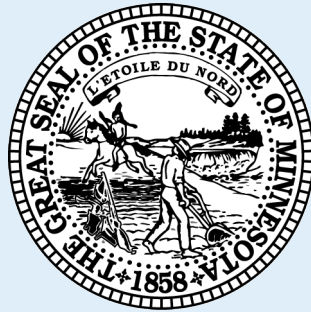

MINNESOTA STATE BOARD OF INVESTMENT

MINNESOTA STATE BOARD
OF INVESTMENT
MEETING
February 26, 2020



Governor Tim Walz
State Auditor Julie Blaha
Secretary of State Steve Simon
Attorney General Keith Ellison

This page intentionally left blank.

STATE BOARD OF INVESTMENT

AGENDA

February 26, 2020

MINUTES

December 2, 2019 and January 21, 2020

This page intentionally left blank.

AGENDA
STATE BOARD OF INVESTMENT MEETING
Wednesday, February 26, 2020
10:00 A.M.
G23 Senate Committee Room
State Capitol
75 Rev. Dr. Martin Luther King Jr. Boulevard
St. Paul, MN

- | | |
|--|--------------|
| 1. Approval of Minutes of December 2, 2019 and January 21, 2020 | TAB |
|
2. Report from the Executive Director (M. Perry) | |
| A. Quarterly Performance Summary
(October 1, 2019 – December 31, 2019) | A |
| B. Administrative Report | B |
| 1. Reports on Budget and Travel | |
| 2. FY19 Audit Report | |
| 3. FY19 Annual Report | |
| 4. Sudan Update | |
| 5. Iran Update | |
| 6. Litigation Update | |
|
3. Update Stable Value Fund Review (M. Perry) |
C |
|
INVESTMENT ADVISORY COUNCIL REPORT (G. Martin) | |
|
4. Private Markets Program |
D |
|
5. Public Markets, Non-Retirement, and Participant Directed Investment Programs |
E |
|
REPORTS | |
|
6. Environmental, Social, and Governance (ESG) Report |
F |
|
7. AON Market Environment Report |
G |
|
8. Meketa Capital Markets Outlook & Risk Metrics Report |
H |
|
9. Comprehensive Performance Report |
I |
|
10. Other Items | |

This page intentionally left blank.

**Minutes
State Board of Investment
December 2, 2019**

The State Board of Investment (SBI) met at 2:02 p.m. Monday, December 2, 2019 in G23 Senate Committee Room of the State Capitol, St. Paul, Minnesota. Governor Tim Walz, State Auditor Julie Blaha, Secretary of State Steve Simon, and Attorney General Keith Ellison were present. The minutes of the August 22, 2019 meeting were approved.

Executive Director's Report

Mr. Perry referred members to Tab A of the meeting materials and stated that as of September 30, 2019 the SBI was responsible for managing approximately \$99.5 billion of assets. Mr. Perry reported that the Combined Funds had outperformed its Composite Index over the ten-year period ending September 30, 2019 (Combined Funds 9.7% vs. Combined Funds-Composite Index 9.4%) and had provided a real rate of return of 4.6% above inflation over the latest 20 year period (Combined Funds 6.7% vs. CPI 2.1%).

Mr. Perry stated that there was a small increase in assets (Combined Funds ending and beginning value \$70.7 billion) as investment returns were slightly higher than the benefits paid over the quarter. The Combined Funds slightly underperformed the benchmark for the quarter (Combined Funds 1.0% vs. Combined Funds-Composite Index 1.1%) and underperformed for the year (Combined Funds 4.7% vs. Combined Funds-Composite Index 5.1%). The Combined Funds outperformed the benchmark return in all other reported time periods.

Mr. Perry stated that the combined public equity performance underperformed the benchmark for the year end (Public Equity 1.1% vs. Public Equity Benchmark 1.5%). Breaking it down between domestic and international equities, domestic equities underperformed its benchmark for the year (Domestic Equity 2.1% vs. Domestic Equity Benchmark 2.8%), the three-year period matched the benchmark and all other time periods reported underperformed. The international equity manager group outperformed its target for the year (International Equity 0.9% vs. International Equity Benchmark -1.2%), the three-year period matched the benchmark and all other time periods reported outperformed. Mr. Perry recognized that the international equity performance has been slightly better, but that domestic equities has far outperformed international equities over the last twenty years in absolute returns. Mr. Perry continued with the fixed income segment, which had outperformed for the year (Fixed Income 10.4% vs. Fixed Income Benchmark 10.3%) and all other time periods reported. He reported that although the Treasury portfolio slightly underperformed its target for the year (Treasuries 17.0% vs. Treasuries Benchmark 17.2%) it was the best performing asset class for the year. Lastly, Mr. Perry stated that the Private Markets program was the best performing asset class for the past three decades with a 12.2% return.

Mr. Perry highlighted the Strategic Allocation Category Framework report, the Volatility Equivalent Benchmark summary and a comparison of the Combined Funds, asset allocation and performance to the Trust Universe Comparison Service (TUCS) universe.

Mr. Perry referred members to Tab B of the meeting materials for the Administrative Report, which included the administrative budget and travel report for the fiscal year to date through September 30, 2019. Mr. Perry also provided an update on the legislative audit and the 2019 Fiscal Year Annual Report. Lastly, Mr. Perry referenced the update on restrictions for Sudan and Iran and stated that the SBI was not involved in any litigation.

Mr. Perry referred members to Tab C of the meeting materials which identified additional TUCS observations available for asset allocation and return comparisons. Staff will continue to use the public and corporate pension plans over \$1 billion as a comparison and will provide the additional universe comparisons as a reference over the next couple quarters.

At the request of Secretary of State Simon, Mr. Perry provided additional detail with regard to the desire to reduce the public equity exposure in the portfolio's asset allocation. Mr. Perry commented that the overriding concern that he and the Investment Advisory Council (IAC) have is the fact that the portfolio has been extremely dependent on public equities. Although the portfolio has benefited from this allocation in the prolonged bull market, there are risks that can be mitigated in a potential downturn. Some things that can be done is to grow the Private Markets Portfolio and include other investment opportunities which will help diversify the overall portfolio.

Mr. Martin, Chairperson of the IAC, referred members to Tab D and reviewed the seven private markets proposals, the first five of which are existing managers, and two new managers: Lexington Co-Investment Partners V Overage Program (Private Equity); Green Equity Investors VIII, L.P. (Private Equity); Madison Dearborn Capital Partners VIII (Private Equity); Marathon Distressed Credit Fund, L.P. (Distressed/Opportunistic); Rockwood Capital Real Estate Partners Fund XI, L.P. (Real Estate); HPS Mezzanine Partners 2019, L.P. (Private Credit); and Vista Equity Partners Perennial, L.P. (Private Equity). Governor Walz acknowledged the work and due diligence that staff does with the Board members prior to the meeting so they can do their due diligence on the recommended investments. State Auditor Blaha moved approval and Attorney General Ellison seconded the motion of the seven 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 \$100 million, or 20% of Lexington Co-Investment Partners V Overage Program, 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 Lexington Partners 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 Lexington Partners 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 \$150 million, or 20% of GEI VIII, 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 Leonard Green & Partners 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 Leonard Green & Partners 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 Madison Dearborn Capital Partners VIII, 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 Madison Dearborn Partners 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 Madison Dearborn Partners 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 \$200 million, or 20% of Marathon Distressed Credit Fund, L.P., 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 Marathon 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 Marathon 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 Rockwood Capital Real Estate Partners Fund XI, L.P., 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 Rockwood 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 Rockwood 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 HPS Mezzanine Partners 2019, L.P., 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 HPS Investment Partners 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 HPS Investment Partners 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 \$200 million, or 20% of Vista Equity Partners Perennial, L.P., 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 Vista 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 Vista or reduction or termination of the commitment." The motion passed unanimously.

Mr. Perry referred members to Tab E of the meeting material, which included information on proposed language to amend the SBI's investment authority in *Minnesota Statutes*, 11A.24. Governor Walz acknowledged that the Board members received letters of support for the proposed legislation from the three statewide retirement systems and a positive recommendation from Minnesota Management and Budget. He also noted that the statutory change being requested by staff will require Legislative approval. In response to a question from State Auditor Blaha, Mr. Perry confirmed that the proposed statutory language will not change the SBI's governance structure and the intent is to increase the investment opportunity set that is available to the SBI. Attorney General Ellison noted his support of the proposed language primarily since it allows the SBI to benefit from investment opportunities, like co-investment, that offers higher return with lower risk. Secretary of State Simon noted that he supports the merits of the proposal, but would like staff to consider additional language that would further define the liquid alternatives and bank loan qualifications. Mr. Perry suggested that definition issues can be resolved in the SBI's investment policies rather than in statute. Governor Walz thanked all of the Board members for their comments and the extensive conversations they have all had with staff with regard to this proposal. He also recognized the public engagement that has already occurred with this proposal so that concerns were vetted before it went to the Legislature. After the discussion, Attorney

General Ellison moved approval and Secretary of State Simon seconded the motion of the Proposed Statutory Amendments to Investment Authority recommendation which reads: **“The Investment Advisory Council concurs with Staff’s recommendation to pursue proposed legislation permitting Private Market investments in separate accounts and co-investment opportunities, while exempting these investments from restrictions which currently prohibit separate accounts and co-investment; permitting investments in bank loans; exempting liquid alternatives from the statutory 35% market capitalization restriction currently applicable to investments in the Private Markets portfolio; and any corresponding administrative or conforming changes consistent with the foregoing.”** The motion passed unanimously.

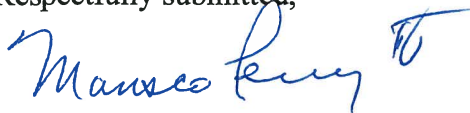
Mr. Perry noted that the four remaining reports in the meeting material are for the member’s to read at their leisure.

Attorney General Ellison noted that he was in possession of the SBI’s Climate Risk Assessment Discussion report, completed by Meketa Investment Group, and that he thinks it’s important that we take climate change seriously. Governor Walz stated that this is something the Board asked staff to start thinking about, how the SBI approach Climate Risk Investment discussions, and what are the principals of responsible investing. At the request of Governor Walz, Mr. Perry briefly provided background on Meketa Investment Group, and the project they were asked to complete. Meketa was engaged by the SBI to identify and discuss the potential long-term impact of climate change on the SBI’s investment portfolio. It was Meketa’s opinion that the SBI actions on climate change place them among the more engaged U.S. public pension plans. The report offered recommendations for the SBI, understanding that its approach to climate change issues is evolving. After a lengthy discussion by the Board, the Board members voiced their appreciation of the report and staff’s pro-active efforts in engagement on Environmental, Social, and Governance (ESG) factors. Mr. Perry noted that the report is available on the SBI’s website for the public to read.

Governor Walz recognized members of the public who had requested to speak before the Board. Ms. Ifrah Ali, Ms. Priya Dalal-Whelan, Ms. Grace Bassekle, and Ms. Juwaria Jama of Minnesota Youth Climate Strike spoke to the Board with a request that the Board divest from Carbon Underground 200 companies. Ms. Lucia Wilkes Smith of Women Against Military Madness; and Mr. Austin Jensen of the Anti-War Committee spoke to the Board with a request that the Board divest from Elbit Systems. Governor Walz thanked the speakers for their testimony and information and adjourned the meeting.

Meeting adjourned at 3:06 p.m.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Mansco Perry III", with a stylized flourish at the end.

Mansco Perry III
Executive Director and
Chief Investment Officer

This page intentionally left blank.

**Minutes
State Board of Investment
January 21, 2020**

The State Board of Investment (SBI) met at 9:00 a.m. Tuesday, January 21, 2020 in G23 Senate Committee Room, State Capitol, St. Paul, Minnesota. Governor Tim Walz, State Auditor Julie Blaha, Secretary of State Steve Simon, and Attorney General Keith Ellison were present.

Opening Statements

Governor Walz called the meeting to order and informed everyone that today's meeting is an educational session to learn more about the State Board of Investment operations, governance, emerging trends and initiatives related to Environmental, Social and Governance (ESG) risk and opportunities.

Introductions

Mansco Perry, Executive Director of the Minnesota State Board of Investment introduced the presenters for the meeting. In addition to himself, speakers included Kristen Doyle, Partner, and Julie Becker, Associate Partner, of Aon Hewitt Investment Consulting, Inc.; Allan Emkin, Managing Principal, and Sarah Bernstein, Principal of Meketa Investment Group, Inc.; Christie Eller, Deputy Attorney General; and John Mulé, Director, Legal and Legislative Policy and Shareholder Services at the State Board of Investment. Mr. Perry also pointed out that Gary Martin, Chair of the Investment Advisory Council (IAC) was present for the meeting.

Mr. Perry went over the agenda for the meeting that covered fiduciary duty, governance, SBI investment programs, risk and return, and Environmental, Social, and Governance (ESG) risks. The primary responsibility of the Board is to monitor and evaluate the investment programs as a fiduciary with the goal of making sound investment decisions using a well-documented process to serve the members and their beneficiaries. The process the SBI uses to execute its fiduciary duty is through delegation of responsibility to the Executive Director and staff, through various committee structures and the retention of other experts.

Fiduciary Duty

Christie Eller and Julie Becker presented on specific state fiduciary statutes, fiduciary responsibility and governance. Ms. Becker noted the Board is legally obligated to act on behalf of and for the benefit of the beneficiaries of plans. Ms. Eller reviewed the primary source of the SBI's fiduciary duties outlined in state statute, the common law Prudent Person Rule, in addition to other sources of fiduciary duties and laws that apply. The presenters answered Board member questions regarding fiduciary duty.

Governance

Ms. Becker reviewed governance, the structure, manner and process by which authority or control is exercised. Good governance helps prevent fiduciary breeches and minimize risk by promoting disciplined oversight of a plan as well as ensuring fiduciaries are informed and knowledgeable.

Ms. Eller presented on the SBI's governance structure. The Board delegates responsibilities through the retention of experienced professionals such as consultants, investment managers, and

staff. With the delegation of responsibilities, the Board is required to monitor and evaluate, which is done formally through quarterly meetings and with the Executive Director's annual review. The Investment Advisory Council (IAC), established by statute, monitors the Executive Director and staff and is responsible for evaluating staff recommendations.

Investment Programs, Asset Allocation, and Risk and Return

Kristen Doyle, consultant with Aon discussed best practices in setting the asset allocation, which has been identified as the most important driver of success for a pension plan in terms of meeting its financial objectives. The asset allocation decision starts with an understanding of the potential range of risk and return outcomes from investing in different institutional quality investment asset classes.

Mr. Perry provided an overview of the five investment programs the SBI is responsible for monitoring and managing. These include the Combined Funds, Participant Directed Investment Program, Non-Retirement Investment Program, Fire Relief Plans, and State Cash. The Combined Funds represents the largest of the assets under management.

Mr. Emkin with Meketa, provided a definition of risk as an outcome for an investment's actual return to be different than what is expected and the different metrics of risk.

Environmental, Social and Governance (ESG) Risk and Opportunities

Ms. Bernstein with Meketa provided an overview of certain risk and return factors, focusing on ESG issues. Ms. Bernstein identified three common approaches to ESG investing; integrating ESG issues into the analysis and implementation of an investment portfolio to improve the financial performance of the plan; screening investments based on ESG factors without any regard to the investment performance results; and impact investing where the investor takes both the market return at the same time as the quantitative impact of the social issue.

Engagement with investment managers, regulators, and to some degree individual companies has become part of how implementation of ESG factors has been evolving. The SBI is in many ways ahead of the curve by taking these issues seriously and talking about how to functionally incorporate ESG factors into the investment strategy.

Mr. Mulé addressed how staff and the SBI approached ESG issues in the past, what the SBI is doing now, and what is planned for the future. The SBI has the investment belief that addressing material ESG related risks is part of the SBI's core function and to the extent that those risks are material they should be factored into how the SBI constructs the portfolio. This starts with proxy voting, which gives the SBI the right to vote on issues presented to a corporation. The Proxy Committee is constructed and authorized by the Board to vote the SBI's proxies according to guidelines developed by the Board and according to precedent, if established. Board members asked questions about proxy voting and ESG.

Mr. Mulé also described ESG coalitions and organizations of which the SBI is a member. Attorney General Ellison requested that staff research comparable organizations that monitor people of color on corporate boards.

Conclusion

All of the Board members thanked staff for putting on the educational session and the consultants for their time and knowledge. They also requested, separately, for staff to generate communication material that describes the SBI's ESG engagement initiatives and coalitions so that the public knows the SBI is listening, being responsive and responsible, and that this is a priority for the Board.

For the Minnesota State Board of Investment, Fiduciary Responsibility & Governance Principles Training Presentation, see **Attachment A**.

The meeting adjourned at 11:50 a.m.

Respectfully submitted,

A handwritten signature in blue ink that reads "Mansco Perry III". The signature is written in a cursive, flowing style with a large initial "M" and a stylized "P".

Mansco Perry III
Executive Director and
Chief Investment Officer

This page intentionally left blank.



**Minnesota State Board of Investment
Fiduciary Responsibility & Governance Principles Training
January 21, 2020**

Why Fiduciary Training Is Important?

As a member of the Minnesota State Board of Investment, you are a fiduciary.

This session is to assist you to understand your role, your responsibilities as a fiduciary, and to help you act accordingly.

Fiduciary law stems from the common law of trusts

General trust law

- Settlor = Creates the trust
- Trustees = Govern the operations of the trust
- Beneficiary= Receives money from the trust

Primary Source: State laws applicable to the Minnesota State Board of Investment

- Other sources

SBI Prudent Person Rule

The members of the state board, director, board staff, and members of the council and any other person charged with the responsibility of investing money [...] shall act in good faith and shall exercise that degree of judgment and care, under circumstances then prevailing, which persons of prudence, discretion, and intelligence exercise in the management of their own affairs, not for speculation, but for investment, considering the probable safety of their capital as well as the probable income to be derived therefrom.

Minn. Stat. §11A.09



-
- In addition to the Prudent Person Rule, Minnesota Statutes Chapter 356A establishes a separate, but very similar fiduciary duty standard with respect to pensions.



Persons to whom the duty is owed

1. The active, deferred, and retired members of the plan, who are its beneficiaries
2. The taxpayers of the state or political subdivision, who help finance the plan; and
3. The state of Minnesota, which established the plan.

Minn. Stat. §356A.04, subd. 1



Purpose of activities

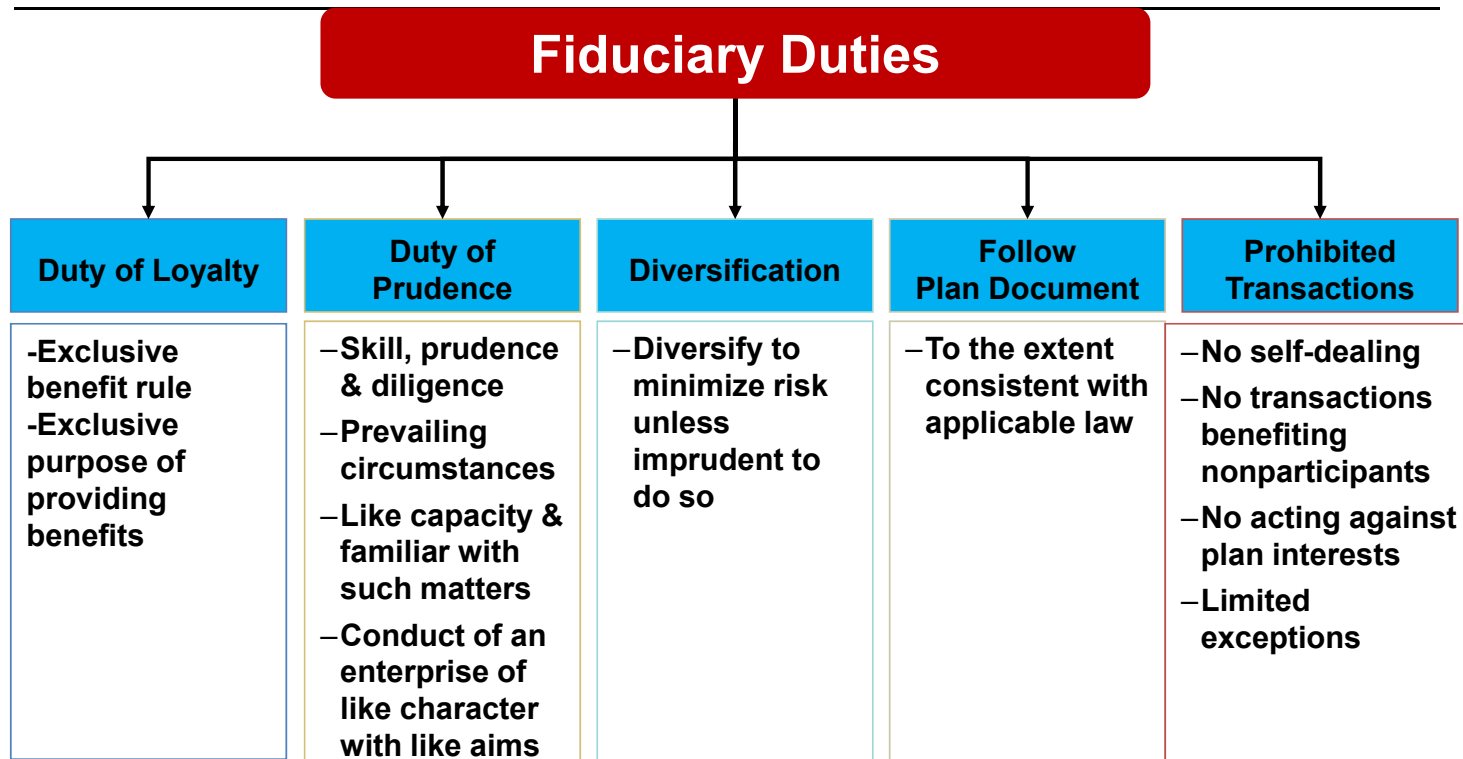
Activities must be carried out solely for the following purposes:

1. To provide authorized benefits to plan participants and beneficiaries;
2. To incur and pay reasonable and necessary administrative expenses; or
3. To manage a covered pension plan in accordance with the purposes and intent of the plan document

Minn. Stat. §356A.05(a)



Fiduciary Duties Overview



What is “Good Governance” And Why is it Important?

- Governance is the structure, manner and process by which authority or control is exercised
- “Good governance” begins with a clear understanding of fiduciary duty
- “Good governance helps to ensure better organizational performance, fewer conflicts of interest, higher probability that goals and objectives will be attained, and less opportunity for misuse of corporate or fund assets” - *The Stanford Institutional Investors’ Forum*
- Good governance adds value – tangible and intangible

Governance – State Board of Investment

The Minnesota Constitution establishes the Board. Minnesota Constitution Article 11 § 8. Minn. Stat. § § 11A.03 and .04 establish the framework with express authority for the Board.



Executive Director

- Appointing and evaluating a qualified Executive Director with an appropriate level of knowledge is key.
- Minn. Stat. § 11A.07 statutorily gives authority to the Executive Director to implement investment policy.
- The Board has retained consultants and investment managers to advise board not just SBI Executive Director and staff.



IAC

By statute there is an Investment Advisory Council that has

- 10 of 17 members that must have investment knowledge and
- 7 members are representatives of various constituencies and some of which in practice do have some general investment experience.

Minn. Stat. § 11A.08.



Administrative Committee

Administrative Committee has representation from the IAC, each of the pension fund directors, and a designee of each board member to review budget, compensation and administrative matters.



Proxy Committee

- The Board has adopted proxy guidelines.
- The Board has established proxy committee with designees from each board member to implement procedures to vote on proxies.



Conflict of Interest

There are statutes and policies in place to limit the potential for conflicts of interest and self-dealing. *See* Minn. Stat. § § 11A.04 (5), 11A.075.



Fiduciary Education

- A fiduciary must make reasonable effort to obtain knowledge and skills sufficient to enable the fiduciary to perform fiduciary activities adequately.
- The SBI maintains a fiduciary education program that it reviews each year as part of its budget process.

Minn. Stat. §356A.13



Different Public Fund Plan Structures

- Examples of Separate Investment Entities:
 - Alaska State Pension Investment Board
 - Florida State Board of Administration
 - Illinois State Board of Investment
 - Massachusetts Pension Reserves Investment Management Board
 - State of Michigan Investment Board
 - Minnesota State Investment Board
 - Montana Board of Investments
 - Nebraska Investment Council
 - New Jersey State Investment Council
 - Oregon Investment Council
 - Rhode Island State Investment Commission
 - South Carolina Retirement Systems Investment Commission
 - South Dakota Investment Council
 - State of Wisconsin Investment Board
 - Washington State Investment Board



Minnesota State Board of Investments – Asset Allocation

January 2020

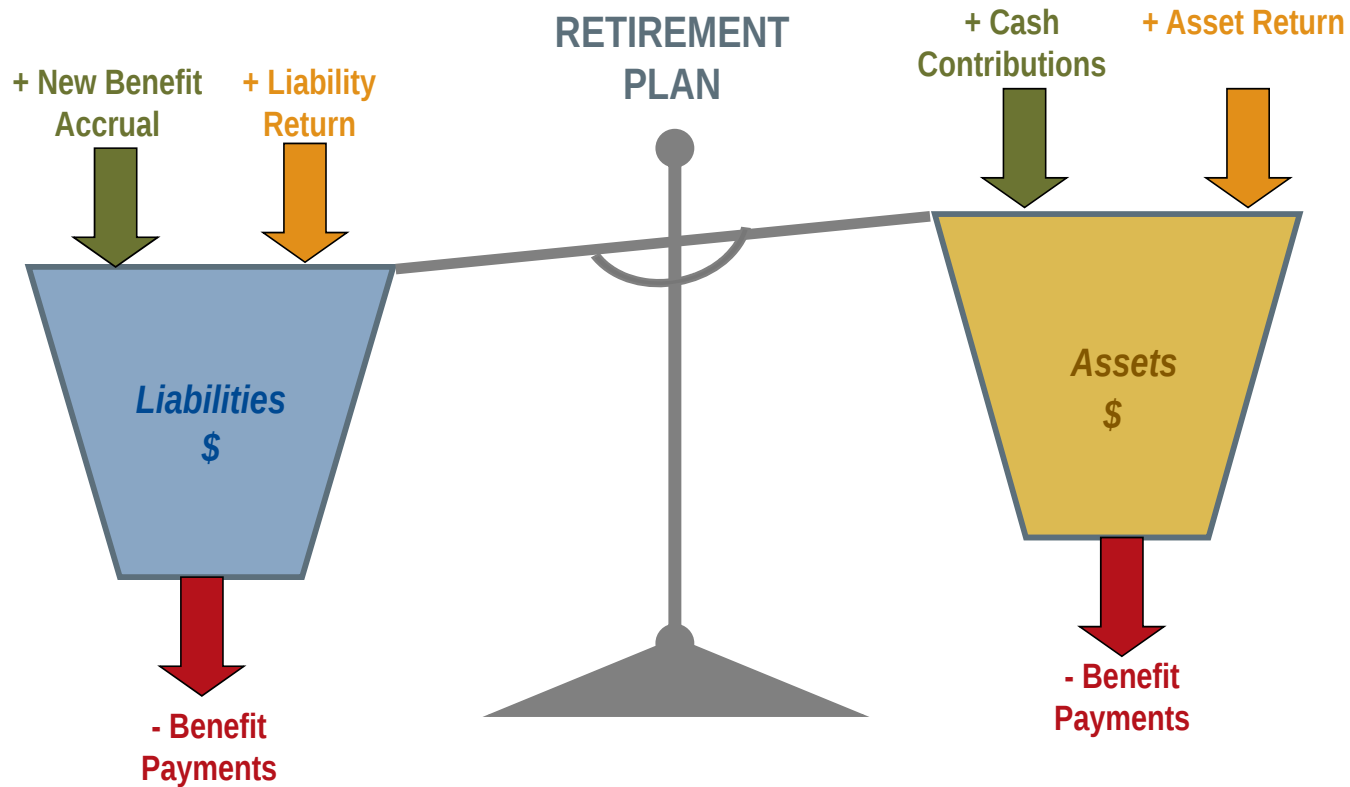
Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

To protect the confidential and proprietary information included in this material, it may not be disclosed or provided to any third parties without the approval of Aon.

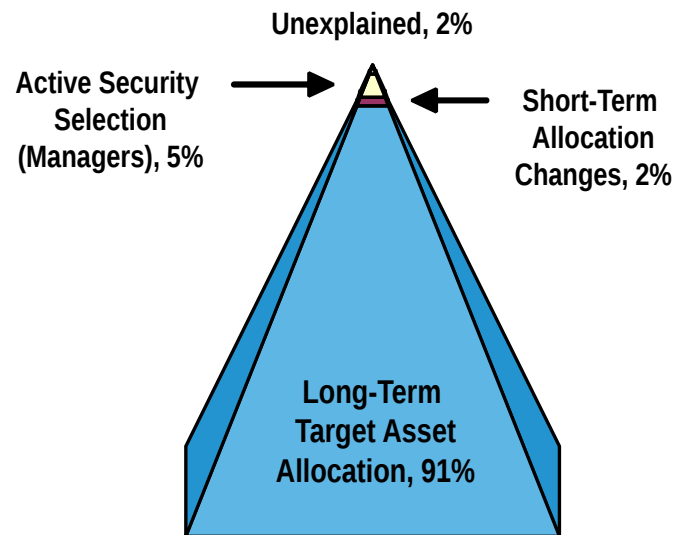


Pension Accounting

Balance of Liabilities and Assets



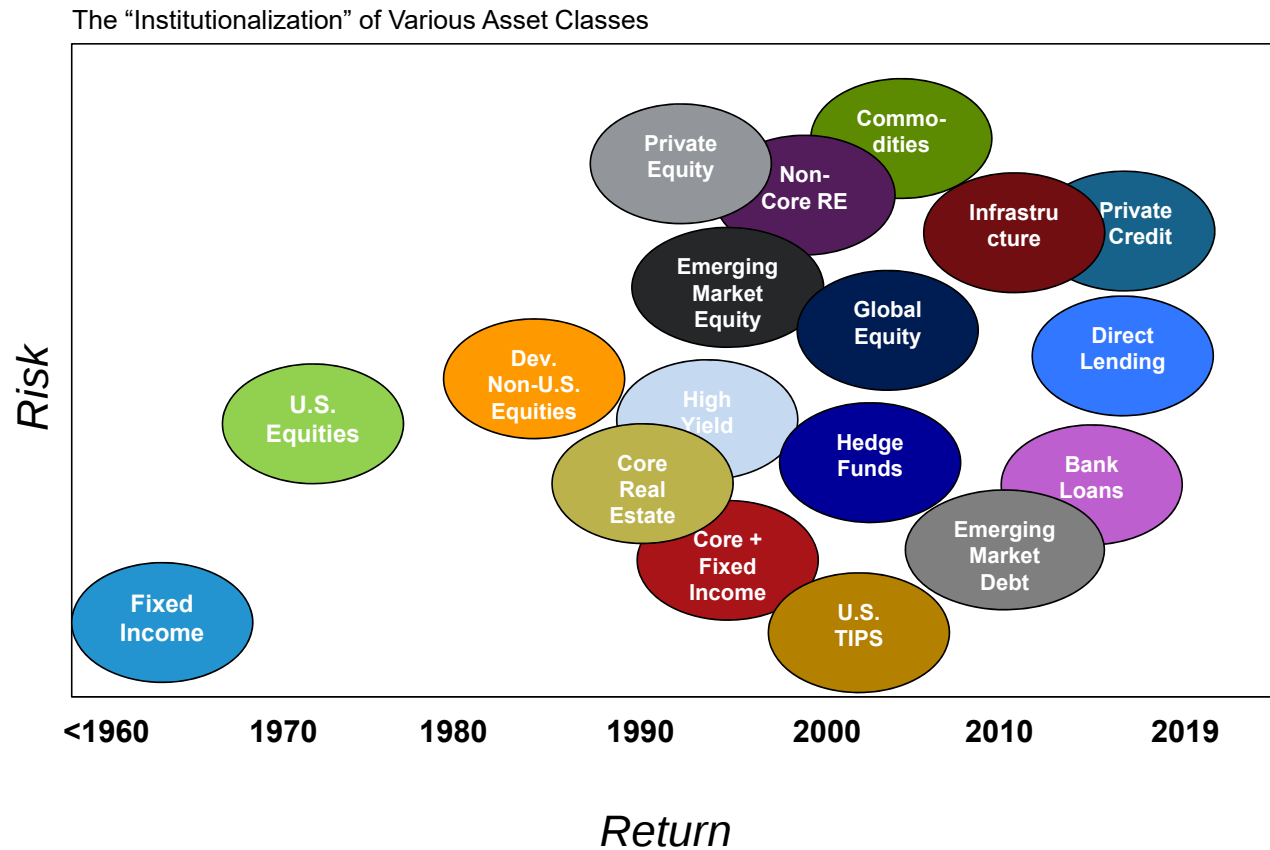
Asset Allocation—The Most Important Decision



Asset allocation refers to the implementation of an investment strategy that seeks to balance reward (investment return) and risk (volatility of returns) by mixing various assets based on investor's risk profile and return goal

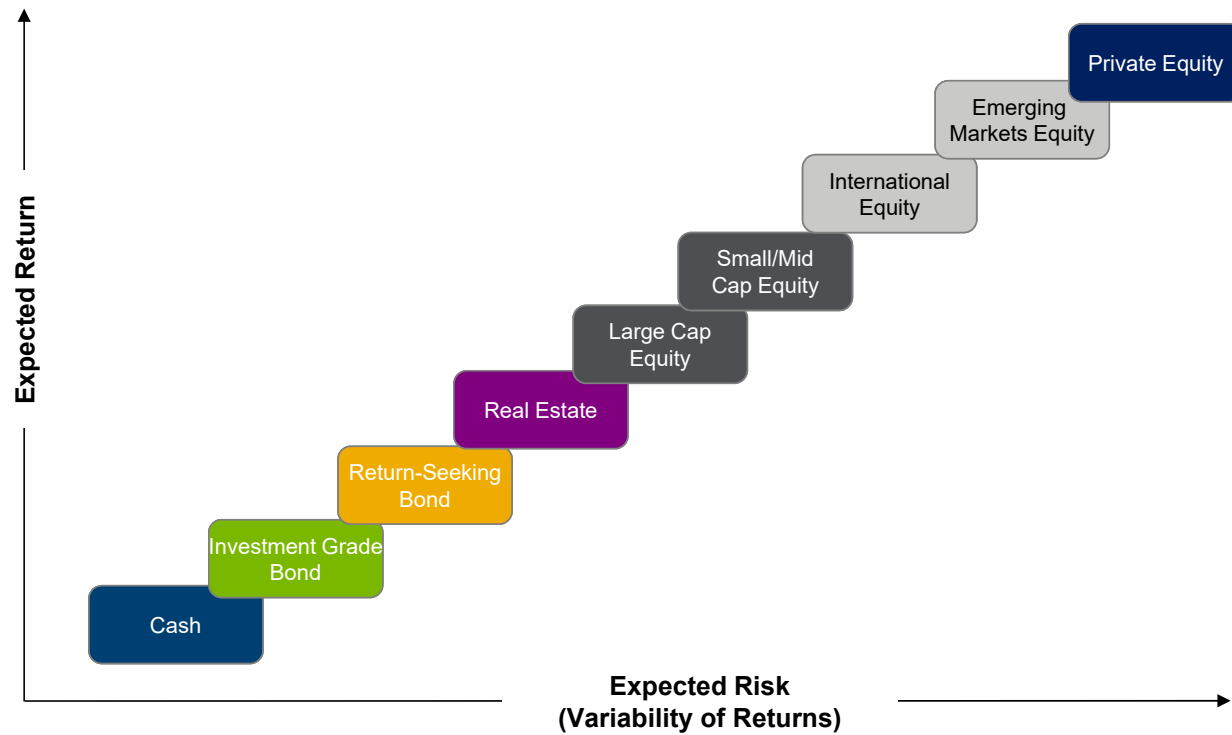
Asset allocation is the most important investment decision as it explains more than 90% of investment return based on multiple historical studies

The Evolution of Institutional Investors' Asset Allocation



- The asset allocation of institutional investors has and likely will continue to evolve over time.

Risk-Return Spectrum (Illustrative)



Importance of an Asset-Liability Study for Setting Asset Allocation

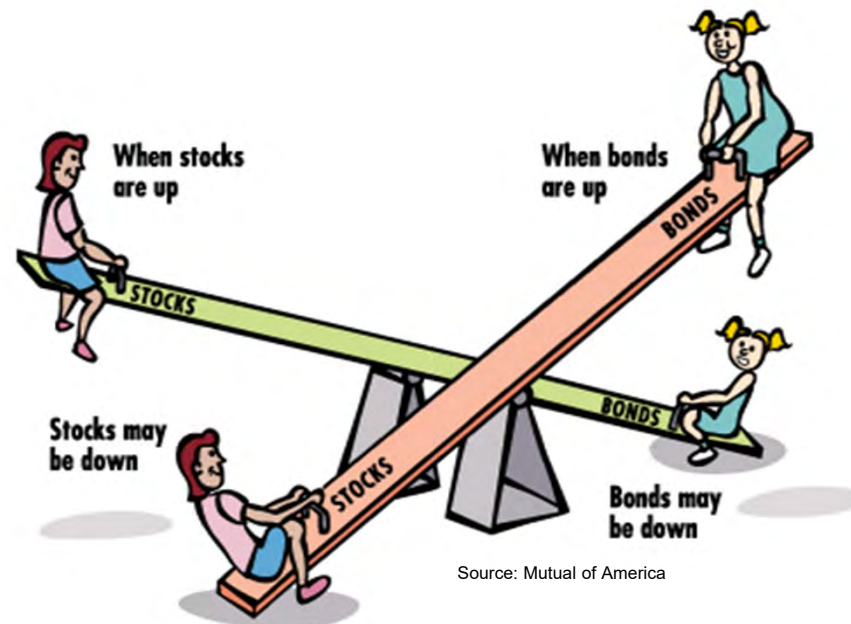
- Provides fiduciaries with an understanding of the dynamic relationship between plan assets and liabilities over time
- Illustrates the impact of various asset allocations on key financial metrics, such as required contributions and funded status, under a range of different macro-economic scenarios
- Helps determine the level of risk that is appropriate in the context of the Plan's liabilities
- **The key take-away from the asset-liability study is the allocation between equity (“return-seeking”) vs. fixed income (“risk-reducing”)**

*An asset-liability study is a **comprehensive toolkit** for making **decisions** on a fund's **asset allocation** and investment risk **that align with the liabilities** those funds support.*

Diversification

Diversification is a requirement in the definition of prudent fiduciary investing

- Diversified portfolios are meant to **reduce risk** while maintaining an expected return
- All asset classes do not produce the same results in a particular economic environment



Benchmarking: Purposes & Types

- Benchmarks are used to measure the performance of the Total Fund, asset classes, and individual managers over various time periods and across methodologies to determine the effectiveness of implementation of an investment program
- There are many types of benchmarks that can be used to analyze relative performance of an investment
 - Broad market (MSCI ACWI IMI Index)
 - Style-specific (S&P 500 Value Index)
 - Risk adjusted returns (vs. benchmark Sharpe ratio)
 - Absolute return metric (i.e. 7% return target)
 - Real return target (i.e. CPI + 3%)
 - Peer universe (i.e. Public Funds >\$1 billion)
- Careful attention should be paid to appropriateness when selecting the benchmark for a given asset class, manager, or strategy

Q & A

Minnesota State Board of Investment: Investment Programs

Introduction

- The SBI manages investments for several investment programs:
 - Combined Pension Funds
 - Participant Directed Investment Program
 - Fire Funds
 - Non-Retirement Investment Program
 - State Cash

Combined Pension Plans: Overview

- Represent the three statewide pension plans: MSRS, TRA, PERA
- \$74.21 billion AUM as of December 31, 2019
- Board sets asset allocation and reviews investments in public equities, fixed income, private markets, and cash

Combined Pension Plans: Asset Allocation

- SBI's current asset allocation is as follows:
 - Public Equity: 53%
 - Fixed Income/Treasuries: 20%
 - Private Markets: 25%
 - Cash: 2%
- Board reviews the SBI asset allocation periodically.

SBI's Strategic Asset Category Framework

Asset Category	Actual % As Of 9/30/19	Category Ranges
<u>Growth - Appreciation</u>	<u>76.5%</u>	<u>50 – 75%</u>
Public Equity	62.9%	
Private Equity	8.5%	
Non-Core Real Assets	3.5%	
Distressed/Opportunistic	1.5%	
<u>Growth-Income Oriented</u>	<u>11.3%</u>	<u>15 – 30%</u>
Core Fixed Income	10.4%	
Private Credit	0.9%	
Return-Seeking Fixed Income	0.0%	
<u>Real Assets</u>	<u>0.7%</u>	<u>0 – 10%</u>
Core Real Estate	0.0%	
Real Assets	0.7%	
<u>Inflation-Protection</u>	<u>0.0%</u>	<u>0 – 10%</u>
TIPS	0.0%	
Commodities	0.0%	
<u>Protection – U.S. Treasuries</u>	<u>10.6%</u>	<u>5 – 20%</u>
<u>Liquidity – Cash</u>	<u>0.9%</u>	<u>0 – 5%</u>
<u>Opportunity</u>	<u>0.0%</u>	<u>0 – 10%</u>

Participant Directed Investment Program

- Retirement and benefit programs in which participants select investments from options made available by the SBI.
- Total AUM of \$11.32 billion. Programs Include:
 - Deferred Compensation Program
 - Unclassified Retirement Plan
 - Health Care Savings Plan
 - PERA Defined Contribution Plan
 - Hennepin County Supplemental Plan
 - Minnesota Achieving a Better Life Experience (ABLE) Plan
 - Minnesota College Savings Plan

Firefighter Plans

- The SBI provides investment options for various volunteer fire departments across the state.
- Statewide Volunteer Firefighter Retirement Plan:
 - Combined fire plans administered through PERA and invested in a balanced fund constructed by the SBI.
 - Total AUM \$120.06 million
- Local Volunteer Fire Relief Plans:
 - Individual plans who choose investment options through the SBI's Supplemental Investment Fund (SIF) platform
 - Total AUM: \$716.41 million

Non-Retirement Investment Program

- Includes various state trusts and other programs for which the SBI provides investment options.
- Total AUM of \$4.30 billion. Programs include:
 - Environmental Trust Fund
 - Permanent School Fund
 - Closed Landfill Investment Fund
 - Other Postemployment Benefits (OPEB)
 - Assigned Risk Plan
 - City and County Equity Investment Program
 - Other various programs for which the SBI provides investment options

State Cash

- The SBI manages state cash not currently needed for general fund expenditures through the Invested Treasurer's Cash account
- Total AUM of \$13.64 billion
- State cash is managed internally in short-term investments such as treasuries and repurchase agreements.

Minnesota State Board of Investment
January 21, 2020

A Brief Discussion of Investment Risk

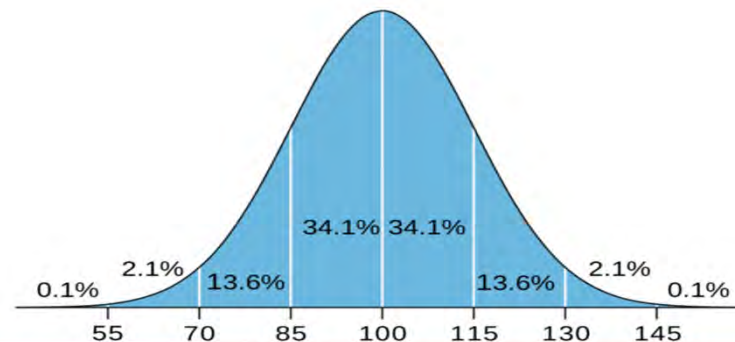
What is Risk?

“Risk is the chance an outcome or investment's actual return will differ from the expected”¹

“The possibility of something bad happening. Something bad that might happen”²

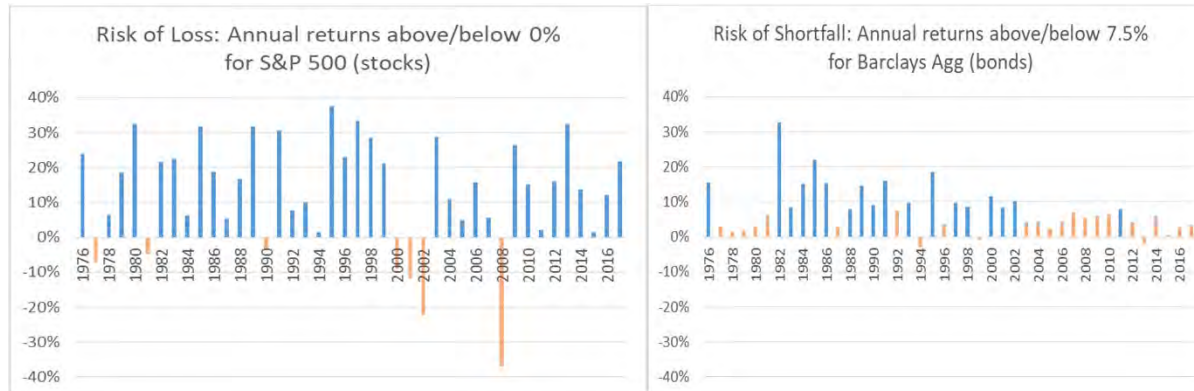
- Two perspectives - consensus boils down to “something bad happening”.
- Traditional measure of risk is standard deviation (a measure of volatility). Key challenge: downside and upside treated equally

A Normal Distribution Curve



¹ Investopedia

² Cambridge Dictionary



- Investors' objectives and tolerance for different outcomes vary. Therefore, no single number can measure all the myriad types of risks
 - Left graph: Risk of Loss
 - Right graph: Risk of Falling Short
- Which is riskier? It depends. In either case, volatility does not provide a clear answer.

Different Measurements of Risk

- Permanent Impairment (returns too poor to recover from)
- Loss (negative returns, over some timeframe)
- Shortfall (returns less than a threshold, over some timeframe)
- Failure to meet spending obligations
- Volatility (standard deviation of returns)
- Inflation (losing purchasing power from returns less than inflation rate)
- Underperformance (returns less than a benchmark)
- Peer comparison (returns less than peer institutions)
- Reputation
- Behavioral (poor returns cause lack of conviction and deviations from strategy)
- Liquidity (likelihood of having to access hard-to-sell assets at the wrong time)

Additional Risk Considerations

- Adequate resources and well-qualified staff
- Economic Regime Change:
 - Examples: shift to low-carbon economy; secular change in interest rates
- Economic Regime Change is very hard to identify in advance

Addressing Economic Regime Change

- Requires time and resources
- Misidentifying regime change is problematic
- The impacts of regime change are complex and nuanced
- Policy responses requires significant resources and time.

Minnesota State Board of Investment

January 2020

Environmental Social Governance Overview

Introduction

- The Minnesota State Board of Investments (SBI) is among a growing number of U.S. public investment entities taking steps to understand how material Environmental, Social and Governance (ESG) issues may be integrated in to their investment decision-making process to support their fiduciary duties
- Today we provide an overview of institutional investor approaches to ESG and offer a range of potential investment strategy/policy options

ESG Investing

- ESG investing: Using Environmental, Social, and Governance factors in investing
- Active managers always considered ESG factors - to varying degrees
- Today ESG factors are being formalized, reflecting increased concern of investors



- All versions of ESG investments combined grew 38% from 2016 to 2018 in the US¹
- ESG investing encompasses shareholder proxy voting and engagement

¹ US SIF 2018 Report.

Common ESG Considerations

Environment	Social	Governance
Climate change	Consumer rights	Board structure
Energy transition	Health and safety	Board diversity
Sustainability best practice	Product safety	Independent directors
Environmental policy & mgmt.	Labor relations	Chairman / CEO split
Water supply	Community / stakeholder relations	Executive pay
Sustainable transport		Shareowner rights
Waste management		Accounting / audit

Materiality

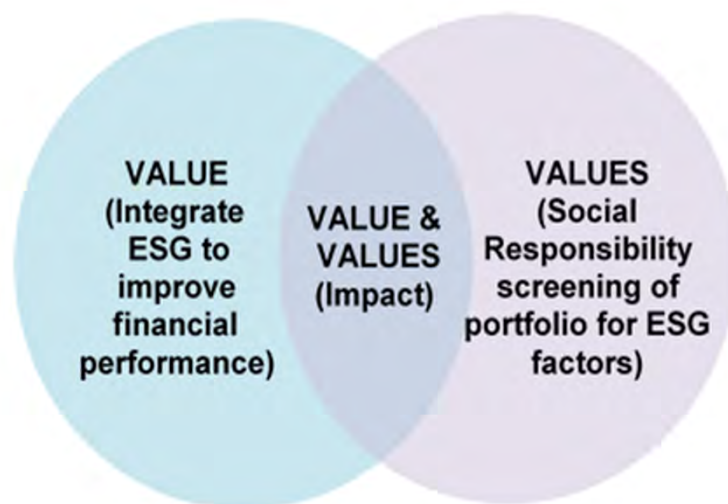
Growing focus on material impact of ESG factors on investment performance

Investment Performance and ESG

- ESG data availability, and regulation increased dramatically in the last few years
- ESG data and scores vary widely, which can result in different performance
- Many ESG performance results are positive and neutral for ESG, but not all

Examples of ESG Investing

ESG Investing spans three types: Integrate, Impact, and Social Responsibility



- Integrating material ESG factors into investment strategy squarely fits within a US public pension plan's fiduciary duty
- ESG integration can be costly, time consuming, and require more staff and external resources

ESG at U.S. Public Pension Plans

- ESG approaches may be incorporated throughout a plan's investment approach
 - Investment beliefs
 - Investment policy
 - Asset allocation
 - Investment manager selection
 - Monitor investment managers
 - Monitor investment portfolio
 - Select ESG factors
 - Climate change reporting
 - Engagement
 - Investment Managers
 - Regulators/Government
 - Companies

Summary

- ESG institutional investor investment standards continue to evolve
- Approaches to ESG vary widely among U.S. public pension plans
- SBI actively incorporates ESG into its investment approach; additional strategies/approaches may be worth exploring
- Time and costs to implement ESG strategies range from some low resource to high internal and external resource and time intensive

Minnesota State Board of Investment Proxy Voting and ESG Overview

SBI Investment Belief

Utilizing engagement initiatives to address environmental, social, and governance related (ESG) issues can lead to positive portfolio and governance outcomes.

Proxy Voting: Procedures

- U.S. securities are voted internally;
- Non-U.S. securities are voted by investment managers;
- The Board delegates voting authority to a four person committee to execute proxy voting rights for U.S. securities.

Proxy Voting: Committee Meetings

- The proxy committee meetings are scheduled on an as-needed basis to vote resolutions not covered by precedent.
- SBI staff provide applicable materials in advance of the meeting.
- The proxy committee votes by majority and may set precedent with a unanimous vote.

Proxy Voting: Precedent

- Most proxy ballots are voted according to precedent

Example of Proxy Precedent:

Performance Based Stock Options [Executive Compensation]

Vote FOR shareholder proposals to adopt a policy of executive compensation that utilizes performance based stock options.

Environmental, Social and Governance (ESG) Introduction

The SBI engages in environmental, social and governance (ESG) initiatives to address long-term, material risks and opportunities that are expected to lead to positive portfolio outcomes.



ESG Initiatives Include: Proxy voting, Coalitions and Memberships, and Engagement.

ESG: Coalitions and Memberships

- Council of Institutional Investors (CII)
- United Nations Principles of Responsible Investing (PRI)
- Ceres Investor Network
- Institutional Limited Partners Association (ILPA)
- Climate Action 100+ (PRI and Ceres)
- Thirty Percent Coalition
- Midwest Investors Diversity Initiative

ESG: Recent Initiatives

- Engagement activities through Ceres and Climate Action 100+
- Signatory to initial engagement letters sent on behalf of the Midwest Investors Diversity Initiative and Thirty Percent Coalition
- Signatory to the Investor Agenda Global Investor Statement to Governments on Climate Change (Ceres; Investor Agenda)
- Signatory to Investor Expectations on Deforestation (Ceres)

ESG: Recent Initiatives

- Signatory to initial engagement letters sent on behalf of the Midwest Investors Diversity Initiative and Thirty Percent Coalition
- Signatory to several letters to regulatory agencies on shareholder and limited partner rights and protections (ILPA; CII)
- Signatory to resolution calling for increased corporate transparency regarding gender diversity (As You Sow)

ESG: Examples of Engagement Successes

- In September 2019, Duke Energy committed to a goal of being carbon neutral by 2050. CalSTRS led the engagement effort with the support of other public plans and organizations including the Climate Action 100+.
- TPG, an SBI private markets manager added 64 female directors to 53 portfolio company boards over the last two years. TPG partnered with the Thirty Percent Coalition to find qualified candidates.

ESG: Future Development

- Continue to incorporate ESG into investment management process;
- Devote additional SBI resources and expand engagement efforts;
- Continue to conduct research on material ESG issues; and
- Continue education efforts.

This page intentionally left blank.

TAB A

Report from the Executive Director

Quarterly Performance Summary

This page intentionally left blank.



Performance Summary

December 31, 2019



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.

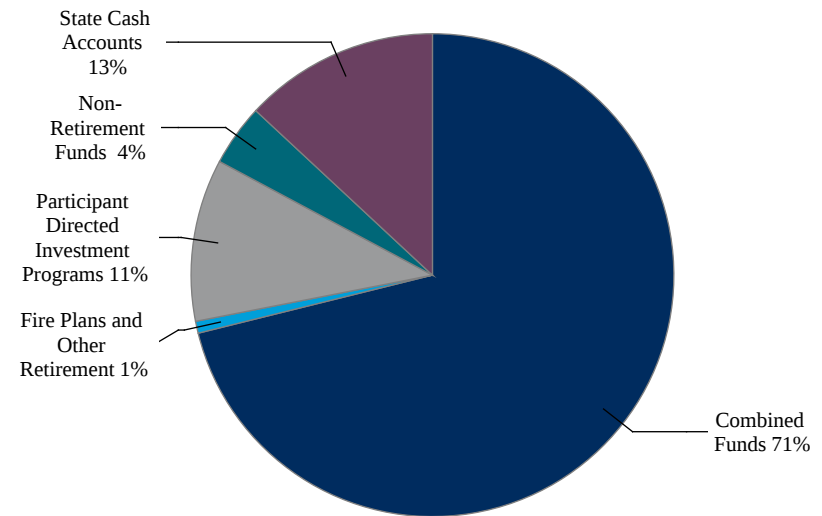
State Cash

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

	<u>\$ Millions</u>
COMBINED FUNDS	\$74,208
FIRE PLANS + OTHER RETIREMENT PLANS	836
PARTICIPANT DIRECTED INVESTMENT PROGRAM	11,340
State Deferred Compensation Plan	7,905
Health Care Savings Plan	1,280
Unclassified Employees Retirement Plan	341
Hennepin County Supplemental Retirement Plan	167
PERA Defined Contribution Plan	78
Minnesota College Savings Plan	1,561
Minnesota Achieve a Better Life Experience	9
NON-RETIREMENT FUNDS	4,305
Assigned Risk Plan	293
Permanent School Fund	1,612
Environmental Trust Fund	1,303
Closed Landfill Investment Fund	104
Miscellaneous Trust Funds	281
Other Postemployment Benefits Accounts	712
STATE CASH ACCOUNTS	13,636
Invested Treasurer's Cash	13,410
Other State Cash Accounts	225
TOTAL SBI AUM	104,325



Note: Differentials within column amounts may occur due to rounding



Combined Funds Long Term Objectives

		<u>Comparison to Objective</u>
		<u>10 Year</u>
Match or Exceed Composite Index (10 yr.)	COMBINED FUNDS	9.8%
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.	COMBINED FUNDS - COMPOSITE INDEX	9.6
	Excess	0.3
		<u>20 Year</u>
Provide Real Return (20 yr.)	COMBINED FUNDS	6.5%
Provide returns that are 3-5 percentage points greater than inflation over the latest 20 year period.	CPI-U	2.2
	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.



Combined Funds Summary

Combined Funds Change in Market Value (\$Millions)

	One Quarter
COMBINED FUNDS	
Beginning Market Value	\$70,692
Net Contributions	-590
Investment Return	4,106
Ending Market Value	74,208

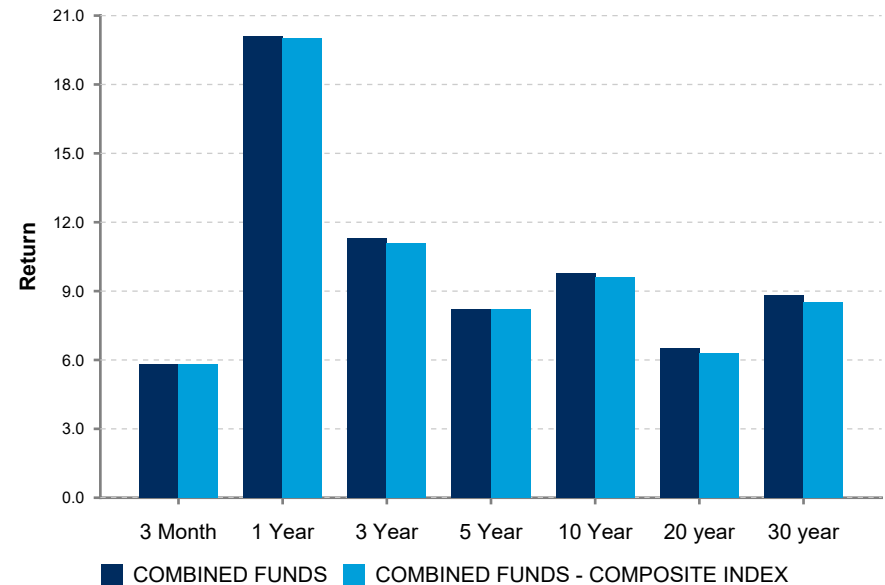
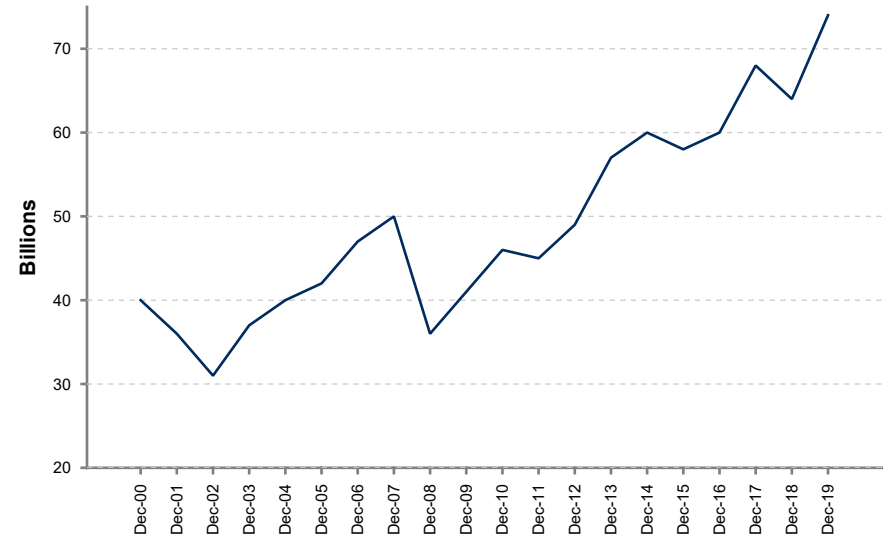
The change in market value of the Combined Funds since the end of last quarter is due to net contributions and investment returns.

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	5.8%	6.9%	20.1%	11.3%	8.2%	9.8%	6.5%	8.8%
COMBINED FUNDS - COMPOSITE INDEX	5.8	6.9	20.0	11.1	8.2	9.6	6.3	8.5
Excess	0.1	-0.0	0.1	0.2	0.0	0.3	0.2	0.3

Asset Growth



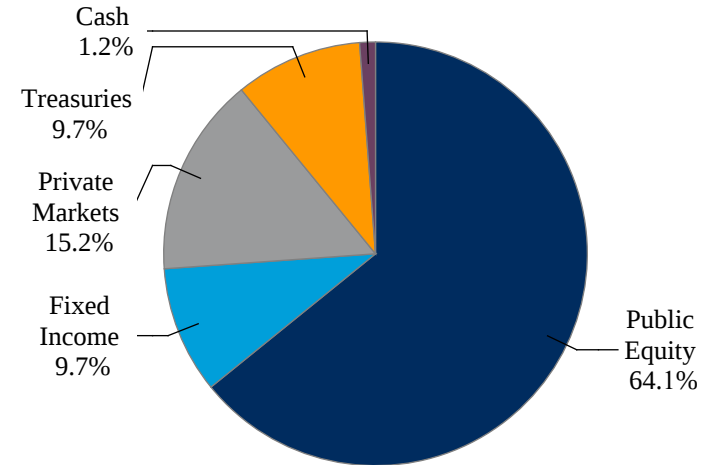


Combined Funds Summary

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.

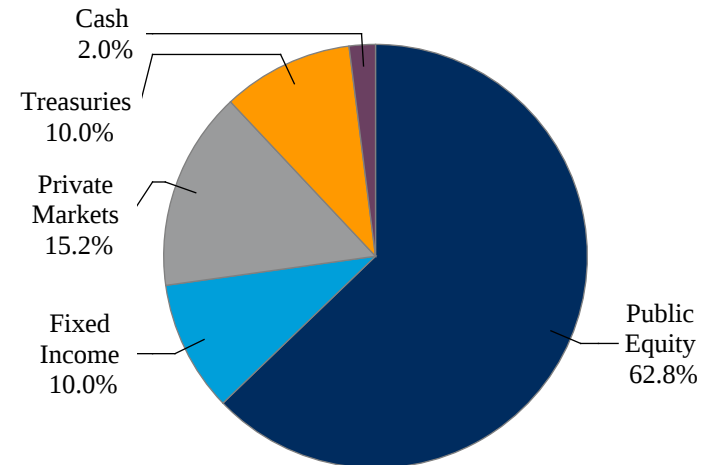
	<u>(Millions)</u>	<u>Actual Mix</u>	<u>Policy Target</u>
Public Equity	\$47,603	64.1%	53.0%
Fixed Income	7,218	9.7	10.0
Private Markets	11,293	15.2	25.0
Treasuries	7,231	9.7	10.0
Cash	863	1.2	2.0
TOTAL	74,208	100.0	



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.

	<u>Policy Weight</u>	<u>Market Index</u>
Public Equity	62.8%	Public Equity Benchmark
Fixed Income	10.0	BB Barclays U.S. Aggregate
Private Markets	15.2	Private Markets
Treasuries	10.0	BB Barclays Treasury 5+ Years
Cash	2.0	3 Month T-Bills





Combined Funds Asset Class Performance Summary

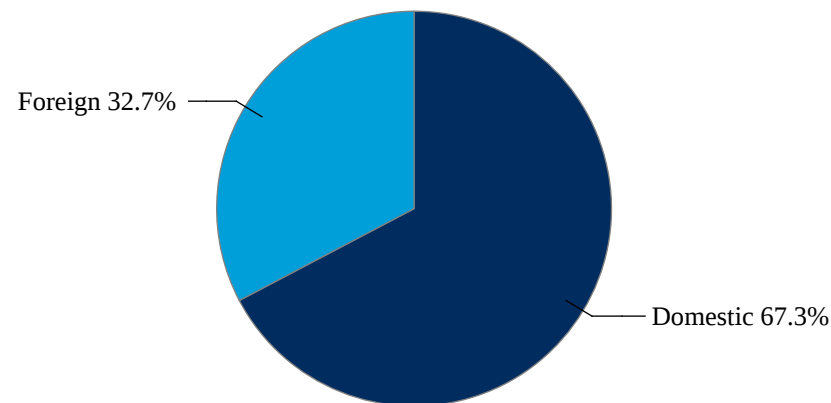
Public Equity

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.



	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>30 year</u>
Public Equity	9.0%	9.1%	28.0%	13.1%	9.5%	11.3%	5.6%	9.1%
Public Equity Benchmark	9.1	9.2	27.7	13.0				
Excess	-0.0	-0.1	0.3	0.1				
Domestic Equity	9.1	9.9	30.7	14.5	10.9	13.3	6.0	9.6
Domestic Equity Benchmark	9.1	10.3	30.8	14.5	11.2	13.4	6.2	9.8
Excess	-0.1	-0.4	-0.2	0.0	-0.3	-0.1	-0.1	-0.2
International Equity	9.0	7.3	22.4	10.1	5.9	5.5	4.1	
International Equity Benchmark	8.9	6.9	21.5	9.9	5.5	5.0	3.8	
Excess	0.1	0.4	0.9	0.3	0.4	0.5	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 Fixed Income and Treasuries. The Combined Funds performance for these asset classes is shown here.

The Core Fixed Income 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.

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>30 year</u>
Fixed Income	0.5%	2.8%	9.7%	4.5%	3.6%	4.5%	5.4%	6.3%
Fixed Income Benchmark	0.2	2.5	8.7	4.0	3.0	3.7	5.0	5.9
Excess	0.3	0.3	1.0	0.5	0.5	0.8	0.4	0.4
Treasuries	-2.2	2.2	10.5					
BBG BARC 5Y + Us Tsy Idx	-2.3	2.2	10.4					
Excess	0.1	0.0	0.0					

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.

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>30 year</u>
Cash	0.5%	1.1%	2.3%	1.8%	1.2%	0.8%	2.1%	3.6%
US 3-Month Treasury Bill	0.5	1.0	2.3	1.7	1.1	0.6	1.8	2.9

Note:

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

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>25 year</u>	<u>30 year</u>
Private Markets	2.4%	4.2%	6.6%	13.5%	9.8%	12.2%	12.5%	13.6%	12.2%
Private Equity	4.2%	7.8%	13.2%	17.7%	15.0%	15.1%	13.5%	15.4%	
Private Credit	3.3	4.7	8.5	13.1	11.9	13.2	12.4		
Resources	-4.0	-7.4	-13.2	3.1	-5.4	4.5	14.5	14.1	
Real Estate	2.3	5.5	9.5	10.4	10.7	10.9	9.1	9.7	

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

	<u>12/31/19</u> <u>(\$ millions)</u>	<u>12/31/19 Weights</u>	<u>Category Ranges</u>	
<u>Growth - Appreciation</u>				
Public Equity	\$ 47,603.27	64.1%		
Private Equity	\$ 6,398.27	8.6%		
Non-Core Real Assets	\$ 2,531.84	3.4%		
Distressed/Opportunistic	\$ 1,065.89	1.4%		
	\$ 57,599.27	77.6%	50%	75%
<u>Growth - Income-oriented</u>				
Core Fixed Income	\$ 7,217.71	9.7%		
Private Credit	\$ 732.15	1.0%		
Return-Seeking Fixed Income		0.0%		
	\$ 7,949.87	10.7%	15%	30%
<u>Real Assets</u>				
Core Real Estate		0.0%		
Real Assets	\$ 492.68	0.7%		
	\$ 492.68	0.7%	0%	10%
<u>Inflation Protection</u>				
TIPS		0.0%		
Commodities		0.0%		
		0.0%	0%	10%
<u>Protection</u>				
U.S. Treasuries	\$ 7,230.81	9.7%		
	\$ 7,230.81	9.7%	5%	20%
<u>Liquidity</u>				
Cash	\$ 935.77	1.3%		
	\$ 935.77	1.3%	0%	5%
<u>Opportunity</u>				
Opportunity		0.0%	0%	10%
Total	\$ 74,208.40	100.0%		
Illiquid Asset Exposure	\$ 11,220.84	15.1%	0%	30%

Volatility Equivalent Benchmark Comparison

Periods Ending 12/31/2019

As of (Date):	12/31/2019							
	1-year	3-year	5-year	10-year	15-year	20-year	25-year	30-year
SBI Combined Funds Return	20.1%	11.3%	8.2%	9.8%	7.9%	6.5%	8.8%	8.8%
Volatility Equivalent Benchmark Return			6.5%	7.0%	6.0%	5.0%	6.9%	7.3%
Value Added			1.7%	2.9%	1.9%	1.4%	1.9%	1.5%
Standard Deviation: Benchmark = Combined Funds			7.2%	7.8%	8.9%	9.3%	9.3%	9.2%
Benchmark Stock Weight			62%	60%	58%	61%	62%	62%
Benchmark Bond Weight			38%	40%	42%	39%	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

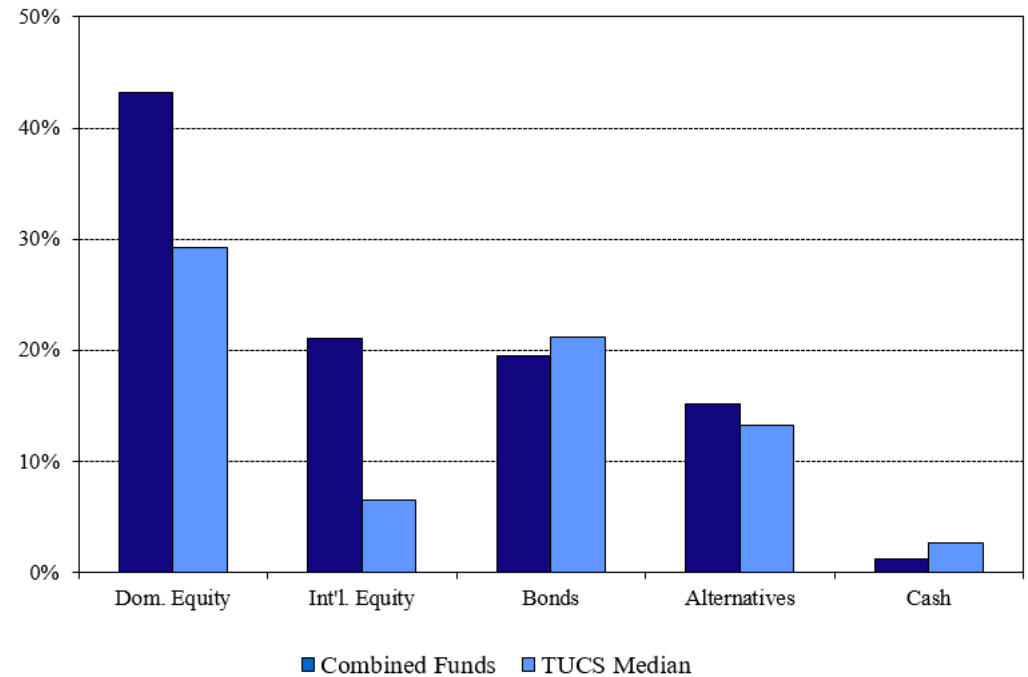
Asset Mix Compared to Other Pension Funds

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

	<u>(\$Millions)</u>	<u>Actual Mix</u>
Public Equity	47,603	64.1
Fixed Income	7,218	9.7
Treasuries	7,231	9.7
Private Markets	11,293	15.2
Cash	863	1.2
TOTAL	74,208	100.0



	<u>Domestic Equity</u>	<u>International Equity</u>	<u>Bonds</u>	<u>Alternatives</u>	<u>Cash</u>
Combined Funds	43.2%	21.0%	19.5%	15.2%	1.2%
Median in TUCS	29.2%	6.5%	21.2%	13.2%	2.6%



Combined Funds Summary

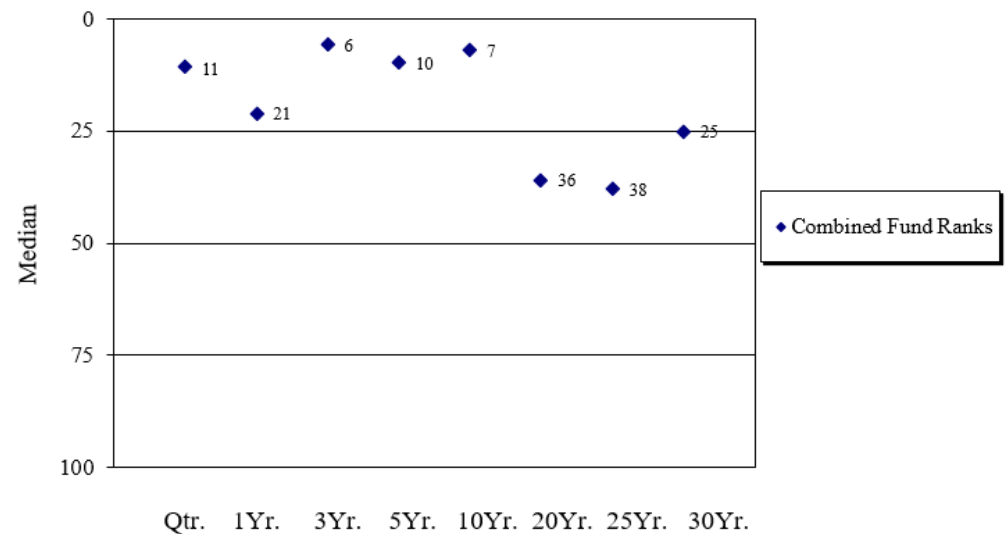
Performance Compared to Other Pension Funds

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.

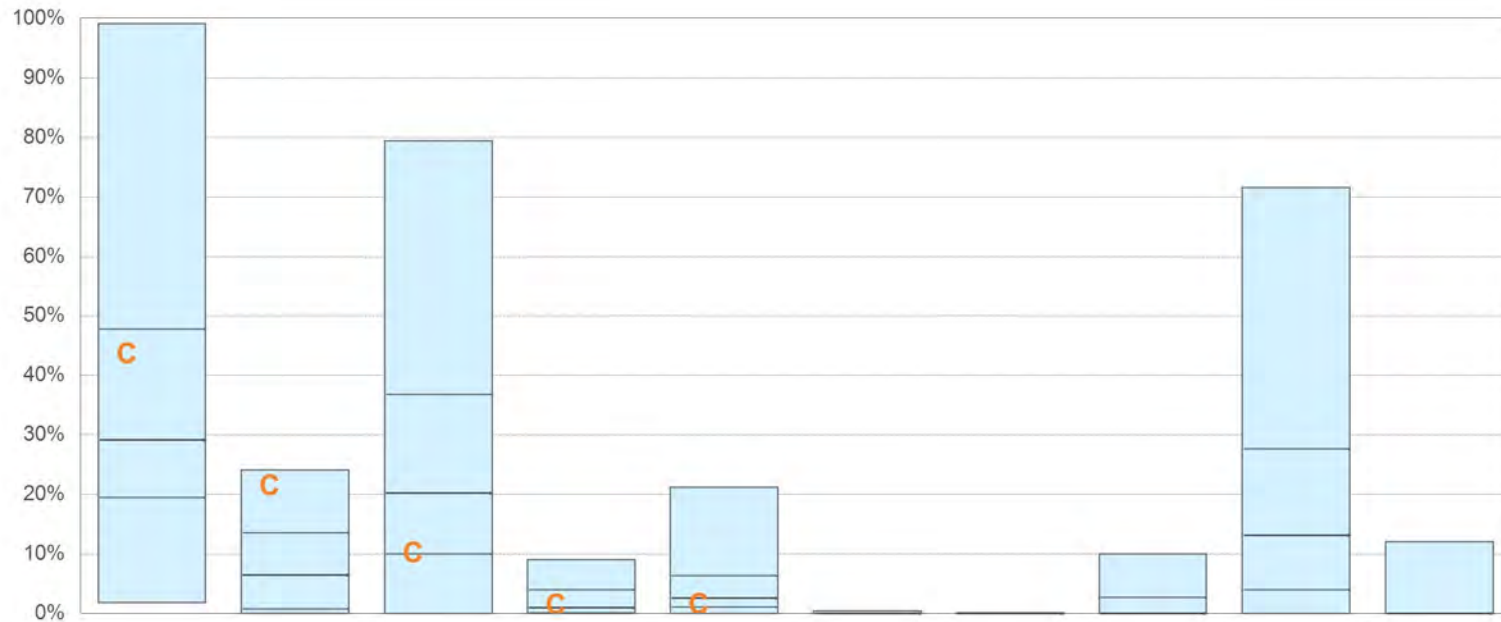
The SBI's returns are ranked against public and corporate plans with over \$1 billion in assets. All funds in TUCS report their returns gross of fees.



	Periods Ended 12/31/2019							
	<u>Qtr</u>	<u>1 Yr</u>	<u>3 Yrs</u>	<u>5 Yrs</u>	<u>10 Yrs</u>	<u>20 Yrs</u>	<u>25 Yrs</u>	<u>30 Yrs</u>
Combined Funds	11th	21st	6th	10th	7th	36th	38th	25th
Percentile Rank in TUCS								

Minnesota State Board of Investments Asset Allocation of Master Trusts - Plans > \$1 Billion

Quarter Ending December 31, 2019

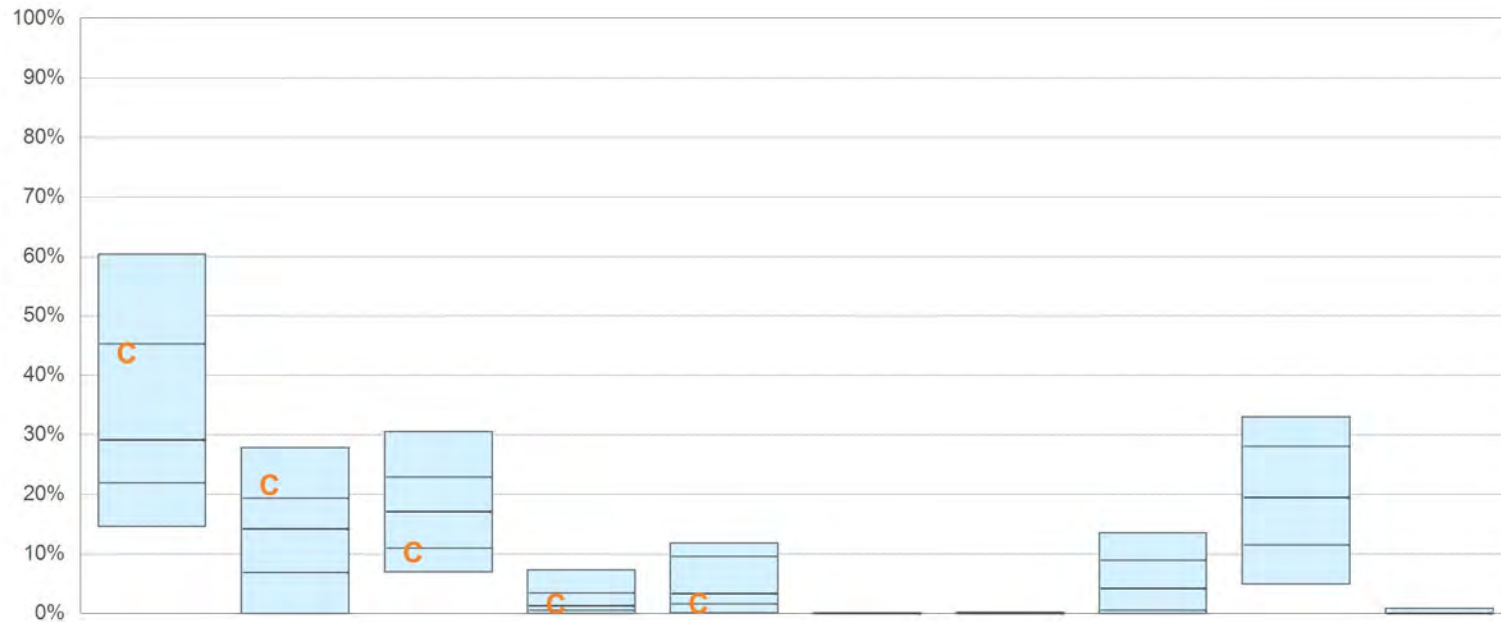


Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	99.13	24.16	79.49	9.06	21.20	0.48	0.12	9.97	71.58	12.06
25th	47.74	13.60	36.82	3.98	6.38	0.00	0.00	2.67	27.71	0.00
50th	29.22	6.51	20.24	0.92	2.59	0.00	0.00	0.04	13.12	0.00
75th	19.44	0.71	9.96	0.06	1.06	0.00	0.00	0.00	3.97	0.00
95th	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C Combined Funds	43.17 (31)	20.98 (9)	9.73 (75)	0.00 (100)	1.04 (75)			1.29 (31)	11.11 (53)	2.79 (9)

Minnesota State Board of Investments

Asset Allocation of Master Trusts - Public : Plans > \$10 Billion

Quarter Ending December 31, 2019

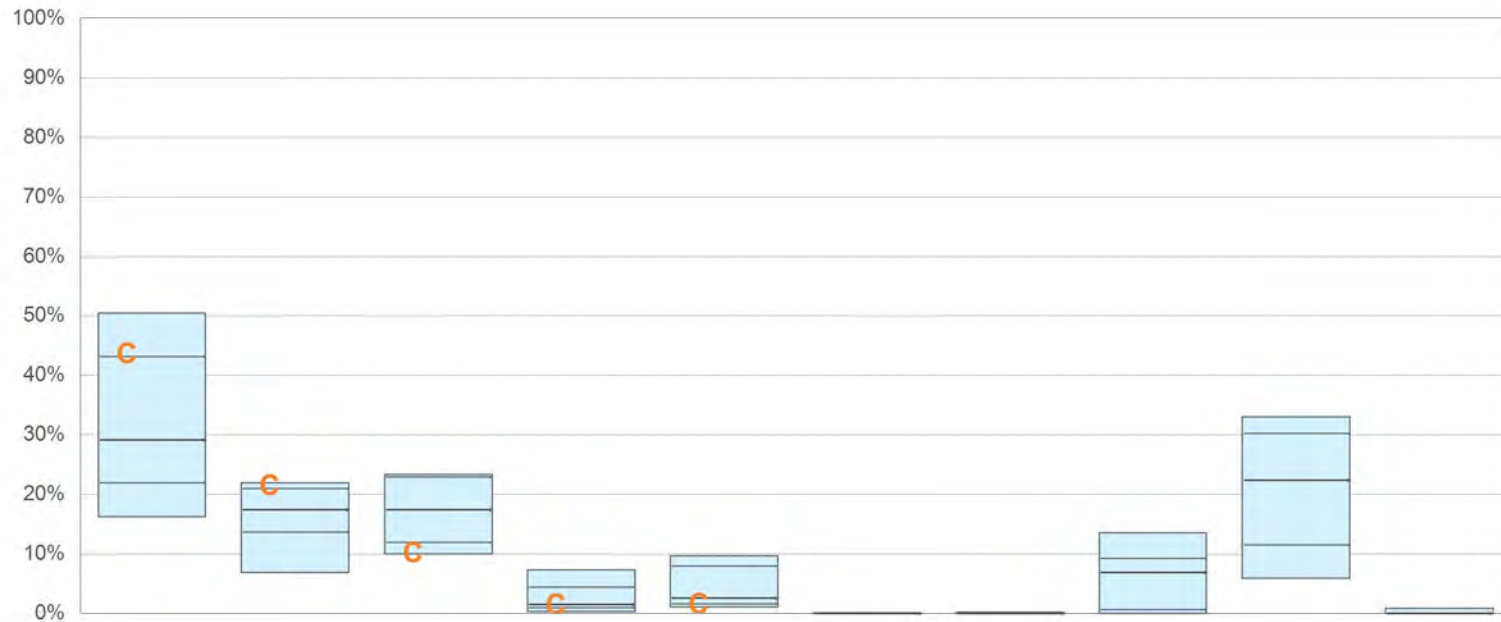


Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	60.37	27.90	30.56	7.32	11.89	0.07	0.18	13.51	33.00	0.90
25th	45.32	19.41	22.93	3.48	9.58	0.00	0.00	8.93	28.08	0.01
50th	29.22	14.21	17.13	1.26	3.29	0.00	0.00	4.20	19.44	0.00
75th	21.97	6.84	10.96	0.59	1.64	0.00	0.00	0.49	11.51	0.00
95th	14.66	0.01	6.95	0.00	0.15	0.00	0.00	0.00	4.91	0.00
C Combined Funds	43.17 (33)	20.98 (20)	9.73 (89)	0.00 (100)	1.04 (89)			1.29 (65)	11.11 (79)	2.79 (1)

Minnesota State Board of Investments

Asset Allocation of Master Trusts - Public : Plans > \$20 Billion

Quarter Ending December 31, 2019



Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	50.51	21.93	23.31	7.32	9.70	0.06	0.18	13.51	33.00	0.90
25th	43.17	20.98	22.92	4.43	7.93	0.00	0.00	9.31	30.27	0.01
50th	29.22	17.45	17.42	1.53	2.59	0.00	0.00	6.94	22.43	0.00
75th	21.97	13.71	11.95	0.92	1.64	0.00	0.00	0.60	11.51	0.00
95th	16.24	6.84	9.96	0.29	1.04	0.00	0.00	0.00	5.91	0.00
C Combined Funds	43.17 (25)	20.98 (25)	9.73 (100)	0.00 (100)	1.04 (99)			1.29 (66)	11.11 (83)	2.79 (1)

Minnesota State Board of Investments

Asset Allocation of Master Trusts - Public : Plans > \$50 Billion

Quarter Ending December 31, 2019



Percentile Rankings	US Equity	Non-US Equity	US Fixed	Non-US Fixed	Cash	Convertible	GIC GAC	Real Estate	Alternative Investments	Other
5th	45.57	21.93	23.31	7.32	9.70	0.06	0.18	13.51	33.00	0.90
25th	43.17	21.31	23.03	6.16	9.62	0.00	0.00	11.50	30.27	0.01
50th	26.91	18.76	19.14	1.53	3.29	0.00	0.00	6.94	19.44	0.00
75th	20.95	13.46	15.16	0.92	2.47	0.00	0.00	0.60	11.51	0.00
95th	16.24	6.84	9.96	0.59	1.04	0.00	0.00	0.00	7.50	0.00
C Combined Funds	43.17 (25)	20.98 (33)	9.73 (100)	0.00 (100)	1.04 (99)			1.29 (62)	11.11 (87)	2.79 (1)

Minnesota State Board of Investments Performance Comparison

Total Returns of Master Trusts - Plans > \$1 Billion

Cumulative Periods Ending : December 31, 2019



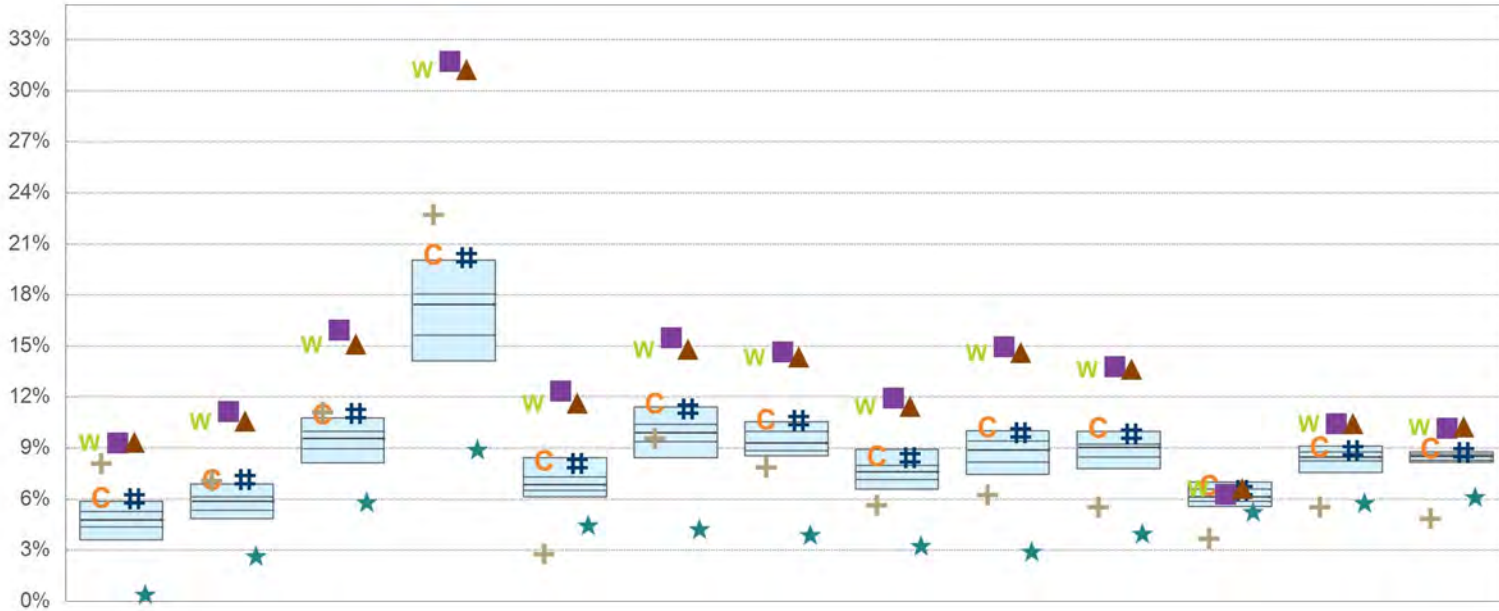
Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
5th	6.16	7.25	12.33	23.00	8.43	11.62	10.66	8.82	10.10	10.04	8.34	10.49	10.20
25th	5.22	6.37	10.35	20.04	7.36	10.37	9.83	7.91	9.07	9.26	6.77	9.12	8.79
50th	4.57	5.80	9.42	17.45	6.81	9.56	9.16	7.35	8.38	8.64	6.27	8.59	8.55
75th	2.69	4.89	8.28	14.50	5.98	8.73	8.43	6.59	7.29	7.88	5.85	8.24	8.32
95th	0.43	2.09	4.42	8.53	3.76	4.63	5.15	3.36	2.97	4.64	3.71	7.68	8.17

No. Of Obs	116	116	115	115	113	112	112	110	110	102	76	53	24
C Combined Funds	5.86 (11)	6.92 (10)	10.78 (21)	20.16 (21)	8.05 (11)	11.41 (6)	10.49 (10)	8.33 (10)	10.04 (5)	9.98 (7)	6.59 (36)	8.86 (38)	8.79 (25)
# SBI Combined Funds Ind	5.79 (15)	6.92 (10)	10.80 (21)	19.98 (25)	7.87 (12)	11.08 (11)	10.39 (12)	8.20 (12)	9.70 (11)	9.59 (18)	6.30 (46)	8.62 (46)	8.53 (50)
W SBI Domestic Equity Tar	9.10 (1)	10.37 (1)	14.89 (1)	31.02 (1)	11.42 (1)	14.57 (1)	14.11 (1)	11.24 (1)	14.38 (1)	13.42 (1)	6.39 (44)	10.21 (6)	10.03 (5)
★ SBI Fixed Income Tar	0.18 (96)	2.45 (91)	5.61 (91)	8.72 (94)	4.27 (92)	4.03 (95)	3.68 (95)	3.05 (95)	2.72 (95)	3.75 (96)	5.03 (91)	5.57 (100)	5.91 (100)
■ S&P 500	9.07 (1)	10.92 (1)	15.70 (1)	31.49 (1)	12.13 (1)	15.27 (1)	14.44 (1)	11.70 (1)	14.73 (1)	13.56 (1)	6.06 (60)	10.22 (6)	9.96 (5)
+ MSCI World Ex US (N)	8.92 (1)	6.96 (9)	10.15 (29)	21.52 (9)	2.11 (99)	9.86 (41)	8.50 (73)	5.51 (86)	5.44 (90)	4.97 (94)	3.83 (93)		
▲ Russell 3000	9.10 (1)	10.37 (1)	14.89 (1)	31.02 (1)	11.42 (1)	14.57 (1)	14.11 (1)	11.24 (1)	14.38 (1)	13.42 (1)	6.39 (44)	10.21 (6)	10.03 (5)

Minnesota State Board of Investments Performance Comparison

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

Cumulative Periods Ending : December 31, 2019

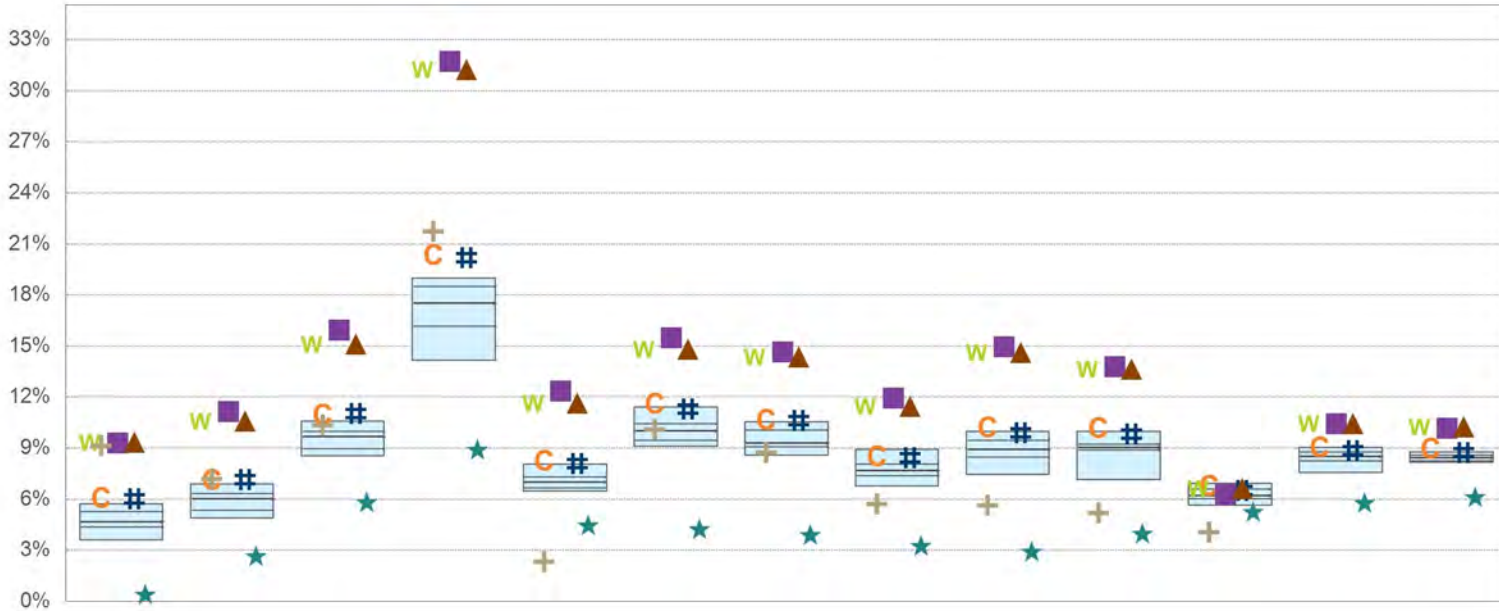


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
5th	5.86	6.88	10.78	20.06	8.43	11.41	10.55	8.93	10.04	9.98	7.02	9.10	8.79
25th	5.29	6.15	9.97	18.05	7.31	10.38	9.99	7.99	9.40	9.22	6.58	8.77	8.64
50th	4.80	5.86	9.56	17.45	6.84	9.89	9.31	7.62	8.91	9.03	6.13	8.49	8.50
75th	4.38	5.34	8.96	15.65	6.51	9.39	8.84	7.15	8.18	8.47	5.89	8.24	8.30
95th	3.60	4.85	8.13	14.14	6.14	8.43	8.55	6.61	7.45	7.79	5.59	7.58	8.17
No. Of Obs	30	30	29	29	29	29	29	29	29	26	25	23	15
C Combined Funds	5.86 (5)	6.92 (1)	10.78 (5)	20.16 (1)	8.05 (9)	11.41 (5)	10.49 (9)	8.33 (12)	10.04 (5)	9.98 (5)	6.59 (21)	8.86 (20)	8.79 (5)
# SBI Combined Funds Ind	5.79 (5)	6.92 (1)	10.80 (1)	19.98 (5)	7.87 (9)	11.08 (12)	10.39 (9)	8.20 (15)	9.70 (15)	9.59 (17)	6.30 (33)	8.62 (29)	8.53 (37)
W SBI Domestic Equity Ta	9.10 (1)	10.37 (1)	14.89 (1)	31.02 (1)	11.42 (1)	14.57 (1)	14.11 (1)	11.24 (1)	14.38 (1)	13.42 (1)	6.39 (33)	10.21 (1)	10.03 (1)

Minnesota State Board of Investments Performance Comparison

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

Cumulative Periods Ending : December 31, 2019

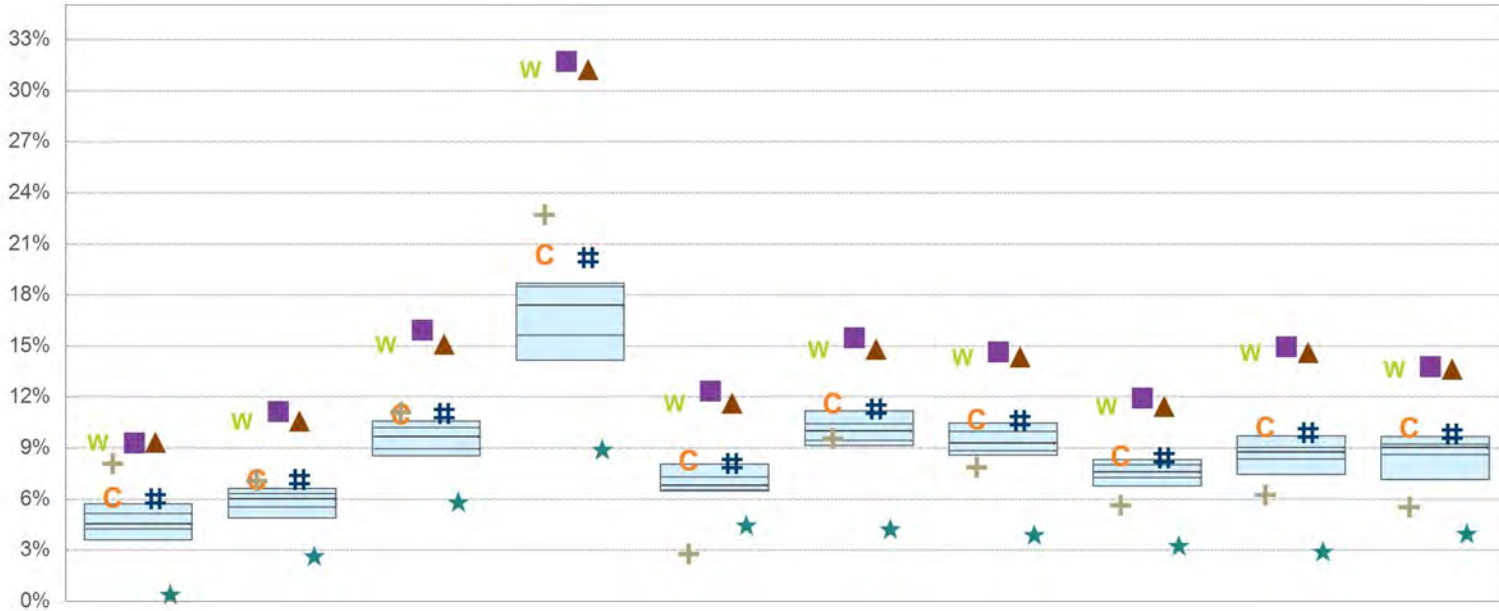


Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years	20 Years	25 Years	30 Years
5th	5.73	6.88	10.57	18.97	8.05	11.41	10.55	8.93	9.97	9.98	6.92	9.03	8.76
25th	5.29	6.32	10.00	18.51	7.32	10.44	10.05	8.07	9.44	9.22	6.59	8.77	8.60
50th	4.67	6.02	9.69	17.53	7.02	10.03	9.31	7.67	8.93	9.03	6.21	8.50	8.43
75th	4.38	5.34	8.98	16.15	6.67	9.44	9.08	7.40	8.47	8.89	6.02	8.24	8.26
95th	3.60	4.89	8.55	14.17	6.48	9.10	8.59	6.77	7.45	7.16	5.64	7.58	8.17
No. Of Obs	20	20	20	20	20	20	20	20	20	18	18	17	13
C Combined Funds	5.86 (1)	6.92 (1)	10.78 (1)	20.16 (1)	8.05 (5)	11.41 (5)	10.49 (12)	8.33 (12)	10.04 (1)	9.98 (5)	6.59 (25)	8.86 (18)	8.79 (1)
# SBI Combined Funds Ind	5.79 (1)	6.92 (1)	10.80 (1)	19.98 (1)	7.87 (5)	11.08 (12)	10.39 (12)	8.20 (18)	9.70 (18)	9.59 (18)	6.30 (37)	8.62 (25)	8.53 (33)
W SBI Domestic Equity Ta	9.10 (1)	10.37 (1)	14.89 (1)	31.02 (1)	11.42 (1)	14.57 (1)	14.11 (1)	11.24 (1)	14.38 (1)	13.42 (1)	6.39 (37)	10.21 (1)	10.03 (1)

Minnesota State Board of Investments Performance Comparison

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

Cumulative Periods Ending : December 31, 2019



Percentile Rankings	1 Qtr	2 Qtrs	3 Qtrs	1 Year	2 Years	3 Years	4 Years	5 Years	7 Years	10 Years
5th	5.72	6.62	10.57	18.69	8.05	11.18	10.49	8.33	9.72	9.70
25th	5.17	6.32	10.22	18.51	7.32	10.44	9.99	8.03	9.05	9.22
50th	4.57	6.02	9.70	17.40	6.81	10.03	9.30	7.62	8.76	9.03
75th	4.24	5.53	8.98	15.65	6.57	9.44	8.84	7.26	8.38	8.62
95th	3.60	4.89	8.55	14.17	6.48	9.17	8.59	6.77	7.45	7.16

No. Of Obs	15	15	15	15	15	15	15	15	15	14
Combined Funds	5.86 (1)	6.92 (1)	10.78 (1)	20.16 (1)	8.05 (5)	11.41 (1)	10.49 (5)	8.33 (5)	10.04 (1)	9.98 (1)
SBI Combined Funds Ind	5.79 (1)	6.92 (1)	10.80 (1)	19.98 (1)	7.87 (5)	11.08 (5)	10.39 (5)	8.20 (15)	9.70 (15)	9.59 (15)
SBI Domestic Equity Tar	9.10 (1)	10.37 (1)	14.89 (1)	31.02 (1)	11.42 (1)	14.57 (1)	14.11 (1)	11.24 (1)	14.38 (1)	13.42 (1)
SBI Fixed Income Tar	0.18 (100)	2.45 (100)	5.61 (100)	8.72 (100)	4.27 (100)	4.03 (100)	3.68 (100)	3.05 (100)	2.72 (100)	3.75 (100)
S&P 500	9.07 (1)	10.92 (1)	15.70 (1)	31.49 (1)	12.13 (1)	15.27 (1)	14.44 (1)	11.70 (1)	14.73 (1)	13.56 (1)
MSCI Wld Ex US (Net)	7.86 (1)	6.85 (1)	10.90 (1)	22.49 (1)	2.58 (100)	9.33 (91)	7.65 (100)	5.42 (100)	6.04 (99)	5.32 (100)
Russell 3000	9.10 (1)	10.37 (1)	14.89 (1)	31.02 (1)	11.42 (1)	14.57 (1)	14.11 (1)	11.24 (1)	14.38 (1)	13.42 (1)

This page intentionally left blank.

TAB B

Report from the Executive Director

Administrative Report

This page intentionally left blank.

EXECUTIVE DIRECTOR'S ADMINISTRATIVE REPORT

DATE: February 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 December 31, 2019 is included as **Attachment A**.

A report on travel for the period from October 1, 2019 – December 31, 2019 is included as **Attachment B**.

2. FY19 Audit Report

The Legislative Auditor letter related to the financial audit of the State Board of Investment financial operations for Fiscal Year 2019 is included as **Attachment C**. The Office of the Legislative Auditor (OLA) had no written findings or recommendations for the SBI.

3. FY19 Annual Report

The Fiscal Year 2019 Annual Report was distributed January 2020.

4. 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 fourth quarter, SBI managers sold 18,593 shares in one company on the divestment list.

On December 19, 2019, 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.

5. 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 fourth quarter, SBI managers sold 37,500 shares in one company on the divestment list.

On December 19, 2019, 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.

6. 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 DECEMBER 31, 2019

ITEM	FISCAL YEAR 2020 BUDGET	FISCAL YEAR 2020 12/31/2019
PERSONNEL SERVICES		
FULL TIME EMPLOYEES	\$ 5,559,000	\$ 2,195,883
PART TIME EMPLOYEES	0	0
MISCELLANEOUS PAYROLL	125,000	3,806
SUBTOTAL	\$ 5,684,000	\$ 2,199,689
STATE OPERATIONS		
RENTS & LEASES	285,000	163,648
REPAIRS/ALTERATIONS/MAINTENANCE	20,000	8,617
PRINTING & BINDING	12,000	1,991
PROFESSIONAL/TECHNICAL SERVICES	260,000	1,398
COMPUTER SYSTEMS SERVICES	120,000	85,192
COMMUNICATIONS	25,000	9,116
TRAVEL, IN-STATE	1,000	500
TRAVEL, OUT-STATE	125,000	52,169
SUPPLIES	30,000	23,249
EQUIPMENT	60,000	28,352
EMPLOYEE DEVELOPMENT	125,000	73,159
OTHER OPERATING COSTS	125,000	56,719
INDIRECT COSTS	300,000	144,070
SUBTOTAL	\$ 1,488,000	\$ 648,181
TOTAL ADMINISTRATIVE BUDGET	\$ 7,172,000	\$ 2,847,870

This page intentionally left blank.

ATTACHMENT B

STATE BOARD OF INVESTMENT

Travel Summary by Date October 1, 2019 - December 31, 2019

Purpose	Name	Destination and Date	Total Cost
Manager Monitoring Private Markets Managers: Leonard Green; Oaktree; Windjammer	A. Krech	Los Angeles, CA Laguna Beach, CA 10/1/2019-10/4/2019	\$ 1,509.71
Manager Monitoring International Managers: Columbia Threadneedle; Fidelity; J.P. Morgan; Marathon; Martin Currie Manager Search Fixed Income Managers: Oaktree; Investec; Ashmore; Franklin Templeton Manager Search International Managers: Hayfin; Baillie Gifford; Record Currency Management	E. Sonderegger	Edinburgh, Scotland London, England 10/11/2019-10/22/2019	4,424.13
Manager Monitoring Private Markets Managers: KKR; Oaktree; Värde CVC Capital Partners Manager Search Private Markets Managers: Hayfin; Permira; Magnator Avenue Capital Manager Search Fixed Income Managers: Franklin Templeton; Ashmore; Investec	C. Boll	London, England 10/12/2019-10/19/2019	4,187.75
Conference: National Council on Teachers Retirement (NCTR)	M. Perry	Nashville, TN 10/13/2019-10/15/2019	1,085.12

STATE BOARD OF INVESTMENT

Travel Summary by Date October 1, 2019 - December 31, 2019

Purpose	Name	Destination and Date	Total Cost
Conference: NRS Fall 2019 Compliance Conference sponsored by National Regulatory Services	I. Shafir	Los Angeles, CA 10/15/2019-10/18/2019	\$ 3,038.29
Conference: Pension Real Estate Association (PREA)	J. Stacy	Washington, D.C. 10/16/2019-10/18/2019	1,958.19
In-State Travel: SEREAM Legislative & Health Conference	M. Perry	Rochester, MN 10/16/2019	100.92
Conference: Public Pension Financial Forum (P2F2)	S. Baribeau	Salt Lake City, UT 10/19/2019-10/23/2019	2,006.65
Conference: Public Pension Financial Forum (P2F2)	K. Anderson	Salt Lake City, UT 10/19/2019-10/23/2019	1,923.84
Conference: Public Pension Financial Forum (P2F2)	P. Anderson	Salt Lake City, UT 10/19/2019-10/23/2019	1,793.84
Manager Monitoring Private Markets Managers: TPG Annual Investor Meeting	A. Krech	Phoenix, AZ 10/21/2019-10/23/2019	855.14

STATE BOARD OF INVESTMENT

Travel Summary by Date October 1, 2019 - December 31, 2019

Purpose	Name	Destination and Date	Total Cost
Manager Monitoring Domestic Equity Managers: Martingale; Wellington Manager Monitoring International Managers: Acadian Manager Search Domestic Equity Manager: Loomis	E. Sonderegger	Boston, MA 10/28/2019-10/30/2019	\$ 1,464.91
Manager Monitoring Domestic Equity Managers: Martingale; Wellington Manager Monitoring International Manager: Acadian Manager Search Domestic Equity Manager: Loomis	T. Brusehaver	Boston, MA 10/28/2019-10/30/2019	1,421.89
Manager Monitoring Private Markets Managers: BlackRock; Marathon; TCW Welsh, Carson, Anderson & Stowe Manager Search Private Markets Manager: HPS	C. Boll	New York, NY 10/28/2019-10/30/2019	1,526.61
Manager Monitoring Private Markets Managers: Advent; TA Realty; Summit Partners	J. Stacy	Boston, MA 11/3/2019-11/6/2019	1,253.50

STATE BOARD OF INVESTMENT

Travel Summary by Date October 1, 2019 - December 31, 2019

Purpose	Name	Destination and Date	Total Cost
Manager Monitoring Private Markets Managers: EMG	A. Krech	Houston, TX 11/4/2019-11/5/2019	\$ 437.73
Manager Monitoring Fixed Income Managers: BlackRock; Goldmans Sachs Neuberger Berman; Prudential	M. Perry	New York, NY 11/7/2019-11/8/2019	1,096.84
Manager Monitoring Private Markets Managers: Lexington Partners Manager Search Private Markets Managers: Insight; Metropolitan Real Estate PWP Growth Equity	J. Stacy	New York, NY 11/12/2019-11/14/2019	1,511.55
Manager Monitoring Private Markets Managers: Thomas H. Lee; Rockpoint; Rockwood Manager Search Public Markets Managers: Charlesbank	J. Stacy	Boston, MA 11/19/2019-11/21/2019	1,051.73
Manager Monitoring Private Markets Managers: Brookfield; Energy Capital Partners	C. Boll	New York, NY 11/19/2019-11/21/2019	1,608.68
In-State Travel Mission Township Fire Relief Board Meeting	P. Ammann	Mission Township, MN 11/25/2019	156.60

STATE BOARD OF INVESTMENT

Travel Summary by Date October 1, 2019 - December 31, 2019

Purpose	Name	Destination and Date	Total Cost
Conference: Aksia Private Credit Investor Forum Manager Search Private Markets Manager: Torch Light Investors	C. Boll	New York, NY 12/2/2019-12/4/2019	\$ 1,901.30
Conference: CIO Influential Investors Forum and the CIO Industry Innovation Awards Dinner	M. Perry	New York, NY 12/11/2019-12/13/2019	1,391.29
Manager Monitoring Fixed Income Managers: BlackRock; Goldman Sachs; Prudential Manager Monitoring Private Markets Manager KKR Manager Search Fixed Income Managers: Oakhill; Marathon	E. Sonderegger	New York, NY 12/16/2019-12/19/2019	2,109.88
Manager Monitoring Fixed Income Managers: BlackRock; Goldman Sachs; Prudential Manager Monitoring Private Markets Manager KKR Manager Search Fixed Income Managers: Oakhill; Marathon	A. Griga	New York, NY 12/16/2019-12/19/2019	767.62

STATE BOARD OF INVESTMENT

**Travel Summary by Date
October 1, 2019 - December 31, 2019**

Purpose	Name	Destination and Date	Total Cost
Manager Monitoring	C. Boll	New York, NY	\$ 736.96
Fixed Income Managers:		12/16/2019-12/19/2019	
BlackRock; Goldman Sachs;			
Prudential			
Manager Monitoring			
Private Markets Manager:			
KKR			
Manager Search			
Fixed Income Managers:			
Oakhill; Marathon			



OFFICE OF THE LEGISLATIVE AUDITOR

STATE OF MINNESOTA • James Nobles, Legislative Auditor

January 2, 2020

Mr. Mansco Perry III, Executive Director and Chief Investment Officer
Minnesota State Board of Investment
60 Empire Drive, Suite 355
Saint Paul, MN 55103

Dear Mr. Perry:

The Office of the Legislative Auditor has completed its audit of certain financial activities at the Minnesota State Board of Investment. This work supports our audit of the State of Minnesota's financial statements for the year ended June 30, 2019. The primary objective of the audit is to render an opinion on the State of Minnesota's financial statements, which will be included in the *Comprehensive Annual Financial Report*, prepared by the Department of Management and Budget. The work in your department also supports our audit opinions on the financial statements of the three state retirement systems: Minnesota State Retirement System, Public Employees Retirement Association, and Teachers Retirement Association. This is not a comprehensive audit of the Minnesota State Board of Investment.

In planning and performing this audit, we considered SBI's internal control system to determine the audit procedures that are appropriate. We gained an understanding, but did not test SBI's internal controls. As part of this audit, we also reviewed certain investment related financial activity presented in the financial statements and notes to the financial statements for the State of Minnesota and the three state retirement systems. This activity includes, but is not limited to, investment balances, investment fees, and securities lending.

On December 13, 2019, we issued an unqualified (clean) opinion on the State of Minnesota's *Comprehensive Annual Financial Report* for the fiscal year ended June 30, 2019. In addition, we issued an unqualified (clean) opinion on the financial statements of each of the three state retirement systems. We also provided the state and three state retirement systems with a report on the Internal Control over Financial Reporting. For the fiscal year ending June 30, 2019, we had no written findings or recommendations directed toward the Minnesota State Board of Investment in the report to the Department of Management and Budget and to the pension plans.

We appreciate the cooperation and assistance provided by the staff and administration of the State Board of Investment throughout our audit process.

Sincerely,

A handwritten signature in black ink, reading 'Tracy Gebhard'.

Tracy Gebhard, CPA
Audit Director

Cc: Paul Anderson, Director Financial Services & Operations

This page intentionally left blank.

TAB C

Investment Advisory Council Report

Stable Value Fund Program Review

This page intentionally left blank.

INVESTMENT ADVISORY COUNCIL REPORT

DATE: February 19, 2020

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Stable Value Fund Program Review

Staff has conducted a program review of the Stable Value Fund option for the 457 Deferred Compensation Plan and other plans in the Participant Directed Investment Program. Following are two items which emanated from Staff's review:

- A. Review of Galliard Capital Management, the current manager of the Stable Value Fund
- B. Establishment of a Bench List of approved stable value managers and a recommendation to pre-authorization the hiring of a manager from the Bench List, if needed

SBI action is required on item B.

A. Review of Galliard Capital Management, the current manager of the Stable Value Fund

Background

The Minnesota State Board of Investment (SBI) hired Galliard Capital Management in 1995 to manage the Stable Value Fund. The Stable Value Fund is a capital preservation investment option offered in four of the qualified contribution plans managed by the SBI. In aggregate, Stable Value assets totaled over \$1.6 billion as of December 31, 2019, which represents 16.5% of the total defined contribution assets where stable value is offered. Prior to 1995, the stable asset option was the Fixed Interest Account managed by various insurance companies in separate, three year Guaranteed Investment Contracts (GICs).

During the past year, Galliard announced the retirements of several key personal, including the two remaining Founding Partners of the firm, Karl Tourville and Richard Merriam. The third Founding Partner, John Caswell, retired in 2016. At the same time, the firm announced the appointment of Andrew Owen as Co-President, alongside Partner Mike Norman, who has been with the firm since 1996. Mr. Owen joined from Wells Fargo Asset Management, where he had served as Executive Vice President and was Chairman of Galliard's Board of Directors since 2014. The departure of the remaining founders and the addition of Mr. Owen coincides with a change in the operational and leadership structure of the firm to bring it into closer alignment with its parent company's asset management group, Wells Fargo Asset Management.

To assess the impact of these changes on the firm, SBI Staff conducted a full review of Galliard, the Stable Value Fund, and the broader universe of stable value managers. As part of its review process, Staff met with all members of Galliard's Executive Management Committee and other members of the Galliard team. In addition, Staff analyzed Galliard's responses to a detailed due diligence questionnaire, and also worked closely with the SBI's consultant, Aon, to incorporate Aon's perspective and manager research opinion.

In addition to the objective of updating its opinion of Galliard, Staff also completed a full review of the stable value product landscape. The product review spanned a total of five managers (not including the incumbent), from which Staff conducted in-depth meetings with four. The results of the product review added perspective to Staff's assessment of Galliard's investment process, quality and depth of the team, as well as the firm's investment results.

Following the review of Galliard, Staff has reaffirmed that Galliard remains one of the premier managers in the asset class. Despite the recent organizational changes, Galliard's core investment team remains intact and the new senior leadership team is focused on continuing to deliver both strong performance and exceptional client service. Staff will continue to closely monitor Galliard to ensure that the firm is responding positively to the recent leadership and organization changes. Additionally, Staff was able to negotiate a favorable modification to the contractual arrangement with Galliard.

Importantly, several factors which could affect Staff's opinion of Galliard and may result in a change in recommendation include:

- Departure of senior investment personnel;
- Further material change in the organization's relationship with Wells Fargo Asset Management; and
- Significant loss of clients resulting in a material decline in stable value assets under management.

A detailed review of Galliard is provided as **Appendix A that begins on page 5.**

B. Establishment of a Bench List of approved stable value managers and pre-authorization to hire a manager from the Bench List, if needed

Stable Value Market Review

Staff conducted a stable value product review to establish a short list of prospective stable value managers. The process began with confirming the objectives of the stable value fund and the requirements of the stable value manager. The screening process focused on larger firms with experience with separate account mandates of SBI's size (approximately \$1.6 billion).

The short list evolved from a screen of the largest stable value managers; discussions and recommendations from the SBI's consultant, Aon; survey of SBI's peers; and other resources. In total, six stable value managers (plus the incumbent) were asked to respond to an extensive due diligence questionnaire. After reviewing the responses, Staff selected four firms for a formal meeting and interview process. Staff met with each of the four firms to cover the following topics: Firm, Organizational Structure, Team, Investment Process, ESG Integration, Portfolio Construction, Stable Value Contract Management and Performance Results. Firms were asked to specifically articulate their investment process in terms of how the stable value portfolio management, fixed income portfolio management, and stable value contract teams work together to manage the product.

Bench List

Historically, and consistent with industry practice, the Stable Value Fund has been managed by a single investment manager. Having a single manager avoids the operational and administrative challenges of maintaining two sets of book value insurance contracts ("wrap contracts"), allows for better scale in fee negotiations, and also avoids the potential for participant confusion from having multiple managers for a single fund.

However, reliance on a single stable value manager limits a plan sponsor's ability to quickly and efficiently replace the manager should conditions warrant a change. Staff believes that the most effective way to shorten the replacement timeline is to establish a formal bench list ("Bench List") of recommended managers that could be hired in the event it was necessary to terminate the incumbent. Staff is recommending that the Executive Director be authorized to execute a contract with one of the managers on the Bench List if necessary. Staff would continue to monitor the managers on the Bench List, provide periodic updates, and recommend changes to the Board, if necessary. It is anticipated that a full review of the Bench List will be conducted and be presented to the Investment Advisory Council (IAC) at least every three (3) years.

As part of its review, Staff identified **Invesco** and **T. Rowe Price** as two highly capable stable value managers for placement on the Bench List. Both firms have stable organizations, experienced investment teams with significant resources dedicated to stable value, and a long-term track record of competitive returns.

Summaries of each manager are attached in **Appendix B that begins on page 9 and Appendix C that begins on page 13.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the Board approve to create a Bench List of approved stable value managers consisting of two firms, Invesco and T. Rowe Price; and to grant authority to the Executive Director to hire a stable value manager from the Bench List if at any time in the future the current stable value manager is given notice of termination.

This page intentionally left blank.

APPENDIX A

Current Stable Value Manager:

Galliard Capital Management

Strategy Location: Minneapolis, MN
Strategy Founded: 1995

6/30/19 Firm AUM: \$92.0 billion
6/30/19 Strategy AUM: \$77.7 billion

Portfolio Benchmark: 3 Year Constant Maturity Treasury Yield +0.45%

Organization

Galliard was founded in July of 1995 as an independently operated investment subsidiary of Wells Fargo. Galliard manages fixed income and stable value portfolios for institutional investors across a variety of mandates. Galliard is the largest stable value manager in the nation with over \$63.4 billion in separate account assets (98 separate accounts) and advises the largest stable value collective fund with over \$28 billion. Galliard received nine new client commitments totaling \$995 million in assets during 2019.

As of January 1, 2020, Galliard's Operational Risk Management, Compliance and Technology Teams report directly to Wells Fargo's centralized risk management and technology groups in order to leverage Wells Fargo's core infrastructure. Galliard's investment and client service teams continue to operate independently.

Personnel

In the Fall of 2019, Galliard announced the upcoming retirements of two of its Founding Managing Partners, Karl Tourville (June 2020) and Richard Merriam (December 2019), as well as Carrie Callahan, Managing Partner (December 2019). Leela Scattum, Partner, has also announced her intention to retire at the end of 2020. At the same time, the firm announced the appointment of Andrew Owen as Co-President, alongside Partner Mike Norman, who has been with the firm since 1996. Mr. Owen joined from Wells Fargo Asset Management, where he had served as Executive Vice President and Chairman of Galliard's Board of Directors since 2014. The departure of the remaining founders and the addition of Mr. Owen coincides with a pivot in the operational and leadership structure of the firm to bring it into closer alignment with its parent company's asset management group, Wells Fargo Asset Management.

As of January 1, 2020 Galliard's Executive Committee consists of:

Mike Norman, Co-President, and Chief Administrative Officer (22 years with firm);

Ajay Mirza, Head of Structured Credit, Co-Head of Fixed Income (since 2015), and Chair of the Investment Committee (23 years with firm); and

Andrew Owen, Co-President, and Chairman of Galliard's Board of Directors (since 2014).

All investment portfolios at Galliard are team-managed under the overall leadership of Mr. Mirza, with all senior fixed income professionals sharing responsibility. With the retirement of Mr. Merriam at the end of 2019, Brandon Kanz (13 years with firm) was named Co-Head of Fixed Income alongside Mr. Mirza. Staff views the elevation of Mr. Mirza, Mr. Norman and Mr. Kanz

as important steps to providing continuity of leadership style, culture and investment philosophy. While the core investment team has been stable and consistent, importantly, the firm has put retention packages in place for key investment personnel.

Portfolio/Process

Galliard's investment process emphasizes a conservative approach to build diversified, high quality portfolios, with the primary objective of safeguarding principal and producing a consistent, low-volatility return. The team-based process emphasizes overweighting high-quality spread sectors to produce a realizable yield advantage over the benchmark. Galliard's research process focuses on fundamental bottom-up credit research with an emphasis on both relative value and downside protection. Galliard does not actively time interest rates and maintains overall portfolio duration within a tight band around the benchmark and overall target of three (3) years.

Strategy	Targeted Alpha Contribution
Sector Allocation	50%
Security Selection	25%
Sector Relative Value	15%
Duration/Yield Curve	10%
Total	100%

Environmental, Social and Governance (ESG) factors are well-integrated into Galliard's fundamental security analysis. Galliard's ESG Working Group is responsible for coordinating ESG efforts across the firm, overseeing adherence to the UN Principles for Responsible Investment (PRI), monitoring developments in ESG, and recommending ESG initiatives. The ESG Working Group is a cross-functional team that includes members of Senior Management, Investment Team, Compliance, and the Client Relationship Team. Galliard has been a signatory of the UNPRI since January of 2017.

Key characteristics for the Stable Value Fund, and its underlying component portfolios, managed by Galliard as of December 31, 2019:

Portfolio Distribution	Portfolio Allocation (%)	Effective Duration (Yrs)	Yield To Maturity (%)	Avg Credit Quality	# of Securities
Cash (Liquidity)	1.7	0.10	1.81	AAA	-
Short Term Duration	39.7	1.77	1.95	AA+	548
Intermediate Duration	58.6	3.88	2.26	AA	609
Total Portfolio¹	100.0%	2.98	2.13%	AA-	1088

¹ Average credit quality represents holdings of the contracts and other book value assets in the portfolio.

Sector breakdown for the Stable Value Fund managed by Galliard as of December 31, 2019:

Portfolio Sectors	Allocation %
U.S. Treasury	14.8%
Other U.S. Gov't	8.7%
Taxable Municipal	5.9%
Corporate	34.5%
MBS	14.6%
CMBS	5.9%
Asset Backed	13.2%
Cash Equivalents	2.3%
Total	100.0%

Annualized returns listed below are for the Stable Value Fund managed by Galliard as of December 31, 2019, net of fees. The benchmark is the 3 Year Constant Maturity Treasury Yield + 0.45%.

Performance	One Year		Three Years		Five Years		Ten Years	
	Mgr	BM	Mgr	BM	Mgr	BM	Mgr	BM
Annualized Returns as of 12/31/19	2.72	2.40	2.39	2.51	2.24	2.09	2.56	1.64

Calendar year-end returns, reported net of fees, and Net Asset Values (NAV) for the last five calendar years are below.

Calendar Year End	Historical		Returns		NAV		
	Blended Rate¹ %	Market to Book² %	Mgr	Benchmark³	Firm (Billions)	Stable Value (Billions)	SBI Portfolio (Millions)
2019	2.7	102.2	2.72	2.40	\$90.7	\$76.3	\$1,588.0
2018	2.6	99.1	2.38	3.09	\$91.9	\$78.8	\$1,567.8
2017	2.2	100.3	2.09	2.04	\$90.9	\$79.5	\$1,534.5
2016	2.2	100.4	2.07	1.46	\$91.6	\$80.3	\$1,577.2
2015	2.0	100.9	1.97	1.48	\$85.4	\$76.0	\$1,511.3

¹Blended rate represents the daily rate earned by participants (the weighted average of the individual book value contracts and cash).

²Market to Book ratio represents the market value of the underlying portfolios and cash, divided by the total book value of the contracts and cash.

³3Yr Constant Maturity Treasury Yield +0.45%

Stable Value Contract Management

Stable value funds invest in high quality, short-and intermediate duration fixed income securities, and utilize wrap contracts issued by financial institutions (wrap providers) to insulate participants from market value fluctuations in order to earn a stable return. Galliard's Stable Value Contract Management team reviews and approves all contract issuers, stable value investment contracts, and manages and monitors contract requirements. Galliard maintains strong relationships with

established contract issuers and are considered a preferred manager among issuers. Galliard has a diversified list of 11 contract issuers, of which five are used for the SBI's portfolio with no more than 25% of book value exposure. Galliard has been successful in negotiating broader investment guidelines that are consistent across all issuers and have standardized more advantageous contract provisions. Galliard's size allows them to negotiate most favorable terms, capacity, and pricing.

Staff Conclusion

Following the review of Galliard, Staff has reaffirmed that Galliard remains one of the premier managers in the asset class. Despite the recent organizational changes, Galliard's core investment team remains intact and the new senior leadership team is focused on continuing to deliver both strong performance and exceptional client service. While the recent organization changes at Galliard are significant, Staff believes the changes have provided clarity regarding the future leadership of the firm and its relationship with parent company Wells Fargo.

Staff will continue to closely monitor Galliard to ensure that the firm is responding positively to the recent leadership and organization changes. Importantly, several factors which could affect Staff's opinion of Galliard and may result in a change in recommendation include:

- Departure of senior investment personnel;
- Further material change in organization's relationship with Wells Fargo Asset Management; and
- Significant loss of clients resulting in a material decline in stable value assets under management.

APPENDIX B

Stable Value Bench Manager:

Invesco

Strategy Location: Louisville, KY

6/30/19 Firm AUM: \$1,197.8 billion

Strategy Founded: 1985

6/30/19 Strategy AUM: \$59.2 billion

Portfolio Benchmark: Bloomberg Barclays US Treasury 3-Month Bellwether Index

Organization/Firm

Invesco Ltd. in its modern form was created by the 1997 combination of two asset management businesses: Invesco and AIM, both of which had been founded in the 1970s. Invesco Advisers, Inc. (IAI) is a wholly-owned subsidiary of Invesco, an independent and publicly owned company (NYSE: IVZ). Invesco's stable value group was founded in 1985 as PRIMCO Capital Management. PRIMCO was acquired by Invesco in 1990. As of June 30, 2019, Invesco managed \$47.9 billion in 73 separate accounts in its stable value product.

Personnel

The Invesco team consists of 27 dedicated stable value professionals supported by an additional 70 investment professionals, including Invesco's structured credit and investment grade credit teams. A six-member Executive Management Team, with final decision-making authority for all stable value portfolio decisions, consists of: George Baumann, Head of Stable Value (30 years with firm); Chris Utz, Managing Director, Head of Product Strategy (31 years with firm); LeAnn Bickel, Chief Administrative Officer (34 years with firm); Jennifer Gillmore, Head of Stable Value Portfolio Management (20 Years with firm); Andy Apostol, Head of Stable Value Client Service (20 years with firm), and Jessica Cole, Head of Stable Value Contract Group (6 years with firm).

Investment Process

Invesco believes that the investment objectives of stable value are best achieved by constructing multi-issuer, actively managed portfolios with individually negotiated wrapped contracts. The firm employs an active approach in managing the portfolio by using a "building block" methodology for portfolio construction, which leverages a series of proprietary commingled fixed income funds to build each stable value portfolio. For clients that prefer a multi-manager solution, Invesco's process allows the seamless integration of a number of third party managers within the strategy's core and intermediate duration allocations.

Typically, the investment grade separate account portfolio has between 4,000 and 5,000 securities. The typical maximum position size per security ranges from 0.5% to 1%. Portfolio duration is managed within a range of +/- 1/2 year around a 3-year target.

Sector allocation is diversified across a broad range of sectors. The portfolio also maintains a high overall average credit quality, with the vast majority of securities rated AA or better.

Strategy	Targeted Alpha Contribution
Duration Management	10%
Yield Curve Positioning	10%
Security Selection	30%
Sector Allocation	30%
Credit Quality Management	15%
Trading/Implementation	5%
Total	100%

Invesco utilizes a number of ESG tool and services. The ESG data and analysis on an entity level becomes part of the overall fundamental assessment of a company. Invesco been a signatory to the UN Principles of Responsible Investment since 2013.

Key characteristics for the Invesco Stable Value Investment Grade Composite as of December 31, 2019:

Characteristic	Composite
Effective Duration	3.05 years
Average Quality	AA
Number of Securities	4,807

Sector breakdown for the Composite as of December 31, 2019:

Portfolio Sectors	Allocation %
U.S. Treasury	24.4%
U.S. Agency	1.1%
Non-U.S. Govt/Agy	0.1%
Corporate + Muni	24.2%
MBS	23.9%
ABS	18.0%
CMBS	7.0%
Cash	1.3%
Total	100.0%

Stable Value Management

Invesco's diversification requirements normally limit exposure to any single wrap provider to 25% for a separate account portfolio and, in practice, typically use 5-7 wrap providers and keep exposure limits to 15%-20%. Investment contracts are designed to provide a consistent rate of return, while preserving capital. Although the value of the underlying securities fluctuates in price

due to changes in the level of interest rates or sector spreads, the investment contracts amortize these gains/losses through resets in the credited rate of interest.

Performance

The returns shown below represent the Invesco's Stable Value Investment Grade Separate Account Composite, net of fees. The benchmark is the Bloomberg Barclays U.S. Treasury Bellwether 3-Month Index. Invesco seeks to outperform the benchmark by 175 basis points annually.

Performance	One Year		Three Years		Five Years		Ten Years	
	Mgr	BM	Mgr	BM	Mgr	BM	Mgr	BM
Annualized Returns as of 12/31/19	2.45	2.30	2.19	1.68	2.28	1.09	2.56	0.60

Staff Conclusion

Invesco has a very experienced, stable team and has built a strong, consistent long-term performance track record. The firm's investment process, which emphasizes high quality investments and a conservative approach to duration management, is a good fit for the stable value mandate overseen by the SBI. In addition, Invesco's strategy is designed for flexibility and leverages Invesco's internal management capabilities and, if desired, can integrate one or more external managers into the strategy to add manager diversification.

This page intentionally left blank.

APPENDIX C

Stable Value Bench Manager:

T. Rowe Price

Strategy Location: Baltimore, MD
Strategy Founded: October 1984

6/30/19 Firm AUM: \$1,125.0 billion
6/30/19 Strategy AUM: \$26.0 billion

Portfolio Benchmark: Hueler Analytics Stable Value Pooled Fund Index

Organization/Firm

T. Rowe Price Associates is a wholly-owned subsidiary of T. Rowe Price Group, Inc. which is a publicly traded company (NASDAQ: TROW). As of June 30, 2019 T. Rowe Price managed \$7.7 billion in separate account assets in their stable value strategy for 16 clients.

Personnel

Tony Luna, Head of Stable Value, has been with T. Rowe Price for 23 years and is supported by four others on the team, including Robert Madore, Portfolio Manager (18 years with firm) and Benjamin Gugliotta, Associate Portfolio Manager (16 years with firm). The team is responsible for setting asset allocation across the underlying portfolio segments, targeting duration and managing wrap providers. In addition to the Stable Value Portfolio Management team, four portfolio managers within T. Rowe's core fixed income team are responsible for overseeing day-to-day portfolio management within the guidelines established by the stable value product and portfolio management teams.

Investment Process

The stable value team is fully integrated into the broader fixed income investment management organization at T. Rowe Price. As a result, the team is able to leverage the firm's broad resources in credit research, quantitative analysis, economic research, and portfolio management. The investment process harnesses the global research platform and is a combination of top-down macro-economic views combined with bottom up fundamental credit research. The firm's investment philosophy and approach are designed to meet the investment objectives of principal preservation, liquidity, transparency, and attractive risk-adjusted returns.

A typical stable value separate account is invested across 2,000 and 2,600 securities. The standard maximum position size per security ranges from 0.5% to 1%. Portfolios are broadly diversified but typically feature a significant allocation to corporate securities for their incremental yield advantage over U.S. Treasuries and Agency securities. T. Rowe typically keeps portfolio duration within a narrow band around the 3-year target duration.

Strategy	Targeted Alpha Contribution
Sector Allocation	70%
Security Selection	20%
Duration/Yield Curve	10%
Total	100%

Key Characteristics for a representative portfolio within the T. Rowe Price Stable Value Separate Account Composite as of December 31, 2019:

Characteristic	Representative Account
Effective Duration	2.95
Average Quality	AA-
Number of Securities	2,329

At T. Rowe Price, fundamental analysis is the foundation of their investment decision making process. Through bottom-up approach, they endeavor to understand the long-term sustainability of a company's business model and the factors that could cause it to change. T. Rowe believes that environmental, social, and governance (ESG) issues can influence investment risk and return and, therefore, incorporate ESG risk considerations into their fundamental investment analysis. T. Rowe Price has been a signatory to the UN Principles of Responsible Investment since July 2010.

Sector breakdown for a representative portfolio within the Composite as of December 31, 2019:

Portfolio Sectors	Allocation
U.S. Treasury	18.6%
U.S. Agency	3.6%
Corporate	45.1%
MBS	14.0%
CMBS	3.6%
ABS	10.1%
Cash	5.0%
Total	100.0%

Stable Value Management

The primary stable value portfolio manager for each account has the final decision-making authority for wrap issuers, duration targets, and allocation among the underlying fixed income strategies available within the Stable Value Strategy. Each stable value separate account has a primary portfolio manager but is managed in a team fashion to ensure that all portfolios benefit from multiple, yet complementary, perspectives. The stable value managers attend a weekly policy meeting and frequently meet with the fixed income portfolio managers as a group to review the stable value asset allocation, cash flow forecasts and underlying portfolio performance and positioning.

Performance

The manager return listed below represents the Stable Value Client Separate Account Composite and is reported net of fees. The benchmark is the Hueler Analytics Stable Value Pooled Fund Index.

Performance	One Year		Three Years		Five Years		Ten Years	
	Mgr	BM	Mgr	BM	Mgr	BM	Mgr	BM
Annualized Returns as of 12/31/2019	2.38	2.51	2.21	2.23	2.16	2.05	2.57	2.18

Staff Conclusion

The T. Rowe Price Stable Value team is experienced and has a proven long-term track record of investing in stable value. T. Rowe's process places an emphasis on capital preservation and liquidity. The strategy relies on a strong underlying fixed income team which manages portfolios using a fundamental investment approach with a combination of both bottom-up and top-down elements.

This page intentionally left blank.

TAB D

Investment Advisory Council Report

Private Markets Program Report and Consideration of Commitments

This page intentionally left blank.

INVESTMENT ADVISORY COUNCIL REPORT

DATE: February 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

Existing Managers:

Private Equity	KKR	KKR Asian IV	\$150 Million
Private Credit	Audax	Audax Mezz V	\$150 Million
Private Credit	Oaktree	Oaktree REDF III	\$100 Million
Private Credit	PGIM	PGIM VI	\$200 Million
Distressed/Opp.	CarVal	CVF V	\$150 Million
Real Estate	Oaktree	Oaktree ROF VIII	\$100 Million

SBI action is required on item B.

A. Status of SBI Current Private Markets Commitments

Minnesota State Board of Investment

Combined Funds

December 31, 2019

Combined Funds Market Value \$74,208,397,951

Amount Available for Investment **\$4,550,589,640**

	Current Level	Target Level	Difference
Market Value (MV)	\$11,220,835,241	\$18,552,099,488	\$7,331,264,247
MV +Unfunded	\$21,422,349,643	\$25,972,939,282.85	\$4,550,589,640

Asset Class	Market Value	Unfunded Commitment	Total
Private Equity	\$6,398,272,995	\$6,216,125,937	\$12,614,398,932
Private Credit	\$732,151,915	\$877,873,076	\$1,610,024,991
Real Assets	\$2,067,451,687	\$905,718,022	\$2,973,169,709
Real Estate	\$957,070,132	\$1,263,071,960	\$2,220,142,092
Distressed/Opportunistic	\$1,065,888,513	\$938,725,406	\$2,004,613,919
Total	\$11,220,835,242	\$10,201,514,401	\$21,422,349,643

Cash Flows

December 31, 2019

Calendar Year	Capital Calls	Distributions	Net Invested
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
2015	\$1,541,161,769	(\$2,128,301,645)	(\$587,139,876)

B. Consideration of New Investment Commitments

ACTION ITEMS:

- 1) Investment with an existing private equity manager, Kohlberg Kravis Roberts & Co. L.P. (“KKR”), in KKR Asian Fund IV, SCSp (“Asian Fund IV”).**

KKR is forming KKR Asian Fund IV to pursue investment opportunities in large, industry-leading businesses in Asia. KKR has a history of investing in Asia across various countries, sectors, and types of investments. KKR’s approach in Asia is to fully combine their leading global resources with the Asia team’s extensive local experience, relationships, and operational expertise to build successful partnerships with leading businesses and entrepreneurs. They typically focus their efforts on opportunities where they can invest a meaningful amount of capital in a business with an existing, sustainable competitive advantage and where the value of the business can be enhanced through active involvement.

In addition to reviewing the attractiveness of the Asian Fund 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 Asian Fund IV 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 \$150 million, or 20% of KKR Asian Fund 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 KKR 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 KKR or reduction or termination of the commitment.

- 2) Investment with an existing private credit manager, Audax Management Company (“Audax”), in Audax Mezzanine Fund V, L.P. (“Fund V”).**

Audax is forming Fund V with a goal of providing investors with attractive rates of return by investing primarily in a diversified portfolio of mezzanine securities, with a specific focus on middle market companies in the U.S. The Audax Mezzanine team plans to execute the same middle market investment strategy in Fund V as it has across prior funds. The team will utilize a broad deal sourcing network to maximize deal flow from multiple sources and will perform credit analysis and due diligence, with a focus on principal preservation, on all relevant investment opportunities.

In addition to reviewing the attractiveness of the Fund 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 Fund V 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 \$150 million, or 20% of Fund 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 Audax 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 Audax or reduction or termination of the commitment.

3) Investment with an existing private credit manager, Oaktree Capital Management ("Oaktree") in Oaktree Real Estate Debt Fund III, L.P. ("REDF III").

Oaktree is establishing REDF III to achieve attractive risk-adjusted returns and generate current income through investments in real estate-related debt with an emphasis on the United States. The real estate group leverages its knowledge advantage gained from its proprietary research, extensive existing real estate portfolio, and the broader Oaktree credit platform. The investment themes for the fund are: private loan origination, regulatory-driven opportunities, real estate structured credit, and real estate-related corporate debt. Together, the Fund will primarily target five categories of debt investment: commercial mezzanine loans, real estate structured credit, real estate-related corporate debt, commercial first mortgages, and residential first mortgages.

In addition to reviewing the attractiveness of the REDF 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 REDF III 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 commitment of up to \$100 million, or 20% of REDF 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 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.

4) Investment with an existing private credit manager, PGIM Capital Partners (“PGIM”), in PGIM Capital Partners VI, L.P. (“Fund VI”).

PGIM is forming Fund VI to provide investors with attractive risk-adjusted returns primarily through mezzanine and structured equity investments with a specific focus on middle market companies. Fund VI will continue to focus on transactions with middle market companies that typically generate annual revenue in the \$75 million to \$500 million range. Fund VI’s investments are expected to be between \$10 and \$150 million. The portfolio of investments will be broadly diversified with respect to industry and geography. Investments will generally be made to facilitate the financing of recapitalizations, acquisitions, internal growth opportunities and buyouts.

In addition to reviewing the attractiveness of the Fund VI 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 Fund VI 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 Fund VI, 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 PGIM 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 PGIM or reduction or termination of the commitment.

5) Investment with an existing distressed/opportunistic manager, CarVal Investors (“CarVal”), in CVI Credit Value Fund V, L.P. (“Fund V”).

CarVal is seeking investors to capitalize on investment opportunities in distressed and credit-intensive assets within its four strategies of loan portfolios, corporate securities, structured

credit, and hard assets. The changing landscape from dislocations globally has created what CarVal believes to be compelling credit investment opportunities. CarVal believes it is well-positioned to capitalize on this uncertainty as it creates entry points and uncorrelated opportunities within the Firm's four core credit strategies and will seek to construct a portfolio that it believes creates an optimal mix of risk, return, and volatility across asset classes.

In addition to reviewing the attractiveness of the Fund 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 Fund V 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 Fund 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 CarVal 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 CarVal or reduction or termination of the commitment.

6) Investment with an existing manager, Oaktree Capital Management ("Oaktree") in Oaktree Real Estate Opportunities Fund VIII ("ROF VIII").

Oaktree is establishing ROF VIII continue Oaktree's risk-controlled investment philosophy across its real estate focus areas: commercial, residential, corporate platforms, opportunistic credit, and global ex-U.S. Within each focus area, the team emphasizes buying right, creating value, and exiting opportunistically. The commercial team focuses primarily on individual asset or portfolio transactions across all types of commercial real estate on a highly opportunistic basis. The residential team focuses on deeply discounted investments in land, land development, master-planned communities, single-family residential NPLs and homebuilding on single-asset, joint-venture, and corporate bases. The corporate team focuses on a variety of potential sources in real estate and real estate-related companies to find corporate investment platforms. The opportunistic team targets investments in real estate structured credit such as CMBS, real estate-related corporate debt, and residential and commercial non-performing loan portfolios.

In addition to reviewing the attractiveness of the ROF VIII 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 ROF VIII 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 \$100 million, or 20% of ROF VIII, 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.

This page intentionally left blank.

ATTACHMENT A

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

<i>Name of Fund:</i>	KKR Asian Fund IV SCSp
<i>Type of Fund:</i>	Private Equity - Buyout
<i>Target Fund Size:</i>	\$12.5 billion
<i>Fund Manager:</i>	Kohlberg Kravis Roberts & Co.
<i>Administrative Contact:</i>	Ari Barkan 9 West 57 th Street New York, NY 10019

II. Organization and Staff

Kohlberg Kravis Roberts & Co. L.P. (“KKR” or the “Firm”) is forming KKR Asian Fund IV (“Asian Fund IV” or the “Fund”) to pursue investment opportunities in large, industry-leading businesses in Asia. KKR has a history of investing in Asia across various countries, sectors, and types of investments. The Fund is a continuation of, and will build upon, the Firm’s private equity investment strategy and over four decades of global private equity investing experience.

KKR was established in 1976 and has invested \$88 billion in private equity transactions. In total, the Firm has \$208 billion of AUM with 465 investment professionals working out of 20 offices on four continents. Two of the Firm’s founders, Henry R. Kravis and George R. Roberts, are co-Chairman and co-CEOs as well as members of the Firm’s Management Committee and regional Private Equity Investment committees. Ming Lu, who has been with KKR since 2006, is the current Head of Asia for KKR. The former Head of Asia, Joe Bae, is now Co-President and Co-COO of KKR. Mr. Bae remains Chairman of the Asian Private Equity Investment Committee. Other key leaders of the Asian Private Equity business are Ashish Shastry and Hiro Hirano.

KKR has invested and committed over \$18 billion in Pan Asia private equity investments since 2005 in 77 transactions. The KKR Asia private equity investment team consists of approximately 64 investment professionals and approximately 22 KKR Capstone professionals (operational consulting team dedicated to KKR portfolio companies in Asia), who are located in eight offices across the Asian region: Hong Kong, Tokyo, Sydney, Beijing, Mumbai, Seoul, Singapore and Shanghai.

KKR believes that in order to deliver outstanding investment performance for the investors in its funds, it needs to become more diverse and inclusive than it is today. In 2014, KKR established its Inclusion & Diversity Council to pursue this goal. KKR also became a signatory of the UN-supported Principles for Responsible Investment in 2009 and over the

past decade has established itself as a credible leader in driving and protecting value through thoughtful Environmental, Social and Governance (“ESG”) management.

III. Investment Strategy

KKR’s approach in Asia is to fully combine their leading global resources with the Asia team’s extensive local experience, relationships, and operational expertise to build successful partnerships with leading businesses and entrepreneurs. They typically focus their efforts on opportunities where they can invest a meaningful amount of capital in a business with an existing, sustainable competitive advantage and where the value of the business can be enhanced through active involvement. They seek to acquire businesses they believe are at an inflection point where KKR’s involvement will drive transformational change, whether through a traditional buyout or as a minority investor.

KKR investment professionals in Asia are primarily organized along six region/country verticals: Australia, China, India, Japan, Korea, and Southeast Asia. Given the dynamic market environment across the pan-Asia region, KKR remains highly flexible with investment structures, ownership stakes, and transaction types. Depending on the characteristics of the region, Asian Fund IV will focus on the following themes: consumption upgrades, corporate carve-outs, consolidation within industries, technology, and growing opportunities for control investing in emerging Asia. Within these themes, food, health care, travel/leisure, environmental services, manufacturing, e-commerce, fintech, and digital media are some of the sectors targeted for investment.

KKR’s due diligence process leverages the wide ranging skills and experiences of the deal team and supporting resources. The consideration of ESG issues is integrated into the overall investment process. KKR believes that their approach to ESG is a particularly strong differentiator for their Asian business, where ESG issues can often be complex and perceived as high-risk and continue to garner more attention from companies, investors and stakeholders.

Once the identified potential investment meets the appropriate investment criteria and standards, the deal team conducts formal due diligence, structuring and negotiations with the support of KKR Capstone, legal, financial and tax advisors. A thorough due diligence review is conducted to ensure the transaction structure and terms take into account all relevant data points specific to the opportunity, including key leverage points that can be utilized to negotiate favorable terms.

Post-investment, KKR seeks to add value through operational improvement, capital market expertise and stakeholder engagement. A detailed 100-Day Plan outlines key actions and assigns responsibilities to various managers and KKR professionals, and delineates a clear set of action steps to achieve operational excellence and a company’s strategic objectives. A portfolio company’s board of directors may include KKR professionals or other designees with relevant industry expertise. KKR Capstone is a global team of over 70 operating professionals focused on delivering operational improvements at KKR portfolio companies. KKR Capital Markets is a team of professionals that works with private equity teams to structure investments, underwrite debt, advise on IPOs and support a variety of other financing activities.

KKR has considerable expertise in exiting portfolio companies through IPOs, secondary offerings, sales to strategic and financial buyers, and recapitalizations. In certain geographies in Asia, some investors may be deterred from entering the market given the perception of a less transparent business environment and underdeveloped corporate cultures. KKR advises its portfolio companies on how to put in place sound corporate governance systems for companies in less developed markets. KKR believes that sound corporate governance systems committed to best practices enables a variety of exit options and helps to maximize value upon exit.

KKR believes that the combination of their global resources, a strong local team across eight offices in Asia, and their investment and operational expertise provide an advantage in identifying and creating value in exceptional investment opportunities that will support the growth of leading companies in Asia. KKR seeks to capitalize on the region's strong economic dynamics, as well as to introduce global best practices and operational value creation to high-quality, leading local businesses. Ultimately, KKR seeks to find companies they are proud to own and to sustainably improve them while generating strong investment returns for their investors.

IV. Investment Performance

Previous fund performance as of September 30, 2019 for KKR Asian funds are shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Asian Fund	2007	\$4.0 billion	--	14%	1.8	1.8
Asian Fund II	2013	\$5.8 billion	--	14%	1.4	0.5
Asian Fund III	2017	\$9.0 billion	\$100 Million	43%	1.3	0.0

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

V. Investment Period and Term

The investment period will last for a period of six years from the date of the initial investment. The Fund will terminate eleven years from the initial investment, but may be extended for two additional one-year periods following consultation with LP Advisory Committee and with the consent of a majority in interest of the Limited Partners.

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.

This page intentionally left blank.

ATTACHMENT B

PRIVATE CREDIT MANAGER SUMMARY PROFILE

I. Background Data

<i>Name of Fund:</i>	Audax Mezzanine Fund V
<i>Type of Fund:</i>	Private Credit
<i>Total Fund Size:</i>	\$1.5 billion
<i>Fund Manager:</i>	Audax Management Company (NY), LLC
<i>Manager Contact:</i>	Edgar (Garz) W. Soule 101 Huntington Ave. Boston, MA 02199

II. Organization and Staff

Audax Management Company (NY), LLC (“Audax” or the “Firm”) is forming Audax Mezzanine Fund V (the “Fund” or “Fund V”) with the goal of delivering attractive rates of return to investors by providing junior debt financing to leading private equity-owned middle market companies in the U.S.

Audax Group is an alternative asset management firm with over 115 investment professionals. Audax Private Debt is part of Audax Group. Founded in 1999 by Co-Chief Executive Officers, Geoffrey S. Rehnert and Marc B. Wolpow, Audax Group has raised over \$26 billion of capital to focus on middle market investing across its private debt and private equity businesses. As they have for prior funds, Kevin P. Magid, President of Audax Private Debt, and U. Peter C. Gummesson, Managing Director, will continue to oversee the day-to-day investment activities of Fund V, joined by a seasoned group of seven additional Managing Directors who have worked together at Audax for more than 14 years, on average. Messrs. Magid and Gummesson have led the junior debt business since inception and have been working together since 2000. They each have over 32 years of industry experience and have invested through numerous economic and credit cycles. The team’s seven other Managing Directors, Rahman Vahabzadeh, Steven Ruby, Ryan Benedict, Adam Weiss, Shehzad Ajmal, Blake Loweth, and Peter Stern average more than 14 years at Audax Private Debt and have spent substantially all of their respective careers assessing leveraged finance transactions. In addition, the team’s four Principals average over a decade at Audax Private Debt. Audax believes that no other junior debt investment team in the middle market has comparable experience, continuity and stability.

Since 2000, Audax has built a successful junior debt investment track record, investing \$2.9 billion across 115 companies in transactions with an aggregate value in excess of \$24.0 billion. The hallmark of their mezzanine funds is their low loss ratio over various economic cycles. The aggregate loss ratio for Audax’ Mezzanine investments is 3.7%.

III. Investment Strategy

The Audax Private Debt team plans to execute the same middle market investment strategy in Fund V as it has across prior funds. The team will utilize a broad deal sourcing network to maximize deal flow from a wide variety of middle market private equity sponsors and will perform credit analysis and due diligence, with a focus on principal preservation, on all relevant investment opportunities.

Audax believes the middle market provides opportunities to generate risk-adjusted returns in private debt investing. Fund V will seek to capitalize on market inefficiencies resulting from U.S. middle market companies having a more limited set of financing options than larger companies. Audax will seek to source investment opportunities directly from middle market private equity firms that favor cultivating long-term financing relationships and “club-oriented” financings (the firm does not target broadly syndicated transactions). The Fund will target investments in companies with \$10 million to \$50 million of EBITDA. The average EBITDA of companies in its prior 115 mezzanine investments is \$26 million.

The Firm’s deal flow is generated through an extensive direct marketing effort to middle market private equity sponsors that they have built over the last 19 years and four funds. As a result of its lasting presence in the market, more than 90% of the Firm’s current deal flow is sourced directly from private equity sponsors. Over two decades, Audax Private Debt has sourced multiple deals from over 350 private equity sponsors, including four or more deals from 229 distinct sponsors.

Once a potential investment is sourced, Audax conducts in-depth due diligence prior to seeking Investment Committee approval. The Firm’s investment professionals make an assessment of a company’s management team, corporate strategy, and product lines or services offered. Audax also assesses the competitive dynamics within a potential issuer’s industry, paying attention to the specific market growth dynamics of each company. The Firm uses these analyses to assess the growth strategy and financial projections of an issuer, which ultimately form the basis for numerous financial models designed to evaluate the issuer’s overall creditworthiness, ability to perform in an economic downturn, and potential to deliver the desired investment return.

A critical element of the Firm’s investment strategy is to perform thorough credit analysis on all investment opportunities. The fundamental goal underlying their credit analysis is the preservation of invested capital. As such, Audax will seek to invest Fund V in companies that are able to demonstrate the following credit-oriented characteristics:

- Leading and defensible market position;
- Attractive financial profile, margin stability, consistent performance and predictable cash flows;
- Diversified business model – customers/suppliers, etc. – with recurring demand;
- Avoid highly cyclical or volatile industries – no retail, restaurants, or apparel investments;
- Proven and experienced management team with capital at risk;

- Strong private equity sponsor with specialization/history in the industry;
- Appropriate capitalization and reasonable closing leverage; and
- High quality EBITDA – conservative addbacks and adjustments.

A core tenet of Audax Private Debt's strategy is to participate in the equity ownership of each investment where the Firm is providing junior debt financing. Audax believes this allows them to create upside potential for their investors and better align interests with their private equity partners. Since inception, Audax Private Debt has purchased equity securities in connection with its mezzanine debt securities in 111 of their 115 investments. Audax has generated a 3.0x multiple and 36% gross IRR on 72 realized equity investments to date. Audax will seek to invest up to 20% of committed capital of Fund V in equity securities.

Audax generally seeks to be the sole or lead mezzanine financing source in each transaction. Fund IV has been the sole or lead investor in transactions representing 90% of invested capital. Audax Private Debt does not provide mezzanine financing for Audax Private Equity transactions.

Audax has adopted a policy regarding environmental, social and governance ("ESG") investing, which they continue to update over time, as ESG best practices continue to evolve. They believe adhering to ESG principles leads to better investment returns and they consider a number of ESG factors during the investment process. Audax also notes that their firm has a longstanding practice of making ethical choices in evaluating new investments. They screen investments using ESG criteria and, as a part of their investment committee process, they report the results of that screening activity. Audax's primary ESG criteria include: risks from environmental contamination, worker health and safety, compliance with labor laws, fairness in executive compensation and compliance with applicable law, including anti-bribery laws. If a material ESG-related question regarding a company's business arises, or it is determined that a percentage of the applicable company's revenues is derived from undesirable activities, Audax Private Debt investment professionals will meet to assess whether to pursue or decline the opportunity. Audax has generally made it a practice to avoid certain industries such as gambling, alcohol, tobacco, sub-prime lending, payday lending, firearms, hunting weapons, and pornography.

IV. Investment Performance

Previous fund performance as of September 30, 2019 is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Fund I	2002	\$440 million	N/A	11.4%	1.4x	1.4x
Fund II	2006	\$700 million	N/A	8.0%	1.3x	1.3x
Fund III	2011	\$1,000 million	\$100 million	9.8%	1.3x	1.1x
Fund IV	2016	\$1,200 million	\$100 million	8.9%	1.1x	0.4x

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net IRR, Multiple of Invested Capital (MOIC) and Net Distributions to Paid-in-Capital (DPI) are provided by Audax.

V. Investment Period and Term

The investment period for Fund V will be five years. The fund term is ten years from the final closing date of the Fund, but may be extended for an additional one-year period at the discretion of the general partner.

This document is a summary of more detailed information provided in the Fund's Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM and the Fund's Agreement of Limited Partnership.

ATTACHMENT C

PRIVATE CREDIT MANAGER SUMMARY PROFILE

I. Background Data

<i>Name of Fund:</i>	Oaktree Real Estate Debt Fund III, L.P.
<i>Type of Fund:</i>	Private Credit
<i>Target Fund Size:</i>	\$3 Billion
<i>Fund Manager:</i>	Oaktree Capital Management
<i>Manager Contact:</i>	Michael Trefz 1301 Avenue of the Americas New York, NY 10019

II. Organization and Staff

Oaktree Capital Management (“Oaktree” or “Firm”) is forming Oaktree Real Estate Debt Fund III (“REDF III” or the “Fund”) to continue Oaktree’s risk-controlled investment philosophy that seeks to deliver superior risk-adjusted returns and produce current income for the Fund’s limited partners through investments in real estate related debt that are not anticipated to result in real estate ownership, with an emphasis on investments in the United States. Investments are anticipated to include commercial mezzanine loans, real estate structured credit, real estate-related corporate debt, commercial first mortgages, residential first mortgages and other similar investments. As of September 2019, the Real Estate Debt fund series has committed \$6.4 billion and currently has \$2.9 billion in assets under management.

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. Oaktree’s primary firm-wide goal is to achieve attractive returns while bearing less-than-commensurate risk.

Headquartered in Los Angeles, California, Oaktree has over 950 employees across 18 cities globally and oversees approximately \$121.9 billion in assets¹. The Real Estate Group consists of 55 investment professionals in seven offices globally. The team is led by John Brady (Managing Director and global head of the Real Estate group), who has led the group since joining the firm in 2007. In July 2018, John organized a leadership team of nine other experienced leaders, including the Fund’s co-portfolio manager Justin Guichard (together with John Brady, the “Portfolio Managers”). The Real Estate group is organized under five separate yet overlapping synergistic investment areas in which team members develop deep, focused expertise and relationships while still functioning on a highly collaborative basis. These five investment areas include: Commercial Real Estate, Residential Real Estate, Opportunistic Credit, Corporate Platforms, and Global Ex-U.S. Real Estate.

¹ As of September 30, 2019

On March 13, 2019, Brookfield Asset Management Inc. (“Brookfield”) and Oaktree Capital Group, LLC (“OCG”) 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 OCG’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.

III. Investment Strategy

The real estate debt strategy seeks to achieve attractive risk-adjusted returns and generate current income through investments in real estate-related debt with an emphasis on the United States. The Portfolio Managers also intend to look opportunistically at investments outside the United States including Canada, the Caribbean, the United Kingdom, Western Europe, Australia and select counties in Asia.

The Real Estate Group leverages its knowledge advantage gained from its proprietary research, extensive existing real estate portfolio, and the broader Oaktree credit platform. This research intensive, thematic approach is the foundation of their investment process informing their view on where to invest capital to generate an attractive return for investors while placing high priority on mitigating losses.

The investment themes for the Fund are: private loan origination, regulatory-driven opportunities, real estate structured credit, and real estate-related corporate debt. Within each of these themes, the Real Estate team has identified the categories of debt that comprise its respective opportunity set. Together, the Fund will primarily target five categories of debt investment: commercial mezzanine loans, real estate structured credit, real estate-related corporate debt, commercial first mortgages, and residential first mortgages. They intend to pivot their deployment of capital between the private loan originations, regulatory-driven opportunities, real estate structured credit and real estate-related corporate debt themes as the environment and opportunity set change, tactically shifting portfolio construction to where the Portfolio Managers view the most attractive risk-adjusted returns to be available.

Private Loan Origination

The Fund’s most active borrowers are value-add and opportunistic real estate funds, which today are sitting on record amounts of dry powder. These investors typically finance acquisitions or need refinancing at terms outside the scope of what traditional lenders, such as banks and life insurance companies, are able to provide.

The category of debt that represents the theme’s opportunity set is:

Commercial First Mortgages: Commercial first mortgages are secured loans collateralized by a first lien on commercial properties, typically office, retail, multifamily, industrial and hotel properties as well as in pools of loans. The Fund will target first mortgage positions with an LTV ratio primarily in the range of 65% to 75%.

Regulatory-driven Opportunities

Regulations including the Dodd-Frank Wall Street Reform and Consumer Protection Act and Basel III have constrained banks' ability to lend on the more transitional or marginally higher leverage segments of commercial and residential real estate debt that the Fund targets. As a result, there is a gap of liquidity in the market that debt funds are able to fill.

The categories of debt that represents the theme's opportunity set are:

Commercial Mezzanine Loans: Mezzanine loans are debt obligations secured by a pledge of equity, membership interests and/or partnership interests in one or more special purpose entities owning a direct or indirect interest in real estate. The Fund will target mezzanine loans with an LTV ratio of 60% to 80%.

Residential First Mortgages: Dodd-frank regulation created a complex standard for qualified mortgages which provides certain liability protection for originators. The regulation largely focuses on borrower income to evaluate a borrower's creditworthiness and includes a prescriptive methodology to calculate income, which dictates whether a borrower qualifies for a QM loan. The Fund will focus on pools of loans with an LTV ratio primarily in the range of 60% to 70% and borrowers with FICO scores above 700.

Real Estate Structured Credit: With regard to the structured credit debt strategy of the Regulatory-driven Opportunistic theme, Oaktree is focused on the horizontal-risk retention bonds of the CMBS issuance, primarily targeting single-asset single-borrower risk retention CMBS.

Real Estate Structured Credit

Structured credit products are created through a securitization process, in which financial assets such as loans and mortgages are packaged into interest-bearing securities backed by those assets and issued to investors. Oaktree's real estate structured credit investments include CMBS, RMBS and other ABS debt.

The category of debt that represents the theme's opportunity set is:

Real Estate Structured Credit: The Real Estate Structured Credit theme will focus on all non-risk retention CMBS, RMBS and other ABS of the structured credit debt category. The Fund anticipates targeting structured credit investments with LTV ratios between 40% and 65%.

Real Estate-related Corporate Debt

Oaktree's foundation as a credit investor with \$61.4 billion in assets under management in their corporate credit-focused strategies, combined with the knowledge advantage from the 244 investment professionals across the broader Oaktree credit platform, is a competitive differentiator for their real estate debt strategy. By leveraging this informational advantage, the team is able to identify opportunities to invest in real estate-related corporate debt at attractive yields, especially during times of market volatility.

The category of debt that represents the theme's opportunity set is:

Real Estate-related Corporate Debt: Corporate debt encompasses loans to real estate-related companies which may be either secured or unsecured. Oaktree is primarily focused on

opportunities that leverage the knowledge advantage gained from the Real Estate team's proprietary research and the broader Oaktree corporate credit platform. The Fund anticipates targeting corporate investments with LTV ratios primarily between 40% to 65%.

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"). Oaktree's real estate team recognizes that ESG issues are the focus of socially responsible investing and can directly impact investment performance, particularly within the real estate industry. The team believes that adherence to ESG principles can serve as a significant risk mitigant and value-enhancer for their investments. The team seeks to integrate and prioritize ESG best practices as part of its investment process by establishing and monitoring key performance indicators ("KPIs") and incorporating ESG factors into its investment reviews. The investment team utilizes various reports as a screening mechanism and in some cases, will abstain from investing if an opportunity is deemed too risky from an environmental perspective, although typically the findings of these reports and the team's additional due diligence better informs the team of opportunities where value-add initiatives can be made, resulting in a potential overall improvement of ESG KPIs. The investment professionals take formal account of ESG considerations in the opportunity's investment committee memo.

IV. Investment Performance

Previous fund performance as of September 30, 2019 is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Real Estate Debt Fund I	2013	\$1.1 Billion	--	14.3%	1.2x	1.07x
Real Estate Debt Fund II	2017	\$2.1 Billion	--	12.4%	1.1x	0.13x

* 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 4-year investment period and a 7-year term. The term is subject to three one-year extensions at the discretion of the GP.

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 D

PRIVATE CREDIT MANAGER SUMMARY PROFILE

I. Background Data

<i>Name of Fund:</i>	PGIM Capital Partners VI, L.P.
<i>Type of Fund:</i>	Private Credit
<i>Total Fund Size:</i>	\$2.2 Billion
<i>Fund Manager:</i>	PGIM Capital Partners
<i>Manager Contact:</i>	Mark Hoffmeister Two Prudential Plaza 180 North Stetson Avenue, Suite 5200 Chicago, Illinois 60601

II. Organization and Staff

PGIM Capital Partners VI, L.P, is being formed to provide investors with attractive risk-adjusted returns primarily through mezzanine and structured equity investments with a specific focus on middle market companies.

PGIM Private Capital (“PPC”) is a leading investor in the global private placement market and manages over \$91 billion of privately placed debt and equity investments across various credit strategies including investment grade and below investment grade corporate fixed rate, infrastructure, direct lending and mezzanine in over 1,000 companies worldwide (as of September 30, 2019).

PPC’s domestic investment activities are conducted through eight U.S. regional offices in Atlanta, Chicago, Dallas, Los Angeles, Minneapolis, New York, Newark and San Francisco. PPC’s international investment activities are conducted through seven offices in Chicago, Frankfurt, London, Mexico City, Milan, Paris and Sydney. PPC believes that this expansive regional office network is key to its successful middle market mezzanine investment strategy. PPC’s regional focus and scope allow it to develop strong local relationships and maintain access to direct deal flow.

Fund VI will be managed by eleven of PPC’s most experienced mezzanine investment professionals, including eight of the nine members of the Fund V investment committee: Jeffrey Dickson, Mark Hoffmeister, Paul Meiring, Stephen Szejner, Mathew Douglass, Marie Fiormaonti, Scott von Fischer, and Allen Weaver.

III. *Investment Strategy*

Consistent with the focused strategy of the Predecessor Funds, Fund VI will pursue an investment strategy primarily concentrated on North American, U.K., and Western Europe middle market subordinated debt and structured equity investments. Fund VI will continue to focus on transactions with middle market companies that typically generate annual revenue in the \$75 million to \$500 million range. Fund VI's investments are expected to be between \$10 and \$150 million. The portfolio of investments will be broadly diversified with respect to industry and geography. Investments will generally be made to facilitate the financing of recapitalizations, acquisitions, internal growth opportunities and buyouts.

This investment strategy will benefit from PPC's scale, global office network and middle market experience. Deal flow will be sourced through PPC's direct prospect calling efforts, existing financing relationships with over 1,000 portfolio companies and through strong equity sponsor and intermediary relationships. These calling efforts and relationships are maintained through PPC's global regional office investment network consisting of 14 regional offices. The regional offices are comprised of 27 underlying investment teams and 189 investment professionals organized by geography that thoroughly cover potential middle market issuers, intermediaries, and equity sponsors in their respective territories. Deal flow generated through this network is often direct and not widely shopped.

Given PPC's depth of resources, it is expected that Fund VI will have the opportunity to invest in non-sponsored transactions, similar to the Predecessor Funds. In a non-sponsored transaction, the Fund will back an owner/management team directly, without the involvement of a private equity sponsor. As of September 30, 2019 the Predecessor Funds had closed 79 non-sponsored investments representing 56% of the total investment made by the Funds, with the balance being sponsored transactions.

To assess the attractiveness of a deal, Fund VI will follow the same investment criteria employed by the Legacy Portfolio and the Predecessor Funds since 1995. Emphasis will be placed on companies with value-added businesses in narrowly defined market sectors. PPC also look for strong management teams with demonstrated track records and significant personal economic stakes in their companies' success. PPC aims to perform thorough due diligence on each investment, utilizing its network of contacts to understand and analyze the particular industry, company and management team. After closing an investment, PPC continues to work actively with its portfolio company, including maintaining an ongoing dialog with management and through board membership and/or observer rights. As of September 30, 2019 PPC has held board seats/or observer rights in 154 out of 157 investments made by the Predecessor Funds.

PGIM Private Capital's investment management process includes a rigorous internal analysis of each investment that includes, among other things, an issuer's operating, industry, and financing profile. Consideration of ESG factors arises in the normal course of the investment review. Relevant ESG factors are documented in PGIM Private Capital's internal investment review package at investment origination, and on an on-going basis via their investment monitoring process.

IV. Investment Performance

Previous fund performance as of September 30, 2019 for is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
Prudential Capital Partners	2000	\$550 Million	\$100 Million	11.07%	1.87	1.55x
Prudential Capital Partners II	2005	\$685 Million	\$100 Million	8.69%	1.74	1.40x
Prudential Capital Partners III	2008	\$833 Million	\$100 Million	13.98%	2.20	1.74x
Prudential Capital Partners IV	2012	\$1.1 Billion	\$100 Million	9.37%	1.49	0.69x
Prudential Capital Partners V	2016	\$1.8 Billion	\$150 Million	14.79%	1.26	0.14x

* Previous fund investments are not indicative of future results. Net IRR and Net MOIC were provided by Prudential.

V. Investment Period and Term

The Fund will have a 5-year investment period and a 10-year term. The term is subject to three 1-year periods.

This document is a summary of more detailed information provided in the Fund's Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM and the Fund's Agreement of Limited Partnership.

This page intentionally left blank.

ATTACHMENT E

DISTRESSED/OPPORTUNISTIC MANAGER SUMMARY PROFILE

I. Background Data

<i>Name of Fund:</i>	CVI Credit Value Fund V L.P.
<i>Type of Fund:</i>	Distressed/Opportunistic
<i>Target Fund Size:</i>	\$2.5 billion
<i>Fund Manager:</i>	CarVal Investors, LP
<i>Manager Contact:</i>	Ryan M. Savell 9320 Excelsior Boulevard Hopkins, MN 55343

II. Organization and Staff

CarVal Investors, LP (“CarVal” or the “Firm”) was founded by Cargill in 1987 and became an independent, wholly-owned subsidiary of Cargill in 2006. In October 2019, the senior management team of CarVal Investors purchased Cargill’s ownership and economic interest in CarVal, making CarVal an employee-owned firm.

CarVal has invested approximately \$117 billion in over 5,390 transactions, including opportunistic investments in corporate securities, liquidations, structured credit, loan portfolios, real estate and real estate loans, hard assets, as well as special opportunities.

CarVal is headquartered in Minneapolis, with operations in London, Luxembourg, New York, and Singapore. CarVal employs approximately 170 people worldwide, including approximately 70 investment professionals and approximately 100 professionals dedicated to legal, tax, operational, accounting and administrative functions. The investment activities of CarVal Investors are overseen by the Managing Principals, Lucas Detor, James Ganley and Jody Gunderson (the “Senior Leadership Team”). The Senior Leadership Team average over 14 years of service with CarVal Investors and its predecessor, 26 years in the industry and are assisted by 21 investment principals and managing directors who collectively lead the investment strategies and geographic locations for the Firm.

CarVal has had a consistent and active presence in Europe since 1993, and currently has a team of approximately 45 employees based in its London office. CarVal’s longstanding presence in Europe has allowed the Firm to pursue negotiated deal opportunities at attractive prices.

CarVal implemented a Responsible Investing Policy in mid-2017 that draws on the United Nations Principles for Responsible Investing. CarVal has also recently become a member of the Sustainability Accounting Standards Board (“SASB”), through which CarVal expects to access additional environmental, social and governance (“ESG”)-related resources and expand its exposure to and participation in conversations regarding responsible investing.

CarVal believes that its experience in alternative investment management and global presence will afford investors opportunities for attractive returns.

III. Investment Strategy

CVI Credit Value Fund V LP (the "Fund") is being formed to capitalize on investment opportunities in distressed and credit-intensive assets within its four strategies of loan portfolios, corporate securities, structured credit, and hard assets. CarVal believes there are four key themes that underpin the current market opportunity and position the Firm to take advantage of these conditions:

- Potential for stress in corporate credit: While corporate default rates remain low in the U.S. and Europe, issuance volumes continue to increase and the credit profile of borrowers continues to deteriorate. U.S. loans attracting the lowest credit ratings represented almost half of all issuance in 2019, a trend reflected in the steady increase in first lien leverage. Covenants are weaker than in prior periods, borrowers have shown themselves to be willing to make full use of any flexibility present in loan agreements and this creativity can extend to the definition of revenues. Simultaneously, loans are held in more concentrated hands that are, in turn, more reliant on access to public funding markets.
- Disorganization and uncertainty in European and U.S. banks: The regulatory pressure on banks in Europe continues to lead to non-core asset sales across the European markets. CarVal believes the pressure stems from the European Central Bank's requirement for banks to get their non-performing loan ratios at or below 5%, to adopt international standards for provisioning loan losses, and from changing requirements coming as part of Basel IV. CarVal is currently very active in several European markets, including Greece, Ireland, Italy, the Netherlands and Spain.

In the U.S. the residential re-performing loan market, driven by the residential credit crisis, continues to be active, with banks and other sellers offering portfolios in the market. CarVal recently completed its 12th securitization and investor demand for those bonds was strong. In the second quarter of 2019, the amount of home equity available for homeowners to borrow against hit a record high as did the average FICO score for the U.S. consumer. CarVal believes these dynamics, as well as the deleveraging of securitization capital structures, has continued to lead to ratings upgrades, which results in these bonds accreting in value.

- Dislocation in U.S. renewable energy: Renewables are the fastest growing source of new energy in the U.S. today, yet CarVal believes the market is immature and dislocated, making it an attractive investment opportunity. Within the renewables sector, solar's share of new capacity has grown rapidly with total solar having increased over 50 times since 2005 and residential solar having grown 77 times. Further, most projects are financed in the private markets with \$50 billion annual investment in the U.S. currently. The U.S. solar industry generates over \$150 billion annually in economic activity, including direct sales, wages, salaries, benefits, taxes and fees. About 30 percent of total new power plant capacity installed in 2018 came from solar. Total installed U.S. solar

capacity is over 60 gigawatts – the equivalent generating capacity of over 50 commercial nuclear reactors. CarVal believes the size, rapid growth and early dislocation in this industry presents a compelling investment opportunity.

- **Disruption in Emerging Markets:** CarVal believes there are three factors that will lead to significant opportunities for the Firm in distressed and special opportunities investments in emerging markets today and in the years ahead: 1) Capital outflows have created a significant repricing of risk across emerging markets; 2) Global bank deleveraging has and will continue to result in capital vacuums and orphaned assets in emerging markets; 3) Growth in emerging market corporate debt over the last decade has led to opportunities in misunderstood, mispriced and/or distressed securities investments.

The changing landscape from dislocations globally has created what CarVal believes to be compelling credit investment opportunities. The Firm is seeing negative interest rates in Europe, a raging trade war, slowing growth in China and geopolitical uncertainty on the rise. At the same time, CarVal is seeing U.S. equity markets near or at all-time highs, low unemployment and consumers who have de-levered. These things don't seem like they should co-exist, but they do. CarVal's role is to look at each of these scenarios and geographies both individually and collectively and one of CarVal's advantages is to see first-hand what is happening in each market and move capital across asset classes. The Firm believes it is well-positioned to capitalize on this uncertainty as it creates entry points and uncorrelated opportunities within the Firm's four core credit strategies of corporate securities, loan portfolios, structured credit, and hard assets.

CarVal believes the opportunities created by the dislocations in the market today are attractive across the Firm's four boxes. The Firm will seek to construct a portfolio that CarVal believes creates an optimal mix of risk, return and volatility across asset classes.

It is CarVal's policy to incorporate ESG-related principles as part of its investment review and underwriting process. Pursuant to the Responsible Investing Policy, CarVal's investment teams and the Portfolio Investment Committee will incorporate into all investment analysis and decision-making those ESG principles and considerations they determine to be relevant, in order to better manage risk and generate sustainable, long-term returns.

IV. Investment Performance

Previous fund performance as of September 30, 2019 is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
CVI Credit Value Fund I	2011	\$844 million	\$100 million	19.4%	2.3x	2.2x
CVI Credit Value Fund II	2013	\$2.3 billion	\$150 million	8.6%	1.4x	1.3x
CVI Credit Value Fund III	2015	\$3.0 billion	\$150 million	9.1%	1.3x	0.6x
CVI Credit Value Fund IV	2018	\$3.0 billion	\$150 million	8.0%	1.1x	0.0x

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

V. *Investment Period and Term*

The Investment Period will last for a period of three 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 two, one-year extensions at the sole discretion of the general partner. Thereafter, any extensions require consent of two-thirds 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 F

REAL ESTATE MANAGER SUMMARY PROFILE

I. Background Data

<i>Name of Fund:</i>	Oaktree Real Estate Opportunities Fund VIII, L.P.
<i>Type of Fund:</i>	Real Estate – Opportunistic
<i>Target Fund Size:</i>	\$3-4 billion
<i>Fund Manager:</i>	Oaktree Capital Management
<i>Manager Contact:</i>	Michael Trefz 1301 Avenue of the Americas New York, NY 10019

II. Organization and Staff

Oaktree Capital Management (“Oaktree” or “Firm”) is forming Oaktree Real Estate Opportunities Fund VIII (“ROF VIII” or the “Fund”) to continue Oaktree’s risk-controlled investment philosophy across its real estate focus areas: commercial, residential, corporate platforms, opportunistic credit, and global ex-U.S. As of March 2019, the Real Estate Opportunities fund series has committed \$10.3 billion and currently has \$5.2 billion in assets under management.

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. Oaktree’s primary firm-wide goal is to achieve attractive returns while bearing less-than-commensurate risk.

Headquartered in Los Angeles, California, Oaktree has over 950 employees across 18 cities globally and oversees approximately \$121.9 billion in assets¹. The Real Estate Group consists of 55 investment professionals in seven offices globally. The team is led by John Brady (Managing Director and global head of the Real Estate group), who has led the group since joining the firm in 2007. The Real Estate group is organized under five synergistic investment areas in which team members develop deep, focused expertise and relationships while operating on a highly collaborative basis. The U.S. real estate team is assigned market and relationship coverage responsibilities across the top-50 markets in the United States while the team outside the United States is assigned regional and/or country-specific coverage responsibilities of the markets internationally. The team pursues investments that fall within the five synergistic investment areas, which include: Commercial Real Estate, Residential Real Estate, Opportunistic Credit, Corporate Platforms, and Global Ex-U.S. Real Estate.

On March 13, 2019, Brookfield Asset Management Inc. (“Brookfield”) and Oaktree Capital Group, LLC (“OCG”) announced that they had entered into an agreement to which Brookfield

¹ As of September 30, 2019

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 OCG'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.

III. Investment Strategy

Oaktree's opportunistic real estate strategy will focus on targeting attractive risk-adjusted opportunities in value and growth investments across the team's five areas of investment focus - commercial, residential, opportunistic credit, corporate platforms and global ex-U.S. investments. Investment team members are designated with geographically-based coverage organized by focus area in order to develop deep, focused expertise and relationships while functioning on a highly collaborative basis. They are complemented by a dedicated asset management team that works in concert with the investment teams and Oaktree's operating partners to provide oversight of the real estate portfolio and to ensure that the portfolio managers have access to accurate and timely reporting on each investment and significant asset-level support services. Within each focus area, the team emphasizes buying right, creating value, and exiting opportunistically.

Buy Right: Consistent with Oaktree's investment philosophy of managing risk, they focus on investments that they believe have both strong downside protection and upside potential. The teams conduct extensive bottom-up, fundamental analysis to ensure they are paying less than intrinsic value, while also structuring – or ensuring sufficient value cushion – for various downside scenarios. Given the Firm's roots in credit, they spend a significant amount of time discussing the downside risks of each deal.

Create Value: Following the purchase of an asset, Oaktree takes a very active approach in seeking to execute value-add initiatives in order to drive results. These initiatives focus on both top- and bottom-line growth. For example, revenue growth may be achieved by repositioning assets and executing tenant improvements to increase occupancy and improve leasing rates. Bottom-line improvements are sought by pursuing operational efficiencies and cost management strategies, such as leveraging the expertise of their operating partners and third-party service provider relationships.

Exit Opportunistically: Oaktree pursues multiple channels of liquidity when exiting investments in order to maximize results. Over the last 24 years, they have exited investments through initial public offerings ("IPOs"), bulk sales, wholesale-to-retail exits, and leveraged recapitalizations, in addition to the more traditional brokered sales. They believe this experience allows them to capitalize on exit windows when liquidity is prevalent, while maximizing flexibility to exit investments in any part of a market cycle.

As with prior funds, ROF VIII has the ability to pivot amongst the five areas of investment focus depending on what Oaktree believes are the most attractive risk-adjusted growth and distress opportunities throughout a market cycle. Within the commercial property type, the team focuses primarily on individual asset or portfolio transactions across all types of

commercial real estate on a highly opportunistic basis, usually working in concert with lenders, borrowers or operating partners. This includes, but is not limited to, equity investments, debt acquisitions, and restructurings involving various asset types, such as office, industrial, multifamily, hospitality and to a limited extent, retail. Within residential, the team focuses on deeply discounted investments in land, land development, master-planned communities, distressed second home resort communities, short-term lending to fix-and-flip investors, single-family residential NPLs and homebuilding on single-asset, joint-venture, and corporate bases. The corporate platform investment area focuses on a variety of potential sources in real estate and real estate-related companies to find corporate investment platforms. This can include REITs or corporate mergers and acquisitions, recapitalizations, corporate joint ventures, acquisitions of securities, or off-balance sheet investments with strategic partners. The team focused on opportunistic credit opportunities targets investments in real estate structured credit such as CMBS, real estate-related corporate debt, and residential and commercial non-performing loan portfolios.

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”). Oaktree’s real estate team recognizes that ESG issues are the focus of socially responsible investing and can directly impact investment performance, particularly within the real estate industry. The team believes that adherence to ESG principles can serve as a significant risk mitigant and value-enhancer for their investments. The team seeks to integrate and prioritize ESG best practices as part of its investment process by establishing and monitoring key performance indicators (“KPIs”) and incorporating ESG factors into its investment reviews. The investment team utilizes various reports as a screening mechanism and in some cases, will abstain from investing if an opportunity is deemed too risky from an environmental perspective. Although typically, the findings of these reports and the team’s additional due diligence better informs the team of opportunities where value-add initiatives can be made, resulting in a potential overall improvement of ESG KPIs. The investment professionals take formal account of ESG considerations in the opportunity’s investment committee memo.

IV. Investment Performance

Previous fund performance as of September 30, 2019 is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*	Net DPI*
ROF A	1996	\$304 million	--	8.4%	1.7	1.7
ROF B	1997	\$286 million	--	7.1%	1.6	1.6
ROF II	1998	\$464 million	--	11.1%	1.5	1.5
ROF III/III A	2002	\$707 million	--	11.3%	1.7	1.7
ROF IV	2008	\$450 million	--	10.6%	1.7	1.6
ROF V	2011	\$1,283 million	--	12.5%	1.6	1.5
ROF VI	2012	\$2,677 million	--	9.6%	1.4	1.1
ROF VII	2015	\$2,921 million	--	25.7%	1.2	0.2

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

V. Investment Period and Term

The Fund will have a 4-year investment period and a 10-year term. The term is subject to extensions that require LPAC approval.

This document is a summary of more detailed information provided in the Fund's Confidential Private Placement Memorandum (the "PPM"). It is qualified in its entirety by the more detailed information provided in the PPM and the Fund's Agreement of Limited Partnership.

TAB E

Investment Advisory Council Report

Public Markets, Non-Retirement, and Participant Directed Investment Programs

This page intentionally left blank.

INVESTMENT ADVISORY COUNCIL REPORT

DATE: February 19, 2020

TO: Members, Investment Advisory Council

FROM: SBI Staff

**SUBJECT: Public Markets, Non-Retirement, and Participant Directed
Investment Programs**

This section of the report provides a brief performance overview of the SBI portfolio. Included in this section is a summary of investment manager activity and performance summaries of the public equity and fixed income managers in the SBI portfolio.

Also, we have included commentary and performance for the non-retirement managers and deferred compensation plan mutual funds.

The report includes the following sections:

	Page
• Review of Public Markets Program	3
• Public Markets Managers' Organizational Update	7
• Non-Retirement Manager Update	10
• Deferred Compensation Manager Update	11

This page intentionally left blank.

Review of SBI Public Markets Program Fourth Quarter 2019

SBI Portfolio - Quarter and Year Performance

In the fourth quarter, the Combined Funds matched the composite benchmark with a +5.8% return. Domestic equities matched the policy benchmark with a +9.1 return, while international equities modestly outperformed the MSCI ACWI ex USA Index (net) return (+9.0% Portfolio versus +8.9% Benchmark). The core fixed income portfolio exceeded the Bloomberg Barclays U.S. Aggregate Index return (+0.5% Portfolio versus +0.2% Benchmark), and the Treasury Protection Portfolio also slightly outperformed its benchmark, the Bloomberg Barclays Treasury 5+ Year Index (Portfolio -2.2% versus Benchmark -2.3%). The private markets portfolio returned +2.4% for the quarter.

For the full year ending Q4 2019, the Combined Funds outperformed the composite benchmark return (+20.1% Combined Funds versus +20.0% Composite Benchmark). Domestic equities narrowly underperformed the policy benchmark (+30.7% Portfolio versus +30.8% Benchmark), while international equities outperformed the MSCI ACWI ex USA Index (net) return (+22.4% Portfolio versus +21.5% Benchmark). The core fixed income portfolio significantly outperformed the Bloomberg Barclays U.S. Aggregate Index return (+9.7% Portfolio versus +8.7% Benchmark), while the Treasury Protection Portfolio slightly outperformed the Bloomberg Barclays Treasury 5+ Year Index (Portfolio +10.5% versus Benchmark +10.4%). The private markets portfolio returned +6.6% for the year.

Domestic Equity

U.S. stocks delivered solid returns for the quarter, with the Russell 3000 Index returning +9.1%, capping off an exceptional year which saw the Russell 3000 Index gain +31.0%. Market performance was consistently positive throughout the quarter, with tailwinds from solid economic data and a softening of U.S.-China trade tensions. Health Care (+14.9%) and Technology (+14.3%) were the best performing sectors of the Russell 3000 Index for the quarter, while defensive and interest rate sensitive sectors such as REITS and Utilities underperformed the broader market. For the full year, Technology (+46.7%) outperformed other sectors by a wide margin while the Energy sector lagged, returning just +9.6%.

Growth stocks outperformed value stocks in the quarter and for the full year as investors continued to favor companies with attractive earnings growth potential. Small caps narrowly outperformed large caps during the quarter, but over the full year, large cap named significantly outpaced smaller companies.

Active Managers

The Combined Funds' large cap growth managers outperformed the Russell 1000 Growth benchmark by +1.1% for the quarter (+11.7% Portfolio versus +10.6% Benchmark). Outperformance was driven by a strong rebound in the Zevenbergen portfolio. Stock selection was positive across most sectors, led by the Consumer Discretionary sector. In particular, Zevenbergen benefitted from strength in its core positions of Tesla, Trade Desk, Zillow and Shopify.

The large cap value managers exceeded the Russell 1000 Value benchmark by +0.7% for the quarter (+8.1% Portfolio versus +7.4% Benchmark). Stock selection in the Health Care sector helped performance. Earnest Partners and LSV outperformed while Barrow Hanley trailed the quarterly benchmark.

The small cap growth managers narrowly beat the Russell 2000 Growth benchmark for the quarter (+11.5% Portfolio versus +11.4% Benchmark). Stock selection helped performance, particularly within the Technology sector. ArrowMark and Wellington outperformed for the quarter while Hood River and Rice Hall underperformed.

The small cap value managers underperformed the Russell 2000 Value benchmark by -1.3% on the quarter (+7.2% Portfolio versus +8.5% Benchmark). Stock selection detracted from performance, particularly in the Technology, Health Care and Producer Durables sectors. All four managers trailed the quarterly benchmark.

Semi-Passive and Passive Managers

For the quarter, the semi-passive managers in aggregate slightly trailed the Russell 1000 Index return (+8.9% Portfolio versus +9.0% Benchmark). Stock selection across sectors was mixed with overall performance hurt by selection in the Consumer Staples and Consumer Discretionary sectors. The passive Russell 3000, Russell 1000 and Russell 2000 Index mandates tracked their respective indices and were within guidelines tolerance for the quarter.

Developed International Equity

International developed markets equities, as measured by the MSCI World ex USA Index, advanced by +7.9% during the quarter. Returns were aided by improving U.S.-China trade relations and a Brexit-related election in the United Kingdom which reduced the odds of an economically damaging no-deal Brexit. The U.S. dollar fell versus most developed markets currencies, which boosted foreign market returns in U.S. dollar terms. Gains were broad-based across nearly every country, and all eleven equity sectors posted gains during the quarter. As in the U.S., the Technology and Health Care sectors led the developed markets overall, growth outpaced value and small cap outperformed larger capitalization stocks.

The British pound staged a powerful rally after U.K. voters gave the Conservative Party a commanding majority, making it likely that the U.K. Prime Minister will gain approval for his Brexit withdrawal plan. However, the Eurozone continued to show signs of weakness and the Manufacturing sector has struggled to return to growth from a recent contraction, perhaps most pointedly within Germany. The European Central Bank (ECB) signaled its intention to maintain a highly accommodative policy stance for an extended period given a subdued inflation outlook and weak growth dynamics. Japan's economy expanded despite trade friction, helped by strong household spending in advance of a consumption tax increase which took effect late in the quarter. The Manufacturing sector remained stuck in contraction, amidst lower demand from both abroad and at home. To offset these effects, Japanese Prime Minister Abe approved the nation's largest stimulus program in almost three years and sealed a new trade deal with the U.S.

The active developed markets managers outperformed the MSCI World ex USA Standard Index (net) (+8.3% Portfolio versus +7.9% Benchmark). Overall, positive stock selection in Australia

and Japan, two markets which lagged the index, contributed positively to performance as did the overweight positions to the United Kingdom and to Ireland, two strong performers. The portfolio also benefitted from stock selection in the Financials and Industrials sectors, as well as underweight positions in Utilities and Real Estate, which lagged the index.

AQR, a semi-passive developed markets portfolio manager, outperformed the index (+9.0% Portfolio versus +7.9% Benchmark). Strong stock selection in Japan, Australia, and Canada, markets which trailed the index, contributed positively to performance. Additionally, an overweight position in Technology and an underweight position in Consumer Staples, the best and worst performing sectors respectively, boosted returns.

The passive developed markets portfolio tracked the MSCI World ex USA index within guideline tolerance for the quarter.

Emerging Markets Equity

Emerging market equities (EME), as measured by MSCI EME Index, posted a positive return of +11.8% during the quarter, the strongest gain in nearly three years, as trade tensions between the U.S. and China eased, manufacturing data improved, and local currencies strengthened versus the U.S. dollar. Gains were widespread, with twenty-two out of twenty-six countries posting gains and all sectors in positive territory for the quarter. China rebounded after two consecutive quarterly declines and pledged to support the economy in 2020 with more fiscal and monetary stimulus measures. Brazilian equities had their strongest return since 2017, as the economy there appears headed in the right direction under the business-friendly policies of first-year president Bolsonaro. Russia posted strong returns where higher dividend payments, an improving economy and a rise in oil prices over the past year helped boost sentiment. Technology-related stocks led the benchmark higher, in part on anticipated demand for chips to support 5G telecommunications networks. In the emerging markets, growth outperformed value and small cap underperformed larger capitalization stocks.

The active emerging markets managers outperformed the MSCI Emerging Markets Standard Index (net) (+12.0% Portfolio versus +11.8% Benchmark). Positive stock selection in China and Taiwan, two top performing markets, contributed positively to performance as did the portfolio's underweight positions to Thailand and Chile, which were among the worst performing markets. The portfolio also benefitted from stock selection in underperforming sectors including Financials, Communication Services, Consumer Staples and Utilities.

The passive emerging markets portfolio tracked the MSCI World ex USA index within guideline tolerance for the quarter.

Fixed Income – Core

The Combined Funds' Fixed Income program returned +0.5%, outperforming the Bloomberg Barclays Aggregate Index performance of +0.2% for the quarter. Within the program, active managers outperformed the benchmark by +45 basis points (bps) for the quarter while the Funds' semi-passive managers matched the benchmark with a +0.2% return.

During the quarter, the Federal Reserve cut its policy rate by 25bps at its October meeting, to a range of 1.50 – 1.75%, and signaled a shift to a more neutral stance. This position was reiterated in December, with the Fed electing to take no action at its December policy meeting. At the same time, an easing of trade tensions between U.S. and China and continued solid employment and economic data out of the U.S. boosted investor sentiment somewhat and lessened the safe-haven demand for Treasuries. As a result, the U.S. yield curve experienced a significant “twist” during the quarter, with interest rates on shorter maturities declining while yields on longer maturity bonds rose sharply, albeit from a low base. The yield on the 1-year Treasury fell -18 bps, to 1.56%, while the yield on the 30-year U.S. Treasury rose +28 bps, to end the quarter at 2.39%. By the end of the quarter, the yield curve displayed a positive slope and was no longer “inverted”.

In terms of index performance, the negative impact from the rise in longer term interest rates was more than offset by muted performance at the front-end of the yield curve and continued spread compression across the spread sectors of corporates, Agency mortgage-backed securities and securitized credit. This combination benefited the Portfolio’s active managers, who tend to be positioned with an overweight to the spread sectors and underweight U.S. Treasuries. Within spread assets, corporate bonds outperformed the most, followed by securitized credit and Agency MBS. During the quarter, several managers noted the stretched valuations within corporate bonds and planned a rotation into Agency MBS.

Fixed Income – Treasury Portfolio

During the quarter, yields on longer U.S. Treasury securities rose in response to an easing of global trade tensions, solid economic conditions and the Fed’s policy pivot to “on hold” from easing. The yield on the 10-year Treasury rose +24 bps, to 1.91%, on the quarter, while the yield on the 30-year Treasury rose +28 bps to end the quarter at 2.39%. For the quarter, all three Treasury Portfolio managers modestly outperformed the Bloomberg Barclays Treasury 5+ Year Index (-2.2% Portfolio versus -2.3% Benchmark). Overall, the Portfolio’s slightly short duration positioning added to performance, as did an allocation to Treasury Inflation Protection Securities (TIPS) as inflation expectations rose. On the negative side, the portfolio’s exposure to U.S. Agency debt was a modest drag as spreads in this sector widened modestly.

Public Markets Managers' Organizational Update Fourth Quarter 2019

Domestic Equity Managers

Barrow Hanley

In September 2019, Jeff Fahrenbruch, Managing Director and lead Portfolio Manager for the SBI's portfolio announced his intention to leave the firm at the end of 2019. Mr. Fahrenbruch's portfolio management responsibilities were absorbed by the remaining five members of the large cap value team. Staff met with the firm in October to discuss the large cap value team and process, as well as to meet Lewis Ropp, who was named the lead portfolio manager for the SBI's account following Mr. Fahrenbruch's announcement.

In December 2019, Barrow Hanley was terminated from their longstanding subadvisor role with the Vanguard Windsor Fund II, resulting in an approximately \$20 billion decline (~25%) in the firm's assets under management. The firm continues to have a broadly diversified institutional client base. Staff will continue to closely monitor the firm.

Developed International Equity Managers

Acadian

In December 2019, following completion of a strategic review, Acadian announced a workforce reduction of 20 positions, or approximately 5% of their total headcount. The restructuring had no impact to the investment leadership team.

AQR

During the quarter, AQR named seven new principals who will join the partnership in 2020. In terms of departures, Brian Hurst (Principal, Research and Portfolio Management) left the firm, while Jacques Friedman (Principal, Research and Portfolio Management), Oktay Kurbanov (Principal, Research and Portfolio Management), and Marco Hanig (Principal, Client Solutions and Portfolio Solutions) all retired from the firm. Staff believes the teams managing the SBI's portfolio remain well-resourced. Staff will continue to monitor future developments.

Fidelity

As announced in April, effective January 1, 2020, Matt Torrey became the sole lead portfolio manager of the International Growth strategy. Camille Carlstrom transitioned off of the strategy at the end of 2019 to focus on her role as managing director of equity research at U.S. parent company Fidelity Management & Research (FMR).

Marathon

In October 2019, Jordane Guillot joined Marathon as a European analyst and trainee portfolio manager. Additionally, Fahad Siddiqi joined Marathon as a portfolio manager on the Global Select strategy. James Beveridge joined Marathon as CFO, following the retirement of Kim Lau after twenty-three years at Marathon.

Emerging Market Equity Managers

Morgan Stanley Investment Management

During the quarter, Morgan Stanley announced that Jessica Whitt will transition her role on the Global Emerging Markets team from research analyst covering Latin America to Head of Environmental, Social and Governance (ESG) effective January 1, 2020.

Neuberger Berman

Ning Meng joined Neuberger Berman as a Senior Portfolio Manager on the Emerging Markets Equity team. Based in Singapore, Ning Meng's expertise is expected to enhance Neuberger Berman's China A-share equities capabilities.

Pzena

During the fourth quarter, Manoj Tandon, Director of Research, stepped down from the firm for personal reasons and was succeeded by Matt Ring as Director of Research.

Fixed Income

PIMCO

Mihir Worah, CIO Asset Allocation and Real Return, announced he will be retiring at the end of March 2020, ending an 18 year tenure with the firm. As part of the transition, Mr. Worah's responsibilities will be absorbed within the firm; the Asset Allocation team will report to Marc Seidner, CIO of Non-Traditional Strategies (and SBI's separate account manager), while all other functions will report to Dan Ivacsyn, Group CIO. Although there is no direct impact to the SBI portfolio, PIMCO's Core Plus strategies include TIPS and staff will monitor any impact from changes to the Real Return team.

Dodge & Cox

The firm announced several changes to investment leadership effective in 2020. Thomas Dugan, Senior VP and Co-Director of Fixed Income, has been named Director of Fixed Income. Mr. Dugan has been with Dodge & Cox since 1993 and serves on the Global Fixed Income Committee and Structured Products Sector Committee. Dana Emery, President and CEO, will no longer be Co-Director, yet remains involved in portfolio management decisions as a member of the U.S. and Global Fixed Income Committee and Credit Sector Committee. Lucy Johns, VP and member of the U.S. and Global Fixed Income Investment Committee, has been named Associate Director of Fixed Income. Ms. Johns joined Dodge & Cox in 1998. Staff will monitor the staffing changes, in particular any further reduction Ms. Emery's portfolio management responsibilities.

2019 Manager Meetings

The fourth quarter manager reviews are noted below.

Investment Manager

- Acadian Asset Management LLC
- Barrow, Hanley, Mewhinney & Strauss, LLC
- Dodge & Cox
- Goldman Sachs Asset Management
- Hood River Capital Management, LLC
- Hotchkis and Wiley Capital Management, LLC
- LSV Asset Management
- Martingale Asset Management, L.P.
- McKinley Capital Management, LLC
- Neuberger Berman Investment Advisers LLC
- Pzena Investment Management, LLC
- The Rock Creek Group, LP
- Wellington Management Company LLP
- Western Asset Management Company

Asset Class

International Equity
Domestic Equity
Fixed Income
Fixed Income
Domestic Equity
Domestic Equity
Domestic Equity
Domestic Equity
International Equity
Fixed Income
International Equity
International Equity
Domestic Equity
Fixed Income

Non-Retirement Manager Update Fourth Quarter 2019

Fixed Income

RBC Global Asset Management

The fixed income portfolio return of +0.07% exceeded the Bloomberg Barclays Intermediate Government benchmark of +0.01% for the quarter. Positive excess yield/carry generated by agency debentures and mortgage pools slightly outweighed the negative principal return resulting from rising interest rates across the yield curve. The portfolio's mandate limits investments in spread products such as Investment Grade corporates and structured credit, thus those asset classes has minimal effect on returns for the quarter.

Prudential Fixed Income

The fixed income portfolio return of +0.26% for the quarter outperformed the benchmark return, the Bloomberg Barclays U.S. Aggregate of +0.18%. The relative gain can be attributed to positive sector allocation within IG Corporates, CMBS and Municipals. Duration and yield curve effects were minimal to performance for the quarter.

Equity

BNY Mellon

Mellon tracked the benchmark for the quarter.

Deferred Compensation Manager Update Fourth Quarter 2019

Domestic Equities

Vanguard Total Stock Market Index Institutional Plus

The all cap domestic equity Fund matched the return of the CRSP U.S. Total Market Index for the quarter with a 9.0% return. The benchmark represents 100% of the investable U.S. stock market and includes large-, mid-, small-, and micro-cap stocks regularly traded on the NYSE and NASDAQ. The Vanguard Total Stock Market Index fund was added to the investment line-up on July 1, 2019 for all participants who use the mutual fund line-up, with the exception of the Minnesota Deferred Compensation Plan, which use the Vanguard Institutional Index Plus Fund.

Vanguard Dividend Growth Fund

The Fund returned 4.6% for the quarter, which underperformed its benchmark, the NASDAQ US Dividend Achievers Select Index return of 4.9%. Unfavorable allocations dragged down performance with an underweight to information technology and a modest allocation to real estate, a sector currently not in the benchmark.

Vanguard Institutional Index Plus

The large cap domestic equity Fund matched the return of the S&P 500 Index for the quarter with a 9.1% return.

Vanguard Mid-Cap Index

The mid-cap equity Fund tracked the benchmark, CRSP US Mid Cap Index, for the quarter with a 6.9% return.

T. Rowe Price

The small cap equity portfolio underperformed the Russell 2000 for the quarter with a 7.5% return versus the benchmark return of 9.9%. Stock selection in Health Care, Consumer Discretionary and Real Estate sectors were a drag on return along with an underweight in Health Care, which was the best performing asset class, and an overweight in Utilities, the only negatively-performing sector for the quarter.

International Equities

Fidelity Diversified International

The international equity portfolio return of 10.0% outperformed the MSCI EAFE Index (Net MA) benchmark return of 8.2%. Stock selection was the primary driver for the outperformance with sector allocation also contributing. Holdings in the Financials and Industrials sectors benefited relative returns along with an overweight to the market-leading Information-Technology sector. By region, security selection in Japan helped most, followed by positioning in Europe ex U.K. and in Asia Pacific ex Japan.

Vanguard Total International Stock Index

The international equity portfolio slightly underperformed the benchmark, the FTSE Global All Cap ex US Index, for the quarter with a 9.1% return. In the short term, the international portfolio will tend to have higher tracking error because of fair value pricing, which tends to smooth out over time. Fair value pricing most frequently occurs when a current price is not readily available and is not reflective of its current value. This most frequently occurs when the foreign market is closed while the U.S. market is open.

Fixed Income**Dodge & Cox Income Fund**

The fixed income portfolio outperformed the benchmark, the Bloomberg Barclays Aggregate, for the quarter with a 0.3% return versus the benchmark return of 0.2%. The Fund's below duration position relative to the benchmark added to relative returns as Treasury yields rose. The Fund also benefited from the significant outperformance of credit with its overweight position in corporate bonds relative to U.S. Treasuries in addition to positive security selection as several issuers performed well.

Vanguard Total Bond Market Index

The fixed income Fund returned 0.0% for the quarter, which underperformed the benchmark, the Bloomberg Barclays U.S. Aggregate Index return of 0.2% for the same time period. Small deviations in the fund's performance relative to the benchmark may occur given the fund's sampling approach to approximate the index.

Balanced and Conservative Options**Vanguard Balanced**

The balanced portfolio return of 5.4% matched the customized benchmark return for the quarter. The benchmark is a combined return of 60% CRSP U.S. total Market and 40% Barclays Aggregate.

Galliard Capital Management

The stable value portfolio outperformed the benchmark, the 3 Year Constant Maturity Treasury plus 0.45%, for the quarter with a 0.7% return versus the benchmark return of 0.5%. A general overweight to spread securities, including corporates, agency MBS, taxable municipals, was the primary driver of performance as they outperformed U.S. Treasuries with similar maturity profiles. An allocation to TIPS was also beneficial, as inflationary pressures increased over the quarter.

State Street Global Advisors

The money market fund matched the 90 Day T-Bill return of 0.5%.

TAB F

Report

Environmental, Social, and Governance (ESG) Report

This page intentionally left blank.

INTRODUCTION

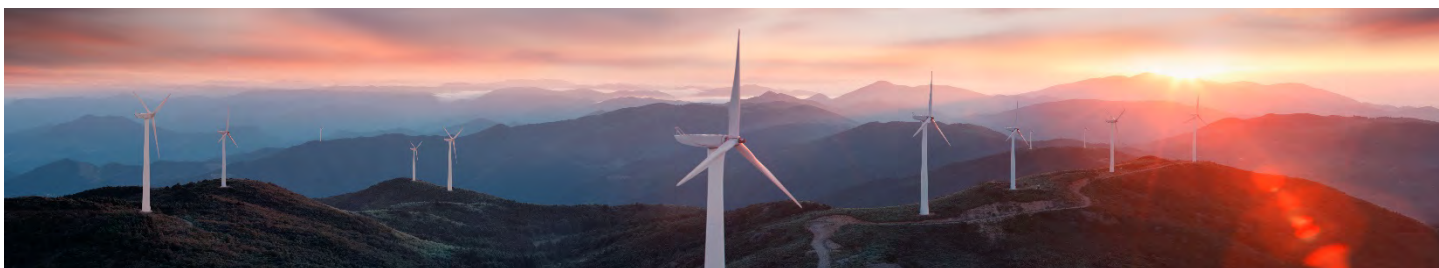
The Minnesota State Board of Investment (SBI) continues to enhance its approach to addressing Environmental, Social, and Governance (ESG) risks in the SBI investment portfolio. The SBI has adopted a core investment belief that emphasizes the importance of addressing ESG risk. Over the past five years, the SBI has supplemented its long history of engagement through proxy voting by increasing its participation in ESG coalitions and engagement efforts. These initiatives continue to gain momentum and lead to positive changes in the investment industry.

In addition to the SBI's efforts, several of the SBI's largest investment managers have aligned with the same coalitions as the SBI:

- BlackRock CEO, Larry Fink, recently announced that BlackRock, SBI's largest investment manager, joined the **Climate Action 100+** to enhance BlackRock's commitment to addressing long-term environmental risks.
- State Street Global Advisors, SBI's largest international developed and emerging markets manager, is a member of the **United Nations Principles for Responsible Investment (UNPRI)**, and maintains a robust engagement program based on the Principles.
- TPG, a manager for the SBI's private markets portfolio, partnered with the **Thirty Percent Coalition** to appoint 64 female directors to 53 company boards within TPG affiliated portfolios.

Investment manager alignment directly benefits the SBI by enhancing the evaluation of ESG risk across the SBI's portfolio. In addition, alignment through ESG coalitions has contributed to a number of positive outcomes, including a commitment from Duke Energy to be carbon neutral by 2050.

The following sections summarize the SBI's proxy voting program, ESG related coalitions, and current ESG related engagement efforts.



Investment Belief: ESG is a Core Part of SBI Risk Analysis

Utilizing engagement initiatives to address environmental, social, and governance related issues can lead to positive portfolio and governance outcomes

In addition to specific engagement strategies the SBI might apply, proxy rights attached to shareholder interests in public companies are also “plan assets” of the SBI and represent a key mechanism for expressing SBI’s positions relating to specific ESG issues. By taking a leadership role in promoting responsible corporate governance through the proxy voting process, SBI can contribute significantly to implementing ESG best practices which should, in turn, add long-term value to SBI’s investments.



SBI Proxy Voting – Exercising Shareholder Rights

Proxy Voting

- The SBI currently votes all proxy rights for domestic equities internally. Non-U.S. rights are voted by external investment managers.
- The SBI establishes a Proxy Committee to review and vote proxies as necessary. The Board sets proxy voting guidelines.
- Most proxies are voted according to established precedents.



Proxy Highlights: 2019

- During the 2019 proxy season, the SBI voted proxies in over 1,900 annual meetings and cast votes on over 26,000 ballot items.
- The SBI voted **for** all shareholder proposals requiring a report on reducing the company’s **greenhouse gas emissions**.
- The SBI voted **for** 78% of shareholder proposals on **environmental issues**.

Coalition and Membership Highlights: Aligning for Progress

United Nations Principles for Responsible Investment (UNPRI)

- ❖ SBI became a signatory in 2019.
- ❖ UNPRI works to achieve a global sustainable financial system that benefits the environment and society as a whole.
- ❖ SBI participates in UNPRI sponsored engagements and educational opportunities.
- ❖ Beginning in 2021, the SBI will report on climate related risks to the SBI's portfolio based on the reporting framework developed by the Taskforce on Climate-Related Financial Disclosures.

Ceres Investor Network

- ❖ SBI became a member in 2016.
- ❖ Ceres is a coalition of various institutional investors that provides resources and advocacy in addressing environmental investment risk.
- ❖ The SBI leverages Ceres organized engagements, educational opportunities, and research.
- ❖ Ceres provides its members with opportunities to engage through the Climate Action 100+, of which SBI is also a member.

Climate Action 100+

- ❖ SBI joined Climate Action 100+ in 2019.
- ❖ The coalition is investor-led and seeks to engage with companies to further the Paris Agreement, with support from Ceres and UNPRI.
- ❖ The SBI participates in company engagements with other members of the coalition.
- ❖ The coalition seeks commitments from companies to implement practices to address risks related to climate change.

Council of Institutional Investors (CII)

- ❖ SBI was a founding member.
- ❖ In recent years, the SBI has signed on to several letters regarding shareholder rights and governance issues addressed to the Security Exchange Commission (SEC) and United States Congress.
- ❖ SBI participates in CII organized events, conferences, and engagement opportunities.



Midwest Investors Diversity Initiative

- ❖ SBI joined the coalition in 2019.
- ❖ The coalition is a network of institutional investors located in the Midwest that seek broader diversity on corporate boards.
- ❖ The coalition engages with companies in the Midwest to promote diverse gender, racial, and ethnic participation on corporate boards.
- ❖ The SBI participates in coalition engagements and meetings.

Thirty Percent Coalition

- ❖ SBI joined the coalition in 2019.
- ❖ The coalition is a network of investors seeking to increase diversity on corporate boards, primarily by increasing the number of woman directors.
- ❖ The SBI participates in coalition engagements and meetings.

Recent Sign-on Efforts

- ❖ 2018 Global Investor Statement to Governments on Climate Change
- ❖ Investor Expectations on Deforestation (Ceres)
- ❖ Institutional Limited Partners Association (ILPA) Letter to SEC on Fiduciary Duty
- ❖ Climate Action 100+ Letter to General Motors
- ❖ Letter to Target Corporation Regarding Greenhouse Reduction Goals
- ❖ Investor Statement Regarding the Need for Corporate Gender Equity Transparency
- ❖ CII Letters Opposing Proposed Regulation of Proxy Advisory Firms
- ❖ Investor Statement on Pay Ratio Disclosure



Engagement Efforts

The SBI has currently undertaken two engagement initiatives for the 2020 proxy season:

Utilities: The SBI is actively participating in engagements with electrical utilities to promote transition to carbon neutral energy in order to mitigate climate risk along with financial and transition risks.

Board Diversity: The SBI is currently participating in engagements with specific companies to emphasize the material financial advantage of a diverse board. The SBI encourages companies to adopt a rule requiring at least one woman and one racial minority interviewed as part of the board candidate pool.



MINNESOTA STATE BOARD OF INVESTMENT

Contact

Mansco Perry III, Executive Director and CIO
Minnesota State Board of Investment
60 Empire Drive, Suite 355
St. Paul, MN 55103

Phone: (651) 296-3328
Fax: (651) 296-9572
Email: minn.sbi@state.mn.us
Website: <http://mn.gov/sbi/>

TAB G

Report

AON Market Environment Report

This page intentionally left blank.



Market Environment

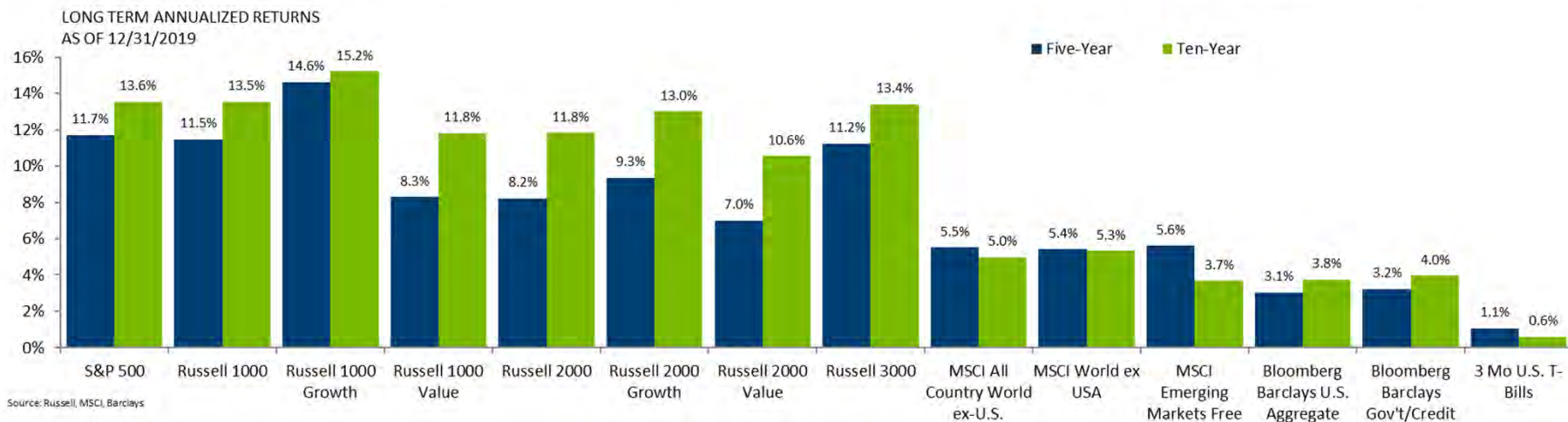
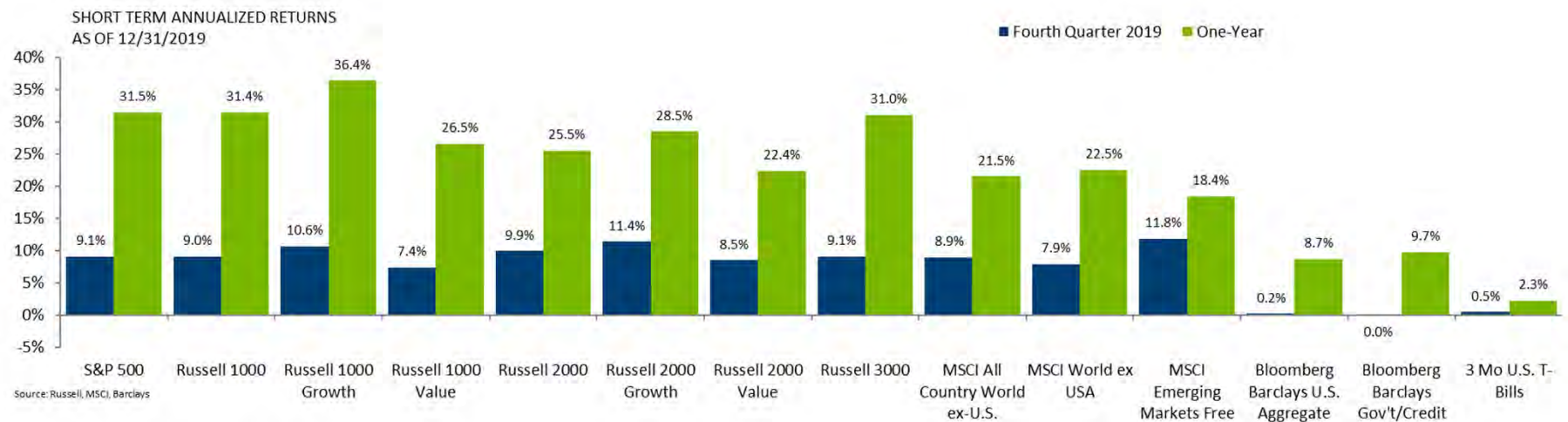
Fourth Quarter 2019

Aon

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Aon
Empower Results®

Market Highlights



Market Highlights

Returns of the Major Capital Markets					
	Periods Ending 12/31/2019				
	Fourth Quarter	1-Year	3-Year ¹	5-Year ¹	10-Year ¹
Domestic Equity					
S&P 500	9.1%	31.5%	15.3%	11.7%	13.6%
Russell 1000	9.0%	31.4%	15.1%	11.5%	13.5%
Russell 1000 Growth	10.6%	36.4%	20.5%	14.6%	15.2%
Russell 1000 Value	7.4%	26.5%	9.7%	8.3%	11.8%
Russell 2000	9.9%	25.5%	8.6%	8.2%	11.8%
Russell 2000 Growth	11.4%	28.5%	12.5%	9.3%	13.0%
Russell 2000 Value	8.5%	22.4%	4.8%	7.0%	10.6%
Russell 3000	9.1%	31.0%	14.6%	11.2%	13.4%
International Equity					
MSCI All Country World ex-U.S.	8.9%	21.5%	9.9%	5.5%	5.0%
MSCI World ex USA	7.9%	22.5%	9.3%	5.4%	5.3%
MSCI Emerging Markets Free	11.8%	18.4%	11.6%	5.6%	3.7%
Fixed Income					
Bloomberg Barclays U.S. Aggregate	0.2%	8.7%	4.0%	3.1%	3.8%
Bloomberg Barclays Gov't/Credit	0.0%	9.7%	4.4%	3.2%	4.0%
3 Mo U.S. T-Bills	0.5%	2.3%	1.7%	1.1%	0.6%
Inflation					
CPI-U	0.8%	2.3%	2.1%	1.8%	1.8%

MSCI Indices show net returns.

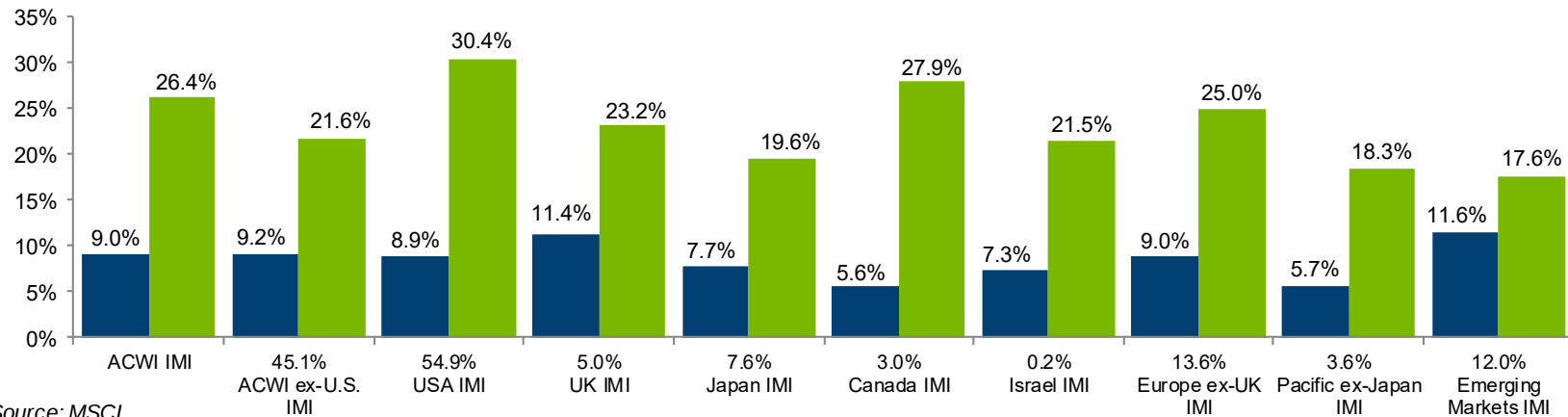
All other indices show total returns.

¹ Periods are annualized.

Global Equity Markets

**GLOBAL MSCI IMI INDEX RETURNS (USD)
AS OF 12/31/2019**

■ Fourth Quarter 2019 ■ One-Year

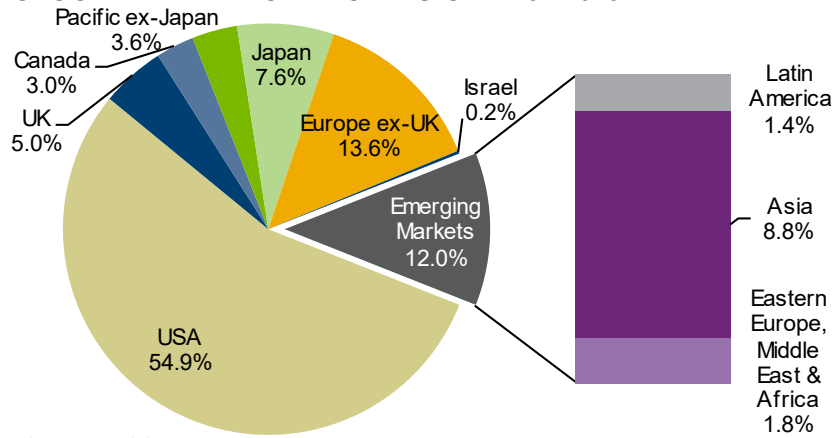


Source: MSCI

- The announcement of a “phase one” U.S.-China trade deal, progress on the U.S.-Mexico-Canada agreement (USMCA) and easing Brexit fears led to a resurgence in risk appetite and boosted equity markets. Accommodative monetary policies from major central banks meanwhile continue to provide further support for risk assets. In local currency terms, the MSCI AC World Investable Market Index returned 7.8% in Q4 2019 and the depreciation of the U.S. dollar provided an additional boost to 9.0% in USD terms.
- Previous laggards in terms of 2019 performance, Emerging Markets (EM) equities, were the strongest performers (11.6%) over the quarter benefiting from the “risk-on” environment and the thawing of trade tensions. With the exception of Indian equities, all other major EM regions delivered double-digit returns. This did, however, come against a backdrop where China recorded the slowest economic growth rate in nearly 30 years as their economy expanded by 6.0% year-on-year in the third quarter.
- Canadian equities markets returned the least with a still respectable quarterly return of 5.6% in USD-terms. Canadian Prime Minister Justin Trudeau’s Liberal party retained power after winning general election but fell short of a majority.

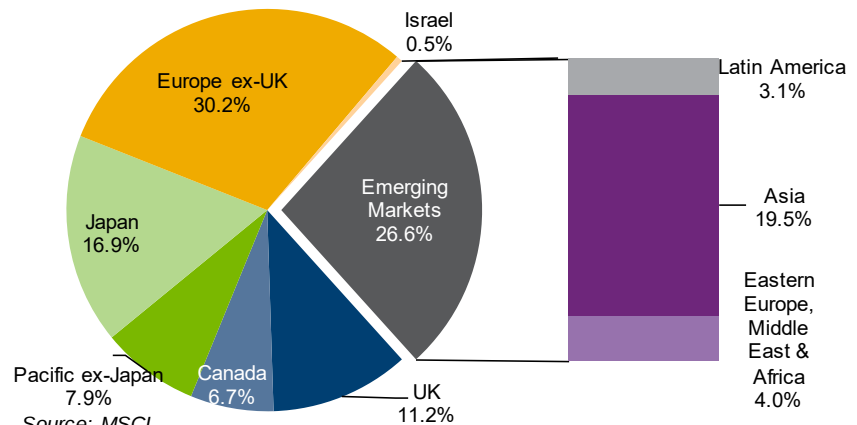
Global Equity Markets

**MSCI ALL COUNTRY WORLD IMI INDEX
GEOGRAPHIC ALLOCATION AS OF 12/31/2019**



Source: MSCI

**MSCI ALL COUNTRY WORLD EX-U.S. IMI INDEX
GEOGRAPHIC ALLOCATION AS OF 12/31/2019**

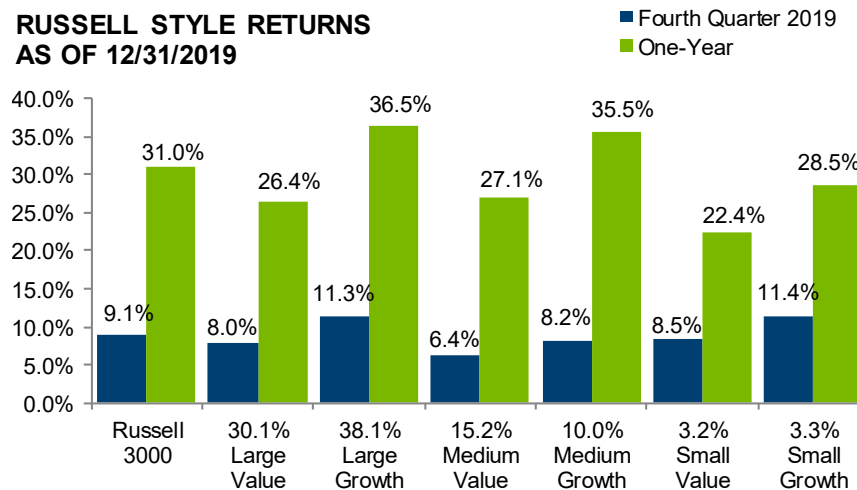


Source: MSCI

- 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.

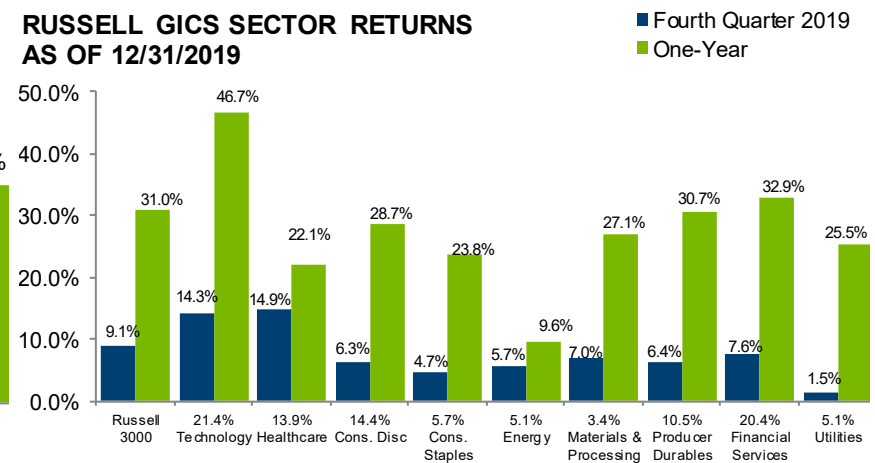
U.S. Equity Markets

**RUSSELL STYLE RETURNS
AS OF 12/31/2019**



Source: Russell Indexes

**RUSSELL GICS SECTOR RETURNS
AS OF 12/31/2019**

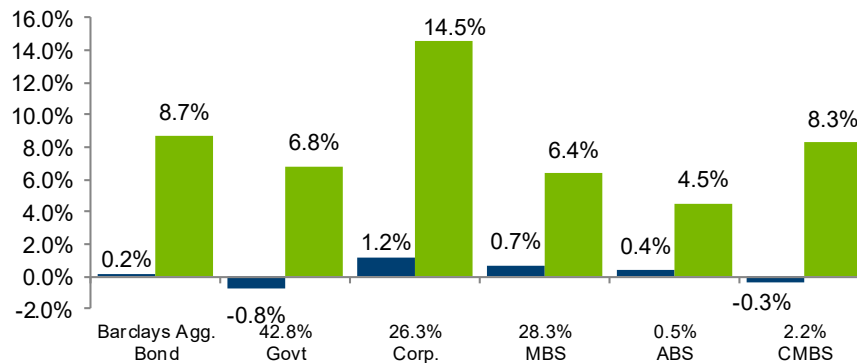


Source: Russell Indexes

- Three major U.S. equity indices (S&P 500, Dow Jones Industrial Average and Nasdaq Composite) touched record highs over the quarter; the truce in the U.S.-China trade war providing a significant tailwind. The Russell 3000 Index rose 9.1% during the fourth quarter and 31.0% over the one-year period.
- Healthcare (14.9%) and Technology (14.3%) were the best performers over the quarter. The former benefited from the falling popularity of Democratic Presidential candidate Elizabeth Warren whom advocated significant healthcare reform which has previously been a headwind for pharmaceuticals. As economic data stabilized over the quarter, more defensive sectors underperformed with Utilities (1.5%) and Consumer Staples (4.7%) the worst performing sectors.
- Performance was positive across the market capitalization spectrum over the quarter. Small cap stocks outperformed both large and medium cap stocks over the quarter. Growth stocks outperformed their Value counterparts in Q4 2019 and over the last year.

U.S. Fixed Income Markets

**BLOOMBERG BARCLAYS AGGREGATE RETURNS BY SECTOR
AS OF 12/31/2019**

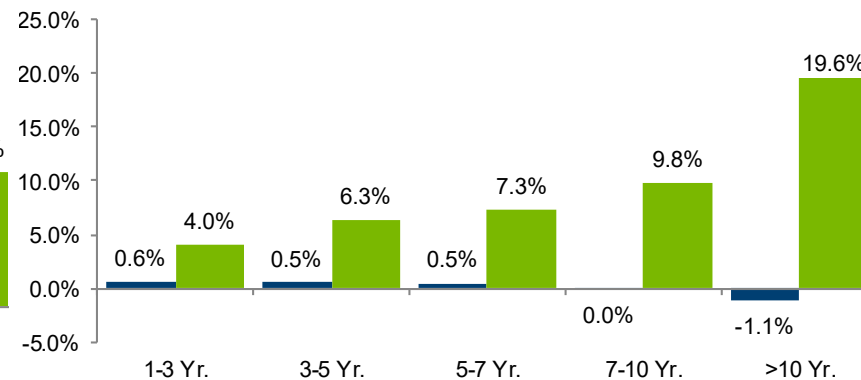


Source: FactSet

■ Fourth Quarter 2019 ■ One-Year

- Against a backdrop of rising yields, the Bloomberg Barclays U.S. Aggregate Bond Index rose by 0.2% over the quarter. Corporate bonds were the best performers, returning 1.2% while Government bonds underperformed with a return of -0.8%.
- Within credit, greater risk appetite led to outperformance of lower quality corporate bonds. High yield bonds returned 2.6% with spread narrowing offsetting the impact of higher underlying government bond yields while AAA-rated bonds underperformed with a return of -0.2%.
- Short-maturity bonds outperformed intermediate and long-maturity bonds over the quarter. Short-maturity bonds returned 0.6% while long-maturity bonds fell by 1.1% in Q4 2019.

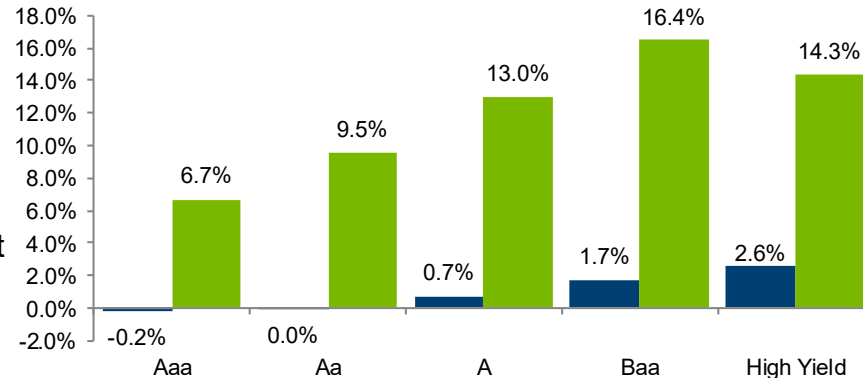
BLOOMBERG BARCLAYS AGGREGATE RETURNS BY MATURITY AS OF 12/31/2019



Source: FactSet

■ Fourth Quarter 2019 ■ One-Year

BLOOMBERG BARCLAYS AGGREGATE RETURNS BY QUALITY AND HIGH YIELD RETURNS AS OF 12/31/2019



Source: FactSet

■ Fourth Quarter 2019 ■ One-Year

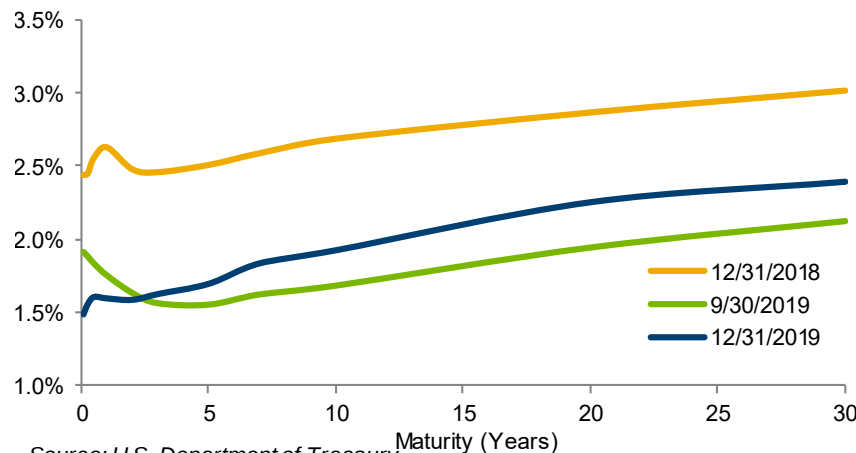
Aon

Proprietary & Confidential

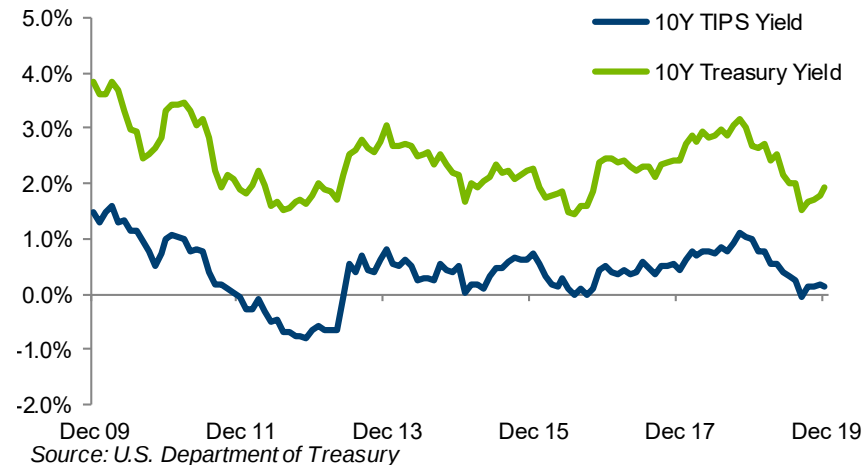
Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

U.S. Fixed Income Markets

U.S. TREASURY YIELD CURVE



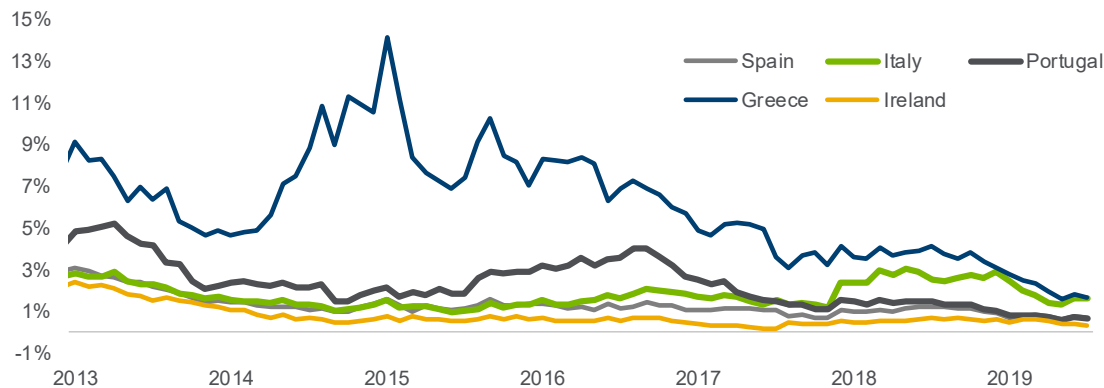
U.S. 10-YEAR TREASURY AND TIPS YIELDS



- The U.S. nominal yield curve steepened over the quarter with yields falling at the short end of the curve and rising at longer maturities. As a result, the yield curve is no longer inverted.
- The 10-year U.S. Treasury yield retraced most of the prior quarter's fall with a 24bps increase over the quarter to 1.92%. The 10-year TIPS yield remained unchanged over the quarter at 0.15%.
- With real yields broadly unchanged over the quarter, it became evident that yield movements were triggered not by growth expectations (which remain low) but instead by increasing inflation expectations. This follows sustained central bank easing, prospects of debt-financed fiscal stimulus and potential changes to inflation-targeting policies; all of which are supportive for higher inflation.
- The US Federal Reserve (Fed) cut the interest rate by 25bps to 1.50% from 1.75%. Meanwhile, in the latest "dot plot", the majority of the Federal Open Market Committee believed that interest rates will stay at current levels for at least the next year, with the next 25bps hike not anticipated until 2021.

European Fixed Income Markets

**EUROZONE PERIPHERAL BOND SPREADS
(10-YEAR SPREADS OVER GERMAN BUNDS)**



Source: FactSet

- German government bond yields rose in line with over developed market government bond yields, rising by 40bps to -0.19% over the quarter. Germany unexpectedly avoided a recession after growing by 0.1% in Q3, buoyed by increased consumer and public sector spending, which mitigated the impact of a weakening manufacturing sector. Italian government bond yields rose by 60bps to 1.42% over the quarter.
- Greek government bond yields rose by comparatively less than other European government bond yields. An increase in the country's sovereign credit rating to BB- from B+ lessened the risk of default and led to a relatively modest 9bps increase in government bond yields to 1.43%.
- Spanish government bond yields rose by 33bps to 0.46% over a quarter in which Pedro Sanchez's Socialist party won the most seats in general election, but fell short of a majority.
- European government bond spreads over 10-year German bunds generally fell across the Euro Area with the exception of Italian government bonds. The European Central Bank (ECB) kept its monetary policy unchanged over the quarter. In what was Christine Lagarde's first rate-setting meeting as President, she sought to calm fears that the Euro Area could have ultra low rates, growth and inflation for an extended period.

Credit Spreads

Spread (bps)	12/31/2019	9/30/2019	12/31/2018	Quarterly Change (bps)	1-Year Change (bps)
U.S. Aggregate	39	46	54	-7	-15
Gov't	0	0	0	0	0
Credit	90	109	143	-19	-53
Gov't/Credit	38	46	60	-8	-22
MBS	39	46	35	-7	4
CMBS	72	70	86	2	-14
ABS	44	37	53	7	-9
Corporate	93	115	153	-22	-60
High Yield	336	373	526	-37	-190
Global Emerging Markets	287	312	330	-25	-43

Source: Barclays Live

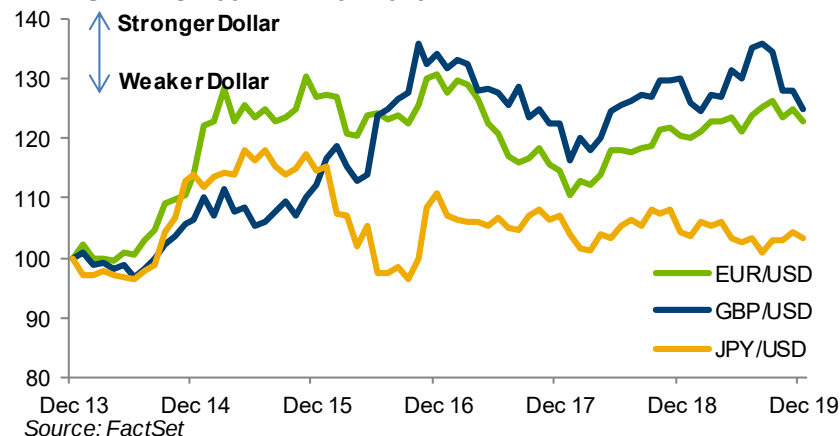
- Credit spreads over U.S. Treasuries generally narrowed over the quarter. Greater risk appetite saw spreads fall across the board but mostly in non-investment grade areas such as high yield and emerging market debt where greater yields are on offer.
- High yield bond spreads narrowed significantly by 37bps over the quarter. This was followed by global emerging markets bond spreads, which narrowed by 25bps.
- Areas within securitized credit in the U.S. underperformed in comparison. While credit spreads in general narrowed over the quarter, spreads on CMBS and ABS securities widened by 2bps and 7bps respectively.

Currency

**TRADE WEIGHTED U.S. DOLLAR INDEX
(1973 = 100)**



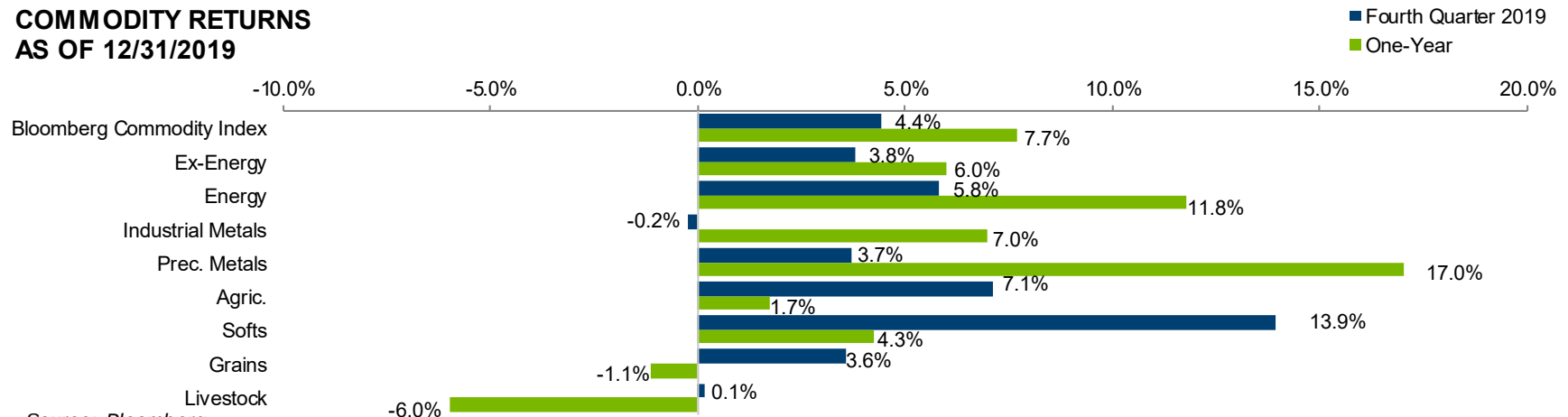
**U.S. DOLLAR RELATIVE TO EUR, GBP AND JPY
REBASED TO 100 AT 12/31/2013**



- The upward trend in the US dollar was halted with cyclical supports of higher interest rates and relative economic strength fading to some extent. Returning risk appetite also upended the 'greenback' which had benefited from safe-haven activity. The U.S. dollar slipped by 2.8% on a trade-weighted basis over the quarter with notable underperformance against sterling.
- The removal of Hard Brexit risks following a sizeable majority gained by the incumbent Conservative Party in the UK general election led sterling significantly higher over the quarter. Sterling appreciated by 7.5% against the U.S. dollar.
- Economic data releases stabilized in the Euro Area over the quarter but the outlook for the manufacturing sector still appears murky with activity shrinking for the eleventh successive month. Despite these economic headwinds, the euro found support against the U.S. dollar from tighter interest rate differentials, appreciating by 2.9% against the U.S. dollar.
- The U.S. dollar moderately appreciated against the Japanese yen, which had appreciated during risk-off episodes earlier in the year. The yen weakened by 0.6% against the U.S. dollar over the quarter.

Commodities

COMMODITY RETURNS AS OF 12/31/2019



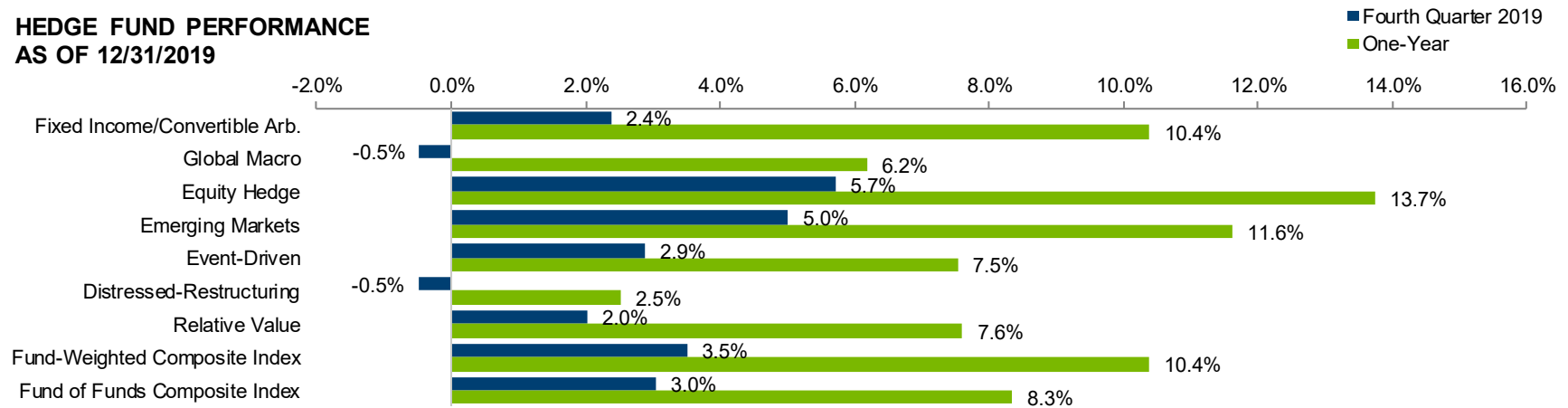
Source: Bloomberg

Note: Softs and Grains are part of the wider Agriculture sector

- Additional supply cuts proposed by OPEC+ as well as a less pessimistic economic outlook helped crude oil prices rebound while the latter also provided firmer footing for commodity prices which saw Bloomberg Commodity Index return 4.4%.
- The price of Brent crude oil rose by 8.6% to \$66/bbl and WTI crude oil spot prices rose by 12.9% to \$61/bbl. Higher crude oil prices helped the Energy sector return 5.8%.
- Industrial Metals was the worst performing sector to post a negative return over the quarter. Remaining headwinds of declines in manufacturing output depressed prices and ultimately led to a return of -0.2%.
- Agriculture (7.1%) was the best performing sector in Q4 2019. Within the Agriculture sector, Softs rose by 13.9% while Grains rose by 3.6%.

Hedge Fund Markets Overview

HEDGE FUND PERFORMANCE AS OF 12/31/2019



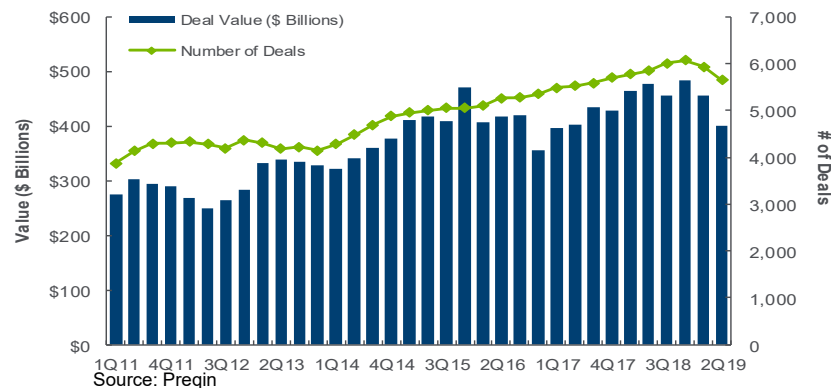
Note: Latest 5 months of HFR data are estimated by HFR and may change in the future.

Source: HFR

- Hedge fund performance was generally positive across all strategies in the fourth quarter. HFRI Fund-Weighted Composite Index and the HFRI Fund of Funds Composite Index produced returns of 3.5% and 3.0% respectively.
- Over the quarter, Equity Hedge and Emerging Markets strategies were the best performers with returns of 5.7% and 5.0% respectively, with these strategies benefiting from long equity positions amidst an equity market rally.
- Conversely, Global Macro and Distressed-Restructuring were the only strategies to generate negative returns of -0.5% each. Trend-following Global Macro strategies experienced a difficult quarter, while their discretionary counterparts performed better.

Private Equity Market Overview – Q2 2019

LTM Global Private Equity-Backed Buyout Deal Volume



- **Fundraising:** In Q2 2019, \$178.1 billion was raised by 366 funds, which was an increase of 25.8% on a capital basis and an increase of 0.3% by number of funds over the prior quarter. Dry powder stood at nearly \$2.0 trillion at the end of the quarter, a modest increase compared to the previous quarter¹.
- **Buyout:** Global private equity-backed buyout deals totaled \$77.7 billion in Q2 2019, which was up 6.8% on a number of deals basis and down 27.0% on a capital basis from Q1 2019¹. Through the end of Q2 2019, the average purchase price multiple for all U.S. LBOs was 11.2x EBITDA, an increase of 0.6x over year-end 2018 and up from the five-year average (10.2x)². Large cap purchase price multiples stood at 11.0x, up compared to the full-year 2018 level of 10.6x². The weighted average purchase price multiple across all European transaction sizes averaged 11.1x EBITDA for Q2 2019, up from the 10.9x multiple seen at the end of Q1 2019. Purchase prices for transactions of €1.0 billion remained at 11.3x at the end of Q2 2019, a drop from the 11.7x seen at year-end 2018. Transactions between €500.0 million and €1.0 billion were down 0.3x from the end of 2018, and stood at 11.0x at the end of the quarter². Globally, exit value totaled \$104.7 billion from 453 deals during the second quarter, significantly higher than the \$40.8 billion in exits from 460 deals during Q1 2019¹.
- **Venture:** During the second quarter, 1,409 venture-backed transactions totaling \$28.7 billion were completed in the U.S., which was an increase on a capital and deal basis over the prior quarter's total of \$26.1 billion across 1,362 deals. This was 41.4% higher than the five-year quarterly average of \$20.3 billion³. Total U.S. venture-backed exit activity totaled approximately \$138.3 billion across 198 completed transactions in Q2 2019, up slightly on a capital basis from the \$50.1 billion across 185 exits in Q1 2019⁴.
- **Mezzanine:** Four funds closed on \$1.2 billion during the second quarter. This was an increase from the prior quarter's total of \$1.0 billion raised by three funds, but represented a decrease of 76.7% from the five-year quarterly average of \$5.1 billion. Estimated dry powder was \$51.5 billion at the end of Q2 2019, down from the \$58.8 billion seen at the end of Q1 2019¹.

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.

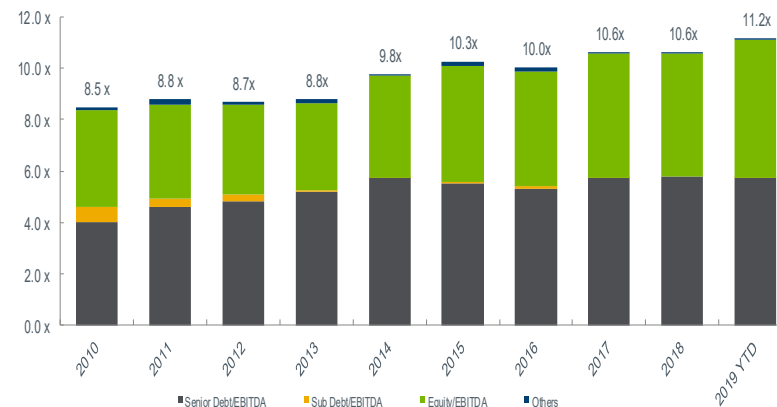
Aon

Proprietary & Confidential

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Private Equity Market Overview – Q2 2019

U.S. LBO Purchase Price Multiples – All Transactions Sizes



Source: S&P

- **Distressed Debt:** The LTM U.S. high-yield default rate was 1.9% as of July 2019, which was down from year-end 2018's LTM rate of 2.4%⁵. During the quarter, \$15.3 billion was raised by 15 funds, higher than both the \$5.0 billion raised by 14 funds in Q1 2019 and the five-year quarterly average of \$11.0 billion¹. Dry powder was estimated at \$119.4 billion at the end of Q2 2019, which was up slightly from the \$118.0 billion seen at the end of Q1 2019. This remained above the five-year annual average level of \$103.3 billion¹.
- **Secondaries:** Four funds raised \$1.5 billion during the quarter, down from the \$2.2 billion raised by nine funds in Q1 2019 and the \$9.0 billion raised by ten funds in Q4 2018¹. At the end of Q2 2019, there were an estimated 58 secondary and direct secondary funds in market targeting roughly \$74.6 billion¹. The average discount rate for all private equity sectors finished the quarter at 9.2%, lower than the 9.5% discount at the end of Q1 2019⁶.
- **Infrastructure:** \$23.1 billion of capital was raised by 29 funds in Q2 2019 compared to \$18.3 billion of capital raised by 21 partnerships in Q1 2019. At the end of the quarter, dry powder stood at an estimated \$217.0 billion, up significantly from Q1 2019's total of \$175.0 billion. Infrastructure managers completed 582 deals with an estimated aggregate deal value of \$155.0 billion in Q2 2019 compared to 552 deals totaling \$63.0 billion a quarter ago¹.
- **Natural Resources:** During Q2 2019, two funds closed on \$0.4 billion compared to five funds totaling \$1.5 billion in Q1 2019. Energy and utilities industry managers completed approximately 80 deals totaling an estimated \$12.4 billion through Q2 2019, which represents 36.1% of the full year capital deployment in 2018¹.

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.

Aon

Proprietary & Confidential

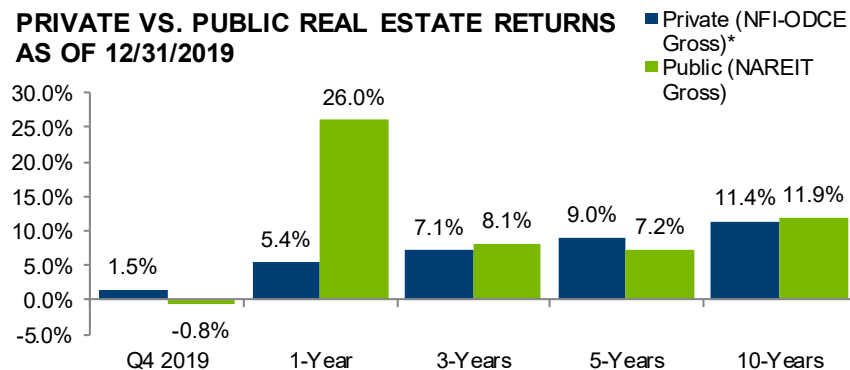
Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

15

Aon
Empower Results®

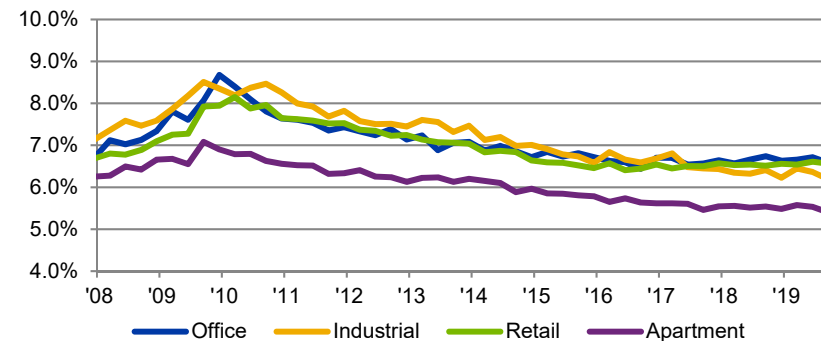
U.S. Commercial Real Estate Markets

PRIVATE VS. PUBLIC REAL ESTATE RETURNS AS OF 12/31/2019



*Fourth quarter returns are preliminary
Sources: NCREIF, FactSet

CAPITALIZATION RATES BY SECTOR



Sources: RCA, AON HEWITT 9/30/2019

- U.S. Core Real Estate returned 1.5%* over the fourth quarter, equating to a 5.4% total gross return year-over-year, including a 4.2% income return. Debt mark to market was a flat for the quarter. The industrial sector was once again the best performing sector, while retail continues perform poorly relative to other major property types. E-commerce continues to be the primary force driving the bifurcation of performance between the industrial and retail sectors. Going forward, income and income growth are expected to be the larger drivers of return, given the current point of the real estate cycle.
- Global property markets, as measured by the FTSE EPRA/NAREIT Developed Real Estate Index, returned 2.0% (USD) in aggregate during the fourth quarter. REIT market performance was driven by Asia Pacific (6.4% USD), North America (-0.9% USD) and Europe (13.8% USD). The U.S. REIT markets (FTSE NAREIT Equity REITs Index) declined -0.8% in the fourth quarter. The U.S. 10-year treasury bond yield increased 25bps to 1.92%.
- According to RCA through November 2019, the U.S. property market has experienced price growth of 8.7% year-over-year across major sectors. The industrial sector pricing appreciated 13.6% year-over-year, leading all sectors. The apartment sector was the second strongest, appreciating 9.3% year-over-year. Transaction volume was down -3% over the same period.
- Return expectations have normalized, with go forward expectations in line with historical norms. During 2019, the market benefited from three rate cuts by the Federal Reserve, and declining interest rates led to a rally across asset classes. According to Preqin, there remains a record amount of dry powder (\$338 billion) in closed-end vehicles seeking real estate exposure, which should continue to lend support to valuations and liquidity in the commercial real estate market.
- Aon prefers investments that offer relatively strong rental income growth, or value-add potential with near-term income generation prospects. It is critical to identify secular driven investment themes in the current environment. Real estate is uniquely positioned in this economic environment, because high quality real estate has the ability to leverage an improving economy, while at the same time high quality income generation offers downside protection.

*Indicates preliminary NFI-ODCE data gross of fees

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

Legal Disclosures and Disclaimers

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc. (“AHIC”). The information contained herein is given as of the date hereof and does not purport to give information as of any other date. The delivery at any time shall not, under any circumstances, create any implication that there has been a change in the information set forth herein since the date hereof or any obligation to update or provide amendments hereto.

This document is not intended to provide, and shall not be relied upon for, accounting, legal or tax advice. Any accounting, legal, or taxation position described in this presentation is a general statement and shall only be used as a guide. It does not constitute accounting, legal, and tax advice and is based on AHIC’s understanding of current laws and interpretation.

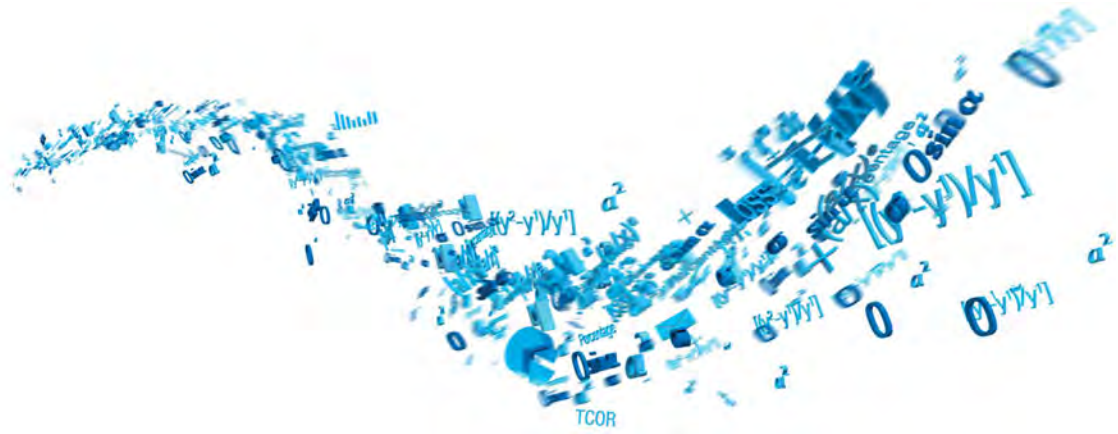
AHIC reserves all rights to the content of this document. No part of this document may be reproduced, stored, or transmitted by any means without the express written consent of AHIC.

Aon Hewitt Investment Consulting, Inc. is a federally registered investment advisor with the U.S. Securities and Exchange Commission. AHIC is also registered with the Commodity Futures Trading Commission as a commodity pool operator and a commodity trading advisor, and is a member of the National Futures Association. The AHIC ADV Form Part 2A disclosure statement is available upon written request to:

Aon Hewitt Investment Consulting, Inc.
200 E. Randolph Street
Suite 700
Chicago, IL 60601
ATTN: AHIC Compliance Officer

© Aon plc 2019. All rights reserved.

(This page left blank intentionally)



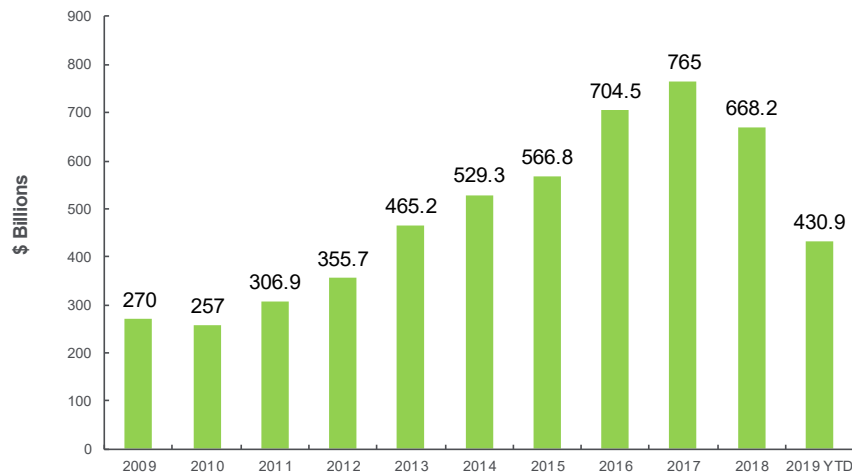
Appendix A:

Global Private Equity Market Overview

3Q 2019

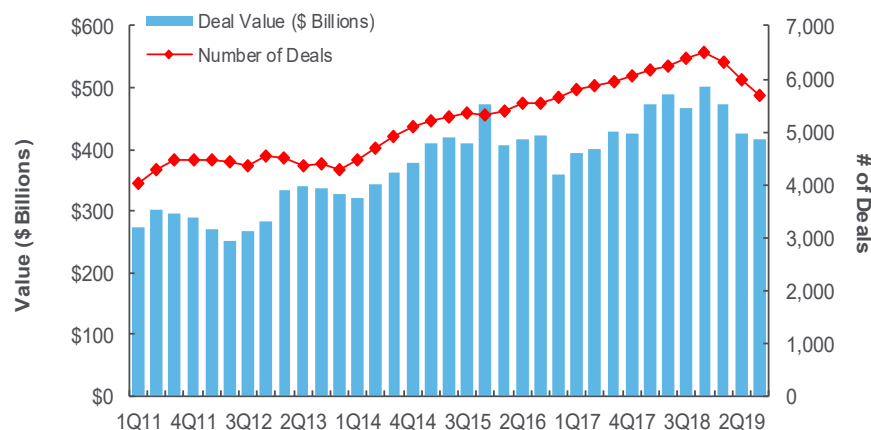
Private Equity Overview

Total Funds Raised



Source: Preqin

LTM Global Private Equity-Backed Buyout Deal Volume



Source: Preqin

Fundraising

- In 3Q 2019, \$174.3 billion was raised by 323 funds, which was an increase of 25.0% on a capital basis and a decrease of 12.9% by number of funds from the prior quarter.¹
 - 3Q 2019 fundraising was 24.0% higher on a capital basis than 3Q 2018.
 - Relative to the five-year quarterly average, the number of funds raised decreased by 37.5% while the total capital raised increased by 22.9%, supporting the observation that larger amounts of capital are being raised by fewer funds.
 - The majority of 3Q 2019 capital was raised by funds with target geographies in North America, comprising 63.3% of the quarterly total. Capital targeted for Europe made up 10.0% of the total funds raised during the quarter, while the remainder was attributable to managers targeting Asia and the other remaining parts of the world. Funding to European groups dropped sharply in Q3, falling 61.8% quarter-over-quarter.
- Dry powder stood at nearly \$2.1 trillion at the end of the quarter, a modest increase compared to the previous quarter.¹

Activity

- In 3Q 2019, 1,279 deals were completed for an aggregate deal value of \$92.0 billion as compared to 1,463 transactions totaling \$89.8 billion in 2Q 2019.¹
 - This was 14.3% lower than the five-year quarterly average deal volume of \$107.3 billion.
- European LBO transaction volume totaled €13.0 billion in 3Q 2019, representing roughly 17.0% of 2018's total LBO loan volume.³
- At the end of 3Q 2019, the average purchase price multiple for all U.S. LBOs was 11.5x EBITDA, up compared to year-end 2018 (10.6x) and up from the five-year average (10.2x). Large corporate purchase price multiples stood at 11.3x through 3Q 2019, up from the 10.6x observed at year-end 2018.³
 - For all U.S. LBOs, this quarter's pricing was 2.7x and 3.5x turns (multiple of EBITDA) above the five and ten-year average levels, respectively.
- European multiples for transactions greater than €1.0 billion averaged 11.3x in the third quarter, equal to that witnessed in the second quarter. Transactions greater than €500.0 million were also flat quarter-to-quarter and ended 3Q at 11.0x.³
- Debt remained broadly available in the U.S.
 - U.S. average leverage levels in 3Q 2019 were 6.1x compared to the five and ten-year averages of 5.7x and 5.2x, respectively.³
 - The amount of debt issued supporting new transactions increased compared to year-end 2018 from 72.2% to 72.4%, which is also higher than the 61.7% average level over the prior five years.³
- In Europe, average senior debt/EBITDA through 3Q 2019 was 5.6x, up from the 5.5x observed year-end 2018. This was also up over the five-year average of 5.2x and ten-year average level of 4.8x.

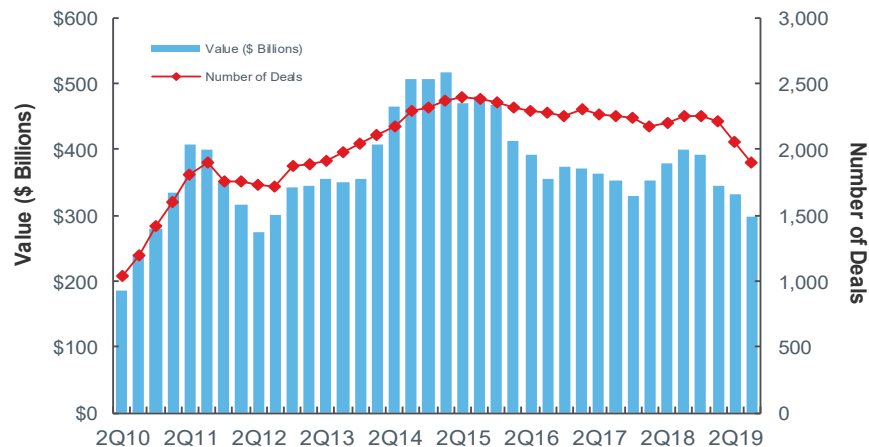
Aon

Proprietary & Confidential

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

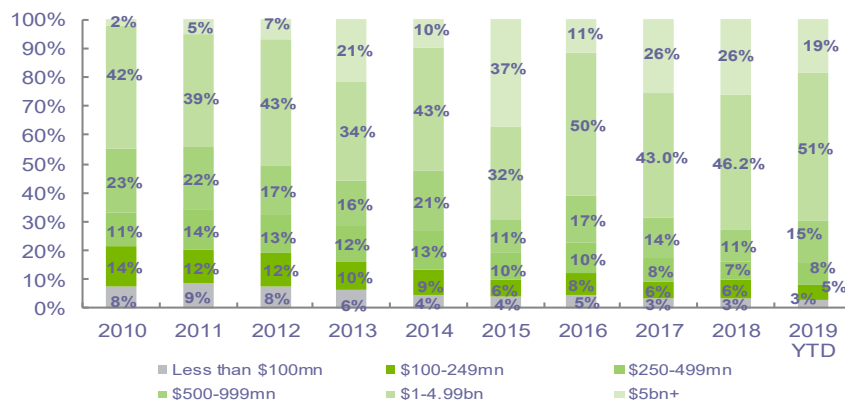
Buyouts / Corporate Finance

LTM PE Exit Volume and Value



Source: Preqin

M&A Deal Value by Deal Size



Source: Preqin

Aon
Proprietary & Confidential
Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Fundraising

- \$127.9 billion was closed on by 97 buyout and growth funds in 3Q 2019, compared to \$101.9 billion raised by 105 funds in 3Q 2018.¹
 - This was higher than the five-year quarterly average of \$88.0 billion.
 - China Integrated Circuit Industry Investment Fund II was the largest fund raised, closing on \$29.1 billion.¹
- Buyout and growth equity dry powder was estimated at \$993.9 billion, which surpassed the \$948.2 billion observed at the end of 2Q 2019. This was substantially higher than the five-year average level of \$684.3 billion.¹
 - Aside from mega funds, which decreased 1.7% quarter-over-quarter, buyout dry powder increased across all fund size categories in 3Q 2019. Large market fund dry powder exhibited the largest increase during the quarter (9.4%), and is now estimated at \$170.6 billion. Middle and small market buyout dry powder finished the quarter up 0.2% and 2.6%, respectively, from 2Q 2019.¹
 - An estimated 59.5% of buyout dry powder was targeted for North America, while European dry powder comprised 26.3% of the total.¹

Activity

- Global private equity-backed buyout deals totaled \$92.0 billion in 3Q 2019, which was an increase of 2.5% from 2Q 2019 but a decrease of 14.3% from the five-year quarterly average, respectively.¹
 - 1,279 deals were completed during 3Q 2019, which was down 12.6% from 2Q 2019 and down 11.6% compared to the five-year quarterly average.
- Entry multiples for all transaction sizes in 3Q 2019 stood at 12.9x EBITDA, up significantly from year-end 2018's level (10.6x), indicating a more competitive deal environment.³
 - Large corporate purchase price multiples stood at 12.8x during the quarter, up from the 10.6x observed at year-end 2018.³
 - The weighted average purchase price multiple across all European transaction sizes averaged 11.1x EBITDA in 3Q 2019, down from the 11.3x seen at year-end 2018. Purchase prices for transactions of €1.0 billion or more remained at 11.3x during the quarter.
 - Transactions greater than €500.0 million were flat with 2Q 2019, and stood at 11.0x.³
 - The portion of average purchase prices financed by equity for all deals was 49.3% in 3Q 2019, up from 40.5% in 2018. This remained above the five and ten-year average levels of 40.0% and 39.8%, respectively.³
- Globally, exit value totaled \$78.2 billion from 432 deals in 3Q 2019 compared to \$104.7 billion for 453 deals in 2Q 2019 and \$112.1 billion across 588 deals in Q3 2018.¹

Opportunity

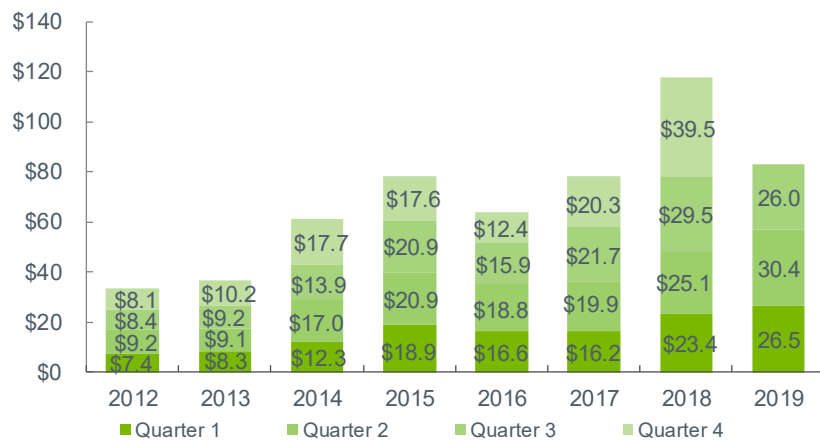
- Operationally focused managers targeting the middle and large markets with expertise in multiple sectors

Venture Capital

Venture Capital Fundraising



U.S. Venture Capital Investments by Quarter (\$B)



Fundraising

- \$18.6 billion of capital closed in 3Q 2019, down from the prior quarter's total of \$26.3 billion and down from the Q3 2018 total of \$21.8 billion.¹
 - 178 funds closed during the quarter, down 17.6% and 34.6% from the prior quarter and five-year quarterly average, respectively.¹
 - Oak HC/FT Partners Fund III was the largest fund raised during the quarter, closing on \$800 million.¹⁶
- The average fund size raised during the quarter was approximately \$114.0 million, which was less than the prior quarter of \$140.0 million but slightly higher than the five year quarterly average of \$113.4 million.¹
- Dry powder was estimated at \$270.2 billion at the end of 3Q 2019, which was up from 2Q 2019's total of \$255.0 billion. This was 62.9% higher than the five year average. An estimated 44.9% of dry powder was targeted for North America, followed by approximately 38.2% earmarked for Asia.¹

Activity

- During the third quarter, 1,304 venture-backed transactions totaling \$26.0 billion were completed in the U.S., which was a decrease on a capital and deal basis over the prior quarter's total of \$30.3 billion across 1,555 deals. This was 21.9% higher than the five-year quarterly average of \$21.3 billion. This marks the ninth consecutive quarter of \$20.0 billion or more invested into venture-backed companies.⁷
 - The number of unicorns in the U.S., or companies with valuations of \$1.0 billion or more, increased by 17 in 3Q 2019.⁷
- Median pre-money valuations increased in Series A, Series B, and Series D+ rounds during Q3 2019. Series A, Series B, and Series D+ increased by 20.0%, 33.3%, and 279.4%, respectively, to valuations of \$30.0 million, \$100.0 million, and \$827.3 million, respectively. Seed and Series C pre-money valuations decreased by 15.8% and 2.2%, respectively, ending at \$8.0 million and \$175.7 million, respectively.⁹
- Total U.S. venture backed exit activity totaled \$35.4 billion across 189 completed transactions in 3Q 2019, down significantly on a capital basis from \$141.1 billion in 2Q 2019.⁸
 - There were 19 venture-backed initial public offerings during the quarter, which was down from the 34 completed in Q2 2019.⁸
 - The number of M&A transactions totaled 163 deals in 3Q 2019, down slightly from 166 deals in Q2 2019.⁷

Opportunity

- Early stage continues to be attractive, although we are monitoring valuation increases
- Smaller end of growth equity
- Technology sector

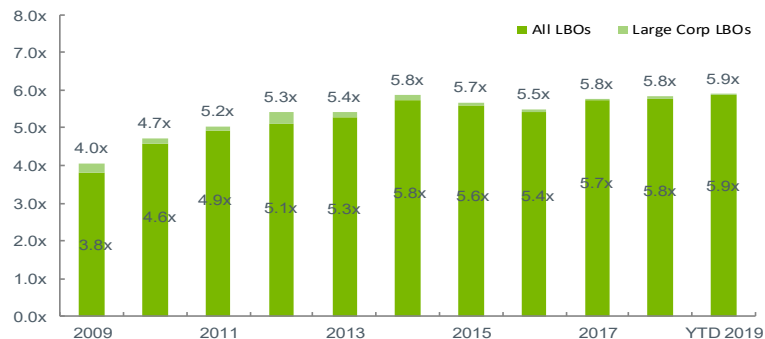
Aon

Proprietary & Confidential

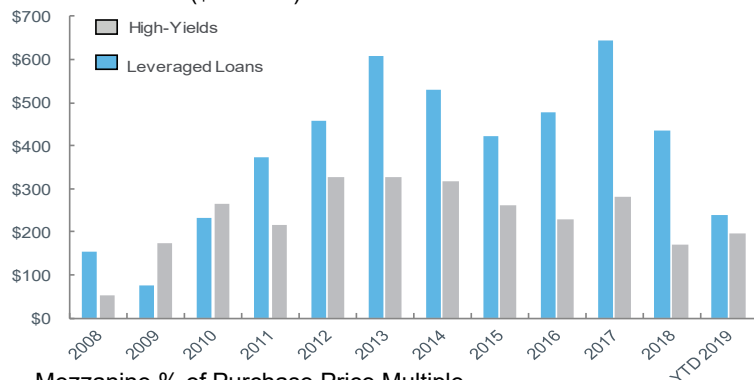
Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Leveraged Loans & Mezzanine

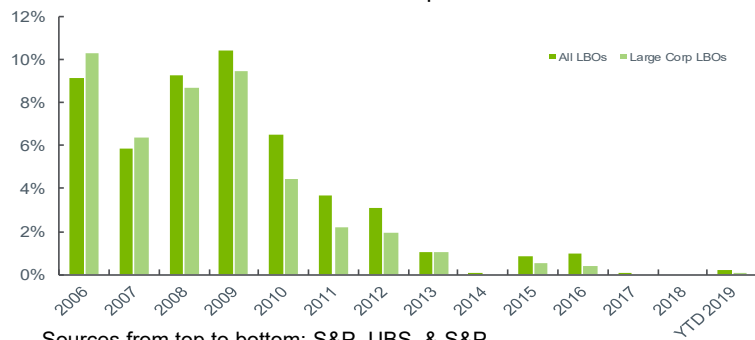
Average Leverage by Deal Size



Debt Issuance (\$ Billions)



Mezzanine % of Purchase Price Multiple



Sources from top to bottom: S&P, UBS, & S&P

Proprietary & Confidential

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

Leveraged Loans

Fundraising

- New CLO issuance totaled \$87.8 billion through 3Q 2019, up \$63.7 billion from 2Q 2019.²
- High-yield debt issuance totaled \$65.1 billion in 3Q 2019, down from \$71.7 billion issued in 2Q 2019.²
- Leveraged loan mutual fund net flows ended 3Q 2019 with a net outflow of \$23.8 billion, compared to a net outflow of \$17.6 billion through 2Q 2019.²

Activity

- Leverage for all LBO transactions ended the quarter at 5.9x, up slightly from 2018's level of 5.8x. Leverage continues to be comprised almost entirely of senior debt. The average leverage level for large cap LBOs was 5.9x during the quarter, up 0.1x from 2Q 2019.³
- YTD institutional new leveraged loan issuances totaled \$237.5 billion through 3Q 2019, down significantly from the \$357.6 billion issued during the same period in 2018.²
- 72.4% of new leveraged loans were used to support M&A and growth activity in 3Q 2019, up from 72.2% in 2Q 2019. This was above the prior five-year average of 61.7%.³
- European leveraged loan issuance increased by 8.4% quarter-over-quarter to €13.0 billion, which was 52.4% of 2018's total sponsored loan volume.³
- High yield YTM's for BB, B, and CCC indices ended the quarter at 4.10%, 5.68%, and 10.71%, respectively.²

Opportunity

- Funds with the ability to source deals directly and the capacity to scale for large transactions
- Funds with an extensive track record and experience through prior credit cycles

Mezzanine

Fundraising

- Nine funds closed on \$1.4 billion during the third quarter. This was a decrease from the \$2.0 billion raised by 12 funds in Q3 2018, but flat quarter-to-quarter from Q2 2019. Q3 2019 represented a decrease of 73.2% from the five-year quarterly average of \$5.2 billion.¹
- Estimated dry powder was \$47.5 billion at the end of 3Q 2019, down from the \$51.5 billion seen at the end of 2Q 2019.¹
- Fundraising activity picked up with an estimated 78 funds in market targeting \$30.6 billion of commitments, compared to 67 funds in market at the end of 2018 targeting \$25.0 billion of commitments. HPS Mezzanine Partners 2019 is the largest fund in market, targeting commitments of \$8.0 billion.¹

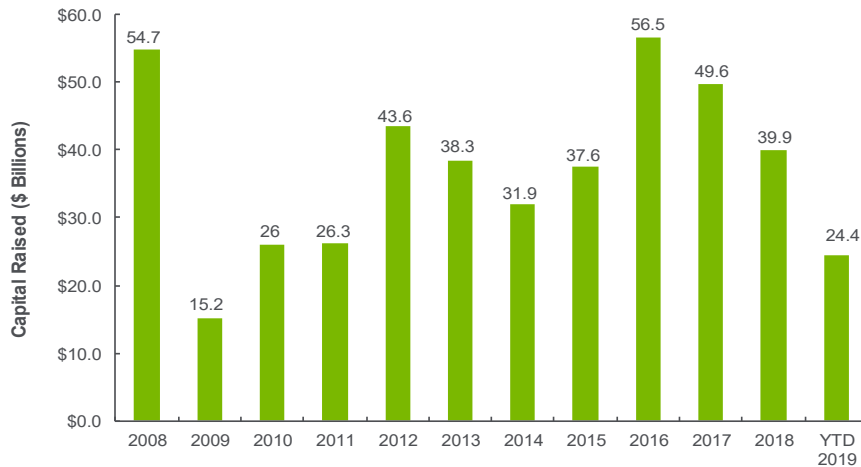
Opportunity

- Funds with the capacity to scale for large sponsored deals



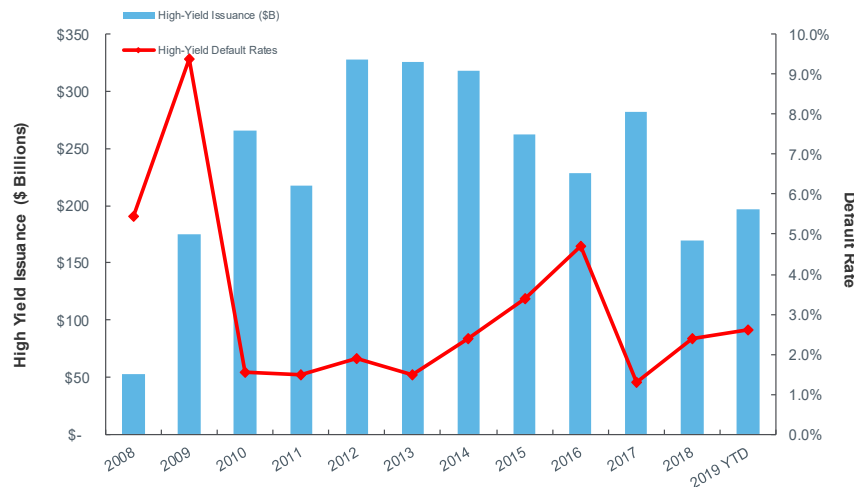
Distressed Private Markets

Distressed Debt, Turnaround, & Special Situations Fundraising



Source: Preqin

High-Yield Bond Volume vs Default Rates



Source: UBS & Fitch Ratings

Fundraising

- During the quarter, \$3.8 billion was raised by seven funds compared to \$15.5 billion raised by 17 funds in 2Q 2019.¹
 - 3Q 2019 fundraising was 65.9% lower than the five-year quarterly average of \$11.2 billion.
 - Sun Capital Partners VII was the largest partnership raised during the quarter, closing on \$2.3 billion.
- Dry powder was estimated at \$110.7 billion at the end of 3Q 2019, down slightly from the \$119.4 billion seen at the end of 2Q 2019. This was down compared to year-end 2018 (\$121.6 billion). This remained above the five-year average level of \$104.1 billion.¹
- Roughly 114 funds were in the market at the end of 3Q 2019, seeking \$60.6 billion in capital commitments.¹
 - Distressed debt managers were targeting the most capital, seeking an aggregate \$27.3 billion.
 - Fortress Credit Opportunities Fund V and KPS Special Situations Fund V were the largest funds in market with target fund sizes of \$5.0 billion each.

Activity

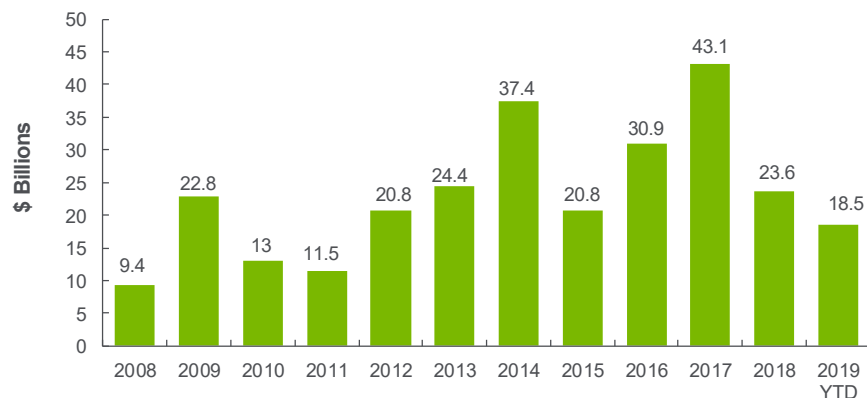
- The LTM U.S. high-yield default rate was 2.6% as of November 2019, which was up from year-end 2018's LTM rate of 2.4%.⁶
- Loan spreads widened during the quarter, due primarily to a decline in LIBOR rates. With the CLO market sensitive to ratings, there was a general flight towards higher-quality names resulting in a gap between most BB-rated and B-rated credits. Opportunities should exist for experienced lenders to benefit from less competition in lower-quality names.⁴
- 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.

Opportunity

- Funds capable of performing operational turnarounds
- Funds with the flexibility to invest globally

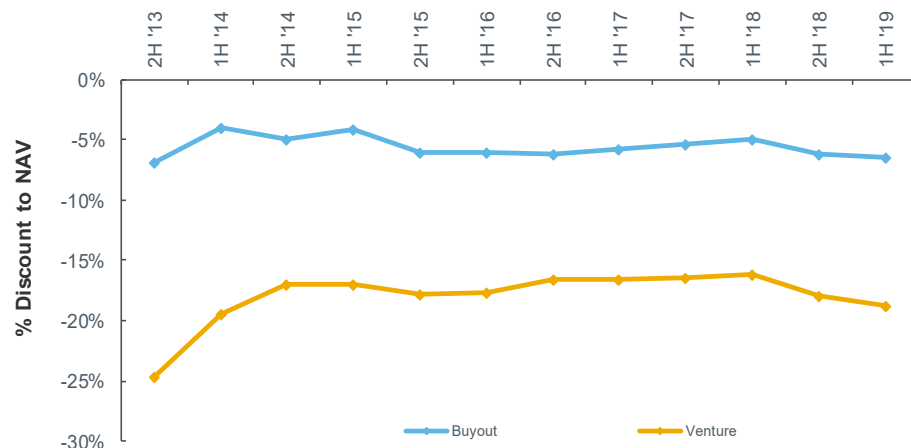
Secondaries

Secondary Fundraising



Source: Preqin

Secondary Pricing



Source: UBS

Fundraising

- Seven funds raised \$14.6 billion during the quarter, significantly higher than the \$1.7 billion raised by five funds in Q2 2019 and the \$4.0 billion raised by eight funds in Q3 2018.¹
 - Through Q3 2019, the aggregate capital raised by secondaries represents 78.4% of 2018's full year total.
 - Strategic Partners VIII was the largest fund raised during the quarter, closing on \$11.1 billion, and accounting for 76.0% of capital raised.¹
- At the end of 3Q 2019, there were an estimated 63 secondary and direct secondary funds in market, targeting approximately \$65.9 billion. Ardian Secondaries Fund VIII and Lexington Capital Partners IX were the largest funds in the market targeting \$12.0 billion each.¹
 - Two funds, Ardian Secondaries Fund VIII and Lexington Capital Partners IX (\$12.0 billion targets, respectively), represent 36.4% of all capital being raised.¹

Activity

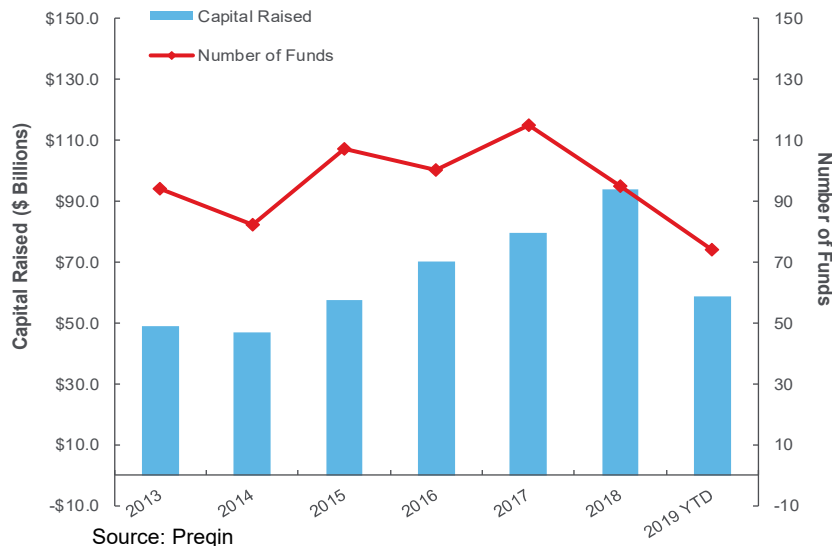
- Buyers have increasingly turned to leverage in their transactions in order to support attractive pricing and transaction execution. The spreads between committed capital and drawn capital by secondary purchasers has increased over the last quarter (and year).²
- The average discount rate for all private equity sectors finished Q3 2019 at 9.4%, up from 9.2% at the end of Q2 2019. The average buyout pricing discount ended at 6.7%, while venture ended at a discount of 19.0%.² The average buyout pricing discount for Q3 was down from Q2 2019's 6.8% discount, while the venture discount was up from 16.0%.
- Pricing, while having become slightly more favorable for buyers over the last quarter, is expected to remain attractive for sellers given the continued high levels of dry powder and competition for secondary transactions. Pricing decreased marginally in Q3 due to public market performance volatility.²
- For buyout pricing, tail-end vintages were being traded at larger discounts, while top performing funds continued to obtain premiums for their assets. While there is support and interest in pre-2010 vintage funds, there is significant volume and competition for younger vintages where premiums are often being commanded.²

Opportunity

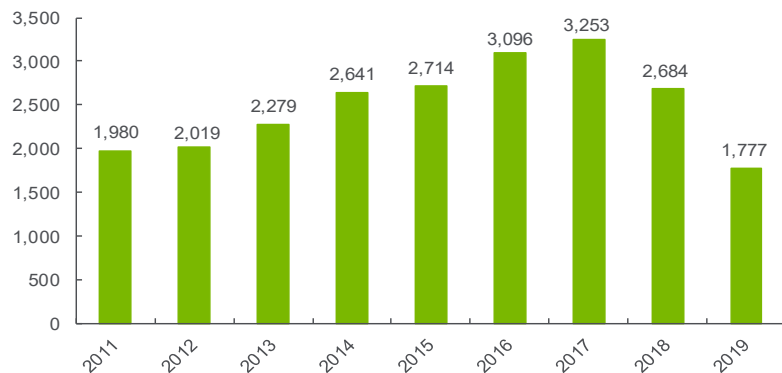
- Funds that are able to execute complex and structured transactions at scale
- Funds that are able to leverage their long-standing relationships and networks in the secondaries marketplace
- Niche strategies

Infrastructure

Global Infrastructure Fundraising



Number of Deals Completed



Fundraising

- \$9.9 billion of capital was raised by 21 funds in Q3 2019 compared to \$22.6 billion of capital raised by 29 partnerships in Q2 2019. This was the least amount of capital raised in a quarter since Q2 2016.¹
 - About 57.9% of the capital raised is targeting investment in North America or Europe.¹
- As of the end of Q3 2019, there were an estimated 230 funds in the market seeking roughly \$198.9 billion, compared to 173 funds targeting \$162.0 billion in Q2 2019.¹
 - Funds in market targeting capital commitments of \$1.0 billion or more account for roughly 65.5% of capital being raised.¹
 - Global Infrastructure Partners IV and Brookfield Infrastructure Fund IV were the largest funds in the market as of the end of 2Q 2019, targeting \$20.0 billion each. Both are focused on making investments within the U.S.¹
- At the end of the quarter, dry powder stood at an estimated \$203.1 billion, up from year-end 2018's total of \$177.5 billion.¹ Current dry powder levels for infrastructure are at five year highs.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

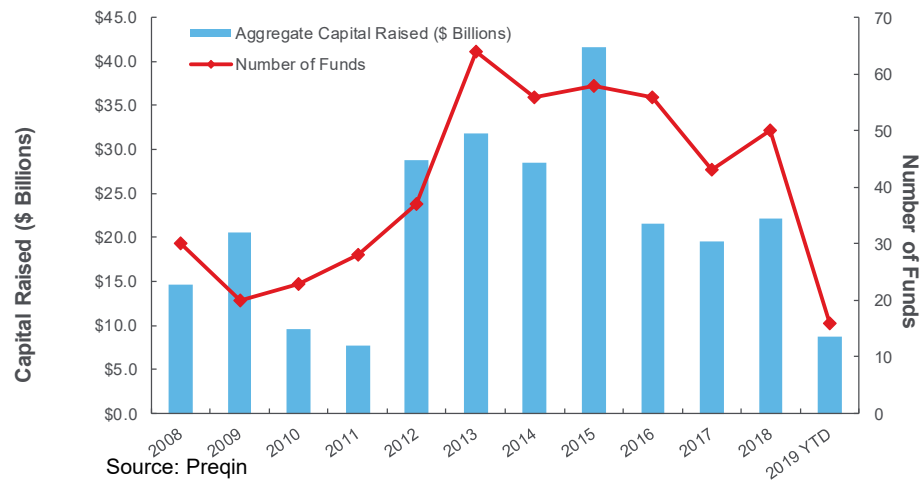
- Infrastructure managers completed 593 deals with an estimated aggregate deal value of \$87.8 billion in Q3 2019 compared to 618 deals totaling \$175.8 billion a quarter ago.¹ The average deal value during the quarter was \$148.0 million, up compared to the five-year average of \$143.6 million.
 - North America accounted for 26.8% of the deals in Q3 2019, while 36.1% and 17.7% of deals were transacted in Europe and Asia, respectively.¹
 - Renewable energy was the dominant industry during the quarter with 50.8% of transactions, followed by the transportation and conventional energy sectors, which accounted for 14.2% and 12.5%, respectively, of the quarter's deals. Utilities accounted for 10.8% of transactions.¹

Opportunity

- Greenfield infrastructure is less competitive and offers a premium for managers willing to take on construction risk

Natural Resources

Natural Resources Fundraising



Fundraising

- During Q3 2019, four funds closed on \$1.5 billion compared to five funds totaling \$5.7 billion in Q2 2019.¹
- At the end of Q3 2019, there were roughly 103 funds in the market targeting an estimated \$47.5 billion in capital, compared to 97 funds seeking an estimated \$36.6 billion in 2Q 2019.¹
 - NGP Natural Resources XII was seeking the most capital with a target fund size of \$5.3 billion.
- Dry powder was estimated at \$54.9 billion at the end of Q3 2019, which was down 11.0% from Q4 2018's level, and remains below the record level of \$73.6 billion observed in Q4 2016.¹

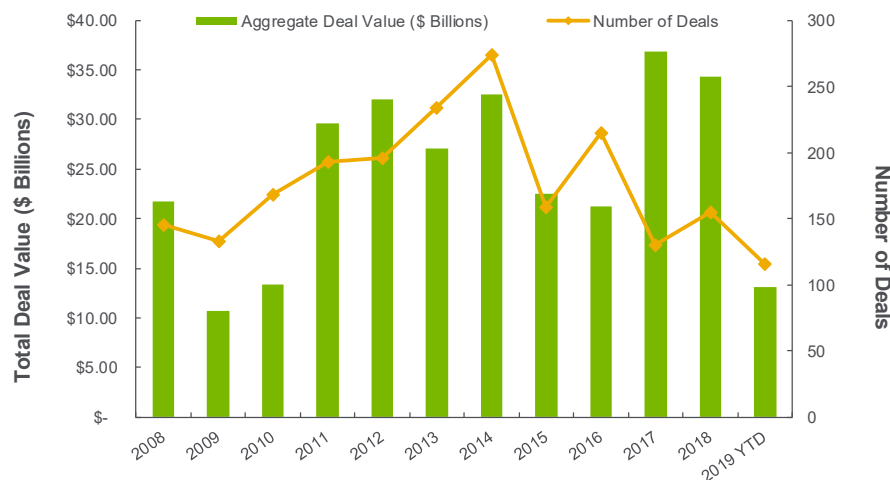
Activity

- Energy and utilities industry managers completed 116 deals totaling a reported \$13.2 billion through Q3 2019, representing 74.8% and 38.2% of 2018's total deal activity and total deal value, respectively.¹
- WTI crude oil prices increased during the quarter, while Brent crude oil prices decreased.
 - WTI crude oil prices increased 4.2% during the quarter to \$56.95/bbl.¹¹
 - Brent crude oil prices ended the quarter at \$62.83/bbl, down 2.2% from Q2 2019.¹¹
- Natural gas prices (Henry Hub) increased by a 6.7% during the third quarter, ending at \$2.56 per MMBtu.¹¹
- A total of 860 crude oil and natural gas rotary rigs were in operation in the U.S. at the end of Q3 2019, down 11.1% from the prior quarter. Crude oil rigs represented 82.9% of the total rigs in operation, while gas rigs represented 17.0% of the total rigs in operation.¹⁵
- The price of iron ore (Tianjin Port) ended the third quarter at \$93.08 per dry metric ton, down by 14.6% quarter-over-quarter.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

Energy & Utilities Deal Activity



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. Federal Reserve
11. U.S. Energy Information Administration
12. Bloomberg
13. KPMG and CB Insights
14. Baker Hughes
15. Dow Jones Venture Capital Report

Notes:

FY: Fiscal year ended 12/31

YTD: Year to date

YE: Year end

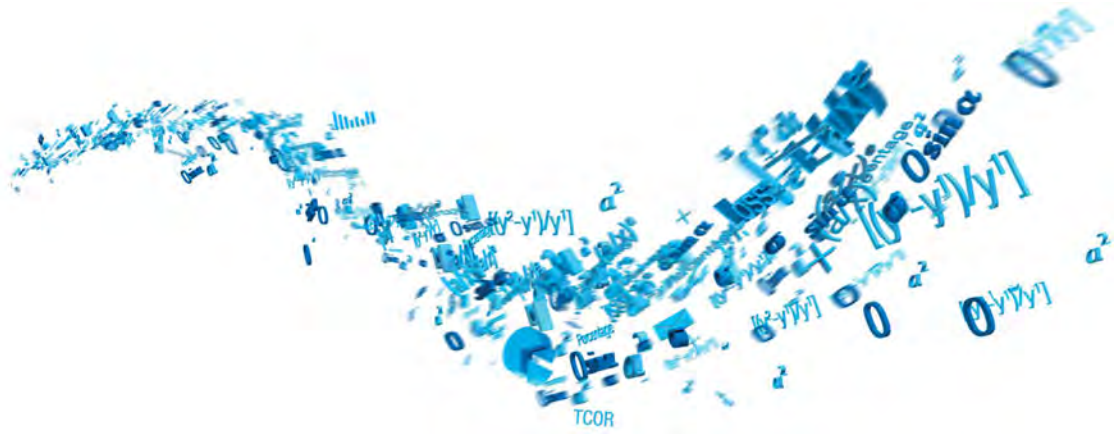
LTM: Last twelve months (aka trailing twelve months or TTM)

PPM: Purchase Price Multiples: Total Purchase Price / EBITDA

/bbl: Price per barrel

MMBtu: Price per million British thermal units

(This page left blank intentionally)



Appendix B:

Real Estate Market Update

3Q 2019

United States Real Estate Market Update (3Q19)

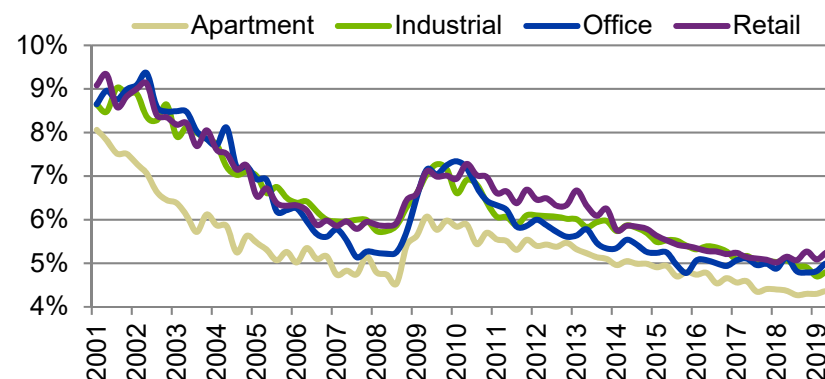
General

- The S&P 500 produced a gross total return of 1.7% during the quarter. The MSCI US REIT index produced a return of 7.7%. Consumer Sentiment declined to 93.2, but rebounded subsequent to quarter-end.
- Macro indicators for U.S. real estate continue to be positive; GDP grew at an annualized rate of 2.1% in the third quarter and headline CPI rose by 1.7% YoY, below the Fed's 2% target. As of quarter-end, the economy has now experienced 108 consecutive months of job growth. The Federal Reserve has cut rates three times this year, including one cut following quarter end, and the current effective rate is 1.55%.

Commercial Real Estate

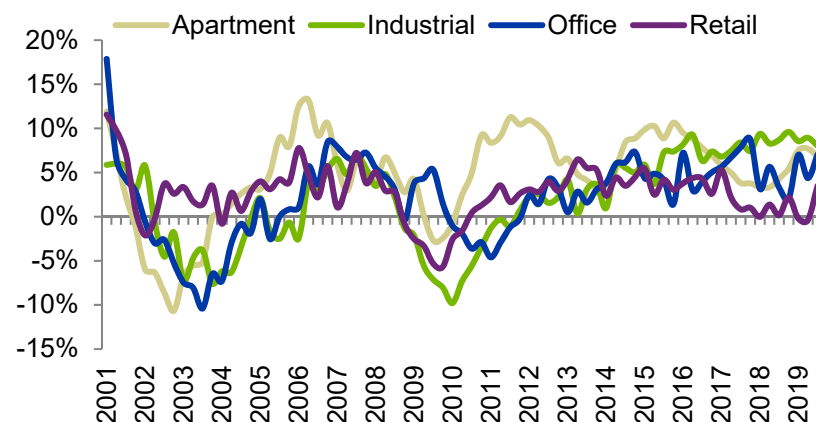
- Private real estate market carrying values remained flat over the quarter. Transaction cap rates (5.4%) expanded 4 bps during the quarter, while current valuation cap rates compressed across property sectors, apartments (-12 bps), industrial (-6 bps), office (-16 bps). Retail cap rates were flat during the quarter.
- NOI growth picked up across property sectors during the quarter, with the industrial sector continuing to outpace the other traditional property types. While the industrial sector has faced increasing supply, it continues to benefit from outsized demand tailwinds (e-commerce and economic growth). Retail NOI growth rebounded to a positive 3.5% year over year.
- In the third quarter of 2019, \$46 bn of aggregate capital was raised by real estate funds. Through the third quarter of 2019, private equity real estate funds raised \$131 bn which is an increase of 16% YoY. However, transaction volume declined during the 3rd quarter by -4% year over year to \$154 bn.
- 10-year treasury bond yields dropped 34 bps to 1.7% during the quarter, and, subsequent to quarter-end, have rebounded to 1.8%. The U.S. yield curve is no longer inverted.

Current Value Cap Rates by Property Type



Source: NCREIF

4 Qtr Rolling NOI Growth



Source: NCREIF

Sources: Bureau of Economic Analysis, U.S. Census Bureau, Federal Reserve Board, NCREIF, Cushman and Wakefield, Real Capital Analytics, Bloomberg LP., Preqin, University of Michigan, Green Street

Aon

Proprietary & Confidential

Investment advice and consulting services provided by Aon Hewitt Investment Consulting, Inc., an Aon Company.

United States Property Matrix (3Q19)



INDUSTRIAL	MULTIFAMILY
- In 3Q19, industrial properties were the highest returning sector at 3.2% and outperformed the NPI by 175 bps. - Transaction volumes reached \$41.3 billion in the third quarter of the year, a 66.0% year-over-year increase. Individual asset sales were up 20.6% year-over-year, while portfolio purchases turned in a year-over-year volume increase of 597.2%. Portfolio transaction volume was driven by multiple megadeals occurring in the sector, as well as a significant year-over-year decrease in entity-level transactions. This large portfolio transaction volume increase is expected to be an outlier and should regress to the mean positive growth rate. - The industrial sector continued to experience steady NOI growth of 8.0% over the past year, decreasing from the prior periods TTM growth of 8.9% in 2Q19. Market rent growth is expected to decelerate compared to the recent phenomenal pace, but still remains strong. - Vacancy increased by 24 bps to 3.4%, still remaining close to all-time historic lows. E-commerce continues to drive demand. - Industrial cap rates compressed approximately 19 bps from a year ago, to 4.74%. Industrial fundamentals still top all property sectors.	- The apartment sector delivered a 1.2% return during the quarter, underperforming the NPI by 23 bps. - Transaction volume in the third quarter of 2019 reached \$46.8 billion, an decrease of 5.6% year-over-year. This volume continues to make multifamily the most actively traded sector for the ninth straight quarter. - Cap rates decreased to 4.2%, compressing 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 above 94.2%, changes in vacancy remain flat 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	RETAIL
- The office sector returned 1.5% in 3Q19, 4 bps above the NPI return over the period. - Transaction volumes decreased by 7.5% year-over-year in Q3. Annual sales volumes equaled \$32.3 billion for the quarter. Single asset transactions accounted for 83% of volume. - Occupancy growth within the office sector has improved, increasing 1.1% year-over-year. Office continues to be the highest vacancy property type at close to 9.6%. - NOI growth of 7.0% in the last year is a positive as the sector continues to benefit from positive job growth. Sun Belt and tech-oriented West Coast office fundamentals are healthiest. - Office cap rates remained relatively flat from a year ago at approximately 4.8% in the third quarter. Office-using job growth is positive, though decelerating as expected.	- As of 3Q19, the retail sector delivered a quarterly return of 0.2%, performing 119 bps below the NPI. - Transaction volumes totaled \$15.0 billion in the third quarter, down 52.6% year-over-year. - Cap rates have expanded approximately 20 bps within the sector over the last year. Strong fundamental headwinds continue to affect the retail landscape. - NOI growth has turned a positive for the first time this year. NOI has increased 349 bps over the past year. Retail is expected to continue to suffer from the shift towards e-commerce. - Retail vacancy rates increased 21 bps over the past year to 7.1%. Many big box stores have closed as the need for retail space shrinks, translating to a negative outlook for rent growth.

Global Real Estate Market Update (3Q19)

- Global investment activity during the third quarter of 2019 was depressed relative to the same period in 2018. Year to date, the New York, San Francisco and Los Angeles metro markets have witnessed the greatest transaction volume.
- Broad geopolitical risk factors, such as Brexit and the Trade War, have negatively influenced sentiment. Fears of recession in the U.S. and an impending global slowdown also served to depress sentiment, in turn weighing on transaction volumes. Further monetary expansion has partially offset this trend, cushioning real estate yield spreads relative to sovereigns and supporting positive capital flows into the sector. Within the Eurozone, quantitative easing will provide stimulus to a flagging economy.

Global Total Commercial Real Estate Volume - 2018 - 2019

\$ US Billions	Q3 2019	Q3 2018	% Change Q3 19 – Q3 18	YTD 2018	H1 2018	% Change YTD 19 - YTD 18
Americas	136	146	-7%	355	366	-3%
EMEA	71	77	-9%	207	235	-12%
Asia Pacific	166	209	-21%	609	635	-4%
Total	372	433	-14%	1172	1236	-5%

Source: Real Capital Analytics, Inc., Q3' 19

- Investment volumes in the Americas decreased during the third quarter year-over-year, including the U.S., Canada, and Mexico all showing declines, with Brazil increasing volume.
- Asia Pacific countries broadly declined, with Hong Kong volume decreasing significantly as a product of continued protests and political uncertainty within the metro. Australia was the sole country to post YoY transaction volume growth, although by a lackluster 1%.
- In EMEA, Brexit continued to press UK investment volumes lower, a 32% decline from third quarter 2018. Other EMEA markets saw similar declines – with France as a notable outlier – as trade tensions weigh on export reliant countries such as Germany.
- In the office sector, global leasing activity was healthy, leasing volumes decreased 3% YoY. The U.S. office market was relatively strong, although leasing reached the lowest level since first quarter 2017. Europe experienced an uptick in demand, and office up-take increased 7% over the previous year. Central and Eastern Europe drove the trend, and experienced a 30% increase in activity.
- The retail sector continued to face headwinds globally as e-commerce disrupts traditional consumer spending habits. Within the U.S., net absorption dropped sharply, down 60% YoY. Surprisingly, mall vacancy held firm and rents rose moderately. Across Europe, rents moved downward, while APAC markets retail markets have remained largely neutral.
- The multifamily market in the U.S. has continued to see strong growth, with vacancy rates decreasing to a cycle low. Development continues, possibly presenting future supply headwinds. Rent control and other regulations hampered European markets, but investment volume remains positive. APAC markets were mixed, a result of macroeconomic uncertainty.
- Industrial properties continued their ascent, with robust uptake globally driven by logistics and omnichannel distribution demand. New supply has been increasing rapidly, and there are signs of slowing demand in Asia and Europe.

Global Outlook - GDP (Real) Growth % pa, 2019-2021

	2019	2020	2021
Global	3.1	3.1	3.2
Asia Pacific	4.4	4.3	4.4
Australia	1.8	2.4	2.5
China	6.1	5.9	5.7
India	6.0	5.6	6.4
Japan	0.9	0.3	0.8
North America	2.1	1.7	1.9
US	2.3	1.8	1.9
EMEA	2.1	2.4	2.6
European Union	1.4	1.3	1.5
France	1.3	1.2	1.3
Germany	0.5	0.7	1.2
UK	1.2	1.1	1.5

Source: Bloomberg (December 2, 2019)

Note: 2021 projections are not yet available for certain regions

TAB H

Report

Meketa Capital Markets Outlook & Risk Metrics

This page intentionally left blank.



Capital Markets Outlook & Risk Metrics

As of December 31, 2019

M E K E T A I N V E S T M E N T G R O U P

100 LOWDER BROOK DRIVE SUITE 1100 WESTWOOD MA 02090

781 471 3500 fax 781 471 3411 www.meketagroup.com

Capital Markets Outlook

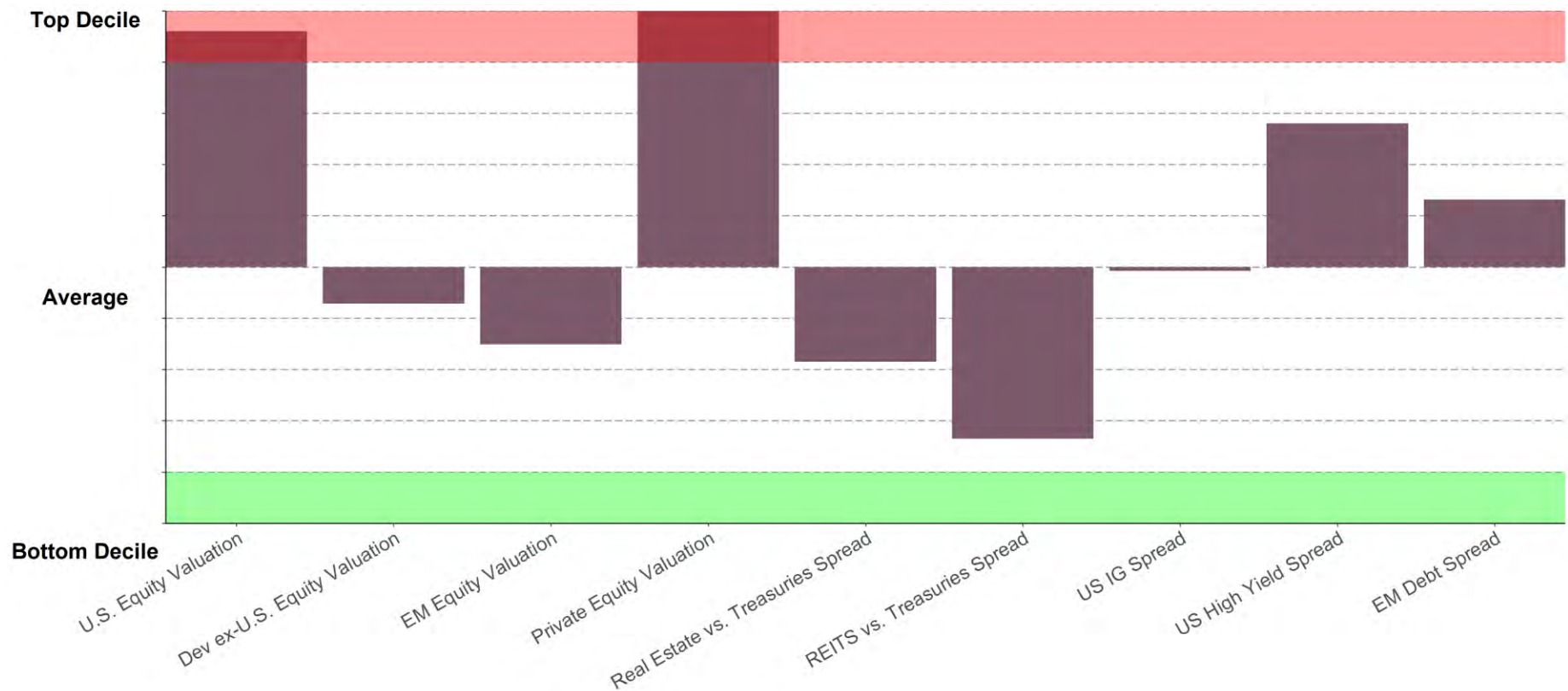
Takeaways

- December capped off a historically strong year for most risk-oriented markets. Global equity markets generally produced gains in the 2-4% range during the month, with full calendar year returns ending up approximately in the 18-32% range.
- With the exception of long-term interest rates (which ticked up during the month), the yield curve remained relatively stable in December. On a trailing one-year basis, however, interest rates declined by a material margin as the Federal Reserve lowered rates three times in 2019. From a performance perspective, broad investment grade bonds produced one-year returns in the high single-digits whereas long US Treasury bonds generated a return of nearly 15% for the year.
- Due in part to strong returns across nearly all asset classes in 2019, investors should anticipate that long-term, forward-looking returns will be lower as of early-2020 when compared to early-2019 capital market assumptions.
- US equity markets remain expensive whereas non-US equity markets remain reasonably valued relative to their histories. US credit and emerging markets debt spreads remain reasonably valued relative to their histories, although the richness of US high yield has recently increased (i.e., is now more expensive).
- Relative to their counterparts (growth and large cap), value and small cap equities continue to remain attractive from a valuation perspective.
- Implied equity market volatility¹ remained at relatively low levels throughout December, generally staying in the 12-16 range throughout the entire month (the historical average is ~19).
- The Market Sentiment Indicator² stayed **green** 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.

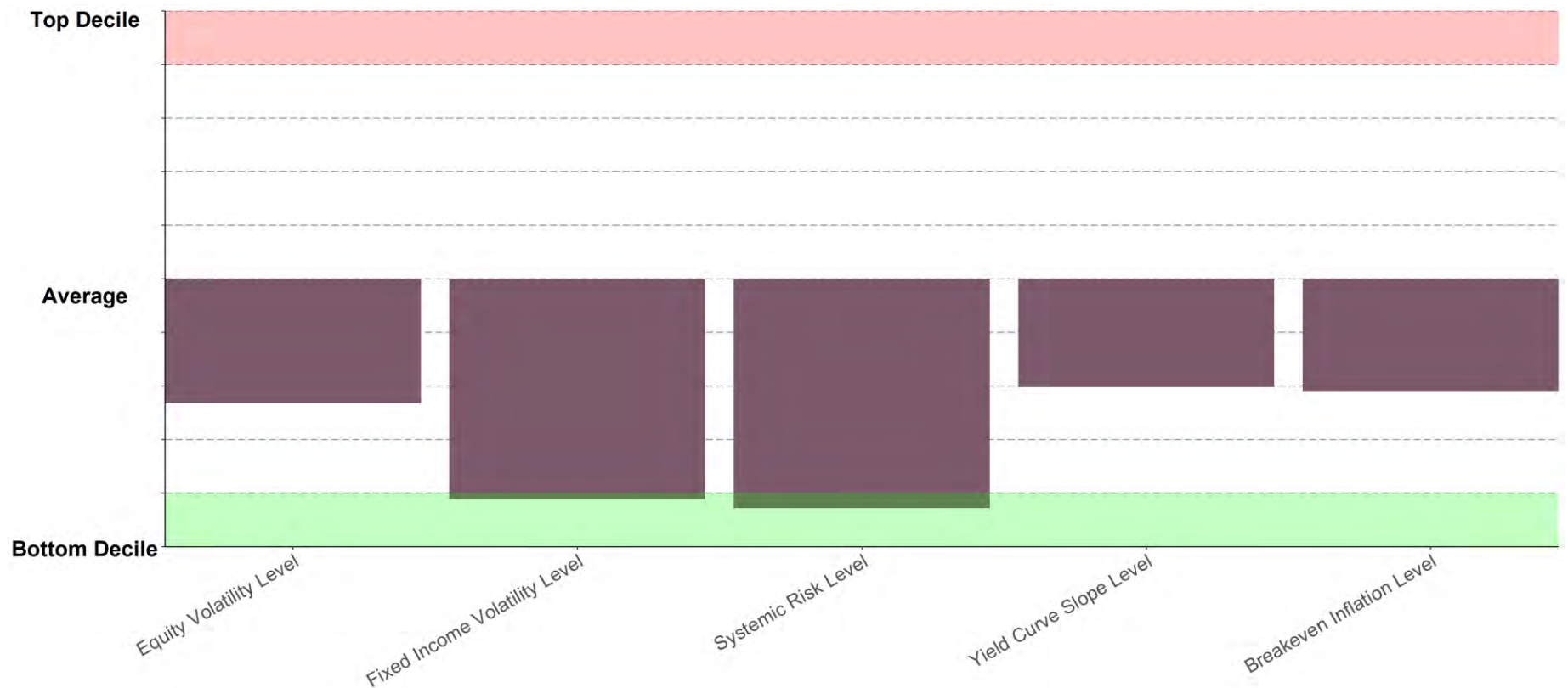
Risk Overview/Dashboard (1) (As of December 31, 2019)¹



- Dashboard (1) summarizes the current state of the different valuation metrics per asset class relative to their own history.

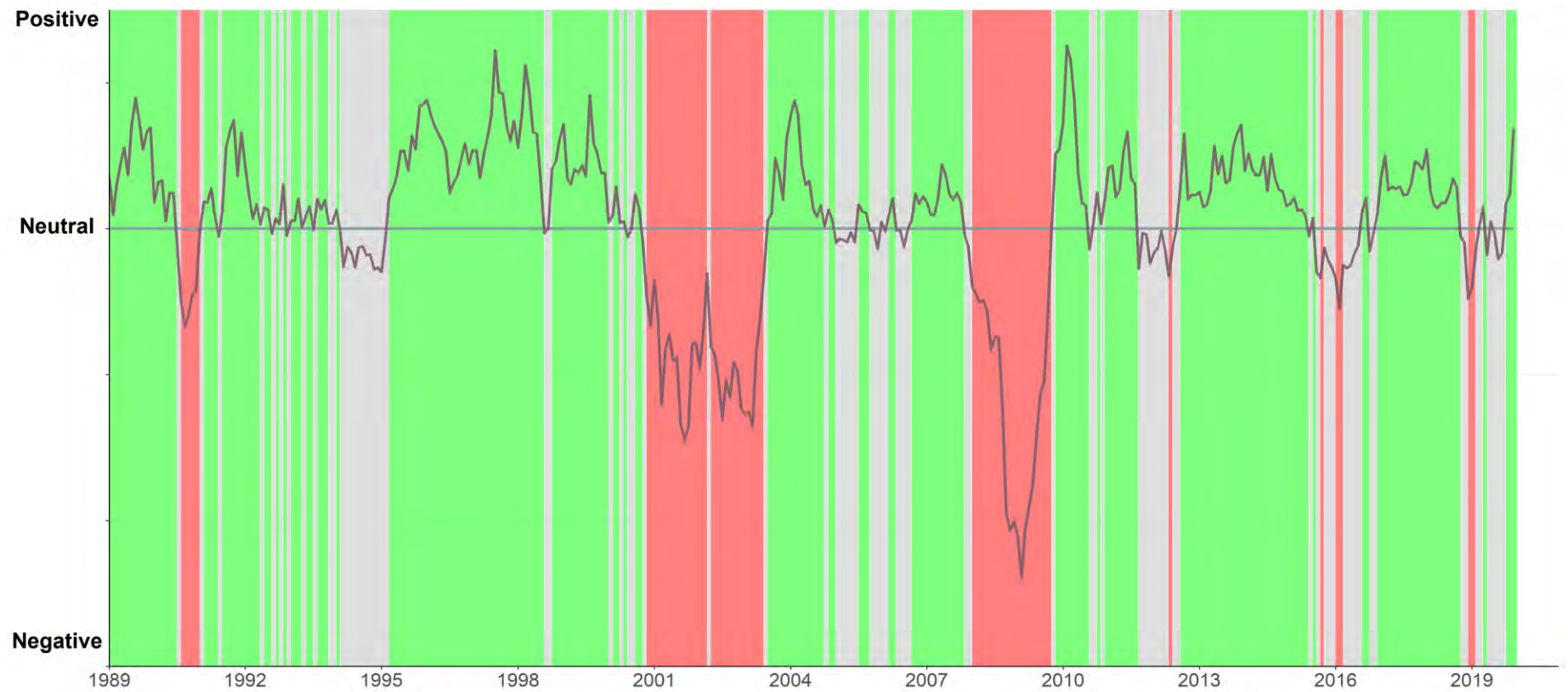
¹ With the exception of Private Equity Valuation, that is YTD as of November 30, 2019.

Risk Overview/Dashboard (2) (As of December 31, 2019)



- Dashboard (2) shows how the current level of each indicator compares to its respective history.

Market Sentiment Indicator (All History) (As of December 31, 2019)



Market Sentiment Indicator (Last Three Years) (As of December 31, 2019)



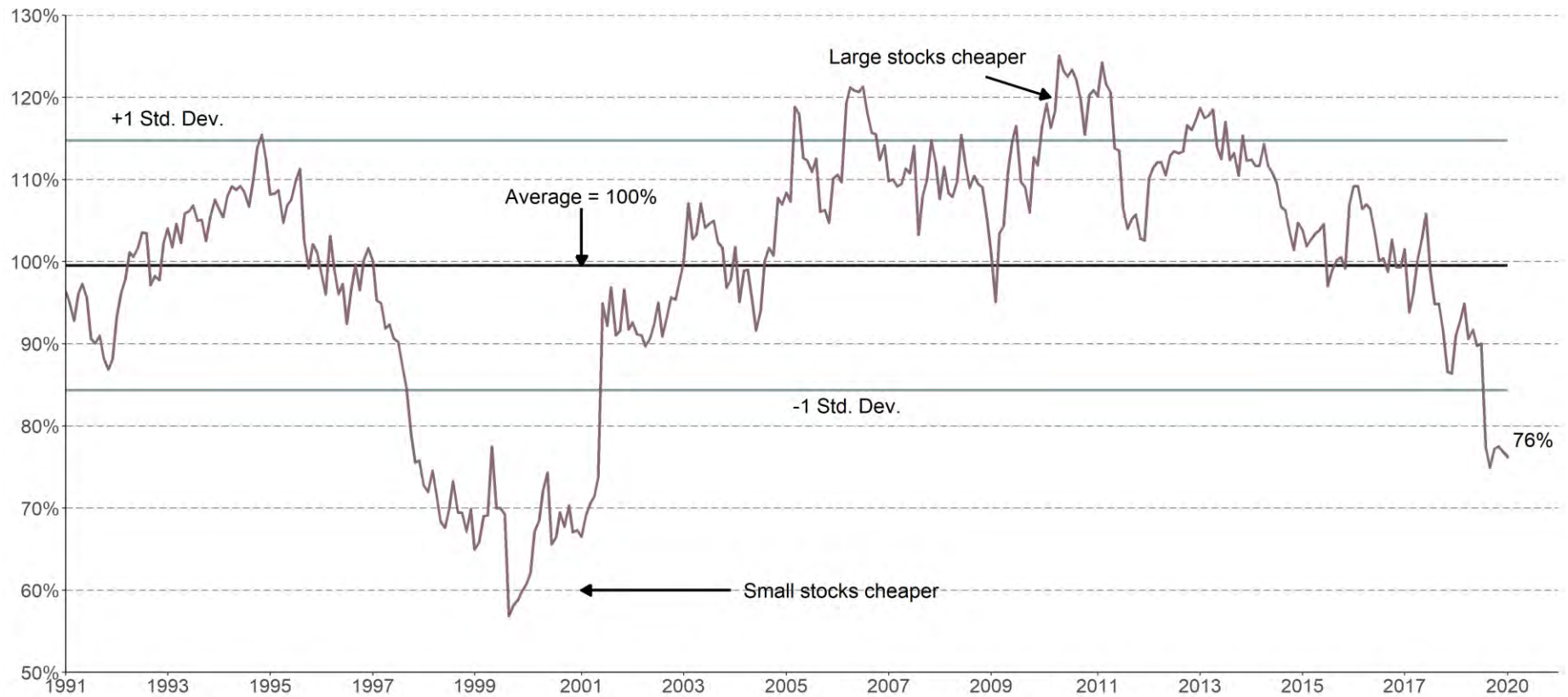
US Equity Cyclically Adjusted P/E¹ (As of December 31, 2019)



- 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/E¹ (As of December 31, 2019)



- 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/E¹ (As of December 31, 2019)



- 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/E¹ (As of December 31, 2019)



- 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.

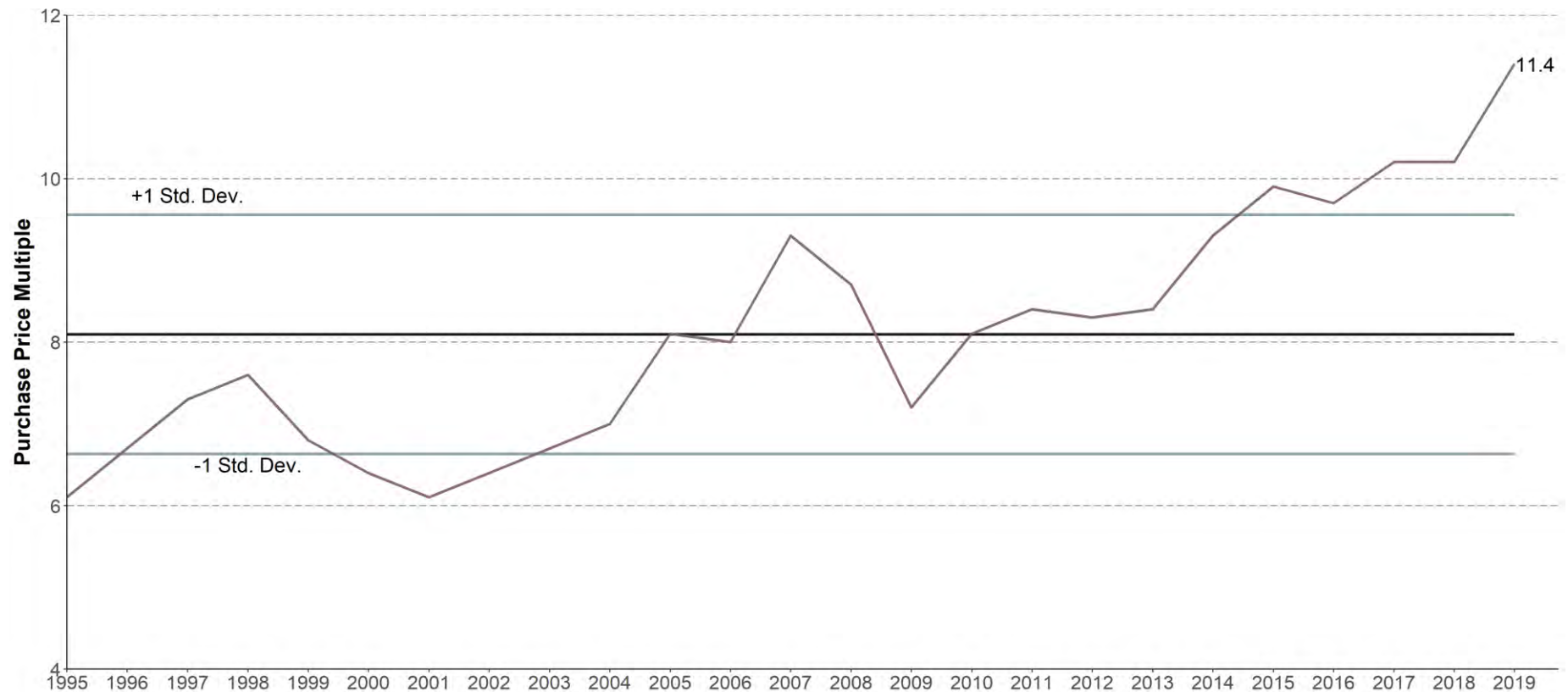
Emerging Market Equity Cyclically Adjusted P/E¹ (As of December 31, 2019)



- 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 Multiples¹ (As of November 30, 2019)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 2019 (YTD).

Core Real Estate Spread vs. Ten-Year Treasury¹ (As of December 31, 2019)



- 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.

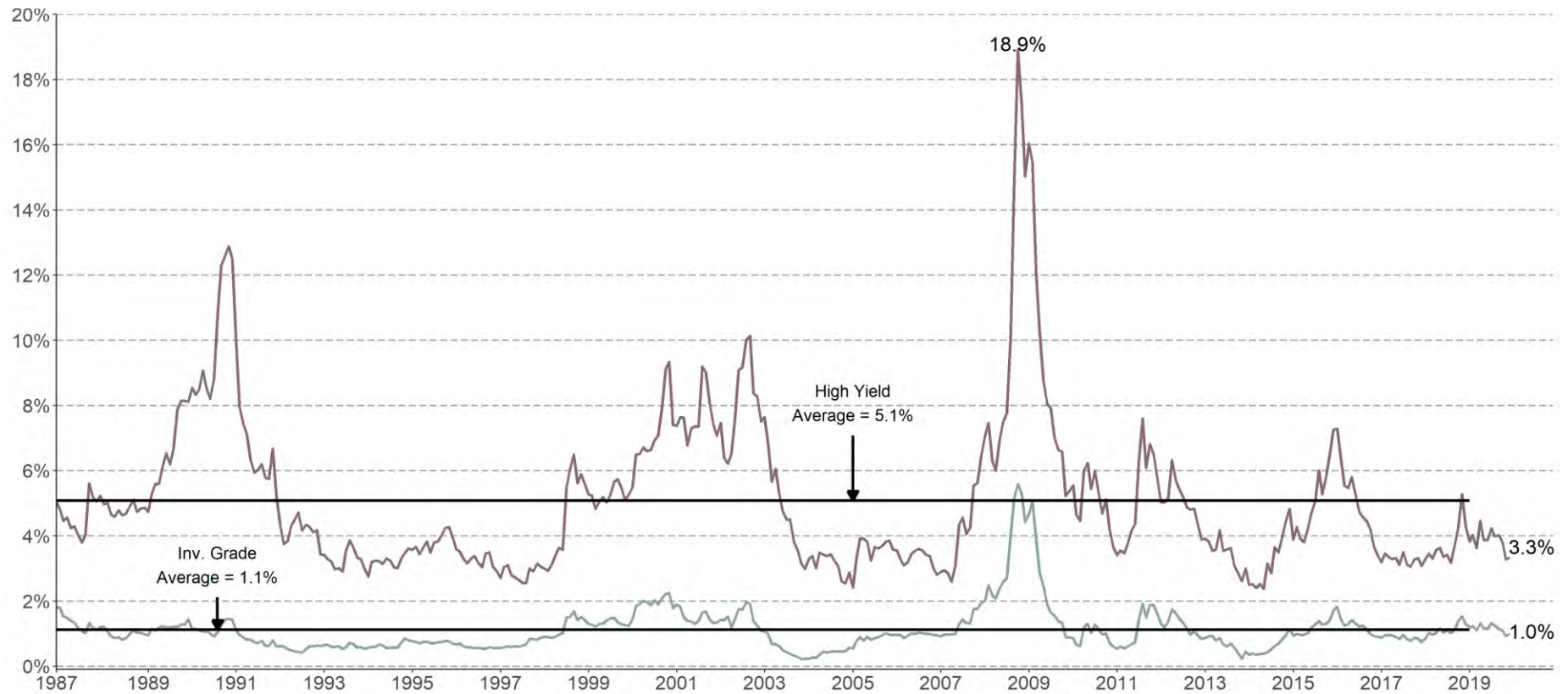
REITs Dividend Yield Spread vs. Ten-Year Treasury¹ (As of December 31, 2019)



- 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 Spreads¹ (As of December 31, 2019)



- 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.

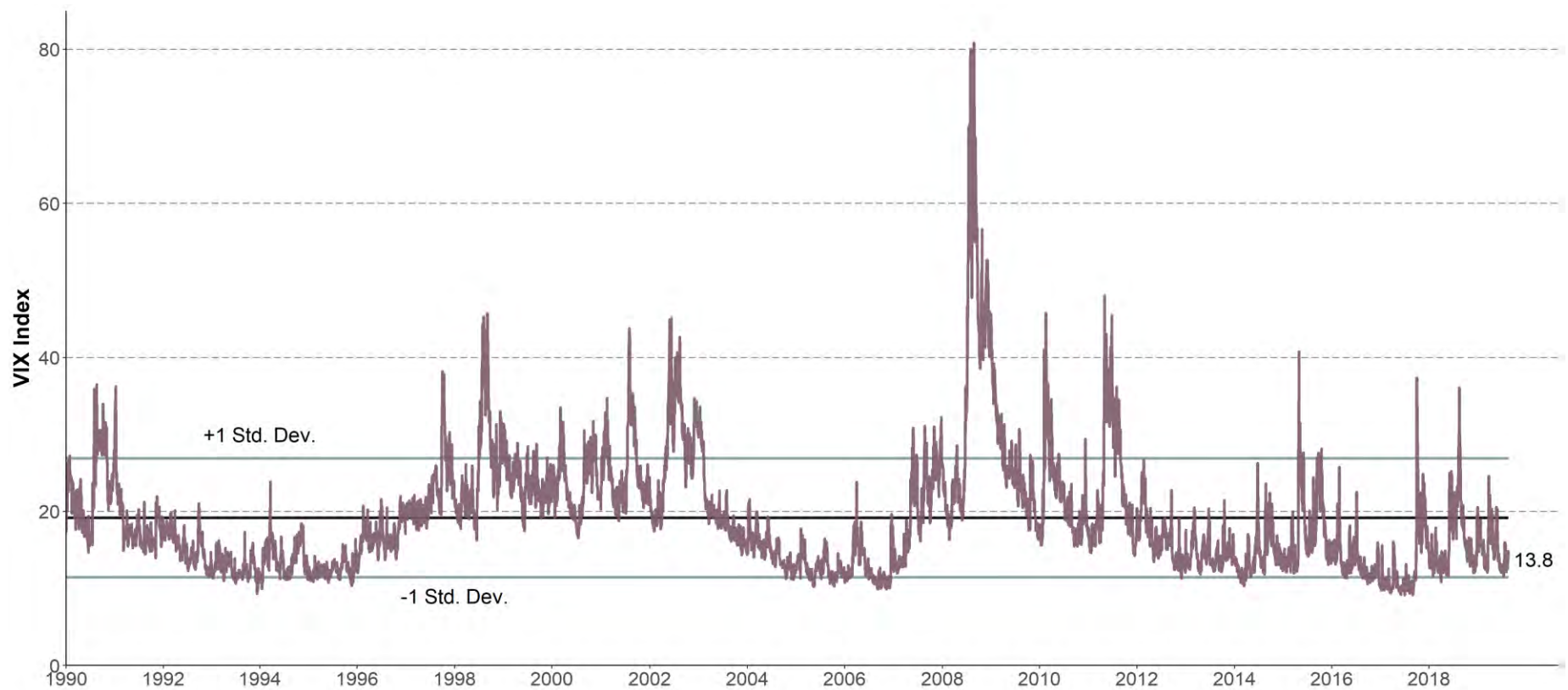
Emerging Market Debt Spreads¹ (As of December 31, 2019)



- 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 December 31, 2019)



- 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.

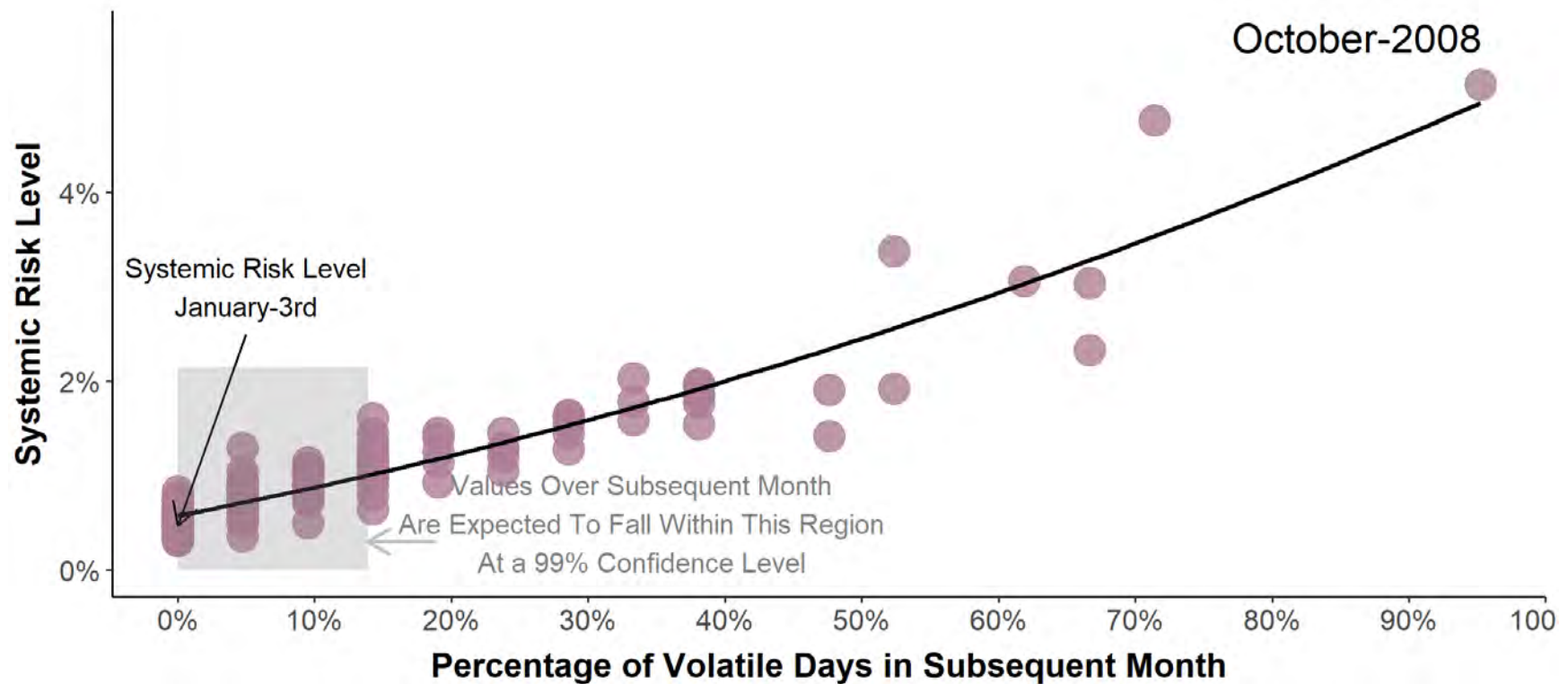
Fixed Income Volatility ¹ (As of December 31, 2019)



- 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.

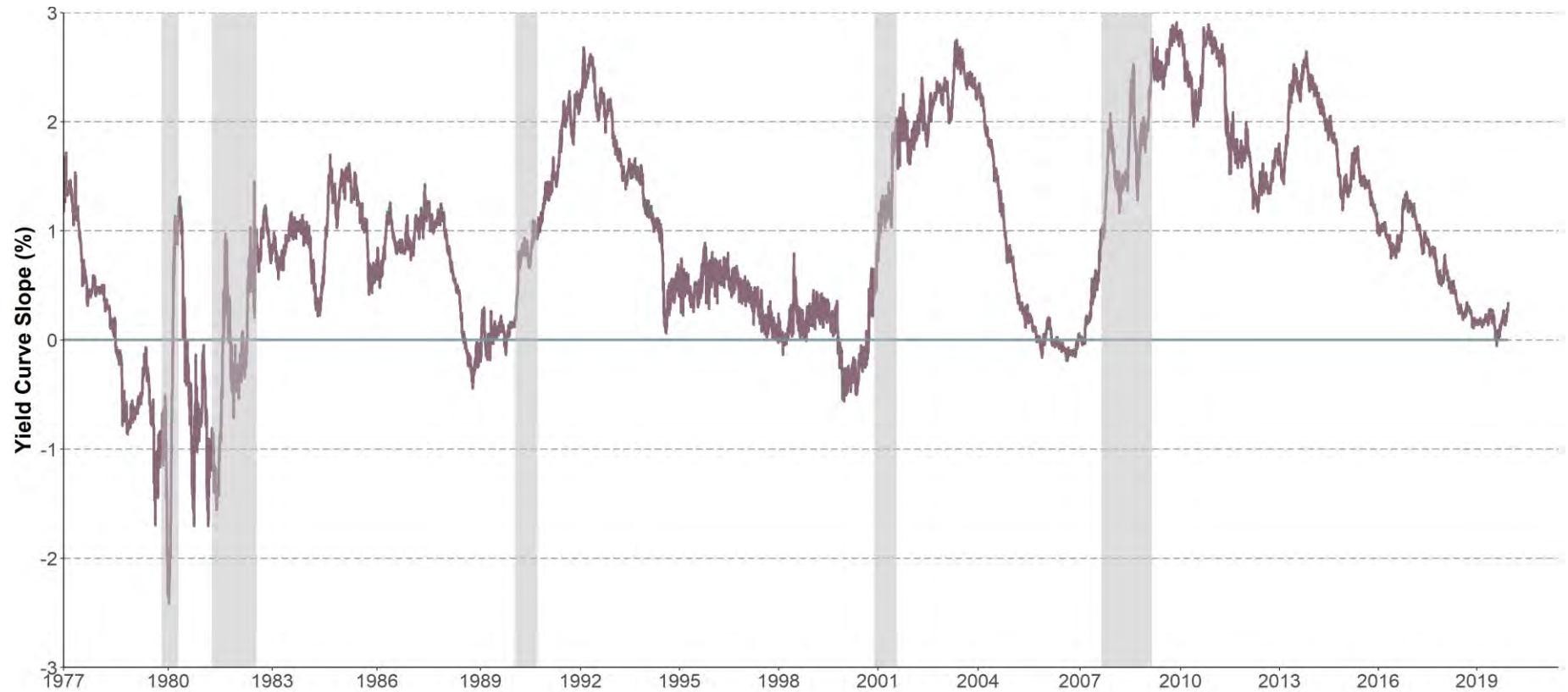
Systemic Risk and Volatile Market Days¹ (As of January 3, 2020)



- 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 December 31, 2019)



- 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.

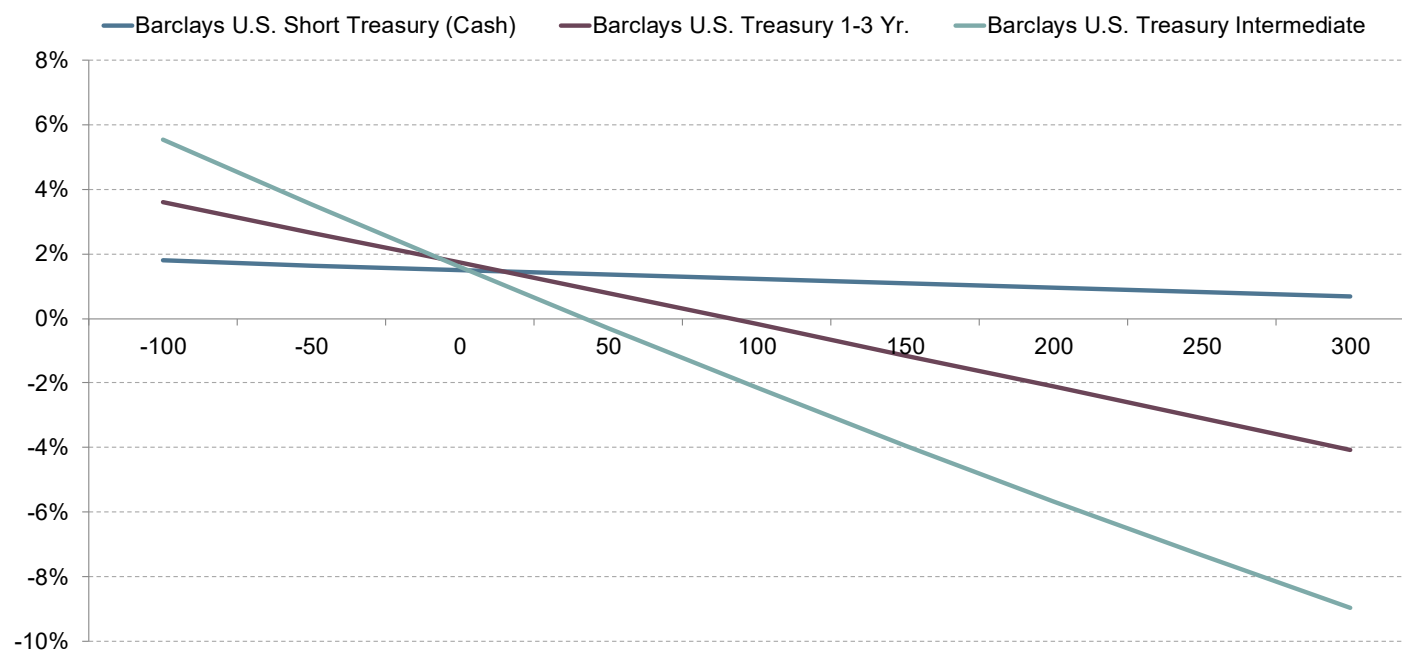
Ten-Year Breakeven Inflation¹ (As of December 31, 2019)



- This chart details the difference between nominal and inflation-adjusted US Treasury bonds. A higher (lower) figure indicates higher (lower) inflation expectations.

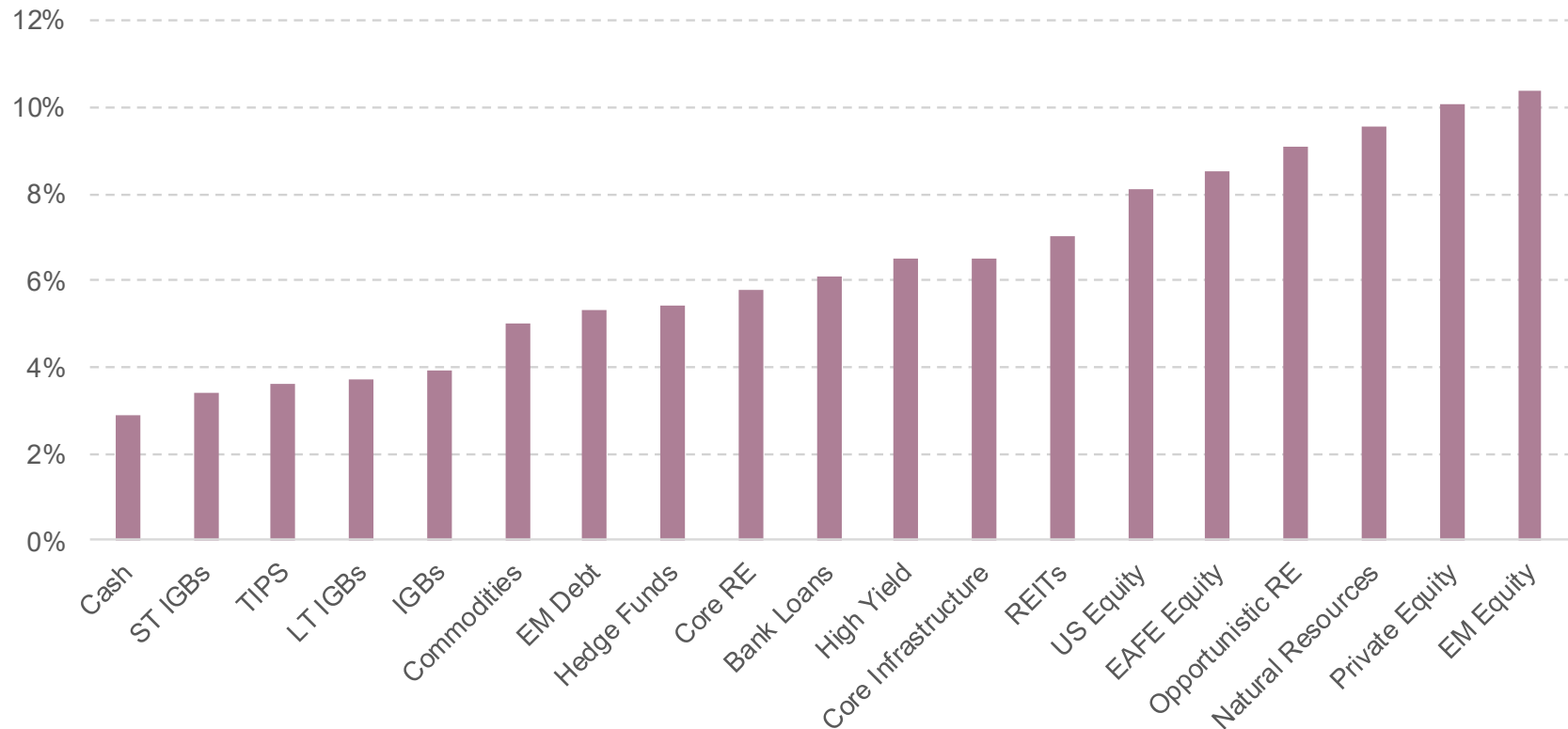
¹ Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

Total Return Given Changes in Interest Rates (bps)¹ (As of December 31, 2019)



	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)	1.9%	1.8%	1.7%	1.5%	1.4%	1.2%	1.1%	1.0%	0.8%	0.7%	0.28
Barclays US Treasury 1-3 Yr.	4.5%	3.6%	2.7%	1.7%	0.8%	-0.2%	-1.1%	-2.1%	-3.1%	-4.1%	1.89
Barclays US Treasury Intermediate	7.6%	5.6%	3.6%	1.6%	-0.3%	-2.1%	-3.9%	-5.7%	-7.3%	-9.0%	3.85
Barclays US Treasury Long	34.1%	22.4%	11.8%	2.2%	-6.3%	-13.9%	-20.3%	-25.7%	-30.1%	-33.4%	18.15

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 Returns¹

- This chart details Meketa's long-term forward-looking expectations for total returns across asset classes.

¹ Source: Meketa Investment Group's 2019 Annual Asset Study.

Appendix

Data Sources and Explanations¹

- 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.
- 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.

¹ All Data as of December 31, 2019 unless otherwise noted.

Appendix

Data Sources and Explanations¹

- 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.
 - 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 December 31, 2019 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.

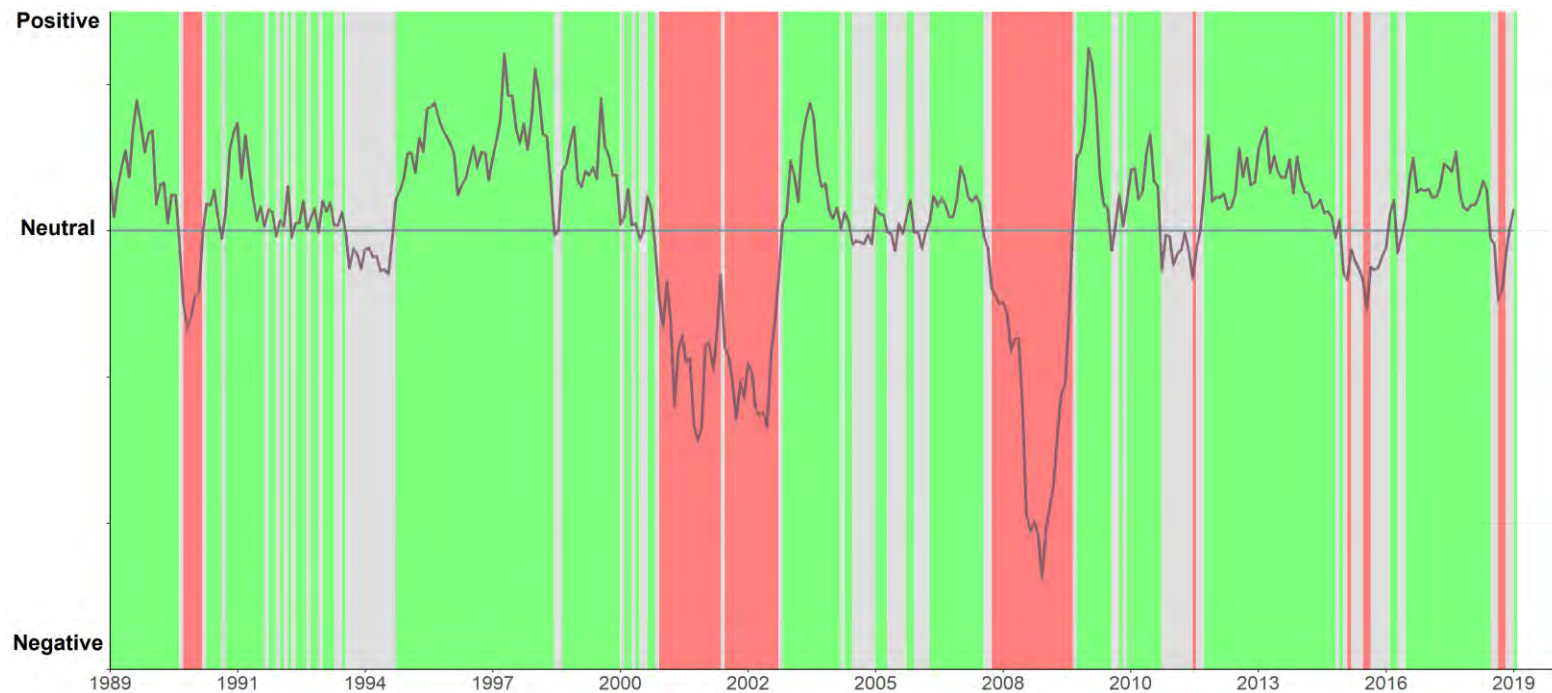
- Meketa’s Risk Metrics, which rely significantly on standard market measures of relative valuation, often provide valid early signals of increasing long-term risk levels in the global investment markets. However, as is the case with numerous valuation measures, the Risk Metrics may convey such risk 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.

This page intentionally left blank.

TAB I

Report

Comprehensive Performance Report

December 31, 2019

This page intentionally left blank.



Comprehensive Performance Report

December 31, 2019



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.

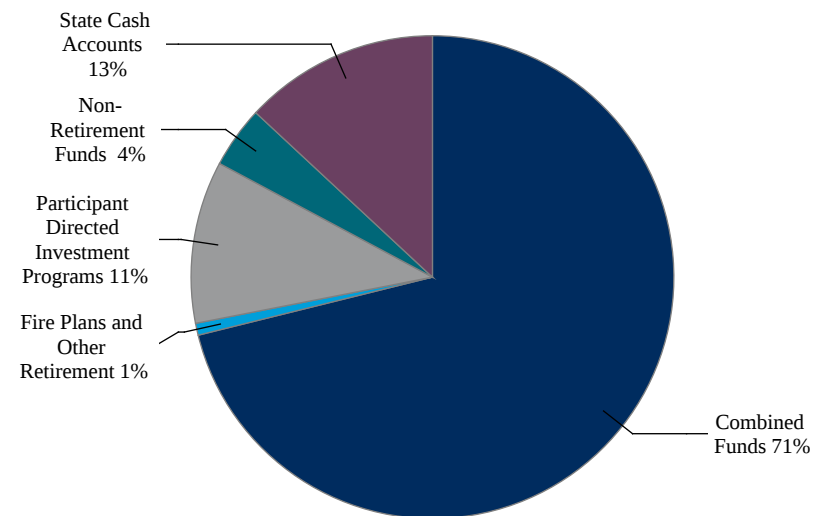
State Cash

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

	<u>\$ Millions</u>
COMBINED FUNDS	\$74,208
FIRE PLANS + OTHER RETIREMENT PLANS	836
PARTICIPANT DIRECTED INVESTMENT PROGRAM	11,340
State Deferred Compensation Plan	7,905
Health Care Savings Plan	1,280
Unclassified Employees Retirement Plan	341
Hennepin County Supplemental Retirement Plan	167
PERA Defined Contribution Plan	78
Minnesota College Savings Plan	1,561
Minnesota Achieve a Better Life Experience	9
NON-RETIREMENT FUNDS	4,305
Assigned Risk Plan	293
Permanent School Fund	1,612
Environmental Trust Fund	1,303
Closed Landfill Investment Fund	104
Miscellaneous Trust Funds	281
Other Postemployment Benefits Accounts	712
STATE CASH ACCOUNTS	13,636
Invested Treasurer's Cash	13,410
Other State Cash Accounts	225
TOTAL SBI AUM	104,325



Note: Differentials within column amounts may occur due to rounding



Quarterly Report

Table of Contents

Combined Funds	5
Domestic Equity	
International Equity	
Fixed Income	
Private Markets	
Treasuries	
 Participant Directed Investment Program	 69
Supplemental Investment Fund	
Deferred Compensation Program Minnesota	
College Savings Plan	
Achieve a Better Life Experience	
 Non-Retirement Funds	 85
Assigned Risk Plan	
Permanent School Fund	
Environmental Trust Fund	
Closed Landfill Investment Fund	
Non-Retirement Managers	
 State Cash Accounts	 93
Invested Treasurer's Cash	
Other State Cash Accounts	
 Addendum	 95

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 because of portfolio management decisions to group managers in different aggregates over time.



Combined Funds

December 31, 2019



Combined Funds Summary

Combined Funds Change in Market Value (\$Millions)

	<u>One Quarter</u>
COMBINED FUNDS	
Beginning Market Value	\$70,692
Net Contributions	-590
Investment Return	4,106
Ending Market Value	74,208

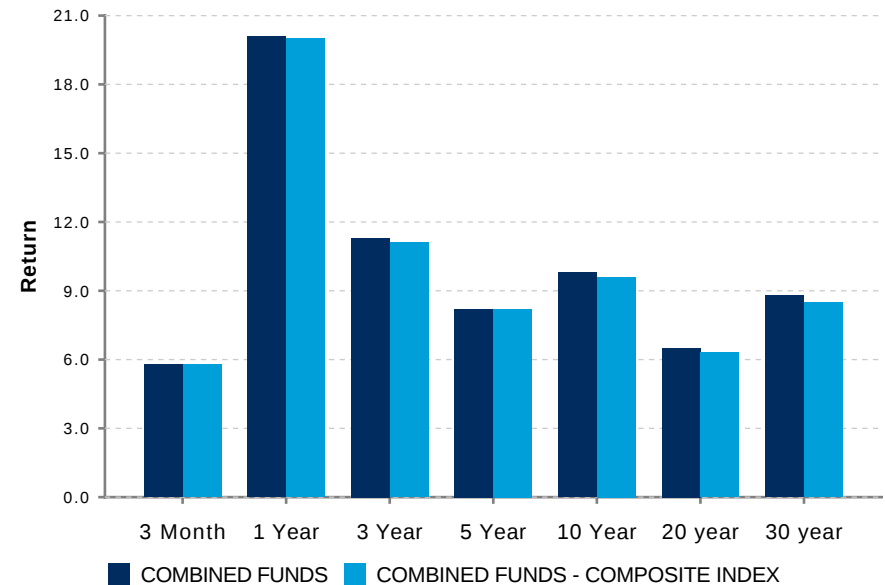
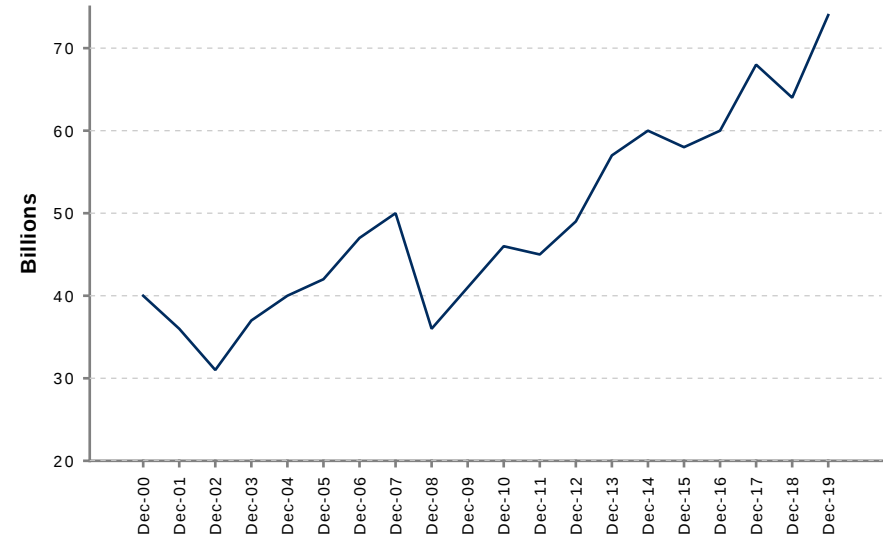
The change in market value of the Combined Funds since the end of last quarter is due to net contributions and investment returns.

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.

	<u>Qtr</u>	<u>FYTD</u>	<u>1 Yr</u>	<u>3 Yr</u>	<u>5 Yr</u>	<u>10 Yr</u>	<u>20 Yr</u>	<u>30 Yr</u>
COMBINED FUNDS	5.8%	6.9%	20.1%	11.3%	8.2%	9.8%	6.5%	8.8%
COMBINED FUNDS - COMPOSITE INDEX	5.8	6.9	20.0	11.1	8.2	9.6	6.3	8.5
Excess	0.1	-0.0	0.1	0.2	0.0	0.3	0.2	0.3

Asset Growth



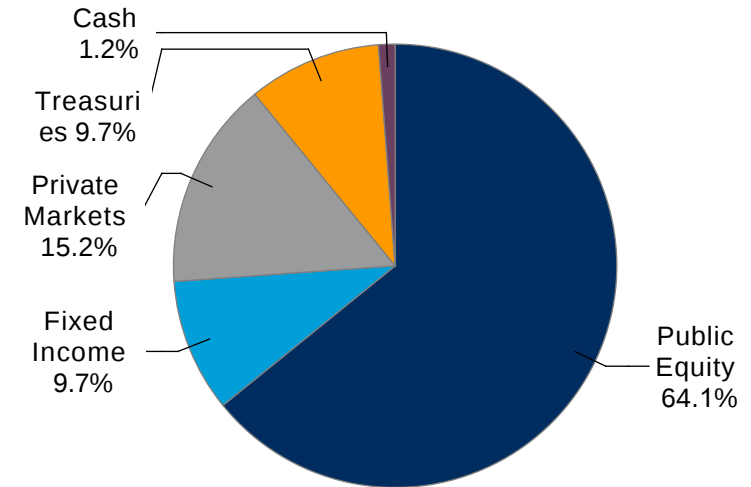


Combined Funds Summary

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.

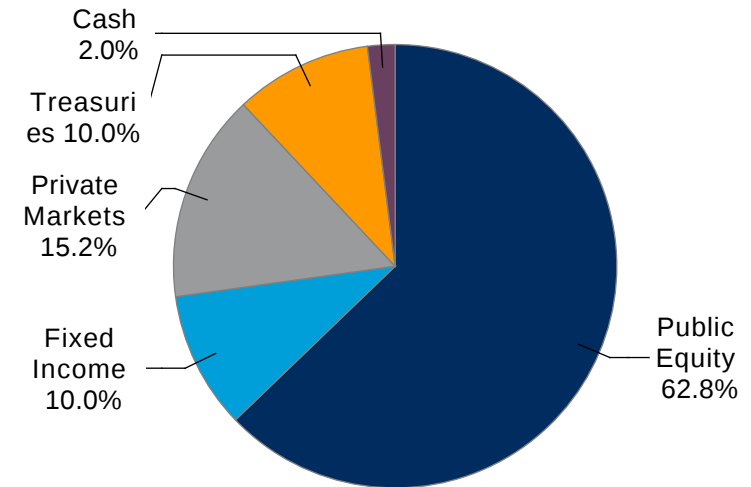
	<u>(Millions)</u>	<u>Actual Mix</u>	<u>Policy Target</u>
Public Equity	\$47,603	64.1%	53.0%
Fixed Income	7,218	9.7	10.0
Private Markets	11,293	15.2	25.0
Treasuries	7,231	9.7	10.0
Cash	863	1.2	2.0
TOTAL	74,208	100.0	



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.

	<u>Policy Weight</u>	<u>Benchmark</u>
Public Equity	62.8%	Public Equity Benchmark
Fixed Income	10.0	BB Barclays U.S. Aggregate
Private Markets	15.2	Private Markets
Treasuries	10.0	BB Barclays Treasury 5+ Years
Cash	2.0	3 Month T-Bills





Combined Funds Asset Class Performance Summary

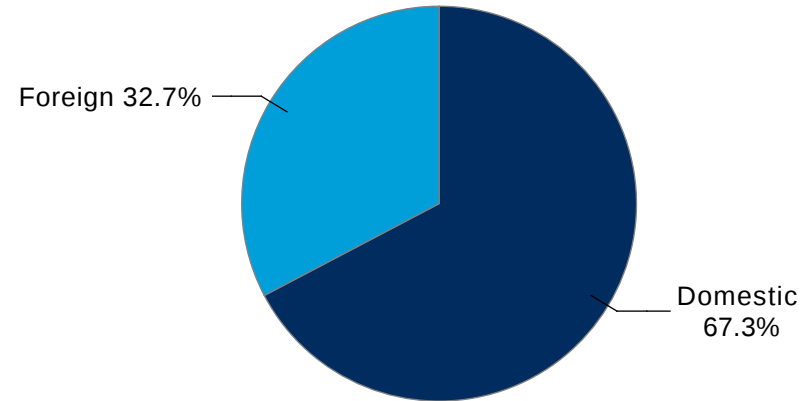
Public Equity

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.



	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>30 year</u>
Public Equity	9.0%	9.1%	28.0%	13.1%	9.5%	11.3%	5.6%	9.1%
Public Equity Benchmark	9.1	9.2	27.7	13.0				
Excess	-0.0	-0.1	0.3	0.1				
Domestic Equity	9.1	9.9	30.7	14.5	10.9	13.3	6.0	9.6
Domestic Equity Benchmark	9.1	10.3	30.8	14.5	11.2	13.4	6.2	9.8
Excess	-0.1	-0.4	-0.2	0.0	-0.3	-0.1	-0.1	-0.2
International Equity	9.0	7.3	22.4	10.1	5.9	5.5	4.1	
International Equity Benchmark	8.9	6.9	21.5	9.9	5.5	5.0	3.8	
Excess	0.1	0.4	0.9	0.3	0.4	0.5	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 Fixed Income and Treasuries. The Combined Funds performance for these asset classes is shown here.

The Core Fixed Income 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.

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>30 year</u>
Fixed Income	0.5%	2.8%	9.7%	4.5%	3.6%	4.5%	5.4%	6.3%
Fixed Income Benchmark	0.2	2.5	8.7	4.0	3.0	3.7	5.0	5.9
Excess	0.3	0.3	1.0	0.5	0.5	0.8	0.4	0.4
Treasuries	-2.2	2.2	10.5					
BBG BARC 5Y + Us Tsy Idx	-2.3	2.2	10.4					
Excess	0.1	0.0	0.0					

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.

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>30 year</u>
Cash	0.5%	1.1%	2.3%	1.8%	1.2%	0.8%	2.1%	3.6%
US 3-Month Treasury Bill	0.5	1.0	2.3	1.7	1.1	0.6	1.8	2.9

Note:

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

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>25 year</u>	<u>30 year</u>
Private Markets	2.4%	4.2%	6.6%	13.5%	9.8%	12.2%	12.5%	13.6%	12.2%
Private Equity	4.2%	7.8%	13.2%	17.7%	15.0%	15.1%	13.5%	15.4%	
Private Credit	3.3	4.7	8.5	13.1	11.9	13.2	12.4		
Resources	-4.0	-7.4	-13.2	3.1	-5.4	4.5	14.5	14.1	
Real Estate	2.3	5.5	9.5	10.4	10.7	10.9	9.1	9.7	

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.



Quarterly Report

Asset Class & Manager Performance

December 31, 2019

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.

This page intentionally left blank.



Domestic Equity

December 31, 2019

Minnesota State Board of Investment
Quarter Ending December 31, 2019
Domestic Equity Managers



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Total Domestic Equity										
ACTIVE DOMESTIC EQUITY AGGREGATE (1)	\$4,658,817,762	14.3%	9.5%	6.7%	27.6%	12.9%	9.7%	12.6%		
Active Domestic Equity Benchmark			9.4	9.0	28.2	11.8	9.9	12.7		
Excess			0.1	-2.3	-0.6	1.1	-0.2	-0.1		
SEMI PASSIVE DOMESTIC EQUITY AGGREGATE (2)	2,522,231,632	7.7	8.9	10.1	30.9	15.1	11.2	13.6		
Semi Passive Domestic Equity Benchmark			9.0	10.6	31.4	15.0	11.5	13.5		
Excess			-0.2	-0.4	-0.5	0.1	-0.2	0.1		
PASSIVE DOMESTIC EQUITY AGGREGATE (3)	25,412,824,931	78.0	9.0	10.5	31.3	14.8	11.3	13.5		
Passive Domestic Equity Benchmark			9.1	10.5	31.3	14.9	11.4	13.5		
Excess			-0.0	0.0	0.0	-0.1	-0.0	-0.0		
TRANSITION AGGREGATE DOMESTIC EQUITY (4)	17,227	0.0								
TOTAL DOMESTIC EQUITY (5)	32,593,891,551	100.0	9.1	9.9	30.7	14.5	10.9	13.3	10.6	01/1984
Domestic Equity Benchmark			9.1	10.3	30.8	14.5	11.2	13.4	10.8	01/1984
Excess			-0.1	-0.4	-0.1	0.0	-0.3	-0.1	-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.



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Total Domestic Equity					
ACTIVE DOMESTIC EQUITY AGGREGATE (1)	-6.5%	20.6%	10.9%	-0.4%	9.3%
Active Domestic Equity Benchmark	-8.0	18.3	15.7	-0.6	11.0
Excess	1.4	2.3	-4.8	0.3	-1.7
SEMI PASSIVE DOMESTIC EQUITY AGGREGATE (2)	-4.9	22.5	11.1	0.5	14.2
Semi Passive Domestic Equity Benchmark	-4.8	21.7	12.1	0.9	13.2
Excess	-0.1	0.8	-1.0	-0.4	1.0
PASSIVE DOMESTIC EQUITY AGGREGATE (3)	-5.0	21.3	12.6	0.5	12.6
Passive Domestic Equity Benchmark	-5.0	21.5	12.5	0.5	12.6
Excess	-0.0	-0.2	0.1	0.0	0.0
TRANSITION AGGREGATE DOMESTIC EQUITY (4)					
TOTAL DOMESTIC EQUITY (5)	-5.3%	21.4%	11.5	0.3	12.3
Domestic Equity Benchmark	-5.2%	21.1%	12.7	0.5	12.6
Excess	-0.0%	0.2%	-1.3	-0.2	-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.



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Large Cap Growth										
SANDS	\$436,889,256	1.3%	10.5%	4.9%	33.5%	24.6%	13.1%	16.6%	11.5%	01/2005
Russell 1000 Growth			10.6	12.3	36.4	20.5	14.6	15.2	10.5	01/2005
Excess			-0.1	-7.3	-2.8	4.1	-1.5	1.4	1.0	
WINSLOW	293,973,646	0.9	9.3	8.9	34.2	23.0	14.3	14.7	11.2	01/2005
Russell 1000 Growth			10.6	12.3	36.4	20.5	14.6	15.2	10.5	01/2005
Excess			-1.3	-3.4	-2.2	2.5	-0.4	-0.5	0.7	
ZEVENBERGEN	390,613,462	1.2	15.0	2.2	43.0	25.5	15.4	15.0	11.2	04/1994
Russell 1000 Growth			10.6	12.3	36.4	20.5	14.6	15.2	10.1	04/1994
Excess			4.4	-10.0	6.7	5.0	0.7	-0.2	1.1	
RUSSELL 1000 GROWTH AGGREGATE	1,121,476,365	3.4	11.7	4.7	37.3	24.2	15.2	15.8		
Russell 1000 Growth			10.6	12.3	36.4	20.5	14.6	15.2		
Excess			1.1	-7.6	0.9	3.7	0.5	0.6		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Large Cap Growth					
SANDS	7.0%	35.3%	-6.9%	2.9%	9.1%
Russell 1000 Growth	-1.5	30.2	7.1	5.7	13.0
Excess	8.6	5.1	-13.9	-2.8	-3.9
WINSLOW	4.2	33.2	-1.9	6.7	11.0
Russell 1000 Growth	-1.5	30.2	7.1	5.7	13.0
Excess	5.7	3.0	-9.0	1.0	-2.0
ZEVENBERGEN	2.3	35.1	-2.8	6.4	3.4
Russell 1000 Growth	-1.5	30.2	7.1	5.7	13.0
Excess	3.8	4.9	-9.9	0.7	-9.6
RUSSELL 1000 GROWTH AGGREGATE	4.7%	33.4%	1.0	4.6	9.6
Russell 1000 Growth	-1.5%	30.2%	7.1	5.7	13.0
Excess	6.2%	3.2%	-6.1	-1.1	-3.4



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Large Cap Value										
BARROW HANLEY	\$351,520,913	1.1%	5.6%	9.7%	26.9%	11.0%	8.6%	11.6%	8.4%	04/2004
Russell 1000 Value			7.4	8.9	26.5	9.7	8.3	11.8	8.1	04/2004
Excess			-1.8	0.8	0.4	1.4	0.3	-0.2	0.4	
EARNEST PARTNERS	323,033,879	1.0	9.4	8.8	28.1	12.3	9.9	11.7	7.4	07/2000
Russell 1000 Value			7.4	8.9	26.5	9.7	8.3	11.8	7.5	07/2000
Excess			2.0	-0.1	1.5	2.6	1.6	-0.1	-0.1	
LSV	429,347,269	1.3	9.5	11.1	26.9	9.9	8.7	12.8	9.2	04/2004
Russell 1000 Value			7.4	8.9	26.5	9.7	8.3	11.8	8.1	04/2004
Excess			2.0	2.2	0.4	0.2	0.4	1.0	1.1	
RUSSELL 1000 VALUE AGGREGATE	1,103,902,061	3.4	8.1	10.1	27.4	10.9	8.8	12.0		
Russell 1000 Value			7.4	8.9	26.5	9.7	8.3	11.8		
Excess			0.7	1.3	0.9	1.3	0.5	0.2		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Large Cap Value					
BARROW HANLEY	-5.9%	14.6%	12.8%	-2.1%	13.0%
Russell 1000 Value	-8.3	13.7	17.3	-3.8	13.5
Excess	2.4	0.9	-4.5	1.7	-0.5
EARNEST PARTNERS	-7.7	19.9	16.2	-2.7	14.0
Russell 1000 Value	-8.3	13.7	17.3	-3.8	13.5
Excess	0.6	6.2	-1.1	1.1	0.5
LSV	-11.8	18.6	17.0	-2.2	14.0
Russell 1000 Value	-8.3	13.7	17.3	-3.8	13.5
Excess	-3.6	4.9	-0.4	1.6	0.6
RUSSELL 1000 VALUE AGGREGATE	-8.7%	17.3%	15.3	-3.2	13.1
Russell 1000 Value	-8.3%	13.7%	17.3	-3.8	13.5
Excess	-0.4%	3.7%	-2.1	0.6	-0.4



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Semi-Passive Large Cap										
BLACKROCK	\$1,232,376,434	3.8%	8.4%	9.4%	30.4%	15.9%	12.1%	14.0%	10.2%	01/1995
Semi Passive Domestic Equity Benchmark			9.0	10.6	31.4	15.0	11.5	13.5	9.8	01/1995
Excess			-0.6	-1.2	-1.0	0.9	0.6	0.5	0.4	
J.P. MORGAN	1,289,855,198	4.0	9.3	10.8	31.3	14.8	11.4	13.8	10.1	01/1995
Semi Passive Domestic Equity Benchmark			9.0	10.6	31.4	15.0	11.5	13.5	9.8	01/1995
Excess			0.2	0.2	-0.1	-0.2	-0.1	0.3	0.3	
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE	2,522,231,632	7.7	8.9	10.1	30.9	15.1	11.2	13.6		
Semi Passive Domestic Equity Benchmark			9.0	10.6	31.4	15.0	11.5	13.5		
Excess			-0.2	-0.4	-0.5	0.1	-0.2	0.1		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Semi-Passive Large Cap					
BLACKROCK	-4.1%	24.6%	12.5%	0.8%	14.2%
Semi Passive Domestic Equity Benchmark	-4.8	21.7	12.1	0.9	13.2
Excess	0.7	2.9	0.5	-0.1	1.0
J.P. MORGAN					
J.P. MORGAN	-5.4	21.8	12.3	0.8	15.0
Semi Passive Domestic Equity Benchmark	-4.8	21.7	12.1	0.9	13.2
Excess	-0.6	0.1	0.2	-0.1	1.8
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE					
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE	-4.9%	22.5%	11.1	0.5	14.2
Semi Passive Domestic Equity Benchmark	-4.8%	21.7%	12.1	0.9	13.2
Excess	-0.1%	0.8%	-1.0	-0.4	1.0



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Small Cap Growth										
ARROWMARK	\$251,167,796	0.8%	13.4%	7.9%	20.1%	15.2%			17.5%	11/2016
Russell 2000 Growth			11.4	6.7	28.5	12.5			15.4	11/2016
Excess			2.0	1.2	-8.4	2.7			2.2	
HOOD RIVER	266,743,937	0.8	9.8	0.4	24.3	11.9			14.2	11/2016
Russell 2000 Growth			11.4	6.7	28.5	12.5			15.4	11/2016
Excess			-1.6	-6.4	-4.2	-0.6			-1.2	
RICE HALL JAMES	237,158,309	0.7	9.6	4.5	18.0	12.0			15.4	11/2016
Russell 2000 Growth			11.4	6.7	28.5	12.5			15.4	11/2016
Excess			-1.8	-2.2	-10.5	-0.5			0.1	
WELLINGTON	284,624,669	0.9	13.1	9.8	35.6	13.7			16.5	11/2016
Russell 2000 Growth			11.4	6.7	28.5	12.5			15.4	11/2016
Excess			1.7	3.1	7.1	1.2			1.2	
RUSSELL 2000 GROWTH AGGREGATE	1,039,694,712	3.2	11.5	5.6	24.6	12.6	8.6	11.3		
Russell 2000 Growth			11.4	6.7	28.5	12.5	9.3	13.0		
Excess			0.1	-1.1	-3.9	0.1	-0.8	-1.7		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Small Cap Growth					
ARROWMARK	0.9%	26.2%			
Russell 2000 Growth	-9.3	22.2			
Excess	10.3	4.1			
HOOD RIVER	-7.0	21.3			
Russell 2000 Growth	-9.3	22.2			
Excess	2.3	-0.9			
RICE HALL JAMES	-6.9	27.9			
Russell 2000 Growth	-9.3	22.2			
Excess	2.4	5.8			
WELLINGTON	-11.6	22.6			
Russell 2000 Growth	-9.3	22.2			
Excess	-2.3	0.4			
RUSSELL 2000 GROWTH AGGREGATE	-6.2%	22.0%	4.7	1.0	-3.4
Russell 2000 Growth	-9.3%	22.2%	11.3	-1.4	5.6
Excess	3.2%	-0.1%	-6.6	2.4	-9.0



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Small Cap Value										
GOLDMAN SACHS	\$389,018,353	1.2%	7.1%	6.1%	23.2%	6.3%	7.3%	12.3%	9.3%	01/2004
Russell 2000 Value			8.5	7.9	22.4	4.8	7.0	10.6	7.8	01/2004
Excess			-1.4	-1.8	0.8	1.5	0.3	1.7	1.5	
HOTCHKIS AND WILEY	316,633,553	1.0	8.4	6.3	19.7	3.4	3.9	12.3	7.9	01/2004
Russell 2000 Value			8.5	7.9	22.4	4.8	7.0	10.6	7.8	01/2004
Excess			-0.1	-1.6	-2.7	-1.4	-3.0	1.7	0.1	
MARTINGALE	306,018,159	0.9	8.2	7.9	21.1	3.3	7.0	12.0	7.7	01/2004
Russell 2000 Value			8.5	7.9	22.4	4.8	7.0	10.6	7.8	01/2004
Excess			-0.3	0.0	-1.3	-1.5	-0.0	1.5	-0.1	
PEREGRINE	382,074,561	1.2	5.5	6.3	21.1	4.5	6.4	10.9	9.8	07/2000
Russell 2000 Value			8.5	7.9	22.4	4.8	7.0	10.6	9.3	07/2000
Excess			-3.0	-1.6	-1.3	-0.2	-0.6	0.4	0.4	
RUSSELL 2000 VALUE AGGREGATE	1,393,744,625	4.3	7.2	6.6	21.3	4.5	6.2	11.8		
Russell 2000 Value			8.5	7.9	22.4	4.8	7.0	10.6		
Excess			-1.3	-1.3	-1.1	-0.3	-0.8	1.2		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Small Cap Value					
GOLDMAN SACHS	-13.3%	12.6%	24.6%	-5.2%	7.4%
Russell 2000 Value	-12.9	7.8	31.7	-7.5	4.2
Excess	-0.5	4.7	-7.1	2.3	3.1
HOTCHKIS AND WILEY	-14.4	7.9	19.9	-8.5	13.0
Russell 2000 Value	-12.9	7.8	31.7	-7.5	4.2
Excess	-1.5	0.0	-11.8	-1.0	8.8
MARTINGALE	-15.0	6.9	34.3	-5.2	7.3
Russell 2000 Value	-12.9	7.8	31.7	-7.5	4.2
Excess	-2.1	-0.9	2.5	2.3	3.1
PEREGRINE	-16.1	12.5	27.8	-6.7	4.1
Russell 2000 Value	-12.9	7.8	31.7	-7.5	4.2
Excess	-3.3	4.7	-3.9	0.8	-0.1
RUSSELL 2000 VALUE AGGREGATE	-14.7%	10.2%	26.5	-6.5	7.5
Russell 2000 Value	-12.9%	7.8%	31.7	-7.5	4.2
Excess	-1.8%	2.3%	-5.2	1.0	3.3

Minnesota State Board of Investment
Quarter Ending December 31, 2019
Domestic Equity Managers



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Total Passive Domestic Equity										
BLACKROCK RUSSELL 1000	\$23,213,796,224	71.2%	9.0%	10.6%	31.4%	15.0%			16.3%	11/2016
Russell 1000			9.0	10.6	31.4	15.0			16.3	11/2016
Excess			-0.0	0.0	0.0	-0.0			-0.0	
BLACKROCK RUSSELL 2000	637,392,341	2.0	9.9	7.2	25.2				10.5	11/2018
RUSSELL 2000 (DAILY)			9.9	7.3	25.5				10.5	11/2018
Excess			-0.1	-0.1	-0.3				0.0	
BLACKROCK RUSSELL 3000 (1)	1,561,636,366	4.8	9.1	10.4	31.1	14.6	11.3%	13.4%	9.6	07/1995
Passive Manager Benchmark			9.1	10.4	31.0	14.6	11.2	13.4	9.5	07/1995
PASSIVE DOMESTIC EQUITY AGGREGATE (2)	25,412,824,931	78.0	9.0	10.5	31.3	14.8	11.3	13.5		
Passive Domestic Equity Benchmark			9.1	10.5	31.3	14.9	11.4	13.5		
Excess			-0.0	0.0	0.0	-0.1	-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.



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Total Passive Domestic Equity					
BLACKROCK RUSSELL 1000	-4.8%	21.7%			
Russell 1000	-4.8	21.7			
Excess	-0.0	-0.0			
BLACKROCK RUSSELL 2000					
RUSSELL 2000 (DAILY)					
Excess					
BLACKROCK RUSSELL 3000 (1)	-5.2	21.1	12.7%	0.5%	12.6%
Passive Manager Benchmark	-5.2	21.1	12.7	0.5	12.6
PASSIVE DOMESTIC EQUITY AGGREGATE (2)	-5.0%	21.3%	12.6	0.5	12.6
Passive Domestic Equity Benchmark	-5.0%	21.5%	12.5	0.5	12.6
Excess	-0.0%	-0.2%	0.1	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.

This page intentionally left blank.



International Equity

December 31, 2019



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Total International Equity										
DEVELOPED MARKETS (1)	\$11,724,612,893	74.6%	8.0%	7.0%	23.3%	9.7%	5.9%	6.1%		
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3		
Excess			0.2	0.1	0.8	0.4	0.5	0.8		
EMERGING MARKETS (2)	3,984,209,212	25.4	11.9	8.5	20.3	11.9	5.6	3.3		
BENCHMARK EM			11.8	7.1	18.4	11.6	5.6	3.7		
Excess			0.1	1.4	1.9	0.4	-0.1	-0.4		
TRANSITION AGGREGATE INTERNATIONAL EQUITY (3)	1,341,980	0.0								
TOTAL INTERNATIONAL EQUITY (4)	15,710,164,086	100.0	9.0	7.3	22.4	10.1	5.9	5.5	6.6	10/1992
International Equity Benchmark			8.9	6.9	21.5	9.9	5.5	5.0	6.1	10/1992
Excess			0.1	0.4	0.9	0.2	0.4	0.5	0.5	

(1) The current benchmark 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.



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Total International Equity					
DEVELOPED MARKETS (1)	-14.2%	24.9%	1.3%	-0.3%	-4.1%
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-0.1	0.7	-1.5	2.8	0.2
EMERGING MARKETS (2)					
EMERGING MARKETS (2)	-15.4	37.7	7.5	-13.1	-3.8
BENCHMARK EM	-14.6	37.3	11.2	-14.9	-2.2
Excess	-0.8	0.4	-3.7	1.9	-1.6
TRANSITION AGGREGATE INTERNATIONAL EQUITY (3)					
TOTAL INTERNATIONAL EQUITY (4)	-14.5%	27.6%	2.6	-2.9	-4.0
International Equity Benchmark	-14.2%	27.2%	4.5	-5.7	-3.9
Excess	-0.3%	0.4%	-1.8	2.8	-0.2

(1) The current benchmark 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.



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Developed Markets										
ACADIAN	\$409,615,730	2.6%	7.1%	5.8%	19.1%	12.2%	9.3%	8.5%	6.6%	07/2005
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	5.1	07/2005
Excess			-0.8	-1.0	-3.4	2.8	3.9	3.2	1.5	
COLUMBIA	385,548,838	2.5	8.5	7.8	28.9	13.3	7.9	7.5	3.4	03/2000
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	3.6	03/2000
Excess			0.6	0.9	6.4	4.0	2.5	2.2	-0.2	
FIDELITY	416,511,632	2.7	8.7	7.4	27.1	11.0	6.7	7.0	6.7	07/2005
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	5.1	07/2005
Excess			0.9	0.5	4.6	1.6	1.3	1.7	1.6	
JP MORGAN	286,232,935	1.8	8.1	6.7	28.5	10.9	6.2	5.8	5.4	07/2005
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	5.1	07/2005
Excess			0.3	-0.1	6.0	1.5	0.8	0.5	0.3	
MARATHON	390,466,216	2.5	9.1	8.5	23.5	9.6	6.8	7.7	8.1	11/1993
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	5.2	11/1993
Excess			1.2	1.6	1.0	0.3	1.4	2.4	2.9	
MCKINLEY	281,667,155	1.8	8.2	6.2	25.6	10.7	5.3	5.9	4.9	07/2005
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	5.1	07/2005
Excess			0.4	-0.7	3.1	1.4	-0.1	0.6	-0.2	
ACTIVE DEVELOPED MARKETS AGGREGATE	2,170,042,506	13.8	8.3	7.1	25.0	11.1	7.1	7.1		
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3		
Excess			0.4	0.3	2.5	1.8	1.7	1.7		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Developed Markets					
ACADIAN	-13.5%	37.0%	8.1%	2.4%	-1.7%
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	0.6	12.8	5.4	5.4	2.6
COLUMBIA	-14.9	32.7	-5.6	6.4	-5.6
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-0.8	8.5	-8.3	9.4	-1.2
FIDELITY	-14.6	25.9	1.2	0.1	-5.6
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-0.5	1.7	-1.5	3.2	-1.3
JP MORGAN	-17.3	28.3	4.0	-4.7	-5.1
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-3.3	4.1	1.2	-1.6	-0.7
MARATHON	-13.4	23.1	-1.1	6.7	-4.0
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	0.7	-1.1	-3.8	9.7	0.3
MCKINLEY	-15.9	28.5	-7.5	3.1	-2.7
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-1.9	4.3	-10.2	6.2	1.6
ACTIVE DEVELOPED MARKETS AGGREGATE	-14.5%	28.4%	-0.2	3.2	-4.1
BENCHMARK DM	-14.1%	24.2%	2.7	-3.0	-4.3
Excess	-0.4%	4.2%	-3.0	6.2	0.2



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Semi-Passive Developed Markets										
AQR	\$364,540,109	2.3%	9.0%	5.9%	20.8%	7.3%	4.7%	5.6%	5.3%	07/2005
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	5.1	07/2005
Excess			1.1	-0.9	-1.7	-2.0	-0.7	0.3	0.1	
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	364,540,109	2.3	9.0	5.9	20.8	6.6	3.8	5.0		
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3		
Excess			1.1	-0.9	-1.7	-2.7	-1.6	-0.4		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Semi-Passive Developed Markets					
AQR	-18.2%	25.1%	0.8%	0.9%	-4.4%
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-4.1	0.9	-2.0	3.9	-0.1
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE					
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	-18.7%	23.3%	-0.4	-0.3	-4.4
BENCHMARK DM	-14.1%	24.2%	2.7	-3.0	-4.3
Excess	-4.6%	-0.9%	-3.1	2.7	-0.1



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Total Developed Markets										
ACTIVE DEVELOPED MARKETS AGGREGATE	\$2,170,042,506	13.8%	8.3%	7.1%	25.0%	11.1%	7.1%	7.1%		
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3		
Excess			0.4	0.3	2.5	1.8	1.7	1.7		
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	364,540,109	2.3	9.0	5.9	20.8	6.6	3.8	5.0		
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3		
Excess			1.1	-0.9	-1.7	-2.7	-1.6	-0.4		
SSgA DEVELOPED MARKETS PASSIVE	9,190,030,279	58.5	7.9	7.0	23.0	9.7	5.8	5.7	6.3	10/1992
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3	6.0	10/1992
Excess			0.1	0.1	0.5	0.4	0.4	0.4	0.3	
DEVELOPED MARKETS TOTAL	11,724,612,893	74.6	8.0	7.0	23.3	9.7	5.9	6.1		
BENCHMARK DM			7.9	6.9	22.5	9.3	5.4	5.3		
Excess			0.2	0.1	0.8	0.4	0.5	0.8		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Total Developed Markets					
ACTIVE DEVELOPED MARKETS AGGREGATE	-14.5%	28.4%	-0.2%	3.2%	-4.1%
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-0.4	4.2	-3.0	6.2	0.2
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	-18.7	23.3	-0.4	-0.3	-4.4
BENCHMARK DM	-14.1	24.2	2.7	-3.0	-4.3
Excess	-4.6	-0.9	-3.1	2.7	-0.1
SSgA DEVELOPED MARKETS PASSIVE	-13.9%	24.7%	3.2	-2.6	-3.9
BENCHMARK DM	-14.1%	24.2%	2.7	-3.0	-4.3
Excess	0.2%	0.5%	0.4	0.5	0.4
DEVELOPED MARKETS TOTAL	-14.2%	24.9%	1.3	-0.3	-4.1
BENCHMARK DM	-14.1%	24.2%	2.7	-3.0	-4.3
Excess	-0.1%	0.7%	-1.5	2.8	0.2



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Emerging Markets										
EARNEST PARTNERS	\$339,952,645	2.2%	11.9%	9.3%	24.7%				9.7%	04/2017
MSCI EMERGING MARKETS			11.8	7.1	18.4				8.3	04/2017
Excess			0.1	2.2	6.3				1.4	
MARTIN CURRIE	376,704,245	2.4	14.2	11.9	27.3				12.8	04/2017
BENCHMARK EM			11.8	7.1	18.4				8.3	04/2017
Excess			2.3	4.8	8.8				4.4	
MACQUARIE	357,018,040	2.3	14.0	12.4	23.2				10.5	04/2017
BENCHMARK EM			11.8	7.1	18.4				8.3	04/2017
Excess			2.2	5.4	4.7				2.1	
MORGAN STANLEY	659,876,904	4.2	11.1	8.7	20.4	11.4%	5.8%	4.4%	9.5	01/2001
BENCHMARK EM			11.8	7.1	18.4	11.6	5.6	3.7	9.2	01/2001
Excess			-0.7	1.6	1.9	-0.2	0.2	0.7	0.3	
NEUBERGER BERMAN	339,357,583	2.2	9.4	6.7	19.7				8.5	04/2017
BENCHMARK EM			11.8	7.1	18.4				8.3	04/2017
Excess			-2.5	-0.4	1.3				0.2	
PZENA	314,263,272	2.0	12.2	6.0	13.4				5.9	04/2017
BENCHMARK EM			11.8	7.1	18.4				8.3	04/2017
Excess			0.4	-1.1	-5.1				-2.4	
ROCK CREEK	323,042,659	2.1	11.9	9.6	22.3				6.9	04/2017
BENCHMARK EM			11.8	7.1	18.4				8.3	04/2017
Excess			0.1	2.5	3.9				-1.4	



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Emerging Markets					
EARNEST PARTNERS	-15.4%				
MSCI EMERGING MARKETS	-14.6				
Excess	-0.8				
MARTIN CURRIE					
MARTIN CURRIE	-16.6				
BENCHMARK EM	-14.6				
Excess	-2.0				
MACQUARIE					
MACQUARIE	-13.3				
BENCHMARK EM	-14.6				
Excess	1.3				
MORGAN STANLEY					
MORGAN STANLEY	-16.7	37.9%	6.1%	-9.4%	-2.5%
BENCHMARK EM	-14.6	37.3	11.2	-14.9	-2.2
Excess	-2.2	0.6	-5.1	5.5	-0.3
NEUBERGER BERMAN					
NEUBERGER BERMAN	-17.1				
BENCHMARK EM	-14.6				
Excess	-2.6				
PZENA					
PZENA	-10.8				
BENCHMARK EM	-14.6				
Excess	3.8				
ROCK CREEK					
ROCK CREEK	-17.6				
BENCHMARK EM	-14.6				
Excess	-3.1				



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Total Emerging Markets										
ACTIVE EMERGING MARKETS AGGREGATE	\$2,710,215,350	17.3%	12.0%	9.2%	21.4%	12.0%	5.3%	3.1%		
BENCHMARK EM			11.8	7.1	18.4	11.6	5.6	3.7		
Excess			0.2	2.1	3.0	0.5	-0.4	-0.6		
SSGA EMERGING MARKETS PASSIVE	1,273,993,862	8.1	11.7	6.9	18.1	11.5	5.6		5.1	01/2012
BENCHMARK EM			11.8	7.1	18.4	11.6	5.6		5.0	01/2012
Excess			-0.1	-0.2	-0.3	-0.1	-0.0		0.1	
EMERGING MARKETS TOTAL	3,984,209,212	25.4	11.9	8.5	20.3	11.9	5.6	3.3		
BENCHMARK EM			11.8	7.1	18.4	11.6	5.6	3.7		
Excess			0.1	1.4	1.9	0.4	-0.1	-0.4		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Total Emerging Markets					
ACTIVE EMERGING MARKETS AGGREGATE	-15.6%	37.2%	5.3%	-12.7%	-4.1%
BENCHMARK EM	-14.6	37.3	11.2	-14.9	-2.2
Excess	-1.0	-0.1	-5.9	2.2	-2.0
SSGA EMERGING MARKETS PASSIVE	-14.7%	37.4%	11.1	-14.6	-2.1
BENCHMARK EM	-14.6%	37.3%	11.2	-14.9	-2.2
Excess	-0.1%	0.1%	-0.1	0.3	0.0
EMERGING MARKETS TOTAL	-15.4%	37.7%	7.5	-13.1	-3.8
BENCHMARK EM	-14.6%	37.3%	11.2	-14.9	-2.2
Excess	-0.8%	0.4%	-3.7	1.9	-1.6

This page intentionally left blank.



Fixed Income

December 31, 2019



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Total Fixed Income										
ACTIVE FIXED INCOME AGGREGATE	\$4,188,177,145	56.5%	0.6%	2.9%	10.0%	4.8%	3.9%	4.9%		
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7		
Excess			0.5	0.4	1.3	0.8	0.8	1.1		
SEMI PASSIVE FIXED INCOME AGGREGATE	3,222,148,798	43.5	0.2	2.7	9.3	4.3	3.3	4.1		
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7		
Excess			0.0	0.2	0.6	0.2	0.2	0.4		
TRANSITION AGGREGATE FIXED INCOME (1)	18,547	0.0								
TOTAL FIXED INCOME (2)	7,410,344,490	100.0	0.5	2.8	9.7	4.5	3.6	4.5	7.5	07/1984
Fixed Income Benchmark			0.2	2.5	8.7	4.0	3.0	3.7	7.1	07/1984
Excess			0.3	0.3	1.0	0.5	0.5	0.8	0.4	

(1) The Transition Aggregate Fixed Income includes fixed income securities that are being transition to a different manager.

(2) The current Fixed Income 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.



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Total Fixed Income					
ACTIVE FIXED INCOME AGGREGATE	0.0%	4.7%	4.4%	0.6%	6.2%
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.0	1.2	1.7	0.0	0.2
SEMI PASSIVE FIXED INCOME AGGREGATE	-0.1	3.7	2.8	0.8	6.1
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.1	0.2	0.2	0.2	0.1
TRANSITION AGGREGATE FIXED INCOME (1)					
TOTAL FIXED INCOME (2)	-0.0%	4.2%	3.6	0.7	6.1
Fixed Income Benchmark	0.0%	3.5%	2.6	0.5	6.0
Excess	-0.1%	0.7%	0.9	0.1	0.2

(1) The Transition Aggregate Fixed Income includes fixed income securities that are being transition to a different manager.

(2) The current Fixed Income 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.



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Active Fixed Income Managers										
COLUMBIA	\$992,605,014	13.4%	0.4%	2.9%	10.7%	5.1%	4.1%	4.8%	5.5%	07/1993
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	5.2	07/1993
Excess			0.2	0.5	1.9	1.1	1.1	1.1	0.2	
DODGE & COX	1,084,871,820	14.6	0.8	2.9	9.6	4.5	3.7	4.7	6.0	02/2000
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	5.1	02/2000
Excess			0.6	0.5	0.9	0.5	0.7	0.9	1.0	
PIMCO	972,494,180	13.1	0.4	2.0	8.4	4.3	3.4	4.6	5.5	10/2008
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	4.3	10/2008
Excess			0.2	-0.5	-0.3	0.3	0.3	0.9	1.2	
WESTERN	1,138,206,131	15.4	0.9	3.6	11.1	5.4	4.3	5.3	8.3	07/1984
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	7.2	07/1984
Excess			0.8	1.1	2.4	1.4	1.3	1.5	1.2	
ACTIVE FIXED INCOME AGGREGATE	4,188,177,145	56.5	0.6	2.9	10.0	4.8	3.9	4.9		
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7		
Excess			0.5	0.4	1.3	0.8	0.8	1.1		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Active Fixed Income Managers					
COLUMBIA	0.2%	4.8%	5.2%	0.2%	5.8%
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	0.2	1.2	2.6	-0.4	-0.2
DODGE & COX	-0.0	4.2	4.8	0.3	6.0
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.1	0.7	2.2	-0.3	0.0
PIMCO	0.4	4.4	2.8	1.0	5.5
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	0.4	0.8	0.2	0.4	-0.4
WESTERN	-0.2	5.6	4.9	0.7	7.0
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.3	2.1	2.2	0.1	1.0
ACTIVE FIXED INCOME AGGREGATE	0.0%	4.7%	4.4	0.6	6.2
BBG BARC Agg (Dly)	0.0%	3.5%	2.6	0.5	6.0
Excess	-0.0%	1.2%	1.7	0.0	0.2



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Semi Passive Fixed Income Managers										
BLACKROCK	\$1,089,479,130	14.7%	0.2%	2.5%	9.3%	4.2%	3.2%	4.0%	5.3%	04/1996
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	5.2	04/1996
Excess			0.0	0.1	0.6	0.2	0.2	0.2	0.1	
GOLDMAN SACHS	1,101,443,636	14.9	0.2	2.9	9.6	4.4	3.4	4.3	5.6	07/1993
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	5.2	07/1993
Excess			0.0	0.4	0.9	0.4	0.3	0.5	0.3	
NEUBERGER	1,031,226,033	13.9	0.2	2.6	9.0	4.1	3.2	4.2	6.4	07/1988
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7	6.2	07/1988
Excess			0.0	0.1	0.3	0.1	0.1	0.4	0.2	
SEMI PASSIVE FIXED INCOME	3,222,148,798	43.5	0.2	2.7	9.3	4.3	3.3	4.1		
BBG BARC Agg (Dly)			0.2	2.5	8.7	4.0	3.0	3.7		
Excess			0.0	0.2	0.6	0.2	0.2	0.4		



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Semi Passive Fixed Income Managers					
BLACKROCK	-0.1%	3.7%	2.8%	0.9%	6.0%
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.2	0.1	0.1	0.3	0.0
GOLDMAN SACHS	-0.0	3.9	3.0	0.8	6.1
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.0	0.4	0.3	0.2	0.1
NEUBERGER	-0.1	3.6	2.7	0.7	6.1
BBG BARC Agg (Dly)	0.0	3.5	2.6	0.5	6.0
Excess	-0.1	0.0	0.1	0.2	0.2
SEMI PASSIVE FIXED INCOME	-0.1%	3.7%	2.8	0.8	6.1
BBG BARC Agg (Dly)	0.0%	3.5%	2.6	0.5	6.0
Excess	-0.1%	0.2%	0.2	0.2	0.1

This page intentionally left blank.



Treasuries

December 31, 2019



	<u>Ending Market Value</u>	<u>Portfolio Weight</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
Treasuries Managers										
BLACKROCK	\$2,346,598,198	32.5%	-2.1%	2.2%	10.4%				6.6%	02/2018
BBG BARC 5Y + Us Tsy Idx			-2.3	2.2	10.4				6.7	02/2018
Excess			0.1	0.0	-0.1				-0.1	
GOLDMAN SACHS	2,431,136,273	33.6	-2.3	2.2	10.6				6.6	02/2018
BBG BARC 5Y + Us Tsy Idx			-2.3	2.2	10.4				6.7	02/2018
Excess			0.0	0.0	0.1				-0.0	
NEUBERGER	2,453,071,645	33.9	-2.2	2.2	10.4				6.5	02/2018
BBG BARC 5Y + Us Tsy Idx			-2.3	2.2	10.4				6.7	02/2018
Excess			0.1	0.0	-0.0				-0.1	
TREASURIES TRANSITION ACCOUNT	0	0.0								03/2018
TOTAL TREASURIES	7,230,806,117	100.0	-2.2	2.2	10.4				6.6%	02/2018
BBG BARC 5Y + Us Tsy Idx			-2.3	2.2	10.4				6.7%	02/2018
Excess			0.1	0.0	0.0				-0.1%	



	<u>2018 Calendar Return</u>	<u>2017 Calendar Return</u>	<u>2016 Calendar Return</u>	<u>2015 Calendar Return</u>	<u>2014 Calendar Return</u>
Treasuries Managers					
BLACKROCK					
BBG BARC 5Y + Us Tsy Idx					
Excess					
GOLDMAN SACHS					
BBG BARC 5Y + Us Tsy Idx					
Excess					
NEUBERGER					
BBG BARC 5Y + Us Tsy Idx					
Excess					
TOTAL TREASURIES					
BBG BARC 5Y + Us Tsy Idx					
Excess					

This page intentionally left blank.



Private Markets

December 31, 2019



Combined Funds Asset Class Performance Summary

Private Markets

	<u>Last Qtr</u>	<u>FYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>20 Year</u>	<u>25 year</u>	<u>30 year</u>
Private Markets	2.4%	4.2%	6.6%	13.5%	9.8%	12.2%	12.5%	13.6%	12.2%
Private Equity	4.2%	7.8%	13.2%	17.7%	15.0%	15.1%	13.5%	15.4%	
Private Credit	3.3	4.7	8.5	13.1	11.9	13.2	12.4		
Resources	-4.0	-7.4	-13.2	3.1	-5.4	4.5	14.5	14.1	
Real Estate	2.3	5.5	9.5	10.4	10.7	10.9	9.1	9.7	

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 December 31, 2019

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
I. PRIVATE EQUITY								
Adams Street Partners								
Adams Street Global Secondary Fund 5	100,000,000	76,529,750	50,794,218	42,776,897	23,470,250	5.94	1.22	7.28
Adams Street Global Secondary Fund 6	100,000,000	23,700,000	26,362,127	1,214,007	76,300,000	34.64	1.16	2.50
Advent International								
Advent International GPE VI	50,000,000	52,993,313	7,707,266	100,573,095	0	16.80	2.04	11.50
Advent International GPE VII	90,000,000	84,690,641	66,681,601	82,131,791	5,400,000	14.95	1.76	7.04
Advent International GPE VIII	100,000,000	88,950,000	110,574,901	0	11,050,000	12.57	1.24	3.65
Advent International GPE IX	115,000,000	13,225,000	12,518,891	0	101,775,000	-5.34	0.95	0.64
Affinity Ventures								
Affinity Ventures IV	4,000,000	4,000,000	314,755	1,541,970	0	-15.66	0.46	15.25
Affinity Ventures V	5,000,000	5,000,000	2,116,220	1,706,245	0	-4.54	0.76	11.25
APAX Partners								
Apax VIII - USD	200,000,000	227,487,449	147,033,330	215,179,630	9,168,362	14.50	1.59	6.56
Apax IX - USD	150,000,000	138,697,018	175,915,976	3,944,404	15,247,386	22.32	1.30	3.36
Apax X - USD	150,000,000	0	0	0	150,000,000	0.00	0.00	0.48
Arsenal Capital Partners								
Arsenal Fund V	75,000,000	20,164,317	20,164,317	0	54,835,683	0.00	1.00	0.74
Asia Alternatives								
Asia Alternatives Capital Partners V	99,000,000	26,275,629	20,993,599	569,636	73,272,834	-24.73	0.82	2.25
Banc Fund								
Banc Fund VIII	98,250,000	98,250,000	54,926,286	160,145,973	0	13.39	2.19	11.44
Banc Fund IX	107,205,932	107,205,932	114,398,592	19,549,737	0	7.04	1.25	5.31
Banc Fund X	71,345,455	37,099,636	36,537,354	0	34,245,818	-2.18	0.98	1.41
BlackRock								
BlackRock Long Term Capital	250,000,000	115,030,072	111,721,922	925,013	134,969,928	-1.89	0.98	0.75
Blackstone Capital Partners								
Blackstone Capital Partners IV	70,000,000	84,459,884	1,715,119	200,025,998	1,832,302	37.02	2.39	17.23
Blackstone Capital Partners V	140,000,000	152,333,301	5,302,014	238,281,850	7,027,560	7.93	1.60	13.66
Blackstone Capital Partners VI	100,000,000	104,564,882	76,078,138	90,352,349	12,389,605	12.25	1.59	11.19
Blackstone Capital Partners VII	130,000,000	100,798,593	110,771,789	11,575,111	42,771,332	15.72	1.21	4.25
Blackstone Capital Partners VIII	150,000,000	0	0	0	150,000,000	0.00	0.00	0.75

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Blackstone Strategic Partners (CSFB/ DLJ)								
<i>Strategic Partners III VC</i>	25,000,000	25,039,648	469,835	33,676,348	1,028,056	6.00	1.36	14.34
<i>Strategic Partners III-B</i>	100,000,000	79,581,948	437,188	118,286,611	14,851,676	6.35	1.49	14.34
<i>Strategic Partners IV VC</i>	40,500,000	42,049,501	5,003,570	58,969,684	2,373,004	9.24	1.52	11.52
<i>Strategic Partners IV-B</i>	100,000,000	99,112,893	9,598,547	145,322,825	17,707,552	12.29	1.56	11.29
<i>Strategic Partners V</i>	100,000,000	84,472,442	18,565,637	118,762,317	37,619,596	19.04	1.63	8.12
<i>Strategic Partners VI</i>	150,000,000	97,348,314	47,175,305	95,525,946	58,902,888	16.11	1.47	5.46
<i>Strategic Partners VII</i>	150,000,000	96,008,033	105,727,193	29,962,530	68,186,972	23.13	1.41	2.77
<i>Strategic Partners VIII</i>	150,000,000	32,247,258	41,302,382	750,000	118,498,757	100.53	1.30	0.99
Bridgepoint								
<i>Bridgepoint Europe VI</i>	168,138,044	24,835,033	21,999,373	0	143,303,011	-19.23	0.89	1.53
Brookfield Asset Management								
<i>Brookfield Capital Partners Fund IV</i>	100,000,000	93,042,897	88,571,448	121,226,181	26,856,915	55.53	2.25	4.05
<i>Brookfield Capital Partners V</i>	250,000,000	53,653,003	48,742,359	0	196,346,997	-15.14	0.91	1.18
Cardinal Partners								
<i>DSV Partners IV</i>	10,000,000	10,000,000	30,783	39,196,082	0	10.61	3.92	34.76
Carlyle Group								
<i>Carlyle Partners VII</i>	150,000,000	37,669,107	32,589,569	210,128	112,541,021	-19.98	0.87	1.79
Chicago Growth Partners (William Blair)								
<i>William Blair Capital Partners VII</i>	50,000,000	48,150,000	578,788	69,698,512	1,650,000	8.59	1.46	18.57
<i>Chicago Growth Partners I</i>	50,000,000	52,441,998	1,845,974	54,532,745	300,000	1.69	1.08	14.19
<i>Chicago Growth Partners II</i>	60,000,000	58,347,626	1,722,529	121,871,703	1,652,374	19.55	2.12	11.56
Court Square Capital Partners								
<i>Court Square Capital Partners II</i>	175,000,000	170,186,067	15,936,492	295,201,185	16,455,909	12.85	1.83	13.07
<i>Court Square Capital Partners III</i>	175,000,000	181,390,725	180,400,820	110,644,670	12,750,068	19.54	1.60	7.33
<i>Court Square Capital Partners IV</i>	150,000,000	29,206,229	31,102,502	0	120,793,771	16.64	1.06	1.39
Crescendo								
<i>Crescendo IV</i>	101,500,000	103,101,226	3,067,040	55,121,736	0	-4.62	0.56	19.56
CVC Capital Partners								
<i>CVC European Equity Partners V</i>	133,919,459	153,813,045	14,982,859	275,096,237	1,603,197	16.48	1.89	11.52
<i>CVC Capital Partners VI</i>	257,521,346	263,643,548	259,956,064	129,679,202	42,692,338	15.94	1.48	6.23
Elevation Partners								
<i>Elevation Partners</i>	75,000,000	73,237,580	144,246	113,492,106	799,634	11.81	1.55	14.38
Glouston Capital Partners**								
<i>Glouston Private Equity Opportunities Fund IV</i>	5,337,098	4,378,779	1,120,078	3,606,251	1,090,000	3.24	1.08	4.75
Goldner Hawn Johnson & Morrison								
<i>Goldner Hawn Fund VII</i>	57,755,138	6,516,618	5,150,897	0	51,403,870	-21.35	0.79	1.43
<i>TrailHead Fund</i>	20,000,000	16,070,803	28,275,070	12,806,955	3,935,813	18.30	2.56	7.60

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
GS Capital Partners								
<i>GS Capital Partners V</i>	100,000,000	74,319,006	1,101,210	191,435,136	1,041,099	18.26	2.59	14.50
<i>GS Capital Partners VI</i>	100,000,000	110,136,316	12,471,882	131,553,863	2,551,356	7.22	1.31	12.66
<i>GS Vintage VII</i>	100,000,000	76,085,978	72,005,938	22,528,375	46,562,536	18.02	1.24	3.25
<i>West Street Capital Partners VII</i>	150,000,000	82,397,501	71,078,307	15,552,958	80,258,025	4.07	1.05	2.77
<i>GS China-US Cooperation Fund</i>	99,800,000	10,154,445	7,526,906	0	89,820,000	-25.88	0.74	1.37
GTCR								
<i>GTCR IX</i>	75,000,000	71,414,933	204,933	128,764,150	3,585,067	13.77	1.81	13.25
<i>GTCR X</i>	100,000,000	103,907,821	13,793,390	188,421,061	6,751,396	20.72	1.95	8.81
<i>GTCR XI</i>	110,000,000	99,095,726	104,092,933	77,861,791	12,066,556	25.08	1.84	5.87
HarbourVest**								
<i>Dover Street VII Cayman Fund</i>	2,198,112	2,073,547	261,679	1,617,089	132,416	-4.67	0.91	4.75
<i>HarbourVest Intl PE Partners V-Cayman US</i>	3,520,205	3,345,135	593,192	3,825,663	179,600	13.61	1.32	4.75
<i>Harbourvest Intl PE Partners VI-Cayman</i>	4,233,572	4,038,952	3,716,553	2,754,700	196,437	15.44	1.60	4.75
<i>HarbourVest Partners VIII Cayman Buyout</i>	4,506,711	4,302,827	1,292,121	4,532,288	234,000	13.39	1.35	4.75
<i>HarbourVest Partners VIII-Cayman Venture</i>	7,190,898	7,084,902	3,449,159	5,924,280	140,000	9.25	1.32	4.75
Hellman & Friedman								
<i>Hellman & Friedman Capital Partners VI</i>	175,000,000	171,037,755	7,530,877	309,639,874	5,084,864	12.90	1.85	12.50
<i>Hellman & Friedman Capital Partners VII</i>	50,000,000	49,780,756	72,879,705	66,253,157	2,321,599	24.73	2.79	10.45
<i>Hellman & Friedman Investors IX</i>	175,000,000	0	-313,512	0	172,258,308	0.00	0.00	1.25
IK Investment Partners								
<i>IK Fund VII</i>	180,221,836	177,217,341	146,541,772	148,679,827	8,513,341	13.53	1.67	6.04
<i>IK Fund VIII</i>	170,997,778	150,391,355	163,562,720	31,294,092	22,047,899	16.89	1.30	3.19
<i>IK Fund IX</i>	151,532,214	315,129	320,343	0	151,217,085	1.65	1.02	0.47
Kohlberg Kravis Roberts								
<i>KKR Millennium Fund</i>	200,000,000	205,167,570	178,659	424,946,028	0	16.37	2.07	16.81
<i>KKR 2006 Fund</i>	200,000,000	219,067,814	65,452,072	321,372,989	3,360,223	9.20	1.77	13.01
<i>KKR Americas Fund XII</i>	150,000,000	73,630,717	77,382,175	988,851	78,250,452	5.38	1.06	3.57
<i>KKR Asian Fund III</i>	100,000,000	48,932,429	62,338,984	4,999,726	55,591,334	39.99	1.38	2.50
<i>KKR Europe V</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	1.15
Leonard Green & Partners								
<i>Green Equity Investors VI</i>	200,000,000	216,367,988	219,510,130	153,320,148	20,125,964	15.57	1.72	7.54
Lexington Capital Partners								
<i>Lexington Capital Partners VI</i>	100,000,000	98,374,022	7,936,348	138,129,769	1,634,703	7.95	1.48	13.77
<i>Lexington Capital Partners VII</i>	200,000,000	172,466,709	47,097,188	227,628,729	38,059,995	14.60	1.59	10.72
<i>Lexington Capital Partners VIII</i>	150,000,000	130,580,881	106,956,236	65,893,646	36,915,301	17.06	1.32	5.58
<i>Lexington Co-Investment Partners IV</i>	200,000,000	151,668,259	166,714,827	8,030,822	56,362,563	12.61	1.15	3.16
<i>Lexington Middle Market Investors IV</i>	100,000,000	17,147,574	17,048,273	1,458,011	82,852,426	22.62	1.08	2.77

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
<i>Lexington Capital Partners IX</i>	150,000,000	10,623,000	20,508,902	0	139,377,000	93.06	1.93	1.23
Madison Dearborn Capital Partners								
<i>Madison Dearborn Capital Partners VII</i>	100,000,000	75,754,661	80,232,705	9,274,293	33,484,237	9.25	1.18	3.78
<i>Madison Dearborn Capital Partners VIII</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.29
Neuberger Berman								
<i>Dyal Capital Partners III</i>	175,000,000	163,645,419	108,043,558	99,461,155	105,714,164	21.90	1.27	4.44
<i>Dyal Capital Partners IV</i>	250,000,000	24,687,639	17,961,925	9,156,912	234,104,683	14.22	1.10	1.48
Nordic Capital								
<i>Nordic Capital Fund VIII</i>	176,980,208	191,778,674	158,931,229	116,714,756	102,747,959	12.61	1.44	6.05
<i>Nordic Capital Fund IX</i>	168,314,388	50,319,549	60,906,950	0	117,994,839	43.65	1.21	2.45
North Sky Capital**								
<i>North Sky Capital LBO Fund III</i>	1,070,259	720,259	290,272	730,649	350,000	13.71	1.42	4.75
<i>North Sky Capital Venture Fund III</i>	1,384,080	1,277,830	288,620	1,369,463	106,250	11.44	1.30	4.75
Oak Hill Capital Management								
<i>Oak Hill Capital Partners IV</i>	150,000,000	119,353,934	114,076,193	28,267,962	52,442,502	21.71	1.19	2.80
<i>Oak Hill Capital Partners V</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	1.06
Paine Schwartz								
<i>Paine Schwartz IV</i>	75,000,000	55,846,197	56,935,933	14,823,737	20,226,957	9.53	1.28	4.80
<i>Paine Schwartz V</i>	150,000,000	0	-1,403,561	0	150,000,000	0.00	0.00	1.41
Permira								
<i>Permira V</i>	177,171,243	173,011,785	246,623,069	131,855,496	25,021,407	21.05	2.19	5.75
<i>Permira VI</i>	136,177,862	106,588,083	127,538,250	0	29,589,779	12.62	1.20	3.18
<i>Permira VII</i>	140,312,434	0	0	0	140,312,434	0.00	0.00	0.58
Public Pension Capital Management								
<i>Public Pension Capital</i>	150,000,000	80,494,048	88,996,837	45,684,523	80,350,177	24.26	1.67	5.37
RWI Ventures								
<i>RWI Ventures I</i>	7,603,265	7,603,265	452,827	6,122,274	0	-4.04	0.86	13.25
Silver Lake Partners								
<i>Silver Lake Partners II</i>	100,000,000	90,200,747	659,100	171,246,452	11,771,953	11.03	1.91	15.25
<i>Silver Lake Partners III</i>	100,000,000	91,961,615	30,007,070	175,803,509	10,559,311	18.53	2.24	12.50
<i>Silver Lake Partners IV</i>	100,000,000	111,140,696	128,279,434	76,819,511	5,231,461	24.39	1.85	7.01
<i>Silver Lake Partners V</i>	135,000,000	62,222,157	68,626,024	992,615	59,737,877	11.01	1.12	2.50
Split Rock Partners								
<i>Split Rock Partners</i>	50,000,000	47,890,906	4,197,791	58,794,192	2,109,094	3.36	1.32	14.42
<i>Split Rock Partners II</i>	60,000,000	59,165,000	29,174,198	47,174,545	835,000	5.32	1.29	11.42
Summit Partners								
<i>Summit Partners Growth Equity Fund VIII</i>	100,000,000	115,667,192	53,525,181	193,525,542	23,496,551	26.54	2.14	8.41
<i>Summit Partners Growth Equity Fund IX</i>	100,000,000	94,530,001	90,810,917	27,851,839	33,321,838	22.49	1.26	4.09

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
<i>Summit Partners Growth Equity Fund X</i>	150,000,000	0	0	0	150,000,000	0.00	0.00	0.82
Thoma Bravo								
<i>Thoma Bravo Fund XII</i>	75,000,000	73,248,476	92,968,436	3,754,581	5,577,340	13.64	1.32	3.05
<i>Thoma Bravo Fund XIII</i>	150,000,000	54,155,519	53,427,181	606	95,844,481	-1.61	0.99	1.50
Thoma Cressey								
<i>Thoma Cressey Fund VII</i>	50,000,000	50,000,000	470,059	107,057,940	0	23.59	2.15	19.10
<i>Thoma Cressey Fund VIII</i>	70,000,000	69,677,888	0	203,028,952	770,000	18.27	2.91	13.42
Thomas H. Lee Partners								
<i>Thomas H. Lee Equity Fund VII</i>	100,000,000	98,172,669	108,093,437	30,607,993	10,593,693	20.04	1.41	4.05
<i>Thomas H. Lee Equity Fund VIII</i>	150,000,000	35,295,943	37,278,456	2,735,321	116,646,079	52.58	1.13	1.50
Thomas, McNerney & Partners								
<i>Thomas, McNerney & Partners I</i>	30,000,000	30,000,000	4,044,714	15,087,143	0	-6.70	0.64	16.91
<i>Thomas, McNerney & Partners II</i>	50,000,000	48,125,000	5,417,250	107,648,037	1,875,000	16.75	2.35	13.25
TPG Capital								
<i>TPG Partners VII</i>	100,000,000	93,975,015	99,709,738	20,902,816	13,616,503	13.37	1.28	4.05
<i>TPG Partners VIII</i>	150,000,000	1,497,778	0	0	148,502,222	0.00	0.00	1.50
Vestar Capital Partners								
<i>Vestar Capital Partners IV</i>	55,000,000	55,652,024	540,804	102,273,825	57,313	14.64	1.85	19.80
<i>Vestar Capital Partners V</i>	75,000,000	76,649,712	10,088,944	91,371,279	-112,878	4.00	1.32	13.79
<i>Vestar Capital Partners VI</i>	100,000,000	106,195,246	63,746,794	123,127,619	357,259	25.26	1.76	8.02
<i>Vestar Capital Partners VII</i>	150,000,000	35,671,184	31,624,951	93,377	114,328,816	-13.07	0.89	1.79
Warburg Pincus								
<i>Warburg Pincus Equity Partners</i>	100,000,000	100,000,000	390,628	163,542,253	0	10.03	1.64	21.27
<i>Warburg Pincus Private Equity VIII</i>	100,000,000	100,373,266	364,622	228,717,051	0	14.74	2.28	17.47
<i>Warburg Pincus Private Equity IX</i>	100,000,000	100,000,000	4,689,455	169,104,301	0	9.73	1.74	14.18
<i>Warburg Pincus Private Equity X</i>	150,000,000	150,000,000	43,806,740	211,039,831	0	9.00	1.70	11.94
<i>Warburg Pincus Private Equity XI</i>	200,000,000	200,299,952	125,749,780	203,441,948	0	13.36	1.64	6.77
<i>Warburg Pincus Private Equity XII</i>	131,000,000	123,205,500	139,182,989	12,356,313	7,794,500	11.64	1.23	3.86
<i>Warburg Pincus China</i>	45,000,000	42,615,000	46,853,257	5,879,250	4,320,000	14.81	1.24	2.79
<i>Warburg Pincus Financial Sector</i>	90,000,000	49,675,808	45,011,422	4,590,000	44,730,000	-0.18	1.00	1.79
<i>Warburg Pincus Global Growth</i>	250,000,000	39,897,089	36,845,905	0	209,875,000	-20.82	0.92	1.11
<i>Warburg Pincus China-Southeast Asia II</i>	50,000,000	1,750,000	1,677,055	0	48,250,000	-4.17	0.96	0.57
Wellspring Capital Partners								
<i>Wellspring Capital Partners VI</i>	125,000,000	42,773,393	39,077,986	0	82,226,607	-12.56	0.91	3.04
Welsh, Carson, Anderson & Stowe								
<i>Welsh, Carson, Anderson & Stowe XI</i>	100,000,000	100,000,000	34,572,342	129,502,945	0	12.07	1.64	11.19
<i>Welsh, Carson, Anderson & Stowe XII</i>	150,000,000	133,905,102	140,566,261	62,562,461	16,094,898	21.18	1.52	4.78
<i>Welsh, Carson, Anderson & Stowe XIII</i>	250,000,000	1,833,825	0	0	248,166,175	0.00	0.00	1.51

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Whitehorse Capital								
<i>Whitehorse Liquidity Partners III</i>	100,000,000	49,860,515	50,033,575	3,696,980	53,902,732	14.54	1.08	0.75
Wind Point Partners								
<i>Wind Point Partners IX</i>	100,000,000	754,603	750,000	0	99,250,000	-0.61	0.99	0.51
Windjammer Capital Investors								
<i>Windjammer Mezzanine & Equity Fund II</i>	66,708,861	55,215,684	65,458	84,876,800	10,139,363	8.94	1.54	19.50
<i>Windjammer Senior Equity Fund III</i>	75,000,000	62,684,411	390,136	154,997,986	13,380,380	19.57	2.48	13.74
<i>Windjammer Senior Equity Fund IV</i>	100,000,000	89,524,405	113,563,380	41,101,357	18,397,478	14.34	1.73	7.60
<i>Windjammer Senior Equity Fund V</i>	100,000,000	12,669,403	11,757,852	0	87,330,597	-13.83	0.93	1.86
Private Equity Total	15,410,396,397	10,047,340,193	6,398,272,995	9,350,309,072	6,216,125,937	12.47	1.57	

II. PRIVATE CREDIT

Audax Group								
<i>Audax Mezzanine Fund III</i>	100,000,000	97,392,001	16,610,905	110,793,425	4,246,122	9.66	1.31	9.49
<i>Audax Mezzanine Fund IV</i>	100,000,000	58,536,874	34,084,136	29,978,904	52,216,273	8.97	1.09	4.48
BlackRock								
<i>BlackRock Middle Market Senior Fund</i>	97,500,000	49,496,251	50,153,611	637,329	48,003,749	3.90	1.03	1.46
Energy Capital Partners								
<i>Energy Capital Credit Solutions II</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.99
GS Mezzanine Partners								
<i>GS Mezzanine Partners 2006</i>	100,000,000	113,454,150	739,157	134,861,849	9,858,563	5.00	1.20	13.48
<i>GS Mezzanine Partners V</i>	150,000,000	147,704,244	1,896,128	179,089,405	37,564,028	9.04	1.23	11.94
Gold Hill Venture Lending								
<i>Gold Hill Venture Lending</i>	40,000,000	40,000,000	396,011	65,077,862	0	10.69	1.64	15.01
<i>Gold Hill 2008</i>	25,852,584	25,852,584	5,865,333	44,745,145	0	14.73	1.96	11.25
HPS Investment Partners								
<i>HPS Mezzanine Partners 2019</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.72
Kohlberg Kravis Roberts								
<i>KKR Lending Partners II</i>	75,000,000	86,189,157	22,426,849	79,154,623	8,802,924	8.82	1.18	4.57
<i>KKR Lending Partners III</i>	199,000,000	94,204,729	91,680,094	17,340,490	111,708,154	15.10	1.16	2.47
LBC Credit Partners								
<i>LBC Credit Partners IV</i>	100,000,000	89,811,121	67,041,211	34,775,536	32,291,029	10.03	1.13	3.42
<i>LBC Credit Partners V</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.50
Marathon								
<i>Marathon Secured Private Strategies Fund II</i>	100,000,000	45,022,008	44,000,000	0	56,000,000	-3.87	0.98	0.25

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
Merit Capital Partners								
<i>Merit Mezzanine Fund IV</i>	75,000,000	70,178,571	0	139,120,463	4,821,429	11.54	1.98	14.79
<i>Merit Mezzanine Fund V</i>	75,000,000	71,044,898	40,338,963	68,849,860	3,955,102	10.09	1.54	9.78
<i>Merit Mezzanine Fund VI</i>	100,000,000	58,328,723	68,288,830	6,343,284	41,604,478	14.76	1.28	3.52
Portfolio Advisors								
<i>DLJ Investment Partners III</i>	100,000,000	82,719,050	558,202	96,478,980	509,988	6.81	1.17	13.28
Prudential Capital Partners								
<i>Prudential Capital Partners II</i>	100,000,000	97,418,748	5,726,946	136,427,860	11,049,052	8.83	1.46	14.25
<i>Prudential Capital Partners III</i>	100,000,000	100,641,752	4,799,098	170,006,438	14,859,276	14.19	1.74	10.46
<i>Prudential Capital Partners IV</i>	100,000,000	108,017,173	55,631,637	83,850,428	3,552,519	9.36	1.29	7.70
<i>Prudential Capital Partners V</i>	150,000,000	104,294,119	107,782,981	15,822,226	49,470,706	13.57	1.19	3.12
Summit Partners								
<i>Summit Subordinated Debt Fund III</i>	45,000,000	44,088,494	3,816,372	60,443,093	2,250,000	8.93	1.46	15.63
<i>Summit Subordinated Debt Fund IV</i>	50,000,000	55,914,003	4,731,635	72,207,729	19,850,132	10.36	1.38	11.51
TCW Asset Management								
<i>TCW Direct Lending VI</i>	100,000,000	83,599,652	43,281,292	56,768,625	25,329,409	8.03	1.20	5.03
<i>TCW Direct Lending VII</i>	100,000,000	63,032,508	62,302,524	5,949,415	39,930,144	13.97	1.08	1.71
Private Credit Total	2,482,352,584	1,786,940,809	732,151,915	1,608,722,967	877,873,076	9.87	1.31	

III. REAL ASSETS

BlackRock

<i>BlackRock Global Renewable Power Fund II</i>	98,500,000	77,999,463	69,420,904	9,218,613	26,858,878	0.51	1.01	3.85
<i>BlackRock Global Renewable Power Infrastructure III</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.25

EIG Global Energy Partners

<i>EIG Energy Fund XIV</i>	100,000,000	113,177,137	9,298,177	94,745,253	2,761,129	-2.89	0.92	12.45
<i>EIG Energy Fund XV</i>	150,000,000	159,358,995	53,348,696	128,179,482	22,639,867	3.40	1.14	9.32
<i>EIG Energy Fund XVI</i>	200,000,000	182,065,404	143,061,018	78,400,507	54,284,878	7.26	1.22	6.05

EnCap Energy

<i>EnCap Energy Capital Fund VII</i>	100,000,000	105,379,160	6,074,195	135,157,214	0	14.67	1.34	12.25
<i>EnCap Energy Capital Fund VIII</i>	100,000,000	99,410,912	27,075,193	54,781,243	4,394,899	-5.48	0.82	9.00
<i>EnCap Energy Capital Fund IX</i>	100,000,000	111,445,745	55,886,655	83,957,459	6,150,487	9.28	1.25	6.81
<i>EnCap Energy Capital Fund X</i>	100,000,000	91,533,815	90,675,985	20,162,033	16,609,822	9.26	1.21	4.57

EnerVest Energy

<i>EnerVest Energy Institutional Fund XIV</i>	100,000,000	94,602,874	81,081,665	41,175,285	13,490,824	9.22	1.29	4.30
---	-------------	------------	------------	------------	------------	------	------	-------------

Energy Capital Partners

<i>Energy Capital Partners II</i>	100,000,000	85,722,480	8,011,307	112,434,332	29,749,110	9.61	1.41	9.20
-----------------------------------	-------------	------------	-----------	-------------	------------	------	------	-------------

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
<i>Energy Capital Partners III</i>	200,000,000	215,922,282	172,715,889	83,824,545	21,712,054	7.43	1.19	5.78
<i>Energy Capital Partners IV</i>	150,000,000	50,324,313	52,561,528	7,914,723	106,939,722	16.31	1.20	1.75
Energy & Minerals Group								
<i>NGP Midstream & Resources</i>	100,000,000	103,527,211	10,911,839	178,013,289	17,857	13.69	1.82	12.50
<i>The Energy & Minerals Group Fund II</i>	100,000,000	105,186,174	92,971,033	102,399,087	723,681	14.25	1.86	8.02
<i>The Energy & Minerals Group Fund III</i>	200,000,000	201,327,783	141,191,100	22,410,545	1,284,543	-4.78	0.81	5.57
<i>The Energy & Minerals Group Fund IV</i>	150,000,000	150,173,111	162,253,537	46,989,014	21,414,947	14.94	1.39	3.92
<i>The Energy & Minerals Group Fund V</i>	112,500,000	77,386,782	81,066,754	0	35,821,118	6.21	1.05	0.70
<i>The Energy & Minerals Group Fund V Accordion</i>	17,500,000	14,108,142	14,622,623	0	3,474,727	5.45	1.04	0.70
First Reserve								
<i>First Reserve Fund X</i>	100,000,000	100,000,000	6,850	182,761,608	0	31.05	1.83	14.92
<i>First Reserve Fund XI</i>	150,000,000	150,292,121	7,623,931	98,040,152	0	-7.12	0.70	12.78
<i>First Reserve Fund XII</i>	150,000,000	165,617,044	24,804,277	82,274,676	0	-9.54	0.65	10.92
<i>First Reserve Fund XIII</i>	200,000,000	189,013,029	145,571,371	66,422,959	34,769,711	7.20	1.12	5.91
Kohlberg, Kravis, Roberts & Co.								
<i>KKR Global Infrastructure Investors III</i>	149,850,000	43,870,417	42,453,841	629,505	106,609,088	-3.58	0.98	1.50
Merit Energy Partners								
<i>Merit Energy Partners B</i>	24,000,000	24,000,000	1,554,840	189,858,902	0	24.28	7.98	22.69
<i>Merit Energy Partners C</i>	50,000,000	50,000,000	4,970,844	514,177,741	0	30.96	10.38	20.93
<i>Merit Energy Partners D</i>	88,000,000	70,938,303	11,709,964	333,800,338	0	22.67	4.87	18.36
<i>Merit Energy Partners E</i>	100,000,000	39,983,197	2,104,157	81,962,528	0	11.33	2.10	15.00
<i>Merit Energy Partners F</i>	100,000,000	59,522,861	8,826,810	29,689,739	0	-7.18	0.65	13.52
<i>Merit Energy Partners H</i>	100,000,000	100,000,000	62,721,585	29,668,582	0	-1.57	0.92	8.66
<i>Merit Energy Partners I</i>	169,721,518	169,721,518	198,462,370	35,839,059	0	11.75	1.38	4.95
<i>Merit Energy Partners K</i>	150,000,000	22,279,430	22,279,430	0	127,720,570	0.00	1.00	0.75
NGP								
<i>Natural Gas Partners IX</i>	150,000,000	173,921,032	3,276,291	245,366,339	605,481	12.04	1.43	11.94
<i>NGP Natural Resources X</i>	150,000,000	145,134,130	35,726,909	116,347,777	4,865,870	1.40	1.05	7.97
<i>Natural Gas Capital Resources XI</i>	150,000,000	141,924,721	124,225,335	43,817,505	14,678,538	7.39	1.18	4.81
<i>NGP Natural Resources XII</i>	149,500,000	70,169,304	69,352,784	0	78,990,221	-1.07	0.99	2.16
Sheridan								
<i>Sheridan Production Partners I</i>	100,000,000	116,552,260	0	82,750,000	0	0.00	0.71	12.50
<i>Sheridan Production Partners II</i>	100,000,000	103,500,000	0	7,000,000	3,500,000	0.00	0.07	9.00
<i>Sheridan Production Partners III</i>	100,000,000	34,353,005	29,552,000	19,050,000	65,650,000	13.89	1.41	4.81
Real Assets Total	4,709,571,518	4,009,444,155	2,067,451,687	3,359,220,034	905,718,022	13.23	1.35	

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
IV. REAL ESTATE								
Angelo, Gordon & Co.								
<i>AG Realty Fund IX</i>	100,000,000	85,141,582	98,011,657	13,500,000	18,650,000	11.05	1.31	4.81
<i>AG Asia Realty Fund III</i>	50,000,000	47,587,261	33,685,720	29,500,000	6,196,250	15.82	1.33	2.99
<i>AG Europe Realty Fund II</i>	75,000,000	59,350,822	64,797,420	28,384	15,000,000	9.89	1.09	2.28
<i>AG Realty Fund X</i>	150,000,000	29,618,800	30,979,148	12,431	118,500,000	8.90	1.05	1.41
<i>AG Asia Realty Fund IV</i>	100,000,000	21,500,000	20,559,225	0	78,500,000	-5.66	0.96	1.31
Blackstone Real Estate Partners								
<i>Blackstone Real Estate Partners V</i>	100,000,000	104,213,007	4,437,315	202,303,108	4,174,052	10.78	1.98	13.43
<i>Blackstone Real Estate Partners VI</i>	100,000,000	109,477,567	7,284,844	213,244,964	4,907,906	13.15	2.01	12.50
<i>Blackstone Real Estate Partners VII</i>	100,000,000	107,947,285	49,481,773	141,590,853	13,995,597	16.40	1.77	7.84
<i>Blackstone Real Estate Partners VIII</i>	150,000,000	159,077,545	143,969,531	59,634,533	29,744,743	13.77	1.28	4.51
<i>Blackstone Real Estate Partners Asia II</i>	74,500,000	25,417,482	25,120,264	593,409	50,964,697	1.70	1.01	2.02
<i>Blackstone Real Estate Partners IX</i>	300,000,000	51,876,190	50,685,143	1,151,479	248,926,649	-0.15	1.00	1.02
Blackstone Strategic Partners (CSFB)								
<i>Strategic Partners III RE</i>	25,000,000	25,988,048	132,833	15,199,539	9,006	-6.49	0.59	14.25
<i>Strategic Partners IV RE</i>	50,000,000	51,489,268	4,245,719	47,804,228	1,080,393	0.18	1.01	11.29
Carlyle Group								
<i>Carlyle Realty Partners VIII</i>	150,000,000	27,587,645	25,827,511	405,648	122,826,870	-5.83	0.95	2.40
Colony Capital								
<i>Colony Investors III</i>	100,000,000	99,660,860	2,650,800	173,802,105	0	14.50	1.77	21.76
Landmark Partners								
<i>Landmark Real Estate Partners VIII</i>	149,500,000	60,331,708	48,365,658	20,304,107	92,724,735	18.74	1.14	2.79
Lubert Adler								
<i>Lubert-Adler Real Estate Fund VII-B</i>	74,147,868	50,901,943	55,040,628	1,731,088	24,098,057	7.97	1.12	2.98
Rockpoint								
<i>Rockpoint Real Estate Fund V</i>	100,000,000	87,998,417	83,455,176	22,427,953	26,125,220	10.21	1.20	4.72
<i>Rockpoint Real Estate Fund VI</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.78
Rockwood								
<i>Rockwood Capital RE Partners X</i>	100,000,000	82,035,499	78,162,504	9,090,910	19,657,120	3.80	1.06	4.21
<i>Rockwood Capital RE Partners XI</i>	100,000,000	0	0	0	100,000,000	0.00	0.00	0.51
Silverpeak Real Estate Partners								
<i>Silverpeak Legacy Pension Partners II</i>	75,000,000	73,005,908	963,868	91,268,650	7,559,162	4.16	1.26	14.17
<i>Silverpeak Legacy Pension Partners III</i>	150,000,000	70,573,046	11,529,027	13,427,052	79,431,504	-11.08	0.35	11.42
T.A. Associates Realty								
<i>Realty Associates Fund VIII</i>	100,000,000	100,000,000	58,262	99,227,557	0	-0.08	0.99	13.25
<i>Realty Associates Fund X</i>	100,000,000	100,000,000	17,156,211	144,650,832	0	12.97	1.62	7.58

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
<i>Realty Associates Fund XI</i>	100,000,000	100,000,000	101,393,713	22,842,900	0	9.41	1.24	4.24
<i>Realty Associates Fund XII</i>	100,000,000	0	-923,817	0	100,000,000	0.00	0.00	1.50
Real Estate Total	2,873,147,868	1,730,779,882	957,070,132	1,323,741,729	1,263,071,960	7.95	1.32	

V. DISTRESSED/ OPPORTUNISTIC

Avenue Capital Partners								
<i>Avenue Energy Opportunities Fund</i>	100,000,000	100,977,328	97,332,546	19,472,941	0	3.70	1.16	5.25
<i>Avenue Energy Opportunities Fund II</i>	100,000,000	100,000,000	102,166,000	417,420	0	1.62	1.03	2.40
BlackRock**								
<i>BlackRock Tempus Fund</i>	1,774,870	1,774,870	303,412	1,683,064	0	6.67	1.12	4.30
Carlyle Group								
<i>Carlyle Strategic Partners IV</i>	100,000,000	44,816,741	26,943,153	20,126,174	75,267,542	4.67	1.05	3.50
Carval Investors								
<i>CVI Global Value Fund</i>	200,000,000	190,000,000	4,870,256	315,888,483	10,000,000	9.54	1.69	12.72
<i>CVI Credit Value Fund I</i>	100,000,000	95,000,000	6,222,517	207,569,569	5,000,000	18.75	2.25	9.00
<i>CVI Credit Value Fund A II</i>	150,000,000	142,500,000	8,473,798	194,560,061	7,500,000	8.38	1.42	6.92
<i>CVI Credit Value Fund A III</i>	150,000,000	142,500,000	80,824,118	101,732,488	7,500,000	9.11	1.28	4.32
<i>CVI Credit Value Fund IV</i>	150,000,000	112,703,333	119,193,638	60	37,500,000	6.38	1.06	1.99
Marathon								
<i>Marathon Distressed Credit Fund</i>	200,000,000	0	0	0	200,000,000	0.00	0.00	0.07
Merced Capital								
<i>Merced Partners III</i>	100,000,000	100,000,000	10,455,777	124,997,107	0	6.15	1.35	9.40
<i>Merced Partners IV</i>	125,000,000	124,968,390	62,573,997	93,097,539	0	5.41	1.25	6.22
<i>Merced Partners V</i>	53,737,500	53,915,358	52,372,944	0	0	-1.21	0.97	2.25
MHR Institutional Partners								
<i>MHR Institutional Partners IV</i>	75,000,000	41,246,892	37,953,756	3,751,515	37,446,043	0.47	1.01	5.28
Oaktree Capital Management								
<i>Oaktree Principal Fund VI</i>	100,000,000	87,272,518	86,109,136	14,037,147	25,193,967	7.39	1.15	4.75
<i>Oaktree Opportunities Fund X</i>	50,000,000	46,500,021	47,114,352	11,119,660	8,500,000	10.96	1.25	4.63
<i>Oaktree Opportunities Fund Xb</i>	100,000,000	25,000,000	23,285,300	0	75,000,000	-10.75	0.93	4.63
<i>Oaktree Special Situations Fund II</i>	100,000,000	2,184,491	2,125,592	0	97,800,000	-7.63	0.97	1.43
Pimco Bravo**								
<i>Pimco Bravo Fund OnShore Feeder I</i>	3,958,027	3,958,027	87,720	3,978,735	2,348,173	2.61	1.03	4.75
<i>Pimco Bravo Fund OnShore Feeder II</i>	5,243,670	4,685,039	2,313,764	3,755,717	4,309,160	6.17	1.30	4.75
TSSP								
<i>TSSP Adjacent Opportunities Partner</i>	50,000,000	28,654,543	28,619,201	2,186,115	23,531,572	9.82	1.08	1.49

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	NET MOIC*	Period Years
<i>TSSP Adjacent Opportunities Contingent</i>	100,000,000	82,193	82,193	204	99,917,807	0.29	1.00	1.56
<i>TSSP Opportunities Partners IV</i>	50,000,000	8,088,859	8,498,238	9,829	41,911,141	7.59	1.05	1.39
Varde Fund								
<i>Varde Fund IX</i>	100,000,000	100,000,000	631,361	215,289,913	0	15.00	2.16	11.27
<i>Varde Fund X</i>	150,000,000	150,000,000	38,743,443	247,345,376	0	11.52	1.91	9.44
<i>Varde Fund XI</i>	200,000,000	200,000,000	175,366,110	126,883,658	0	7.93	1.51	6.22
<i>Varde Fund XIII</i>	150,000,000	15,000,000	14,709,915	0	135,000,000	-3.70	0.98	1.22
Wayzata								
<i>Wayzata Opportunities Fund II</i>	150,000,000	174,750,000	2,254,926	327,229,040	30,000,000	16.48	1.89	11.94
<i>Wayzata Opportunities Fund III</i>	150,000,000	68,415,000	26,261,350	37,605,787	15,000,000	-2.06	0.93	7.29
<i>Distressed/Opportunistic Total</i>	3,064,714,067	2,164,993,603	1,065,888,513	2,072,737,600	938,725,406	10.44	1.45	
<i>Private Markets Total</i>	28,540,182,433	19,739,498,643	11,220,835,241	17,714,731,403	10,201,514,400	11.77	1.47	

<i>Private Markets Portfolio Status</i>	Investment Manager Count	Investments Count
PRIVATE EQUITY	52	139
PRIVATE CREDIT	14	25
REAL ASSETS	11	42
REAL ESTATE	11	27
DISTRESSED/ OPPORTUNISTIC	12	29
Total	100	262

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.

This page intentionally left blank.



Participant Directed Investment Program

December 31, 2019



Quarterly Report

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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Option Since</u>
BALANCED FUND	\$96,724,020	5.5%	21.7%	10.5%	8.2%	9.8%	01/1980
U.S. ACTIVELY MANAGED FUND	65,109,317	9.4	31.2	15.5	11.2	13.5	07/1986
U.S. STOCK INDEX FUND	390,072,802	9.1	31.1	14.6	11.3	13.4	07/1986
BROAD INTERNATIONAL STOCK FUND	124,249,837	9.0	22.4	10.1	5.9	5.5	09/1994
BOND FUND	107,162,509	0.5	9.7	4.5	3.6	4.5	07/1986
MONEY MARKET FUND	500,866,484	0.5	2.4	1.8	1.3	0.7	07/1986
STABLE VALUE FUND	1,588,008,044	0.7	2.7	2.4	2.2	2.6	11/1994
VOLUNTEER FIREFIGHTER ACCOUNT	120,056,286	4.7	18.3	8.8	6.6	7.7	01/2010



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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
*BALANCED FUND	\$96,724,020	5.5%	21.7%	10.5%	8.2%	9.8%
SIF BALANCED FUND BENCHMARK		5.5	21.6	10.3	8.0	9.5
Excess		0.0	0.2	0.1	0.1	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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
U.S. ACTIVELY MANAGED FUND	65,109,317	9.4	31.2	15.5	11.2	13.5
Russell 3000		9.1	31.0	14.6	11.2	13.4
Excess		0.3	0.2	0.9	0.0	0.1

*Please note that the returns reflect a price adjustment that occurred in December to correctly reflect a cash flow entry from a 7/1/2019 rebalance.



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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
U.S. STOCK INDEX FUND	\$390,072,802	9.1%	31.1%	14.6%	11.3%	13.4%
Russell 3000		9.1	31.0	14.6	11.2	13.4
Excess		-0.0	0.0	0.0	0.0	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).

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
BROAD INTERNATIONAL STOCK FUND	124,249,837	9.0	22.4	10.1	5.9	5.5
International Equity Benchmark		8.9	21.5	9.9	5.5	5.0
Excess		0.1	0.9	0.3	0.4	0.5



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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
BOND FUND	\$107,162,509	0.5%	9.7%	4.5%	3.6%	4.5%
BBG BARC US Agg		0.2	8.7	4.0	3.0	3.7
Excess		0.3	1.0	0.5	0.5	0.8

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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
MONEY MARKET FUND	500,866,484	0.5	2.4	1.8	1.3	0.7
ICE BofA US 3-Month Treasury Bill		0.5	2.3	1.7	1.1	0.6
Excess		0.0	0.1	0.2	0.2	0.1



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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
STABLE VALUE FUND	\$1,588,008,044	0.7%	2.7%	2.4%	2.2%	2.6%
Fixed Interest Blended Benchmark		0.5	2.4	2.5	2.1	1.6
Excess		0.2	0.3	-0.1	0.2	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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
VOLUNTEER FIREFIGHTER ACCOUNT	120,056,286	4.7	18.3	8.8	6.6	7.7
SIF Volunteer Firefighter Account BM		4.6	18.0	8.6	6.4	7.3
Excess		0.1	0.3	0.2	0.3	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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Option Since</u>
VANGUARD TOTAL STOCK MARKET INSTITUTIONAL INDEX PLUS	\$533,329,510						07/2019
VANGUARD INSTITUTIONAL INDEX PLUS	1,417,766,534	9.1%	30.8%	15.0%	11.6%	13.5%	07/1999
VANGUARD DIVIDEND GROWTH	783,205,109	4.6	31.0	16.1			10/2016
VANGUARD MID CAP INDEX	601,499,107	6.9	31.1	12.4	9.3	13.1	01/2004
T. ROWE PRICE SMALL-CAP STOCK	824,467,520	7.5	34.0	14.5	11.6	15.2	04/2000
FIDELITY DIVERSIFIED INTERNATIONAL	319,807,149	10.0	29.7	11.7	6.9	6.7	07/1999
VANGUARD TOTAL INTERNATIONAL STOCK INDEX	309,067,750	9.1	20.9	9.7	5.8		07/2011
VANGUARD BALANCED INDEX	1,268,304,822	5.4	21.8	10.5	8.1	9.7	12/2003
DODGE & COX INCOME	276,132,483	0.3	8.4	4.1	3.4	4.3	07/1999
VANGUARD TOTAL BOND MARKET INDEX	340,396,170	-0.0	8.6	4.0	3.0	3.7	12/2003
2020 FUND	134,885,381	3.2	13.7	6.6	4.9		07/2011
2025 FUND	171,045,216	4.3	16.8	8.1	5.9		07/2011
2030 FUND	126,926,231	5.2	19.9	9.5	6.8		07/2011
2035 FUND	96,456,505	5.9	21.7	10.2	7.3		07/2011
2040 FUND	76,425,529	6.5	22.9	10.8	7.6		07/2011
2045 FUND	65,351,564	7.0	23.9	11.1	7.9		07/2011
2050 FUND	49,126,151	7.4	24.7	11.5	8.1		07/2011
2055 FUND	29,377,635	7.6	25.0	11.5	8.1		07/2011
2060 FUND	23,934,738	7.6	25.0	11.5	8.1		07/2011
INCOME FUND	100,314,276	3.2	13.2	6.0	4.5		07/2011
TD Ameritrade SDB	77,818,096						
TD Ameritrade SDB Roth	1,145,090						



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	\$533,329,510	9.0%				07/2019
CRSP US Total Market Index		9.0				07/2019
Excess		0.0				
VANGUARD INSTITUTIONAL INDEX PLUS	1,417,766,534	9.1%	31.5%	15.3%	11.7%	07/1999
S&P 500		9.1	31.5	15.3	11.7	07/1999
Excess		-0.0	-0.0	-0.0	-0.0	
VANGUARD DIVIDEND GROWTH	783,205,109	4.6	31.0	16.1		10/2016
NASDAQ US Dividend Achievers Select		4.9	29.8	15.9		10/2016
Excess		-0.3	1.2	0.3		
Mid Cap US Equity						
VANGUARD MID CAP INDEX	601,499,107	6.9	31.1	12.4	9.3	01/2004
CRSP US Mid Cap Index		6.9	31.1	12.4	9.3	01/2004
Excess		0.0	-0.0	-0.0	-0.0	
Small Cap US Equity						
T. ROWE PRICE SMALL-CAP STOCK	824,467,520	7.5	34.0	14.5	11.6	04/2000
Russell 2000		9.9	25.5	8.6	8.2	04/2000
Excess		-2.5	8.4	5.9	3.3	
International Equity						
FIDELITY DIVERSIFIED INTERNATIONAL	319,807,149	10.0	29.7	11.7	6.9	07/1999
MSCI EAFE FREE (NET)		8.2	22.0	9.6	5.7	07/1999
Excess		1.8	7.7	2.2	1.2	
VANGUARD TOTAL INTERNATIONAL STOCK INDEX	309,067,750	9.1	21.6	9.9	5.9	07/2011
FTSE Global All Cap ex US Index Net		9.2	21.8	9.8	5.8	07/2011
Excess		-0.2	-0.2	0.1	0.1	



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	\$1,268,304,822	5.4%	21.8%	10.5%	8.1%	12/2003
Vanguard Balanced Fund Benchmark		5.4	21.8	10.5	8.1	12/2003
Excess		-0.0	-0.0	-0.0	-0.0	

Fixed Income

DODGE & COX INCOME	276,132,483	0.3	8.4	4.1	3.4	07/1999
BBG BARC Agg Bd		0.2	8.7	4.0	3.0	07/1999
Excess		0.1	-0.3	0.1	0.4	

VANGUARD TOTAL BOND MARKET INDEX	340,396,170	-0.0	8.6	4.0	3.0	12/2003
BBG BARC Agg Bd		0.2	8.7	4.0	3.0	12/2003
Excess		-0.2	-0.1	-0.0	-0.1	

MONEY MARKET FUND	500,866,484	0.5	2.4	1.8	1.3	07/1986
ICE BofA US 3-Month Treasury Bill		0.5	2.3	1.7	1.1	07/1986
Excess		0.0	0.1	0.2	0.2	

Stable Value

STABLE VALUE FUND	1,588,008,044	0.7	2.7	2.4	2.2	11/1994
Fixed Interest Blended Benchmark		0.5	2.4	2.5	2.1	11/1994
Excess		0.2	0.3	-0.1	0.2	

- (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 decision by investing their assets in the fund that is closest to their anticipated retirement date.

Target Date Retirement Funds

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>Option Since</u>		<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>Option Since</u>	
SSgA														
2020 FUND	\$134,885,381	3.2%	13.7%	6.6%	4.9%	07/2011		2045 FUND	\$65,351,564	7.0%	23.9%	11.1%	7.9%	07/2011
2020 FUND BENCHMARK		3.2	13.7	6.6	4.9	07/2011		2045 FUND BENCHMARK		7.0	23.9	11.2	7.9	07/2011
Excess		-0.0	-0.0	-0.0	0.0			Excess		-0.0	-0.0	-0.0	0.0	
2025 FUND	171,045,216	4.3	16.8	8.1	5.9	07/2011		2050 FUND	49,126,151	7.4	24.7	11.5	8.1	07/2011
2025 FUND BENCHMARK		4.3	16.8	8.1	5.9	07/2011		2050 FUND BENCHMARK		7.5	24.8	11.5	8.1	07/2011
Excess		-0.0	0.0	0.0	0.0			Excess		-0.0	-0.0	-0.0	0.0	
2030 FUND	126,926,231	5.2	19.9	9.5	6.8	07/2011		2055 FUND	29,377,635	7.6	25.0	11.5	8.1	07/2011
2030 FUND BENCHMARK		5.2	19.9	9.5	6.8	07/2011		2055 FUND BENCHMARK		7.6	25.0	11.5	8.1	07/2011
Excess		-0.0	0.0	-0.0	0.0			Excess		-0.0	-0.0	-0.0	0.0	
2035 FUND	96,456,505	5.9	21.7	10.2	7.3	07/2011		2060 FUND	23,934,738	7.6	25.0	11.5	8.1	07/2011
2035 FUND BENCHMARK		6.0	21.7	10.3	7.3	07/2011		2060 FUND BENCHMARK		7.6	25.0	11.5	8.1	07/2011
Excess		-0.0	-0.0	-0.0	0.0			Excess		-0.0	-0.0	0.0	0.0	
2040 FUND	76,425,529	6.5	22.9	10.8	7.6	07/2011		INCOME FUND	100,314,276	3.2	13.2	6.0	4.5	07/2011
2040 FUND BENCHMARK		6.5	22.9	10.8	7.6	07/2011		INCOME FUND BENCHMARK		3.2	13.2	6.1	4.5	07/2011
Excess		-0.0	-0.0	-0.0	0.0			Excess		-0.0	-0.0	-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 enrollment 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: December 31, 2019

Total = \$1,561 Million

Fund Name	Ending Market	3 Months	1 Year	Annualized				Inception Date
				3 Years	5 Years	10 Years	Since Inception	
2036/2037 Enrollment Option	\$11,751,847						4.80%	10/28/2019
2036-2037 Custom Benchmark							5.55%	
2034/2035 Enrollment Option	\$21,921,516						4.70%	10/28/2019
2034-2035 Custom Benchmark							5.42%	
2032/2033 Enrollment Option	\$28,436,050						4.50%	10/28/2019
2032-2033 Custom Benchmark							5.18%	
2030/2031 Enrollment Option	\$38,971,010						4.30%	10/28/2019
2030-2031 Custom Benchmark							4.93%	
2028/2029 Enrollment Option	\$54,624,880						3.90%	10/28/2019
2028-2029 Custom Benchmark							4.51%	
2026/2027 Enrollment Option	\$81,159,140						3.30%	10/28/2019
2026-2027 Custom Benchmark							3.82%	
2024/2025 Enrollment Option	\$119,668,299						2.80%	10/28/2019
2024-2025 Custom Benchmark							3.21%	
2022/2023 Enrollment Option	\$154,868,778						2.20%	10/28/2019
2022-2023 Custom Benchmark							2.58%	
2020/2021 Enrollment Option	\$189,082,958						1.50%	10/28/2019
2020-2021 Custom Benchmark							1.79%	
In School Option	\$226,002,463						1.30%	10/28/2019
In School Custom Benchmark							1.47%	



MINNESOTA COLLEGE SAVINGS PLAN

Performance Statistics for the Period Ending: December 31, 2019

Fund Name	Ending Market	3 Months	1 Year	Annualized				Inception Date
				3 Years	5 Years	10 Years	Since Inception	
U.S. and International Equity Option	\$300,161,165	7.98%	27.95%	12.91%	9.34%	10.95%	7.36%	10/ 1/2001
BB: U.S. and International Equity Option		8.97%	28.86%	13.10%	9.62%	11.33%	8.56%	
Moderate Allocation Option	\$76,975,219	4.92%	20.11%	9.34%	6.86%	7.98%	5.67%	8/ 2/2007
BB: Moderate Allocation Option		5.57%	20.69%	9.54%	7.18%	8.53%	6.79%	
100% Fixed-Income Option	\$18,895,445	0.32%	8.60%	3.68%	2.86%	3.30%	3.69%	8/16/2007
BB: 100% Fixed-Income Option		0.59%	8.98%	4.03%	3.19%	3.77%	4.33%	
International Equity Index Option	\$5,585,790	8.58%	21.04%	10.03%	5.72%		5.19%	6/18/2013
BB: International Equity Index Option		8.90%	21.35%	10.03%	5.74%		5.42%	
Money Market Option	\$13,733,009	0.47%	2.00%	1.41%	0.86%	0.39%	0.57%	11/ 1/2007
BB: Money Market Option		0.34%	1.79%	1.22%	0.75%	0.38%	0.51%	
Principal Plus Interest Option	\$122,728,035	0.51%	2.02%	1.76%	1.59%	1.74%	2.48%	10/10/2001
Citigroup 3-Month U.S. Treasury Bill		0.46%	2.25%	1.65%	1.05%	0.56%	1.35%	
Aggressive Allocation Option	\$35,564,678	6.47%	23.77%	11.19%	8.13%		8.02%	8/12/2014
BB: Aggressive Allocation Option		7.26%	24.74%	11.33%	8.43%		8.22%	
Conservative Allocation Option	\$12,708,730	2.62%	12.46%	6.06%	4.54%		4.32%	8/18/2014
BB: Conservative Allocation Option		3.02%	12.93%	6.19%	4.68%		4.53%	
Equity and Interest Accumulation Option	\$5,111,464	4.74%	15.23%	8.03%	6.31%		6.35%	8/18/2014
BB: Equity and Interest Accumulation Option		4.72%	15.98%	8.14%	6.27%		6.42%	
U.S. Large Cap Equity Option	\$40,365,259	9.04%	31.29%	15.06%	11.48%		12.06%	8/12/2014
BB: U.S. Large Cap Equity Option		9.07%	31.49%	15.27%	11.70%		12.14%	
Matching Grant	\$2,282,916	0.51%	2.02%	1.76%	1.59%	1.74%	2.48%	3/22/2002
Citigroup 3-Month U.S. Treasury Bill		0.46%	2.25%	1.65%	1.05%	0.56%	1.35%	



MINNESOTA COLLEGE SAVINGS PLAN

Performance Statistics for the Age Based Investment Option for the Period Ending: October 25, 2019

The age-based investment option transitioned to the Enrollment-Based Option on 10/28/2019. The following table shows the returns of each Investment Option over the time period(s) indicated for the time period ending 10/24/2019.

Fund Name	Calendar YTD	1 Year	Annualized				Inception Date
			3 Years	5 Years	10 Years	Since Inception	
Managed Ages 0-4	18.39%	13.30%	10.23%	7.74%		7.39%	8/12/2014
BB: Managed Ages 0-4	18.26%	13.51%	10.20%	7.84%		7.47%	
Managed Ages 5-8	17.06%	12.84%	9.31%	7.14%		6.83%	8/12/2014
BB: Managed Ages 5-8	17.02%	13.13%	9.33%	7.28%		6.95%	
Managed Ages 9-10	15.79%	12.47%	8.44%	6.55%		6.29%	8/12/2014
BB: Managed Ages 9-10	15.77%	12.73%	8.45%	6.70%		6.43%	
Managed Ages 11-12	14.25%	11.57%	7.45%	5.85%		5.63%	8/12/2014
BB: Managed Ages 11-12	14.18%	11.91%	7.49%	6.01%		5.78%	
Managed Ages 13-14	12.62%	10.69%	6.48%	5.20%		5.01%	8/12/2014
BB: Managed Ages 13-14	12.59%	11.07%	6.53%	5.31%		5.13%	
Managed Age 15	10.11%	9.04%	5.39%	4.37%		4.24%	8/12/2014
BB: Managed Age 15	10.35%	9.43%	5.40%	4.40%		4.25%	
Managed Age 16	8.93%	7.96%	4.78%	3.90%		3.79%	8/12/2014
BB: Managed Age 16	9.07%	8.43%	4.80%	3.88%		3.76%	
Managed Age 17	7.67%	6.99%	4.22%	3.48%		3.38%	8/12/2014
BB: Managed Age 17	7.81%	7.42%	4.20%	3.37%		3.26%	
Managed Ages 18 & Over	6.20%	5.91%	3.66%	3.04%		2.96%	8/12/2014
BB: Managed Ages 18 & Over	6.55%	6.42%	3.60%	2.85%		2.76%	



Performance as of
12/31/19

Total Market Value: \$ 8,816,334

<u>Fund Name</u>	<u>Market Value</u>	<u>% of Plan</u>	<u>1 Month</u>	<u>3 Months</u>	<u>YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Inception</u>	<u>Inception Date</u>
Aggressive Option	\$ 773,364	8.77%	1.88	7.11	24.54	24.54	10.69			10.50	12/15/16
ABLE Aggressive Custom Benchmark			2.49	7.32	25.09	25.09	11.16			11.08	
Variance			(0.61)	(0.21)	(0.55)	(0.55)	(0.47)			(0.58)	
Moderately Aggressive Option	\$ 855,369	9.70%	1.55	5.91	21.32	21.32	9.39			9.25	12/15/16
ABLE Moderately Aggressive Custom Benchmark			2.13	6.18	21.90	21.90	9.87			9.84	
Variance			(0.58)	(0.27)	(0.58)	(0.58)	(0.48)			(0.59)	
Growth Option	\$ 1,211,494	13.74%	1.28	4.81	18.24	18.24	8.05			8.00	12/15/16
ABLE Growth Custom Benchmark			1.77	5.03	18.74	18.74	8.55			8.58	
Variance			(0.49)	(0.22)	(0.50)	(0.50)	(0.50)			(0.58)	
Moderate Option	\$ 1,088,137	12.34%	0.99	3.65	14.99	14.99	6.75			6.75	12/15/16
ABLE Moderate Custom Benchmark			1.40	3.89	15.63	15.63	7.21			7.28	
Variance			(0.41)	(0.24)	(0.64)	(0.64)	(0.46)			(0.53)	
Moderately Conservative Option	\$ 928,819	10.54%	0.78	2.56	10.87	10.87	5.06			5.09	12/15/16
ABLE Moderately Conservative Custom Benchmark			0.99	2.74	11.42	11.42	5.48			5.55	
Variance			(0.21)	(0.18)	(0.55)	(0.55)	(0.42)			(0.46)	
Conservative Option	\$ 1,519,287	17.23%	0.37	1.11	5.42	5.42	2.81			2.84	12/15/16
ABLE Conservative Custom Benchmark			0.44	1.21	5.88	5.88	3.13			3.17	
Variance			(0.07)	(0.10)	(0.46)	(0.46)	(0.32)			(0.33)	
Checking Option	\$ 2,439,864	27.67%									03/30/17

MINNESOTA ACHIEVE A BETTER LIFE EXPERIENCE

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

December 31, 2019



Quarterly Report

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 trusted by the Public Employees Retirement Association.
- Miscellaneous 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

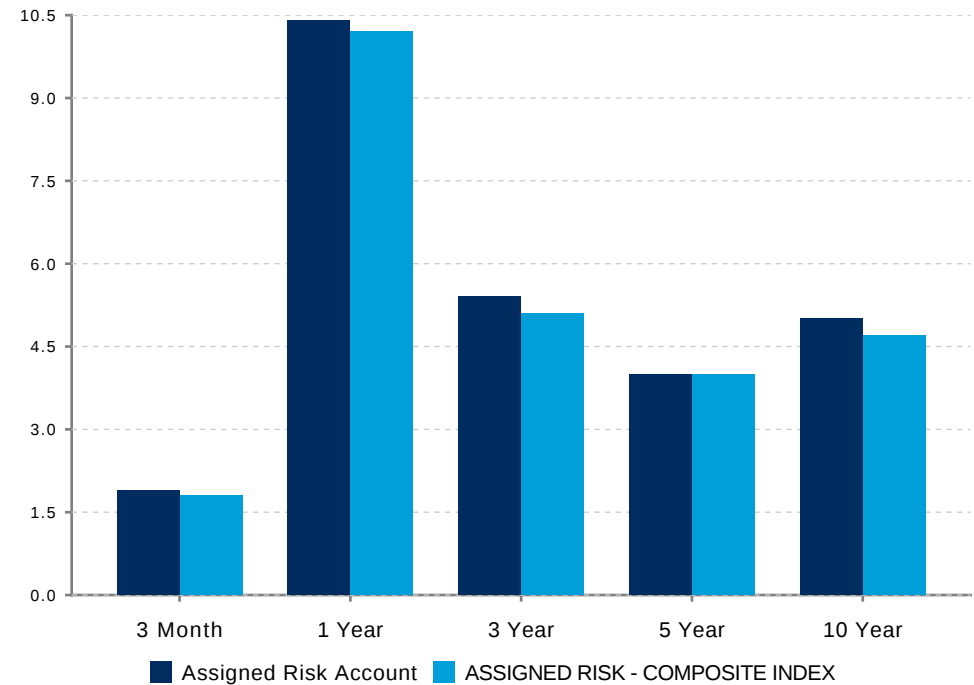
Assigned Risk Plan

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.

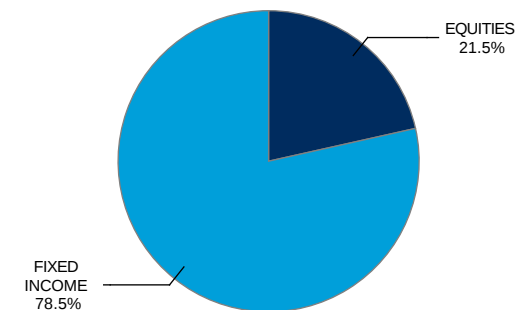
The Assigned Risk Plan is invested in a portfolio of common stocks and bonds

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	\$293,438,876	1.9%	10.4%	5.4%	4.0%	5.0%
EQUITIES	63,198,792	9.0	31.5	15.5	10.9	12.4
FIXED INCOME	230,240,084	0.1	5.2	2.6	2.0	2.8
ASSIGNED RISK - COMPOSITE INDEX		1.8	10.2	5.1	4.0	4.7
Excess		0.1	0.2	0.2	-0.0	0.3
S&P 500		9.1	31.5	15.3	11.7	13.6
BBG BARC US Gov: Int		0.0	5.2	2.6	2.0	2.4



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.



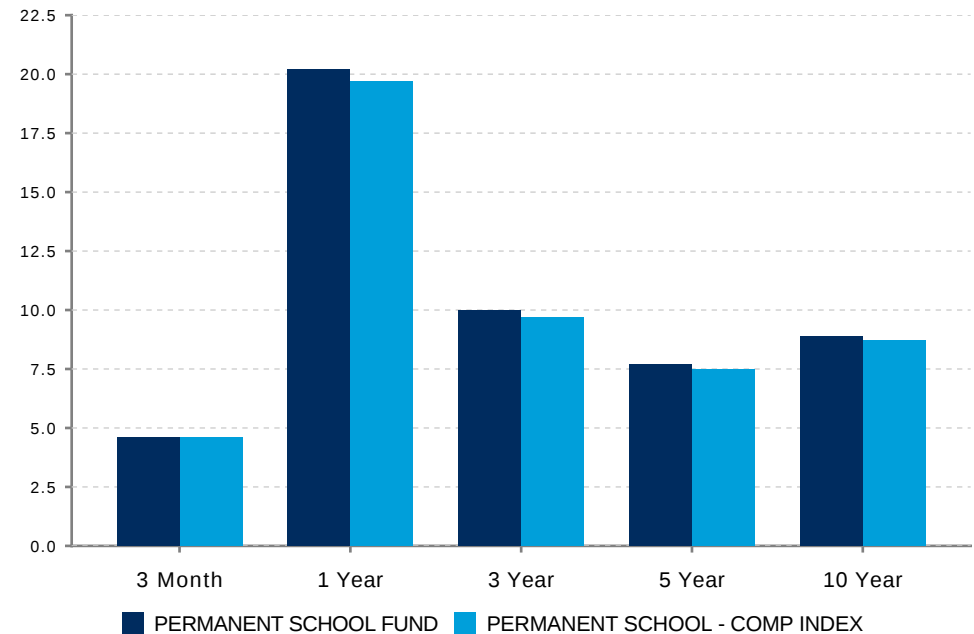
Non-Retirement

Permanent School Fund

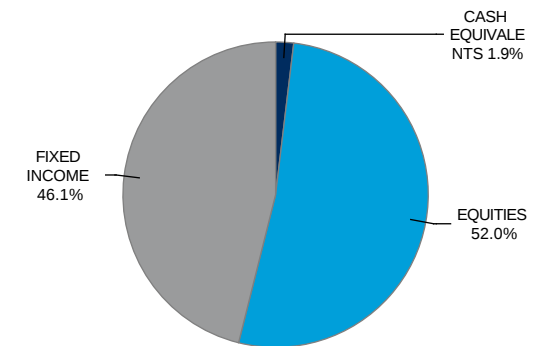
The investment objective of the Permanent School Fund is to produce a growing level of spendable income, within the constraints of maintaining adequate portfolio quality and liquidity. The income from the portfolio is transferred to the school endowment fund and distributed to Minnesota's public schools.

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	\$1,611,614,840	4.6%	20.2%	10.0%	7.7%	8.9%
CASH EQUIVALENTS	31,292,577	0.5	2.3	1.7	1.1	0.7
EQUITIES	837,433,622	9.0	31.5	15.3	11.7	13.6
FIXED INCOME	742,888,641	0.3	9.6	4.5	3.5	4.1
PERMANENT SCHOOL - COMP INDEX		4.6	19.7	9.7	7.5	8.7
Excess		0.1	0.5	0.3	0.2	0.2
S&P 500		9.1	31.5	15.3	11.7	13.6
BBG BARC US Agg		0.2	8.7	4.0	3.0	3.7



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.



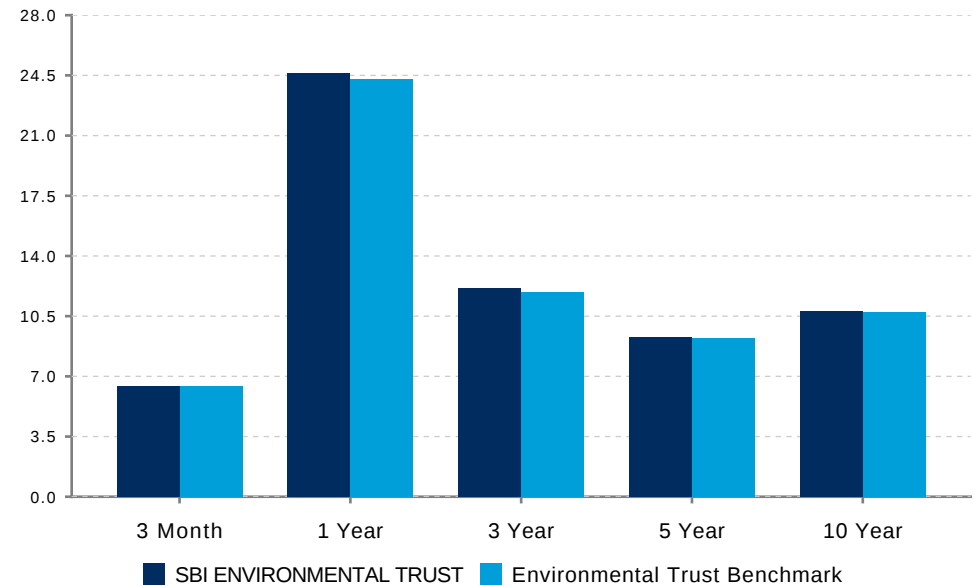
Non-Retirement

Environmental Trust Fund

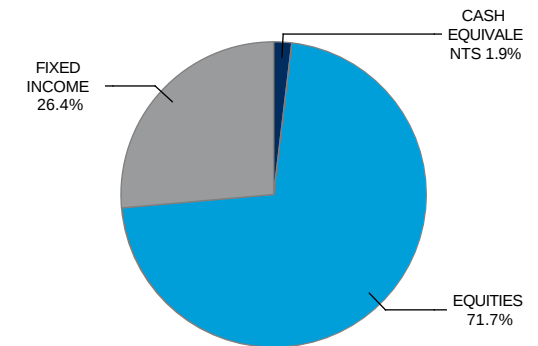
The objective of the Environmental Trust Fund is to increase the market value of the Fund over time in order to increase the annual amount made available for spending within the constraints of maintaining adequate portfolio quality and liquidity.

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	\$1,302,579,036	6.4%	24.6%	12.1%	9.3%	10.8%
CASH EQUIVALENTS	24,749,915	0.5	2.3	1.7	1.1	0.7
EQUITIES	933,752,235	9.0	31.5	15.3	11.7	13.6
FIXED INCOME	344,076,886	0.3	9.6	4.5	3.5	4.1
Environmental Trust Benchmark		6.4	24.3	11.9	9.2	10.7
Excess		0.1	0.3	0.2	0.1	0.1
S&P 500		9.1	31.5	15.3	11.7	13.6
BBG BARC US Agg		0.2	8.7	4.0	3.0	3.7



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.

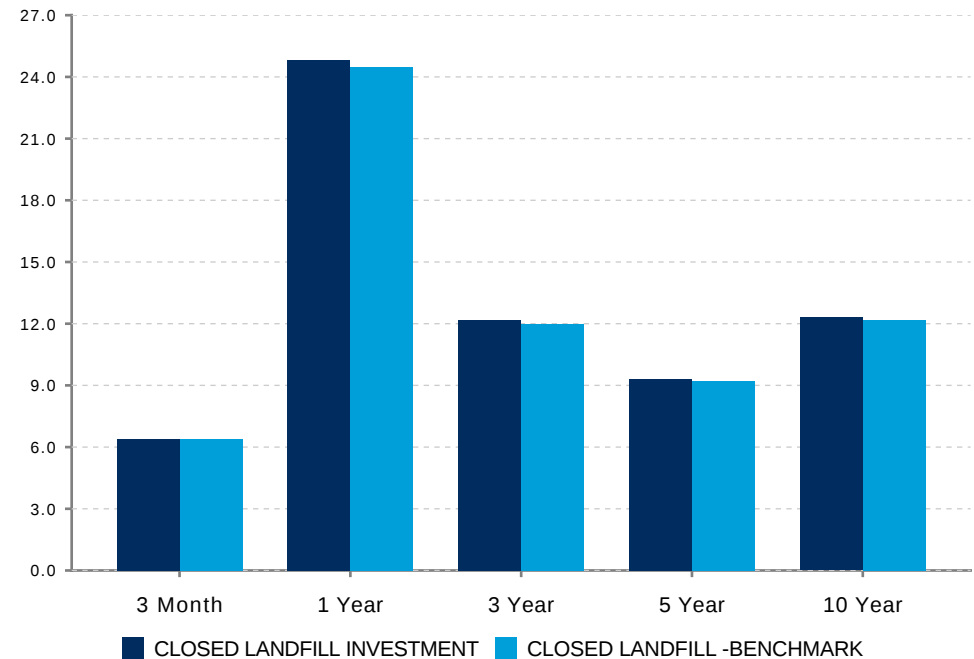


Non-Retirement

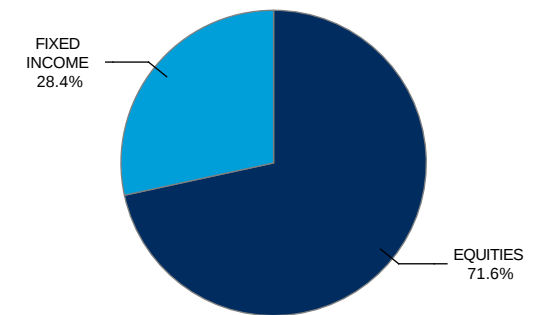
Closed Landfill Investment Fund

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	\$103,994,724	6.4%	24.8%	12.2%	9.3%	12.3%
EQUITIES	74,487,172	9.0	31.5	15.3	11.7	13.6
FIXED INCOME	29,507,552	0.3	9.6	4.5	3.5	
CLOSED LANDFILL -BENCHMARK		6.4	24.5	12.0	9.2	12.2
Excess		0.1	0.3	0.2	0.1	0.1
S&P 500		9.1	31.5	15.3	11.7	13.6
BBG BARC US Agg		0.2	8.7	4.0	3.0	3.7



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.

Minnesota State Board of Investment
Quarter Ending December 31, 2019
Non-Retirement Managers



	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>Fiscal YTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>	<u>Since Inception</u>	<u>Inception Date</u>
NON RETIREMENT EQUITY INDEX - MELLON	2,616,754,538	9.0	10.9	31.5	15.3	11.7	13.6	9.9	07/1993
S&P 500 INDEX (DAILY)		9.1	10.9	31.5	15.3	11.7	13.6	9.9	07/1993
Excess		-0.0	-0.0	-0.0	0.0	0.0	0.0	0.1	
NON RETIREMENT FIXED INCOME - PRUDENTIAL	1,295,006,770	0.3	2.7	9.6	4.5	3.5	4.1	6.0	07/1994
BBG BARC Agg (Dly)		0.2	2.5	8.7	4.0	3.0	3.7	5.5	07/1994
Excess		0.1	0.3	0.9	0.4	0.4	0.4	0.5	
RBC	230,240,019	0.1	1.3	5.2	2.6	2.0	2.8	4.8	07/1991
RBC Custom Benchmark		0.0	1.2	5.2	2.6	2.0	2.4	4.9	07/1991
Excess		0.0	0.1	-0.0	0.1	0.1	0.4	-0.1	
MET COUNCIL OPEB BOND POOL	66,771,680	0.4	1.3	4.3					02/2009
NON RETIREMENT CASH	152,696,364	0.5	1.0	2.3	1.7	1.2	0.7	2.7	
iMoneyNet Money Fund Average- All Taxable		0.4	0.8	1.9	1.3	0.8	0.4		
Excess		0.1	0.2	0.5	0.5	0.3	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.

This page intentionally left blank.



State Cash

December 31, 2019



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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Treasurer's Cash	13,410,482,706	0.5	2.5	1.9	1.4	1.0
iMoneyNet Money Fund Average-All Taxable		0.4	1.9	1.3	0.8	0.4

Other State Cash Accounts

Due to differing investment objectives, strategies, and time horizons, some State agencies' accounts are invested separately. 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.

	<u>Ending Market Value</u>	<u>Last Qtr</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>10 Year</u>
Debt Service	77,162,069	0.5	5.2	3.5	2.7	
Housing Finance	87,677,023	-0.5	1.2	1.5	1.5	
Public Facilities Authority	60,499,058	0.5	2.8	2.3	2.1	



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.

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.

Fixed Income 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.



Addendum

Benchmark Definitions (continued)

Fixed Interest Blended Benchmark:

On 6/1/2002, the benchmark was set as the 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 the benchmark 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 the 67% and 33% weighting.

Semi-Passive Domestic Equity Benchmark:

Russell 1000 index effective 1/1/2004. Prior to 1/1/2004 it was the Completeness Fund benchmark.

This page intentionally left blank.

