

**MINNESOTA
STATE
BOARD OF
INVESTMENT**



Board Members:

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Tim Walz**

**State Auditor
Julie Blaha**

**Secretary of State
Steve Simon**

**Attorney General
Keith Ellison**

**Executive Director
& Chief Investment
Officer**

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DATE: January 31, 2019

TO: The Honorable Tim Walz
Minnesota Legislative Reference Library

FROM: Mansco Perry III
Executive Director and Chief Investment Officer

MP3

**SUBJECT: External Money Manager Report Pursuant to Minnesota
Statutes Section 11A.04, clause (12)**

Minnesota Statutes, Section 11A.04, clause (12) requires the State Board of Investment (SBI) to report annually to the Governor and Legislative Reference Library the cost and investment performance of external investment managers employed by the Board.

On June 30, 2018, the SBI utilized 16 domestic stock managers, 15 international stock managers, 7 fixed income managers and three Treasury portfolio managers for the defined benefit retirement assets under its control. The SBI also utilized one fixed income manager and one equity manager within the Non-Retirement Program. In addition, the Assigned Risk Plan used one additional external fixed income manager. Finally, a stable value manager was used in for the conservative option in the defined contribution plan.

The investment performances of each manager, as well as the fees paid to each, are reported in the charts on the following pages. This information is also included in the Board's annual report for FY18. (See **pages 5-6.**)

It is important to note that all performance data reported by the SBI is net of fees and transactions costs associated with the various portfolios. The SBI's Fiscal Year 2018 Annual Report contains additional detail on manager performance and may be accessed online at <http://mn.gov/sbi>. Relevant pages from the SBI's Fiscal Year 2018 Annual Report are included within this report.

Retirement Program - Defined Benefit Plan

Domestic Public Stock Managers

The SBI evaluates domestic stock manager returns against the performance of Russell style indices which reflect the managers' specific investment approaches. The benchmark portfolios take into account the market forces that, at times,

favorably or unfavorably impact certain investment styles. The aggregate domestic stock program is designed to outperform the Russell 3000 Index. Assets are allocated to managers within each Russell style index in the same proportion as in the Russell 3000 Index.

As a group, the managers outperformed the broad market by 0.6 percentage point for the fiscal year. For fiscal year 2018, ten of the 14 active managers outperformed their respective benchmarks while four managers underperformed. (In March of FY18, one small-cap growth manager was terminated). One semi-passive manager outperformed and the other semi-passive manager underperformed the Russell 1000 index. The passive manager (Russell 1000) and the passive manager (Russell 3000) matched the performance of their respective benchmarks for the fiscal year. (See **page 7**.)

Fixed Income Public Managers

The SBI evaluates the performance of its fixed income managers against the Bloomberg Barclays U.S. Aggregate Bond Index. As a group, the fixed income managers outperformed the broad bond market by 0.5 percentage point for the fiscal year. For fiscal year 2018, the active managers and one of the semi-passive managers outperformed the benchmark, while two of the semi-passive managers matched the benchmark return. (See **page 8**.)

Treasury Portfolio Managers

In fiscal year 2018, three Treasury Portfolio managers were hired with a blend of investment styles to outperform the Bloomberg Barclays Treasury 5+ years Total Return overtime. One year of performance data is not available. (See **page 9**.)

International Public Stock Managers

The SBI evaluates individual international stock managers against market indices published by Morgan Stanley Capital International (MSCI). Two indices are used: the World ex USA (net) and the Emerging Markets Index (net). (In March of FY18, two developed markets, semi-passive managers were terminated). As a group, the international stock managers outperformed the MSCI All Country World Index (ACWI) ex USA Index (net) by 0.2 percentage point for the fiscal year. All six of the active developed market managers outperformed their respective benchmarks for the year. For fiscal year 2018, two of the seven active emerging markets managers outperformed the benchmark. The semi-passive developed market manager underperformed the benchmark over the year. The passive developed markets portfolio outperformed the MSCI World ex USA Index (net) while the passive emerging markets manager matched the MSCI Emerging Markets Index (net). (See **page 10**.)

Assigned Risk Portfolio

Fixed Income Manager

The SBI evaluates the performance of the Assigned Risk Plan bond manager (RBC Global Asset Management) against the Bloomberg Barclays Intermediate Government Index. During fiscal year 2018, the bond manager outperformed its benchmark by 0.1 percentage point. (See **pages 11-12.**)

Domestic Stock Manager

In addition, the Assigned Risk Plan uses the external equity fund manager in the Non-Retirement Equity Fund within the Non-Retirement Program. This manager's benchmark is the S&P 500 Index. See details below.

Conservative Option in Defined Contribution Plan

Stable Value Portfolio

The SBI evaluates the performance of the stable value manager against the 3-Year Constant Maturity Treasury plus 45 basis points, overtime. During fiscal year 2018, the stable value manager underperformed its benchmark by 0.2 percentage point. (See **pages 13-15.**)

Non-Retirement Program

Equity Fund Manager (S&P 500 Index)

In December 2017, the management of the fund was transferred from the SBI internal investment staff to an external, passive stock manager for the Non-Retirement Equity Fund which is measured against the S&P 500 Index. The SBI does not have enough performance data available to report on the fiscal year. (See **page 16.**)

Bond Fund Manager

In December 2017, the management of the fund was transferred from the SBI internal staff to an external, fixed income manager for the Non-Retirement Bond Fund. The benchmark is the Bloomberg Barclays U.S. Aggregate Bond Index, a broad-based index of investment grade, U.S. dollar denominated, fixed rate taxable bonds. The SBI does not have enough performance data available to report on the fiscal year. (See **page 17.**)

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External Stock and Bond Managers' Fees

Total Payments for Fiscal Year 2018

Domestic Equity Active Managers

ArrowMark Colorado Holdings, LLC	\$ 1,534,491
Barrow, Hanley, Mewhinney & Strauss, LLC	620,342
Earnest Partners, LLC	429,384
Goldman Sachs Asset Management, L.P.	2,205,768
Hood River Capital Management, LLC	1,730,689
Hotchkis and Wiley Capital Management, LLC	2,377,353
LSV Asset Management	1,491,057
Martingale Asset Management, L.P.	1,853,665
McKinley Capital Management, LLC	514,240
Peregrine Capital Management	2,145,816
Rice Hall James & Associates, LLC	1,513,072
Sands Capital Management, LLC	1,261,072
Wellington Management Company LLP	1,472,354
Winslow Capital Management, LLC	653,583
Zevenbergen Capital Investments LLC	1,712,350

Domestic Equity Semi-Passive Managers

BlackRock Institutional Trust Company, N.A.	1,017,301
J.P. Morgan Investment Management Inc.	1,562,428

Domestic Equity Passive Manager

BlackRock Institutional Trust Company, N.A. (Passive R3000)	505,964
BlackRock Institutional Trust Company, N.A. (Passive R1000)	568,241

Fixed Income Active Managers

Columbia Threadneedle Investments	1,158,171
Dodge & Cox	1,756,282
Pacific Investment Management Company LLC (PIMCO)	2,896,822
Western Asset Management Company	1,472,340

Fixed Income Semi-Passive Managers

BlackRock Financial Management, Inc.	1,075,515
Goldman Sachs Asset Management	1,663,408
Neuberger Berman Investment Advisers LLC	668,132

Treasury Portfolio Managers

BlackRock Financial Management, Inc.	383,773
Goldman Sachs Asset Management	403,634
Neuberger Berman Investment Advisers LLC	371,118

External Stock and Bond Managers' Fees

Total Payments for Fiscal Year 2018

International Active Developed Markets Managers	
Acadian Asset Management LLC	\$ 1,807,067
Columbia Threadneedle Investments	1,275,185
Fidelity Institutional Asset Management LLC	1,291,173
J.P. Morgan Investment Management Inc.	1,237,118
Marathon Asset Management LLP	2,800,965
McKinley Capital Management, LLC	1,295,032
International Semi Passive Developed Markets Managers	
AQR Capital Management, LLC	1,886,074
Fidelity Institutional Asset Management LLC	1,209,516
State Street Global Advisors	38,140
International Passive Developed Markets Manager	
State Street Global Advisors	677,834
International Active Emerging Markets Managers	
Earnest Partners LLC	2,016,930
Macquarie Investment Management Advisers	1,763,943
Martin Currie Inc.	1,857,152
Morgan Stanley Investment Management Inc.	4,441,056
Neuberger Berman Investment Advisers LLC	2,456,273
Pzena Investment Management, LLC	2,308,643
The Rock Creek Group, LLC	2,394,166
International Passive Emerging Markets Manager	
State Street Global Advisors	565,957
Supplemental Fixed Interest Account	
Galliard Capital Management, Inc.	3,788,705
Assigned Risk Plan	
RBC Global Asset Management (U.S.) Inc.	252,341
Non-Retirement Managers	
BNY Mellon Asset Management North America Corporation	54,478
Prudential Global Investment Management, Inc. (PGIM)	668,297

Retirement Program – Combined and Supplemental Investment Funds Investment Programs

Figure 21. Domestic Stock Program Manager Performance for Periods Ending June 30, 2018

	1 Year		3 Years		5 Years		Market Value
	Actual %	Bmk %	Actual %	Bmk %	Actual %	Bmk %	(\$ in millions)
Active Managers							
Large Cap Growth (Russell 1000 Growth)							
Sands Capital Mgmt.	34.7	22.5	16.1	15.0	17.6	16.4	598.5
Winslow Capital Mgmt.	28.2	22.5	15.1	15.0	16.9	16.4	240.2
Zevenbergen Capital	34.2	22.5	16.6	15.0	18.6	16.4	567.1
Large Cap Value (Russell 1000 Value)							
Barrow, Hanley	8.3	6.8	7.8	8.3	10.6	10.3	382.3
Earnest Partners	12.9	6.8	10.0	8.3	12.2	10.3	273.0
LSV Asset Mgmt.	11.9	6.8	9.5	8.3	12.5	10.3	419.1
Small Cap Growth (Russell 2000 Growth)							
ArrowMark	27.1	21.9					235.5
Hood River	16.5	21.9					253.6
Rice Hall James	28.3	21.9					246.1
Wellington	19.0	21.9					258.1
Small Cap Value (Russell 2000 Value)							
Goldman Sachs	12.2	13.1	9.6	11.2	11.8	11.2	371.2
Hotchkis & Wiley	13.4	13.1	7.0	11.2	11.5	11.2	326.3
Martingale Asset Mgmt.	12.6	13.1	11.3	11.2	13.1	11.2	309.4
Peregrine Capital Mgmt.	16.0	13.1	10.5	11.2	11.4	11.2	394.2
Semi-Passive Managers (Russell 1000)							
BlackRock Institutional	17.3	14.5	12.8	11.6	14.4	13.4	1,060.7
J.P. Morgan Investment Mgmt.	14.0	14.5	11.5	11.6	13.6	13.4	1,535.8
Passive Manager (Russell 1000)							
BlackRock Institutional	14.5	14.5					12,600.5
Passive Manager (Russell 3000)							
BlackRock Institutional	14.8	14.8	11.6	11.6	13.3	13.3	9,424.7
Aggregate Domestic Stock Program⁽¹⁾	15.4	14.8	11.3	11.6	13.3	13.3	29,500.3
Asset Class Target							
Russell 3000		14.8		11.6		13.3	

(1) Aggregate includes the performance of terminated managers.

Retirement Program – Combined and Supplemental Investment Funds Investment Programs

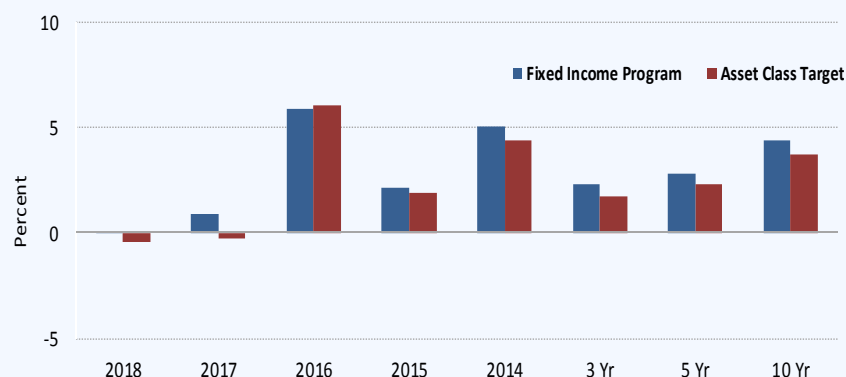
successfully fulfilled their long-term risk objectives during fiscal year 2018. The managers constructed portfolios consistent with stated investment approaches and maintained appropriate levels of quality and duration.

The **returns** of each of the bond managers are compared to the Bloomberg Barclays U.S. Aggregate Bond Index. Individual managers are expected to exceed the target, net of fees, on an annualized basis. In total, the program outperformed the Bloomberg Barclays U.S. Aggregate Bond Index by 0.5 percentage point for the recent fiscal year. Relative to the benchmark, the program benefited from overweight positions in CMBS and ABS as well as a slightly underweight duration position. Managers also outperformed the benchmark over the long-term. The program outperformed the asset class target by 0.7 percentage point over the ten

year period ending June 30, 2018. All four active managers outperformed the benchmark. One semi-passive manager outperformed and two met the benchmark for the fiscal year. Figure 26 shows historical

performance for the entire program. Individual manager performance is shown in Figure 27. Aggregate portfolio sector and portfolio characteristics are shown in Figure 28.

Figure 26. Fixed Income Program Performance For Periods Ending June 30, 2018



	2018	2017	2016	2015	2014	3 Yr.	5 Yr.	10 Yr.
Fixed Income Program	0.1%	0.9%	5.9%	2.1%	5.0%	2.3%	2.8%	4.4%
Asset Class Target*	-0.4	-0.3	6.0	1.9	4.4	1.7	2.3	3.7

* The Fixed Income Program asset class target has been the Bloomberg Barclays U.S. Aggregate Bond Index since July 1994.

Figure 27. Fixed Income Program Manager Performance for Periods Ending June 30, 2018

	1 Year		3 Years		5 Years		Market Value
	Actual %	Bmk %	Actual %	Bmk %	Actual %	Bmk %	(\$ in millions)
Active Managers							
Columbia Mgmt.	0.7	-0.4	2.8	1.7	3.1	2.3	1,169.3
Dodge & Cox	0.6	-0.4	2.7	1.7	3.2	2.3	1,655.9
PIMCO	0.2	-0.4	2.0	1.7	2.5	2.3	1,075.7
Western Asset Mgmt.	0.4	-0.4	3.1	1.7	3.5	2.3	1,594.3
Semi-Passive Managers							
BlackRock Financial Mgmt.	-0.4	-0.4	1.8	1.7	2.4	2.3	1,659.0
Goldman Sachs Asset Mgmt.	0.0	-0.4	2.0	1.7	2.6	2.3	2,084.5
Neuberger Investment Mgmt.	-0.4	-0.4	1.8	1.7	2.4	2.3	1,821.5
Aggregate Fixed Income Program⁽¹⁾	0.1	-0.4	2.3	1.7	2.8	2.3	11,060.2
Asset Class Target							
Bloomberg Barclays U.S. Aggregate Bond Index		-0.4		1.7		2.3	

(1) Aggregate includes the performance of terminated managers.

Retirement Program – Combined Funds Investment Programs

Treasury Portfolio

The Treasury Portfolio, launched in early 2018, is used exclusively by the Combined Funds. As of June 30, 2018, the program had a market value of \$5.9 billion. In developing the program, the SBI's objectives included offsetting credit risk inherent in the bond program, and providing downside protection for the overall retirement program during periods of significant equity drawdowns.

Investment Management

A group of three bond managers was retained for its blend of investment styles. Each manager has been given a modest risk budget with the goal of outperforming the Bloomberg Barclays Treasury 5+ Years Total Return over time, while largely retaining the primary characteristics of the benchmark.

The manager is required to remain within +/- 0.5 years of the overall benchmark duration (currently 10.5 years), but may employ interest rates strategies that result in overweight or underweight positions in certain maturities along the curve. In addition, managers finding relative value in the short end may choose to hold out-of-benchmark Treasury securities of less than five years duration, either through direct purchases or through those becoming shorter than 5 years due to the passage of time/roll down the curve.

The managers are also permitted to purchase out-of-benchmark U.S. Agencies, U.S. Supranationals, and Treasury Inflation Protected Securities

(TIPS). A description of each bond manager's investment approach is included in the **Investment Manager Summaries** section beginning on page 59.

FY 2018 Changes

The Treasury Portfolio was launched in FY 2018.

Investment Performance

The SBI constrains the risk of the Treasury Portfolio managers to ensure that their accounts continue to be comparable to the benchmark and fulfill their total fund diversification roles. Since inception in February, the Treasury Portfolio returned 0.3% through June 30, matching benchmark performance.

Treasury Portfolio Characteristics

	Total Portfolio	Benchmark
Effective Duration (yrs)	10.7	10.6
Convexity	1.8	1.8
Coupon Rate (%)	2.7	2.8
Yield to Maturity (%)	2.9	2.9
Option Adjusted Spread (bps)	4	1

Retirement Program – Combined and Supplemental Investment Funds Investment Programs

Figure 24. International Stock Program Manager Performance for Periods Ending June 30, 2018

	1 Year		3 Years		5 Years		Market Value
	Actual %	Bmk %	Actual %	Bmk %	Actual %	Bmk %	(\$ in millions)
Active Managers							
Developed Mkts (MSCI World ex USA net)							
Acadian Asset Mgmt.	13.5	7.0	13.4	4.9	12.1	6.2	452.6
Columbia Mgmt. Investment Advisers	12.8	7.0	6.2	4.9	7.8	6.2	347.3
Fidelity Institutional Asset Management	9.1	7.0	5.9	4.9	7.0	6.2	431.1
J.P. Morgan Investment Management	8.4	7.0	5.3	4.9	6.3	6.2	259.6
Marathon Asset Management	7.3	7.0	5.6	4.9	7.9	6.2	831.9
McKinley Capital Management	12.8	7.0	4.7	4.9	7.0	6.2	266.4
Semi-Passive Managers							
Developed Mkts (MSCI World ex USA net)							
AQR Capital Management	4.4	7.0	4.9	4.9	6.4	6.2	404.3
Active Managers							
Emerging Mkts (MSCI Emerging Markets net)							
Earnest Partners	3.3	8.2					294.0
Macquarie Investment Management Advisers	8.1	8.2					314.6
Martin Currie	14.5	8.2					337.1
Morgan Stanley Investment Management	3.3	8.2	4.7	5.6	4.4	5.0	597.5
Neuberger Berman Investment Advisers	10.0	8.2					318.3
Pzena Investment Management	2.1	8.2					289.6
Rock Creek	5.0	8.2					297.3
Passive Managers							
Developed Mkts (MSCI World ex USA net)							
State Street Global Advisors	7.3	7.0	5.3	4.9	6.7	6.2	7,098.8
Passive Managers							
Emerging Mkts (MSCI Emerging Markets net)							
State Street Global Advisors	8.2	8.2	5.7	5.6	5.2	5.0	770.4
Aggregate International Stock Program⁽¹⁾	7.5	7.3	5.3	5.1	6.4	6.0	13,315.7
Asset Class Target							
MSCI ACWI ex USA (net)		7.3		5.1		6.0	

(1) Aggregate includes the performance of terminated managers.

Non-Retirement Program Assigned Risk Plan

The Minnesota Workers Compensation Assigned Risk Plan was established in 1983 to provide workers' compensation coverage to Minnesota employers rejected by a private insurance carrier. On June 30, 2018, the market value of the Plan's portfolio was \$319 million.

The Assigned Risk Plan operates as a non-profit, tax-exempt entity and is administered by the Department of Commerce. The Plan provides disability income, medical expenses, retraining expenses and death benefits with payments being made either periodically or in lump sum.

Investment Objectives

The SBI recognizes that the Assigned Risk Plan has limited tolerance for risk due to erratic cash flows, no allowance for surplus, and generally short duration liabilities.

Therefore, the SBI has established two investment objectives for the Plan:

- To minimize mismatch between assets and liabilities.
- To provide sufficient liquidity (cash) for payment of on-going claims and operating expenses.

Performance relative to these objectives is measured against a composite index that reflects the asset allocation of the portfolio.

Asset Allocation

The SBI believes that due to the uncertainty of premium and liability cash flows, the Plan should be invested very conservatively.

The **bond** segment is invested to fund the shorter-term liabilities

(less than 10 years) and the common stock segment is invested to fund the longer-term liabilities. The result is a high fixed income allocation which minimizes the possibility of a future fund deficit. The smaller **stock** exposure provides higher expected returns and hedges some of the inflation risk associated with the future liability stream.

The current long-term asset allocation targets for the Plan are as follows:

Domestic Stocks	20%
Domestic Bonds	80%

The asset allocation may fluctuate in response to changes in the liability stream projected by the Plan's actuary and further analysis by the SBI staff. Figure 41 presents the actual asset mix of the Assigned Risk Plan at the end of fiscal year 2018.

Investment Management

RBC Global Asset Management (U.S.) Inc. (RBC GAM-US) manages the bond segment of the Assigned Risk Plan, and the stock portfolio is currently managed in the Non-Retirement Equity Fund.

Bond Segment

RBC GAM-US uses a fundamental approach in managing the portfolio, with a focus primarily on security selection and secondarily on sector analysis. RBC GAM-US has managed the bond portfolio since July 1991.

Stock Segment

The stock segment is structured to fund the longer-term liabilities of the Plan and is managed by BNY Mellon Asset Management North America Corporation in the Non-Retirement Equity Fund.

Investment Performance

Due to the focus on liability matching, the Assigned Risk Plan's investment portfolio is conservatively structured. While active management is utilized, return enhancement plays a secondary role.

The Assigned Risk Plan is measured against a composite index which is weighted to reflect the asset allocation of the Plan:

- The target for the fixed income component is a custom benchmark which reflects the duration target established for the bond segment (approximately three years).
- The target for the equity component is the S&P 500.

During fiscal year 2018, the **bond** segment outperformed its benchmark by 0.1%. The **stock** segment underperformed its benchmark by 0.1 percentage point.

Non-Retirement Program Assigned Risk Plan

Overall, the Assigned Risk Plan provided a return of 2.4% for fiscal year 2018, which was 0.2 percentage point above the composite index. For the ten year period, the portfolio outperformed by 0.3 percentage point.

Historical performance results are presented in Figure 42.

Fixed Income Manager

RBC Global Asset Management (U.S.) Inc.

RBC GAM-US manages the fixed income portfolio for the Assigned Risk Plan. The main objective for the portfolio is to provide cash for the payment of workers compensation claims on the required dates. Because of the uncertainty of premium and liability cash flows, the fund is invested conservatively and is benchmarked to the Bloomberg Barclays Intermediate Government Index.

Equity Manager

BNY Mellon Asset Management North America Corporation.

See page 108 for more detail.

Figure 41. Assigned Risk Plan Asset Mix as of June 30, 2018

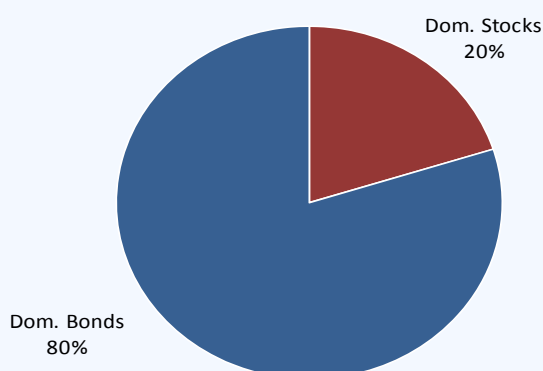
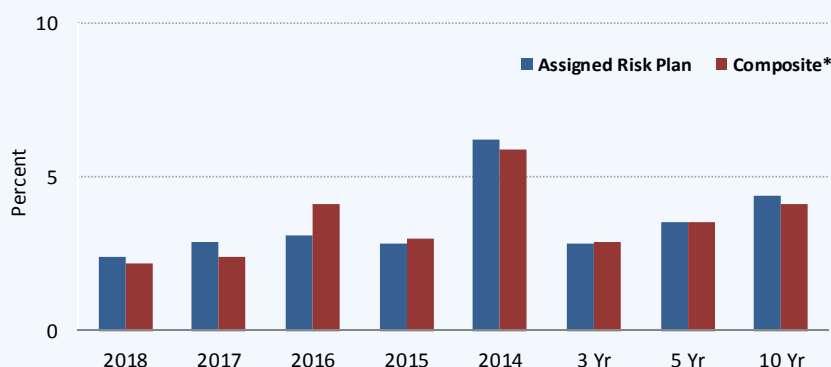


Figure 42. Assigned Risk Plan Performance For Periods Ending June 30, 2018



	2018	2017	2016	2015	2014	Annualized		
						3 Yr.	5 Yr.	10 Yr.
Total Fund	2.4%	2.9%	3.1%	2.8%	6.2%	2.8%	3.5%	4.4%
Composite Index*	2.2	2.4	4.1	3.0	5.9	2.9	2.9	4.1
Stock Segment	14.3	19.6	-1.1	6.7	25.3	10.6	12.6	9.5
S&P 500	14.4	17.9	4.0	7.4	24.6	11.9	13.4	10.2
Bond Segment	-0.6	-1.1	4.0	1.7	1.5	0.8	1.1	2.9
BB U.S. Gov't Intermediate	-0.7	-1.2	3.9	1.8	1.5	0.6	1.0	2.4

* Weighted 20% stocks, 80% bonds.

Retirement Program

State Deferred Compensation 457(b) Plan

The State Deferred Compensation Plan (Plan) provides public employees with a tax-sheltered retirement savings program that is a supplemental plan to their primary retirement plan. (In most cases, the primary plan is TRA, PERA, or MSRS.) On June 30, 2018 the market value of the State Deferred Compensation Plan was \$7.0 billion.

Program Structure

The State Deferred Compensation Plan offers plan participants three sets of investment options. The first is a set of four actively managed mutual funds, five passively managed mutual funds, a Money Market Fund, and a Stable Value 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.

Actively Managed Options

The Plan offers a range of actively managed options that allows participants the flexibility to create an investment program to meet their needs.

Performance results for the mutual fund investment options for periods ending June 30, 2018 are shown in Figure 31.

- **Large-Cap Equity**

This option is a concentrated portfolio of high quality stocks that generally offer current dividends. The fund is expected to outperform the NASDAQ U.S. Dividend Achievers Select Index. The fund currently offered is the Vanguard Dividend Growth Fund.

- **Small-Cap Equity**

This option invests primarily in companies with small market capitalizations. The fund is expected to outperform the Russell 2000 over time. T. Rowe Price Small-Cap Stock Fund is the fund currently offered.

- **Bond Fund**

This option invests primarily in investment grade securities in the U.S. bond market. The fund is expected to outperform the Bloomberg Barclays U.S. Aggregate Bond Index over time. The fund currently offered is the Dodge & Cox Income Fund.

- **International Equity**

This option invests primarily in stocks of companies in developed countries located outside the United States. The fund is expected to outperform the Morgan Stanley Capital International (MSCI) Index of Europe, Australasia and the Far East (EAFE) over time. The fund currently offered is the Fidelity Diversified International Fund.

- **Money Market Fund**

This option invests in high quality short-term debt instruments and is expected to outperform the return on 3 month U.S. Treasury Bills. This option is the SIF Money Market Fund invested by State Street Global Advisors (see page 22).

- **Stable Value Fund**

The fund is invested in a well-diversified portfolio of high quality fixed income securities. The fund also holds insurance 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, and maintain a relatively stable return profile for the portfolio.

The option is expected to outperform the return of the three year Constant Maturity Treasury plus 45 basis points (0.45%), over time. Currently, Galliard Capital Management, Inc. manages the option (see page 23).

Passively Managed Options

The plan offers a range of passively managed options that allows participants the flexibility to create a lower cost investment program to meet their needs.

- **Large-Cap Equity**

This option is a passive domestic stock portfolio that tracks the S&P 500. The fund currently offered is the Vanguard Institutional Index Plus Fund.

- **Mid-Cap Equity**

This option invests in companies with medium market capitalizations that track the CRSP U.S. Mid-Cap Index. The fund currently

Retirement Program

State Deferred Compensation 457(b) Plan

offered is the Vanguard Mid-Capitalization Index Institutional Fund.

- **Balanced Fund**

This option is a mix of stocks and bonds. The fund is expected to track a weighted benchmark of 60% CRSP U.S. Total Market Index and 40% Bloomberg Barclays U.S. Aggregate Bond Index. The fund currently offered is the Vanguard Balanced Index Fund.

- **Bond Fund**

This option invests in a broad range of U.S. fixed income securities. The fund is expected to track the performance of the Bloomberg Barclays U.S. Aggregate Bond Index. The fund currently offered is the Vanguard Total Bond Market Index Fund.

- **International Equity**

This option invests in international equities and is expected to track the FTSE Global All Cap ex U.S. Index, an index designed to measure equity market performance in developed and emerging markets, excluding the United States. The fund currently offered is the Vanguard Total International Stock Index Fund.

Minnesota Target Retirement Funds

The plan offers a range of target date funds which are diversified options with allocations that change over time to reduce risk and become more conservative as the target retirement date approaches. The funds are currently offered by State Street Global Advisors (SSgA).

Performance results for the target date fund option for periods ending June 30, 2018 are shown in Figure 32.

Figure 31. State Deferred Compensation Plan (457b Plan) for Periods Ending June 30, 2018

Fund/Benchmark	RETURNS ⁽¹⁾						Market Value ⁽²⁾ (\$ in millions)
	1 Year		3 Years		5 Years		
	Actual %	Bmk %	Actual %	Bmk %	Actual %	Bmk %	
Actively Managed							
Vanguard Dividend Growth ⁽³⁾	10.6	11.9					612.7
T. Rowe Price Small-Cap (Russell 2000)	18.3	17.6	11.9	11.0	13.3	12.5	732.3
Fidelity Diversified Int'l. (MSCI EAFE)	6.0	6.8	4.0	4.9	7.2	6.4	309.1
Dodge & Cox Income Fund (BB Barclays U.S. Aggregate)	0.4	-0.4	2.6	1.7	3.1	2.3	240.2
SIF Money Market (3 Month T-Bills)	1.5	1.4	0.9	0.7	0.6	0.4	76.3
SIF Stable Value (3 year Constant Maturity Treas. +45 basis points)	2.2	2.4	2.1	1.8	2.0	1.6	1,339.8
Passively Managed							
Vanguard Institutional Index (S&P 500)	14.4	14.4	11.9	11.9	13.4	13.4	1,258.8
Vanguard Mid-Cap Index (CRSP US Mid-Cap)	12.1	12.1	9.2	9.2	12.3	12.4	546.7
Vanguard Total Int'l Stock Index (FTSE Global All Cap ex US)	7.1	7.4	5.4	5.3	6.5	6.4	201.0
Vanguard Balanced Index Inst. (60% CRSP US Total Market, 40% BB Barclays U.S. Aggregate)	8.6	8.6	7.7	7.7	8.9	8.9	785.7
Vanguard Tot. Bond Market Index (BB Barclays U.S. Aggregate)	-0.5	-0.4	1.7	1.7	2.2	2.3	209.0
Ameritrade Self Directed Fund							74.9

(1) Returns are reported net of fund operating expenses, but do not include the MSRS and SBI administrative fees.

(2) Market value of SBI participation in fund.

(3) Fund retained September 2016.

Retirement Program

State Deferred Compensation 457(b) Plan

Figure 32. State Deferred Compensation Plan (457b Plan) for Periods Ending June 30, 2018

	RETURNS ⁽¹⁾						Market Value ⁽³⁾ (\$ in millions)
	1 Year		3 Years		5 Years		
	Actual %	Bmk ⁽²⁾ %	Actual %	Bmk ⁽²⁾ %	Actual %	Bmk %	
MN Target Retirement Funds							
Income Fund	4.0	4.0	3.8	3.8	4.1	4.2	85.1
2020 Fund	4.7	4.7	4.4	4.4	5.3	5.4	116.8
2025 Fund	6.1	6.2	5.5	5.5	6.7	6.7	118.4
2030 Fund	7.7	7.7	6.6	6.6	7.8	7.8	84.5
2035 Fund	8.5	8.6	7.1	7.1	8.3	8.4	65.7
2040 Fund	9.4	9.4	7.5	7.5	8.8	8.9	48.9
2045 Fund	10.1	10.1	7.9	7.9	9.2	9.3	39.9
2050 Fund	10.7	10.7	8.2	8.2	9.5	9.5	30.4
2055 Fund	10.7	10.7	8.2	8.2	9.5	9.5	16.0
2060 Fund	10.7	10.7	8.2	8.2	9.5	9.5	14.6

(1) Returns are reported net of fund operating expenses, but do not include the MSRS administrative fee.

(2) Managed by SSgA, each Fund benchmark is the aggregate of the returns of the Fund's underlying index funds weighted by the Fund's asset allocation.

(3) Market value of SBI participation in fund.

Non-Retirement Program

Non-Retirement Equity Fund Manager

BNY Mellon Asset Management North America Corporation manages the Non-Retirement Equity Fund that is used by various state trust funds such as the Permanent School Fund, Environmental Trust Fund, Assigned Risk Plan, and Closed Landfill Investment Fund. On June 30, 2018, the total market value of the Non-Retirement Equity Fund was \$2.2 billion.

The Non-Retirement Equity Fund is an investment vehicle that provides domestic equity exposure to entities that have received authority to use this vehicle. The types of entities that invest in the Non-Retirement Equity Fund include State and other Trust funds and OPEB funds, and Qualifying Governmental Entities.

Investment Objectives

The investment objective of the Non-Retirement Equity Fund is to track the S&P 500 index. The portfolio is expected to have a realized active risk level relative to the benchmark of 0.2 or less, where active risk is the annualized standard deviation of the Manager's excess returns relative to the benchmark. Over time, the annual return shortfall relative to the benchmark, due to fees and trading expenses, should be no more than 0.1%.

Asset Allocation

This fund provides 100% domestic equity exposure.

Investment Management

On December 1, 2017 the management of the fund was transferred from the SBI internal investment staff to BNY Mellon Asset Management North America Corporation. The strategy replicates the S&P 500 by owning all of the names in the index at the weightings assigned by the index. To maintain appropriate liquidity for daily cash flows,

some cash is held in the portfolio and is equitized by using S&P 500 futures contracts.

Investment Performance

The SBI measures the Non-Retirement Equity Fund against the S&P 500 Index.

For fiscal year 2018, the Non-Retirement Equity Fund slightly underperformed its benchmark, the S&P 500 Index. Performance results are shown in Figure 43.

Figure 43. Non-Retirement Equity Fund Performance for Periods Ending June 30, 2018

	1 Yr.	Annualized		
		3 Yr.	5 Yr.	10 Yr.
Non-Retirement Equity Fund*	14.3%	11.9%	13.4%	10.2%
S&P 500 Index	14.4	11.9	13.4	10.2

* Actual returns are calculated net of fees.

Non-Retirement Program

Non-Retirement Bond Fund Manager

Prudential Global Investment Management manages the Non-Retirement Bond Fund that is used by various state trust funds such as the Permanent School Fund, Environmental Trust Fund, and Closed Landfill Investment Fund. On June 30, 2018, the total market value of the Non-Retirement Bond Fund was \$1.1 billion.

Investment Objectives

The investment objectives for the Non-Retirement Bond Fund are to deliver cumulative returns in excess of the Bloomberg Barclays U.S. Aggregate Bond Index, and to manage the level and composition of active risk in the portfolio relative to this benchmark.

Asset Allocation

The composition of the Fund as of June 30, 2018 is shown in Figure 44. At the end of fiscal year 2018, the Non-Retirement Bond Fund had an effective duration of 5.9 years vs. the benchmark duration of 6.0 years and a yield to maturity of 3.5% vs. the benchmark yield to maturity of 3.3%.

Investment Management

On December 1, 2017 the management of the fund was transferred from the SBI internal staff to Prudential Global Investment Management (PGIM). PGIM is required to adhere to investment guidelines in managing the account. These guidelines give PGIM the flexibility to actively manage the portfolio through duration, yield curve, sector and security selection decisions, while maintaining a maximum five year active risk level of 1.5. PGIM is required to maintain the duration of the portfolio within +/- one year of the index duration. The Fund primarily invests in U.S. government,

corporate and mortgage securities.

Current Positioning

Characteristics of the portfolio as of June 30, 2018 are shown in Figure 45. PGIM has the portfolio duration positioned roughly equal to the benchmark, and has modestly reduced its exposure to corporate bonds as the outlook for further spread tightening is diminished.

Investment Performance

The benchmark for the Non-Retirement Bond Fund is the Bloomberg Barclays U.S. Aggregate Bond Index, a broad-based index of investment grade, U.S. dollar denominated, fixed rate taxable bonds. For fiscal year 2018, the Non-Retirement Bond Fund matched its benchmark and outperformed for all other periods. Historical performance results are presented in Figure 46.

Figure 44. Non-Retirement Bond Fund Distribution as of June 30, 2018

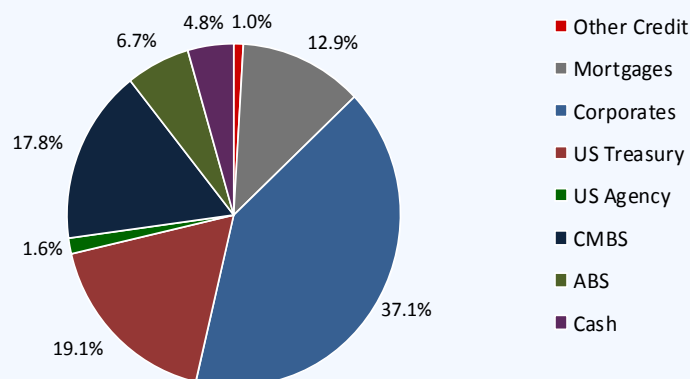


Figure 45. Fixed Income Characteristics for Period Ending June 30, 2018

	Bond Fund	Benchmark
Effective Duration (yrs)	5.92	5.97
Convexity	0.97	0.81
Coupon Rate (%)	3.40	3.16
Yield to Maturity (%)	3.54	3.29
Option Adjusted Spread (bps)	79	50
Rating – Moody's	A1	Aa2

Figure 46. Non-Retirement Bond Fund Performance for Periods Ending June 30, 2018

	1 Yr.	3 Yr.	5 Yr.	10 Yr.
Non-Retirement Bond Fund	-0.4%	2.0%	2.7%	4.3%
Bloomberg Barclays U.S. Agg.	-0.4%	1.7%	2.3%	3.7%