such as investor relations, legal, compliance, and risk management. They typically have multiple products and are not key-person dependent. Managers will be evaluated both for their investment acumen and their ability to build and manage growth businesses successfully. In addition to business stability and attractiveness to institutional investors and consultants, institutionalized firms are generally large enough to be profitable even in years with little or no carried interest.

Fund V Partner Managers will be entitled to benefit from the customized suite of services provided by Dyal's Business Services Platform. Broadly speaking, the Business Services Platform executes projects in five key areas:

- **Client Development & Marketing Support** – The Business Services Platform team focuses on making, subject to any applicable information barriers, strategic, qualified introductions of Dyal's Partner Managers to select investors, including investors in Dyal's funds.

- **Product Development** – The Business Services Platform has assisted several Partner Managers as they have considered launching new products. This assistance has included extensive market and product opportunity analyses that define relevant peer groups, examine performance data and identify potential target investors and barriers to entry.

- **Talent Management** – The Business Services Platform provides talent management services to Partner Managers, including guidance on organizational development, talent sourcing, and in-depth compensation benchmarking and structuring assistance.

- **Business Strategy** – The Business Services Platform undertakes individualized management consulting projects such as developing firm strategic growth plans, evaluating distribution expansion options, and assessing brand development strategies. Additionally, the team provides strategic best practices advice, and competitive benchmarking reports.

- **Operational Advisory** – The Business Services Platform delivers support and best practices advice to our partners' business operations, technology, and infrastructure functions through peer benchmarking, thought leadership and customized analysis.

Neuberger Berman believes that Environmental, Social and Governance ("ESG") characteristics are an important part of the due diligence of any private investment. The Firm considers ESG factors when investing in a private equity fund or firm (through a primary, secondary or general partner stake), and view the track record and commitment to ESG integration by general partners as an indication of their quality and approach to risk management.

While accounting for ESG is not an explicit component of the Dyal program, the handling of such risk and opportunities by partner managers can impact the future growth and stability of their businesses, and as a result, is in the general mix of factors considered by the Dyal investment team in the due diligence process.

Previous fund performance as of March 31, 2020 is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Dyal I	2012	$1.3 billion	N/A	-1.5%	0.94	0.47
Dyal II	2015	$2.1 billion	N/A	-8.1%	0.84	0.19
Dyal III	2016	$5.3 billion	$175 million	17.5%	1.53	0.61
Dyal IV	2018	$9 billion	$250 million	-2.9%	0.98	0.32

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net IRR and Net MOIC provided by the manager.

IV. Investment Period and Term

The investment period will last for five years from the date of the final closing, subject to extensions, unless terminated earlier by the General Partner. Fund V will continue in existence indefinitely. However, the General Partner may pursue either full or partial liquidity opportunities, as evidenced by a recent $1.0 billion dividend recapitalization of Fund III, and may cause Fund V to enter into a transaction or restructuring that affords the Limited Partners with an opportunity to receive cash or marketable securities in exchange for all or substantially all of their interests.

This document is a summary of more detailed information provided in the Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM.

ATTACHMENT E

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Nordic Capital X, L.P.
Type of Fund:	Private Equity – Buyout
Target Fund Size:	€5 billion
Fund Manager:	Nordic Capital X Limited
Manager Contact:	Pär Norberg Head of Investor Relations Mäster Samuelsgatan 21, SE-11144 Stockholm, Sweden

II. Organization and Staff

Nordic Capital (or the "Firm") is establishing Nordic Capital X to make growth buyouts primarily in the Northern Europe as well as Healthcare growth buyouts across Europe and in North America. Nordic Capital is one of the oldest Nordic region mid-market private equity investors and is supported by strong local presence and long-standing industry relationships in Northern Europe. Nordic Capital Fund I was established in 1989 and, since then, the predecessor Nordic Capital Funds to Nordic Capital Fund X have invested over €16.4 billion in 117 portfolio companies.

Nordic Capital Fund X will leverage the Firm's 148 person team with 57 investment professionals and dedicated professionals supporting Ownership Excellence, Capital Markets, ESG, Investor Relations, Legal, Controlling & Valuation and Fund Operations. In addition, Nordic Capital has a deep network of operating partners and long-term industrial advisors. Nordic Capital is led by Managing Partner Kristoffer Melinder, who has been with Nordic Capital since 1998. Mr. Melinder became co-Managing Partner in 2010 and sole Managing Partner in 2016. Under his leadership, Nordic Capital has made significant refinements to its operating model including sharpening its sector-based focus and developing dedicated Ownership Excellence resources.

Environmental, Social, and Governance ("ESG") principles have become an important focus of Nordic Capital in recent years. In an effort to increase gender diversity of the investment staff, 1/3 of the investment professionals recruited in 2019 were women. In 2014 the Firm developed a Responsible Investment Policy and in 2019 it became a signatory of the UNPRI (United Nations Principles for Responsible Investment). Today it has a three person sustainability team.

Nordic Capital has offices in Stockholm, Oslo, Copenhagen, Helsinki, Frankfurt, London, New York, Jersey and Luxembourg.

III. Investment Strategy

Nordic Capital Fund X is a continuation of Nordic Capital's strategy of focusing on upper middle-market companies (enterprise value of €250-1,000 million) in Northern Europe, as well as across Europe and North America for Healthcare investments. Fund X will target robust, difficult to replicate businesses operating within non-cyclical and resilient sectors benefitting from long term secular drivers and strong downside protections throughout market cycles. Nordic Capital believes that Northern Europe is an attractive region for the Firm's investment strategy due to the region's historically stable macroeconomic environment, reputation for innovation, and fragmented ecosystem of attractive high growth middle market companies. Investments will be made primarily in three core sectors: Healthcare, Technology & Payments ("T&P"), and Financial Services, with some investments made opportunistically in Industrial Goods & Services.

The Healthcare sector's relatively low exposure to economic cycles, strong secular drivers and transformative changes create what Nordic Capital believes are attractive investment opportunities as companies re-position themselves to access growth. Examples of such shifts include aging populations, patient centrism, digitalization and innovation. The Firm targets specific segments within the Healthcare market where it has developed sector experience, networks and value creation capabilities. Examples of such specific segments are Devices & Equipment, Specialty Generic Drugs, and various segments of Healthcare services.

The Technology & Payments sector is undergoing significant change driven predominantly by digital transformation which is affecting the way that people live and work globally. Digital transformation forces businesses to be re-invented and as a result new winners in business-to business software and payments are emerging that Nordic Capital believes may constitute attractive investment opportunities. Nordic has been successful navigating the evolution of the T&P marketplace for over two decades as evidenced by its strong track record in the space.

The Financial Services industry is changing rapidly and Nordic Capital believes that the success of a financial services business now lies in its ability to adapt, evolve and accelerate growth. In the aftermath of the Global Financial Crisis, large financial services institutions are undergoing a long-term restructuring of their businesses: streamlining operations, deleveraging their balance sheets and divesting non-core subsidiaries. As consumer behaviors evolve, regulation increases and technology reshapes the market, traditional players are facing new competitors who are developing different and compelling value propositions. Nordic Capital believes this dynamic provides a strong flow of attractive investment opportunities in subsectors such as savings and wealth management, retail lending and debt collection that are exhibiting strong underlying fundamentals.

Nordic Capital has invested in developing a sophisticated Ownership Excellence Framework where it is able to draw upon expert resources both in-house and externally. Specific in-house resources are dedicated to implementing ownership best practices, portfolio company operational support, ESG, human resources management, procurement and exit planning. Nordic Capital also uses a deep network of outside advisors with industrial experience to support portfolio companies with specific value creation initiatives or as operating chairpersons. Post-acquisition, Nordic Capital uses these resources and framework to accelerate growth through R&D, geographic expansion, transformational M&A, small scale build-ups and/or strategic repositioning.

Nordic Capital believes that ESG initiatives can create value at a portfolio company through sales growth, cost reduction, risk reduction, and employee productivity increases. The Firm has developed policies, trainings and a toolkit to support portfolio companies as they integrate sustainability into their business practices. Since 2014, the Firm has had more than 500 people from its employee base and portfolio companies participate in its sustainability training program.

Nordic Capital applies a structured approach to maintain an ongoing view of the preferred exit route and timing for each portfolio company. The potential exit routes are an important part of the original investment evaluation. The Exit Office, established by Nordic Capital in 2015, is led by partner Robert Furuhjelm and includes 2 other corporate finance professionals. Through a systematic process covering all portfolio companies, the Exit Office supports Nordic Capital in early identification and evaluation of attractive exit alternatives such as trade sales, sales to financial sponsors or IPOs. The Exit Office also provides concrete advice in relation to positioning portfolio companies for specific exit avenues, selection of best-suited advisors in each situation and assessing optimal exit timing. Systematic management of exit processes has created significant value for Nordic Capital, as demonstrated by the diverse exit routes utilized since late 2014.

IV. Investment Performance

Previous fund performance as of March 31, 2020 are shown below:

Fund	Vintage Year	Total Committed Capital	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Fund I	1990	€55 million	-	69%	4.0x	4.0x
Fund II	1993	€110 million	-	85%	4.6x	4.6x
Fund III	1998	€350 million	-	31%	3.3x	3.3x
Fund IV	2000	€760 million		24%	2.2x	2.2x
Fund V	2003	€1,500 million	-	20%	2.7x	2.7x
Fund VI	2006	€1,900 million	-	9%	1.7x	1.7x
Fund VII	2008	€4,300 million	-	8%	1.6x	1.6x
Fund VIII	2013	€3,591 million	€150 million	13%	1.5x	0.8x
Fund IX	2018	€4,311 million	€150 million	15%	1.2x	0.0x

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Returns information provided by the manager.

V. Investment Period and Term

The investment period will end six years from the date that Nordic Capital Fund X makes its first portfolio investment or, if earlier, the date that Nordic Capital Fund IX's commitment period terminates. The term of Nordic Capital Fund X is ten years from the later of the final closing and the start date, subject to extension.

This document is a summary of more detailed information provided in the Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM. Any capitalized terms used herein and not otherwise defined shall have the meaning attributed to them in the PPM.

ATTACHMENT F

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Thoma Bravo Fund XIV, L.P.
Type of Fund:	Private Equity - Buyout
Target Fund Size:	\$14.0 billion; \$16.5 billion hard cap
Fund Manager:	Thoma Bravo, L.P.
Manager Contact:	Jennifer James 600 Montgomery Street, 20th Floor San Francisco, CA 94111

II. Organization and Staff

Thoma Bravo, L.P. ("Thoma Bravo" or the "Firm") is sponsoring Thoma Bravo Fund XIV, L.P. (the "Fund" or "Fund XIV") to make investments (generally expected to consist of control buyouts) in software and technology-enabled services companies in North America.

Thoma Bravo is a successor to Golder Thoma & Co., which was founded in 1980 by Stanley Golder and Carl Thoma, who had worked together within what was then First Chicago Corporation's venture capital group. It was there that the partners began to develop the consolidation or "buy and build" investment strategy of seeking to create value by building companies in fragmented industries through add-on acquisitions. The original firm subsequently became Golder, Thoma, Cressey, Rauner, Inc. (often referred to as GTCR), which in 1998 split into two firms, one of which was Thoma Cressey Equity Partners Inc. ("TCEP"). From 1998 through 2007, TCEP (renamed Thoma Cressey Bravo, Inc. in 2007) raised and invested three private equity funds: Fund VI, Fund VII and Fund VIII, which invested principally in companies in the services, software and healthcare sectors.

With offices in San Francisco and Chicago, the Firm employs 50 investment professionals, including 30 senior investment professionals. The Firm also utilizes the services of 24 operating partners and operating advisors[1] who are not employees of the Firm. All six Managing Partners have been with Thoma Bravo for a minimum of fifteen years.

III. Investment Strategy

Fund XIV is expected to build upon the investment strategy and process originally created by Carl Thoma and his partners more than 35 years ago, and more recently refined by Orlando Bravo and the other current Thoma Bravo partners. This strategy seeks to create value by transforming businesses in fragmented, consolidating industry sectors into larger, more

[1] Personnel figures are as of March 31, 2020.

profitable and more valuable businesses through rapid operational improvements, growth initiatives, and strategic and accretive add-on acquisitions. The application and infrastructure software and technology enabled services industry sectors on which Thoma Bravo focuses today are fragmented and consolidating, which lend themselves particularly well to this strategy. Fund XIV is expected to target roughly 12-15 platform investments and typically commit between $600 million and $2 billion over the life of each investment.

The investment process starts with proactive deal sourcing, where investment professionals seek out companies that appear to fit with Thoma Bravo's buy and build strategy. Thoma Bravo professionals are active in the software and technology enabled services sectors by contacting industry professionals and intermediaries, through face-to-face meetings, email correspondence, phone conversations, and attendance at industry conferences. Once formal due diligence is initiated on a company, the Thoma Bravo investment staff and sometimes one or more operating partners embark on a rigorous, hands-on and time-intensive process. In addition to thoroughly evaluating the prospective portfolio company, the process also allows Thoma Bravo time to work with the target company's management team to develop an operational improvement program. Upon the closing of an investment, the company's management is expected to implement the operational improvement plan agreed upon during due diligence with the guidance of Thoma Bravo and often one or more operating partners or operating advisors.

Once the operating improvements are achieved and management is functioning as planned, a consolidation strategy typically will be pursued to generate continued growth. Like operating plans, Thoma Bravo's consolidation plans typically are formulated pre-investment and are central to the investment thesis on which any investment is pursued. However, the investment return to which the investment is underwritten generally does not include the impact of acquisitions, so a successful consolidation program may produce a return that is incremental to the original plan. Together, these consolidation initiatives and operational improvements are intended to quickly transform a company into a more profitable, larger and more valuable business that is attractive to strategic or financial acquirers or public investors. Throughout the process of managing an investment, Thoma Bravo intends to proactively manage liquidity options by developing and cultivating relationships with potential strategic and financial purchasers, the investment community and lending sources. Thoma Bravo expects to use the following methods of exiting investments in portfolio companies: (i) sales to strategic purchasers or financial purchasers; (ii) initial public offerings; and (iii) recapitalizations (for interim liquidity).

Throughout the sourcing and ownership process, environmental, social and governance (ESG) factors are evaluated to identify potential risks and opportunities. In practice, investment professionals are responsible for the integration of ESG considerations into the pre-investment process, rather than outsourcing this responsibility to other parties. Throughout the investment, Thoma Bravo may monitor ESG considerations and encourage a portfolio company's management team to identify and raise ESG risks and opportunities to the relevant decision-makers, including, where appropriate, portfolio company board members. If needed, investment professionals may collaborate with subject-matter experts (internal or external) as they deem appropriate. The basis of Thoma Bravo's ESG policy is an ESG matrix tailored to the Software sector. It focuses on analyzing the portfolio company's annual energy spend, electronic waste disposal policies, family leave policy, non-discrimination and anti-harassment policy, employee wellness programs, data and cyber security, customer privacy policies, business continuity risks, and the code of conduct, among many other elements.

IV. Investment Performance

Previous fund performance as of March 31, 2020 for Thoma Bravo is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Fund VII**	2000	$554 million	$50 million	24.8%	2.1	2.14x
Fund VIII**	2005	$765 million	$70 million	18.3%	2.9	2.93x
Fund IX	2008	$823 million	--	44.7%	3.8	3.74x
Fund X	2011	$1,275 million	--	38.7%	2.8	2.29x
SOFI	2013	$418 million	--	33.4%	2.6	1.80x
Fund XI	2014	$3,662 million	--	29.3%	2.8	1.25x
SOFII	2015	$1,065 million	--	20.5%	2.0	0.87x
Discover I	2015	$1,074 million	--	33.5%	1.9	0.81x
Fund XII	2016	$7,604 million	$75 million	14.1%	1.3	0.06x
Discover II	2017	$2,438 million	--	-1.4%	1.0	0.00x
Fund XIII	2018	$12,595 million	$150 million	13.9%	1.1	0.00x

* Previous fund investments are not indicative of future results.

** Funds VII and VIII include investments in sectors other than software and technology enabled services. Net IRR, Net MOIC and Net DPI were provided by Thoma Bravo.

V. Investment Period and Term

The Fund will have a six-year investment period and a ten-year term. The Fund may be extended for an additional one-year period at the discretion of the General Partner and, thereafter, for two additional one-year periods at the discretion of the General Partner with the consent of the Fund's advisory committee.

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ATTACHMENT G

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Whitehorse Liquidity Partners IV LP
Type of Fund:	Private Equity – Secondaries
Target Fund Size:	$3 billion
Fund Manager:	Whitehorse Liquidity Partners
Manager Contact:	Josh Booth 200 Wellington Street West, Suite 600 Toronto, Ontario | M5V 3C7 | Canada

II. Organization and Staff

Whitehorse Liquidity Partners Inc. ("Whitehorse" or "the Firm") is seeking commitments for Whitehorse Liquidity Partners IV LP ("Fund IV"), which is being formed principally to make preferred equity investments in private equity portfolios.

Whitehorse was founded in 2015 and is headquartered in Toronto. Since its founding, the Firm has raised three funds and is currently raising Fund IV to make preferred equity investments. The Firm has closed or is pending close on 55 transactions for a total of $4.6 billion invested, committed or reserved capital. The Whitehorse team has grown to 53 professionals with experience in investing, managing and administering private equity investments, including the structuring and execution of complex secondary transactions. The Senior Leadership Team at Whitehorse includes: Yann Robard, Michael Gubbels, Giorgio Riva, Rob Gavin, and Leah Boyd. Firm founder Yann Robard was previously at Canada Pension Plan Investment Board for 13 years where his most recent position was Managing Director, Head of Secondaries and Co-Investments.

Whitehorse follows an ESG policy based on the ten principles of the United Nations Global Compact which it applies to its general business and investment considerations. While the Firm is working to improve its gender diversity, the 53-person team includes people from a variety of ethnic backgrounds. In addition, as part of its efforts to promote social responsibility and foster a positive culture at the Firm, Whitehorse has committed to donate 1% of its revenue to charities chosen by its employees.

III. Investment Strategy

Whitehorse's strategy is to provide counterparties with flexible liquidity solutions for their private equity portfolios through the creation of preferred securities. Whitehorse has identified what it believes to be a significant and untapped market opportunity in the utilization of structures to accelerate liquidity on private equity portfolios and/or finance the acquisition of private equity portfolios, which are designed to provide attractive, risk-adjusted returns for its investors.

Whitehorse has identified four different applications of its strategy: alternatives to a secondary sale, securitized secondaries, fund level solutions and general partner balance sheet solutions. As an alternative to a secondary sale, Whitehorse enables a limited partner to generate liquidity on its existing private equity portfolio, while retaining ownership, investment upside and flexibility. Through securitized secondaries, Whitehorse will execute an outright purchase of the portfolio and subsequently tranche the acquired portfolio into two classes of securities: a preferred equity security, which will be held by the Fund, and a common equity security, a portion of which will typically be held by the Fund and the rest of which will be syndicated to co-investors. With fund level liquidity solutions, Whitehorse provides a general partner with the ability to accelerate liquidity back to its investors or access follow-on capital for the fund's portfolio companies. Finally, by creating a general partner balance sheet liquidity solution, Whitehorse allows a general partner to unlock liquidity in existing investments, make a larger commitment to its fund, and/or pursue other strategic initiatives.

Whitehorse completes fulsome due diligence on each potential transaction with an underwriting methodology driven by the level of concentration in the portfolios. In more concentrated portfolios, Whitehorse utilizes a single asset approach leveraging the team's prior experience in direct private equity transactions. In highly diversified portfolios, Whitehorse utilizes portfolio-level metrics to benchmark and project future cash flows, leveraging the team's prior experience in secondary transactions. Each deal is also subject to an ESG assessment, the results of which are reviewed by the Investment Committee.

In general, Whitehorse will provide some portion of the value of a portfolio of assets to its counterparty in exchange for receiving all of the cash flows generated by that portfolio until an internal rate of return or multiple return hurdle is met. Once the return hurdle is reached, the cash flows are shared with the counterparty so that both groups retain exposure to the upside. This structure provides investors in Whitehorse the potential for attractive downside protection and for additional upside above the return requirement. Whitehorse also believes that this product is attractive to counterparties because they receive early liquidity without timing the market, crystalizing a loss, or giving up all potential future upside. Whitehorse seeks to support every transaction with a quality portfolio. Whether the counterparty is a seller, buyer or a general partner of private equity funds, the preferred equity solution is structured in a similar manner.

While Whitehorse targets a credit-like risk and return profile, its main competitors for transactions are secondary funds. Whitehorse believes that sharing some upside with a prospective seller of LP interests is more attractive to the seller than a complete sale and allows Whitehorse to create a preferred equity structure with attractive risk-adjusted return characteristics.

For investors, the Whitehorse strategy combines diversification and regular distributions with asset-level liquidation preference to provide capital preservation and protection against downside risk, all while retaining exposure to potential upside through a back-end profit share. To achieve these goals, Whitehorse focuses on four main factors in structuring an investment, namely: (i) portfolio selection; (ii) preferred equity to value ratio; (iii) terms of cash sweep on portfolio distributions to meet a minimum preferred return hurdle; and (iv) the terms of the residual profit share.

Utilizing this strategy, Whitehorse intends to construct a portfolio for Fund IV of 10-15 investments generally ranging from $100 to $500 million in size that it believes have the potential to provide compelling, risk-adjusted returns. The Fund's objective is to seek investments with the potential to generate gross IRR of 12-14% while maintaining exposure to upside that could increase gross returns to high teens.

IV. Investment Performance

Previous fund performance as of March 31, 2020 is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Whitehorse Liquidity Partners I	2016	$400 M	-	11.4%	1.2x	0.75x
Whitehorse Liquidity Partners II	2018	$1,000 M	-	7.1%	1.1x	0.27x
Whitehorse Liquidity Partners III	2019	$2,000 M	$100M	33.2%	1.1x	0.13x

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net returns provided by the manager.

V. Investment Period and Term

The Investment Period will end 3 years after the initial closing date. The Term will end 6 years after the initial closing date, subject to three one-year extensions with the consent of the LP Advisory Committee.

This document is a summary of more detailed information provided in the Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM.

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TAB F

Public Markets Investment Program

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INVESTMENT ADVISORY COUNCIL REPORT

DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Public Markets Investment Program

This section of the report provides a brief performance review of the SBI Public Markets portfolio through the second quarter. Included in this section are a short market commentary, manager performance summaries and a report of any organizational updates for the public equity and fixed income managers in the SBI portfolio.

The report includes the following sections:

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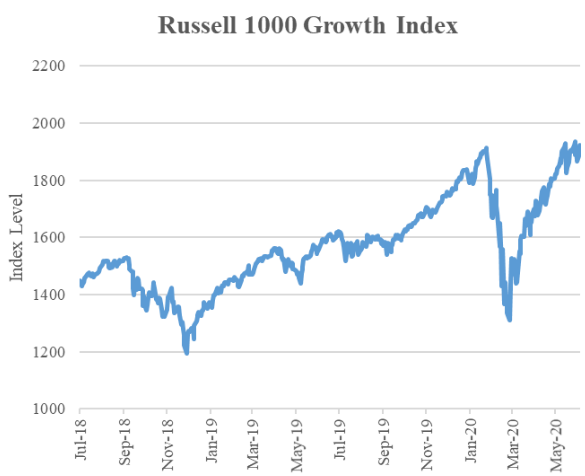
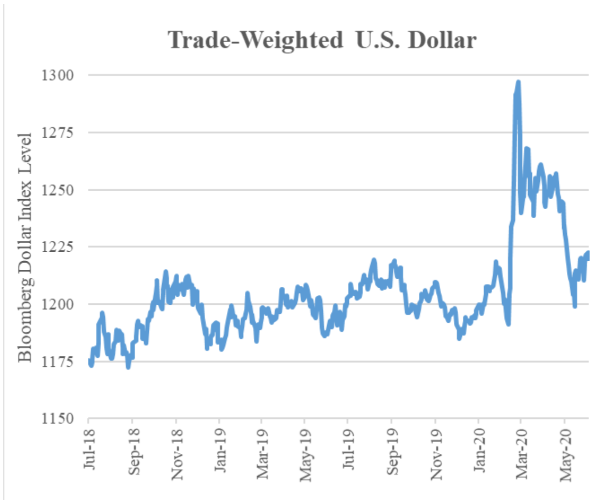
Review of SBI Public Markets Program
Second Quarter 2020





Source: Bloomberg, FTSE Russell

Market Summary

In many ways, the market's performance during the second quarter looked like a mirror image of the first quarter: asset prices recovered sharply in April-May from the February-March selloff and market tone grew more ebullient seemingly by the day. Indeed, a number of equity indices producing record breaking gains for the June quarter, despite uneven progress both in the U.S. and globally in terms of "flattening the curve" of the COVID-19 pandemic. Equities rallied as investors looked past the current economic pain and towards the future with optimism about re-opening, economic recovery, and progress towards a COVID vaccine/treatment. The COVID-19 crisis has dramatically accelerated some secular spending and investment trends, including the move to online shopping, cloud computing, AI, and streaming services. Information Technology and certain Consumer Discretionary stocks led global equity markets during the quarter as these companies benefitted from government-imposed lockdowns that have placed a premium on online services for work, education, communication and entertainment.

U.S. growth equities (as measured by the Russell 1000 Growth) posted their best quarterly return since the index's inception, and the tech-heavy Nasdaq Composite fared even better, rising more than +30% on the quarter and easily retaking its previous all-time high set in February 2020. Across global equity markets, value indices lagged growth indices by even wider margins than in 1Q20 as represented by the MSCI and Russell Indices, already one of the worst quarters on record for value stocks relative to growth stocks.

An important factor in the changing sentiment regarding the economy has been the amount of monetary and fiscal accommodation offered by policymakers across the globe. In the U.S., Congress and the Trump administration implemented a massive fiscal policy package targeted at

U.S. households and small businesses while the Federal Reserve added record stimulus in the form of purchases of U.S. Treasuries, Agency mortgage-backed securities, lending facilities to primary dealers and, for the first time in history, outright purchases of corporate bonds and exchange-traded funds backed by corporate debt. Similar actions by central banks around the globe, including the ECB and Bank of Japan, helped ease market tensions and led to a rebound in investor sentiment during the quarter.

After rising sharply in the first quarter of 2020 on the back of a safe-haven bid, the U.S. dollar fell 2% on a trade-weighted basis during the second quarter. While some dollar weakness is to be expected as investors unwind panic buying of Treasuries and dollar positions established during the March selloff, continued dollar weakness might reflect deeper worries about the U.S. economy and fiscal position. Specifically, investors may be starting to price-in concerns about the dramatic increase in Treasury supply that will be required to fund deficit spending, as well as anxiety over the recent spike in COVID-19 cases across the southern U.S. and California which threatens to derail many States' efforts to re-open their economies.

Overall Combined Funds Portfolio - Quarter and Year Performance

In the second quarter, the overall Combined Funds outperformed the composite benchmark return (+11.1% Combined Funds versus +10.6% Composite Benchmark). The public equity portfolio outperformed its benchmark (+20.8% Public Equity versus +20.2% Public Equity Benchmark), supported by strong performance within both the domestic equity portfolio (+22.8% Domestic Equity versus +22.2% Domestic Equity Benchmark) and the international equity portfolio (+16.7% International Equity versus +16.1% International Equity Benchmark). Within fixed income, the core fixed income portfolio strongly rebounded from a difficult first quarter, outperforming the Bloomberg Barclays U.S. Aggregate Index return for the second quarter (+5.5% Core Bonds versus +2.9% Fixed Income Benchmark). The Treasury Protection portfolio slightly underperformed the Bloomberg Barclays Treasury 5+ Year Index (Portfolio +0.3% versus Benchmark +0.6%), while the private markets portfolio returned -9.0% for the quarter. It is important to note that in general the investments in the private markets portfolio are valued quarterly and reported on a lagged basis. As a result, private markets portfolio performance is reflective of the first quarter market dislocation.

For the year ending June 30, 2020, the Combined Funds outperformed the composite benchmark return (+4.2% Combined Funds versus +4.0% Composite Benchmark). The public equity portfolio posted positive results and outperformed its benchmark (+2.7% Public Equity versus +2.4% Public Equity Benchmark). Within equities, domestic equities posted strong absolute and relative performance (+6.2% Domestic Equity versus +6.0% Domestic Equity Benchmark), while the international equity portfolio lagged the U.S. market on an absolute basis but outperformed relative to its benchmark (-4.2% International Equity versus -4.8% International Equity Benchmark). The core fixed income portfolio outperformed the Bloomberg Barclays U.S. Aggregate Index return (+9.2% Fixed Income versus +8.7% Fixed Income Benchmark), while the Treasury Protection Portfolio modestly underperformed the Bloomberg Barclays Treasury 5+ Year

Index (Portfolio +16.7% vs. Benchmark +17.2%). The private markets portfolio returned -2.6% for the year.

Domestic Equity

During the second quarter, the Russell 3000 Index rose +22.0%. Within domestic equity, growth continued to outpace value (R3000G +28.0% vs. R3000V +14.6%), while small cap companies outperformed large caps (R2000 +25.4% vs. R1000 +21.8%) as investors rewarded higher risk, higher potential return stocks during Q2's risk rebound.

Within the Combined Funds domestic equity portfolio, large cap growth managers outperformed their Russell 1000 Growth benchmark by +13.5% for the quarter (+41.4% Large Cap Growth versus +27.8% Russell 1000 Growth). Stock selection was strong across all sectors, led by Consumer Discretionary and Technology. Noteworthy performers included Twilio (+145% quarterly total return), Shopify (+127%), The Trade Desk (+110%) and Tesla (+106%). Managers Zevenbergen and Sands exceeded the benchmark and posted record quarterly total returns for their mandates, +53.9% and +37.9%, respectively, while Winslow matched the benchmark's return for the quarter.

The portfolio's large cap value managers outperformed the Russell 1000 Value benchmark by +3.9% for the quarter (+18.2% Large Cap Value versus +14.3% Russell 1000 Value). Stock selection within the Consumer Discretionary and Financial Services sectors helped performance. All three managers outperformed the benchmark for the quarter.

The portfolio's small cap growth managers outpaced the Russell 2000 Growth benchmark by +3.3% for the quarter (+33.9% Small Cap Growth versus +30.6% Russell 2000 Growth). Stock selection drove the outperformance, led by names within the Producer Durables and Consumer Discretionary sectors. Several out-of-benchmark names, including Wix.com and DraftKings, were also strong contributors. Hood River and Rice Hall outperformed the benchmark for the quarter, while ArrowMark and Wellington trailed modestly.

The portfolio's small cap value managers outperformed the Russell 2000 Value benchmark by 2.0% during the second quarter (+20.9% Small Cap Value versus +18.9% Russell 2000 Value). Stock selection benefited performance, led by Financial Services and Producer Durables names. Managers Peregrine, Hotchkis & Wiley and Martingale outperformed for the quarter, while Goldman Sachs lagged the benchmark.

The portfolio's semi-passive large cap core managers in aggregate exceeded the Russell 1000 Index for the quarter (+22.2% Portfolio vs. +21.8% Russell 1000). Stock selection was positive overall as was a sector tilt to the Consumer Discretionary sector. The passive Russell 3000, Russell 1000 and Russell 2000 Index mandates tracked their respective indices within guideline ranges for the quarter.

Developed International Equity

International developed markets equities, as measured by the MSCI World ex USA Index (net), advanced +15.3% during the quarter rebounding sharply from a first quarter selloff sparked by the coronavirus pandemic. The powerful rally erased nearly all of the losses suffered in February and March as investors looked optimistically toward an economic reawakening. The markets responded favorably to monetary and fiscal stimulus measures intended to blunt the economic impact of the coronavirus pandemic, including massive new bond-buying pledges from the European Central Bank and the Bank of Japan. All sectors and countries in the developed markets experienced gains during the quarter. Growth outpaced value, small caps outperformed large caps, and U.S. dollar returns exceeded local currency returns as the dollar weakened. Australia, New Zealand and Germany were the strongest performing markets, while the United Kingdom, Spain and Asian markets lagged the overall index return. Information technology stocks led markets higher as e-commerce, networking and streaming companies benefited from government-imposed lockdowns in many countries. While still managing a positive return for the quarter, the Energy sector lagged the rest of the market as the industry struggled with oversupply amidst collapsing demand.

The portfolio's active developed markets managers strongly outperformed the MSCI World ex USA Index (net) return (+17.6% Portfolio versus +15.3% Benchmark). Positive stock selection in Japan and the United Kingdom contributed to performance as did good stock selection in the Industrials, Financials, and Consumer Discretionary sectors and an overweight position in the Information Technology sector.

AQR, the portfolio's sole semi-passive developed markets portfolio manager, outperformed the MSCI World ex USA Index (net), returning +17.2% versus the benchmark's +15.3% return. AQR's stock selection in Canada, the United Kingdom and Australia contributed positively to performance. Additionally, stock selection within the Consumer Staples and Energy sectors was positive, as were net underweight positions in both sectors. The passive developed markets portfolio tracked the MSCI World ex USA Index (net) within guideline tolerance for the quarter (+15.6% Portfolio versus +15.3% Benchmark).

Emerging Markets Equity

The MSCI Emerging Markets Index (net), rose by +18.1% during the quarter, keeping pace with the strong rebound in global equity markets overall. The strongest quarterly return in a decade for emerging markets came largely in response to the scale and pace of monetary and fiscal stimulus as global central banks aggressively moved to keep financial markets functioning and to allow economies to negotiate a path of recovery from the devastation of the coronavirus pandemic. No fewer than ten EM countries saw their central banks cut interest rates during the quarter. China moved forward with its plan to impose upon Hong Kong a wide-reaching national security law, which many view as compromising the independence of the region's judiciary system and threatening civil and political freedoms. Western nations reacted with strong disapproval.

Countries that produce oil and industrial metals, including South Africa, Brazil and Russia, rebounded sharply as commodity prices rose. Health Care and Materials were the strongest performing sectors, while Real Estate and Financials had the weakest returns. As in the developed markets, all countries and sectors were in positive territory. Growth outpaced value and small caps outperformed large caps, while U.S. dollar returns exceeded local currency returns as stronger commodity prices and cautious optimism led to an appreciation in emerging markets currencies versus the dollar.

The portfolio's active emerging markets managers outperformed the MSCI Emerging Markets Index (net) return (+19.3% Portfolio versus +18.1% Benchmark). Key sources of positive active return included stock selection in China, India and Taiwan, positive stock selection in the Financials sector and a combination of stock selection and an underweight position in both the Consumer Discretionary and Energy sectors. The passive emerging markets portfolio tracked the MSCI Emerging Markets Index (net) within guideline tolerance for the quarter (+18.3% Portfolio vs. +18.1% Benchmark.)

Core Bonds

Interest rates were little changed during the quarter as market participants viewed the Fed as increasingly in control of Treasury yields, particularly for shorter-term maturities. The Fed added over $1.2 trillion worth of U.S. Treasuries, Agency MBS and other marketable securities to its balance sheet during the quarter, bringing its total balance sheet to nearly $7 trillion by the end of June.

During the quarter, risk assets like corporate bonds, asset-backed securities and commercial mortgage-backed securities rallied strongly as market participants backed-off from the panic selling of March and took comfort in the prospect of a near-term gradual reopening of the global economy and the potential for a COVID-19 vaccine/treatment. Fixed income risk assets were also aided by the Federal Reserve's bond buying programs, including the new Primary Dealer Credit Facility and the Asset Backed Securities Loan Facility. With these programs, the Fed has effectively backstopped key parts of the credit markets, resulting in a snap-back in valuations as investors look to "Follow the Fed" back into these markets in search of yield. As seen in the below table, the high yield corporate sector felt the strongest snap-back during Q2, with spreads tightening 234 basis points to end the quarter at a spread of 626 basis points above comparable maturity Treasuries.

Fixed Income Sectors Spread Performance since 12/31/19					
	Spread to Treasuries (bps)				
Sector	12/31/19	3/31/20	6/30/20	Q2 Chg	YTD Chg
US Inv. Grade Credit	90	255	150	-105	+60
US High Yield	360	860	626	-234	+266
US CMBS	72	188	132	-56	+60
US ABS	44	213	68	-145	+24
US Agency MBS	39	60	70	+10	+31
US TIPS (Break Evens)	179	93	134	+41	-93

Source: Barclays Live, Bloomberg

The portfolio's core bond managers rebounded strongly during the second quarter following a challenging first quarter of 2020 during which spreads on non-Treasury sectors gapped wider and Treasury yields fell sharply. For the June quarter, the Core Bond portfolio strongly outperformed the Bloomberg Barclays Aggregate benchmark (+5.5% vs. +2.9% Benchmark), led by the portfolio's active managers (+6.4% Portfolio vs. +2.9% Benchmark). All managers posted positive returns versus the benchmark during the quarter, with most bringing their calendar year relative performance back into positive territory for the calendar year-to-date period.

Treasury Protection Portfolio

While interest rates on balance were little changed during the quarter, the long-end of the market experienced slight underperformance. The yield on the 30-year Treasury Bond rose 9 basis points to end the quarter at 1.41%, while the 2-5 year maturity segment of Treasury yield curve saw yields decline slightly. Higher inflation data during the quarter combined with expectations of continued aggressive fiscal and monetary stimulus breathed new life into longer-term inflation expectations. The market-implied breakeven level of inflation on 10-year U.S. Treasury Inflation Protected Securities rose +41 basis points during the quarter to end at 1.34%.

For the three months ending 6/30/2020, the Treasury Protection Portfolio underperformed the Bloomberg Barclays Treasury 5+ Year Index (+0.3% Portfolio versus +0.6% Benchmark). While the managers were generally well-positioned with respect to overweight positions in U.S. Agencies and TIPS, which outperformed Treasuries on the quarter, an overweight duration position was a slight detractor to performance overall. Notably, the primary driver of measured underperformance for the quarter was due to the lingering effects of the extreme market volatility experienced during the March-April timeframe. Security pricing differences between end-March and end-April pricing, combined with the performance impact from the timing of portfolio cashflows needed to raise cash for the Combined Funds portfolio, all contributed to the performance gap between manager-reported and custodian-calculated performance for the quarter. Importantly, a good portion of the performance difference reflects a catch-up from the prior quarter and therefore the impact to year-to-date and longer performance measurement periods is muted.

Public Markets Managers’ Organizational Update
Second Quarter 2020

AQR (Developed International)
The firm announced that Isaac Chang, who most recently served as AQR’s Head of Trading, is leaving to pursue another opportunity. Scott Carter, a Principal with AQR, was named head of Trading and Finance, leading both the portfolio finance effort as well as the trading team.

BlackRock (Core Bonds, Treasury Protection, Passive Equity)
During Q2, the firm realigned its investment platform structure, organizing seven portfolio management businesses into a combined Portfolio Management Group (PMG). Rich Kushel was tapped to provide overall leadership as Head of PMG. PMG now stands alongside ETF/Index, Alternatives, Global Trading & TRIM, The BlackRock Investment Institute and Sustainable Investing as Blackrock’s core functional areas.

Goldman Sachs (Core Bonds, Treasury Protection)
Ben Johnson, head of Investment Grade credit, was promoted to global head of corporate credit, overseeing the investment grade, high yield and bank loans teams. Brian Kim, VP of high yield research, has left the firm, with responsibilities assumed by other team members. Mike McGuiness, PM and head of research for opportunistic credit, will now lead high yield, loan and opportunistic credit research.

McKinley (Developed International)
Effective June 30, 2020, Dr. John Guerard Jr. Ph.D., Director of Quantitative Research retired from that role and assumed the role of Chairman of McKinley’s Scientific Advisory Board. Also, Dr. Anureet Saxena, Ph.D. transitioned from the Scientific Advisory Board to become Director of Quantitative Research, replacing Dr. Guerard. Flora Kim departed from her role as Portfolio Manager to pursue a role as CFO for an Alaska tech start-up firm. Ms. Kim will join the Scientific Advisory Board.

Morgan Stanley (Emerging Market Equity)
Samson Hung joined the investment team as an analyst focusing on Taiwan and the technology sector.

Pzena (Emerging Markets Equity)
During the quarter, senior research analyst, Kelleen Kiely, left the firm to pursue another opportunity.

2020 Manager Meetings

As a result of the ongoing COVID-19 pandemic and continued restrictions on business travel, both due to MSBI Staff policies and managers' travel restrictions, there were no in-person meetings conducted with the MSBI's Public Markets managers during second quarter 2020. Throughout the quarter, however, Staff utilized teleconference and videoconference technologies to remain in communication with managers as needed. During the quarter, Staff held 34 manager strategy review calls via teleconference or videoconference.

Investment Manager	Asset Class
• Acadian Asset Management LLC	International Equity
• AQR Capital Management, LLC	International Equity
• ArrowMark Colorado Holdings, LLC	Domestic Equity
• Barrow, Hanley, Mewhinney & Strauss, LLC	Domestic Equity
• BlackRock Institutional Trust Company, N.A.	Domestic Equity
• Columbia Management Investment Advisers, LLC	International Equity
• Dodge & Cox	Fixed Income
• Earnest Partners, LLC	Domestic Equity International Equity
• Fidelity Institutional Asset Management LLC	International Equity
• Goldman Sachs Asset Management, L.P.	Domestic Equity
• Hood River Capital Management, LLC	Domestic Equity
• Hotchkis and Wiley Capital Management, LLC	Domestic Equity
• J.P. Morgan Investment Management Inc.	Domestic Equity International Equity
• LSV Asset Management	Domestic Equity
• Macquarie Investment Management Advisers	International Equity
• Marathon Asset Management LLP	International Equity
• Martin Currie Inc.	International Equity
• Martingale Asset Management, L.P.	Domestic Equity
• McKinley Capital Management, LLC	International Equity

2020 Manager Meetings (cont)

• Morgan Stanley Investment Management Inc.	International Equity
• Neuberger Berman Investment Advisers LLC	International Equity Fixed Income
• Peregrine Capital Management	Domestic Equity
• Pacific Investment Management Company LLC (PIMCO)	Fixed Income
• Pzena Investment Management, LLC	International Equity
• Rice Hall James & Associates, LLC	Domestic Equity
• Sands Capital Management, LLC	Domestic Equity
• The Rock Creek Group, LP	International Equity
• Wellington Management Company LLP	Domestic Equity
• Western Asset Management Company	Fixed Income
• Winslow Capital Management, LLC	Domestic Equity
• Zevenbergen Capital Investments LLC	Domestic Equity

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TAB G

Participant Directed Investment Program and Non-Retirement Program

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INVESTMENT ADVISORY COUNCIL REPORT

DATE: August 19, 2020

TO: Member, State Board of Investment

FROM: Members, Investment Advisory Committee and SBI Staff

SUBJECT: Participant Directed Investment Program and Non-Retirement Program

This section of the report provides commentary on the Participant Directed Investment Program (PDIP) investment options and Non-Retirement Program managers along with the list of due diligence meetings staff conducted during the second quarter.

The report includes the following sections:

Page

Participant Directed Investment Program Fund Commentaries
Second Quarter 2020

Domestic Equities

Vanguard Total Stock Market Index Institutional Plus

The fund employs an indexing approach designed to track the performance of the CRSP U.S. Total Market Index, which represents approximately 100% of the investable U.S. stock market and includes large-, mid-, small-, and micro-cap stocks. The fund matched the return of the benchmark for the quarter and the year with a 22.1% and 6.5% return, respectively. Technology holdings have the largest exposure in the portfolio with a 26% allocation. *This option is not available to the Minnesota State Deferred Compensation Plan (MNDCP).*

Vanguard Institutional Index Plus

The fund attempts to employ a full replication indexing approach designed to track the S&P 500 Index. Performance for the fund matched the S&P 500 Index return for the quarter and the year with a 20.5% and 7.5% return, respectively. The largest company exposure by industry are in Information Technology and Healthcare with a 27.5% and 14.6% allocation, respectively. Consumer Services and Consumer Discretionary sectors both represent 10.8% of the portfolio. *This option is only available to the Minnesota Deferred Compensation Plan (MNDCP).*

Vanguard Dividend Growth Fund

The fund is actively managed by Wellington Management and invests in large- and mid- cap equity holdings with an emphasis on companies that have a history of growing dividends over time. Performance for the fund lagged the benchmark for the quarter with a 13.1% return compared to a 14.0% return for the NASDAQ US Dividend Achievers Select Index. For the year, the fund reported a 1.3% return compared to a 3.7% return for the benchmark. An underweight in Information Technology and an overweight in Real Estate detracted from relative performance for the quarter along with negative stock selection in the Industrial sector. The one-year return underperformance was primarily driven by negative stock selection in Consumer Staples and an underweight to Information Technology.

Vanguard Mid-Cap Index

The fund attempts to employ a full replication indexing approach designed to track the performance of a broadly diversified pool of medium-size U.S. stocks. The fund matched the CRSP US Mid Cap Index return for the quarter and the year with a 25.0% and -0.2% return, respectively. Holdings in Financials, Technology, and Industrials make up 21%, 20%, and 15% of the portfolio sector weight, respectively.

T. Rowe Price

The fund’s investment process emphasizes fundamental research and active, bottom-up stock selection. The small cap equity fund matched the Russell 2000 for the quarter with a 25.4% return. The one-year return for the fund of -0.5% outperformed the benchmark return of -6.6%. Relative performance for the quarter benefited from stock selection in Information Technology, whereas holdings in Industrials and Business Services detracted. The one-year return outperformance was mainly from stock selection in Information Technology, Energy, and Communication Services.

International Equities

Fidelity Diversified International

The fund's approach is based on actively selecting companies based on fundamental analysis, management quality, and attractive valuations over a long time horizon. The international equity fund returned 21.7% for the quarter outperforming the MSCI EAFE benchmark return of 14.9%. For the year, the fund returned 8.5% outperforming the benchmark return of -5.1%. The quarterly outperformance was primarily driven by stock selection, with sector/industry positioning contributing to a lesser extent. Positive stock selection in Industrials, Information Technology, Communication Services and Financials provided most of the relative return for the quarter. The fund's biggest individual relative contributor was a small non-benchmark position. The fund also benefited from not owning an integrated oil & gas company along with other benchmark names.

Vanguard Total International Stock Index

The fund attempts to employ an indexing approach designed to track the FTSE Global All Cap ex US Index, a market-cap weighted pool designed to measure performance of developed and emerging market companies. The fund outperformed for the quarter and the year. The fund earned an 18.1% return compared to the benchmark return of 17.0% for the quarter. For the year, the fund returned -4.0% compared to the benchmark return of -4.6%. The largest country and industry exposure in the fund is Japan, with a 17.1% allocation, and Financials with a 22% allocation.

Fixed Income

Dodge & Cox Income Fund

The fund invests in a diversified portfolio that consist primarily of investment-grade debt securities with a larger allocation to corporate and securitized debt relative to the benchmark. The fixed income fund outperformed the Bloomberg Barclays U.S. Aggregate Index for the quarter with a 6.0% return compared to a 2.9% return for the benchmark. For the year, the fund returned 8.3%, compared to 8.7% for the benchmark. Performance for the quarter benefited from the overweight to corporate bonds in addition to security selection within credit. For the year, relative returns lagged from the below-benchmark duration position of the fund as Treasury yields declined. Security selection within credit was also negative for the year as several corporate bond holdings underperformed.

Vanguard Total Bond Market Index

The fund employs a sampling process to its index investment approach to track the performance of the Bloomberg Barclays U.S. Aggregate Index. The fund reported positive relative return for the quarter with a 3.0% return compared to the benchmark return of 2.9% and a one-year return of 9.0% compared to 8.7% for the benchmark. The large allocation in U.S. Government issuer bonds and the fund's duration position is consistent with that of the index.

Balanced and Conservative Options

Vanguard Balanced

The fund seeks to track the investment performance of a benchmark index that measures 60% U.S. stock market index and 40% in a U.S. broad, market-weighted bond index. The fund matched the benchmark with a 14.2% return for the quarter and outperformed for the year with an 8.2% return compared to the benchmark return of 8.0%. Equity holdings in Technology, Financials and Consumer Services had the largest exposure in the portfolio. Within the bond portfolio, the largest issuer-bond allocations was in Treasury/Agency and Government with a 42% and 22.7% weight, respectively.

Stable Value Fund

Galliard Asset Management manages the stable value fund in a separate account and invests in diversified, high quality, fixed income securities and investment contracts issued by high quality financial institutions. The portfolio returned 0.6% for the quarter compared to a 0.2% return for the benchmark, the 3-Year Constant Maturity Treasury +45 basis points. For the year, the portfolio returned 2.7% compared to the benchmark return of 1.6%. Performance for the quarter benefited from an overweight to corporates along with allocations to consumer ABS, Agency RMBS, taxable municipals, and CMBS. For the year, security selection along with an overweight to Corporate debt benefited relative returns. An out-of-benchmark allocation to Agency RMBS also helped returns for the one-year period.

Money Market Fund

State Street Global Advisors manages the money market fund in a commingled pool. For the quarter, the fund outperformed its benchmark, the ICE BofA U.S. 3 Month T-Bill, with a 0.1% return compared to 0.0% return for the benchmark. The one-year return for the fund of 1.7% outperformed the benchmark return of 1.6%. The Federal Open Market Committee (FOMC) met twice during the quarter, on April 29 and June 10, and left its policy rate unchanged (target range of 0 to ¼ percent) at both meetings. The Fed remains highly accommodative and has indicated it intends to keep its policy rate at the current level for some time and will continue to make asset purchases through various programs in order to support the flow of credit in the economy.

Non-Retirement Fund Commentaries
Second Quarter 2020

Assigned Risk Plan Fixed Income Manager
RBC Global Asset Management actively manages the fixed income portfolio for the Assigned Risk Plan to the Bloomberg Barclays U.S. Governmental Intermediate benchmark with a focus on security selection and secondarily on sector analysis. The portfolio returned 0.7% for the quarter compared to the benchmark return of 0.5%. For the year, the portfolio return of 7.2% outperformed the benchmark return of 7.0%. Relative performance for the quarter benefited from curve positioning with an overweight to the 2-3 year portion of the curve. Additionally, the portfolio benefited during the quarter from a slight overweight to non-Treasury sectors, primarily Agency Securitized bonds. For the year, the declining Treasury yields were the primary driver of positive relative returns due to the above-benchmark duration position of the fund.

Non-Retirement Program Fixed Income Manager
Prudential Global Investment Management (PGIM) manages the Non-Retirement Fund Program fixed income portfolio in a separately managed portfolio. The fixed income portfolio return of +4.9% for the quarter outperformed the benchmark return, the Bloomberg Barclays U.S. Aggregate of +2.9%. The prior two quarters were mirror images of each other, with spread sectors recovering a substantial portion of the Q1 widening. Positioning within IG Corporates (added supply of IG new issue in April), High Yield, Emerging Markets and conduit CMBS contributed to performance. The new positions were funded with Treasury sales, while duration and yield curve effects were minimal to performance for the quarter.

Prudential announced that Katharine Neiss has joined the firm as Chief European Economist on the Global Macro Research team, reporting to Nathan Sheets, PGIM's Chief Economist. Katharine previously served for over 20 years in various policy and strategy roles at the Bank of England. Staff welcomes Ms. Neiss expected contributions to the team's top down house views regarding macro policy, shared across Core Bond and other strategies. In addition, PGIM has hired Gregory Cass and Carras Holmstead as distressed credit and special situations analysts within the firm's US High Yield Credit Research team.

Non-Retirement Program Domestic Equity Manager
Mellon Investments Corporation manages the Non-Retirement Program domestic equity portfolio in a separately managed portfolio. Mellon invests the portfolio to track the S&P 500. The portfolio matched the benchmark return for the quarter and the year with a 20.5% and 7.5% return, respectively.

Non-Retirement Program Money Market Manager
State Street Global Advisors manages the Non-Retirement Money Market Fund against the iMoneyNet All Taxable Money Fund Average. The fund matched the return of the benchmark for the quarter with a 0.1% return. For the year, the fund return of 1.5% outperformed the benchmark return of 1.1%.

2020 Manager Meetings

During the second quarter staff met with the investment funds noted below.

Investment/Program Manager	Asset Class	Investment Platform
• Ascensus	Multi-Asset Class Platform	PDIP (ABLE Plan)
• Dodge & Cox	Fixed Income	PDIP
• Fidelity	International Equities	PDIP
• Prudential	Fixed Income	Non-Retirement Program Bond Fund Manager
• RBC Global Asset Manager	Fixed Income	Non-Retirement Program Assigned Risk Bond Manager
• State Street Global Advisors	Target Date Funds Money Market Fund	PDIP PDIP
• TIAA	Multi-Asset Class Platform	PDIP (MN 529 Plan)
• T. Rowe Price	Small Cap Equities	PDIP
• Vanguard	Fixed Income Domestic Equities International Equities	PDIP PDIP PDIP

TAB H

IAC Discussion on Diversity and Inclusion

INVESTMENT ADVISORY COUNCIL REPORT

DATE: August 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Investment Advisory Council Discussion on Diversity and Inclusion

At its August 17, 2020 meeting, the Investment Advisory Council (IAC) discussed a memo from IAC member Susanna Gibbons regarding diversity and inclusion. In the memo, which is attached hereto as **Attachment A**, Ms. Gibbons listed various options for the SBI to specifically address diversity and inclusion in connection with the SBI's February 26, 2020 resolution on ESG initiatives, which directed the SBI Executive Director to, among other things, promote efforts for greater diversity on corporate boards and in the investment community. The memo lists options such as developing diversity goals for the SBI's investment managers; develop proxy guidelines on board diversity with achievable goals in mind; and reviewing the work of the Intentional Endowments Network.

During the IAC meeting, Ms. Gibbons stated that the investment industry in particular continues to struggle with diversity and inclusion at investment management firms. Other members of the IAC agreed and noted that, despite being told for years that investment managers were addressing a talent "pipeline" issue amongst diverse candidates, the industry has made little progress in addressing the issue. Ms. Gibbons also pointed out that a growing body of research proves that diversity and inclusion enhances the value of an organization and that, in addition to being a normative issue, diversity and inclusion is an economic imperative. IAC members, Board designees, and SBI staff shared thoughts on various initiatives to address diversity and inclusion with the SBI's investment managers. IAC members generally agree that the SBI should continue to expand its evaluation of managers and portfolio holdings with respect to diversity and inclusion.

The IAC and SBI staff also discussed measures the SBI is currently taking to address diversity and inclusion with respect to the SBI's money managers and companies in the SBI's investment portfolios. These initiatives include the SBI's membership in the Midwest Investors Diversity Initiative; the Thirty Percent Coalition; and work with the RFK Compass Foundation. Within these coalitions the SBI participates in engagement with companies on diversity and inclusion. Additionally, the SBI Proxy Committee reviews and votes on ballot measures related to diversity and inclusion issues, and will look at ways to refine its proxy policies to continue addressing the issue.

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ATTACHMENT A

To: Members of the Investment Advisory Council

From: Susanna Gibbons

Re: Diversity, Equity & Inclusion

CC: Mansco Perry

Date: August 5, 2020

A few weeks ago, I attended the CFA Society's virtual conference "Race and Inclusion Now: An Investment Industry Call to Action." This call to action is consistent with the MSBI resolution passed in February directing us "to promote efforts for greater diversity and inclusion on corporates boards and within the investment industry." I think that, as an organization, the MSBI has done an excellent job so far of bringing these issues to light as part of its broader ESG agenda, and I applaud staff on their ongoing efforts. However, the murder of George Floyd and subsequent demonstrations are forcing all of us to confront the persistent and insidious racism that remains firmly imbedded in our economic systems. I think greater action is needed. I am hoping we can get some time on the August agenda to discuss what form that might take.

Some specific ideas I am hoping we might consider include:

1. Establish specific goals around diversity for all Investment Managers with which the MSBI does business. We have heard for too many years from asset managers that they really want to support diversity and inclusion, but they simply cannot find the talent. I have never believed this to be true, a view shared on the CFA Society webcast. It is time to put pressure on them to deliver results. Once it becomes an economic imperative, I think we will start to see action.
2. Further develop our proxy voting guidelines around Board diversity, with achievable objectives in mind.
3. Through our investment managers, encourage the companies in which we invest to begin reporting on diversity across the career pipeline. We have all seen the narrowing of the funnel as diverse talent fails to achieve promotion alongside white male peers. We have been told for decades that the disparity would self-correct with the mere passage of time. This passive approach has been unsuccessful, and providing data to investors on both numbers and wage gaps can be the first step in ensuring that diverse talent rises to the top.
4. Review the work of the Intentional Endowments Network, which primarily targets University Endowments, to identify additional strategies and networks that can support these efforts.
5. Ask the MSBI to consider signing the IEN 2020 belonging pledge, which states: *"We commit to discussing racial equity at our next investment committee meeting. We will move our agenda forward on this. We will share our next steps and results (perhaps privately), so that we can help to identify industry-wide barriers and the technical resources required to advance the practice of investing with a racial equity lens."*

I am sure there are many other ideas; these are just a few to start. As participants in the investment industry, we have an outsized voice in our society. I would like us to use it to the greatest extent possible to achieve greater equity. In order to do this, we need to establish specific goals and hold ourselves accountable. I realize it is not the role of the IAC to take decisions on these matters, but I do think we can provide valuable input, which will help the MSBI and its staff take action.

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REPORT

SBI Environmental, Social, and Governance (ESG) Report

MINNESOTA STATE BOARD OF INVESTMENT

ENVIRONMENTAL, SOCIAL, GOVERNANCE REPORT

2020 PROXY ROUNDUP

The SBI's Proxy Committee worked with SBI Staff to review and vote on numerous proxy ballots during the 2020 proxy season. In addition to common proxy votes, such as board elections and executive compensation advisory votes, the SBI voted on numerous proposals related to Environmental, Social, and Governance Issues. The information below is a snapshot of the SBI's 2020 proxy season.

- **Total Proposals Voted:** During the 2020 proxy season, the SBI voted proxies in over 2,400 annual meetings and cast votes on nearly 10,000 ballot items.

- **Executive Compensation:** The SBI Proxy Committee maintains a number of well-developed precedents related to votes on executive compensation at companies (also known as "say-on-pay" votes). These precedents identify compensation schemes that the SBI does not believe are in the best interest of the company or its investors. In 2020, the SBI voted against nearly 70% of executive compensation proposals.

- **Environmental Proposals:** The SBI voted for 87% of proposals on environmental issues.

- **Success Stories:** The 2020 proxy season included a number of notable success stories in which the SBI was part of a majority supporting important ESG related proposals. These are a few examples:

  - **Johnson & Johnson—Opioid Related Risk:** Shareholders approved a resolution calling on the company to provide additional disclosure regarding its business and reputational risk from its involvement in opioid production and certain legal and regulatory proceedings. The resolution also called for disclosure of company policies creating oversight of its various subsidiaries.

  - **National Healthcare—Board Diversity:** Shareholders approved a resolution calling on the company to disclose steps it is taking to broaden diversity on its board of directors. The resolution also suggests that the company make a commitment to diversity on the board including sex, gender identity, race, ethnicity, age, gender expression, and sexual orientation, and include women and people of color in its pool of board candidates.

  - **Chevron Corporation—Climate Lobbying:** Shareholders approved a resolution calling on the company to provide information on how its lobbying activities align with the goals of the Paris Climate Accord and, conversely, where its lobbying efforts and involvement in trade associations may delay or frustrate the goals of the Accord.



BOARD RESOLUTIONS

Update on Implementing SBI Resolution on Thermal Coal

SBI staff have been working to implement the Board's resolution to remove publicly traded companies deriving 25% or more of their revenue from the extraction and/or production of thermal coal from the SBI's authorized investments in the combined pension funds portfolio. The SBI staff uses various screening services to identify those companies. As of June 30, the SBI held securities in ten companies that will be removed from the portfolio no later than December 31, 2020. In addition, the SBI will provide its investment managers with a full list of restricted companies that may not be purchased in the future. The list will be updated annually and SBI staff will continue to report to the Board on the implementation of the resolution.

SBI Comment to U.S. Department of Labor on ESG Guidance

The SBI recently submitted a comment in opposition to the United States Department of Labor's proposed rule regarding ESG risk and opportunity by investors subject to the Employee Retirement Income Security Act of 1974 ("ERISA"). ERISA regulates, among other things, how fiduciaries invest retirement funds. The SBI noted that the proposed rule:

- Has the potential to conflate ESG risk and opportunity analysis—which is part of analyzing the economics of an investment—with Economically Targeted Investing ("ETI")—which is an investment strategy that targets investments for potentially reasons other than economic risk and opportunity;
- Any ERISA guidance issued should clearly separate ESG analysis from ETI investing to provide clarity for investors and investment managers.

While the SBI is not subject to the investment provisions at issue in the proposed ERISA rule, the SBI generally requires its investment managers to act as ERISA fiduciaries. As a result, the SBI was concerned that, if implemented, the rule may inappropriately limit the ability of investment managers to consider ESG risks and opportunities when choosing investments on the SBI's behalf.

A copy of the SBI's comment letter can be found on the ESG and Stewardship page of the SBI website.

The text of the proposed rule, along with other information including a summary of the rule, can be found on the Employee Benefit Security Administration website.

Coalition Highlight:
Thirty Percent Coalition Broadens Diversity Focus

The Thirty Percent Coalition recently voted to update its mission statement:

"To advocate for diversity on corporate boards, including women and people of color."

While the organization has always broadly advocated for diversity on boards, its traditional focus has been on promoting women on corporate boards. The change reinforces the coalition's commitment to promoting diversity on corporate boards to reflect the gender, racial, and diversity amongst the workforce and recognize well established research demonstrating the diversity on corporate boards leads to better outcomes for investors.

Additional information is available on the Thirty Percent Coalition's website.

MINNESOTA STATE BOARD OF INVESTMENT

Contact

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REPORT

AON Market Environment Report

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Market Environment

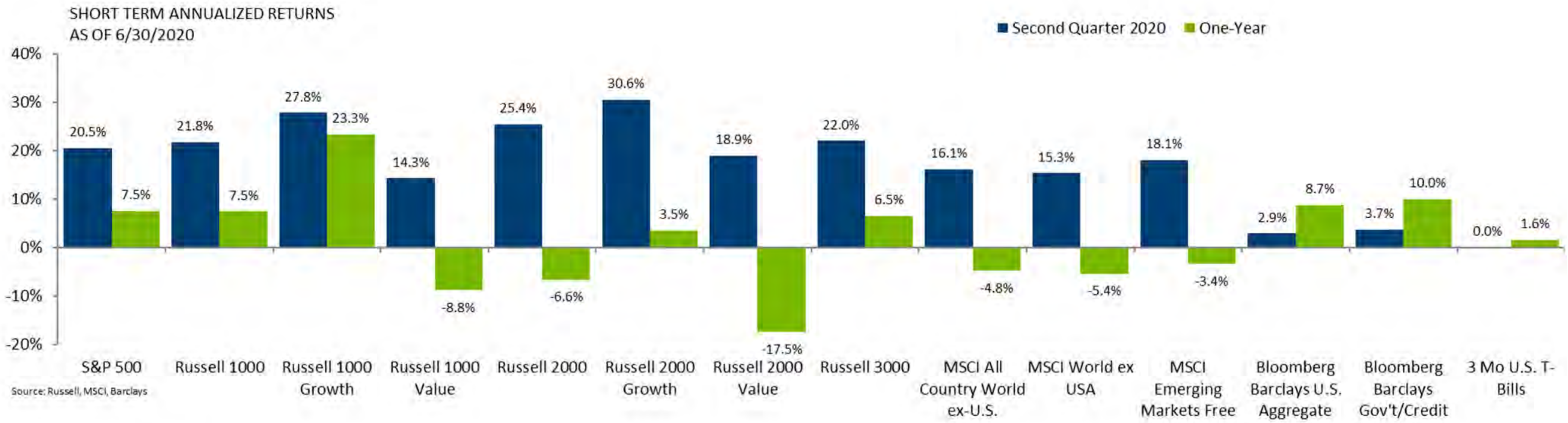
Second Quarter 2020

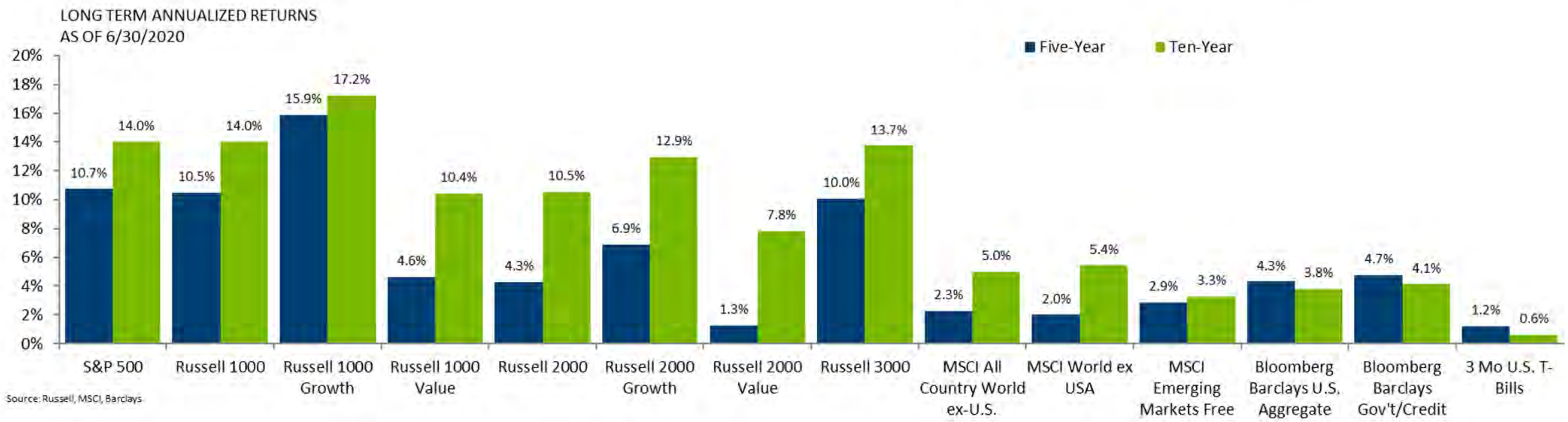
Aon

Investment advice and consulting services provided by Aon Investments USA Inc., an Aon Company.

Empower Results®

Market Highlights





Market Highlights

Returns of the Major Capital Markets

Periods Ending 6/30/2020

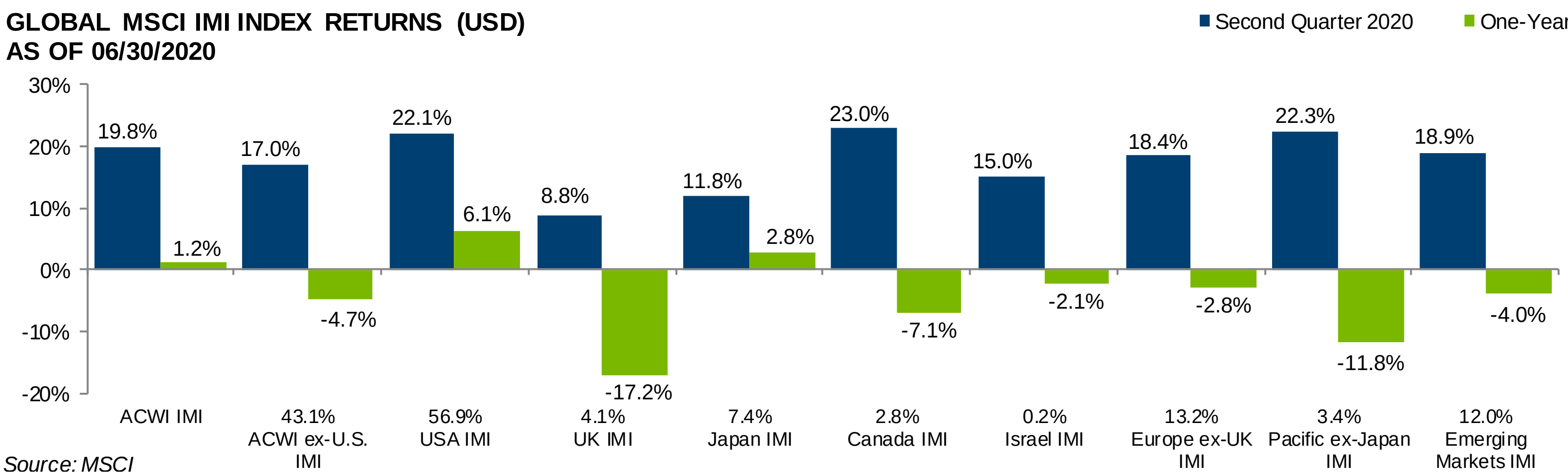
	Second Quarter	1-Year	3-Year[1]	5-Year[1]	10-Year[1]
Domestic Equity					
S&P 500	20.5%	7.5%	10.7%	10.7%	14.0%
Russell 1000	21.8%	7.5%	10.6%	10.5%	14.0%
Russell 1000 Growth	27.8%	23.3%	19.0%	15.9%	17.2%
Russell 1000 Value	14.3%	-8.8%	1.8%	4.6%	10.4%
Russell 2000	25.4%	-6.6%	2.0%	4.3%	10.5%
Russell 2000 Growth	30.6%	3.5%	7.9%	6.9%	12.9%
Russell 2000 Value	18.9%	-17.5%	-4.4%	1.3%	7.8%
Russell 3000	22.0%	6.5%	10.0%	10.0%	13.7%
International Equity					
MSCI All Country World ex-U.S.	16.1%	-4.8%	1.1%	2.3%	5.0%
MSCI World ex USA	15.3%	-5.4%	0.8%	2.0%	5.4%
MSCI Emerging Markets Free	18.1%	-3.4%	1.9%	2.9%	3.3%
Fixed Income					
Bloomberg Barclays U.S. Aggregate	2.9%	8.7%	5.3%	4.3%	3.8%
Bloomberg Barclays Gov't/Credit	3.7%	10.0%	5.9%	4.7%	4.1%
3 Mo U.S. T-Bills	0.0%	1.6%	1.8%	1.2%	0.6%
Inflation					
CPI-U	-0.3%	0.7%	1.8%	1.6%	1.7%

MSCI Indices show net returns.

All other indices show total returns.

[1] Periods are annualized.

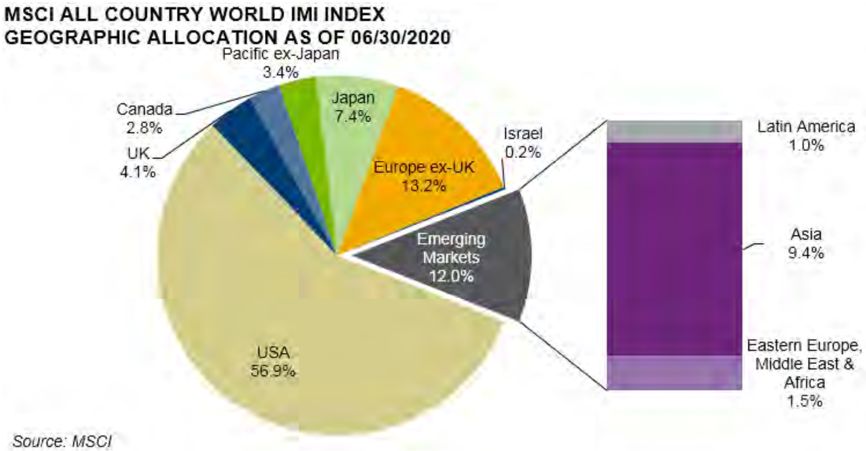
Global Equity Markets

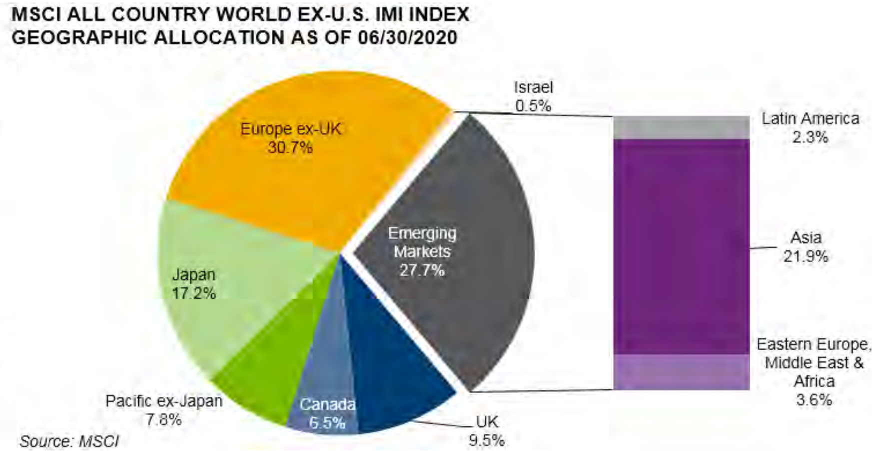


Source: MSCI

- Global equities rebounded sharply over the second quarter, recovering the bulk of losses sustained during the previous quarter's selloff. Investors appear to be willing to overlook economic data suggesting the worst recession in generations. Data on infections indicated that the "first wave" of the pandemic may have passed in many developed economies and a relatively quick re-opening of economies has boosted investor optimism. This coupled with expanding fiscal and monetary stimulus measures from governments has provided further support for markets. In local currency terms, the MSCI AC World Investable Market Index rose by 18.8% in Q2 2020. Depreciation of the U.S. dollar further pushed up the returns to 19.8% in USD terms.
- Canadian equities were the best performers with a return of 23.0% over the quarter, supported by strong returns from the Information Technology and Materials sectors.
- UK equities were the worst performer returning 8.8% over the quarter. The UK suffered the fastest monthly contraction on record as GDP plunged by 20.4% in April, the first full month of the UK's coronavirus lockdown. Meanwhile, the UK formally rejected the option to extend its post-Brexit transition period beyond the end of 2020 but did announce plans for "intensified" trade negotiations over July in a bid to break the deadlock.

Global Equity Markets

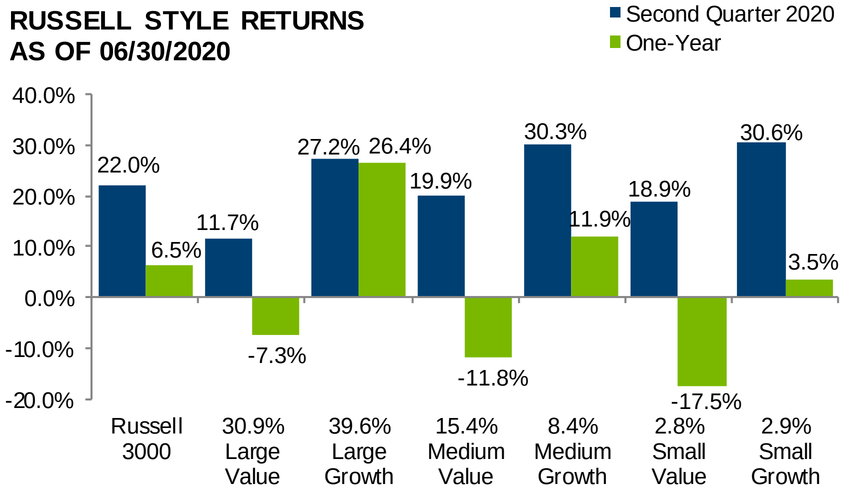




- The two exhibits on this slide illustrate the percentage that each country/region represents of the global and international equity markets as measured by the MSCI All Country World IMI Index and the MSCI All Country World ex-U.S. IMI Index, respectively.

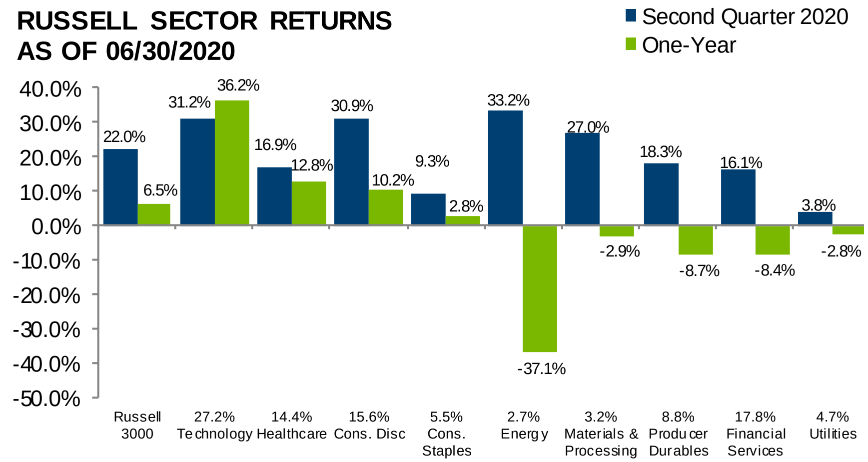
U.S. Equity Markets

RUSSELL STYLE RETURNS
AS OF 06/30/2020



Source: Russell Indexes

RUSSELL SECTOR RETURNS
AS OF 06/30/2020

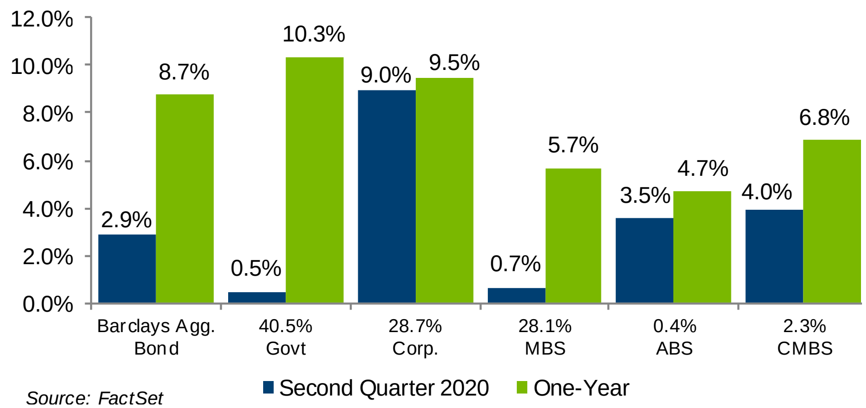


Source: Russell Indexes

- U.S. equity markets achieved significant gains over the quarter, boosted by rebounding economic data. The U.S. unemployment rate fell from April's all-time high of 14.7% to 11.1% in June, defying analysts who have been expecting the unemployment rate to peak at close to 20%. The technology and consumer discretionary sectors provided the bulk of the gains, benefiting from increased demand for technology and e-commerce services amidst social distancing measures. The Russell 3000 Index rose 22.0% during the second quarter and 6.5% over the one-year period.
- The CBOE Volatility Index (VIX), Wall Street's "fear gauge", steadily declined over the quarter from the record highs seen in Q1. It fell from 53.5 to 30.4 over the quarter, having averaged 23.8 over the previous 12 months.
- All sectors generated positive returns over the quarter. In particular, the energy sector achieved a 33.2% return on the back of rebounding oil prices, but the sector is still 37.1% down over the past 12 months.
- Large cap stocks underperformed both medium and small cap stocks over the quarter, whilst Value stocks continued to underperform their Growth counterparts in Q2 2020.

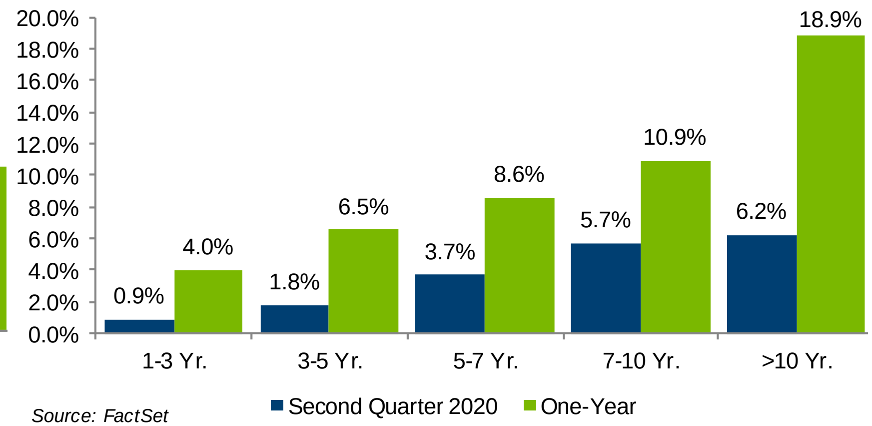
U.S. Fixed Income Markets

BLOOMBERG BARCLAYS AGGREGATE RETURNS BY SECTOR AS OF 06/30/2020



Source: FactSet

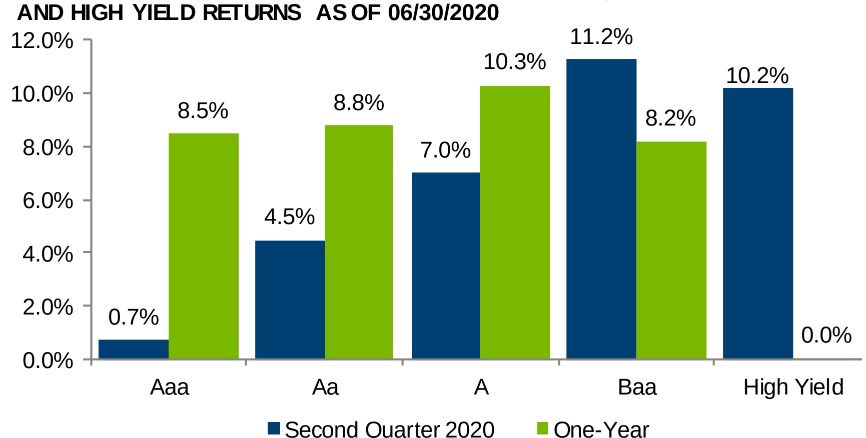
BLOOMBERG BARCLAYS AGGREGATE RETURNS BY MATURITY AS OF 06/30/2020



Source: FactSet

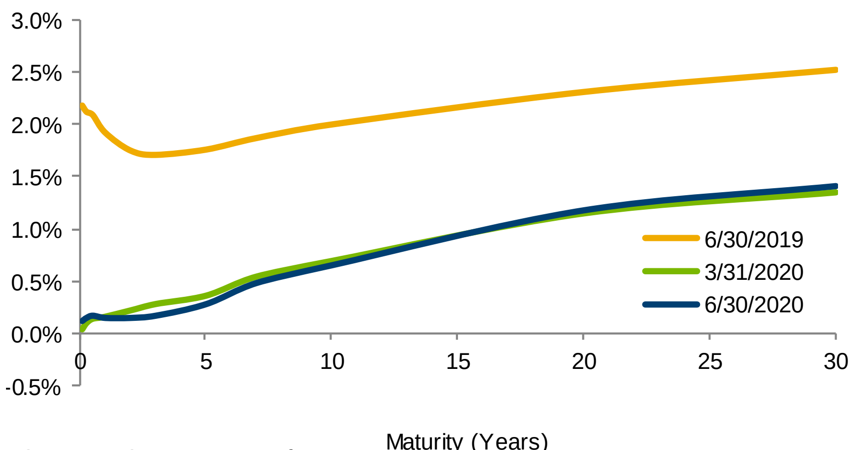
- The Bloomberg Barclays U.S. Aggregate Bond Index rose by 2.9%.
- The increase in investors' risk appetite were evident in the corporate bonds space as corporate bonds rose by 9.0%.
- Corporate bonds were also boosted by the Fed's decision to start buying individual corporate bonds on the secondary market for the first time in history through its $750 billion corporate lending facility.
- High yield bonds rose by 10.2%. Within investment grade bonds, Baa bonds outperformed with a return of 11.2%.

BLOOMBERG BARCLAYS AGGREGATE RETURNS BY QUALITY AND HIGH YIELD RETURNS AS OF 06/30/2020

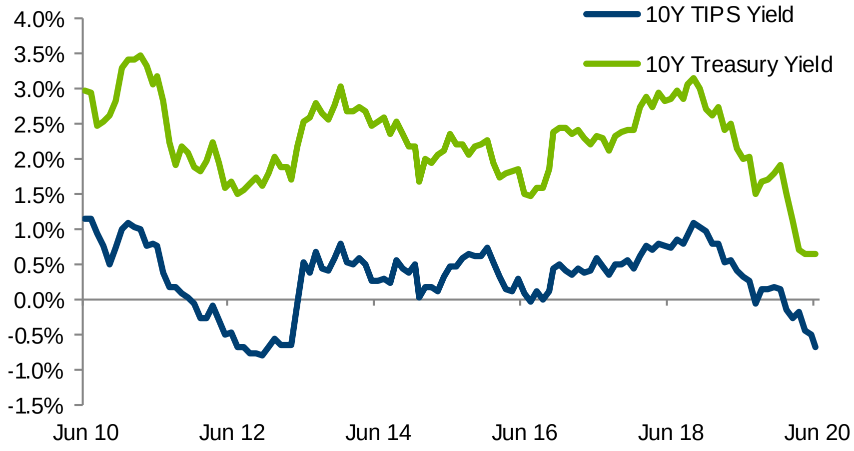


Source: FactSet

U.S. Fixed Income Markets



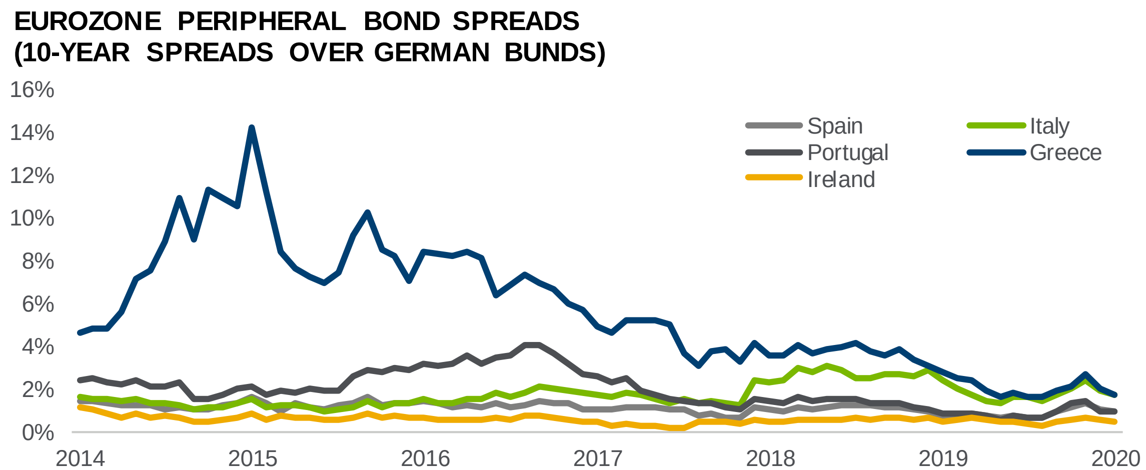
Source: U.S. Department of Treasury



Source: U.S. Department of Treasury

- The U.S. nominal yield curve ended the quarter broadly unchanged. The Federal Reserve forecasted that the U.S. economy will contract by 6.5% this year before rebounding by 5.0% in 2021, as Fed officials signaled that interest rates will likely remain near zero until the end of 2022.
- The 10-year US treasury yield ended the quarter 4bps lower at 0.66% whilst the 30-year yield increased by 6bps to 1.41%.
- The 10-year TIPS yield fell by 51bps over the quarter to -0.68%, whilst the 10-year breakeven inflation increased from 0.87% to 1.34%. Breakeven inflation rebounded as markets appeared to be anticipating some longer-term inflationary effects from recent monetary and fiscal stimulus measures. Meanwhile, rising oil prices and the relaxation of lockdown measures also raised near-term inflationary expectations.

European Fixed Income Markets



Source: FactSet

- European government bond spreads over 10-year German bunds narrowed across the Euro Area. The European Commission proposed a €750 billion recovery fund to be funded partly by issuing mutualized EU debt. The move towards fiscal burden sharing stabilised the spread between peripheral and core Eurozone government bonds, reducing a source of friction within the Eurozone. Meanwhile, the European Central Bank (ECB) increased the size of its asset purchases under the Pandemic Emergency Purchase Program by an additional €600 billion to €1.35 trillion and extended the program until June 2021.
- German government bund yields rose by 1bp to -0.48% over the quarter. The Eurozone recorded a quarter-on-quarter growth rate of -3.8%, the worst economic contraction since the Eurozone was formed. France, which was amongst the first European countries to be locked down, recorded a quarter-on-quarter contraction of 5.8% in Q1, its worst GDP figure since 1945, whilst the German economy contracted by 2.2%.
- Greek and Portuguese government bond yields fell by 41bps and 39bps to 1.20% and 0.47% respectively.

Credit Spreads

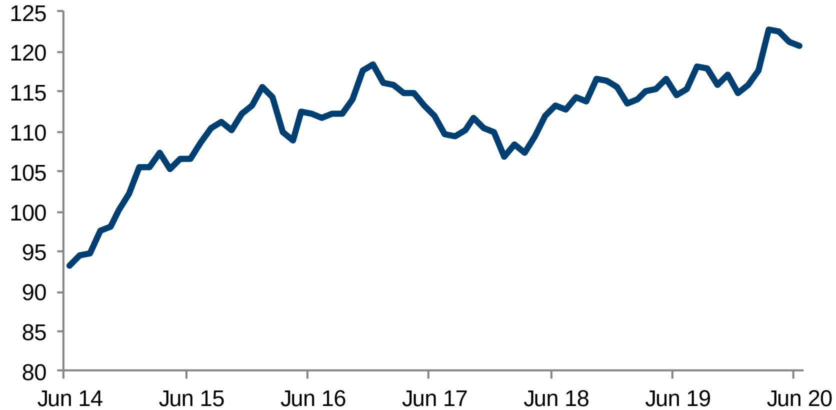
Spread (bps)	6/30/2020	3/31/2020	6/30/2019	Quarterly Change (bps)	1-Year Change (bps)
U.S. Aggregate	68	95	46	-27	22
Gov't	1	3	0	-2	1
Credit	142	255	109	-113	33
Gov't/Credit	65	105	46	-40	19
MBS	70	60	46	10	24
CMBS	132	188	69	-56	63
ABS	68	213	41	-145	27
Corporate	150	272	115	-122	35
High Yield	626	880	377	-254	249
Global Emerging Markets	393	619	282	-226	111

Source: Barclays Live

- Credit assets rebounded strongly, benefiting from a broad risk asset recovery due to improving investor sentiment and reduced coronavirus fears. Credit spreads reversed much of last quarter’s spike, boosted by huge fiscal and monetary stimulus measures.
- Credit spreads over U.S. Treasuries narrowed over the quarter (except MBS).
- Riskier areas of credit, such as US high yield bonds and emerging market debt also performed well. Boosted by the Federal Reserve’s decision to expand its quantitative easing programmes to include some non-investment grade credit, High Yield credit spreads narrowed significantly in Q2 2020, decreasing by 254bps.

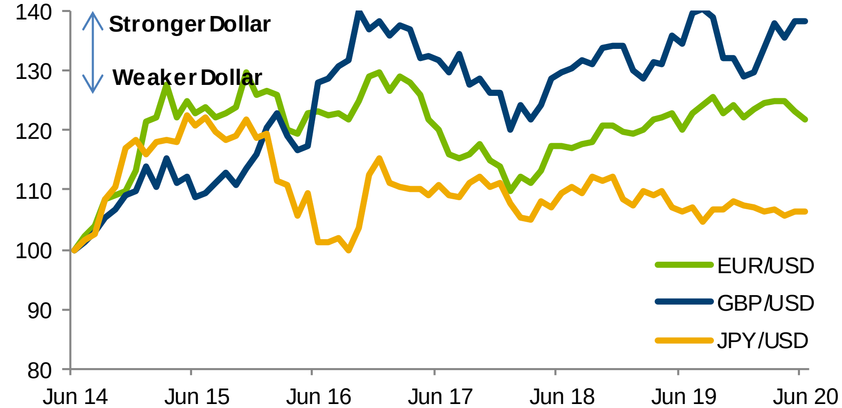
Currency

TRADE WEIGHTED U.S. DOLLAR INDEX (1973 = 100)



Source: Federal Reserve

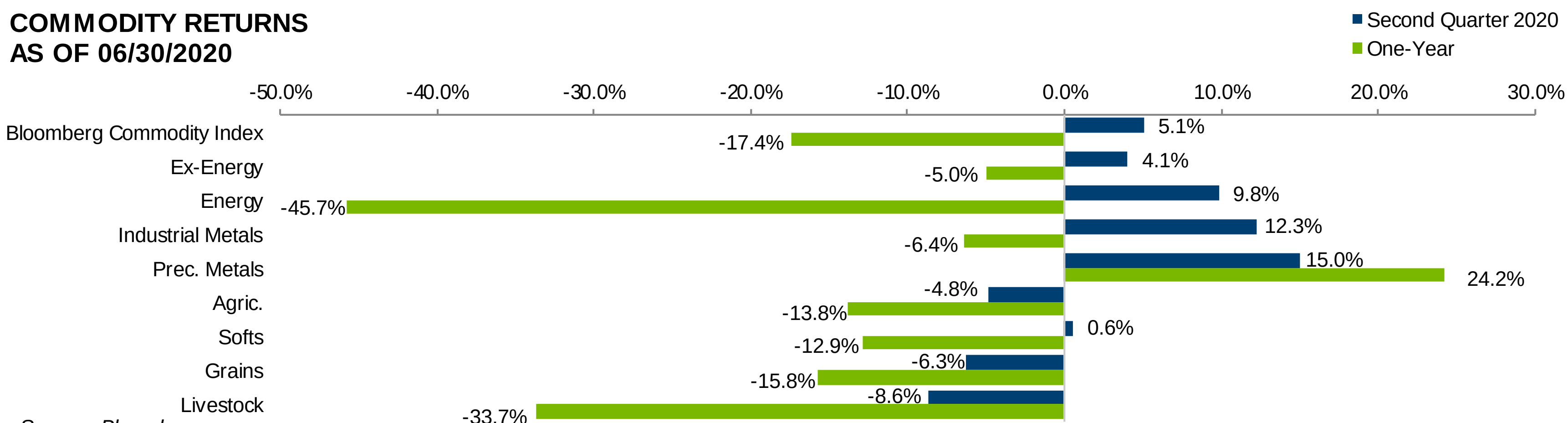
U.S. DOLLAR RELATIVE TO EUR, GBP AND JPY REBASED TO 100 AT 06/30/2014



Source: FactSet

- The U.S. dollar generally weakened against major currencies over the quarter as it fell 1.6% on a trade-weighted basis. The safe haven fund flows which supported the dollar over the first quarter was partially reversed in Q2 on the back of easing coronavirus concerns. U.S. dollar depreciated against euro and yen but marginally appreciated against sterling.
- Sterling fell by 2.2% on a trade-weighted basis over the quarter. The increasing prospects of negative rates in the UK made holding sterling assets less attractive, whilst a weak economic outlook and ongoing Brexit uncertainty also weighed on sterling. Sterling depreciated by 0.4% against the U.S. dollar.
- The U.S. dollar depreciated by 2.3% and 0.1% against the euro and yen respectively.

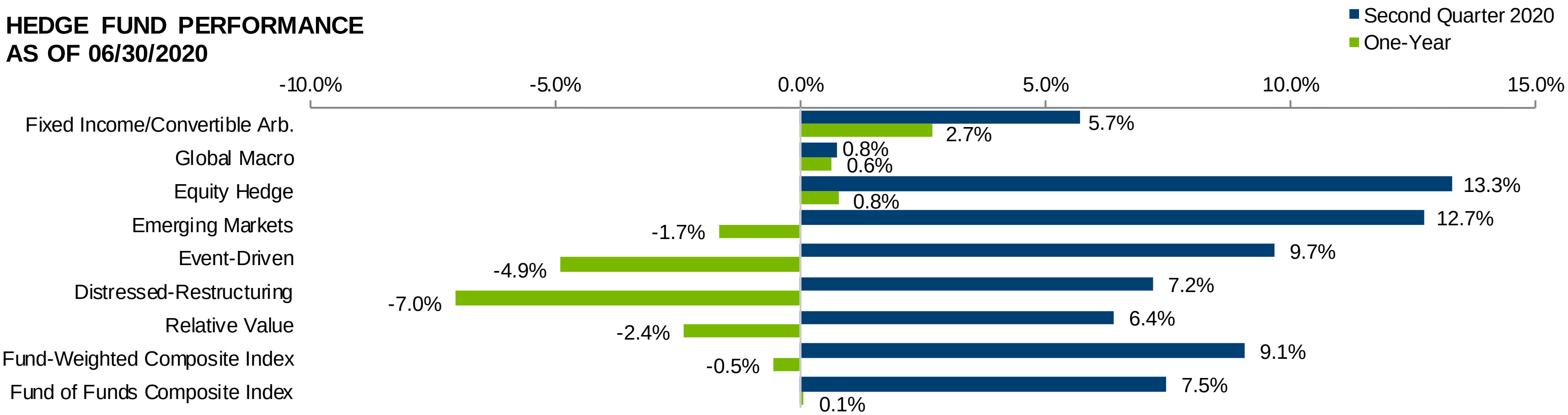
Commodities



Source: Bloomberg
Note: Softs and Grains are part of the wider Agriculture sector

- Commodities rose over the quarter which saw the Bloomberg Commodity Index return 5.1%.
- The Energy sector rose by 9.8% over the quarter. Oil had an especially turbulent quarter as U.S oil futures prices fell into negative territory for the first time ever when the price of West Texas Intermediate (WTI) futures expiring in May closed at -$37.63 on April 20th. Investors faced storage facility shortages and a decreasing demand, leaving them with no choice but to pay in order to not receive physical barrels. To combat the growing imbalance between supply and demand OPEC+, led by Saudi Arabia and Russia, implemented record setting production cuts in May. An increase in global travel along with the supply cuts created major tailwinds for oil later in the quarter.
- The price of Brent crude oil recovered and sharply rose by 81.0% to $41/bbl. and WTI crude oil spot prices rose by 91.7% to $39/bbl. On a one-year basis, the Energy sector is down by 46%.
- Livestock was the worst performing sector, falling by 8.6% in Q2 2020.

Hedge Fund Markets Overview

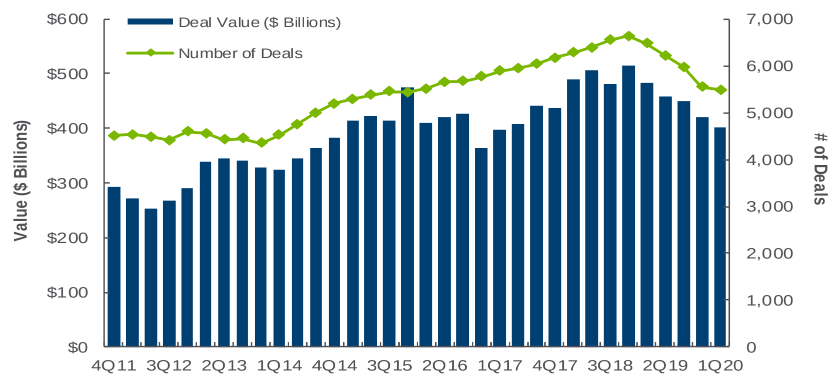


Note: Latest 5 months of HFR data are estimated by HFR and may change in the future.
Source: HFR

- Hedge fund performance was positive across all strategies in the second quarter.
- The HFRI Fund-Weighted Composite Index and the HFRI Fund of Funds Composite Index produced returns of 9.1% and 7.5% respectively.
- Equities-oriented strategies performed well amidst a broad risk assets rally. Equity Hedge and Emerging Markets strategies were the best performers over the quarter, returning 13.3% and 12.7% respectively.

Private Equity Market Overview – 1Q 2020

LTM Global Private Equity-Backed Buyout Deal Volume

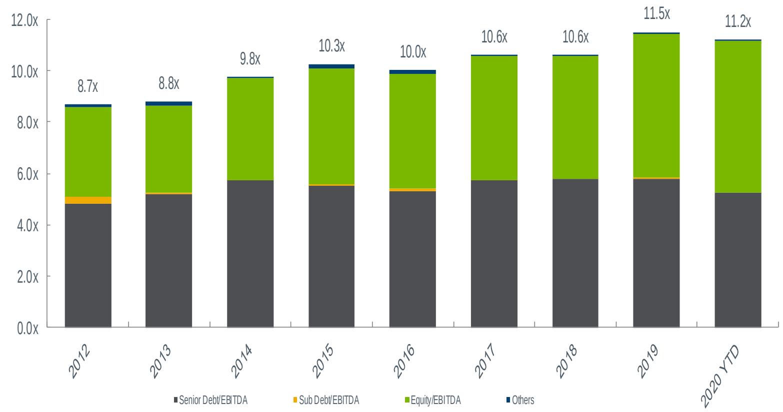


Source: Preqin

- **Fundraising:** In 1Q 2020, $190.7 billion was raised by 373 funds, which was a decrease of 29.8% on a capital basis and 32.2% by number of funds over the prior quarter. Dry powder stood at nearly $2.2 trillion at the end of the quarter, a modest increase compared to the previous quarter.[1]
- **Buyout:** Global private equity-backed buyout deals totaled $95.0 billion in 1Q 2020, which was down 0.5% on a capital basis and up 7.5% by number of deals from 4Q 2019.[1] Through the end of 1Q 2020, the average purchase price multiple for all U.S. LBOs was 11.2x EBITDA, a decrease of 0.3x over year-end 2019 but higher than the five-year average (10.6x).[2] Large cap purchase price multiples stood at 10.9x, down compared to the full-year 2019 level of 11.4x.[2] The weighted average purchase price multiple across all European transaction sizes averaged 12.2x EBITDA for 1Q 2020, up significantly from the 10.9x multiple seen at the end of 4Q 2019. Purchase prices for transactions of greater than €1.0 billion increased to 12.1x at the end of 1Q 2020, a jump from the 11.2x seen at year-end 2019. Globally, exit value totaled $76.0 billion from 496 deals during the first quarter, down from the $84.2 billion in exits from 458 deals during 4Q 2019.[1]
- **Venture:** During the first quarter, 1,271 venture-backed transactions totaling $26.4 billion were completed in the U.S., which was an increase on a capital basis over the prior quarter's total of $23.3 billion across 1,399 deals. This was 17.5% higher than the five-year quarterly average of $22.5 billion.[3] Total U.S. venture-backed exit activity totaled approximately $19.3 billion across 183 completed transactions in 1Q 2020, down on a capital basis from the $24.2 billion across 215 exits in 4Q 2019. 1Q 2020's U.S. exit activity represented only 7.3% of 2019's total.[4]
- **Mezzanine:** Six funds closed on $2.3 billion during the first quarter. This was down from the prior quarter's total of $3.2 billion raised by eight funds and represented 47.4% of the five-year quarterly average of $4.9 billion. Estimated dry powder was $48.5 billion at the end of 1Q 2020, up from the $44.6 billion seen at the end of 2019.[1]

Private Equity Market Overview – 1Q 2020

U.S. LBO Purchase Price Multiples – All Transactions Sizes



Source: S&P

- **Distressed Debt:** The LTM U.S. high-yield default rate was 2.9% as of March 2020, and was expected to increase substantially during the following quarter.[5] During the quarter, $4.5 billion was raised by nine funds, lower than both the $22.3 billion raised by 24 funds in 4Q 2019 and the five-year quarterly average of $11.4 billion.[1] Dry powder was estimated at $117.0 billion at the end of 1Q 2020, which was down slightly from the $117.2 billion seen at the end of 4Q 2019. This remained above the five-year annual average level of $109.4 billion.[1]
- **Secondaries:** 12 funds raised $20.8 billion during the quarter, up significantly from the $5.1 billion raised by 10 funds in 4Q 2019. This was the largest amount raised since 1Q 2017 when 14 funds raised $20.1 billion.[1] At the end of 1Q 2020, there were an estimated 79 secondary and direct secondary funds in market targeting roughly $73.6 billion.[1] The average discount rate for all private equity sectors finished the quarter at 18.1%, significantly lower than the 9.4% discount at the end of 4Q 2019.[6]
- **Infrastructure:** $39.6 billion of capital was raised by 24 funds in 1Q 2020 compared to $47.8 billion of capital raised by 38 partnerships in 4Q 2019. At the end of the quarter, dry powder stood at an estimated $220.7 billion, up from 4Q 2019's total of $212.1 billion. Infrastructure managers completed 603 deals with an estimated aggregate deal value of $79.4 billion in 1Q 2020 compared to 730 deals totaling $149.1 billion a quarter ago.[1]
- **Natural Resources:** During 1Q 2020, six funds closed on $4.6 billion compared to eleven funds totaling $2.6 billion in 4Q 2019. Energy and utilities industry managers completed approximately 39 deals totaling an estimated $5.3 billion through 1Q 2020, which represented 31.2% of energy and utilities deal value during 2019.[1]

Sources: [1] Preqin [2] Standard & Poor's [3] PwC/CB Insights MoneyTree Report [4] PitchBook/NVCA Venture Monitor [5] Fitch Ratings [6] Thomson Reuters [7] UBS

Notes: FY=Fiscal year ended 12/31; YTD=Year to date; LTM=Last 12 months (aka trailing 12 months); PPM=Purchase Price Multiples: Total Purchase Price ÷ EBITDA.

Notes

1. Preqin
2. Standard & Poors
3. PitchBook/National Venture Capital Association Venture Monitor
4. First Trust Advisors
5. Evercore

Notes:

FY: Fiscal year ended 12/31

YTD: Year to date

YE: Year end

LTM: Last twelve months (aka trailing twelve months or TTM)

PPM: Purchase Price Multiples: Total Purchase Price / EBITDA

/bbl: Price per barrel

MMBtu: Price per million British thermal units

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ATTN: AHIC Compliance Officer

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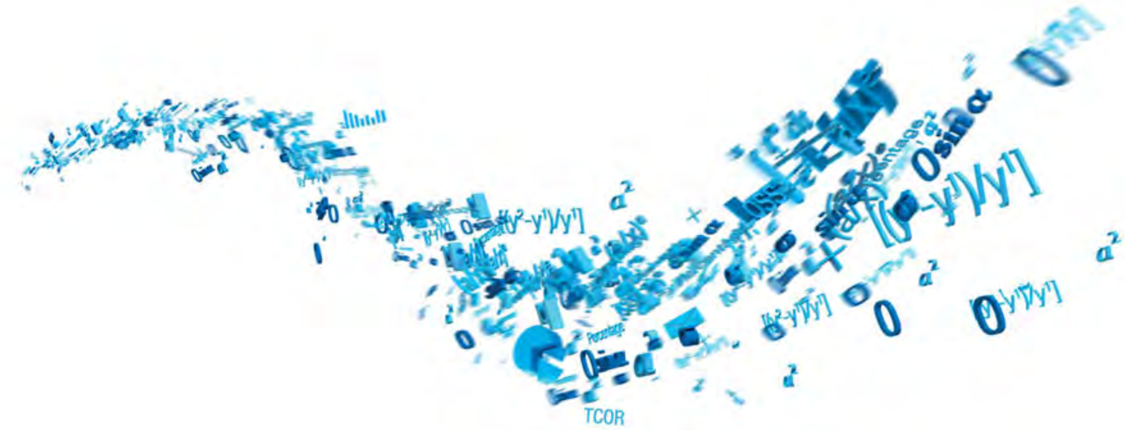


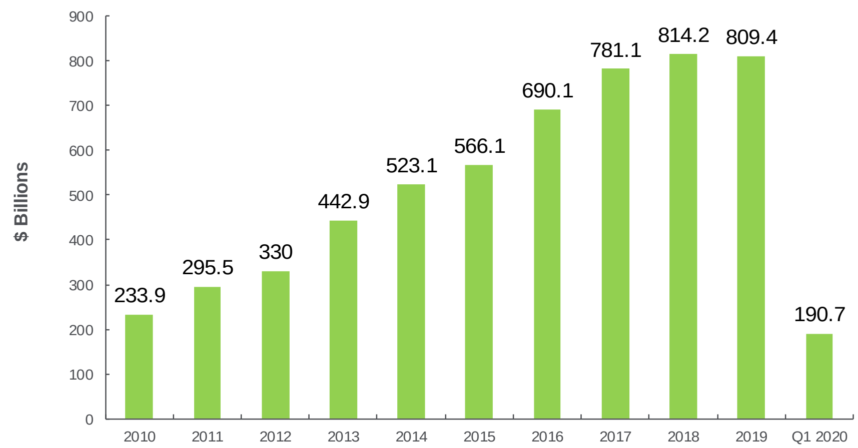
Appendix A:

Global Private Equity Market Overview

1Q 2020

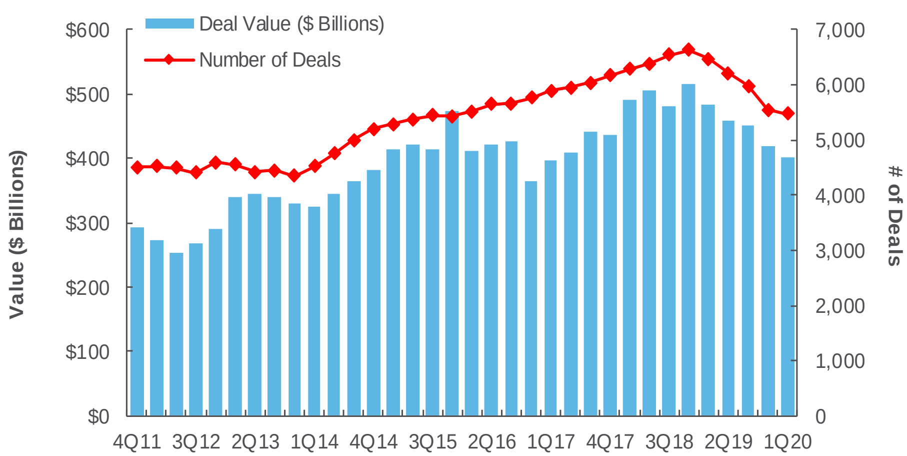
Private Equity Overview

Total Funds Raised



Source: Preqin

LTM Global Private Equity-Backed Buyout Deal Volume



Source: Preqin

Fundraising

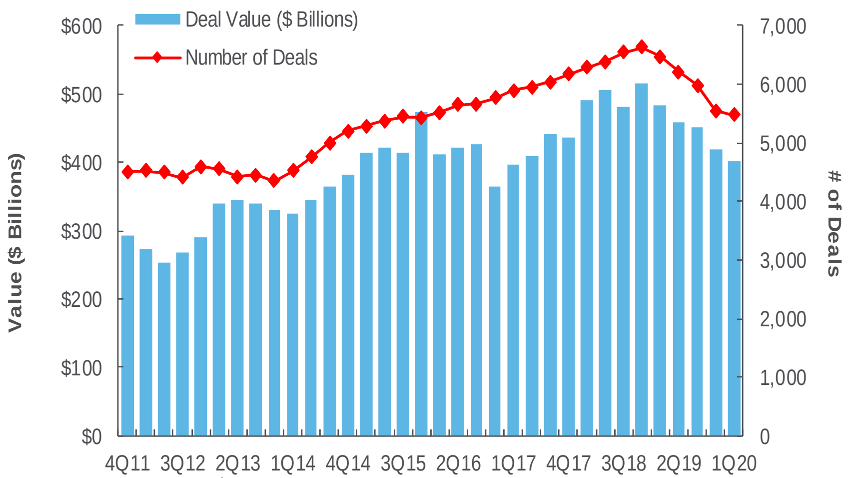
- In Q1 2020, $190.7 billion was raised by 373 funds, which was a decrease of 29.8% on a capital basis and 32.2% by number of funds from the prior quarter. This represented 23.6% of capital raised in 2019.[1]
  - Q1 2020 fundraising was 4.2% higher, on a capital basis, than the five-year quarterly average, but 38.6% lower by number of funds raised.
  - The majority of capital was raised by funds with target geographies in North America, comprising 74.8% of the quarter's total. Capital targeted for Europe made up 14.9% of the total funds raised during the year, while the remainder was attributable to managers targeting Asia and other parts of the world.
- Dry powder stood at nearly $2.2 trillion at the end of the year, an increase of 1.8% and 26.1% compared to Q4 2019 and the five-year average, respectively.[1]

Activity

- In Q1 2020, 1,321 deals were completed for an aggregate deal value of $95.0 billion as compared to 1,229 transactions totaling $95.5 billion in Q4 2019.[1]
  - This was 14.0% lower than the five-year quarterly average deal volume of $110.5 billion.
  - Average deal size was $71.9 million in Q1 2020. This was down 12.1% compared to Q1 2019 and down 4.3% relative to the five-year quarterly average.
- European LBO transaction volume totaled €52.5 billion in Q1 2020, up by 15.2% compared to 2019's total of €45.5 billion. Q1 2020's total was equal to the five-year average level of €52.5 billion.[3]
- At the end of 2019, the average purchase price multiple for all U.S. LBOs was 11.2x EBITDA, down from year-end 2019 (11.5x) but up from the five-year average (10.6x). Large-cap purchase price multiples stood at 10.9x, down from the 11.4x observed at year-end 2019.[3]
  - This was 0.4x and 1.2x turns (multiple of EBITDA) above the five and ten-year average levels, respectively.
- European multiples were up a significant 1.2x year-over-year, averaging 12.2x EBITDA for all transaction sizes on a weighted basis, with large and medium transactions each running at 12.1x and 12.2x, respectively.[3]
- Debt remained broadly available in the U.S.
  - The average leverage for U.S. deals in Q1 2020 was 5.3x compared to the five and ten-year averages of 5.7x and 5.4x, respectively.[3]
  - The amount of debt issued supporting new transactions decreased compared to year-end 2019, moving from 72.2% to 65.8%, but was higher than the five-year average of 64.7%.[3]
- In Europe, average senior debt/EBITDA in Q1 2020 was 5.8x, up from the 5.5x observed in 2019.

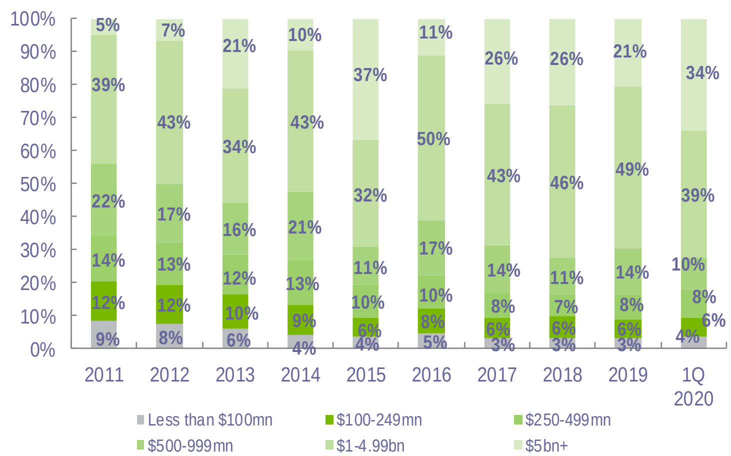
Buyouts / Corporate Finance

LTM PE Exit Volume and Value



Source: Preqin

M&A Deal Value by Deal Size



Source: Preqin

Fundraising

- $70.7 billion was closed on by 114 buyout and growth funds in Q1 2020, compared to $153.4 billion raised by 135 funds in Q4 2019.[1]
  - This was significantly below the five-year quarterly average of $92.8 billion and 176 funds.
  - Platinum Equity Capital Partners Fund V was the largest fund raised during the quarter, closing on $10.0 billion.[1]
- Buyout and growth equity dry powder was estimated at $1.0 trillion, in line with year-end 2019 and substantially higher than the five-year average level of $779.3 billion.[1]
  - Mega and small cap funds increased in dry powder quarter-over-quarter by 0.6% and 35.3%, respectively. Mid cap dry powder exhibited the largest increase during the year, setting a new record mark of $131.8 billion, increasing by 15.7% over Q4 2019. Large cap funds ended Q1 2020 with $183.5 billion in dry powder, an increase of 12.3% over the prior quarter.[1]
  - An estimated 59.2% of buyout dry powder was targeted for North America, while European dry powder comprised 25.6% and Asia/Rest of World accounted for the remainder.[1]

Activity

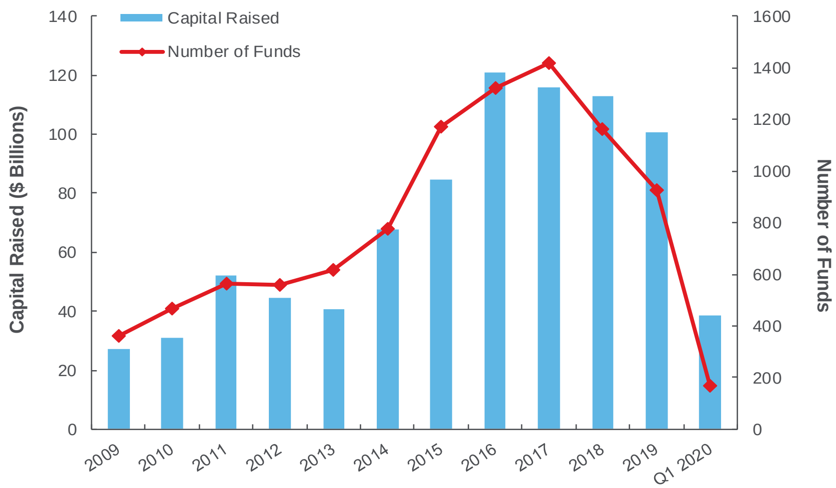
- Global private equity-backed buyout deals totaled $95.0 billion in Q1 2020, which was a decrease of 0.5% and 14.0% from year-end 2019 and the five-year quarterly average, respectively.[1]
  - Q1 2020 deal level accounted for 22.6% of 2019's total buyout activity and represented a decrease of 16.4% compared to Q1 2019's total.
  - In Q1 2020, deals valued at $5.0 billion or greater accounted for an estimated 33.8% of total deal value during the year compared to 20.9% in 2019 and 26.3% in 2018.[1] Deals valued between $1.0 billion to $4.99 billion represented 38.6% of total deal value during the first quarter.
  - By geography, North American deals accounted for the largest percentage of total deal value at an estimated 55.7% the quarter, while Information Technology deals accounted for the largest percentage by industry at 30.8% of total deal value.
- U.S. Entry multiples for all transaction sizes in Q1 2020 stood at 11.2x EBITDA, down slightly from year-end 2019's level (11.5x).[3]
  - Large cap purchase price multiples stood at 10.9x, down compared to 11.4x in 2019.[3]
  - The weighted average purchase price multiple across all European transaction sizes averaged 12.2x EBITDA in Q1 2020, up significantly from 10.9x in 2019. Purchase prices for transactions of €1.0 billion or more increased from 11.2x to 12.1x quarter-over-quarter.
  - The portion of average purchase prices financed by equity for all deals was 46.7% in Q1 2020, up from 43.5% in 2019. This remained above the five and ten-year average levels of 41.2% and 39.6%, respectively.[3]
- Globally, exit value totaled $76.0 billion across 496 deals in Q1 2020 compared to $84.2 billion across 458 deals in the prior quarter.[1]

Opportunity

- Value-focused strategies
- Managers with expertise across business cycles

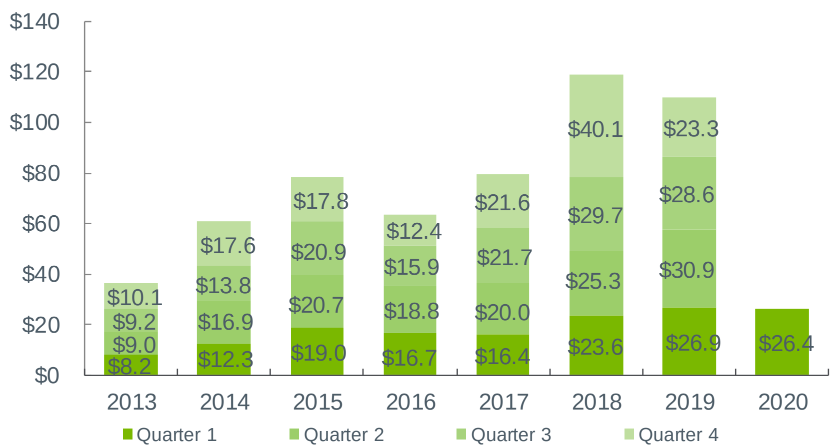
Venture Capital

Venture Capital Fundraising



Source: Preqin

U.S. Venture Capital Investments by Quarter ($B)



Source: PwC/CB Insights Report

Fundraising

- $38.4 billion of capital was raised by 171 funds in Q1 2020, up from the prior quarter's total of $27.6 billion raised by 252 managers. Continuing the trend seen in previous quarters, a smaller number of funds continue to raise larger pools of capital, raising the average fund size to $240.0 million.[1]
  - 1Q 2020 fundraising was up by 43.3% on a capital basis compared to the five-year quarterly average of $26.8 billion.
  - Tiger Global Private Investments Partners XII was the largest fund raised during the quarter, closing on $3.8 billion.
- The average fund size raised during the quarter was approximately $240.0 million. This represented a significant increase compared to 4Q 2019's average of $134.0 million and increased the spread between the five-year quarterly average fund size of $110.4 million.
- At the end of Q1 2019, there were an estimated 2,170 funds in market targeting $190.4 billion.[1]
  - Softbank Vision Fund – Latin America was the largest venture fund in market, targeting an estimated $5.0 billion.
  - The majority of funds in market are seeking commitments of $200.0 million or less.
- Dry powder was estimated at $302.9 billion at the end of 1Q 2020, up from 2019's total of $275.3 billion. This was 52.3% higher than the five-year average.[1]

Activity

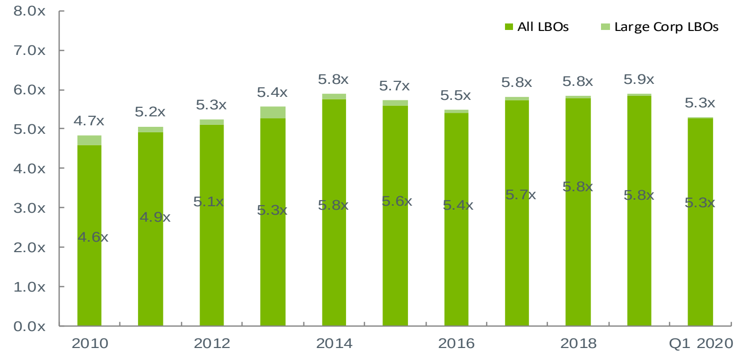
- During the quarter, 1,271 venture-backed transactions totaling $26.4 billion were completed, which was an increase a capital basis over the prior quarter's total of $23.2 billion across 1,399 deals. This was 17.3% higher than the five-year quarterly average of $22.5 billion.[7]
  - In Q1 2020, there were 41 U.S.-based deals involving unicorn companies, representing roughly $11.3 billion in deal value. This was up by number and value compared to Q4 2019, which saw 31 unicorn deals closed at a deal value of $7.8 billion. 2018 continues to be the year in which deal value by U.S. unicorns was the highest, with 132 deals raising $46.8 billion in value.[8]
- At the end of Q1 2020, median pre-money valuations increased only for Series A, while Seed, Series B, Series C, and Series D+ decreased. Compared to year-end 2019, Series D+ transactions decreased to a median pre-money valuation of $410.0 million from $450.0 million. Series C's median pre-money valuation decreased from $232.2 million to $166.1 million during the quarter. Series A increased from $28.0 million to $29.9 million.[9]
- Total U.S. venture-backed exit activity totaled approximately $19.3 billion across 183 completed transactions in 1Q 2020, down from $24.2 billion across 215 exits in Q4 2019.Exit value in Q1 2020 represented only 7.3% of 2019's total exit value.[8]
  - The number of U.S. venture-backed initial public offerings declined over 4Q 2019, with 10 IPOs completed in 1Q 2020. The first quarter was also lower on a value basis, with IPOs accounting for $5.6 billion in value compared to $8.0 billion in the prior quarter.[8]

Opportunity

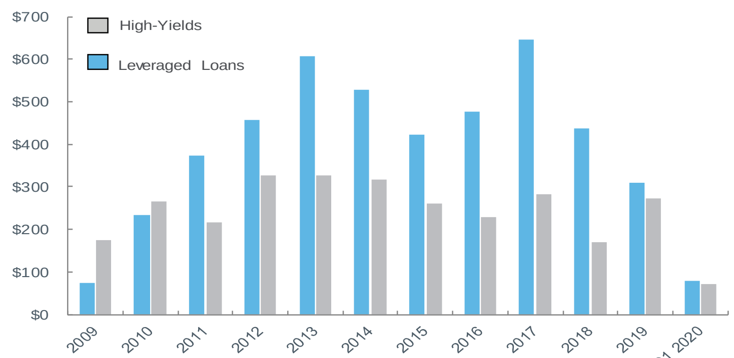
- Early stage continues to be attractive, although we continue to monitor valuations
- Current business climate providing new segments of interest within remote work, education, home delivery, and network services
- Smaller end of growth equity
- Technology sector

Leveraged Loans & Mezzanine

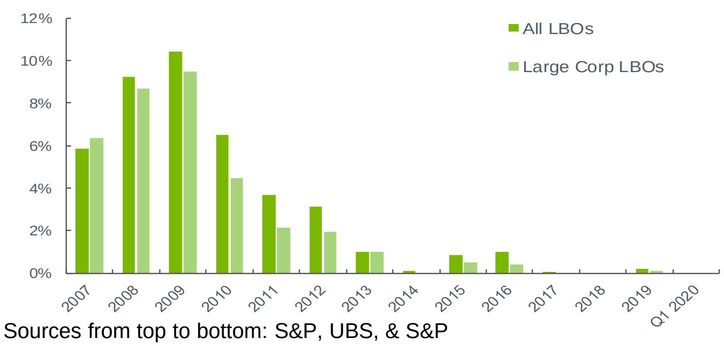
Average Leverage by Deal Size



Debt Issuance ($ Billions)



Mezzanine % of Purchase Price Multiple



Sources from top to bottom: S&P, UBS, & S&P

Leveraged Loans

Fundraising

- New CLO issuance totaled $15.6 billion in Q1 2020 compared to $118.3 billion in full-year 2019.[2]
- High-yield debt issuance totaled $72.4 billion in 1Q 2020, up 15.3% from the $62.8 billion issued in the same period of 2019.[2]
- Leveraged loan mutual fund net flows ended 1Q 2020 with a net outflow of $12.1 billion, the second largest outflow on record.[2]

Activity

- Leverage for all LBO transactions ended the year at 5.3x, down from 2019's leverage of 5.8x. Leverage continues to be comprised almost entirely of senior debt. The average leverage level for large cap LBOs was 5.3x during the year, down from the 5.9x witnessed in 2019.[3]
- YTD institutional new leveraged loan issuances totaled $89.5 million in Q1 2020, compared to full-year 2019's total of $309.2 billion.[2]
- 65.8% of new leveraged loans were used to support M&A and growth activity in 1Q 2020, down from 72.2% in 2019. This was above the five-year average of 64.7%.[3]
- European leveraged loan issuance increased substantially to €52.5 during the first quarter compared to €45.4 during full-year 2019. This was equal to the five-year average level of €52.5 billion.[3]
- March 2020 saw 10 leveraged loans cancelled or postponed due to market conditions, worth an aggregate $12.6 billion.
- UBS estimates that more than $140.0 billion of capital was drawn on companies' revolving credit facilities, indicating a willingness to improve liquidity and balance sheets as impacts of COVID-19 penetrate markets.

Opportunity

- Funds with the ability to source deals directly and the capacity to scale for large transactions (both sponsored and non-sponsored)
- Funds with an extensive track record, experience through prior credit cycles, and staff with workout experience

Mezzanine

Fundraising

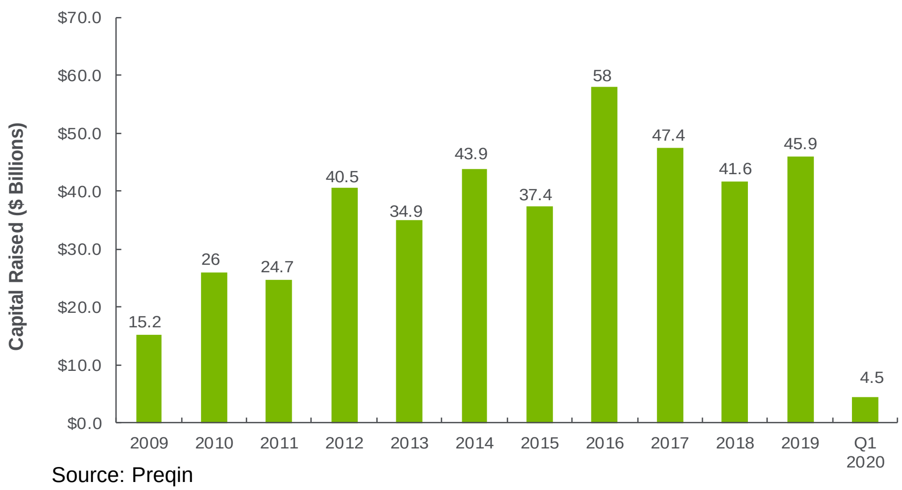
- Six funds closed on $2.3 billion during the quarter. This was a decrease from the prior quarter's total of $3.2 billion raised by eight funds and represented a decrease from the five-year quarterly average of $5.2 billion.[1]
- Estimated dry powder was $48.5 billion at the end of Q1 2020, which was up 8.7% from year-end 2019.[1]
- An estimated 84 funds are in market targeting $35,5 billion of commitments. HPS Mezzanine Partners 2019 is the largest fund in market targeting commitments of $8.0 billion.[1]

Opportunity

- Funds with the capacity to scale for large sponsored deals

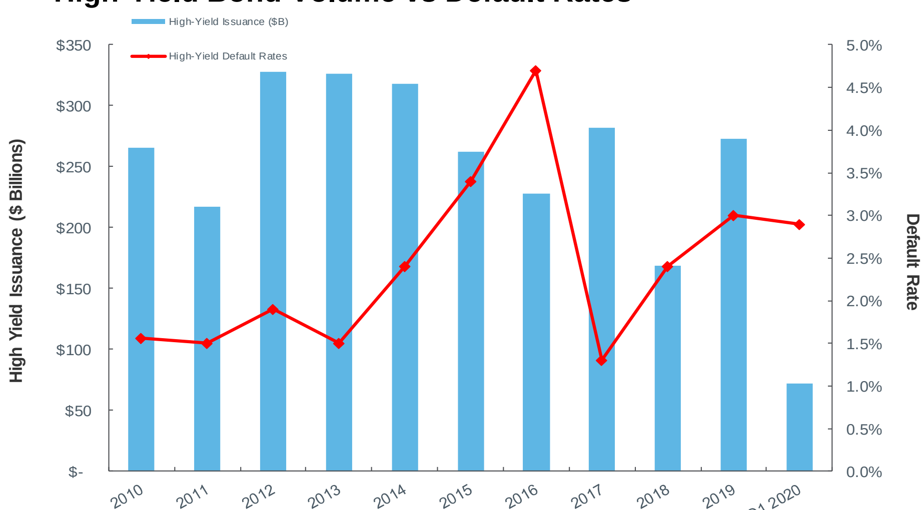
Distressed Private Markets

Distressed Debt, Turnaround, & Special Situations Fundraising



Source: Preqin

High-Yield Bond Volume vs Default Rates



Source: UBS & Fitch Ratings

Fundraising

- During the quarter, $4.5 billion was raised by nine funds compared to $22.3 billion raised by 24 funds in 4Q 2019.[1]
  - Q1 2020's fundraising was 60.1% lower than the five-year quarterly average and represented only 9.8% of 2019's total.
  - AG Credit Solutions Fund was the largest partnership raised during the quarter, closing on $1.8 billion.
- Dry powder was estimated at $117.0 billion at the end of the quarter, down slightly from year-end 2019. This was also down compared to year-end 2018 ($118.2 billion), but remained above the five-year average level of $101.8 billion.[1]
- Roughly 121 funds were in the market at the end of 1Q 2020, seeking $66.7 billion in capital commitments.[1]
  - Distressed debt managers were targeting the most capital, seeking an aggregate $35.6 billion, followed by special situation managers ($28.8 billion).
  - Clearlake Capital Partners VI and Centerbridge Special Credit Partners IV were the largest funds in market with target fund sizes of $5.0 billion.

Activity

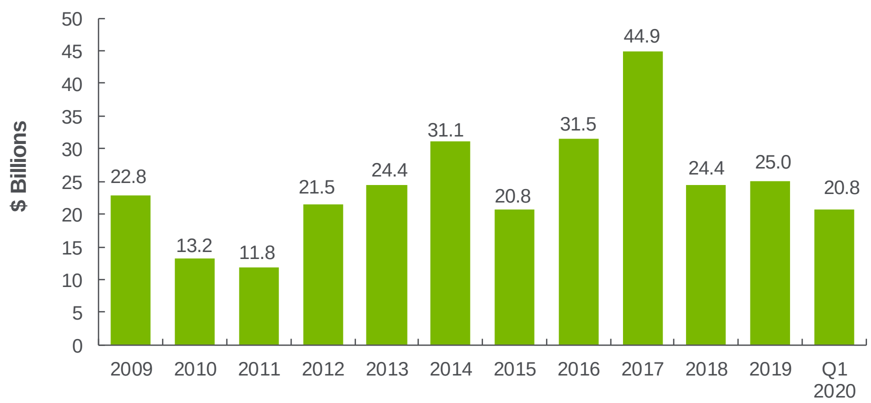
- The LTM U.S. high-yield default rate was 2.9% as of March 2020, which was down from year-end 2019's rate of 3.0%.The default rate is expected to increase substantially over the second quarter of 2020.[6]
- High purchase prices and continued elevated levels of leverage may result in an increase in distressed opportunities looking out over the next two to three years, or sooner if there is a stall in the economy. Additionally, the market dislocation caused by COVID-19 is expected to supply an abundance of distressed opportunities in the next several months.

Opportunity

- Funds capable of performing operational turnarounds
- Funds with the flexibility to invest globally
- Increased focus on distressed and turnaround opportunities during current downturn

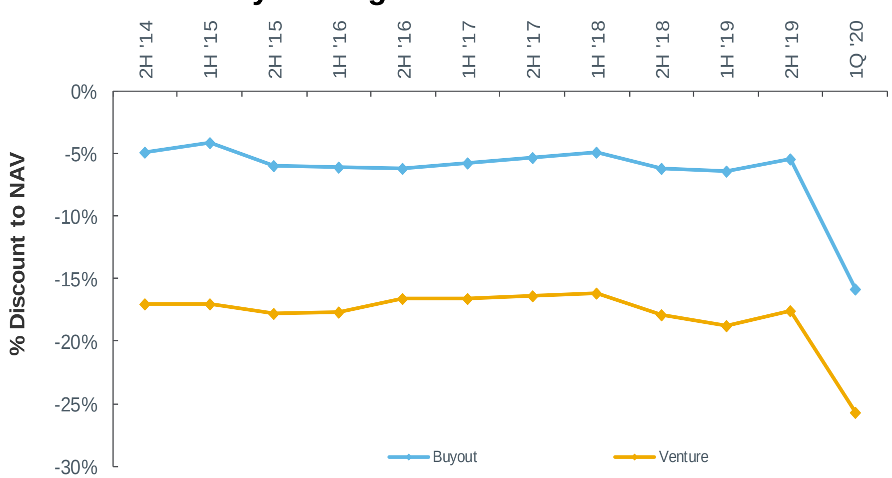
Secondaries

Secondary Fundraising



Source: Preqin

Secondary Pricing



Source: UBS

Fundraising

- 12 funds raised $20.8 billion during the quarter, up significantly from the $5.1 billion by 10 funds in 4Q 2019.This represented 83.2% of 2019's total capital raised.[1]
  - Lexington Capital Partners IX was the largest fund raised during the quarter, closing on $14.0 billion.
- Through 1Q 2020, there were an estimated 79 secondary funds in market, targeting approximately $73.6 billion. The majority of secondary funds are targeting North American investments.
  - Five funds are currently in market targeting greater than $5.0 billion in capital commitments. Together, the five funds account for $42.5 billion of the $73.6 billion of capital being raised.[1]

Activity

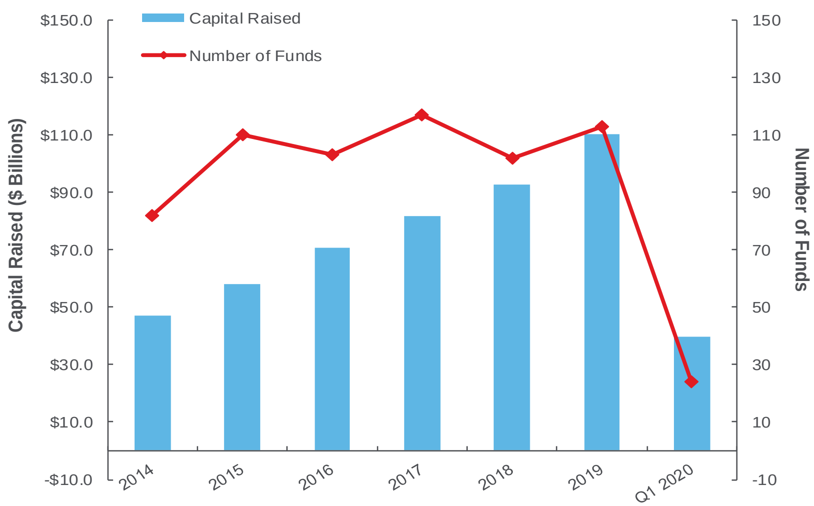
- The market continues to have strong participation from both buyers and sellers, with opportunistic selling activity from public and private pensions, financial institutions and insurance companies.
  - Middle market buyouts are expected to remain as the primary investment strategy for buyers, with continued demand for growth and mega fund strategies.
- The average discount rate for all private equity sectors finished Q1 2020 at 18.0%, down from 8.1% at the end of Q4 2019. The average buyout pricing discount ended at 15.9%, while venture ended at a discount of 25.7%. The average buyout pricing discount for Q1 was down from Q4 2019's 5.5% discount, while the venture discount was down from 17.6%.[2]
- Transaction fund leverage and deferred payment structures continue to be prevalent and are used as a means to improve pricing and deal returns in an increasingly competitive environment.[2]
- Pricing is expected to remain attractive for sellers given lower targeted return thresholds, the strong level of dry powder and the robust competitive dynamics seen in the sector.[2]
- GP-led transactions continue to take a greater share of transaction volume and activity, accounting for 38% of volume in 2019.[2]

Opportunity

- Funds that are able to execute complex and structured transactions
- Niche strategies

Infrastructure

Global Infrastructure Fundraising



Source: Preqin

Number of Deals Completed

Source: Preqin

Fundraising

- $39.6 billion of capital was raised by 24 funds in 1Q 2020 compared to $47.8 billion of capital raised by 38 partnerships in 4Q 2019.This represented 37.2% of capital raised in 2019.[1]
  - Brookfield Infrastructure Fund IV was the largest fund raised during the quarter, closing on $20.0 billion.[1]
- As of the end of 1Q 2020, there were an estimated 249 funds in the market seeking roughly $172.7 billion.[1]
  - Stonepeak Infrastructure Partners IV was the largest fund in market and was seeking commitments of $10.0 billion.
- At the end of the quarter, dry powder stood at $220.7 billion, up from the year-end 2019's record total of $212.1 billion.[1]
- Concerns surrounding the relative availability and pricing of assets remain. Fundraising continues to be very competitive given the number of funds and aggregate target level of funds in market. Investor appetite for the asset class persists despite the record levels of dry powder and increased investment activity from strategic and corporate buyers as well as institutional investors.

Activity

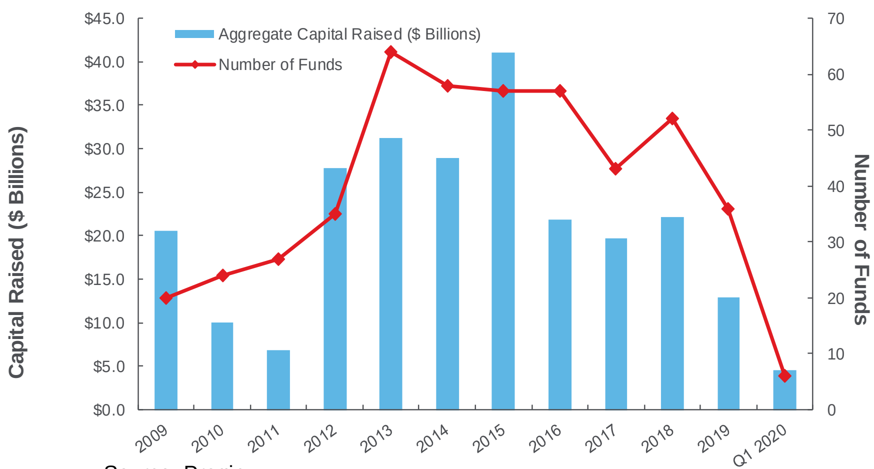
- Infrastructure managers completed 603 deals for an aggregate deal value of $79.5 billion in Q1 2020 compared to 730 deals totaling $149.2 billion in Q4 2019.[1]
  - By region, Europe saw the largest amount of deals completed, with 36.2% of deals being invested in the region, followed by North America at 30.9%. Asia amassed 15.0% of activity during the year.
  - Renewable energy was the dominant industry during the quarter with 50.3% of transactions, followed by the transportation sector, which accounted for 11.1% of deals. Utilities and telecommunications accounted for 10.6% and 9.1%, respectively, of deals during the first quarter.[1]

Opportunity

- Avoid funds with pre-specified assets due to lag in and uncertainty around valuation impact
- Blind-pool funds may be better positioned to take advantage of the market dislocation across core and core+ infrastructure, however careful review of such strategies is required
- Greenfield social / PPP infrastructure will likely continue to be less competitive and offer a premium for managers willing to take on construction risk

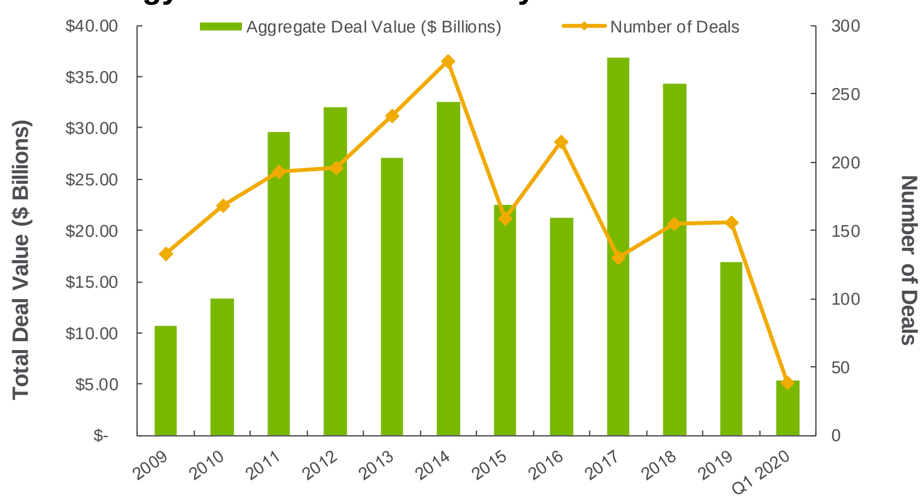
Natural Resources

Natural Resources Fundraising



Source: Preqin

Energy & Utilities Deal Activity



Source: Preqin

Fundraising

- During Q1 2020, six funds closed on $4.6 billion compared to 11 funds totaling $2.6 billion in Q4 2019.[1] The quarter's total represented 35.7% of 2019's total.
  - Kayne Private Energy Income Fund II was the largest fund raised during the quarter, securing commitments of $1.7 billion.
- At the end of the first quarter, there were roughly 105 funds in the market targeting an estimated $42.9 billion in capital, compared to 100 funds seeking an estimated $42.5 billion in 4Q 2019.[1]
  - Blackstone Energy Partners III and Carlyle International Energy Partners II remain the largest funds currently raising, each with a target fund size of $4.0 billion.
- Dry powder stood at $58.4 billion at the end of 1Q 2020, which was 8.3% higher than 4Q 2019's level of $53.9 billion and down from the five-year average level by 9.1%.[1]

Activity

- Energy and utilities industry managers completed 39 deals totaling $5.3 billion in 1Q 2020, compared to $17.0 billion across 156 deals in 2019.[1]
- Crude oil prices decreased during the quarter.
  - WTI crude oil prices decreased 51.2% during the quarter to $29.21 per bbl. This was also a decrease of 49.8% year-over-year.[11]
  - Brent crude oil prices ended the quarter at $32.01/bbl, down 52.4% and 51.6% from 4Q 2019 and 1Q 2019, respectively.[11]
- Natural gas prices (Henry Hub) finished Q1 2020 at $1.79 per MMBtu, which was down 19.4% from 4Q 2019 and down 39.3% from 1Q 2019.[11]
- A total of 728 crude oil and natural gas rotary rigs were in operation in the U.S. at the end of the quarter. This was down by 9.6% from the prior quarter and down 27.6% year-over-year.[15]
  - Crude oil rigs represented 85.7% of the total rigs in operation. 61.2% of the 624 active oil rigs were in the Permian basin.
  - 39.2% and 38.2% of natural gas rigs at the end of 2019 were operating in the Haynesville and Marcellus basins, respectively.
- The price of iron ore (Tianjin Port) ended the quarter at $88.99 per dry metric ton, down from $92.65 at year-end 2019.[12]

Opportunity

- Acquire and exploit existing oil and gas strategies preferred over early stage exploration in core U.S. and Canadian basins
- Select midstream opportunities

Notes

1. Preqin
2. UBS
3. Standard & Poor's
4. Aon Hewitt Investment Consulting
5. Moody's
6. Fitch Ratings
7. PriceWaterhouseCoopers/National Venture Capital Association MoneyTree Report
8. PitchBook/National Venture Capital Association Venture Monitor
9. Cooley Venture Financing Report
10. U.S. Energy Information Administration
11. Bloomberg
12. Setter Capital Volume Report: Secondary Market FY 2019
13. KPMG and CB Insights
14. Baker Hughes

Notes:

FY: Fiscal year ended 12/31
YTD: Year to date
YE: Year end
LTM: Last twelve months (aka trailing twelve months or TTM)
PPM: Purchase Price Multiples: Total Purchase Price / EBITDA
/bbl: Price per barrel
MMBtu: Price per million British thermal units

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Appendix B:

Real Estate Market Update

1Q 2020

United States Real Estate Market Update (1Q20)

TOWNSEND GROUP
an Aon company

General

- December 31, 2019, China reported an abnormal cluster of pneumonia cases to the World Health Organization. The cause of the pneumonia cluster, COVID-19, rapidly spread and produced a global pandemic, which led to a stark halt of economic growth. The pandemic resulted in quarantines and extended shelter in place orders. Equity markets reacted quickly, and the S&P 500 produced a gross total return of -19.6% during the quarter. The MSCI US REIT index produced a return of -27.0%. Globally, consumption, supply chains, and daily routines were disrupted.

- The U.S. entered a recession in February; GDP grew at an annualized rate of -4.8%. Initial jobless claims reached 10 million in March alone, while the unemployment rate peaked in April at 14.7%. The Federal Reserve has acted aggressively via quantitative easing and rate cuts, thus far financial markets have stabilized. In addition, the CARES Act provided $1.5 trillion of stimulus to the economy.

Commercial Real Estate

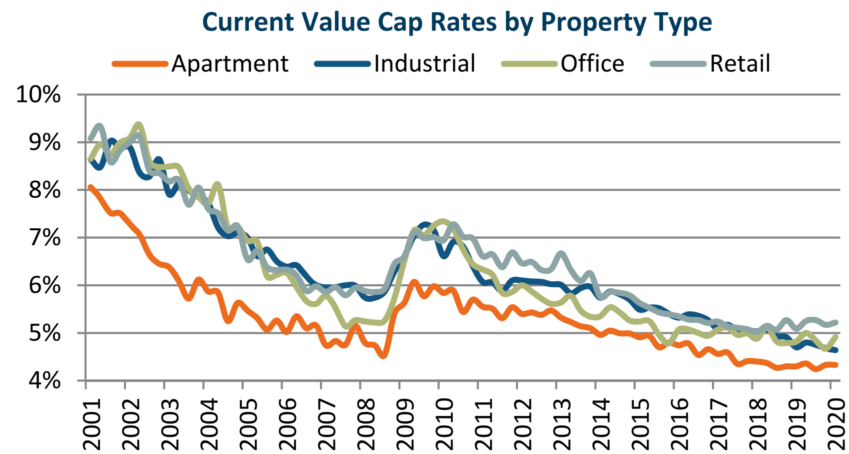
- Shelter in place orders and social distancing have restricted the ability to complete due diligence and acquire assets. Price discovery has been limited.

- Private real estate market carrying values remained flat over the quarter. Transaction cap rates (5.4%) expanded 4 bps during the quarter, while current valuation cap rates reacted differently across property sectors, industrial (-4 bps), apartments (0 bps) office (+24 bps), and retail (+5 bps).

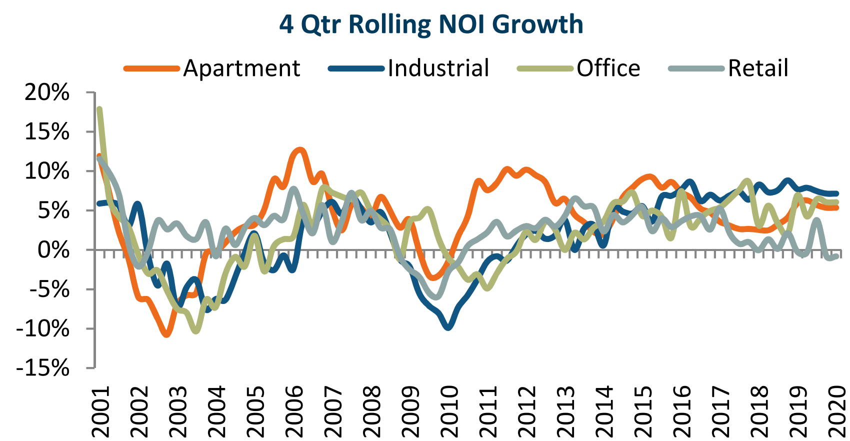
- NOI growth continued to be positive across property sectors during the quarter. Retail NOI growth continues to struggle (-230 bps) in the face of e-commerce headwinds. NOI is expected to contract in the 2nd quarter. Subsequent to quarter-end, rent collections have remained strong in the Apartment, Industrial, and Office sectors. The Retail sector has seen rent collections of 30-50% vs. more than 85% in the other major sectors.

- In the first quarter of 2020, $26 bn of aggregate capital was raised by real estate funds. There continues to be substantial dry powder,~$335 billion, seeking exposure to private real estate.

- 10-year treasury bond yields declined 122 bps to 0.70% during the quarter, as investors sought safety.



Source: NCREIF



Source: NCREIF

Sources: Bureau of Economic Analysis, U.S. Census Bureau, St. Louis Fed, NCREIF, Real Capital Analytics, Bloomberg LP., Preqin

United States Property Matrix (1Q20)

TOWNSEND® GROUP an Aon company

INDUSTRIAL

- In 1Q20, industrial properties were the highest returning sector at 2.6% and outperformed the NPI by 190 bps.
- Transaction volumes reached $33.6 billion in the first quarter of the year, a 90.0% year-over-year increase. Individual asset sales were up 4.2% year-over-year, while portfolio purchases turned in a year-over-year volume increase of 26.8%. Yet again, portfolio transaction volume was driven by multiple megadeals. The portfolio transaction volume regressed to the mean growth rate in 1Q20 following the past two quarter of astronomical growth.
- The industrial sector continued to experience steady NOI growth of 8.3% over the past year, significantly increasing from the prior periods TTM growth of 7.1% in 4Q19. Market rent growth is expected to decelerate compared to the recent phenomenal pace, but still remains very strong.
- Vacancy decreased by 2 bps to 3.5%, still remaining close to all-time historic lows. E-commerce continues to drive demand.
- Industrial cap rates compressed approximately 6 bps from a year ago, to 4.64%. Industrial fundamentals still top all property sectors.

MULTIFAMILY

- The apartment sector delivered a 1.0% return during the quarter, outperforming the NPI by 25 bps.
- Transaction volume in the first quarter of 2020 reached $39.8 billion, an increase of 2.9% year-over-year. This volume continues to make multifamily the most actively traded sector for the eleventh straight quarter.
- Cap rates stayed steady at 4.33%, inflating 3 bps year-over-year. Robust job growth and improving wages have supported healthy operating fundamentals.
- Steady demand for the sector continues to keep occupancy floating around 94.0%, vacancy has decreased 35 bps from a year ago. The aging millennials have begun shifting their desires to suburban living but continued home price appreciation has deterred the full effect of this migratory trend.

OFFICE

- The office sector returned 1.3% in 1Q20, 60 bps above the NPI return over the period.
- Transaction volumes increased by 5.7% year-over-year in Q1. Annual sales volumes equaled $30.0 billion for the quarter. Single asset transactions accounted for 80% of volume.
- Occupancy growth within the office sector has improved, increasing 0.3% year-over-year. Office continues to be the highest vacancy property type at close to 10.1%.
- NOI growth of 5.8% in the last year is a positive as the sector continued to benefit from positive job growth in the beginning of the quarter. Sun Belt and tech-oriented West Coast office fundamentals continue to prove healthiest. Due to a number of work from home orders put in place at the end of the first quarter, NOI growth is expected to trend downward.
- Office cap rates expanded from a year ago to approximately 4.91% in the first quarter. Office-using job growth is shifting negatively as expected. Many work from home policies were put in place at the end of the quarter, slowing overall office growth.

RETAIL

- As of 1Q20, the retail sector delivered a quarterly return of -2.1%, performing 280 bps below the NPI.
- Transaction volumes totaled $13.0 billion in the first quarter, increasing 4.7% year-over-year.
- Cap rates have expanded approximately 13 bps within the sector over the last year, to 5.22%.
- NOI growth remains negative for the first quarter of 2020. NOI has decreased 153 bps over the past year. Retail is expected to continue to suffer from the shift towards e-commerce and the recent shelter in place orders.
- Retail vacancy rates increased 6 bps over the past year to 7.6%. Many big box stores have closed as the need for retail space shrinks, translating to a negative outlook for rent growth.

Sources: Real Capital Analytics, Green Street, NCREIF

Global Real Estate Market Update (1Q20)

TOWNSEND® GROUP an Aon company

- Global investment activity during the first quarter of 2020 was down relative to the same period in 2019. In 2020, the New York, Los Angeles, San Francisco metro markets have witnessed the greatest transaction volume.

- Broad geopolitical risk factors, such as Brexit and the Trade War, continue to have negatively influenced sentiment. A global slowdown was triggered by the COVID-19 pandemic (with full impact beginning in March), further dampening transaction volumes. Loose monetary policy continued supporting low yields and pushing capital inflows towards real estate which offers a premium to other asset classes.

Global Total Commercial Real Estate Volume - 2019 - 2020

$ US Billions	Q1 2020	Q1 2019	% Change Q1 20 - Q1 19	Full Year Ending 1Q20	Full Year Ending 1Q19	% Change Full Year
Americas	116	99	17%	549	522	5%
EMEA	70	67	4%	377	349	8%
Asia Pacific	111	185	-40%	769	836	-8%
Total	296	351	-16%	1694	1707	-1%

Source: Real Capital Analytics, Inc., Q1' 20

- Investment volumes in the Americas increased by 17% year-over-year, including Canada and the U.S. posting investment volume growth, and Brazil showing substantial declines. The COVID-19 pandemic did not escalate in the Americas until the second half of March.

- The Asia Pacific region declined as a whole due largely to activity levels falling as a result of the pandemic. Specifically in Hong Kong, volume hit its lowest level since the Global Financial Crisis as a product of continued sociopolitical uncertainty within the metro. While South Korea experienced some growth, China, Australia, and Japan declined.

- In EMEA, Brexit continued to press UK investment volumes lower, a 1% decline from first quarter 2019. Growth for the rest of EMEA countries led to the highest Q1 investment volumes on record. The COVID-19 crisis did not escalate in EMEA until the second half of March.

- In the office sector, global leasing activity begun to see a decline as deals were cancelled or delayed. The U.S office market saw net absorption decline, as well as an 8% YoY decline in leasing activity. Europe experienced an uptick in demand and no office markets saw a fall in rents. Economic, geopolitical, and sectoral headwinds subdued leasing activity in the APAC region.

- The retail sector continued to face headwinds globally as e-commerce disrupts traditional consumer spending habits and the lockdowns to slow the spread of COVID-19 all but halted foot traffic. Within the U.S., net absorption continued to trend downward. Retail sales saw the largest monthly decline in March on record. Across both Europe and APAC, rents saw declines as sentiment begins to turn negative.

- The multifamily market in the U.S. has continued to see solid growth, with vacancy rates remaining low. Construction remains near peak levels, possibly presenting future supply headwinds. Rent control and low supply constrained activity in many European markets, but investment volume remains positive. APAC markets were mixed, a result of macroeconomic uncertainty and holiday season effects.

- Industrial properties demand continued to grow but at a slower pace. Uptake was robust globally driven by logistics and omnichannel distribution demand. New supply has been increasing rapidly, and there are signs of slowing demand in Asia while Europe recovered from a slow start earlier in the year.

Global Outlook - GDP (Real) Growth % pa, 2020-2022

	2020	2021	2022
Global	**-3.1**	**4.9**	**3.4**
Asia Pacific	**0.0**	**5.1**	**4.6**
Australia	-4.5	4.0	3.4
China	1.7	8.0	5.5
India	-2.0	7.1	
Japan	-5.0	2.2	1.1
North America	**-5.9**	**3.9**	**2.9**
US	-5.7	4.0	3.0
MENA*	**-1.0**	**2.9**	
European Union	**-7.2**	**5.0**	**2.2**
France	-9.0	6	1.8
Germany	-6.2	4.9	2.0
UK	-7.8	5.5	2.7

*Middle East North Africa

Source: Bloomberg

Sources: Jones Lang LaSalle Research, Real Capital Analytics, Inc., CBRE, Cushman & Wakefield

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REPORT

Meketa Capital Markets Outlook & Risk Metrics

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Capital Markets Outlook & Risk Metrics

As of June 30, 2020

Capital Markets Outlook

Takeaways

- For risk-oriented assets, Q2 was a mirror image of Q1. Equity markets across the globe retraced a material portion of their Q1 drawdowns, with certain markets (e.g., US growth stocks) now standing in positive return territory on a year-to-date basis. While not the strongest month of Q2, June saw most equity indices produce returns in the low-to-mid single digit range.
- The triumph of growth stocks over value stocks continued during June. In an extension from May, small cap stocks outperformed large cap stocks during June and over the most recent quarter in aggregate. There continues to be a material divergence in trailing period performance for growth vs. value and small vs. large, and this is exemplified at the extremes with large cap growth stocks (e.g., Russell 1000 Growth) outperforming small cap value stocks (e.g., Russell 2000 Value) by over 30% thus far in 2020.
- As the Federal Reserve continued to implement unprecedented monetary policies, US Treasuries produced flat-to-positive returns during June.
- The US Treasury interest rate curve was essentially unchanged from the end of May to the end of June. Intramonth volatility did occur at the long end of the curve, however, as 10- to 30-year bonds saw their yields fluctuate within a range of approximately 30 basis points (at current levels, 30 basis point swings represent material bond price fluctuations).

Capital Markets Outlook

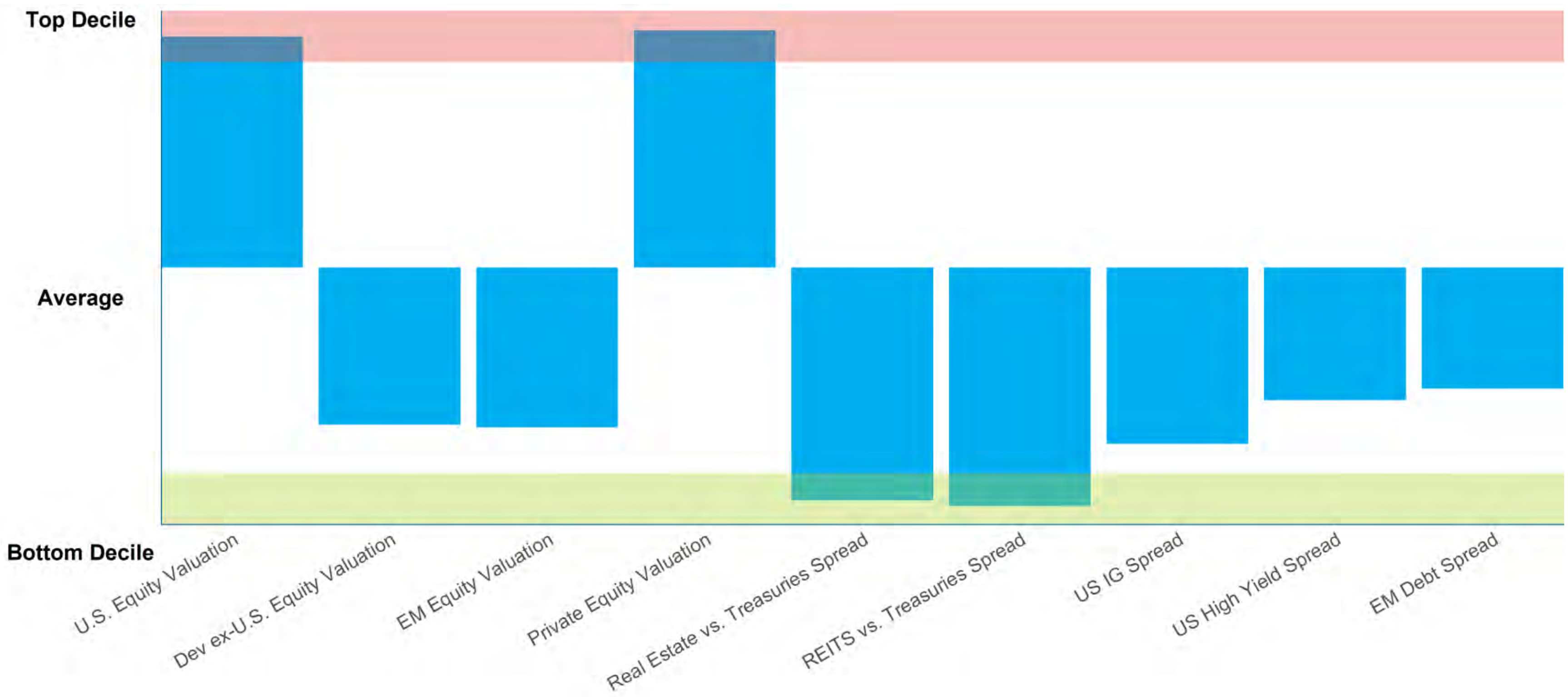
Takeaways

- Local/regional US economies are in various stages of reopening, and the timeline for returning to normal levels of economic activity remains uncertain. Relatedly, the aggregate impacts to global GDP due to the COVID-19 pandemic are still unknown. Although certain pieces of economic data have come in higher than expectations, economic conditions are still far from pre-COVID levels.
- Although monetary and fiscal policies across the globe remain extremely accommodative, many global authorities appear to be in a period of observation as they attempt to gauge how the economy does, or does not, recover in the short term. If the recovery proves insufficient, it is expected that we will experience a continuation of the until recently unprecedented policies to combat a sustained economic downturn.
- Implied equity market volatility[1] began the month around 28 and hit a peak near 44 during the middle of the month before declining to roughly 30.5 at month-end. Likewise, our Systemic Risk measure increased at the margin during June.
- While valuations for several risk-based asset classes appear attractive at first glance, it is important to note that the full impact on corporate earnings and solvencies remains unknown. The actual path that the global economy will take moving forward is uncertain.
- The Market Sentiment Indicator[2] flipped to grey (i.e., neutral) at month-end.

[1] As measured by VIX Index.

[2] See Appendix for the rationale for selection and calculation methodology used for the risk metrics.

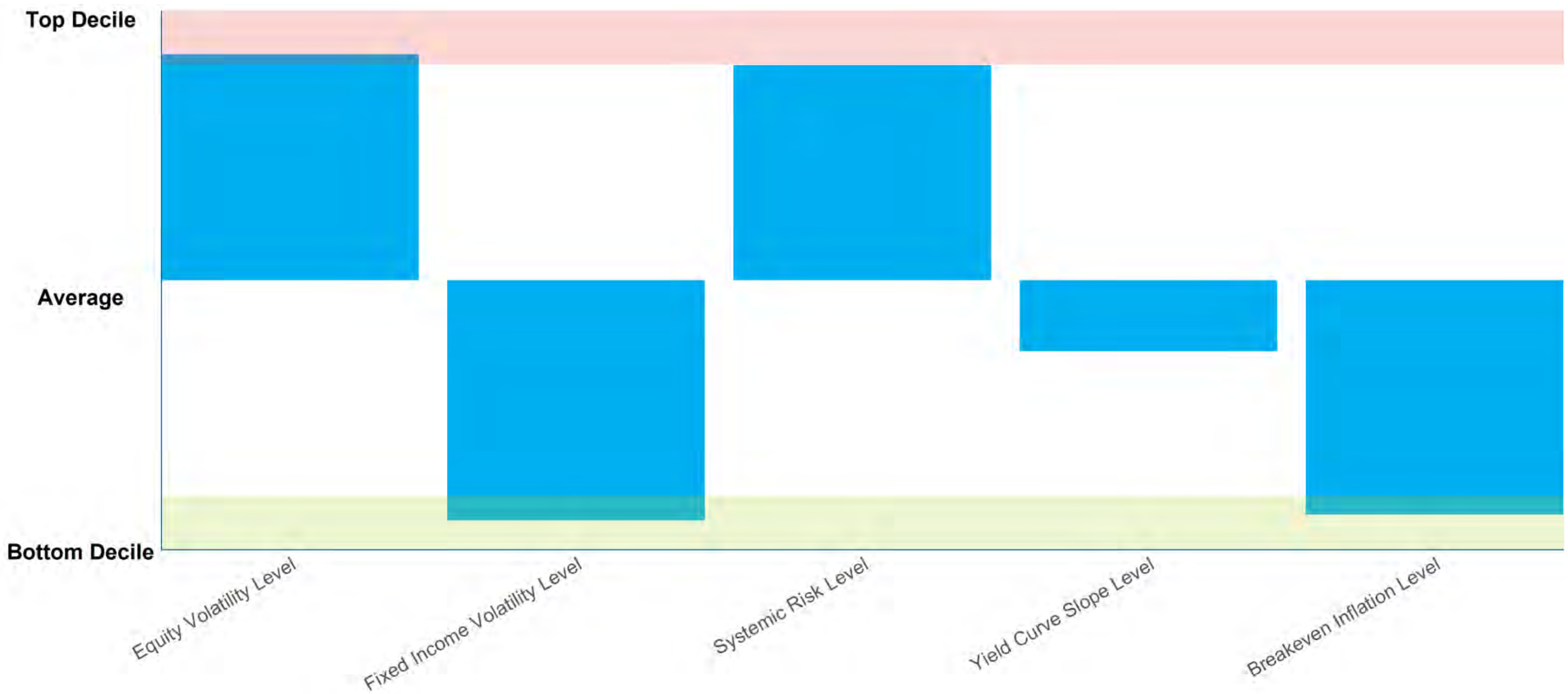
Risk Overview/Dashboard (1)
(As of June 30, 2020)[1]



- Dashboard (1) summarizes the current state of the different valuation metrics per asset class relative to their own history.

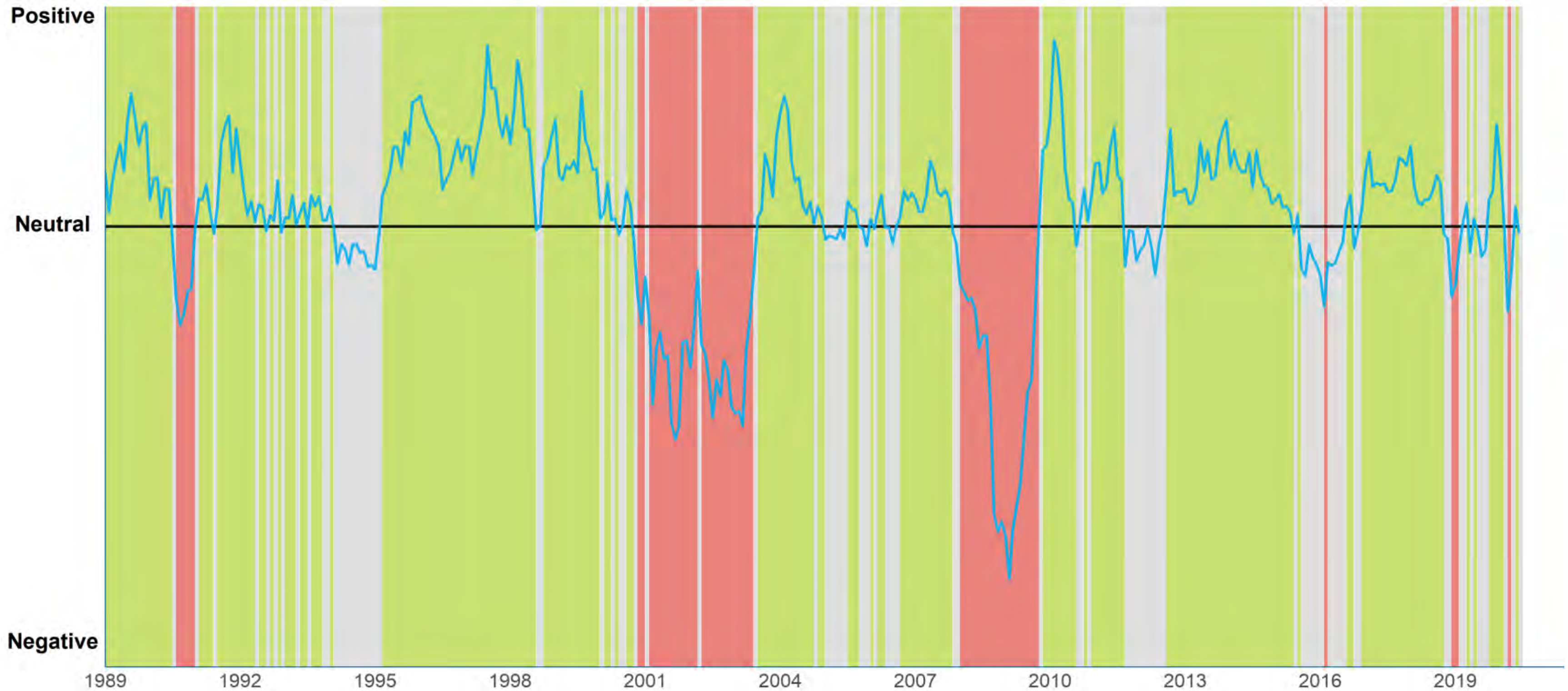
[1] With the exception of Private Equity Valuation, that is YTD as of December 31, 2019.

Risk Overview/Dashboard (2)
(As of June 30, 2020)

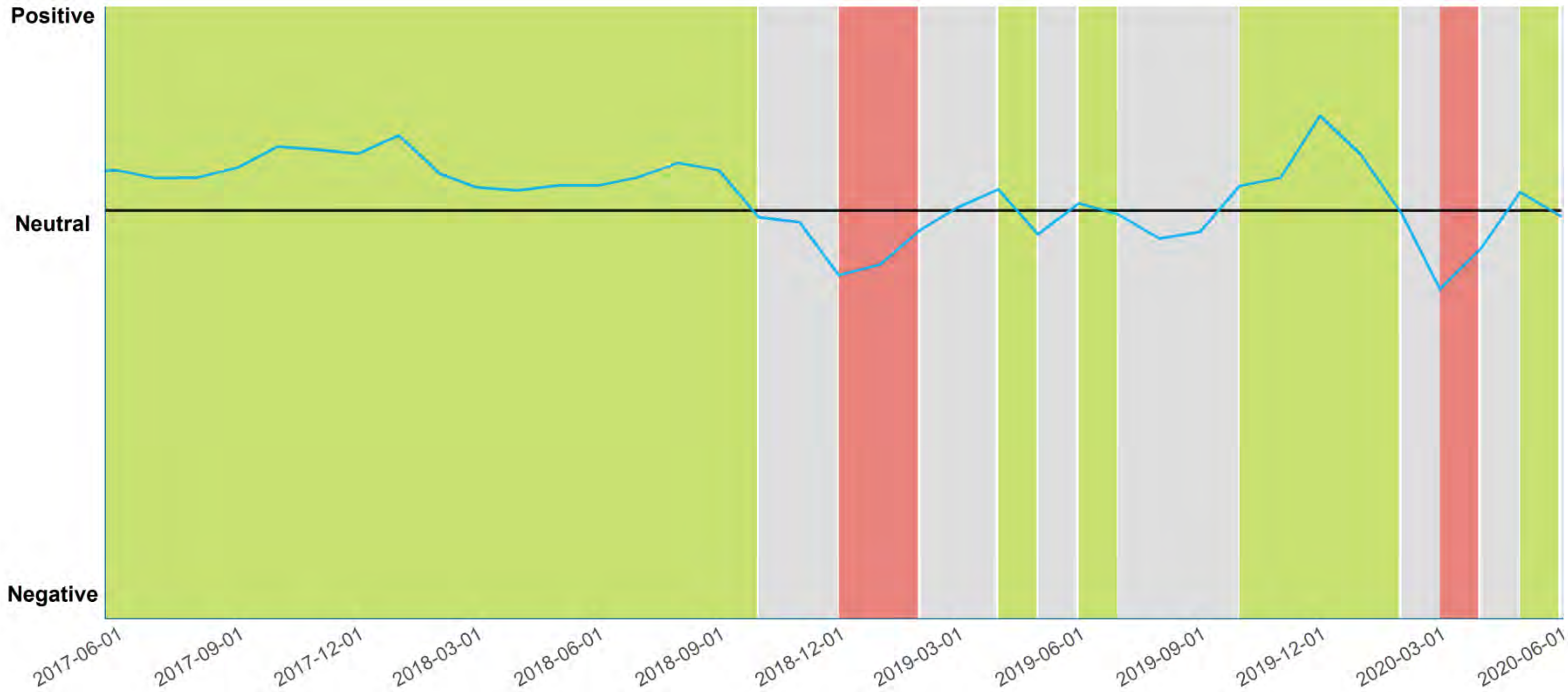


- Dashboard (2) shows how the current level of each indicator compares to its respective history.

Market Sentiment Indicator (All History)
(As of June 30, 2020)



Market Sentiment Indicator (Last Three Years)
(As of June 30, 2020)



US Equity Cyclically Adjusted P/E[1]
(As of June 30, 2020)

- This chart details one valuation metric for US equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group.

Small Cap P/E vs. Large Cap P/E[1]
(As of June 30, 2020)

- This chart compares the relative attractiveness of small cap US equities vs. large cap US equities on a valuation basis. A higher (lower) figure indicates that large cap (small cap) is more attractive.

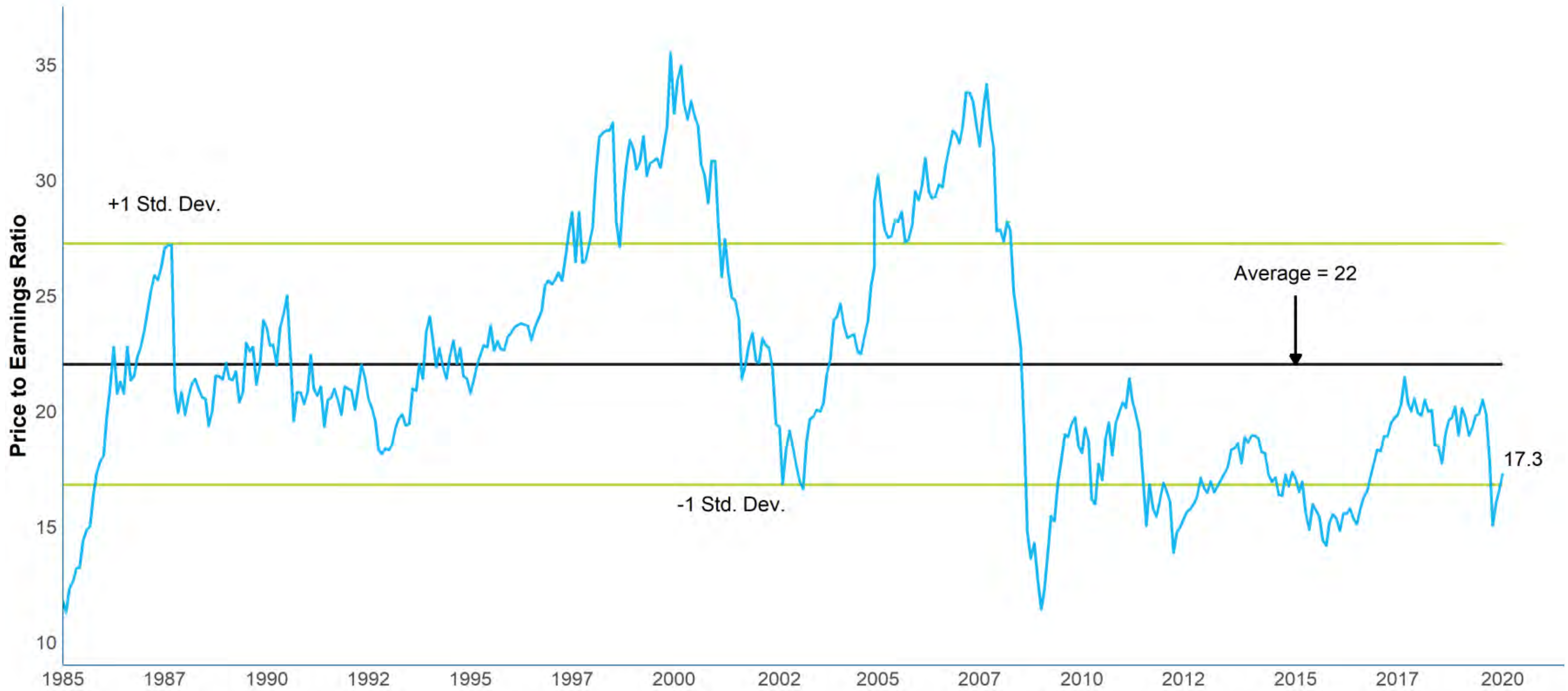
[1] Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.

Growth P/E vs. Value P/E[1]
(As of June 30, 2020)

- This chart compares the relative attractiveness of US growth equities vs. US value equities on a valuation basis. A higher (lower) figure indicates that value (growth) is more attractive.

[1] Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.

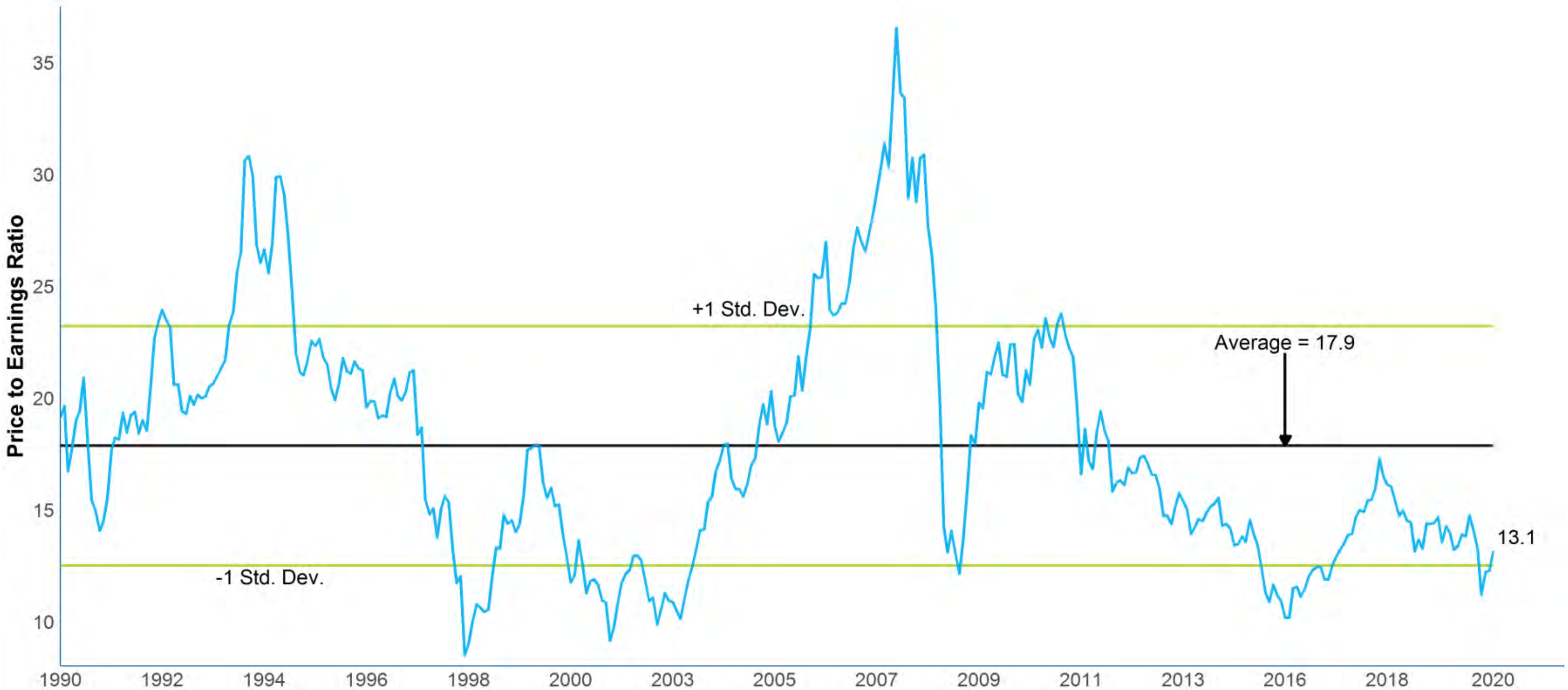
Developed International Equity Cyclically Adjusted P/E[1]
(As of June 30, 2020)



- This chart details one valuation metric for developed international equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Developed International Equity (MSCI EAFE ex Japan Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

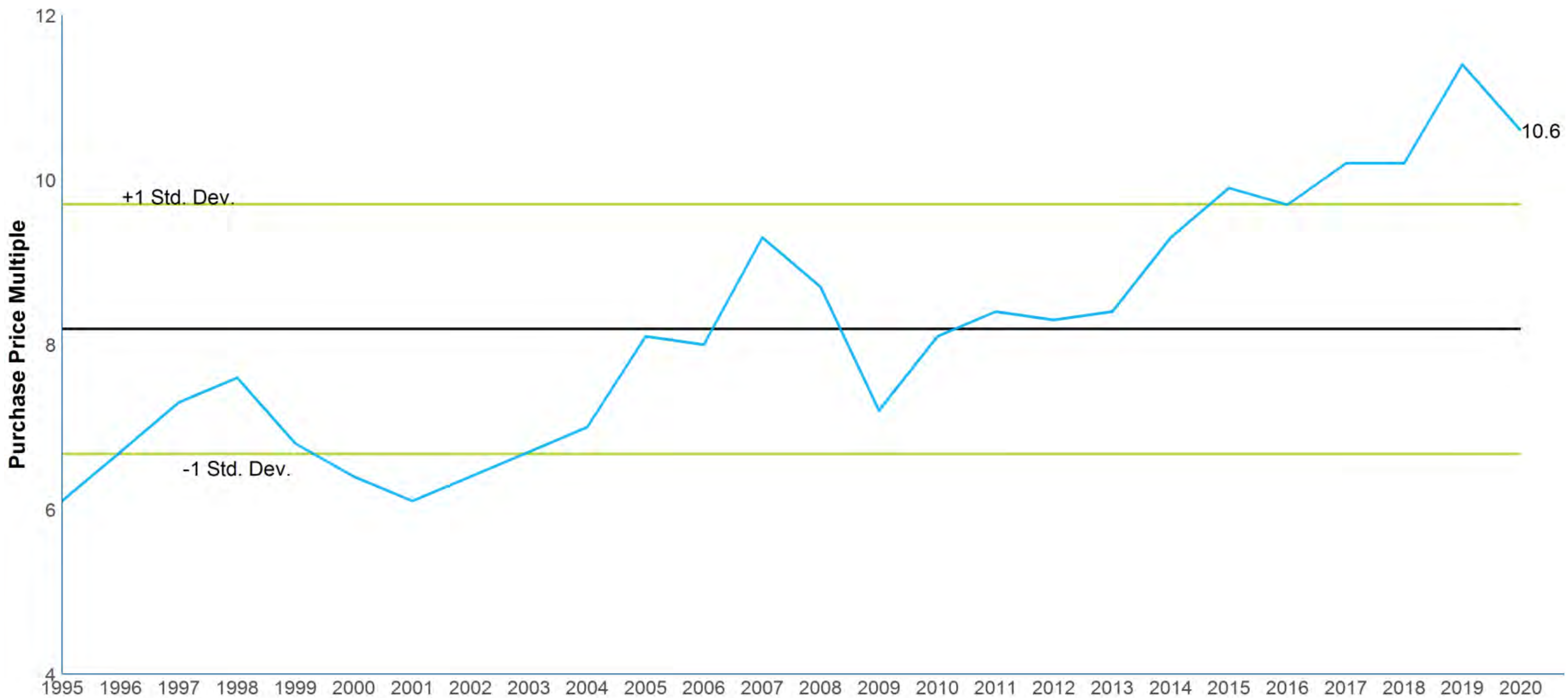
Emerging Market Equity Cyclically Adjusted P/E[1]
(As of June 30, 2020)



- This chart details one valuation metric for emerging markets equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

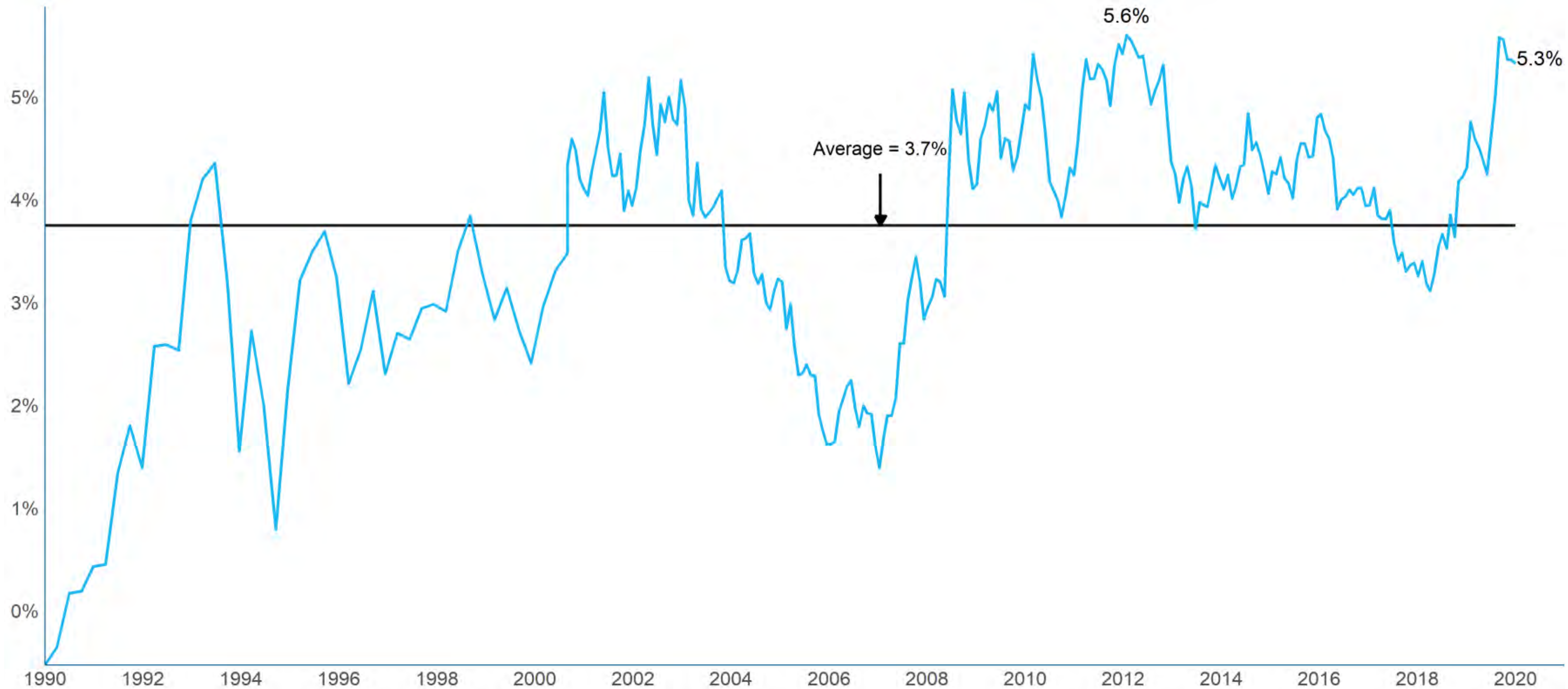
Private Equity Multiples[1]
(As of February 29, 2020)[2]



- This chart details one valuation metric for the private equity market. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs.
[2] Annual figures, except for 2020 (YTD).

Core Real Estate Spread vs. Ten-Year Treasury[1]
(As of June 30, 2020)

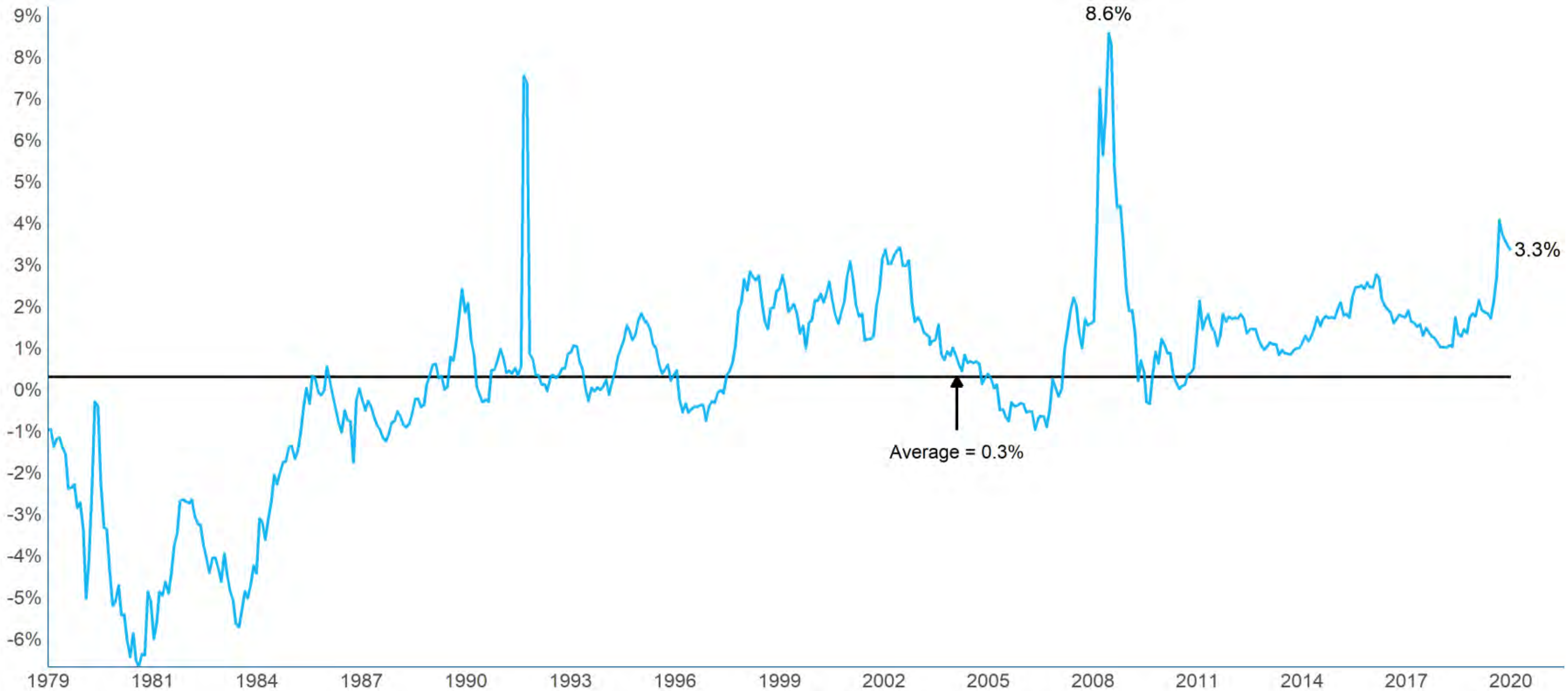


- This chart details one valuation metric for the private core real estate market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction based indices from Real Capital Analytics and Meketa Investment Group.

REITs Dividend Yield Spread vs. Ten-Year Treasury[1]

(As of June 30, 2020)

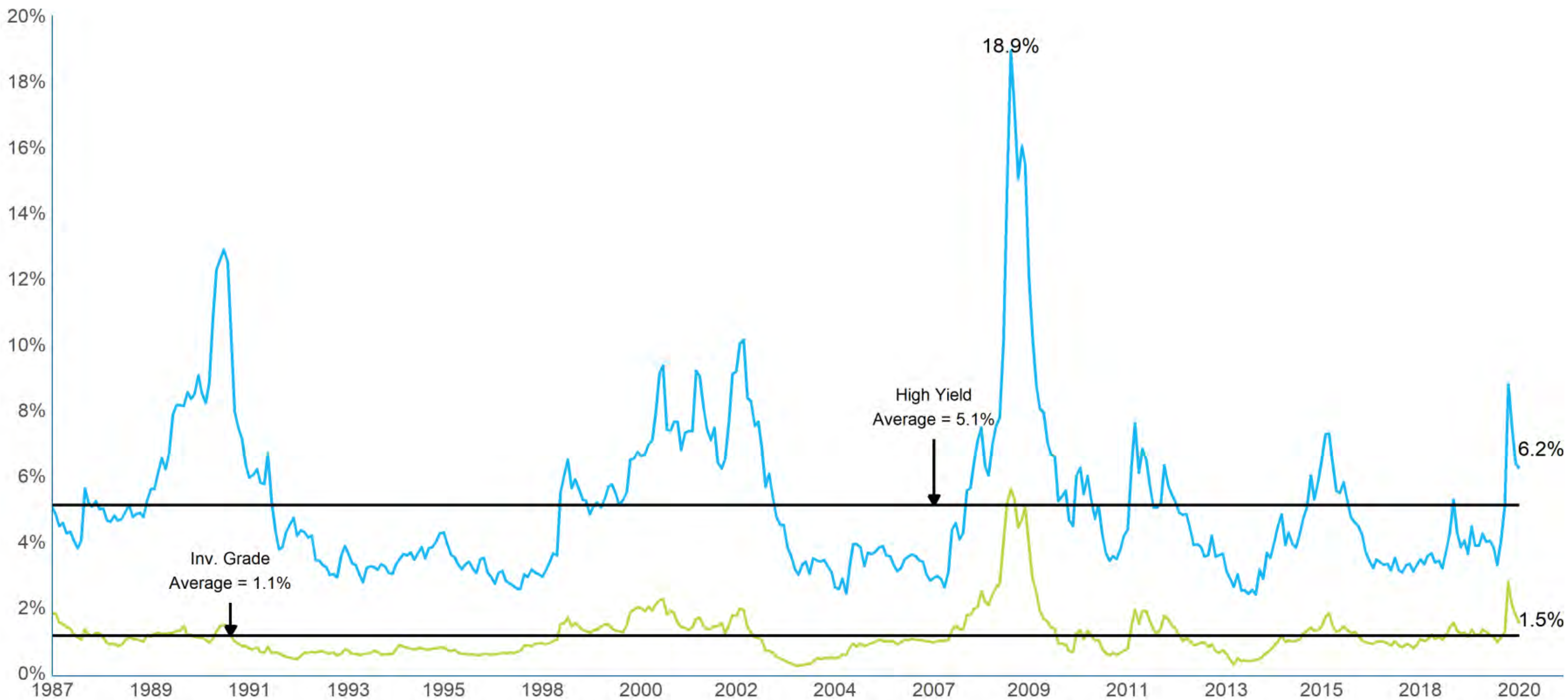


- This chart details one valuation metric for the public REITs market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity index.

Credit Spreads[1]

(As of June 30, 2020)



- This chart details one valuation metric for the US credit markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

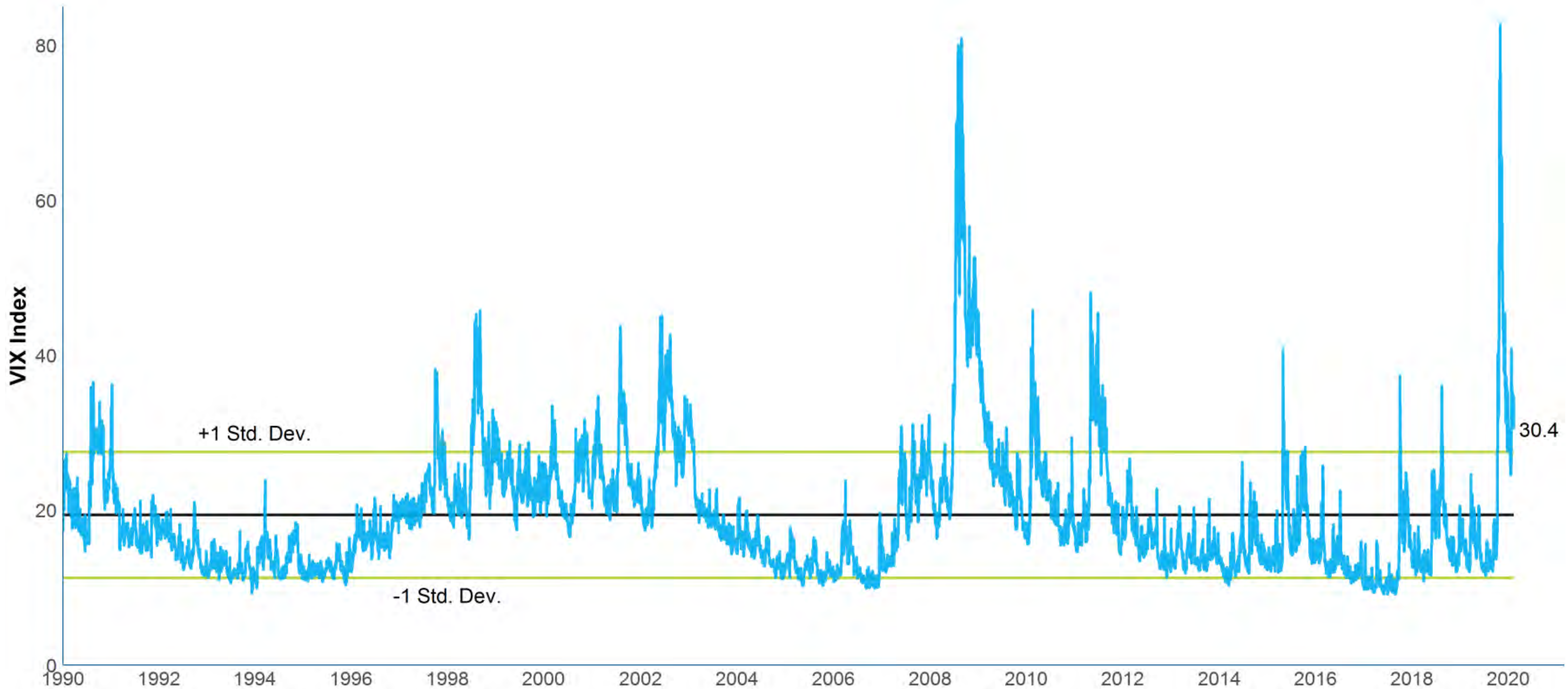
[1] Credit Spreads – Source: Barclays Capital. High Yield is proxied by the Barclays High Yield index and Investment Grade Corporates are proxied by the Barclays US Corporate Investment Grade index. Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year US Treasury yield.

Emerging Market Debt Spreads[1]
(As of June 30, 2020)

- This chart details one valuation metric for the EM debt markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

[1] EM Spreads – Source: Bloomberg. Option Adjusted Spread (OAS) for the Bloomberg Barclays EM USD Aggregate Index.

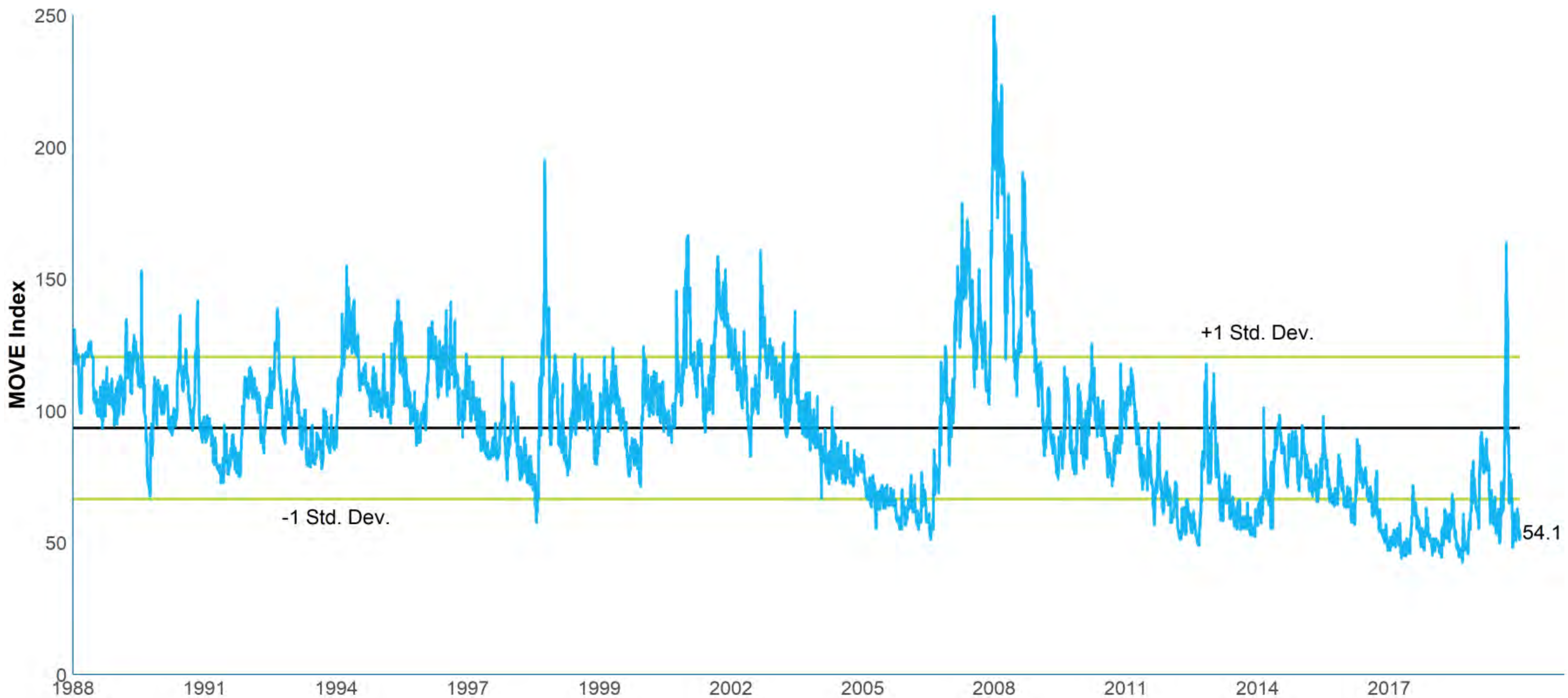
Equity Volatility[1]
(As of June 30, 2020)



- This chart details historical implied equity market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.

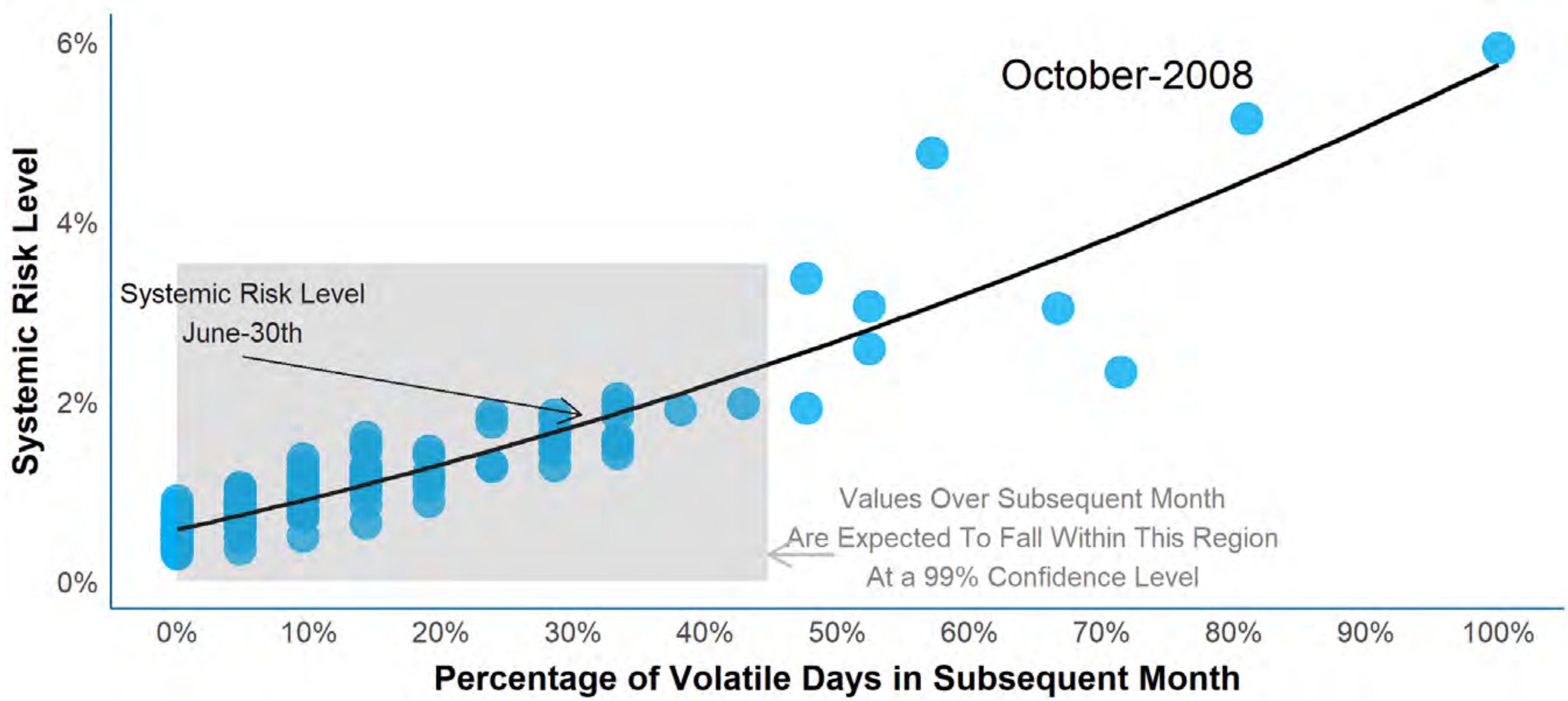
Fixed Income Volatility[1]
(As of June 30, 2020)



- This chart details historical implied fixed income market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Fixed Income Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.

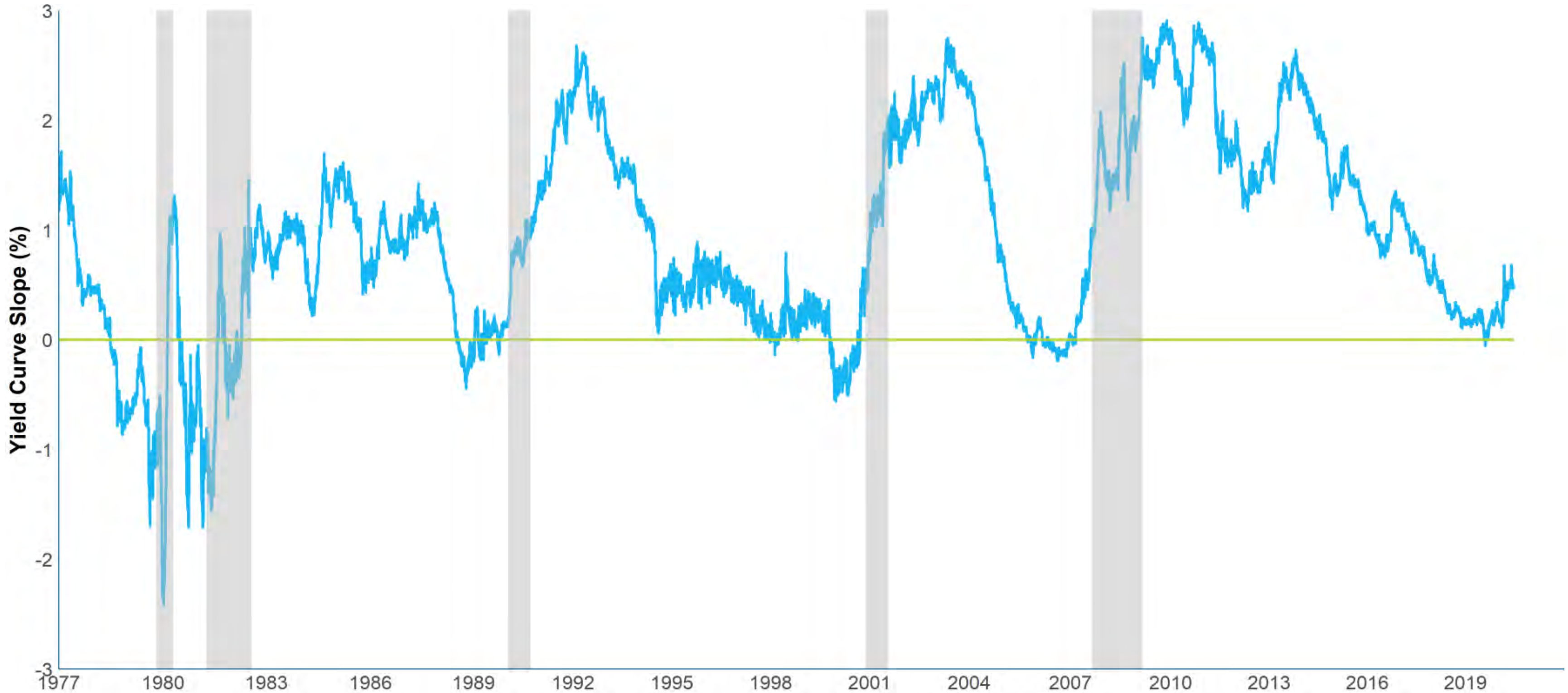
Systemic Risk and Volatile Market Days[1]
(As of June 30, 2020)



- Systemic Risk is a measure of 'System-wide' risk, which indicates herding type behavior.

[1] Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

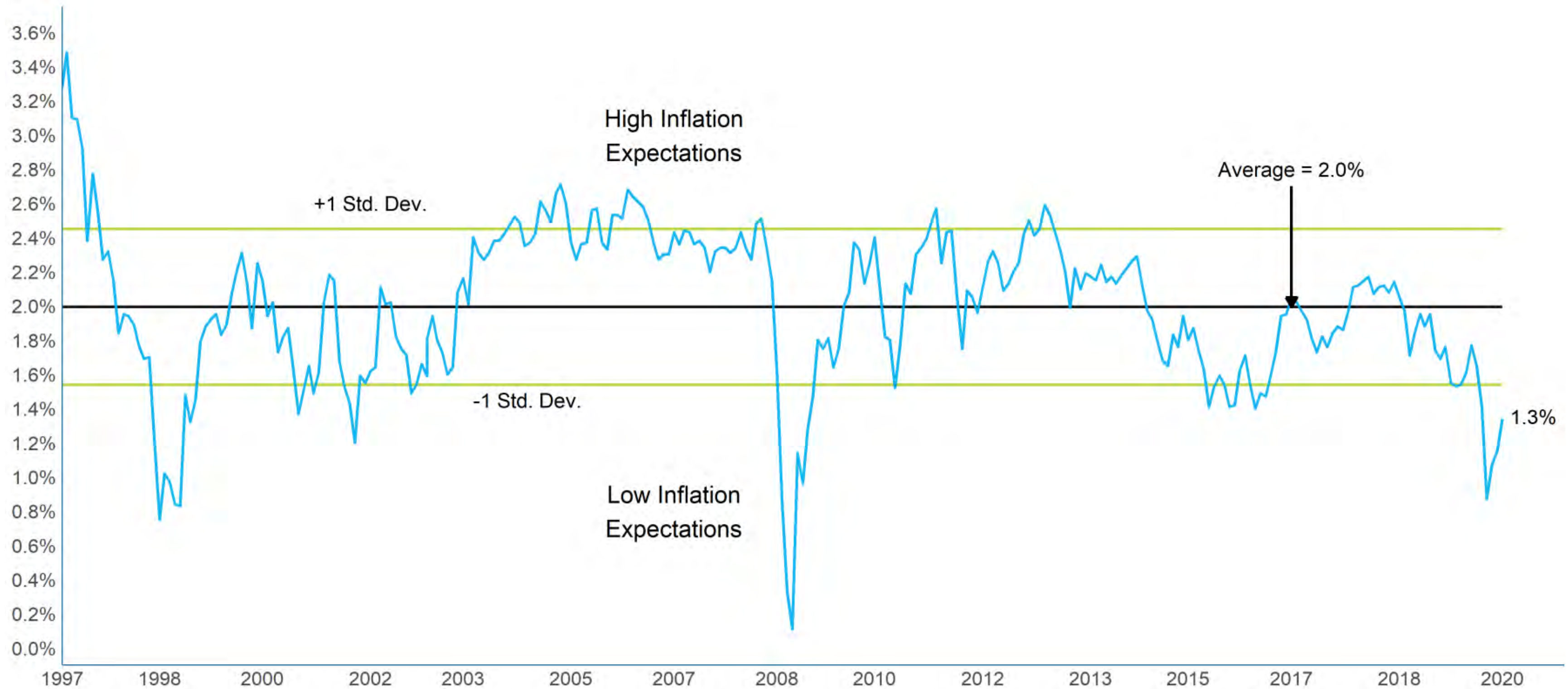
Yield Curve Slope (Ten Minus Two)[1]
(As of June 30, 2020)



- This chart details the historical difference in yields between ten-year and two-year US Treasury bonds/notes. A higher (lower) figure indicates a steeper (flatter) yield curve slope.

[1] Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

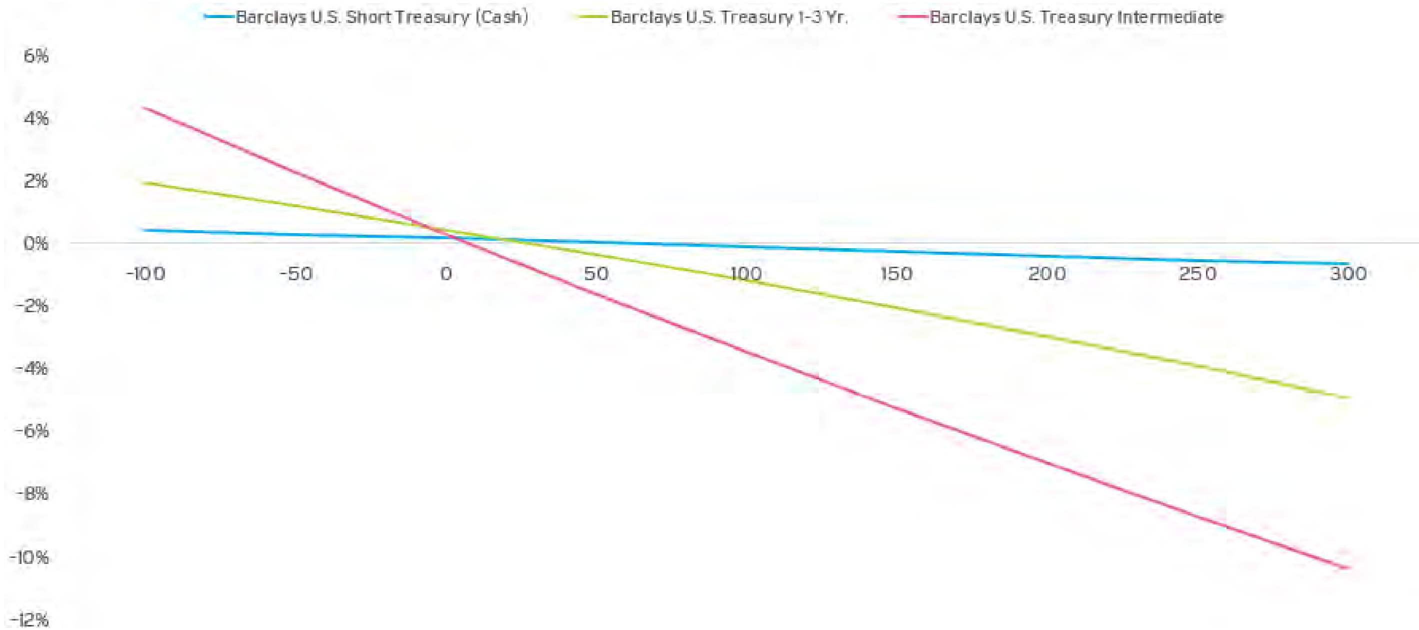
Ten-Year Breakeven Inflation[1]
(As of June 30, 2020)



- This chart details the difference between nominal and inflation-adjusted US Treasury bonds. A higher (lower) figure indicates higher (lower) inflation expectations.

[1] Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

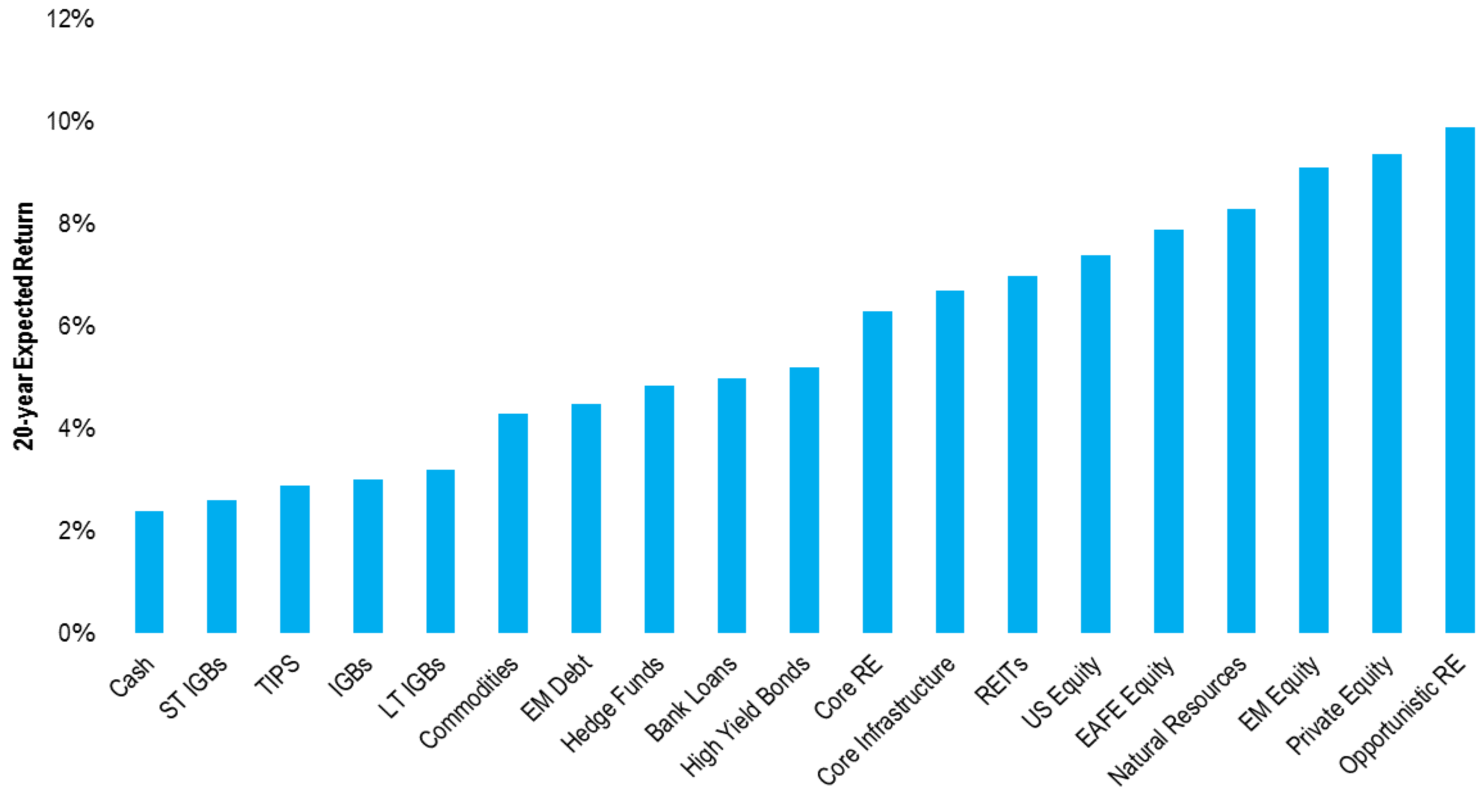
Total Return Given Changes in Interest Rates (bps)[1]
(As of June 30, 2020)



	Total Return for Given Changes in Interest Rates (bps)									Statistics	
	-100	-50	0	50	100	150	200	250	300	Duration	YTW
Barclays US Short Treasury (Cash)	0.40%	0.27%	0.14%	0.01%	-0.12%	-0.25%	-0.37%	-0.50%	-0.63%	0.26	0.14%
Barclays US Treasury 1-3 Yr.	1.90%	1.17%	0.41%	-0.39%	-1.22%	-2.10%	-3.01%	-3.95%	-4.94%	1.56	0.41%
Barclays US Treasury Intermediate	4.28%	2.25%	0.28%	-1.64%	-3.50%	-5.30%	-7.05%	-8.75%	-10.39%	3.89	0.28%
Barclays US Treasury Long	23.08%	11.62%	1.32%	-7.82%	-15.80%	-22.63%	-28.29%	-32.80%	-36.15%	19.44	1.32%

[1] Data represents the expected total return from a given change in interest rates (shown in basis points) over a 12-month period assuming a parallel shift in rates. Source: Bloomberg, and Meketa Investment Group.

Long-Term Outlook – 20-Year Annualized Expected Returns[1]



- This chart details Meketa's long-term forward-looking expectations for total returns across asset classes.

[1] Source: Meketa Investment Group's 2020 Annual Asset Study.

Appendix

Data Sources and Explanations[1]

- US Equity Cyclically Adjusted P/E on S&P 500 Index – Source: Robert Shiller and Yale University.
- Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.
- Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.
- Developed International Equity (MSCI EAFE ex Japan Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.
- Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years
- Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs
- Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction based indices from Real Capital Analytics and Meketa Investment Group.

[1] All Data as of March 31, 2020 unless otherwise noted.

Appendix

Data Sources and Explanations[1]

- REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity index.
- Credit Spreads – Source: Barclays Capital. High Yield is proxied by the Barclays High Yield index and Investment Grade Corporates are proxied by the Barclays US Corporate Investment Grade index.
  - Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year Treasury Yield.
- EM Debt Spreads – Source: Bloomberg, and Meketa Investment Group. Option Adjusted Spread (OAS) for the Bloomberg Barclays EM USD Aggregate Index.
- Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.
- Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.
- Systemic Risk and Volatile Market Days – Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

[1] All Data as of March 31, 2020 unless otherwise noted.

Appendix

Data Sources and Explanations[1]

- Systemic Risk, which measures risk across markets, is important because the more contagion of risk that exists between assets, the more likely it is that markets will experience volatile periods.
- Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.
- Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

[1] All Data as of March 31, 2020 unless otherwise noted.

Meketa Market Sentiment Indicator

Explanation, Construction and Q&A

Meketa has created the MIG Market Sentiment Indicator (MIG-MSI) to complement our valuation-focused Risk Metrics. This measure of sentiment is meant to capture significant and persistent shifts in long-lived market trends of economic growth risk, either towards a risk-seeking trend or a risk-aversion trend.

This appendix explores:

- What is the Meketa Market Sentiment Indicator?
- How do I read the indicator graph?
- How is the Meketa Market Sentiment Indicator constructed?
- What do changes in the indicator mean?

Meketa has created a market sentiment indicator for monthly publication (the MIG-MSI – see below) to complement Meketa's Risk Metrics.

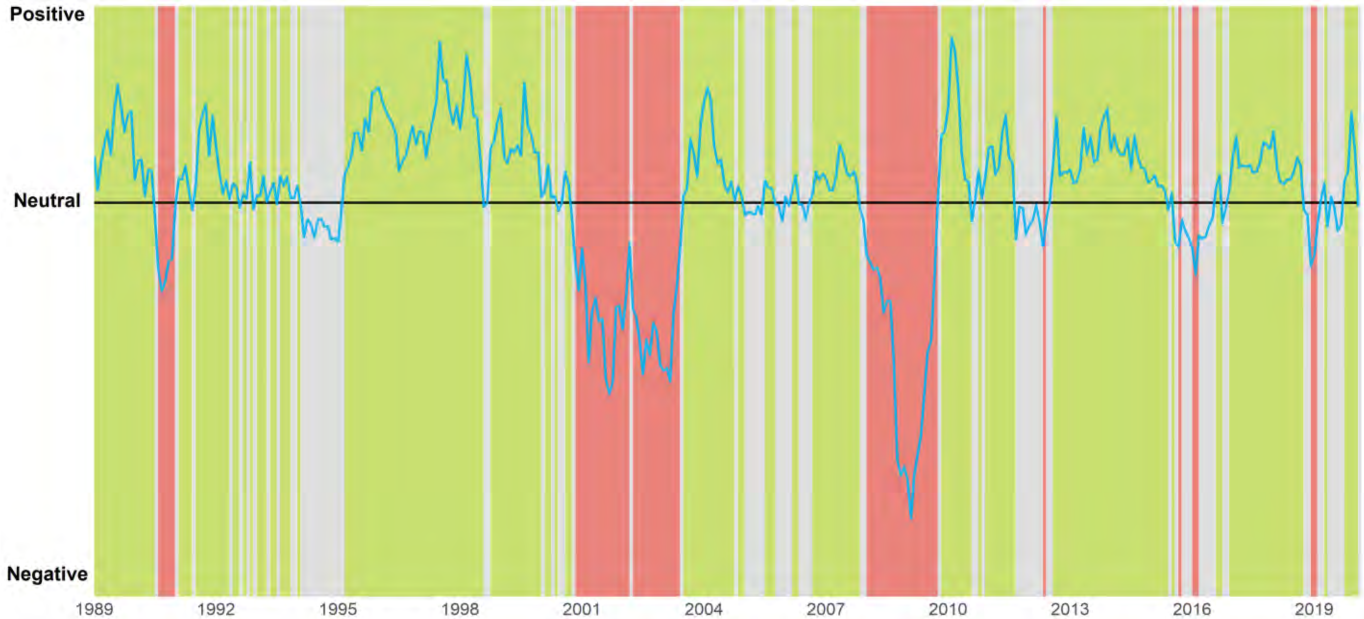
- Meketa's Risk Metrics, which rely significantly on standard market measures of relative valuation, often provide valid early signals of increasing long-term risk levels in the global investment markets. However, as is the case with numerous valuation measures, the Risk Metrics may convey such risk concerns long before a market corrections take place. The MIG-MSI helps to address this early-warning bias by measuring whether the markets are beginning to acknowledge key Risk Metrics trends, and / or indicating non-valuation based concerns. Once the MIG-MSI indicates that the market sentiment has shifted, it is our belief that investors should consider significant action, particularly if confirmed by the Risk Metrics. Importantly, Meketa believes the Risk Metrics and MIG-MSI should always be used in conjunction with one another and never in isolation. The questions and answers below highlight and discuss the basic underpinnings of the Meketa MIG-MSI:

What is the Meketa Market Sentiment Indicator (MIG-MSI)?

- The MIG-MSI is a measure meant to gauge the market's sentiment regarding economic growth risk. Growth risk cuts across most financial assets, and is the largest risk exposure that most portfolios bear. The MIG-MSI takes into account the momentum (trend over time, positive or negative) of the economic growth risk exposure of publicly traded stocks and bonds, as a signal of the future direction of growth risk returns; either positive (risk seeking market sentiment), or negative (risk averse market sentiment).

How do I read the Meketa Market Sentiment Indicator graph?

- Simply put, the MIG-MSI is a color-coded indicator that signals the market's sentiment regarding economic growth risk. It is read left to right chronologically. A green indicator on the MIG-MSI indicates that the market's sentiment towards growth risk is positive. A gray indicator indicates that the market's sentiment towards growth risk is neutral or inconclusive. A red indicator indicates that the market's sentiment towards growth risk is negative. The black line on the graph is the level of the MIG-MSI. The degree of the signal above or below the neutral reading is an indication the signal's current strength.
- Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.



How is the Meketa Market Sentiment Indicator (MIG-MSI) Constructed?

- The MIG-MSI is constructed from two sub-elements representing investor sentiment in stocks and bonds:
  - Stock return momentum: Return momentum for the S&P 500 Equity Index (trailing 12-months)
  - Bond yield spread momentum: Momentum of bond yield spreads (excess of the measured bond yield over the identical duration US Treasury bond yield) for corporate bonds (trailing 12-months) for both investment grade bonds (75% weight) and high yield bonds (25% weight).
  - Both measures are converted to Z-scores and then combined to get an “apples to apples” comparison without the need of re-scaling.
- The black line reading on the graph is calculated as the average of the stock return momentum measure and the bonds spread momentum measure.[1] The color reading on the graph is determined as follows:
  - If both stock return momentum and bond spread momentum are positive = GREEN (positive)
  - If one of the momentum indicators is positive, and the other negative = GRAY (inconclusive)
  - If both stock return momentum and bond spread momentum are negative = RED (negative)

[1] Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.
“Time Series Momentum” Moskowitz, Ooi, Pedersen, August 2010. *http://pages.stern.nyu.edu/~lpederse/papers/TimeSeriesMomentum.pdf*

What does the Meketa Market Sentiment Indicator (MIG-MSI) mean? Why might it be useful?

- There is strong evidence that time series momentum is significant and persistent. In particular, across an extensive array of asset classes, the sign of the trailing 12-month return (positive or negative) is indicative of future returns (positive or negative) over the next 12-month period. The MIG-MSI is constructed to measure this momentum in stocks and corporate bond spreads. A reading of green or red is agreement of both the equity and bond measures, indicating that it is likely that this trend (positive or negative) will continue over the next 12 months. When the measures disagree, the indicator turns gray. A gray reading does not necessarily mean a new trend is occurring, as the indicator may move back to green, or into the red from there. The level of the reading (black line) and the number of months at the red or green reading, gives the user additional information on which to form an opinion, and potentially take action.

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REPORT

Comprehensive Performance Report

June 30, 2020

Comprehensive Performance Report

June 30, 2020

Description of SBI Investment Programs

The Minnesota State Board of Investment is responsible for the investment management of various retirement funds, trust funds and cash accounts.

Combined Funds

The Combined Funds represent the assets for both the active and retired public employees in the statewide retirement systems, the biggest of which are the Public Employees Retirement Association (PERA), the Teachers Retirement Association (TRA), and the Minnesota State Retirement System (MSRS). The SBI commingles the assets of these plans into the Combined Funds to capture investment efficiencies. All assets in the Combined Funds are managed externally by investment management firms retained by contract.

Fire Plans + Other Retirement Plans

Fire Plans and Other Retirement Plans include assets from volunteer fire relief plans and other public retirement plans with authority to invest with the SBI, if they so choose. Fire Plans that are not eligible to be consolidated with Public Employees Retirement Association (PERA) or elect not to be administered by PERA may invest their assets with the SBI using the same asset pools as the Combined Funds. The Statewide Volunteer Firefighter Retirement Plan is administered by PERA and has its own investment vehicle called the Volunteer Firefighter Account.

Participant Directed Investment Program

The Participant Directed Investment Program (PDIP) provides investment vehicles for a variety of retirement or other tax-advantaged savings plans. Investment goals among the PDIP’s many participants are varied. In order to meet the variety of goals, participants may allocate their investments among one or more accounts that are appropriate for their needs within statutory requirements and rules established by the participating organizations.

Non-Retirement

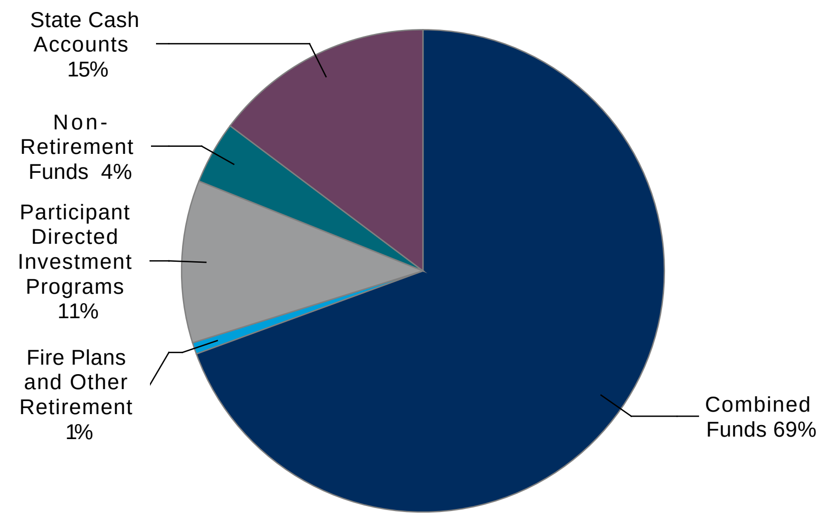
The Non-Retirement Funds are funds established by the State of Minnesota and other government entities for various purposes which include the benefit of public schools, the environment, other post-employment benefits, workers compensation insurance, and other purposes.

State Cash

The State Cash accounts are cash balances of state government funds including the State General Fund. Most accounts are invested by SBI staff through a short-term pooled fund referred to as the Treasurer's Cash Pool. It contains the cash balances of special or dedicated accounts necessary for the operation of certain State agencies and non-dedicated cash in the State Treasury. Because of special legal restrictions, a small number of cash accounts cannot be commingled.

Funds Under Management

	$ Millions
COMBINED FUNDS	$71,053
FIRE PLANS + OTHER RETIREMENT	792
PARTICIPANT DIRECTED INVESTMENT PROGRAMS	11,154
State Deferred Compensation Plan	7,717
Health Care Savings Plan	1,299
Unclassified Employees Retirement Plan	331
Hennepin County Supplemental Retirement Plan	160
PERA Defined Contribution Plan	78
Minnesota College Savings Plan	1,557
Minnesota Achieve a Better Life Experience	12
NON-RETIREMENT FUNDS	4,298
Assigned Risk Plan	308
Permanent School Fund	1,621
Environmental Trust Fund	1,289
Closed Landfill Investment Fund	103
Miscellaneous Trust Funds	279
Other Postemployment Benefits Accounts	699
STATE CASH ACCOUNTS	15,074
Invested Treasurer's Cash	14,982
Other State Cash Accounts	92
TOTAL SBI AUM	102,372



Note: Differentials within column amounts may occur due to rounding

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Performance Reporting Legend

Manager Level Data
Aggregate Level Data
Sub-Asset Class Level Data
Asset Class Level Data

Note:

Throughout this report performance is calculated net of investment management fees, aggregates include terminated managers, and returns for all periods greater than one year are annualized. Inception Date and Since Inception Returns refer to the date of retention by the SBI. FYTD refers to the return generated by an account since July 1 of the most recent year. For historical benchmark details, please refer to the addendum of this report. Inception to date return information is included for manager accounts and total asset class but not other aggregates becuase of portfolio management decisions to group managers in different aggregates over time.

Combined Funds

June 30, 2020

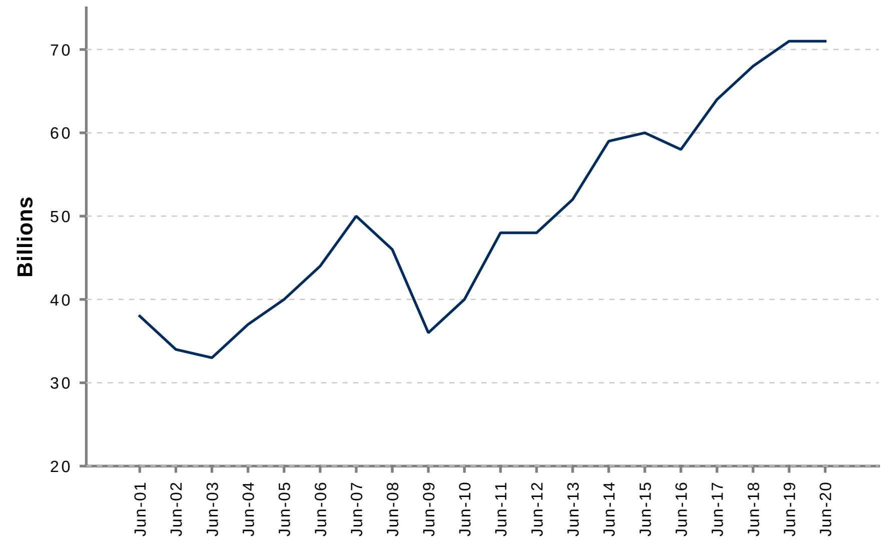
Combined Funds Summary

Combined Funds Change in Market Value ($Millions)

	One Quarter
COMBINED FUNDS	
Beginning Market Value	$64,559
Net Contributions	-620
Investment Return	7,114
Ending Market Value	71,053

The change in market value of the Combined Funds since the end of last quarter is due to net contributions and investment returns.

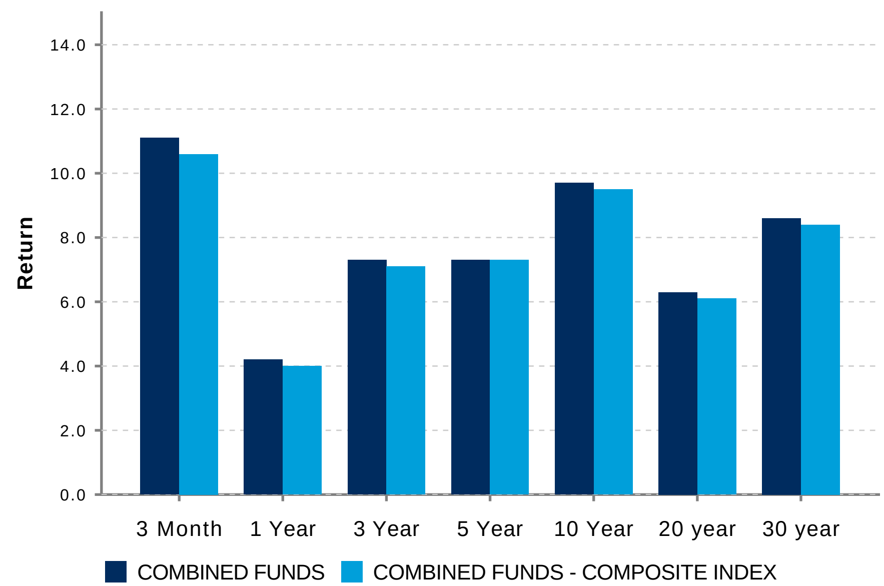
Asset Growth



Performance (Net of Fees)

The Combined Funds' performance is evaluated relative to a composite of public market index and private market investment returns. The Composite performance is calculated by multiplying the beginning of month Composite weights and the monthly returns of the asset class benchmarks.

	Qtr	FYTD	1 Yr	3 Yr	5 Yr	10 Yr	20 Yr	30 Yr
COMBINED FUNDS	11.1%	4.2%	4.2%	7.3%	7.3%	9.7%	6.3%	8.6%
COMBINED FUNDS - COMPOSITE INDEX	10.6	4.0	4.0	7.1	7.3	9.5	6.1	8.4
Excess	0.5	0.2	0.2	0.2	-0.0	0.2	0.2	0.2



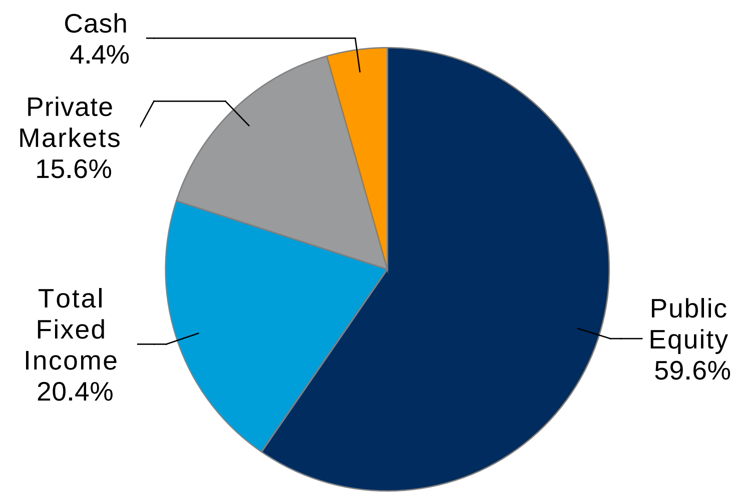
STATE STREET

Combined Funds Summary

Asset Mix

The Combined Funds actual asset mix relative to the Strategic Asset Allocation Policy Target is shown below. Any uninvested portion of the Private Markets allocation is held in Public Equity.

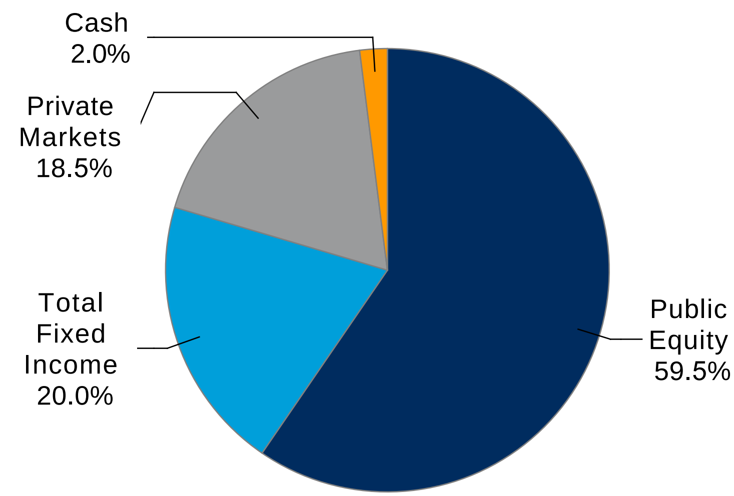
	(Millions)	Actual Mix	Policy Target
Public Equity	$42,351	59.6%	53.0%
Total Fixed Income	14,463	20.4	20.0
Private Markets	11,104	15.6	25.0
Cash	3,135	4.4	2.0
TOTAL	71,053	100.0	



Composite Index Comparison

The Combined Funds Composite is set as the Strategic Asset Allocation Policy Target with the uninvested portion of Private Markets allocated to Public Equity. Asset class weights for Public Equity and Private Markets are reset at the start of each month. The Combined Funds Composite weighting shown below is as of the first day of the quarter.

	Policy Weight	Benchmark
Public Equity	59.5%	Public Equity Benchmark
Total Fixed Income	20.0	Total Fixed Income Benchmark
Private Markets	18.5	Private Markets
Cash	2.0	3 Month T-Bills



Combined Funds Asset Class Performance Summary

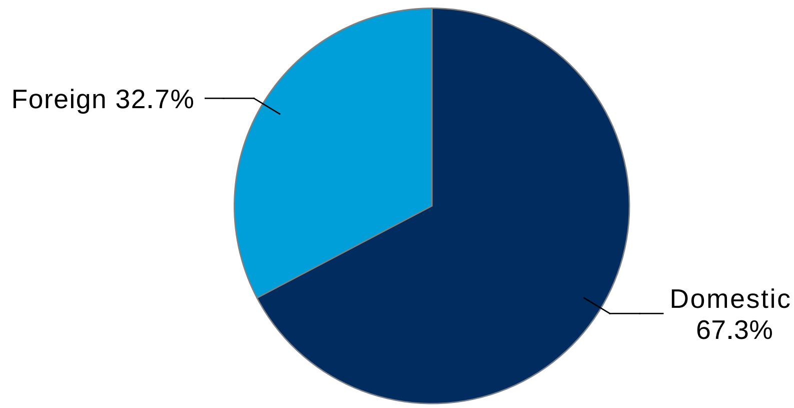
Public Equity

The Combined Funds Public Equity includes Domestic Equity and International Equity.

The Public Equity benchmark is 60.3% Russell 1000, 6.7% Russell 2000, 24.75% MSCI World ex US (net), and 8.25% MSCI EM (net).

The Russell 1000 and Russell 2000 measure the performance of the 1000 largest and 2000 next largest U.S. companies based on total market capitalization.

The MSCI World ex US index is composed of large and mid cap companies that capture approximately 85% of the total market capitalization in 22 of the 23 developed markets. The MSCI Emerging Markets index is composed of large and mid cap companies that capture approximately 85% of the total market capitalization across 24 Emerging Markets countries.



	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Public Equity	20.8%	2.7%	2.7%	7.1%	7.5%	11.4%	5.3%	8.8%
Public Equity Benchmark	20.2	2.4	2.4	7.0				
Excess	0.7	0.3	0.3	0.1				
Domestic Equity	22.8	6.2	6.2	9.9	9.7	13.7	5.9	9.4
Domestic Equity Benchmark	22.2	6.0	6.0	9.9	9.9	13.7	6.0	9.6
Excess	0.6	0.1	0.1	0.1	-0.3	-0.0	-0.1	-0.2
International Equity	16.7	-4.2	-4.2	1.3	2.5	5.4	3.8	
International Equity Benchmark	16.1	-4.8	-4.8	1.1	2.3	5.0	3.4	
Excess	0.7	0.6	0.6	0.2	0.2	0.4	0.4	

Note:

Prior to 6/30/16 the returns of Domestic and International Equity were not reported as a total Public Equity return. For additional information regarding historical asset class performance and benchmarks, please refer to the Combined Funds Performance Report.

Combined Funds Asset Class Performance Summary

Fixed Income

The Combined Funds Fixed Income program includes Core Bonds and Treasuries. The Combined Funds performance for these asset classes is shown here.

The Core Bonds benchmark is the Bloomberg Barclays U.S. Aggregate Index. This index reflects the performance of the broad bond market for investment grade (Baa or higher) bonds, U.S. Treasury and agency securities, and mortgage obligations with maturities greater than one year.

The Treasuries benchmark is the Bloomberg Barclays Treasury 5+ Years Index.

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Total Fixed Income	2.9%	13.0%	13.0%	7.4%	5.7%	5.0%	5.8%	6.6%
Total Fixed Income Benchmark	1.7	13.0	13.0					
Excess	1.2	0.1	0.1					
Core Bonds	5.5	9.2	9.2	5.8	4.8	4.5	5.5	6.4
Core Bonds Benchmark	2.9	8.7	8.7	5.3	4.3	3.8	5.1	6.0
Excess	2.6	0.5	0.5	0.4	0.5	0.7	0.4	0.4
Treasuries	0.3	16.7	16.7					
BBG BARC 5Y + Us Tsy Idx	0.6	17.2	17.2					
Excess	-0.3	-0.5	-0.5					

Cash

The Combined Funds Cash performance is shown here. Cash is held by the Combined Funds to meet the liquidity needs of the retirement systems to pay benefits.

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Cash	0.1%	1.5%	1.5%	1.8%	1.3%	0.8%	2.0%	3.5%
US 3-Month Treasury Bill	0.0	1.6	1.6	1.8	1.2	0.6	1.7	2.8

Note:

Prior to 3/31/2020 the returns of Core Bonds and Treasuries were not reported as a total Fixed Income return. For additional information regarding historical asset class performance and benchmarks, please refer to the Combined Funds Performance Report.

Combined Funds Asset Class Performance Summary

Private Markets

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 year	30 year
Private Markets	-9.0%	-2.6%	-2.6%	7.3%	8.2%	10.6%	11.1%	13.2%	11.9%
Private Equity	-7.3%	3.6%	3.6%	12.3%	12.6%	13.5%	11.7%	15.3%	
Private Credit	-6.9	0.4	0.4	7.6	10.6	11.9	11.4		
Resources	-19.6	-25.4	-25.4	-7.8	-5.7	1.4	12.6	12.6	
Real Estate	-3.9	3.5	3.5	8.2	8.1	11.4	8.5	9.4	

Private Markets

The time-weighted rates of return for the Private Markets portfolio are shown here. Private Markets included Private Equity, Private Credit, Resources, and Real Estate. Some of the existing investments are relatively immature and returns may not be indicative of future results.

Private Equity Investments

The objectives of the Private Equity portfolio, which may include leveraged buyouts, growth equity, venture capital and special situations, are to achieve attractive returns and to provide overall portfolio diversification to the total plan.

Private Credit Investments

The objectives of the Private Credit portfolio, which may include mezzanine debt, direct lending, and other forms of non-investment grade fixed income instruments, are to achieve a high total return over a full market cycle and to provide some degree of downside protection and typically provide current income in the form of a coupon. In certain situations, investments in the Private Credit portfolio also provide an equity component of return in the form of warrants or re-organized equity.

Resource Investments

The objectives of the Resources portfolio, which may include energy, infrastructure, and other hard assets, are to provide protection against the risks associated with inflation and to provide overall portfolio diversification to the total plan.

Real Estate Investments

The objectives of the Real Estate portfolio, which may include core and non-core real estate investments, are to achieve attractive returns, preserve capital, provide protection against risks associated with inflation, and provide overall portfolio diversification to the total plan.

The SBI also monitors Private Markets performance using money-weighted return metrics such as Internal Rate of Return and Multiple of Invested Capital. For money-weighted return metrics please refer to the Combined Funds Performance Report.

Asset Class & Manager Performance

June 30, 2020

The assets of the Combined Funds are allocated to public equity, fixed income, private markets, and cash. Each asset class may be further differentiated by geography, management style, and/or strategy. Managers are hired to manage the assets accordingly. This diversification is intended to reduce wide fluctuations in investment returns on a year-to-year basis and enhances the Funds' ability to meet or exceed the actuarial return target over the long-term.

The Combined Funds consist of the assets of active employees and retired members of the statewide retirement plans. The SBI commingles the assets of these plans into the Combined Funds to capture investment efficiencies. This sharing is accomplished by grouping managers by asset class, geography, and management style, into several Investment Pools. The individual funds participate in the Investment Pools by purchasing units which function much like the shares of a mutual fund.

While the vast majority of the units of these pools are owned by the Combined Funds, the Supplemental Investment Fund also owns units of these pools. The Supplemental Investment Funds are mutual fund-like investment vehicles which are used by investors in the Participant Directed Investment Program. Please refer to the Participant Directed Investment Program report for more information.

The performance information presented on the following pages for Public Equity and Fixed Income includes both the Combined Funds and Supplemental Investment Fund. The Private Markets is Combined Funds only. All assets in the Combined Funds are managed externally by investment management firms retained by contract.

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Domestic Equity
June 30, 2020

Total Domestic Equity

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
ACTIVE DOMESTIC EQUITY AGGREGATE (1)	**$4,134,059,513**	**14.2%**	**28.4%**	**0.5%**	**0.5%**	**7.3%**	**7.6%**	**12.6%**		
Active Domestic Equity Benchmark			23.0	-0.7	-0.7	5.8	7.4	12.3		
Excess			5.4	1.3	1.3	1.5	0.2	0.3		
SEMI PASSIVE DOMESTIC EQUITY AGGREGATE (2)	**2,531,367,763**	**8.7**	**22.2**	**7.8**	**7.8**	**11.0**	**10.4**	**14.2**		
Semi Passive Domestic Equity Benchmark			21.8	7.5	7.5	10.6	10.5	14.0		
Excess			0.4	0.3	0.3	0.3	-0.1	0.2		
PASSIVE DOMESTIC EQUITY AGGREGATE (3)	**22,348,974,994**	**77.0**	**21.9**	**7.1**	**7.1**	**10.4**	**10.2**	**13.8**		
Passive Domestic Equity Benchmark			21.9	7.1	7.1	10.4	10.2	13.8		
Excess			-0.0	0.0	0.0	-0.0	-0.0	-0.0		
TRANSITION AGGREGATE DOMESTIC EQUITY (4)	15,470	0.0								
TOTAL DOMESTIC EQUITY (5)	**29,014,417,740**	**100.0**	**22.8**	**6.2**	**6.2**	**10.0**	**9.7**	**13.7**	**10.3**	**01/1984**
Domestic Equity Benchmark			22.2	6.0	6.0	9.9	9.9	13.7	10.5	01/1984
Excess			0.6	0.1	0.1	0.1	-0.3	-0.0	-0.2	

(1) The Active Domestic Equity Benchmark is a weighted composite each of the individual active domestic equity manager's benchmarks.
(2) The current Semi-Passive Domestic Equity Benchmark is the Russell 1000 index.
(3) The current Passive Domestic Equity Benchmark is a weighted average of the Russell 1000, Russell 2000 and Russell 3000.
(4) The Transition Domestic Equity Aggregate contains Domestic Equity securities that are being transitioned to a different manager.
(5) The current Domestic Equity Benchmark is 90% Russell 1000 and 10% Russell 2000.
Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

Total Domestic Equity

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
ACTIVE DOMESTIC EQUITY AGGREGATE (1)	**27.6%**	**-6.5%**	**20.6%**	**10.9%**	**-0.4%**
Active Domestic Equity Benchmark	28.2	-8.0	18.3	15.7	-0.6
Excess	-0.6	1.4	2.3	-4.8	0.3
SEMI PASSIVE DOMESTIC EQUITY AGGREGATE (2)	**30.9**	**-4.9**	**22.5**	**11.1**	**0.5**
Semi Passive Domestic Equity Benchmark	31.4	-4.8	21.7	12.1	0.9
Excess	-0.5	-0.1	0.8	-1.0	-0.4
PASSIVE DOMESTIC EQUITY AGGREGATE (3)	**31.3**	**-5.0**	**21.3**	**12.6**	**0.5**
Passive Domestic Equity Benchmark	31.3	-5.0	21.5	12.5	0.5
Excess	0.0	-0.0	-0.2	0.1	0.0
TRANSITION AGGREGATE DOMESTIC EQUITY (4)					
TOTAL DOMESTIC EQUITY (5)	**30.7%**	**-5.3%**	**21.4%**	**11.5**	**0.3**
Domestic Equity Benchmark	30.8%	-5.2%	21.1%	12.7	0.5
Excess	-0.1%	-0.0%	0.2%	-1.3	-0.2

(1) The Active Domestic Equity Benchmark is a weighted composite each of the individual active domestic equity manager's benchmarks.

(2) The current Semi-Passive Domestic Equity Benchmark is the Russell 1000 index.

(3) The current Passive Domestic Equity Benchmark is a weighted average of the Russell 1000, Russell 2000 and Russell 3000.

(4) The Transition Domestic Equity Aggregate contains Domestic Equity securities that are being transitioned to a different manager.

(5) The current Domestic Equity Benchmark is 90% Russell 1000 and 10% Russell 2000.

Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Large Cap Growth										
SANDS	**$367,539,175**	**1.3%**	**37.9%**	**31.6%**	**31.6%**	**25.8%**	**18.2%**	**20.1%**	**12.8%**	**01/2005**
Russell 1000 Growth			27.8	23.3	23.3	19.0	15.9	17.2	10.8	01/2005
Excess			10.1	8.3	8.3	6.8	2.3	2.8	2.0	
WINSLOW	**272,900,791**	**0.9**	**27.8**	**22.1**	**22.1**	**20.7**	**15.9**	**17.3**	**11.6**	**01/2005**
Russell 1000 Growth			27.8	23.3	23.3	19.0	15.9	17.2	10.8	01/2005
Excess			-0.0	-1.2	-1.2	1.7	0.0	0.0	0.8	
ZEVENBERGEN	**466,721,447**	**1.6**	**53.9**	**55.2**	**55.2**	**33.8**	**23.1**	**20.9**	**12.8**	**04/1994**
Russell 1000 Growth			27.8	23.3	23.3	19.0	15.9	17.2	10.3	04/1994
Excess			26.1	31.9	31.9	14.8	7.2	3.6	2.5	
RUSSELL 1000 GROWTH AGGREGATE	**1,107,161,413**	**3.8**	**41.4**	**37.3**	**37.3**	**27.5**	**20.5**	**19.9**		
Russell 1000 Growth			27.8	23.3	23.3	19.0	15.9	17.2		
Excess			13.5	14.0	14.0	8.5	4.7	2.7		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Large Cap Growth					
SANDS	**33.5%**	**7.0%**	**35.3%**	**-6.9%**	**2.9%**
Russell 1000 Growth	36.4	-1.5	30.2	7.1	5.7
Excess	-2.8	8.6	5.1	-13.9	-2.8
WINSLOW	**34.2**	**4.2**	**33.2**	**-1.9**	**6.7**
Russell 1000 Growth	36.4	-1.5	30.2	7.1	5.7
Excess	-2.2	5.7	3.0	-9.0	1.0
ZEVENBERGEN	**43.0**	**2.3**	**35.1**	**-2.8**	**6.4**
Russell 1000 Growth	36.4	-1.5	30.2	7.1	5.7
Excess	6.7	3.8	4.9	-9.9	0.7
RUSSELL 1000 GROWTH AGGREGATE	**37.3%**	**4.7%**	**33.4%**	**1.0**	**4.6**
Russell 1000 Growth	36.4%	-1.5%	30.2%	7.1	5.7
Excess	0.9%	6.2%	3.2%	-6.1	-1.1

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Large Cap Value										
BARROW HANLEY	**$289,477,296**	**1.0%**	**19.3%**	**-9.7%**	**-9.7%**	**2.1%**	**4.2%**	**10.6%**	**6.9%**	**04/2004**
Russell 1000 Value			14.3	-8.8	-8.8	1.8	4.6	10.4	6.7	04/2004
Excess			5.0	-0.8	-0.8	0.3	-0.4	0.2	0.2	
EARNEST PARTNERS	**255,379,624**	**0.9**	**18.9**	**-6.9**	**-6.9**	**4.6**	**6.1**	**10.6**	**6.4**	**07/2000**
Russell 1000 Value			14.3	-8.8	-8.8	1.8	4.6	10.4	6.3	07/2000
Excess			4.6	1.9	1.9	2.7	1.5	0.2	0.0	
LSV	**337,877,715**	**1.2**	**16.8**	**-12.6**	**-12.6**	**0.0**	**3.2**	**10.7**	**7.3**	**04/2004**
Russell 1000 Value			14.3	-8.8	-8.8	1.8	4.6	10.4	6.7	04/2004
Excess			2.5	-3.7	-3.7	-1.8	-1.4	0.3	0.6	
RUSSELL 1000 VALUE AGGREGATE	**882,734,635**	**3.0**	**18.2**	**-9.9**	**-9.9**	**2.0**	**4.2**	**10.5**		
Russell 1000 Value			14.3	-8.8	-8.8	1.8	4.6	10.4		
Excess			3.9	-1.1	-1.1	0.2	-0.4	0.1		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Large Cap Value					
BARROW HANLEY	**26.9%**	**-5.9%**	**14.6%**	**12.8%**	**-2.1%**
Russell 1000 Value	26.5	-8.3	13.7	17.3	-3.8
Excess	0.4	2.4	0.9	-4.5	1.7
EARNEST PARTNERS	**28.1**	**-7.7**	**19.9**	**16.2**	**-2.7**
Russell 1000 Value	26.5	-8.3	13.7	17.3	-3.8
Excess	1.5	0.6	6.2	-1.1	1.1
LSV	**26.9**	**-11.8**	**18.6**	**17.0**	**-2.2**
Russell 1000 Value	26.5	-8.3	13.7	17.3	-3.8
Excess	0.4	-3.6	4.9	-0.4	1.6
RUSSELL 1000 VALUE AGGREGATE	**27.4%**	**-8.7%**	**17.3%**	**15.3**	**-3.2**
Russell 1000 Value	26.5%	-8.3%	13.7%	17.3	-3.8
Excess	0.9%	-0.4%	3.7%	-2.1	0.6

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Semi-Passive Large Cap										
BLACKROCK	**$1,240,592,519**	**4.3%**	**22.2%**	**7.3%**	**7.3%**	**11.6%**	**11.2%**	**14.7%**	**9.9%**	**01/1995**
Semi Passive Domestic Equity Benchmark			21.8	7.5	7.5	10.6	10.5	14.0	9.5	01/1995
Excess			0.4	-0.2	-0.2	0.9	0.7	0.8	0.4	
J.P. MORGAN	**1,290,775,244**	**4.4**	**22.2**	**8.2**	**8.2**	**10.6**	**10.5**	**14.3**	**9.8**	**01/1995**
Semi Passive Domestic Equity Benchmark			21.8	7.5	7.5	10.6	10.5	14.0	9.5	01/1995
Excess			0.4	0.7	0.7	-0.0	0.0	0.3	0.3	
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE	**2,531,367,763**	**8.7**	**22.2**	**7.8**	**7.8**	**11.0**	**10.4**	**14.2**		
Semi Passive Domestic Equity Benchmark			21.8	7.5	7.5	10.6	10.5	14.0		
Excess			0.4	0.3	0.3	0.3	-0.1	0.2		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Semi-Passive Large Cap					
BLACKROCK	**30.4%**	**-4.1%**	**24.6%**	**12.5%**	**0.8%**
Semi Passive Domestic Equity Benchmark	31.4	-4.8	21.7	12.1	0.9
Excess	-1.0	0.7	2.9	0.5	-0.1
J.P. MORGAN	**31.3**	**-5.4**	**21.8**	**12.3**	**0.8**
Semi Passive Domestic Equity Benchmark	31.4	-4.8	21.7	12.1	0.9
Excess	-0.1	-0.6	0.1	0.2	-0.1
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE	**30.9%**	**-4.9%**	**22.5%**	**11.1**	**0.5**
Semi Passive Domestic Equity Benchmark	31.4%	-4.8%	21.7%	12.1	0.9
Excess	-0.5%	-0.1%	0.8%	-1.0	-0.4

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Small Cap Growth										
ARROWMARK	**$222,419,865**	**0.8%**	**30.4%**	**-4.4%**	**-4.4%**	**6.3%**			**11.2%**	**11/2016**
Russell 2000 Growth			30.6	3.5	3.5	7.9			12.2	11/2016
Excess			-0.2	-7.9	-7.9	-1.6			-0.9	
HOOD RIVER	**287,287,486**	**1.0**	**39.1**	**8.1**	**8.1**	**9.7**			**14.4**	**11/2016**
Russell 2000 Growth			30.6	3.5	3.5	7.9			12.2	11/2016
Excess			8.6	4.6	4.6	1.8			2.2	
RICE HALL JAMES	**230,302,908**	**0.8**	**37.2**	**1.5**	**1.5**	**6.3**			**12.3**	**11/2016**
Russell 2000 Growth			30.6	3.5	3.5	7.9			12.2	11/2016
Excess			6.7	-2.0	-2.0	-1.6			0.1	
WELLINGTON	**311,476,637**	**1.1**	**29.5**	**4.7**	**4.7**	**7.7**			**12.7**	**11/2016**
Russell 2000 Growth			30.6	3.5	3.5	7.9			12.2	11/2016
Excess			-1.0	1.2	1.2	-0.1			0.5	
RUSSELL 2000 GROWTH AGGREGATE	**1,051,486,896**	**3.6**	**33.9**	**2.6**	**2.6**	**7.5**	**5.4**	**11.4**		
Russell 2000 Growth			30.6	3.5	3.5	7.9	6.9	12.9		
Excess			3.3	-0.9	-0.9	-0.4	-1.5	-1.6		

STATE STREET

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Small Cap Growth					
ARROWMARK	**20.1%**	**0.9%**	**26.2%**		
Russell 2000 Growth	28.5	-9.3	22.2		
Excess	-8.4	10.3	4.1		
HOOD RIVER	**24.3**	**-7.0**	**21.3**		
Russell 2000 Growth	28.5	-9.3	22.2		
Excess	-4.2	2.3	-0.9		
RICE HALL JAMES	**18.0**	**-6.9**	**27.9**		
Russell 2000 Growth	28.5	-9.3	22.2		
Excess	-10.5	2.4	5.8		
WELLINGTON	**35.6**	**-11.6**	**22.6**		
Russell 2000 Growth	28.5	-9.3	22.2		
Excess	7.1	-2.3	0.4		
RUSSELL 2000 GROWTH AGGREGATE	**24.6%**	**-6.2%**	**22.0%**	**4.7**	**1.0**
Russell 2000 Growth	28.5%	-9.3%	22.2%	11.3	-1.4
Excess	-3.9%	3.2%	-0.1%	-6.6	2.4

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Small Cap Value										
GOLDMAN SACHS	**$322,855,957**	**1.1%**	**17.7%**	**-19.7%**	**-19.7%**	**-3.8%**	**0.9%**	**9.2%**	**7.2%**	**01/2004**
Russell 2000 Value			18.9	-17.5	-17.5	-4.3	1.3	7.8	5.8	01/2004
Excess			-1.3	-2.2	-2.2	0.5	-0.4	1.4	1.4	
HOTCHKIS AND WILEY	**238,351,958**	**0.8**	**22.1**	**-24.2**	**-24.2**	**-7.8**	**-3.2**	**7.9**	**5.5**	**01/2004**
Russell 2000 Value			18.9	-17.5	-17.5	-4.3	1.3	7.8	5.8	01/2004
Excess			3.2	-6.7	-6.7	-3.4	-4.5	0.0	-0.4	
MARTINGALE	**239,524,191**	**0.8**	**21.1**	**-20.0**	**-20.0**	**-6.2**	**0.2**	**9.0**	**5.5**	**01/2004**
Russell 2000 Value			18.9	-17.5	-17.5	-4.3	1.3	7.8	5.8	01/2004
Excess			2.2	-2.5	-2.5	-1.8	-1.0	1.1	-0.3	
PEREGRINE	**291,944,464**	**1.0**	**23.6**	**-18.8**	**-18.8**	**-4.9**	**-0.0**	**7.9**	**8.1**	**07/2000**
Russell 2000 Value			18.9	-17.5	-17.5	-4.3	1.3	7.8	7.7	07/2000
Excess			4.7	-1.3	-1.3	-0.6	-1.3	0.1	0.4	
RUSSELL 2000 VALUE AGGREGATE	**1,092,676,569**	**3.8**	**20.9**	**-20.7**	**-20.7**	**-5.6**	**-0.5**	**8.4**		
Russell 2000 Value			18.9	-17.5	-17.5	-4.3	1.3	7.8		
Excess			2.0	-3.2	-3.2	-1.2	-1.8	0.6		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Small Cap Value					
GOLDMAN SACHS	**23.2%**	**-13.3%**	**12.6%**	**24.6%**	**-5.2%**
Russell 2000 Value	22.4	-12.9	7.8	31.7	-7.5
Excess	0.8	-0.5	4.7	-7.1	2.3
HOTCHKIS AND WILEY	**19.7**	**-14.4**	**7.9**	**19.9**	**-8.5**
Russell 2000 Value	22.4	-12.9	7.8	31.7	-7.5
Excess	-2.7	-1.5	0.0	-11.8	-1.0
MARTINGALE	**21.1**	**-15.0**	**6.9**	**34.3**	**-5.2**
Russell 2000 Value	22.4	-12.9	7.8	31.7	-7.5
Excess	-1.3	-2.1	-0.9	2.5	2.3
PEREGRINE	**21.1**	**-16.1**	**12.5**	**27.8**	**-6.7**
Russell 2000 Value	22.4	-12.9	7.8	31.7	-7.5
Excess	-1.3	-3.3	4.7	-3.9	0.8
RUSSELL 2000 VALUE AGGREGATE	**21.3%**	**-14.7%**	**10.2%**	**26.5**	**-6.5**
Russell 2000 Value	22.4%	-12.9%	7.8%	31.7	-7.5
Excess	-1.1%	-1.8%	2.3%	-5.2	1.0

Minnesota State Board of Investment
Quarter Ending June 30, 2020
Domestic Equity Managers

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Total Passive Domestic Equity										
BLACKROCK RUSSELL 1000	**$20,289,639,163**	**69.9%**	**21.8%**	**7.5%**	**7.5%**	**10.6%**			**13.0%**	**11/2016**
RUSSELL 1000 (DAILY)			21.8	7.5	7.5	10.6			13.1	11/2016
Excess			-0.1	-0.0	-0.0	-0.0			-0.0	
BLACKROCK RUSSELL 2000	**549,068,964**	**1.9**	**25.6**	**-5.8**	**-5.8**				**-0.8**	**11/2018**
RUSSELL 2000 (DAILY)			25.4	-6.6	-6.6				-1.3	11/2018
Excess			0.2	0.8	0.8				0.5	
BLACKROCK RUSSELL 3000 (1)	**1,510,266,867**	**5.2**	**22.1**	**6.7**	**6.7**	**10.1**	**10.1%**	**13.7%**	**9.2**	**07/1995**
Passive Manager Benchmark			22.0	6.5	6.5	10.0	10.0	13.7	9.1	07/1995
Excess			0.1	0.2	0.2	0.1	0.1	0.0	0.1	
PASSIVE DOMESTIC EQUITY AGGREGATE (2)	**22,348,974,994**	**77.0**	**21.9**	**7.1**	**7.1**	**10.4**	**10.2**	**13.8**		
Passive Domestic Equity Benchmark			21.9	7.1	7.1	10.4	10.2	13.8		
Excess			-0.0	0.0	0.0	-0.0	-0.0	-0.0		

(1) The current Passive Manager Benchmark is the Russell 3000. For historical benchmark details please refer to the addendum of this report.

(2) The current Passive Domestic Equity Benchmark is a weighted average of the Russell 1000, Russell 2000 and Russell 3000.

STATE STREET.

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Total Passive Domestic Equity					
BLACKROCK RUSSELL 1000	**31.4%**	**-4.8%**	**21.7%**		
RUSSELL 1000 (DAILY)	31.4	-4.8	21.7		
Excess	0.0	-0.0	-0.0		
BLACKROCK RUSSELL 2000	**25.2**				
RUSSELL 2000 (DAILY)	25.5				
Excess	-0.3				
BLACKROCK RUSSELL 3000 (1)	**31.1**	**-5.2**	**21.1**	**12.7%**	**0.5%**
Passive Manager Benchmark	31.0	-5.2	21.1	12.7	0.5
Excess	0.0	-0.0	0.0	0.0	0.0
PASSIVE DOMESTIC EQUITY AGGREGATE (2)	**31.3%**	**-5.0%**	**21.3%**	**12.6**	**0.5**
Passive Domestic Equity Benchmark	31.3%	-5.0%	21.5%	12.5	0.5
Excess	0.0%	-0.0%	-0.2%	0.1	0.0

(1) The current Passive Manager Benchmark is the Russell 3000. For historical benchmark details please refer to the addendum of this report.

(2) The current Passive Domestic Equity Benchmark is a weighted average of the Russell 1000, Russell 2000 and Russell 3000.

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International Equity
June 30, 2020

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Total International Equity										
DEVELOPED MARKETS (1)	**$10,412,679,310**	**74.4%**	**16.0%**	**-4.6%**	**-4.6%**	**1.3%**	**2.4%**	**6.2%**		
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4		
Excess			0.7	0.9	0.9	0.5	0.4	0.7		
EMERGING MARKETS (2)	**3,579,443,535**	**25.6**	**19.0**	**-3.2**	**-3.2**	**1.5**	**2.6**	**2.8**		
BENCHMARK EM			18.1	-3.4	-3.4	1.9	2.9	3.3		
Excess			0.9	0.2	0.2	-0.4	-0.3	-0.5		
TRANSITION AGGREGATE INTERNATIONAL EQUITY (3)	915,555	0.0								
TOTAL INTERNATIONAL EQUITY (4)	**13,993,038,400**	**100.0**	**16.7**	**-4.2**	**-4.2**	**1.3**	**2.5**	**5.4**	**6.0**	**10/1992**
International Equity Benchmark			16.1	-4.8	-4.8	1.1	2.3	5.0		10/1992
Excess			0.6	0.6	0.6	0.2	0.2	0.4		

(1) The current benchmak for Developed Markets, Benchmark DM, is the Standard (large + mid) MSCI World ex USA (net).

(2) The current benchmark for Emerging Markets, Benchmark EM, is the Standard (large + mid) MSCI Emerging Markets Free (net).

(3) The Transition Aggregate International Equity contains International Equity securities that are being transitioned to a different manager.

(4) The current International Equity Benchmark is 75% MSCI World ex USA (net) and 25% MSCI Emerging Markets Free (net). Does not includes impact of currency overlay on the passive EAFE portfolio from 12/1/95-10/31/00. This impact is included in the return for the Combined Funds portion of the International Equity portfolio.

Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Total International Equity					
DEVELOPED MARKETS (1)	**23.3%**	**-14.2%**	**24.9%**	**1.3%**	**-0.3%**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	0.8	-0.1	0.7	-1.5	2.8
EMERGING MARKETS (2)	**20.3**	**-15.4**	**37.7**	**7.5**	**-13.1**
BENCHMARK EM	18.4	-14.6	37.3	11.2	-14.9
Excess	1.9	-0.8	0.4	-3.7	1.9
TRANSITION AGGREGATE INTERNATIONAL EQUITY (3)					
TOTAL INTERNATIONAL EQUITY (4)	**22.4%**	**-14.5%**	**27.6%**	**2.6**	**-2.9**
International Equity Benchmark	21.5%	-14.2%	27.2%	4.5	-5.7
Excess	0.9%	-0.3%	0.4%	-1.8	2.8

(1) The current benchmak for Developed Markets, Benchmark DM, is the Standard (large + mid) MSCI World ex USA (net).

(2) The current benchmark for Emerging Markets, Benchmark EM, is the Standard (large + mid) MSCI Emerging Markets Free (net).

(3) The Transition Aggregate International Equity contains International Equity securities that are being transitioned to a different manager.

(4) The current International Equity Benchmark is 75% MSCI World ex USA (net) and 25% MSCI Emerging Markets Free (net). Does not includes impact of currency overlay on the passive EAFE portfolio from 12/1/95-10/31/00. This impact is included in the return for the Combined Funds portion of the International Equity portfolio.

Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Developed Markets										
ACADIAN	**$374,683,641**	**2.7%**	**17.7%**	**-3.2%**	**-3.2%**	**2.1%**	**6.4%**	**8.5%**	**5.8%**	**07/2005**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	4.1	07/2005
Excess			2.4	2.2	2.2	1.3	4.4	3.1	1.6	
COLUMBIA	**401,057,838**	**2.9**	**15.8**	**-1.3**	**-1.3**	**4.7**	**4.0**	**7.8**	**2.8**	**03/2000**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	2.9	03/2000
Excess			0.4	4.1	4.1	3.9	2.0	2.4	-0.1	
FIDELITY	**385,469,976**	**2.8**	**19.0**	**-0.3**	**-0.3**	**3.7**	**4.0**	**7.4**	**5.9**	**07/2005**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	4.1	07/2005
Excess			3.7	5.1	5.1	2.9	1.9	2.0	1.8	
JP MORGAN	**312,007,656**	**2.2**	**17.7**	**-1.7**	**-1.7**	**3.3**	**3.5**	**6.5**	**4.7**	**07/2005**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	4.1	07/2005
Excess			2.4	3.8	3.8	2.4	1.5	1.0	0.6	
MARATHON	**334,587,985**	**2.4**	**14.4**	**-7.1**	**-7.1**	**-0.3**	**1.7**	**6.7**	**7.3**	**11/1993**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	4.6	11/1993
Excess			-0.9	-1.6	-1.6	-1.1	-0.3	1.3	2.7	
MCKINLEY	**265,250,231**	**1.9**	**22.0**	**0.0**	**0.0**	**3.9**	**2.7**	**6.7**	**4.4**	**07/2005**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	4.1	07/2005
Excess			6.7	5.4	5.4	3.1	0.7	1.2	0.2	
ACTIVE DEVELOPED MARKETS AGGREGATE	**2,073,057,327**	**14.8**	**17.6**	**-2.4**	**-2.4**	**2.7**	**3.7**	**7.2**		
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4		
Excess			2.2	3.0	3.0	1.9	1.7	1.8		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Developed Markets					
ACADIAN	**19.1%**	**-13.5%**	**37.0%**	**8.1%**	**2.4%**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	-3.4	0.6	12.8	5.4	5.4
COLUMBIA	**28.9**	**-14.9**	**32.7**	**-5.6**	**6.4**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	6.4	-0.8	8.5	-8.3	9.4
FIDELITY	**27.1**	**-14.6**	**25.9**	**1.2**	**0.1**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	4.6	-0.5	1.7	-1.5	3.2
JP MORGAN	**28.5**	**-17.3**	**28.3**	**4.0**	**-4.7**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	6.0	-3.3	4.1	1.2	-1.6
MARATHON	**23.5**	**-13.4**	**23.1**	**-1.1**	**6.7**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	1.0	0.7	-1.1	-3.8	9.7
MCKINLEY	**25.6**	**-15.9**	**28.5**	**-7.5**	**3.1**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	3.1	-1.9	4.3	-10.2	6.2
ACTIVE DEVELOPED MARKETS AGGREGATE	**25.0%**	**-14.5%**	**28.4%**	**-0.2**	**3.2**
BENCHMARK DM	22.5%	-14.1%	24.2%	2.7	-3.0
Excess	2.5%	-0.4%	4.2%	-3.0	6.2

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Semi-Passive Developed Markets										
AQR	**$316,947,399**	**2.3%**	**17.2%**	**-7.9%**	**-7.9%**	**-1.9%**	**0.8%**	**5.5%**	**4.1%**	**07/2005**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	4.1	07/2005
Excess			1.8	-2.5	-2.5	-2.8	-1.2	0.1	-0.0	
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**316,947,399**	**2.3**	**17.2**	**-7.9**	**-7.9**	**-2.5**	**-0.2**	**4.8**		
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4		
Excess			1.8	-2.5	-2.5	-3.3	-2.2	-0.6		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Semi-Passive Developed Markets					
AQR	**20.8%**	**-18.2%**	**25.1%**	**0.8%**	**0.9%**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	-1.7	-4.1	0.9	-2.0	3.9
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**20.8%**	**-18.7%**	**23.3%**	**-0.4**	**-0.3**
BENCHMARK DM	22.5%	-14.1%	24.2%	2.7	-3.0
Excess	-1.7%	-4.6%	-0.9%	-3.1	2.7

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Total Developed Markets										
ACTIVE DEVELOPED MARKETS AGGREGATE	**$2,073,057,327**	**14.8%**	**17.6%**	**-2.4%**	**-2.4%**	**2.7%**	**3.7%**	**7.2%**		
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4		
Excess			2.2	3.0	3.0	1.9	1.7	1.8		
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**316,947,399**	**2.3**	**17.2**	**-7.9**	**-7.9**	**-2.5**	**-0.2**	**4.8**		
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4		
Excess			1.8	-2.5	-2.5	-3.3	-2.2	-0.6		
SSgA DEVELOPED MARKETS PASSIVE	**8,022,674,583**	**57.3**	**15.6**	**-5.0**	**-5.0**	**1.2**	**2.4**	**5.8**	**5.7**	**10/1992**
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4	5.4	10/1992
Excess			0.2	0.5	0.5	0.3	0.4	0.4	0.3	
DEVELOPED MARKETS TOTAL	**10,412,679,310**	**74.4**	**16.0**	**-4.6**	**-4.6**	**1.3**	**2.4**	**6.2**		
BENCHMARK DM			15.3	-5.4	-5.4	0.8	2.0	5.4		
Excess			0.7	0.9	0.9	0.5	0.4	0.7		

STATE STREET

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Total Developed Markets					
ACTIVE DEVELOPED MARKETS AGGREGATE	**25.0%**	**-14.5%**	**28.4%**	**-0.2%**	**3.2%**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	2.5	-0.4	4.2	-3.0	6.2
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**20.8**	**-18.7**	**23.3**	**-0.4**	**-0.3**
BENCHMARK DM	22.5	-14.1	24.2	2.7	-3.0
Excess	-1.7	-4.6	-0.9	-3.1	2.7
SSgA DEVELOPED MARKETS PASSIVE	**23.0%**	**-13.9%**	**24.7%**	**3.2**	**-2.6**
BENCHMARK DM	22.5%	-14.1%	24.2%	2.7	-3.0
Excess	0.5%	0.2%	0.5%	0.4	0.5
DEVELOPED MARKETS TOTAL	**23.3%**	**-14.2%**	**24.9%**	**1.3**	**-0.3**
BENCHMARK DM	22.5%	-14.1%	24.2%	2.7	-3.0
Excess	0.8%	-0.1%	0.7%	-1.5	2.8

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Emerging Markets										
EARNEST PARTNERS	**$275,824,720**	**2.0%**	**15.5%**	**-11.3%**	**-11.3%**	**-1.1%**			**1.4%**	**04/2017**
MSCI EMERGING MARKETS			18.1	-3.4	-3.4	1.9			3.7	04/2017
Excess			-2.6	-8.0	-8.0	-2.9			-2.3	
MARTIN CURRIE	**378,406,198**	**2.7**	**18.6**	**3.0**	**3.0**	**5.6**			**7.9**	**04/2017**
BENCHMARK EM			18.1	-3.4	-3.4	1.9			3.7	04/2017
Excess			0.5	6.4	6.4	3.7			4.3	
MACQUARIE	**381,130,190**	**2.7**	**25.5**	**6.0**	**6.0**	**5.0**			**6.8**	**04/2017**
BENCHMARK EM			18.1	-3.4	-3.4	1.9			3.7	04/2017
Excess			7.5	9.4	9.4	3.1			3.2	
MORGAN STANLEY	**488,420,271**	**3.5**	**19.1**	**-4.1**	**-4.1**	**0.2**	**2.3%**	**3.8%**	**8.5**	**01/2001**
BENCHMARK EM			18.1	-3.4	-3.4	1.9	2.9	3.3	8.4	01/2001
Excess			1.0	-0.7	-0.7	-1.7	-0.6	0.5	0.2	
NEUBERGER BERMAN	**337,466,419**	**2.4**	**17.2**	**-3.7**	**-3.7**	**1.9**			**3.8**	**04/2017**
BENCHMARK EM			18.1	-3.4	-3.4	1.9			3.7	04/2017
Excess			-0.8	-0.3	-0.3	0.0			0.2	
PZENA	**251,561,161**	**1.8**	**16.8**	**-15.1**	**-15.1**	**-3.9**			**-2.0**	**04/2017**
BENCHMARK EM			18.1	-3.4	-3.4	1.9			3.7	04/2017
Excess			-1.2	-11.8	-11.8	-5.8			-5.6	
ROCK CREEK	**358,043,158**	**2.6**	**21.0**	**0.9**	**0.9**	**1.7**			**3.2**	**04/2017**
BENCHMARK EM			18.1	-3.4	-3.4	1.9			3.7	04/2017
Excess			2.9	4.3	4.3	-0.2			-0.5	

STATE STREET.

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Emerging Markets					
EARNEST PARTNERS	**24.7%**	**-15.4%**			
MSCI EMERGING MARKETS	18.4	-14.6			
Excess	6.3	-0.8			
MARTIN CURRIE	**27.3**	**-16.6**			
BENCHMARK EM	18.4	-14.6			
Excess	8.8	-2.0			
MACQUARIE	**23.2**	**-13.3**			
BENCHMARK EM	18.4	-14.6			
Excess	4.7	1.3			
MORGAN STANLEY	**20.4**	**-16.7**	**37.9%**	**6.1%**	**-9.4%**
BENCHMARK EM	18.4	-14.6	37.3	11.2	-14.9
Excess	1.9	-2.2	0.6	-5.1	5.5
NEUBERGER BERMAN	**19.7**	**-17.1**			
BENCHMARK EM	18.4	-14.6			
Excess	1.3	-2.6			
PZENA	**13.4**	**-10.8**			
BENCHMARK EM	18.4	-14.6			
Excess	-5.1	3.8			
ROCK CREEK	**22.3**	**-17.6**			
BENCHMARK EM	18.4	-14.6			
Excess	3.9	-3.1			

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Total Emerging Markets										
ACTIVE EMERGING MARKETS AGGREGATE	**$2,470,852,118**	**17.7%**	**19.3%**	**-3.4%**	**-3.4%**	**1.3%**	**2.1%**	**2.5%**		
BENCHMARK EM			18.1	-3.4	-3.4	1.9	2.9	3.3		
Excess			1.3	0.0	0.0	-0.6	-0.7	-0.7		
SSGA EMERGING MARKETS PASSIVE	**1,108,591,417**	**7.9**	**18.3**	**-3.1**	**-3.1**	**2.0**	**3.0**		**3.6**	**01/2012**
BENCHMARK EM			18.1	-3.4	-3.4	1.9	2.9		3.5	01/2012
Excess			0.2	0.3	0.3	0.1	0.1		0.1	
EMERGING MARKETS TOTAL	**3,579,443,535**	**25.6**	**19.0**	**-3.2**	**-3.2**	**1.5**	**2.6**	**2.8**		
BENCHMARK EM			18.1	-3.4	-3.4	1.9	2.9	3.3		
Excess			0.9	0.2	0.2	-0.4	-0.3	-0.5		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Total Emerging Markets					
ACTIVE EMERGING MARKETS AGGREGATE	**21.4%**	**-15.6%**	**37.2%**	**5.3%**	**-12.7%**
BENCHMARK EM	18.4	-14.6	37.3	11.2	-14.9
Excess	3.0	-1.0	-0.1	-5.9	2.2
SSGA EMERGING MARKETS PASSIVE	**18.1%**	**-14.7%**	**37.4%**	**11.1**	**-14.6**
BENCHMARK EM	18.4%	-14.6%	37.3%	11.2	-14.9
Excess	-0.3%	-0.1%	0.1%	-0.1	0.3
EMERGING MARKETS TOTAL	**20.3%**	**-15.4%**	**37.7%**	**7.5**	**-13.1**
BENCHMARK EM	18.4%	-14.6%	37.3%	11.2	-14.9
Excess	1.9%	-0.8%	0.4%	-3.7	1.9

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Core Bonds
June 30, 2020

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Core Bonds										
ACTIVE CORE BONDS AGGREGATE	**$4,199,253,367**	**56.2%**	**6.4%**	**9.1%**	**9.1%**	**5.9%**	**5.0%**	**4.8%**		
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8		
Excess			3.5	0.4	0.4	0.6	0.7	1.0		
SEMI PASSIVE CORE BONDS AGGREGATE	**3,266,736,856**	**43.8**	**4.3**	**9.5**	**9.5**	**5.7**	**4.6**	**4.2**		
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8		
Excess			1.4	0.7	0.7	0.3	0.3	0.4		
TRANSITION AGGREGATE CORE BONDS (1)	18,715	0.0								
TOTAL CORE BONDS (2)	**7,466,008,938**	**100.0**	**5.5**	**9.2**	**9.2**	**5.8**	**4.8**	**4.5**	**7.6**	**07/1984**
Core Bonds Benchmark			2.9	8.7	8.7	5.3	4.3	3.8	7.2	07/1984
Excess			2.6	0.5	0.5	0.4	0.5	0.7	0.4	

(1) The Transition Aggregate Core Bonds includes core bonds securities that are being transition to a different manager.

(2) The current Core Bonds Benchmark is the Bloomberg Barclays U.S. Aggregate calculated daily: BBG BARC Agg (Dly). For historical benchmark details please refer to the addendum of this report.

Note: All aggregates include the performance of terminated managers. Inception refers to the date of retention by the SBI.

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Core Bonds					
ACTIVE CORE BONDS AGGREGATE	**10.0%**	**0.0%**	**4.7%**	**4.4%**	**0.6%**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	1.3	-0.0	1.2	1.7	0.0
SEMI PASSIVE CORE BONDS AGGREGATE	**9.3**	**-0.1**	**3.7**	**2.8**	**0.8**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	0.6	-0.1	0.2	0.2	0.2
TRANSITION AGGREGATE CORE BONDS (1)					
TOTAL CORE BONDS (2)	**9.7%**	**-0.0%**	**4.2%**	**3.6**	**0.7**
Core Bonds Benchmark	8.7%	0.0%	3.5%	2.6	0.5
Excess	1.0%	-0.1%	0.7%	0.9	0.1

(1) The Transition Aggregate Core Bonds includes core bonds securities that are being transition to a different manager.

(2) The current Core Bonds Benchmark is the Bloomberg Barclays U.S. Aggregate calculated daily: BBG BARC Agg (Dly). For historical benchmark details please refer to the addendum of this report.

Note: All aggregates include the performance of terminated managers. Inception refers to the date of retention by the SBI.

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Core Bonds Managers										
COLUMBIA	**$1,045,440,564**	**14.0%**	**8.1%**	**9.4%**	**9.4%**	**6.3%**	**5.3%**	**4.9%**	**5.6%**	**07/1993**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	5.4	07/1993
Excess			5.2	0.7	0.7	0.9	1.0	1.1	0.2	
DODGE & COX	**1,033,443,375**	**13.8**	**5.6**	**8.5**	**8.5**	**5.5**	**4.8**	**4.7**	**6.1**	**02/2000**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	5.3	02/2000
Excess			2.7	-0.2	-0.2	0.2	0.5	0.9	0.9	
PIMCO	**1,026,428,114**	**13.7**	**4.3**	**8.5**	**8.5**	**5.5**	**4.5**	**4.5**	**5.8**	**10/2008**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	4.6	10/2008
Excess			1.4	-0.2	-0.2	0.2	0.2	0.7	1.2	
WESTERN	**1,093,941,313**	**14.7**	**7.4**	**9.8**	**9.8**	**6.2**	**5.5**	**5.2**	**8.4**	**07/1984**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	7.3	07/1984
Excess			4.5	1.1	1.1	0.9	1.2	1.4	1.1	
ACTIVE CORE BONDS AGGREGATE	**4,199,253,367**	**56.2**	**6.4**	**9.1**	**9.1**	**5.9**	**5.0**	**4.8**		
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8		
Excess			3.5	0.4	0.4	0.6	0.7	1.0		

STATE STREET.

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Active Core Bonds Managers					
COLUMBIA	**10.7%**	**0.2%**	**4.8%**	**5.2%**	**0.2%**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	1.9	0.2	1.2	2.6	-0.4
DODGE & COX	**9.6**	**-0.0**	**4.2**	**4.8**	**0.3**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	0.9	-0.1	0.7	2.2	-0.3
PIMCO	**8.4**	**0.4**	**4.4**	**2.8**	**1.0**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	-0.3	0.4	0.8	0.2	0.4
WESTERN	**11.1**	**-0.2**	**5.6**	**4.9**	**0.7**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	2.4	-0.3	2.1	2.2	0.1
ACTIVE CORE BONDS AGGREGATE	**10.0%**	**0.0%**	**4.7%**	**4.4**	**0.6**
BBG BARC Agg (Dly)	8.7%	0.0%	3.5%	2.6	0.5
Excess	1.3%	-0.0%	1.2%	1.7	0.0

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Semi Passive Core Bonds Managers										
BLACKROCK	**$1,138,717,736**	**15.3%**	**4.1%**	**9.2%**	**9.2%**	**5.6%**	**4.5%**	**4.1%**	**5.4%**	**04/1996**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	5.3	04/1996
Excess			1.2	0.5	0.5	0.2	0.2	0.2	0.1	
GOLDMAN SACHS	**997,909,450**	**13.4**	**4.9**	**9.6**	**9.6**	**5.8**	**4.7**	**4.3**	**5.7**	**07/1993**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	5.4	07/1993
Excess			2.0	0.9	0.9	0.5	0.4	0.5	0.3	
NEUBERGER	**1,130,109,671**	**15.1**	**3.9**	**9.6**	**9.6**	**5.7**	**4.5**	**4.2**	**6.5**	**07/1988**
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8	6.3	07/1988
Excess			1.0	0.9	0.9	0.3	0.2	0.4	0.2	
SEMI PASSIVE CORE BONDS AGGREGATE	**3,266,736,856**	**43.8**	**4.3**	**9.5**	**9.5**	**5.7**	**4.6**	**4.2**		
BBG BARC Agg (Dly)			2.9	8.7	8.7	5.3	4.3	3.8		
Excess			1.4	0.7	0.7	0.3	0.3	0.4		

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Semi Passive Core Bonds Managers					
BLACKROCK	**9.3%**	**-0.1%**	**3.7%**	**2.8%**	**0.9%**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	0.6	-0.2	0.1	0.1	0.3
GOLDMAN SACHS	**9.6**	**-0.0**	**3.9**	**3.0**	**0.8**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	0.9	-0.0	0.4	0.3	0.2
NEUBERGER	**9.0**	**-0.1**	**3.6**	**2.7**	**0.7**
BBG BARC Agg (Dly)	8.7	0.0	3.5	2.6	0.5
Excess	0.3	-0.1	0.0	0.1	0.2
SEMI PASSIVE CORE BONDS AGGREGATE	**9.3%**	**-0.1%**	**3.7%**	**2.8**	**0.8**
BBG BARC Agg (Dly)	8.7%	0.0%	3.5%	2.6	0.5
Excess	0.6%	-0.1%	0.2%	0.2	0.2

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Treasuries
June 30, 2020

Minnesota State Board of Investment
Quarter Ending June 30, 2020
Treasuries Managers

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Treasuries Managers										
BLACKROCK	**$2,461,036,907**	**34.2%**	**0.2%**	**16.8%**	**16.8%**				**11.2%**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			0.6	17.2	17.2				11.4	02/2018
Excess			-0.4	-0.4	-0.4				-0.3	
GOLDMAN SACHS	**2,307,928,584**	**32.1**	**0.3**	**16.7**	**16.7**				**11.2**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			0.6	17.2	17.2				11.4	02/2018
Excess			-0.3	-0.5	-0.5				-0.2	
NEUBERGER	**2,420,428,091**	**33.7**	**0.3**	**16.6**	**16.6**				**11.1**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			0.6	17.2	17.2				11.4	02/2018
Excess			-0.2	-0.6	-0.6				-0.3	
TREASURIES TRANSITION ACCOUNT	0	0.0								
TOTAL TREASURIES	**7,189,393,582**	**100.0**	**0.3**	**16.7**	**16.7**				**11.1%**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			0.6	17.2	17.2				11.4%	02/2018
Excess			-0.3	-0.5	-0.5				-0.3%	

	2019 Calendar Return	2018 Calendar Return	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return
Treasuries Managers					
BLACKROCK	**10.4%**				
BBG BARC 5Y + Us Tsy Idx	10.4				
Excess	-0.1				
GOLDMAN SACHS	**10.6**				
BBG BARC 5Y + Us Tsy Idx	10.4				
Excess	0.1				
NEUBERGER	**10.4**				
BBG BARC 5Y + Us Tsy Idx	10.4				
Excess	-0.0				
TOTAL TREASURIES	**10.4%**				
BBG BARC 5Y + Us Tsy Idx	10.4%				
Excess	0.0%				

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Private Markets
June 30, 2020

Combined Funds Asset Class Performance Summary

Private Markets

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 year	30 year
Private Markets	-9.0%	-2.6%	-2.6%	7.3%	8.2%	10.6%	11.1%	13.2%	11.9%
Private Equity	-7.3%	3.6%	3.6%	12.3%	12.6%	13.5%	11.7%	15.3%	
Private Credit	-6.9	0.4	0.4	7.6	10.6	11.9	11.4		
Resources	-19.6	-25.4	-25.4	-7.8	-5.7	1.4	12.6	12.6	
Real Estate	-3.9	3.5	3.5	8.2	8.1	11.4	8.5	9.4	

Private Markets

The time-weighted rates of return for the Private Markets portfolio are shown here. Private Markets included Private Equity, Private Credit, Resources, and Real Estate. Some of the existing investments are relatively immature and returns may not be indicative of future results.

Private Equity Investments

The objectives of the Private Equity portfolio, which may include leveraged buyouts, growth equity, venture capital and special situations, are to achieve attractive returns and to provide overall portfolio diversification to the total plan.

Private Credit Investments

The objectives of the Private Credit portfolio, which may include mezzanine debt, direct lending, and other forms of non-investment grade fixed income instruments, are to achieve a high total return over a full market cycle and to provide some degree of downside protection and typically provide current income in the form of a coupon. In certain situations, investments in the Private Credit portfolio also provide an equity component of return in the form of warrants or re-organized equity.

Resource Investments

The objectives of the Resources portfolio, which may include energy, infrastructure, and other hard assets, are to provide protection against the risks associated with inflation and to provide overall portfolio diversification to the total plan.

Real Estate Investments

The objectives of the Real Estate portfolio, which may include core and non-core real estate investments, are to achieve attractive returns, preserve capital, provide protection against risks associated with inflation, and provide overall portfolio diversification to the total plan.

The SBI also monitors Private Markets performance using money-weighted return metrics such as Internal Rate of Return and Multiple of Invested Capital. For money-weighted return metrics please refer to the Combined Funds Performance Report.

Minnesota State Board of Investment
- Alternative Investments -

As of June 30, 2020

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
I. PRIVATE EQUITY								
Adams Street Partners								
Adams Street Global Secondary Fund 5	100,000,000	77,114,692	42,824,511	44,968,248	22,885,308	3.65	1.14	**8.04**
Adams Street Global Secondary Fund 6	100,000,000	33,700,000	32,902,356	1,214,007	66,300,000	1.66	1.01	**3.25**
Advent International								
Advent International GPE VI	50,000,000	52,993,313	5,925,500	100,573,095	0	16.52	2.01	**12.25**
Advent International GPE VII	90,000,000	84,690,641	51,159,605	87,618,069	5,400,000	12.71	1.64	**7.79**
Advent International GPE VIII	100,000,000	93,700,002	98,485,542	0	6,299,998	2.29	1.05	**4.40**
Advent International GPE IX	115,000,000	28,175,001	25,523,311	0	86,824,999	-13.12	0.91	**1.40**
Affinity Ventures								
Affinity Ventures IV	4,000,000	4,000,000	83,585	1,541,970	0	-23.88	0.41	**16.01**
Affinity Ventures V	5,000,000	5,000,000	1,510,838	1,706,245	0	-7.54	0.64	**12.00**
APAX Partners								
Apax VIII - USD	200,000,000	229,550,511	116,090,147	235,740,031	15,627,330	12.86	1.53	**7.32**
Apax IX - USD	150,000,000	138,697,018	167,287,206	3,944,404	15,247,386	12.90	1.23	**4.12**
Apax X - USD	150,000,000	0	0	0	150,000,000	0.00	0.00	**1.23**
Arsenal Capital Partners								
Arsenal Fund V	75,000,000	34,591,003	31,741,760	51,772	40,419,115	-10.49	0.92	**1.49**
Asia Alternatives								
Asia Alternatives Capital Partners V	99,000,000	41,611,306	37,163,382	1,154,949	58,080,727	-9.27	0.92	**3.00**
Banc Fund								
Banc Fund VIII	98,250,000	98,250,000	25,293,030	174,293,973	0	12.16	2.03	**12.19**
Banc Fund IX	107,205,932	107,205,932	87,411,643	19,549,737	0	-0.06	1.00	**6.06**
Banc Fund X	71,345,455	49,757,818	38,234,256	0	21,587,636	-25.36	0.77	**2.16**
BlackRock								
BlackRock Long Term Capital	250,000,000	127,530,934	128,373,276	1,492,700	122,469,066	2.07	1.02	**1.51**
Blackstone Capital Partners								
Blackstone Capital Partners IV	70,000,000	84,459,884	1,721,388	200,025,998	1,832,302	37.02	2.39	**17.98**
Blackstone Capital Partners V	140,000,000	152,334,232	3,960,822	238,282,782	7,027,560	7.86	1.59	**14.42**

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Blackstone Capital Partners VI	100,000,000	105,990,221	49,100,047	100,361,596	11,175,309	9.04	1.41	**11.94**
Blackstone Capital Partners VII	130,000,000	121,041,462	122,253,556	11,819,671	23,388,945	7.11	1.11	**5.00**
Blackstone Capital Partners VIII LP	150,000,000	0	0	0	150,000,000	0.00	0.00	**1.76**
Blackstone Strategic Partners (CSFB/ DLJ)								
Strategic Partners III VC	25,000,000	25,039,648	487,713	33,676,348	1,028,056	6.00	1.36	**15.09**
Strategic Partners III-B	100,000,000	79,581,948	419,981	118,286,611	14,851,676	6.35	1.49	**15.09**
Strategic Partners IV VC	40,500,000	42,083,951	3,963,302	59,792,682	2,338,555	9.14	1.51	**12.27**
Strategic Partners IV-B	100,000,000	99,238,544	8,911,599	146,516,648	17,581,785	12.27	1.57	**12.04**
Strategic Partners V	100,000,000	85,901,206	17,215,925	122,214,974	36,190,793	18.90	1.62	**8.87**
Strategic Partners VI	150,000,000	100,514,557	45,404,098	100,033,772	55,824,023	15.17	1.45	**6.21**
Strategic Partners VII	150,000,000	97,039,790	105,058,415	35,311,333	67,371,716	20.13	1.45	**3.52**
Strategic Partners VIII	150,000,000	33,195,737	43,375,078	2,625,000	119,377,709	58.82	1.39	**1.75**
Bridgepoint								
Bridgepoint Europe VI	167,979,608	55,807,120	52,839,589	0	112,172,488	-10.66	0.95	**2.28**
Brookfield Asset Management								
Brookfield Capital Partners Fund IV	100,000,000	96,443,104	81,602,941	124,645,731	23,980,870	49.68	2.14	**4.80**
Brookfield Capital Partners V	250,000,000	76,879,595	68,586,978	0	173,120,405	-15.16	0.89	**1.93**
Cardinal Partners								
DSV Partners IV	10,000,000	10,000,000	30,735	39,196,082	0	10.61	3.92	**35.52**
Carlyle Group								
Carlyle Partners VII	150,000,000	59,333,669	50,737,009	317,553	90,983,884	-18.40	0.86	**2.54**
Chicago Growth Partners (William Blair)								
William Blair Capital Partners VII	50,000,000	48,150,000	753,957	69,698,512	1,650,000	8.61	1.46	**19.32**
Chicago Growth Partners I	50,000,000	52,441,998	1,801,646	54,532,745	300,000	1.66	1.07	**14.94**
Chicago Growth Partners II	60,000,000	58,347,626	1,984,538	121,871,703	1,652,374	19.56	2.12	**12.31**
Court Square Capital Partners								
Court Square Capital Partners II	175,000,000	170,186,067	12,402,860	295,201,185	16,455,909	12.68	1.81	**13.82**
Court Square Capital Partners III	175,000,000	182,333,473	173,842,425	115,512,736	11,739,519	17.52	1.59	**8.08**
Court Square Capital Partners IV	150,000,000	37,431,304	39,060,012	0	112,510,570	6.03	1.04	**2.15**
Crescendo								
Crescendo IV	101,500,000	103,101,226	526,369	57,625,039	0	-4.63	0.56	**20.32**
CVC Capital Partners								
CVC European Equity Partners V	133,920,388	153,813,045	11,941,627	279,808,725	1,604,127	16.51	1.90	**12.27**
CVC Capital Partners VI	257,546,087	263,643,548	268,465,716	130,560,514	42,717,080	15.03	1.51	**6.98**
Elevation Partners								
Elevation Partners	75,000,000	73,237,580	136,977	113,492,106	799,634	11.81	1.55	**15.13**
Glouston Capital Partners**								

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Glouston Private Equity Opportunities Fund IV	5,337,098	4,386,760	1,009,827	3,696,251	1,090,000	2.86	1.07	**5.50**
Goldner Hawn Johnson & Morrison								
Goldner Hawn Fund VII, L.P.	57,755,138	11,972,863	12,413,651	0	45,947,625	6.44	1.04	**2.19**
TrailHead Fund	20,000,000	16,070,803	28,539,675	12,806,955	3,935,813	17.37	2.57	**8.35**
GS Capital Partners								
GS Capital Partners V	100,000,000	74,319,006	1,103,390	191,435,136	1,041,099	18.25	2.59	**15.25**
GS Capital Partners VI	100,000,000	110,196,079	11,629,632	132,005,252	2,551,356	7.10	1.30	**13.42**
GS Vintage VII	100,000,000	79,493,216	75,654,507	24,463,676	45,090,599	15.33	1.26	**4.01**
West Street Capital Partners VII	150,000,000	88,397,501	62,354,402	15,552,958	74,258,025	-8.15	0.88	**3.53**
GS China-US Cooperation Fund	99,800,000	13,647,445	6,445,874	0	86,327,000	-50.36	0.47	**2.13**
GTCR								
GTCR X	100,000,000	104,934,096	3,273,939	202,619,633	6,751,396	20.92	1.96	**9.56**
GTCR XI	110,000,000	99,095,726	88,172,520	93,035,406	12,066,556	22.95	1.83	**6.62**
HarbourVest**								
Dover Street VII Cayman Fund	2,198,112	2,073,906	234,114	1,639,420	132,416	-4.66	0.90	**5.50**
HarbourVest Intl PE Partners V-Cayman US	3,520,309	3,345,452	559,566	3,943,142	179,704	13.99	1.35	**5.50**
Harbourvest Intl PE Partners VI-Cayman	4,233,685	4,038,952	3,330,478	2,940,367	196,551	13.42	1.55	**5.50**
HarbourVest Partners VIII Cayman Buyout	4,506,711	4,387,189	1,086,955	4,639,746	156,000	11.78	1.31	**5.50**
HarbourVest Partners VIII-Cayman Venture	7,190,898	7,085,519	2,826,175	6,377,548	140,000	8.26	1.30	**5.50**
Hellman & Friedman								
Hellman & Friedman Capital Partners VI	175,000,000	171,037,755	6,705,385	309,639,874	5,084,864	12.86	1.85	**13.26**
Hellman & Friedman Capital Partners VII	50,000,000	49,838,762	57,238,293	75,275,383	2,263,593	22.83	2.66	**11.20**
Hellman & Friedman Investors IX	175,000,000	38,901,558	33,400,994	0	133,356,750	-48.44	0.86	**2.01**
IK Investment Partners								
IK Fund VII	180,226,770	178,082,353	78,876,377	215,835,488	8,518,275	12.79	1.65	**6.80**
IK Fund VIII	170,790,642	172,066,602	170,267,242	31,294,092	165,516	9.11	1.17	**3.95**
IK Fund IX	151,600,917	2,009,192	991,125	0	149,591,725	-60.08	0.49	**1.22**
Kohlberg Kravis Roberts								
KKR Millennium Fund	200,000,000	205,167,570	161,924	424,946,028	0	16.37	2.07	**17.57**
KKR 2006 Fund	200,000,000	219,082,928	51,585,564	326,553,330	3,300,979	8.87	1.73	**13.76**
KKR Americas Fund XII	150,000,000	78,613,842	80,544,369	988,851	73,267,327	2.33	1.04	**4.33**
KKR Asian Fund III	100,000,000	60,201,509	59,741,446	12,838,876	46,769,649	18.06	1.21	**3.25**
KKR Asian Fund IV	150,000,000	0	0	0	150,000,000	0.00	0.00	**0.12**
KKR Europe V	100,000,000	22,697,167	18,149,994	0	77,302,833	-31.25	0.80	**1.90**
Leonard Green & Partners								
Green Equity Investors VI	200,000,000	219,721,361	200,903,249	156,469,267	16,790,263	13.26	1.63	**8.30**
Green Equity Investors VIII	125,000,000	0	0	0	125,000,000	0.00	0.00	

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Lexington Capital Partners								
Lexington Capital Partners VI	100,000,000	98,374,022	7,148,296	139,280,691	1,634,703	7.96	1.49	**14.52**
Lexington Capital Partners VII	200,000,000	172,466,709	44,180,742	231,718,226	38,059,995	14.46	1.60	**11.47**
Lexington Capital Partners VIII	150,000,000	134,716,285	102,437,919	78,667,570	33,715,785	15.83	1.34	**6.33**
Lexington Co-Investment Partners IV	200,000,000	184,108,627	189,204,927	12,618,581	27,562,725	6.74	1.10	**3.91**
Lexington Co-Investment Partners V, L.P.	300,000,000	0	0	0	300,000,000	0.00	0.00	**0.75**
Lexington Middle Market Investors IV	100,000,000	23,262,562	25,548,971	1,458,011	76,737,438	23.21	1.16	**3.52**
Lexington Capital Partners IX	150,000,000	10,623,000	17,033,597	2,837,523	140,340,799	94.05	1.87	**1.99**
Madison Dearborn Capital Partners								
Madison Dearborn Capital Partners VII	100,000,000	90,673,280	94,635,986	9,298,015	18,589,340	7.15	1.15	**4.53**
Madison Dearborn Capital Partners VIII-A, L.P.	100,000,000	0	0	0	100,000,000	0.00	0.00	**1.04**
Neuberger Berman								
Dyal Capital Partners III	175,000,000	176,947,208	122,589,220	135,891,321	110,484,158	29.67	1.46	**5.20**
Dyal Capital Partners IV	250,000,000	30,937,639	24,110,844	10,164,281	228,862,052	12.64	1.11	**2.23**
Nordic Capital								
Nordic Capital Fund VIII	176,829,302	196,739,045	125,959,246	143,324,844	21,808,975	10.43	1.37	**6.80**
Nordic Capital Fund IX Beta	167,924,851	101,017,549	111,064,342	4,774,012	66,907,301	26.31	1.15	**3.20**
North Sky Capital**								
North Sky Capital LBO Fund III	1,070,259	720,259	179,097	841,678	350,000	13.23	1.42	**5.50**
North Sky Capital Venture Fund III	1,384,080	1,277,830	227,849	1,369,463	106,250	9.76	1.25	**5.50**
Oak Hill Capital Management, Inc.								
Oak Hill Capital Partners IV	150,000,000	119,353,934	111,122,592	28,267,962	52,442,502	13.04	1.17	**3.56**
Oak Hill Capital Partners V	100,000,000	0	0	0	100,000,000	0.00	0.00	**1.82**
Paine Schwartz								
Paine Schwartz IV	75,000,000	62,851,819	65,130,361	14,823,737	13,221,335	8.82	1.27	**5.55**
Paine Schwartz V	150,000,000	16,532,480	12,532,661	0	133,467,520	-34.12	0.76	**2.16**
Permira								
Permira V	177,185,743	173,983,591	185,299,389	215,682,471	25,035,907	21.09	2.30	**6.50**
Permira VI	136,834,757	122,910,381	126,299,282	18,619,429	30,224,372	9.80	1.18	**3.93**
Permira VII	139,815,723	26,714,519	25,328,410	0	113,101,204	-6.73	0.95	**1.33**
Public Pension Capital Management								
Public Pension Capital	150,000,000	81,796,093	93,479,801	48,204,147	80,046,009	22.99	1.73	**6.13**
RWI Ventures								
RWI Ventures I	7,603,265	7,603,265	0	6,440,987	0	-4.84	0.85	**14.01**
Silver Lake Partners								
Silver Lake Partners II	100,000,000	90,200,747	86,657	171,694,975	11,771,953	11.02	1.90	**16.01**
Silver Lake Partners III	100,000,000	93,670,226	21,652,028	182,877,943	8,874,018	18.22	2.18	**13.26**

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Silver Lake Partners IV	100,000,000	112,636,118	119,030,287	86,580,842	4,168,036	22.05	1.83	**7.76**
Silver Lake Partners V	135,000,000	91,227,603	96,139,846	992,615	30,732,431	5.42	1.06	**3.25**
Split Rock Partners								
Split Rock Partners	50,000,000	47,890,906	4,132,208	58,794,192	2,109,094	3.34	1.31	**15.17**
Split Rock Partners II	60,000,000	59,165,000	24,767,080	49,975,369	835,000	4.75	1.26	**12.18**
Summit Partners								
Summit Partners Growth Equity Fund VIII	100,000,000	116,057,192	46,298,131	193,525,542	23,106,551	25.19	2.07	**9.16**
Summit Partners Growth Equity Fund IX	100,000,000	114,634,107	114,494,560	37,059,941	22,425,834	23.78	1.32	**4.84**
Summit Partners Growth Equity Fund X	150,000,000	11,670,000	13,239,475	0	138,330,000	16.92	1.13	**1.58**
Thoma Bravo								
Thoma Bravo Fund XII	75,000,000	75,960,561	97,234,950	5,117,450	4,228,124	12.30	1.35	**3.81**
Thoma Bravo Fund XIII	150,000,000	108,511,069	114,287,113	606	41,488,931	6.68	1.05	**2.25**
Thoma Cressey								
Thoma Cressey Fund VII	50,000,000	50,000,000	462,527	107,057,940	0	23.59	2.15	**19.86**
Thomas H. Lee Partners								
Thomas H. Lee Equity Fund VII	100,000,000	98,576,770	96,866,519	45,725,599	10,189,592	17.98	1.45	**4.81**
Thomas H. Lee Equity Fund VIII	150,000,000	65,640,135	60,946,200	11,089,430	93,707,986	25.52	1.10	**2.25**
Thomas, McNerney & Partners								
Thomas, McNerney & Partners I	30,000,000	30,000,000	3,434,118	15,087,143	0	-7.23	0.62	**17.66**
Thomas, McNerney & Partners II	50,000,000	48,125,000	4,628,157	107,648,037	1,875,000	16.64	2.33	**14.01**
TPG Capital								
TPG Partners VII	100,000,000	97,222,158	92,803,356	22,059,928	10,369,360	7.57	1.18	**4.81**
TPG Partners VIII	150,000,000	14,789,674	10,167,325	0	135,210,326	-54.33	0.69	**2.26**
Vestar Capital Partners								
Vestar Capital Partners IV	55,000,000	55,652,024	341,894	102,293,320	57,313	14.63	1.84	**20.55**
Vestar Capital Partners V	75,000,000	76,712,048	7,954,605	91,821,429	0	3.76	1.30	**14.54**
Vestar Capital Partners VI	100,000,000	106,195,246	62,496,976	123,127,619	357,259	23.89	1.75	**8.77**
Vestar Capital Partners VII	150,000,000	36,416,947	31,296,555	120,808	113,583,053	-10.60	0.86	**2.54**
Vista Equity Partners								
Vista Equity Partners Perennial, L.P.	200,000,000	68,988,098	67,013,334	0	132,224,805	-2.86	0.97	**0.35**
Warburg Pincus								
Warburg Pincus Equity Partners, L.P.	100,000,000	100,000,000	393,972	163,542,253	0	10.03	1.64	**22.27**
Warburg Pincus Private Equity VIII	100,000,000	100,373,266	370,506	228,717,051	0	14.74	2.28	**18.22**
Warburg Pincus Private Equity IX	100,000,000	100,000,000	3,835,817	169,104,301	0	9.67	1.73	**14.94**
Warburg Pincus Private Equity X	150,000,000	150,000,000	20,115,679	231,683,952	0	8.77	1.68	**12.69**
Warburg Pincus Private Equity XI	200,000,000	200,299,952	101,876,177	206,939,948	0	11.32	1.54	**7.53**
Warburg Pincus Private Equity XII	131,000,000	125,825,500	137,687,786	15,330,013	5,174,500	8.95	1.22	**4.61**

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Warburg Pincus China	45,000,000	42,615,000	48,039,387	7,760,025	4,320,000	14.54	1.31	**3.55**
Warburg Pincus Financial Sector, L.P.	90,000,000	55,930,808	53,523,463	4,590,000	38,430,000	3.26	1.04	**2.79**
Warburg Pincus Global Growth	250,000,000	56,897,089	53,407,094	0	192,750,000	-10.51	0.94	**1.86**
Warburg Pincus China-Southeast Asia II	50,000,000	1,750,000	1,533,607	0	48,250,000	-12.24	0.88	**1.32**
Wellspring Capital Partners								
Wellspring Capital Partners VI	125,000,000	42,773,393	36,027,302	0	82,226,607	-13.64	0.84	**3.80**
Welsh, Carson, Anderson & Stowe								
Welsh, Carson, Anderson & Stowe XI	100,000,000	100,000,000	28,933,415	130,320,188	0	11.36	1.59	**11.95**
Welsh, Carson, Anderson & Stowe XII	150,000,000	134,579,934	129,525,484	77,974,598	15,420,066	19.41	1.54	**5.53**
Welsh, Carson, Anderson & Stowe XIII	250,000,000	15,635,083	7,830,222	0	234,364,917	-88.75	0.50	**2.27**
Whitehorse Capital								
Whitehorse Liquidity Partners III, LP	100,000,000	70,128,933	65,081,006	10,945,804	40,840,380	14.28	1.08	**1.50**
Wind Point Partners								
Wind Point Partners IX	100,000,000	17,474,236	15,859,614	0	82,530,367	-21.09	0.91	**1.26**
Windjammer Capital Investors								
Windjammer Mezzanine & Equity Fund II	66,708,861	55,215,684	62,554	84,876,800	1,013,936	8.94	1.54	**20.26**
Windjammer Senior Equity Fund IV	100,000,000	94,740,728	117,845,897	41,101,357	13,181,155	13.01	1.68	**8.35**
Windjammer Senior Equity Fund V	100,000,000	33,313,693	29,423,695	1,206,897	67,893,204	-14.13	0.92	**2.62**
Private Equity Total	**15,964,764,590**	**10,716,108,844**	**6,538,456,020**	**9,385,282,788**	**6,104,830,936**	**11.68**	1.49	
II. PRIVATE CREDIT								
Audax Group								
Audax Mezzanine Fund III	100,000,000	98,308,857	16,706,661	112,148,579	3,329,266	9.61	1.31	**10.24**
Audax Mezzanine Fund IV	100,000,000	59,314,713	34,065,870	31,794,821	51,438,433	8.45	1.11	**5.23**
Audax Mezzanine Fund V	100,000,000	0	0	0	100,000,000	0.00	0.00	
BlackRock								
BlackRock Middle Market Senior Fund	97,500,000	69,802,405	64,758,204	1,247,100	27,697,595	-6.08	0.95	**2.21**
Energy Capital Partners								
Energy Capital Credit Solutions II	100,000,000	6,262,940	5,672,202	124,550	93,861,610	-7.59	0.93	**1.75**
GS Mezzanine Partners								
GS Mezzanine Partners 2006	100,000,000	113,454,150	771,246	134,861,849	9,858,563	5.00	1.20	**14.24**
GS Mezzanine Partners V	150,000,000	147,710,122	1,023,875	180,259,366	37,564,028	9.07	1.23	**12.69**
Gold Hill Venture Lending								
Gold Hill Venture Lending	40,000,000	40,000,000	378,579	65,077,862	0	10.69	1.64	**15.76**
Gold Hill 2008	25,852,584	25,852,584	5,692,965	44,745,145	0	14.58	1.95	**12.00**
HPS Investment Partners								

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
HPS Mezzanine Partners 2019, L.P.	100,000,000	32,385,029	28,064,867	5,571,203	73,053,494	6.19	1.04	**1.47**
Kohlberg Kravis Roberts								
KKR Lending Partners II	75,000,000	86,380,377	14,488,674	79,747,153	8,802,924	4.68	1.09	**5.33**
KKR Lending Partners III	199,000,000	100,847,925	91,801,026	24,175,539	105,064,958	10.95	1.15	**3.23**
LBC Credit Partners								
LBC Credit Partners IV	100,000,000	89,731,768	64,593,545	36,654,383	32,291,029	7.76	1.13	**4.17**
LBC Credit Partners V	100,000,000	-15,023	0	0	100,000,000	0.00	0.00	**1.25**
Marathon								
Marathon Secured Private Strategies Fund II, L.P.	100,000,000	41,129,132	46,779,867	160,057	59,892,876	15.02	1.14	**1.01**
Merit Capital Partners								
Merit Mezzanine Fund IV	75,000,000	70,178,571	545,539	139,120,463	4,821,429	11.57	1.99	**15.55**
Merit Mezzanine Fund V	75,000,000	71,044,898	32,719,244	75,273,236	3,955,102	9.58	1.52	**10.54**
Merit Mezzanine Fund VI	100,000,000	65,231,708	58,506,171	22,854,478	34,701,493	11.65	1.25	**4.27**
Oaktree Capital Management								
Oaktree Real Estate Debt Fund, III L.P	17,500,000	10,950,000	10,950,000	0	6,550,000	0.00	1.00	**0.27**
Portfolio Advisors								
DLJ Investment Partners III	100,000,000	82,719,050	416,047	96,478,980	509,988	6.77	1.17	**14.03**
Prudential Capital Partners								
Prudential Capital Partners II	100,000,000	97,418,748	2,581,349	136,427,860	11,049,052	8.52	1.43	**15.01**
Prudential Capital Partners III	100,000,000	101,899,412	3,719,217	172,533,033	14,064,511	14.18	1.73	**11.21**
Prudential Capital Partners IV	100,000,000	109,489,572	55,189,070	84,670,654	3,088,035	8.55	1.28	**8.45**
Prudential Capital Partners V	150,000,000	111,156,307	112,718,340	19,975,206	42,608,517	11.18	1.19	**3.87**
PGIM Capital Partners VI	100,000,000	0	0	0	100,000,000	0.00	0.00	
Summit Partners								
Summit Subordinated Debt Fund III	45,000,000	44,088,494	3,869,957	60,443,093	2,250,000	8.91	1.46	**16.38**
Summit Subordinated Debt Fund IV	50,000,000	55,914,003	4,255,674	72,207,729	19,850,132	10.15	1.37	**12.26**
TCW Asset Management								
TCW Direct Lending VI	100,000,000	83,599,652	35,627,083	63,307,087	25,329,409	7.00	1.18	**5.78**
TCW Direct Lending VII	100,000,000	63,032,508	57,320,137	8,762,521	39,930,144	4.95	1.05	**2.47**
TCW TALF Opportunties Fund	60,000,000	6,000,000	6,000,000		54,000,000		1.00	
Private Credit Total	**2,759,852,584**	**1,883,887,903**	**759,215,408**	**1,668,621,946**	**1,065,562,587**	**9.43**	1.29	
III. REAL ASSETS								
BlackRock								
BlackRock Global Renewable Power Fund II	98,500,000	86,408,825	71,908,912	17,734,445	19,018,389	1.99	1.04	**4.60**
BlackRock Global Renewable Power Infrastructure III	100,000,000	0	0	0	100,000,000	0.00	0.00	**1.00**

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
EIG Global Energy Partners								
EIG Energy Fund XIV	100,000,000	113,459,470	4,732,180	95,309,310	2,761,129	-4.74	0.88	**13.21**
EIG Energy Fund XV	150,000,000	159,823,964	41,394,643	131,650,694	22,871,323	2.07	1.08	**10.07**
EIG Energy Fund XVI	200,000,000	186,918,939	126,056,070	86,016,925	56,458,417	4.38	1.13	**6.80**
EnCap Energy								
EnCap Energy Capital Fund VII	100,000,000	105,379,160	2,439,063	135,157,214	0	14.11	1.31	**13.01**
EnCap Energy Capital Fund VIII	100,000,000	99,762,883	13,545,744	54,781,243	4,042,927	-11.68	0.68	**9.75**
Encap Energy Capital Fund IX	100,000,000	111,977,305	24,891,526	85,276,789	5,626,291	-0.73	0.98	**7.56**
EnCap Energy Capital Fund X	100,000,000	93,305,185	57,927,230	21,277,953	14,848,153	-6.84	0.85	**5.32**
EnerVest Energy								
EnerVest Energy Institutional Fund XIV	100,000,000	94,867,108	47,970,068	41,175,285	13,226,590	-2.06	0.94	**5.06**
Energy Capital Partners								
Energy Capital Partners II	100,000,000	85,722,480	3,959,106	112,434,332	29,749,110	8.85	1.36	**9.95**
Energy Capital Partners III	200,000,000	221,489,260	171,186,502	83,824,545	16,145,076	5.48	1.15	**6.53**
Energy Capital Partners IV	150,000,000	53,885,389	51,613,595	10,887,130	105,754,151	10.30	1.16	**2.50**
Energy & Minerals Group								
NGP Midstream & Resources	100,000,000	103,527,211	6,042,645	178,140,260	17,857	13.33	1.78	**13.26**
The Energy & Minerals Group Fund II	100,000,000	106,674,084	86,761,298	104,295,500	170,365	13.06	1.79	**8.77**
The Energy & Minerals Group Fund III	200,000,000	201,327,783	96,222,714	22,410,545	1,284,543	-11.04	0.59	**6.32**
The Energy & Minerals Group Fund IV	150,000,000	150,988,007	133,963,359	48,704,539	21,139,998	7.51	1.21	**4.67**
The Energy & Minerals Group Fund V	112,500,000	75,226,151	82,970,193	287,001	38,071,852	11.88	1.11	**1.46**
The Energy & Minerals Group Fund V Accordion	17,500,000	14,108,142	15,979,947	0	3,474,727	15.80	1.13	**1.46**
First Reserve								
First Reserve Fund XI	150,000,000	150,292,121	117,631	98,378,656	0	-9.47	0.66	**13.53**
First Reserve Fund XII	150,000,000	165,617,044	16,324,411	82,471,718	0	-11.78	0.60	**11.67**
First Reserve Fund XIII	200,000,000	209,630,039	128,279,095	66,890,196	15,533,312	-4.30	0.93	**6.66**
Kohlberg, Kravis, Roberts & Co.								
KKR Global Infrastructure Investors III	149,850,000	55,239,723	50,700,454	3,441,605	98,051,882	-2.37	0.98	**2.26**
Merit Energy Partners								
Merit Energy Partners B	24,000,000	24,000,000	1,554,840	189,858,902	0	24.27	7.98	**23.45**
Merit Energy Partners C	50,000,000	50,000,000	4,970,844	514,177,741	0	30.10	10.38	**21.68**
Merit Energy Partners D	88,000,000	70,938,303	11,709,964	333,800,338	0	22.67	4.87	**19.11**
Merit Energy Partners E	100,000,000	39,983,197	1,942,294	82,850,913	0	11.38	2.12	**15.75**
Merit Energy Partners F	100,000,000	59,522,861	7,385,286	30,129,452	0	-7.58	0.63	**14.28**
Merit Energy Partners H	100,000,000	100,000,000	41,656,973	29,668,582	0	-6.47	0.71	**9.41**
Merit Energy Partners I	169,721,518	169,721,518	143,962,956	43,839,059	0	3.20	1.11	**5.70**
Merit Energy Partners K	150,000,000	39,706,295	41,851,680	188,422	110,293,705	10.49	1.06	**1.51**

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
NGP								
Natural Gas Partners IX	150,000,000	173,921,032	2,649,187	245,366,339	605,481	11.98	1.43	**12.69**
NGP Natural Resources X	150,000,000	146,856,370	25,271,583	116,514,590	3,143,630	-1.09	0.97	**8.73**
Natural Gas Capital Resources XI	150,000,000	148,267,241	98,546,971	44,498,161	8,336,018	-1.42	0.96	**5.56**
NGP Natural Resources XII	149,500,000	77,140,377	61,047,783	0	72,019,148	-15.34	0.79	**2.92**
Sheridan								
Sheridan Production Partners III	100,000,000	34,353,005	23,998,993	19,675,000	13,500,000	8.78	1.27	**5.56**
Real Assets Total	**4,409,571,518**	**3,780,040,473**	**1,701,535,740**	**3,131,113,383**	**776,144,074**	**11.82**	1.28	
IV. REAL ESTATE								
Angelo, Gordon & Co.								
AG Realty Fund IX	100,000,000	92,141,126	94,626,646	23,500,000	11,650,000	9.32	1.28	**5.56**
AG Asia Realty Fund III	50,000,000	47,587,261	31,337,778	32,500,000	6,196,250	14.43	1.34	**3.75**
AG Europe Realty Fund II	75,000,000	59,350,822	68,555,580	28,384	15,000,000	10.60	1.16	**3.03**
AG Europe Realty Fund III, L.P.	75,000,000	10,500,000	10,500,000	0	64,500,000	0.00	1.00	**0.75**
AG Realty Fund X	150,000,000	42,743,800	42,616,072	12,431	105,375,000	-0.44	1.00	**2.16**
AG Asia Realty Fund IV	100,000,000	34,049,050	35,992,506	0	64,750,000	8.03	1.06	**2.06**
Blackstone Real Estate Partners								
Blackstone Real Estate Partners V	100,000,000	104,213,007	2,691,999	202,609,987	4,174,052	10.70	1.97	**14.18**
Blackstone Real Estate Partners VI	100,000,000	109,477,567	5,020,403	214,728,977	4,907,906	13.09	2.01	**13.26**
Blackstone Real Estate Partners VII	100,000,000	109,614,544	42,886,383	143,449,143	12,575,003	15.27	1.70	**8.59**
Blackstone Real Estate Partners VIII	150,000,000	164,162,591	143,995,392	62,300,925	25,507,103	11.13	1.26	**5.26**
Blackstone Real Estate Partners Asia II	74,500,000	31,471,946	28,437,617	2,122,235	46,616,128	-3.04	0.97	**2.77**
Blackstone Real Estate Partners IX	300,000,000	94,506,812	78,292,737	13,380,599	217,027,533	-5.50	0.97	**1.78**
Blackstone Strategic Partners (CSFB)								
Strategic Partners III RE	25,000,000	25,987,864	101,616	15,252,523	9,006	-6.46	0.59	**15.01**
Strategic Partners IV RE	50,000,000	51,496,145	2,603,554	49,563,304	1,061,572	0.21	1.01	**12.04**
Carlyle Group								
Carlyle Realty Partners VIII	150,000,000	43,420,598	41,941,082	3,427,277	110,015,546	4.67	1.04	**3.15**
Colony Capital								
Colony Investors III	100,000,000	99,660,860	2,309,700	173,802,105	0	14.49	1.77	**22.51**
Landmark Partners								
Landmark Real Estate Partners VIII	149,500,000	62,662,496	50,099,214	23,213,855	92,663,765	16.06	1.17	**3.54**
Lubert Adler								
Lubert-Adler Real Estate Fund VII-B	74,147,868	58,316,730	64,108,942	3,943,034	16,683,270	9.42	1.17	**3.73**
Oaktree Capital Management								

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Oaktree Real Estate Opportunities Fund VIII	100,000,000	9,500,000	9,500,000	0	90,500,000	0.00	1.00	
Rockpoint								
Rockpoint Real Estate Fund V	100,000,000	93,489,853	74,630,984	27,330,781	21,119,727	4.19	1.09	**5.47**
Rockpoint Real Estate Fund VI	100,000,000	16,292,723	16,245,327	0	83,707,277	-0.29	1.00	**1.53**
Rockwood								
Rockwood Capital RE Partners X	100,000,000	83,845,591	70,001,212	12,500,001	17,838,938	-0.80	0.98	**4.96**
Rockwood Capital Partners (XI), LLC	100,000,000	664,712	0	0	99,338,405	-99.98	0.00	**1.26**
Silverpeak Real Estate Partners								
Silverpeak Legacy Pension Partners II	75,000,000	73,020,516	610,030	91,672,685	7,544,554	4.16	1.26	**14.92**
Silverpeak Legacy Pension Partners III	150,000,000	70,647,525	8,352,699	14,125,306	0	-12.11	0.32	**12.17**
T.A. Associates Realty								
The Realty Associates Fund X, L.P.	100,000,000	100,000,000	11,318,286	149,874,563	0	12.78	1.61	**8.58**
The Realty Associates Fund XI, L.P.	100,000,000	100,000,000	100,454,789	23,861,052	0	8.05	1.24	**5.25**
The Realty Associates Fund XII, L.P.	100,000,000	10,000,000	8,094,460	0	90,000,000	-19.06	0.81	**2.50**
Real Estate Total	**2,948,147,868**	**1,798,824,138**	**1,045,325,008**	**1,283,199,165**	**1,208,761,034**	**8.61**	1.30	
V. DISTRESSED/ OPPORTUNISTIC								
Avenue Capital Partners								
Avenue Energy Opportunities Fund	100,000,000	100,977,328	72,011,874	24,472,941	0	-1.04	0.96	**6.00**
Avenue Energy Opportunities Fund II	100,000,000	100,000,000	90,646,100	417,420	0	-4.40	0.91	**3.16**
BlackRock**								
BlackRock Tempus Fund	1,774,870	1,774,870	249,321	1,717,220	0	5.93	1.11	**5.05**
Carlyle Group								
Carlyle Strategic Partners IV	100,000,000	53,119,880	26,502,383	21,499,086	68,331,442	-9.09	0.90	**4.25**
Carval Investors								
CVI Global Value Fund	200,000,000	190,000,000	3,856,174	316,834,320	10,000,000	9.53	1.69	**13.47**
CVI Credit Value Fund I	100,000,000	95,000,000	3,846,379	209,934,827	5,000,000	18.73	2.25	**9.75**
CVI Credit Value Fund A II	150,000,000	142,500,000	5,773,126	194,560,061	7,500,000	8.07	1.41	**7.67**
CVI Credit Value Fund A III	150,000,000	142,500,000	66,788,806	110,492,431	7,500,000	7.52	1.24	**5.08**
CVI Credit Value Fund IV	150,000,000	135,203,333	124,045,290	60	15,000,000	-6.99	0.92	**2.74**
CVI Credit Value Fund V	150,000,000	7,500,000	7,500,000	0	142,500,000	0.00	1.00	
Marathon								
Marathon Distressed Credit Fund GP, LLC	200,000,000	10,000,000	10,103,420	0	190,000,000	1.03	1.01	**0.82**
Merced Capital								
Merced Partners III	100,000,000	100,000,000	7,347,737	128,176,445	0	6.13	1.36	**10.15**
Merced Partners IV	125,000,000	124,968,390	46,312,292	93,097,539	0	2.62	1.12	**6.97**

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Merced Partners V	53,737,500	53,915,358	41,039,597	0	0	-9.02	0.76	**3.00**
MHR Institutional Partners								
MHR Institutional Partners IV	75,000,000	47,059,392	46,346,245	6,556,698	34,438,726	4.69	1.12	**6.03**
Oaktree Capital Management								
Oaktree Principal Fund VI	100,000,000	94,105,499	87,412,689	17,636,178	18,241,294	5.15	1.12	**5.50**
Oaktree Opportunities Fund X	50,000,000	46,500,021	43,190,460	11,119,660	8,500,000	6.36	1.17	**5.38**
Oaktree Opportunities Fund Xb	100,000,000	40,000,000	32,332,840	0	60,000,000	-24.70	0.81	**5.38**
Oaktree Special Situations Fund II	100,000,000	9,213,559	8,891,250	0	90,748,304	-8.48	0.97	**2.18**
Pimco Bravo**								
Pimco Bravo Fund OnShore Feeder I	3,958,027	3,958,027	40,381	3,978,735	2,348,173	1.52	1.02	**5.50**
Pimco Bravo Fund OnShore Feeder II	5,243,670	4,685,039	1,768,765	3,910,408	4,463,852	4.44	1.21	**5.50**
TSSP								
TSSP Adjacent Opportunities Partner	50,000,000	34,984,418	35,355,928	2,186,115	17,201,697	6.83	1.07	**2.24**
TSSP Adjacent Opportunities Contingent	100,000,000	13,051,899	13,051,899	204	86,948,101	0.01	1.00	**2.32**
TSSP Opportunities Partners IV	50,000,000	17,263,175	17,185,014	9,829	32,736,825	-0.58	1.00	**2.14**
Varde Fund								
Varde Fund IX	100,000,000	100,000,000	468,995	215,525,625	0	15.00	2.16	**12.02**
Varde Fund X	150,000,000	150,000,000	22,807,050	249,265,784	0	10.74	1.81	**10.20**
Varde Fund XI	200,000,000	200,000,000	130,330,413	155,022,046	0	6.53	1.43	**6.98**
Varde Fund XIII	150,000,000	75,000,000	72,164,775	20,038	75,000,000	-9.55	0.96	**1.98**
Wayzata								
Wayzata Opportunities Fund II	150,000,000	174,750,000	2,030,370	327,229,040	750,000	16.46	1.88	**12.69**
Wayzata Opportunities Fund III	150,000,000	68,415,000	22,591,815	39,068,770	15,000,000	-2.96	0.90	**8.04**
Distressed/Opportunistic Total	**3,214,714,067**	**2,336,445,188**	**1,041,991,388**	**2,132,731,480**	**892,208,413**	**9.21**	1.36	
Private Markets Total	**29,297,050,627**	**20,515,306,545**	**11,086,523,564**	**17,600,948,762**	**10,047,507,045**	**11.00**	1.40	
Difference* ***			17,935,353					
Private Markets Total with Difference			11,104,458,917					

Private Markets Portfolio Status	Investment Manag	Investments Count
PRIVATE EQUITY	54	140
PRIVATE CREDIT	15	31
REAL ASSETS	11	42
REAL ESTATE	11	27
DISTRESSED/ OPPORTUNISTIC	12	30
Total	103	270

Investment	Total Commitment	Total Contribution	MarketValue	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years

Notes

None of the data presented herein has been reviewed or approved by either the general partner or investment manager. The performance and valuation data presented herein is not a guarantee or prediction of future results. Ultimately, the actual performance and value of any investment is not known until final liquidation. Because there is no industry-standardized method for valuation or reporting comparisons of performance and valuation data among different investments is difficult.

Data presented in this report is made public pursuant to Minn. Stat. Chs. 13 and 13D, and Minn. Stat. § 11A.24, subd. 6(c). Additional information on private markets investments may be classified as non-public and not subject to disclosure.

* MOIC: Multiple of Invested Capital
**Partnership interests transferred to the MSBI during 1Q2015. All data presented as of the transfer date.
*** Difference is from the T. Rowe Price portfolio, which is an in-kind stock distribution liquidating account, and cash transactions posted to next day

Participant Directed Investment Program

June 30, 2020

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Participant Directed Investment Program

The Participant Directed Investment Program (PDIP) provides investment vehicles for a variety of retirement or other tax-advantaged savings plans. The objective of the Plan is to be competitive in the marketplace by providing quality investment options with low fees to its participants. Investment goals among the PDIP's many participants are varied.

- The Supplemental Investment Fund (SIF) is an investment platform that provides participants with the option to invest in many of the same pools as the Combined Fund in addition to a Stable Value Fund and a Money Market Fund. The Volunteer Firefighter Account is an option in the SIF for local firefighter entities that join the Statewide Voluntary Firefighter Plan administered by PERA. The investment vehicles are structured much like a family of mutual funds where participating entities buy or sell units in each fund. Participants may allocate their investments among one or more funds that are appropriate for their needs and are within statutory requirements and rules established by the participating organizations.
- The Mutual Fund Line-up is an investment platform that offers participants three sets of investment options. The first is a set of actively and passively managed mutual funds, a Stable Value Fund and a Money Market Fund. The second is a set of target date funds called Minnesota Target Retirement Funds. The third is a self-directed brokerage account window which offers thousands of mutual funds. The SBI has no direct management responsibilities for funds within the self-directed brokerage account window. Participants may allocate their investments among one or more accounts that are appropriate for their needs within the statutory requirements and rules established by the participating organizations.
- The SBI is responsible for the investment options provided in the two State Sponsored Savings Plans established under provisions of the Internal Revenue Code 529, the Minnesota College Savings Plan and Minnesota Achieving a Better Life Experience Plan (ABLE). The Minnesota College Savings Plan is an educational savings plan designed to help families save for qualified nationwide college costs. The SBI is responsible for the investments and the Minnesota Office of Higher Education (OHE) is responsible for the overall administration of the Plan. The SBI and OHE have contracted jointly with TIAA-CREF Tuition Financing, Inc. to provide administrative, marketing, communication, recordkeeping and investment management services. The ABLE Plan is a savings plan designed to help individuals save for qualified disability expenses without losing eligibility for certain assistance programs. The plan is administered by the Department of Human Services (DHS). The SBI and DHS have jointly contracted with Ascensus to provide recordkeeping, administrative, and investment management services for the plan.

The investment returns shown in this report are calculated using a time-weighted rate of return formula. These returns are net of investment management fees and transaction costs. They do not, however, reflect administrative expenses that may be deducted by the retirement systems or other agencies to defray administrative costs.

Supplemental Investment Fund Summary

The Minnesota Supplemental Investment Fund (SIF) is a multi-purpose investment platform that offers a range of investment options to state and local public employees. This investment platform provides some or all of the investment options to the Public Employees Retirement Association (PERA) Defined Contribution Plan, local pension plans and the Statewide Volunteer Firefighter plan.

A wide diversity of investment goals exists among the Fund's participants. In order to meet those needs, the Fund has been structured much like a "family of mutual funds." Participants may allocate their investments among one or more accounts that are appropriate for their needs, within the statutory requirements and rules established by the participating organizations. Participation in the Fund is accomplished through the purchase or sale of shares in each account. All returns are net of investment management fees.

Investment Option Descriptions

- Balanced Fund - a balanced portfolio utilizing both common stocks and bonds
- U.S. Stock Actively Managed Fund - an actively managed, U.S. common stock portfolio.
- U.S. Stock Index Fund - a passively managed, common stock portfolio designed to broadly track the performance of the U.S. stock market.
- Broad International Stock Fund - a portfolio of non-U.S. stocks that incorporates both active and passive management.
- Bond Fund - an actively managed, bond portfolio.
- Money Market Fund - a portfolio utilizing short-term, liquid debt securities.
- Stable Value Fund - a portfolio of stable value instruments, including security backed contracts and insurance company and bank investment contracts.
- Volunteer Firefighter Account - a balanced portfolio only used by the Statewide Volunteer Firefighter Plan.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year	Option Since
BALANCED FUND	$91,776,782	15.1%	8.2%	8.6%	8.1%	10.1%	01/1980
U.S. ACTIVELY MANAGED FUND	64,096,867	25.7	8.5	11.8	10.7	14.3	07/1986
U.S. STOCK INDEX FUND	367,179,396	22.1	6.7	10.1	10.1	13.7	07/1986
BROAD INTERNATIONAL STOCK FUND	110,506,111	16.7	-4.2	1.3	2.5	5.4	09/1994
BOND FUND	107,941,432	5.5	9.2	5.8	4.8	4.5	07/1986
MONEY MARKET FUND	557,011,017	0.1	1.7	1.9	1.4	0.8	07/1986
STABLE VALUE FUND	1,659,785,904	0.6	2.7	2.5	2.3	2.5	11/1994
VOLUNTEER FIREFIGHTER ACCOUNT	118,023,919	12.6	7.1	6.9	6.5	7.9	01/2010

Note:
The Market Values for the Money Market Fund, the Stable Value Fund, and the Total Supplemental Investment Fund also include assets held through other plans.

STATE STREET.

Supplemental Investment Fund Performance

Balanced Fund

The primary investment objective of the Balanced Fund is to gain exposure to publicly traded U.S. equities, bond and cash in a diversified investment portfolio. The Fund seeks to maximize long-term real rates of return, while limiting short-run portfolio return volatility. The Balanced Fund is invested in a balanced portfolio of common stocks and bonds. Common stocks provide the potential for significant capital appreciation, while bonds act as a deflation hedge and provide portfolio diversification. The benchmark is a blend of 60% Russell 3000/35% Barclays Aggregate Bond Index/5% T-Bills Composite.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
BALANCED FUND	**$91,776,782**	**15.1%**	**8.2%**	**8.6%**	**8.1%**	**10.1%**
SIF BALANCED FUND BENCHMARK		14.0	7.7	8.4	7.9	9.8
Excess		1.1	0.5	0.3	0.2	0.3

U.S. Actively Managed Fund

The U.S. Stock Actively Managed Fund's investment objective is to generate above-average returns from capital appreciation on common stocks. The U.S. Stock Actively Managed Fund is invested primarily in the common stocks of U.S. companies. The managers in the account also hold varying levels of cash.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
U.S. ACTIVELY MANAGED FUND	**64,096,867**	**25.7**	**8.5**	**11.8**	**10.7**	**14.3**
Russell 3000		22.0	6.5	10.0	10.0	13.7
Excess		3.7	2.0	1.7	0.7	0.6

Supplemental Investment Fund Performance

U.S. Stock Index Fund

The investment objective of the U.S. Stock Index Fund is to generate returns that track those of the U.S. stock market as a whole. The Fund is designed to track the performance of the Russell 3000 Index, a broad-based equity market indicator. The Fund is invested 100% in common stock.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
U.S. STOCK INDEX FUND	**$367,179,396**	**22.1%**	**6.7%**	**10.1%**	**10.1%**	**13.7%**
Russell 3000		22.0	6.5	10.0	10.0	13.7
Excess		0.1	0.2	0.1	0.1	-0.0

Broad International Stock Fund

The investment objective of the Broad International Stock Fund is to earn a high rate of return by investing in the stock of companies outside the U.S. Portions of the Fund are passively managed and semi-passively managed. These portions of the Fund are designed to track and modestly outperform, respectively, the return of developed markets included in the MSCI World ex USA Index. A portion of the Fund is "actively managed" by several international managers and emerging markets specialists who buy and sell stocks in an attempt to maximize market value. The International Equity Benchmark is currently the MSCI ACWI ex USA (net).

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
BROAD INTERNATIONAL STOCK FUND	**110,506,111**	**16.7**	**-4.2**	**1.3**	**2.5**	**5.4**
International Equity Benchmark		16.1	-4.8	1.1	2.3	5.0
Excess		0.7	0.6	0.2	0.2	0.4

STATE STREET.

Supplemental Investment Fund Performance

Bond Fund

The investment objective of the Bond Fund is to exceed the return of the broad domestic bond market by investing in fixed income securities. The Bond Fund invests primarily in high-quality, government and corporate bonds that have intermediate to long-term maturities, usually 3 to 20 years. The Bond Fund benchmark is the Bloomberg Barclays U.S. Aggregate.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
BOND FUND	**$107,941,432**	**5.5%**	**9.2%**	**5.8%**	**4.8%**	**4.5%**
BBG BARC US Agg		2.9	8.7	5.3	4.3	3.8
Excess		2.6	0.5	0.4	0.5	0.7

Money Market Fund

The investment objective of the Money Market Fund is to protect principal by investing in short-term, liquid U.S. Government securities. The Fund is invested entirely in high-quality, short-term U.S. Treasury and Agency securities. The average maturity of the portfolios is less than 90 days. Please note that the Market Value for the Money Market Fund reflects assets held through the Deferred Compensation Plan as well.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
MONEY MARKET FUND	**557,011,017**	**0.1**	**1.7**	**1.9**	**1.4**	**0.8**
ICE BofA US 3-Month Treasury Bill		0.0	1.6	1.8	1.2	0.6
Excess		0.1	0.0	0.1	0.2	0.1

STATE STREET.

Supplemental Investment Fund Performance

Stable Value Fund

The investment objectives of the Stable Value Fund are to protect investors from loss of their original investment and to provide competitive interest rates using somewhat longer-term investments than typically found in a money market fund. The Fund is invested in a well-diversified portfolio of high-quality fixed income securities with strong credit ratings. The Fund also invests in contracts issued by highly rated insurance companies and banks which are structured to provide principal protection for the Fund's diversified bond portfolios, regardless of daily market changes. The Stable Value Fund Benchmark is the 3-year Constant Maturity Treasury Bill +45 basis points. Please note that the Market Value for the Stable Value Fund reflects assets held through the Deferred Compensation Plan as well.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
STABLE VALUE FUND	**$1,659,785,904**	**0.6%**	**2.7%**	**2.5%**	**2.3%**	**2.5%**
Fixed Interest Blended Benchmark		0.2	1.6	2.3	2.0	1.6
Excess		0.5	1.1	0.2	0.3	0.9

Volunteer Firefighter Account

The Volunteer Firefighter Account is different than other SIF program options. It is available only to the local entities that participate in the Statewide Volunteer Firefighter Plan (administered by PERA) and have all of their assets invested in the Volunteer Firefighter Account. There are other volunteer firefighter plans that are not eligible to be consolidated that may invest their assets through other SIF program options. The investment objective of the Volunteer Firefighter Account is to maximize long-term returns while limiting short-term portfolio return volatility. The account is invested in a balanced portfolio of domestic equity, international equity, fixed income and cash. The benchmark for this account is 35% Russell 3000, 15% MSCI ACWI ex USA (net), 45% Bloomberg Barclays U.S. Aggregate, 5% 3 Month T-Bills.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
VOLUNTEER FIREFIGHTER ACCOUNT	**118,023,919**	**12.6**	**7.1**	**6.9**	**6.5**	**7.9**
SIF Volunteer Firefighter Account BM		11.2	6.1	6.5	6.1	7.5
Excess		1.3	0.9	0.3	0.4	0.4

Mutual Funds

The mutual fund investment line-up provides investment options to the Minnesota Deferred Compensation Plan (MNDCP), Unclassified Retirement Plan, Health Care Savings Plan, and the Hennepin Country Retirement Plan. The MNDCP is a tax-sheltered retirement savings plan that is supplemental to public employees primary retirement plan. (In most cases, the primary plan is a defined benefit plan administered by TRA, PERA, or MSRS.) Participants can choose from active and passively managed stock and bond funds, a Stable Value Fund, a Money Market Fund, a set of 10 target date retirement fund options, and a brokerage window where participants can choose from hundreds of mutual funds.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year	Option Since
VANGUARD TOTAL STOCK MARKET INSTITUTIONAL INDEX PLUS	$493,798,746	22.1%	6.5%				07/2019
VANGUARD INSTITUTIONAL INDEX PLUS	1,335,839,857	20.5	7.5	10.7%	10.7%	14.0%	07/1999
VANGUARD DIVIDEND GROWTH	709,554,754	13.1	1.3	10.1			10/2016
VANGUARD MID CAP INDEX	542,524,842	25.0	-0.2	6.5	7.0	12.5	01/2004
T. ROWE PRICE SMALL-CAP STOCK	734,924,504	25.4	-0.4	9.3	9.1	14.3	04/2000
FIDELITY DIVERSIFIED INTERNATIONAL	310,651,010	21.7	8.5	5.7	4.8	8.0	07/1999
VANGUARD TOTAL INTERNATIONAL STOCK INDEX	274,779,157	18.1	-4.0	1.1	2.5		07/2011
VANGUARD BALANCED INDEX	1,241,210,878	14.2	8.2	8.6	8.0	9.9	12/2003
DODGE & COX INCOME	302,153,430	6.0	8.3	5.4	4.7	4.5	07/1999
VANGUARD TOTAL BOND MARKET INDEX	383,413,748	3.0	9.0	5.3	4.3	3.8	12/2003
2025 FUND	178,297,848	10.8	4.0	5.5	5.3		07/2011
2030 FUND	131,549,038	13.6	5.9	6.6	6.4		07/2011
2035 FUND	102,083,247	15.4	6.8	7.2	6.9		07/2011
2040 FUND	81,609,025	16.6	6.5	7.3	7.0		07/2011
2045 FUND	70,405,872	17.7	5.9	7.2	7.0		07/2011
2050 FUND	53,500,838	18.8	5.2	7.1	7.1		07/2011
2055 FUND	33,230,579	19.3	5.0	7.0	7.0		07/2011
2060 FUND	28,409,466	19.3	4.9	7.0	7.0		07/2011
2065 FUND	873,271	19.3					04/2020
INCOME FUND	223,298,443	8.4	4.2	4.7	4.3		07/2011
TD Ameritrade SDB	76,041,207						
TD Ameritrade SDB Roth	1,500,533						

STATE STREET.

Mutual Funds

LARGE CAP EQUITY

Vanguard Total Stock Market Institutional Index Plus (passive)

A passive domestic stock portfolio of large and small companies that tracks the CRSP US Total Market Index.

Vanguard Index Institutional Plus (passive)

A passive domestic stock portfolio that tracks the S&P 500.

Vanguard Dividend Growth (active) (1)

A fund of large cap stocks which is expected to outperform the Nasdaq US Dividend Achievers Select Index, over time.

MID CAP EQUITY

Vanguard Mid Cap Index (passive) (2)

A fund that passively invests in companies with medium market capitalizations that tracks the CRSP US Mid-Cap Index.

SMALL CAP EQUITY

T Rowe Price Small Cap (active)

A fund that invests primarily in companies with small market capitalizations and is expected to outperform the Russell 2000 Index.

INTERNATIONAL EQUITY

Fidelity Diversified International (active)

A fund that invests primarily in stocks of companies located outside of the United States and is expected to outperform the MSCI index of Europe, Australasia and the Far East (EAFE), over time.

Vanguard Total International Stock Index (passive) (3)

A fund that seeks to track the investment performance of the FTSE Global All Cap ex US Index, an index designed to measure equity market performance in developed and emerging markets, excluding the United States.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
Large Cap US Equity						
VANGUARD TOTAL STOCK MARKET INSTITUTIONAL INDEX PLUS	**$493,798,746**	**22.1%**	**6.5%**			**07/2019**
CRSP US Total Market Index		22.1	6.5			07/2019
Excess		0.0	0.0			
VANGUARD INSTITUTIONAL INDEX PLUS	**1,335,839,857**	**20.5**	**7.5**	**10.7%**	**10.7%**	**07/1999**
S&P 500		20.5	7.5	10.7	10.7	07/1999
Excess		0.0	0.0	-0.0	-0.0	
VANGUARD DIVIDEND GROWTH	**709,554,754**	**13.1**	**1.3**	**10.1**		**10/2016**
NASDAQ US Dividend Achievers Select		14.0	3.7	10.3		10/2016
Excess		-0.9	-2.4	-0.3		
Mid Cap US Equity						
VANGUARD MID CAP INDEX	**542,524,842**	**25.0**	**-0.2**	**6.5**	**7.0**	**01/2004**
CRSP US Mid Cap Index		25.0	-0.2	6.5	7.0	01/2004
Excess		-0.0	0.0	0.0	0.0	
Small Cap US Equity						
T. ROWE PRICE SMALL-CAP STOCK	**734,924,504**	**25.4**	**-0.4**	**9.3**	**9.1**	**04/2000**
Russell 2000		25.4	-6.6	2.0	4.3	04/2000
Excess		-0.0	6.2	7.3	4.9	
International Equity						
FIDELITY DIVERSIFIED INTERNATIONAL	**310,651,010**	**21.7**	**8.5**	**5.7**	**4.8**	**07/1999**
MSCI EAFE FREE (NET)		14.9	-5.1	0.8	2.1	07/1999
Excess		6.9	13.6	4.9	2.7	
VANGUARD TOTAL INTERNATIONAL STOCK INDEX	**274,779,157**	**18.1**	**-4.0**	**1.1**	**2.5**	**07/2011**
FTSE Global All Cap ex US Index Net		17.0	-4.6	0.9	2.2	07/2011
Excess		1.1	0.5	0.2	0.2	

Mutual Funds

BALANCED

Vanguard Balanced Index (passive) (4)

A fund that passively invests in a mix of domestic stocks and bonds. The fund is expected to track a weighted benchmark of 60% CRSP US Total Market Index/40% BB Barclays U.S. Aggregate.

FIXED INCOME

Dodge & Cox Income Fund (active)

A fund that invests primarily in investment grade securities in the U.S. bond market which is expected to outperform the BB Barclays U.S. Aggregate, over time.

Vanguard Total Bond Market Index (passive)

A fund that passively invests in a broad, market weighted bond index that is expected to track the BB Barclays U.S. Aggregate.

Money Market Fund (5)

A fund that invests in short-term debt instruments which is expected to outperform the return on 90-Day U.S. Treasury Bills.

STABLE VALUE

Stable Value Fund (5)

A portfolio composed of stable value instruments which are primarily investment contracts and security backed contracts. The fund is expected to outperform the return of the 3 year Constant Maturity Treasury +45 basis points, over time.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
Balanced Funds						
VANGUARD BALANCED INDEX	**$1,241,210,878**	**14.2%**	**8.2%**	**8.6%**	**8.0%**	**12/2003**
Vanguard Balanced Fund Benchmark		14.2	8.0	8.6	8.0	12/2003
Excess		0.0	0.2	0.0	0.0	
Fixed Income						
DODGE & COX INCOME	**302,153,430**	**6.0**	**8.3**	**5.4**	**4.7**	**07/1999**
BBG BARC Agg Bd		2.9	8.7	5.3	4.3	07/1999
Excess		3.1	-0.4	0.0	0.4	
VANGUARD TOTAL BOND MARKET INDEX	**383,413,748**	**3.0**	**9.0**	**5.3**	**4.3**	**12/2003**
BBG BARC Agg Bd		2.9	8.7	5.3	4.3	12/2003
Excess		0.1	0.2	0.0	0.0	
MONEY MARKET FUND	**557,011,017**	**0.1**	**1.7**	**1.9**	**1.4**	**07/1986**
US 3-Month Treasury Bill		0.0	1.6	1.8	1.2	07/1986
Excess		0.1	0.0	0.1	0.2	
Stable Value						
STABLE VALUE FUND	**1,659,785,904**	**0.6**	**2.7**	**2.5**	**2.3**	**11/1994**
Fixed Interest Blended Benchmark		0.2	1.6	2.3	2.0	11/1994
Excess		0.5	1.1	0.2	0.3	

(1) Vanguard Dividend Growth replaced the Janus Twenty Fund in the third quarter of 2016.

(2) Prior to 02/01/2013 the benchmark was the MSCI US Mid-Cap 450 Index

(3) Prior to 06/01/2013 the benchmark was MSCI ACWI ex USA IMI.

(4) Prior to 01/01/2013 the benchmark was 60% MSCI US Broad Market Index and 40% Bloomberg Barclays U.S. Aggregate.

(5) Money Market and Stable Value are Supplemental Investment Fund options which are also offered to eligible plans that invest through other plans.

Mutual Funds

MN TARGET RETIREMENT ACCOUNTS

Target retirement funds offer a mix of investments that are adjusted over time to reduce risk and become more conservative as the target retirement date approaches. A participant only needs to make one investment decison by investing their assets in the fund that is closest to their anticipated retirement date.

Target Date Retirement Funds

SSgA

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
2025 FUND	**$178,297,848**	**10.8%**	**4.0%**	**5.5%**	**5.3%**	**07/2011**
2025 FUND BENCHMARK		10.5	3.9	5.4	5.3	07/2011
Excess		0.2	0.1	0.0	0.0	
2030 FUND	**131,549,038**	**13.6**	**5.9**	**6.6**	**6.4**	**07/2011**
2030 FUND BENCHMARK		13.3	5.7	6.6	6.4	07/2011
Excess		0.3	0.2	0.1	0.0	
2035 FUND	**102,083,247**	**15.4**	**6.8**	**7.2**	**6.9**	**07/2011**
2035 FUND BENCHMARK		15.0	6.7	7.2	6.8	07/2011
Excess		0.4	0.2	0.0	0.0	
2040 FUND	**81,609,025**	**16.6**	**6.5**	**7.3**	**7.0**	**07/2011**
2040 FUND BENCHMARK		16.2	6.3	7.2	7.0	07/2011
Excess		0.4	0.2	0.1	0.0	
2045 FUND	**70,405,872**	**17.7**	**5.9**	**7.2**	**7.0**	**07/2011**
2045 FUND BENCHMARK		17.3	5.7	7.1	7.0	07/2011
Excess		0.4	0.2	0.1	0.0	

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
2050 FUND	**$53,500,838**	**18.8%**	**5.2%**	**7.1%**	**7.1%**	**07/2011**
2050 FUND BENCHMARK		18.3	5.1	7.0	7.0	07/2011
Excess		0.5	0.2	0.1	0.0	
2055 FUND	**33,230,579**	**19.3**	**5.0**	**7.0**	**7.0**	**07/2011**
2055 FUND BENCHMARK		18.8	4.9	6.9	7.0	07/2011
Excess		0.5	0.1	0.0	0.0	
2060 FUND	**28,409,466**	**19.3**	**4.9**	**7.0**	**7.0**	**07/2011**
2060 FUND BENCHMARK		18.8	4.9	6.9	7.0	07/2011
Excess		0.5	0.1	0.0	0.0	
2065 FUND	**873,271**	**19.3**				**04/2020**
2065 FUND BENCHMARK		18.8				04/2020
Excess		0.5				
INCOME FUND	**223,298,443**	**8.4**	**4.2**	**4.7**	**4.3**	**07/2011**
INCOME FUND BENCHMARK		8.2	4.0	4.6	4.2	07/2011
Excess		0.2	0.2	0.0	0.0	

Note: Each SSgA Fund benchmark is the aggregate of the returns of the Fund's underlying index funds weighted by the Fund's asset allocation

MN College Savings Plan Options

The Minnesota College Savings Plan is an education savings plan designed to help families set aside funds for future college costs. The SBI is responsible for the investments and the Minnesota Office of Higher Education (OHE) is responsible for the overall administration of the Plan.

The SBI and OHE contract jointly with TIAA to provide administrative, marketing, communication, recordkeeping and investment management services. Please see the next page for the performance as reported by TIAA.

ENROLLMENT-BASED MANAGED ALLOCATIONS

The Enrollment Year Investment Option is a set of single fund options representing the date your future student needs their college savings. The asset allocation adjusts automatically to a more conservative investment objective and level of risk as the enrollement year approaches. The managed allocation changed from Age-Based to Enrollment-Based on October 28, 2019.

RISK BASED ALLOCATIONS

The Risk Based Allocation Option offers three separate allocation investment options - Aggressive, Moderate and Conservative, each of which has a fixed risk level that does not change as the Beneficiary ages.

ASSET CLASS BASED ALLOCATIONS

U.S. LARGE CAP EQUITY INDEX - A passive domestic stock portfolio that tracks the S&P 500.

INTERNATIONAL EQUITY INDEX - A fund that passively invests in a mix of developed and emerging market equities. The fund is expected to track a weighted benchmark of 80% MSCI ACWI World ex USA and 20% MSCI Emerging Markets Free Index.

U.S. AND INTERNATIONAL EQUITY INDEX - A fund that invests in a mix of equities, both U.S. and international, across all capitalization ranges and real estate-related securities. The fund is expected to track a weighted benchmark of 60% Russell 3000, 24% International, 6% Emerging Markets, and 10% Real Estate Securities Fund.

PRINCIPAL PLUS INTEREST OPTION - A passive fund where contributions are invested in a Funding Agreement issued by TIAA-CREF Life. The funding agreement provides for a return of principal plus a guaranteed rate of interest which is made by the insurance company to the policyholder, not the account owners. The account is expected to outperform the return of the 3-month T-Bill.

EQUITY AND INTEREST ACCUMULATION - A fund that passively invests half of the portfolio in U.S. equities across all capitalization ranges and the other half in the same Funding Agreement issued by TIAA-CREF Life as described above. The fund is expected to track a weighted benchmark of 50% Russell 3000 and 50% 3-month T-Bill.

100% FIXED INCOME - A fund that passively invests in fixed income holdings that tracks the Bloomberg Barclays U.S. Aggregate and two active funds that invest in inflation-linked bonds and high yield securities. The fund is expected to track a weighted benchmark of 70% BB Barclays Aggregate, 20% inflation-linked bond, and 10% high yield.

MONEY MARKET - An active fund that invests in high-quality, short-term money market instruments of both domestic and foreign issuers that tracks the iMoneyNet Average All Taxable benchmark.

MINNESOTA COLLEGE SAVINGS PLAN

Performance Statistics for the Period Ending: June 30 2020

Total = $1,557 Million

Fund Name	Ending Market	3 Months	1 Year	Annualized 3 Years	5 Years	10 Years	Since Inception	Inception Date
2036/2037 Enrollment Option	$16,707,944	16.07%					1.10%	10/28/2019
2036-2037 Custom Benchmark		16.50%					2.08%	
2034/2035 Enrollment Option	$24,539,783	15.68%					1.10%	10/28/2019
2034-2035 Custom Benchmark		16.05%					2.29%	
2032/2033 Enrollment Option	$30,589,898	15.08%					1.50%	10/28/2019
2032-2033 Custom Benchmark		15.38%					2.51%	
2030/2031 Enrollment Option	$40,919,752	14.41%					1.60%	10/28/2019
2030-2031 Custom Benchmark		14.53%					2.87%	
2028/2029 Enrollment Option	$57,042,073	12.99%					1.80%	10/28/2019
2028-2029 Custom Benchmark		13.06%					3.38%	
2026/2027 Enrollment Option	$82,926,550	11.17%					2.50%	10/28/2019
2026-2027 Custom Benchmark		11.13%					3.64%	
2024/2025 Enrollment Option	$123,593,507	9.47%					2.90%	10/28/2019
2024-2025 Custom Benchmark		9.26%					3.82%	
2022/2023 Enrollment Option	$157,351,042	7.23%					2.40%	10/28/2019
2022-2023 Custom Benchmark		6.96%					3.74%	
2020/2021 Enrollment Option	$191,315,343	5.11%					2.80%	10/28/2019
2020-2021 Custom Benchmark		4.77%					2.92%	
In School Option	$208,455,204	4.34%					3.40%	10/28/2019
In School Custom Benchmark		4.05%					2.47%	

MINNESOTA 529 COLLEGE SAVINGS PLAN

MINNESOTA COLLEGE SAVINGS PLAN
Performance Statistics for the Period Ending: June 30 2020

				Annualized				
Fund Name	**Ending Market**	**3 Months**	**1 Year**	**3 Years**	**5 Years**	**10 Years**	**Since Inception**	**Inception Date**
U.S. and International Equity Option	$263,551,556	19.58%	1.97%	6.79%	7.40%	10.95%	6.77%	10/ 1/2001
BB: U.S. and International Equity Option		20.00%	3.73%	7.31%	7.74%	11.26%	7.65%	
Moderate Allocation Option	$75,986,862	12.90%	4.78%	6.28%	6.23%	8.03%	5.32%	8/ 2/2007
BB: Moderate Allocation Option		13.30%	5.55%	6.62%	6.49%	8.42%	5.98%	
100% Fixed-Income Option	$20,921,833	3.35%	6.72%	4.49%	3.73%	3.25%	3.90%	8/16/2007
BB: 100% Fixed-Income Option		3.65%	7.03%	4.80%	4.03%	3.71%	4.51%	
International Equity Index Option	$5,122,791	16.78%	-4.37%	1.04%	2.23%		3.18%	6/18/2013
BB: International Equity Index Option		15.54%	-4.72%	1.08%	2.28%		3.29%	
Money Market Option	$17,002,909	0.00%	1.23%	1.44%	0.92%	0.43%	0.57%	11/ 1/2007
BB: Money Market Option		0.02%	1.06%	1.26%	0.80%	0.41%	0.51%	
Principal Plus Interest Option	$135,687,651	0.51%	2.07%	1.88%	1.69%	1.70%	2.47%	10/10/2001
Citigroup 3-Month U.S. Treasury Bill		0.14%	1.56%	1.72%	1.15%	0.61%	1.34%	
Aggressive Allocation Option	$38,036,729	16.04%	3.41%	6.61%	6.83%		6.57%	8/12/2014
BB: Aggressive Allocation Option		16.62%	4.72%	7.02%	7.15%		6.75%	
Conservative Allocation Option	$13,087,577	7.22%	4.64%	4.81%	4.49%		4.06%	8/18/2014
BB: Conservative Allocation Option		7.51%	5.12%	5.05%	4.62%		4.23%	
Equity and Interest Accumulation Option	$5,052,570	10.67%	4.70%	6.02%	5.86%		5.64%	8/18/2014
BB: Equity and Interest Accumulation Option		10.80%	4.68%	6.22%	5.82%		5.66%	
U.S. Large Cap Equity Option	$46,979,572	20.49%	7.39%	10.53%	10.51%		10.38%	8/12/2014
BB: U.S. Large Cap Equity Option		20.54%	7.51%	10.73%	10.73%		10.47%	
Matching Grant	$2,204,022	0.51%	2.07%	1.88%	1.69%	1.70%	2.47%	3/22/2002
Citigroup 3-Month U.S. Treasury Bill		0.14%	1.56%	1.72%	1.15%	0.61%	1.34%	

MINNESOTABLEplan
A member of The National ABLE Alliance

Performance as of
06/30/20

Total Market Value: $ **11,996,675**

Fund Name	Market Value	% of Plan	1 Month	3 Months	YTD	1 Year	3 Year	5 Year	10 Year	Inception	Inception Date
Aggressive Option	$ 934,990	7.79%	2.76	19.06	(6.42)	0.71	5.53			6.93	12/15/16
ABLE Aggressive Custom Benchmark			2.95	19.64	(6.09)	1.23	5.98			7.52	
Variance			**(0.19)**	**(0.58)**	**(0.33)**	**(0.52)**	**(0.45)**			**(0.59)**	
Moderately Aggressive Option	$ 1,093,833	9.12%	2.45	16.13	(4.28)	2.04	5.44			6.57	12/15/16
ABLE Moderately Aggressive Custom Benchmark			2.61	16.80	(3.88)	2.66	5.97			7.19	
Variance			**(0.16)**	**(0.67)**	**(0.40)**	**(0.62)**	**(0.53)**			**(0.62)**	
Growth Option	$ 1,495,075	12.46%	2.07	13.13	(2.53)	2.92	5.24			6.07	12/15/16
ABLE Growth Custom Benchmark			2.25	13.96	(1.89)	3.81	5.82			6.75	
Variance			**(0.18)**	**(0.83)**	**(0.64)**	**(0.89)**	**(0.58)**			**(0.68)**	
Moderate Option	$ 1,342,568	11.19%	1.76	10.48	(0.66)	3.95	4.97			5.58	12/15/16
ABLE Moderate Custom Benchmark			1.87	11.12	(0.11)	4.70	5.54			6.20	
Variance			**(0.11)**	**(0.64)**	**(0.55)**	**(0.75)**	**(0.57)**			**(0.62)**	
Moderately Conservative Option	$ 1,366,788	11.39%	1.22	7.28	0.09	3.56	4.03			4.38	12/15/16
ABLE Moderately Conservative Custom Benchmark			1.33	7.64	0.63	4.25	4.56			4.93	
Variance			**(0.11)**	**(0.36)**	**(0.54)**	**(0.69)**	**(0.53)**			**(0.55)**	
Conservative Option	$ 2,108,792	17.58%	0.55	2.90	1.01	2.90	2.68			2.73	12/15/16
ABLE Conservative Custom Benchmark			0.56	2.95	1.16	3.16	3.04			3.06	
Variance			**(0.01)**	**(0.05)**	**(0.15)**	**(0.26)**	**(0.36)**			**(0.33)**	
Checking Option	$ 3,654,628	30.46%									03/30/17

The Minnesota Achieve a Better Life Experience Plan (ABLE) is a savings plan designed to help individuals save for qualified disability expenses without losing eligibility for certain assistance programs. The plan is administered by the Department of Human Services (DHS).

The SBI and DHS have jointly contracted with Ascensus to provide recordkeeping, administrative, and investment management services for the plan.

RISK BASED ALLOCATIONS

The plan offers seven different allocation investment options: Aggressive, Moderately Aggressive, Growth, Moderate, Moderately Conservative, Conservative, and Checking. Each allocation is based on a fixed risk level.

Non-Retirement

June 30, 2020

Non-Retirement Funds

The SBI manages funds for trusts and programs created by the Minnesota State Constitution and Legislature.

- The Permanent School Fund is a trust established for the benefit of Minnesota public schools.
- The Environmental Trust Fund is a trust established for the protection and enhancement of Minnesota's environment. It is funded with a portion of the proceeds from the state's lottery.
- The Minnesota Workers Compensation Assigned Risk Plan provides worker compensation insurance for companies unable to obtain coverage through private carriers.
- The Closed Landfill Investment Fund is a trust created by the Legislature to invest money to pay for the long-term costs of maintaining the integrity of landfills in Minnesota once they are closed.
- Other Post-Employment Benefits Accounts (OPEB) are the assets set aside by local units of government for the payment of retiree benefits trusteed by the Public Employees Retirement Association.
- Miscellanous Trust Accounts are other small funds managed by the SBI for a variety of purposes.

All equity, fixed income, and cash assets for these accounts are managed externally by investment management firms retained by the SBI.

Non-Retirement

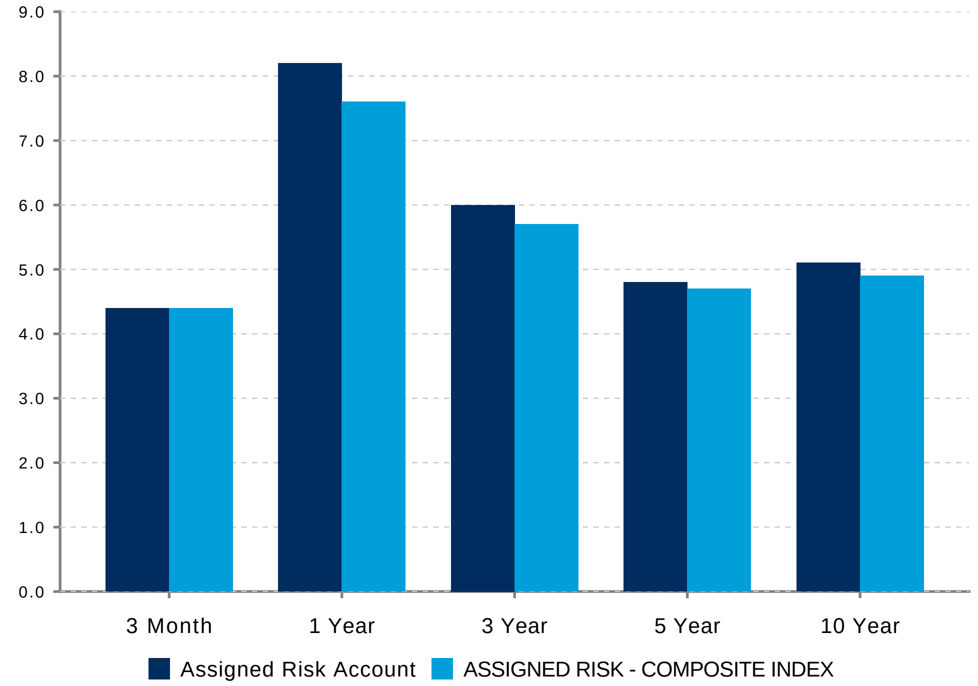
Assigned Risk Plan

The Assigned Risk plan has two investment objectives: to minimize the mismatch between assets and liabilities and to provide sufficient liquidity for the payment of ongoing claims and operating expenses.

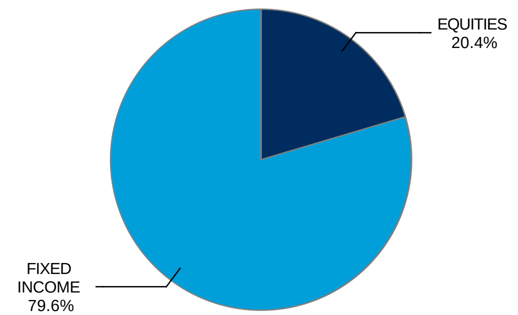
The Assigned Risk Plan is invested in a portfolio of common stocks and bonds

The equity segment is passively managed to track the performance of the S&P 500.

The fixed income benchmark is the Bloomberg Barclays Intermediate Government Index. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 80% equities and 20% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
Assigned Risk Account	$307,549,947	4.4%	8.2%	6.0%	4.8%	5.1%
EQUITIES	62,790,297	20.5	7.5	10.7	9.9	13.2
FIXED INCOME	244,759,650	0.7	7.2	4.2	3.0	2.8
ASSIGNED RISK - COMPOSITE INDEX		4.4	7.6	5.7	4.7	4.9
Excess		0.0	0.6	0.3	0.1	0.2
S&P 500		20.5	7.5	10.7	10.7	14.0
BBG BARC US Gov: Int		0.5	7.0	4.1	3.0	2.5



Note: Since 12/1/2017 the Assigned Risk equity segment has been managed by Mellon. From 1/17/2017-11/30/2017 it was managed internally by SBI staff. Prior to 1/17/2017 the equity segment was managed by SSgA (formerly GE Investment Mgmt.). RBC manages the fixed income segment of the Fund.

STATE STREET

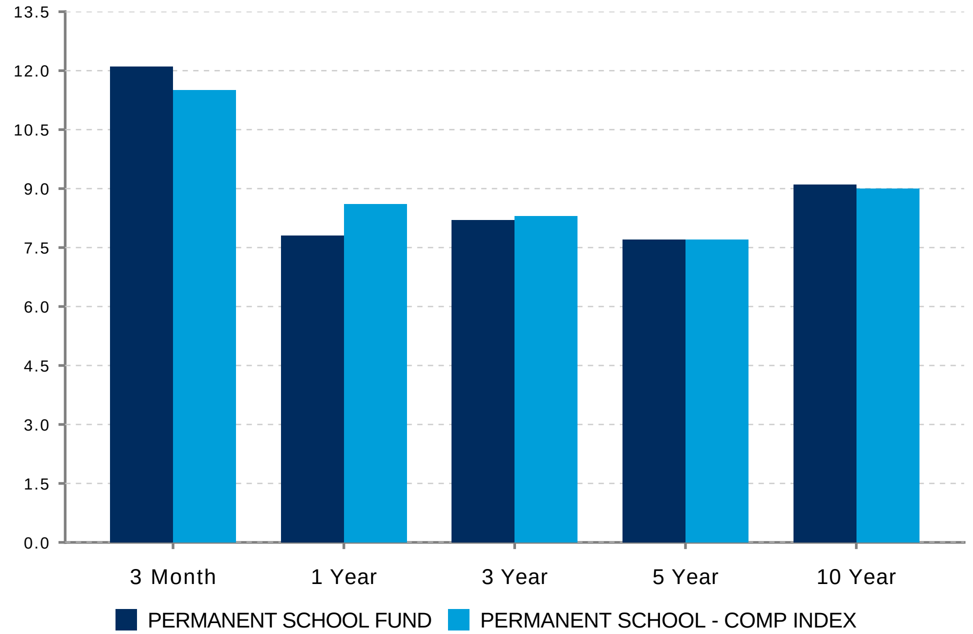
Non-Retirement

Permanent School Fund

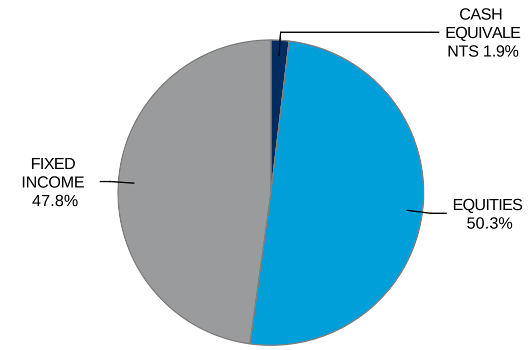
The investment objective of the Permanent School Fund is to produce a growing level of spendable income, within the constraints of maintaining adequate portfolio quality and liquidity. The income from the portfolio is transferred to the school endowment fund and distributed to Minnesota's public schools.

The Permanent School Fund is invested in a balanced portfolio of common stocks and bonds. Common stocks provide the potential for significant capital appreciation, while bonds provide portfolio diversification and a more stable stream of current income.

The stock segment is passively managed to track the performance of the S&P 500. The bond segment is actively managed to add incremental value through sector, security and yield curve decisions. The fixed income benchmark is the Bloomberg Barclays U.S. Aggregate. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 2% cash, 50% equity, and 48% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
PERMANENT SCHOOL FUND	$1,621,486,420	12.1%	7.8%	8.2%	7.7%	9.1%
CASH EQUIVALENTS	31,327,419	0.1	1.5	1.8	1.2	0.7
EQUITIES	815,702,441	20.5	7.5	10.7	10.7	14.0
FIXED INCOME	774,456,561	4.9	8.2	5.3	4.5	4.2
PERMANENT SCHOOL - COMP INDEX		11.5	8.6	8.3	7.7	9.0
Excess		0.6	-0.8	-0.1	-0.0	0.2
S&P 500		20.5	7.5	10.7	10.7	14.0
BBG BARC US Agg		2.9	8.7	5.3	4.3	3.8



Note: Since 12/1/2017 the equity segment has been managed by Mellon and the fixed income segment by Prudential. Prior to 12/1/2017 both segments were managed internally by SBI staff. Prior to 7/1/97 the Fund allocation was 100% fixed income.

STATE STREET

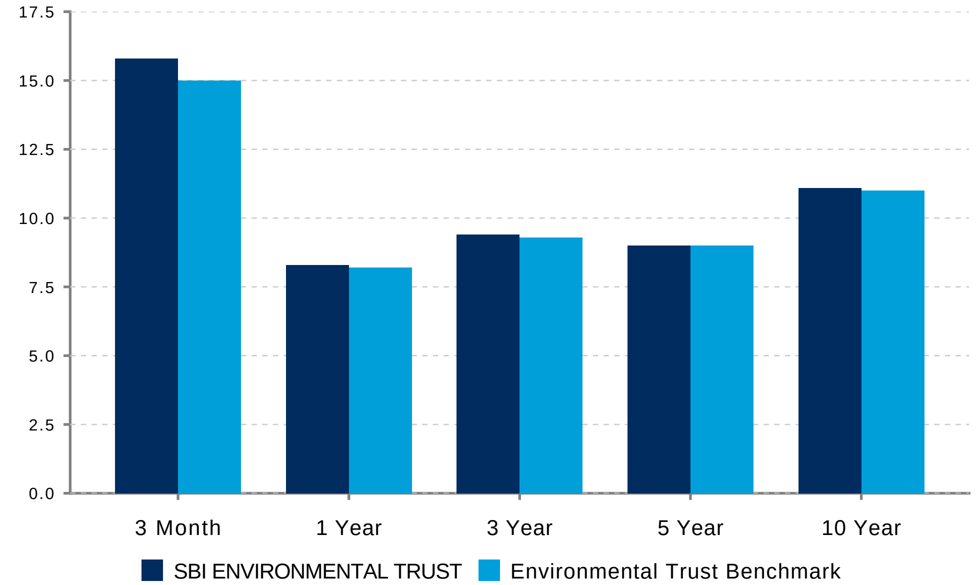
Non-Retirement

Environmental Trust Fund

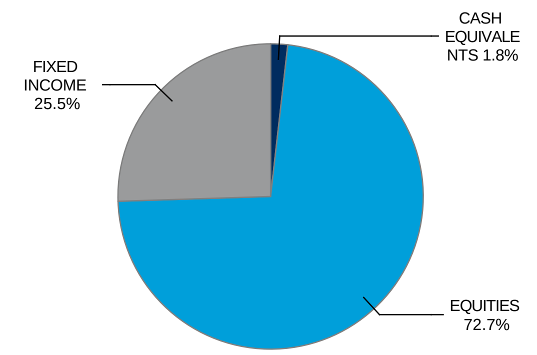
The objective of the Environmental Trust Fund is to increase the market value of the Fund over time in order to increase the annual amount made available for spending within the constraints of maintaining adequate portfolio quality and liquidity.

The Environmental Trust Fund is invested in a balanced portfolio of common stocks and bonds. Common stocks provide the potential for significant capital appreciation, while bonds act as a deflation hedge and provide portfolio diversification.

The bond segment is actively managed to add incremental value through sector, security and yield curve decisions. The stock segment is passively managed to track the performance of the S&P 500. The fixed income benchmark is the Bloomberg Barclays U.S. Aggregate. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 2% cash, 70% equities, and 28% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
SBI ENVIRONMENTAL TRUST	$1,288,713,393	15.8%	8.3%	9.4%	9.0%	11.1%
CASH EQUIVALENTS	23,485,556	0.1	1.5	1.8	1.2	0.7
EQUITIES	936,962,507	20.5	7.5	10.7	10.7	14.0
FIXED INCOME	328,265,330	4.9	8.2	5.3	4.5	4.2
Environmental Trust Benchmark		15.0	8.2	9.3	9.0	11.0
Excess		0.7	0.1	0.1	0.1	0.1
S&P 500		20.5	7.5	10.7	10.7	14.0
BBG BARC US Agg		2.9	8.7	5.3	4.3	3.8



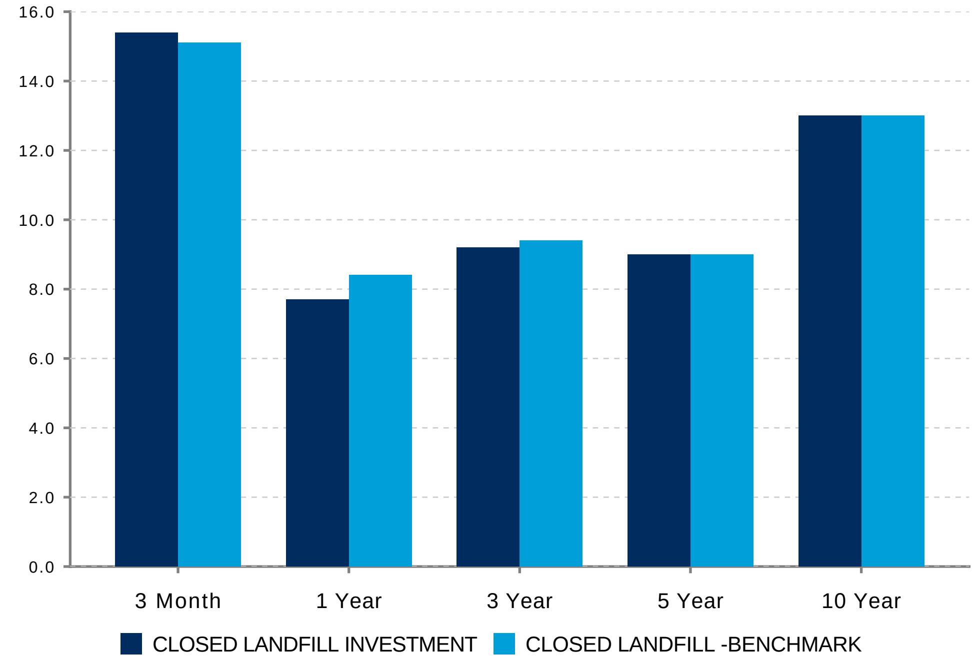
Note: Since 12/1/2017 the equity segment has been managed by Mellon and the fixed income segment by Prudential. Prior to 12/1/2017 both segments were managed internally by SBI staff. From 7/1/94 to 7/1/99, the Fund's target allocation and benchmark was 50% fixed income and 50% stock. Prior to 7/1/94 the Fund was invested entirely in short-term instruments as part of the Invested Treasurer's Cash pool.

Non-Retirement

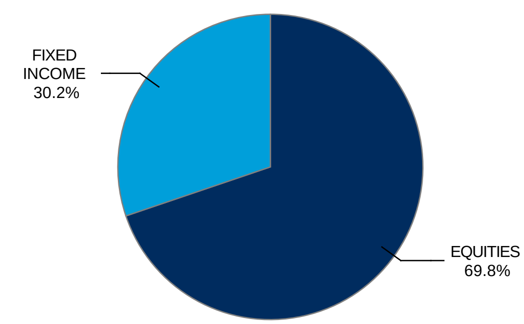
Closed Landfill Investment Fund

The investment objective of the Closed Landfill Investment Fund is to increase the market value of the Fund and to reduce volatility to meet future expenditures. By statute, the assets of the Fund are unavailable for expenditure until after the fiscal year 2020 to pay for long-term costs of maintaining the integrity of landfills in Minnesota once they are closed. In FY 2011, $48 million was transferred out of the general fund leaving a balance of $1 million in the account. Legislation was enacted in 2013 to replenish the principal and earnings back into the fund and in FY 2014 a repayment was made in the amount of $64.2 million. In 2015, legislation was passed which repealed any further repayments.

The bond segment is actively managed to add incremental value through sector, security and yield curve decisions. The stock segment is managed to passively track the performance of the S&P 500. The fixed income benchmark is the Bloomberg Barclays U.S. Aggregate. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 70% equities and 30% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
CLOSED LANDFILL INVESTMENT	$102,593,645	15.4%	7.7%	9.2%	9.0%	13.0%
EQUITIES	71,656,095	20.5	7.5	10.7	10.7	14.0
FIXED INCOME	30,937,550	4.9	8.2	5.3	4.5	
CLOSED LANDFILL -BENCHMARK		15.1	8.4	9.4	9.0	13.0
Excess		0.3	-0.6	-0.2	-0.1	-0.0
S&P 500		20.5	7.5	10.7	10.7	14.0
BBG BARC US Agg		2.9	8.7	5.3	4.3	3.8



Note: Since 12/1/2017 the equity segment has been managed by Mellon and the fixed income segment by Prudential. Prior to 12/1/2017 both segments were managed internally by SBI staff. Prior to 9/10/14 the Fund's target allocation and benchmark was 100% domestic equity.

	Ending Market Value	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
NON RETIREMENT EQUITY INDEX - MELLON	**2,570,065,466**	**20.5**	**7.5**	**7.5**	**10.7**	**10.7**	**14.0**	**9.6**	**07/1993**
S&P 500 INDEX (DAILY)		20.5	7.5	7.5	10.7	10.7	14.0	9.5	07/1993
Excess		-0.0	0.0	0.0	-0.0	0.0	0.0	0.1	
NON RETIREMENT FIXED INCOME - PRUDENTIAL	**1,320,511,484**	**4.9**	**8.2**	**8.2**	**5.3**	**4.5**	**4.2**	**6.1**	**07/1994**
BBG BARC Agg (Dly)		2.9	8.7	8.7	5.3	4.3	3.8	5.6	07/1994
Excess		2.0	-0.6	-0.6	0.0	0.2	0.4	0.5	
RBC	**244,759,583**	**0.7**	**7.2**	**7.2**	**4.2**	**3.0**	**2.8**	**5.0**	**07/1991**
RBC Custom Benchmark		0.5	7.0	7.0	4.1	3.0	2.5	5.0	07/1991
Excess		0.2	0.2	0.2	0.1	0.1	0.2	-0.1	
MET COUNCIL OPEB BOND POOL	68,669,031	0.3	4.1	4.1					
NON RETIREMENT CASH	**146,844,817**	**0.1**	**1.5**	**1.5**	**1.8**	**1.2**	**0.7**	**2.6**	
iMoneyNet Money Fund Average-All Taxable		0.1	1.1	1.1	1.3	0.9	0.4		
Excess		0.0	0.4	0.4	0.4	0.4	0.3		

Note:

RBC is the manager for the fixed income portion of the assigned risk account. RBC changed its name from Voyageur Asset Management on 1/1/2010. The current benchmark is the Bloomberg Barclays Intermediate Government Index. Prior to 7/1/11 the Voyageur Custom Index was 10% 90 day T-Bill, 25% Merrill 1-3 Government, 15% Merrill 3-5 Government, 25% Merrill 5-10 Government, 25% Merrill Mortgage Master.

Prior to 12/1/17 the Non Retirement Equity Index and Non Retirement Fixed Income accounts were managed internally by SBI staff.

In addition to the Non-Retirement Funds listed on the previous pages, the Non Retirement Equity Index and the Non Retirement Fixed Income accounts also include the assets of various smaller Miscellaneous Trust Accounts and Other Post Employment Benefits.

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State Cash

June 30, 2020

State Cash Accounts

Invested Treasurer's Cash

The Invested Treasurer's Cash Pool (ITC) represents the balances in more than 400 separate accounts that flow through the Minnesota State Treasury. These accounts vary greatly in size. The ITC contains the cash balances of certain State agencies and non-dedicated cash in the State Treasury.

The investment objectives of the ITC, in order of priority, are as follows:

- Safety of Principal. To preserve capital.
- Liquidity. To meet cash needs without the forced sale of securities at a loss.
- Competitive Rate of Return. To provide a level of current income consistent with the goal of preserving capital.

The SBI seeks to provide safety of principal by investing all cash accounts in high quality, liquid, short term investments. These include U.S. Treasury and Agency issues, repurchase agreements, bankers acceptances, commercial paper, and certificates of deposit.

Beginning in January 2003, the Treasurer's Cash Pool is measured against the iMoneyNet, All Taxable Money Fund Report Average.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
Treasurer's Cash	14,982,196,056	0.4	1.9	2.0	1.5	1.0
iMoneyNet Money Fund Average-All Taxable		0.1	1.1	1.3	0.9	0.4

Other State Cash Accounts

Due to differing investment objectives, strategies, and time horizons, some State agencies' accounts are invested seperately. These agencies direct the investments or provide the SBI with investment guidelines and the SBI executes on their behalf. Consequently, returns are shown for informational purposes only and there are no benchmarks for these accounts.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
Debt Service	83,331,133	2.3	4.9	3.6	3.2	
Housing Finance	0	0.5	1.3	1.7	1.5	
Public Facilities Authority	9,064,561	0.7	1.2	1.8	2.0	

Addendum

Benchmark Definitions

Active Domestic Equity Benchmark:

A weighted composite each of the individual active domestic equity managers’ benchmarks. Effective 3/1/2017 the calculation uses the average weight of the manager relative to the total group of active managers during the month. Prior to 3/1/2017 the beginning of the month weight relative to the total group was used.

Benchmark DM:

Since 6/1/08 the developed markets managers' benchmark, "Benchmark DM," is the Standard (large + mid) MSCI World ex USA (net). From 10/1/07 through 5/31/08 the benchmark was the Provisional Standard MSCI World ex USA (net). From 10/1/03 to 9/30/07 the benchmark was the MSCI World ex USA (net). Prior to that date, it was the MSCI EAFE Free (net), including from 10/1/01 to 5/31/02 when it was the Provisional MSCI EAFE Free (net).

Benchmark EM:

Since 6/1/08 the emerging markets managers' benchmark, "Benchmark EM,"is the Standard (large + mid) MSCI Emerging Markets Free (net). From 10/1/07 through 5/31/08 the benchmark was the Provisional Standard MSCI Emerging Markets Free (net). From 1/1/01 to 9/30/07 the benchmark was the MSCI Emerging Markets Free (net), including from 10/1/01 to 5/31/02 when it was the Provisional MSCI Emerging Markets Free (net). Prior to 1/1/01, it was the MSCI Emerging Markets Free (gross).

Combined Funds Composite Index:

The Composite Index performance is calculated by multiplying the beginning of month Composite weights by the monthly returns of the asset class benchmarks. The Combined Funds Composite weight is set as the Strategic Asset Allocation Policy Target with the uninvested portion of Private Markets allocated to Public Equity. Asset class weights for Public Equity and Private Markets are reset at the start of each month. From 1/1/2018-2/28/2019 the Transitional Policy Target was used to reflect the addition of Treasuries to the Fixed Income portfolio. From 7/1/2016-12/31/2016 the composite weights were set to match actual allocation as the portfolio was brought into line with the new Strategic Asset Allocation Policy Target. Prior to 7/1/2016 the uninvested portion of the Private Markets was invested in Fixed Income and the Composite Index was adjusted accordingly. When the Strategic Asset Allocation Policy Target changes, so does the Composite Index.

Core Bonds Benchmark:

In 2016, the Barclays Agg was rebranded Bloomberg Barclays Agg to reflect an ownership change. Prior to 9/18/2008 this index was called the Lehman Brothers Aggregate Bond Index. From 7/1/84-6/30/94 the asset class benchmark was the Salomon Brothers Broad Investment Grade Index. The SBI name for this benchmark changed from Fixed Income to Core Bonds on March 31, 2020.

Domestic Equity Benchmark:

Since 1/1/2019 the benchmark is 90% Russell 1000 and 10% Russell 2000. From 10/1/2003 to 12/31/2018 it was the Russell 3000. From 7/1/1999 to 9/30/2003, it was the Wilshire 5000 Investable Index. From 11/1/1993 to 6/30/1999, the target was the Wilshire 5000 as reported with no adjustments. Prior to 11/1/1993, the Wilshire 5000 was adjusted to reflect SBI mandated restrictions, which included liquor and tobacco, American Home Products and South Africa.

STATE STREET.

Addendum

Fixed Interest Blended Benchmark:

Since 6/1/2002, equals 3 Year Constant Maturity Treasury Yield + 45 bps. Prior to this change it was the 3 Year Constant Maturity Treasury Yield + 30 bps.

International Equity Benchmark:

Since 1/1/2019 equals is 75% MSCI World ex USA Index (net) and 25% MSCI Emerging Markets Index (net). From 6/1/08 to 12/31/2018 the International Equity asset class target was the Standard (large + mid) MSCI ACWI ex U.S. (net). From 10/1/07 through 5/31/08 the benchmark was the Provisional Standard MSCI ACWI ex U.S. (net). From 10/1/03 to 9/30/07 the target was MSCI ACWI ex U.S. (net). From 1/1/01 to 9/30/03, the target was MSCI EAFE Free (net) plus Emerging Markets Free (net), and from 7/1/99 to 12/31/00 the target was MSCI EAFE Free (net) plus Emerging Markets Free (gross). From 7/1/99 to 9/30/03, the weighting of each index fluctuated with market capitalization. From 10/1/01 to 5/31/02 all international benchmarks being reported were the MSCI Provisional indices. From 12/31/96 to 6/30/99 the benchmark was fixed at 87% EAFE Free (net)/13% Emerging Markets Free (gross). On 5/1/96, the portfolio began transitioning from 100% EAFE Free (net) to the 12/31/96 fixed weights. Prior to 5/1/96 it was 100% the EAFE Free (net).

Passive Domestic Equity Benchmark:

A weighted average of the Russell 1000 and Russell 3000 effective 10/1/2016. From 10/1/2003 to 10/1/2016 it was equal to the Russell 3000. From 7/1/2000 to 9/30/2003, it was the Wilshire 5000 Investable Index. From 11/1/1993 to 6/30/2000, the target was the Wilshire 5000 as reported with no adjustments. Prior to 11/1/1993, the Wilshire 5000 was adjusted to reflect SBI mandated restrictions, which included liquor and tobacco, American Home Products and South Africa.

Passive Manager Benchmark:

Russell 3000 effective 10/1/2003. From 7/1/2000 to 9/30/2003, it was the Wilshire 5000 Investable Index. From 11/1/1993 to 6/30/2000, the target was the Wilshire 5000 as reported with no adjustments. Prior to 11/1/1993, the Wilshire 5000 was adjusted to reflect SBI mandated restrictions, which included liquor and tobacco, American Home Products and South Africa.

Public Equity Benchmark:

60.3% Russell 1000, 6.7% Russell 2000, 24.75% MSCI World Ex US (net), and 8.25% MSCI EM (net) effective 1/1/2019. From 7/1/2017 thru 12/31/2018 it was 67% Russell 3000 and 33% MSCI ACWI ex USA. Prior to 6/30/16 the returns of Domestic and International Equity were not reported as a total Public Equity return. From 6/30/16-6/30/17 the Public Equity benchmark adjusted by 2% each quarter from 75% Russell 3000 and 25% MSCI ACWI ex USA until it reached 67% and 33%.

Semi-Passive Domestic Equity Benchmark:

Russell 1000 index effective 1/1/2004. Prior to 1/1/2004 it was the Completeness Fund benchmark.

Total Fixed Income Benchmark:

Since 4/1/2019 equals 50% Bloomberg Barclays Agg and 50% Bloomberg Barclays Treasury 5+ Years Index. From 2/1/2018-3/31/19 the weighting of this benchmark reflected the relative weights of the Core Bonds and Treasuries allocations in the Combined Funds Composite.