

2019

Goals, Strategies & Performance Report

Table of Contents

Mission, Vision & Future Direction Statements	2
Message from the Executive Director /CIO	3
About the Investment Board	4
Performance	5
Wisconsin Retirement System	6
Long-Term Strategies	7
Peer Comparison	8
Diversification Reduces Risk	9
SWIB Manages Risk	9
SWIB Optimizes Strategy Implementation	11
Internal Management Is Cost Effective	11
Qualified Staff and Systems	12
Goals and Strategies	13
State Investment Fund	15
Investments in Wisconsin	16
Awards & Recognitions	18
Appendix A - Core and Variable Fund Holdings by Asset Class	19
Appendix B - Risk Management	21
Appendix C - Separately Managed Funds	22

MISSION

To be a trusted and skilled global investment organization contributing to a strong financial future for the beneficiaries of the funds entrusted to us.

VISION

SWIB will be an innovative, agile, integrated organization that optimizes investment returns while managing risk and cost over the long term.

FUTURE DIRECTION

Throughout our history, we have been committed to contributing to a strong financial future for the beneficiaries of the funds entrusted to us. We understand that carrying that commitment into the future demands more than maintaining the status quo.

As a global investment organization, our mission requires that we keep pace with ever-changing financial markets while remaining true to our values and operating principles. Accordingly, we continually seek to effectively manage risk and achieve the target returns for our funds over the long term.



Message from the Executive Director/CIO

Wisconsin is known for many things. From world class universities, to top dairy producing farms, to being home to some of the country's newest and most successful technology startup companies, Wisconsin is leading the way into the future. Our state is known for a strong work ethic and innovative and forward-thinking approach that has helped build a foundation for success.



Building on that proud tradition, the State of Wisconsin Investment Board (SWIB) has built a strong foundation as an investment industry leader. SWIB manages more than \$110 billion, most of which is in the Wisconsin Retirement System (WRS), one of the only fully funded public pension funds in the country. More than 632,000 former and current state and local government employees and their families count on the WRS for some of their retirement security.

SWIB's successful management of the WRS investments reaches far beyond just benefiting the system's members. More than 85 percent of the approximately \$5.4 billion in WRS benefits go to retirees living in Wisconsin who help boost the state's economy by purchasing goods and services and paying state taxes. Credit rating agencies have cited a well-funded and well-managed WRS as a factor in increasing the state's bond rating. And, while SWIB is not an economic development agency, we have made significant investments in Wisconsin companies. Over the last five years (as of June 30, 2018), new investments in Wisconsin companies or companies doing business in Wisconsin totaled over \$1 billion.

With strong returns over the long-term, SWIB's investment management for the WRS is a model for other public pensions. Thanks in part to the Legislature granting SWIB's independent Board of Trustees budget and staffing authority in 2011, we have been able to adapt to changing market conditions and to keep the WRS well-positioned to meet its promised retirement benefits today and in the future. This flexibility has helped us make a commitment to investing in the technology and the systems needed to support our work and to continuously improve. We also are able to attract and retain talented professionals with the skills needed to support the complex and sophisticated investment strategies we have implemented.

We continue to look to the future and set goals and define strategies that will keep us among the premier investment managers in the country. And, we are proud of the work we are doing to help keep the success of the WRS among those things that make Wisconsin great.

A handwritten signature in black ink, appearing to read "David Villa". The signature is fluid and cursive, written over a faint, light-colored geometric pattern in the background.

David Villa
Executive Director/Chief Investment Officer

About the Investment Board

SWIB is a trusted and skilled investment organization contributing to the strong financial future of the beneficiaries of the funds entrusted to us. An independent state agency governed by Chapter 25 of state statutes, SWIB is responsible for managing the assets of the WRS, the State Investment Fund (SIF), and four separately managed funds. As of December 31, 2018, SWIB managed over \$110 billion in assets.

The largest portion of the assets managed by SWIB, about 91 percent, is the trust funds of the WRS. Seven percent of the assets managed by SWIB include the SIF, a pool of invested cash balances of the WRS and various state and local government units. The remaining 2 percent of the total assets are the separately managed funds invested by SWIB including the State Life Insurance Fund, Historical Society Endowment Fund, Injured Patients & Families Compensation Fund, and UW System Trust Funds.

SWIB and its governing body, the Board of Trustees, have a fiduciary responsibility to invest this money in the best interest of the trust funds as a prudent expert. To help it meet this responsibility, SWIB needs to attract and retain qualified investment professionals and to invest in its technology and systems. Over the years, the Legislature has helped to ensure that SWIB can meet its fiduciary duty by providing SWIB flexibility, independence, and authority that are different from those of other state agencies, including investment authority, budget authority,



position authority, and compensation setting authority.

SWIB's budget differs from that of other state agencies. SWIB receives no direct general purpose revenues from the state. All costs to manage assets in the trust funds are paid from those trust funds. 2011 Wisconsin Act 32 gave SWIB's independent Board of Trustees the authority to establish SWIB's operating budget and staffing level. This law change has given SWIB the flexibility to adapt to swiftly changing market conditions and to increase its internal management of assets in a cost-effective manner. Annually, SWIB is required to report its long-term strategies, investment goals and the status of goals and investment performance for the previous year. This report is submitted to the Legislature pursuant to section 25.17(14m) of the Wisconsin State Statutes.

More information about SWIB and the funds it manages can be found at www.swib.state.wi.us.

Performance

2018 Performance

U.S. equity markets struggled towards the end of 2018. In October, the Dow Jones Industrial Average and the S&P 500 Index suffered significant losses, wiping out all gains for the year. In December, the S&P 500 dropped more than 9.0 percent resulting in the index's worst December performance since 1931 and worst annual performance since 2008. Even with an extremely volatile end of the year for U.S. financial markets, SWIB's disciplined and innovative investment strategy helped provide moderate protection to the trust funds under management, including the WRS.

- The Core Trust Fund (Core Fund), the larger of the two WRS trust funds with more than \$93 billion in assets, ended the year with a gross return of -3.3 percent and five-year and ten-year gross returns of 5.2 percent and 8.8 percent respectively.
- SWIB's gross of fees returns exceeded its performance benchmarks for all these periods. Benchmarks, a market reference that the Board of Trustees uses to compare and evaluate SWIB's performance, are set by the Board of Trustees, with the guidance of an independent benchmarking consultant.
- SWIB's ten-year gross return of 8.8 percent exceeds the long-term WRS investment target, which was 7.2 percent during that period. (Note: The investment target was lowered to 7.0 percent in December 2018.)
- The Variable Trust Fund (Variable Fund), an optional stock-only fund with more than \$7 billion in assets, ended the year with a gross return of -7.9 percent, and a five-year gross return of 5.9 percent and a ten-year gross return of 11.7 percent.
- When looking over a 20-year period through December 31, 2018, SWIB's active management and its diversified holdings generated \$43.8 billion dollars for the Core Fund above what SWIB would have earned by simply investing in a low-cost passive portfolio consisting of 60 percent global equities and 40 percent global sovereign bonds, assuming no contributions or withdrawals.

Wisconsin Retirement System

The WRS is a hybrid defined benefit plan. It contains elements of both a 401(k) or defined contribution plan and a defined benefit plan. SWIB works to protect and grow the assets for the more than 632,000 participants of the WRS that they count on for a more secure financial future. These individuals, along with about 1,500 employers, contribute to the WRS throughout their careers in the public sector. SWIB has helped fuel one of the only fully funded pension systems in the U.S. during a time when many public pension plans are struggling with underfunding. Generally, investment returns account for about 75 percent of the income needed to fund the WRS.

WRS assets are divided into two funds: The Core Fund and the Variable Fund. Investment performance for both funds is included in the table entitled **2018 Investment Performance**. Performance is as of December 31, 2018, and is gross of external management fees and costs.

The Core Fund, the larger of the two WRS funds at approximately \$93.6 billion as of December 31, 2018, with diversified holdings in stocks, bonds, private equity, real estate, hedge funds, and other investments, earned -3.3 percent in 2018 (on a gross of fee basis), which is ahead of its benchmark of -3.5 percent. SWIB has designed and built the Core Fund investment strategy to strike the best possible balance between protecting the WRS and growing its assets. Asset class returns as of December 31, 2018, are presented in the table entitled **Core Fund Returns**.

SWIB diversifies its assets among many types of public and private investments, optimizes its

2018 Investment Performance*				
Annualized for period ending Dec. 31, 2018				
	One Year	Three Years	Five Years	Ten Years
Core Fund	-3.3%	6.9%	5.2%	8.8%
Core Fund Benchmark	-3.5%	6.5%	4.9%	8.2%
Variable Fund	-7.9%	7.9%	5.9%	11.7%
Variable Fund Benchmark	-7.8%	7.8%	5.9%	11.3%

*Gross of external management fees and costs.

Core Fund Returns*		
As of December 31, 2018		
Asset Class	Benchmark	One Year
Stocks	-8.8%	-9.1%
Fixed Income	-0.8%	-0.8%
Inflation Sensitive	-0.8%	-0.5%
Real Estate	8.7%	8.8%
Private Equity	13.2%	17.9%
Multi-Asset**	-4.9%	-6.6%
Alpha Pool Overlay	2.6%	-0.2%
Total	-3.5%	-3.3%

*Gross of external management fees and costs.
**Multi-Asset includes cross-asset class strategies.

costs (which saved \$90 million over its peers in 2017 and \$1.3 billion over the last ten years) and actively manages the WRS assets. This investment management strategy is designed to weather a variety of economic environments to provide the best value to all WRS participants in the long run and to help ensure the WRS can meet its obligations today and in the future. It also allows SWIB to meet its standards of

responsibility that is outlined in state statutes. That statute, s. 25.15 (2), requires that SWIB manage the funds as a prudent expert, diversify investments in order to minimize the risk of large losses, and administer assets of each trust or fund solely for its purpose and at a reasonable cost. The investment goal of the Core Fund is to earn an optimum rate of return while taking an acceptable level of risk, and to meet or exceed the actuarially assumed rate of return of 7.0 percent (expected return over 20-30 years), which was lowered from 7.2 percent effective December 31, 2018. The table entitled **Core Fund Asset Allocation Targets** shows policy targets for the Core Fund asset classes for each of the last three years. SWIB's actual asset allocation may vary up to +/-6 percent from the targets shown in the table.

Core Fund Asset Allocation Targets			
As of December 31, 2018			
Asset Class	2016	2017	2018
Stocks	51.5%	50.0%	50.0%
Fixed Income	27.5%	24.5%	24.5%
Inflation Sensitive	12.0%	15.5%	15.5%
Real Estate	7.0%	8.0%	8.0%
Private Equity	7.0%	8.0%	8.0%
Multi-Asset	4.0%	4.0%	4.0%
Cash & Overlays*	-9.0%	-10.0%	-10.0%
Total	100%	100%	100%

*Negative percentages reflect SWIB's leverage strategy.

WRS participants can elect to have 50 percent of their contributions invested in the all-stock Variable Fund instead of 100 percent in the Core Fund. The Variable Fund provides participants the potential for higher returns in exchange for higher investment risk. By choosing this option, participants also forego part of the formula benefit guarantee. The Variable Fund's gains and losses are not smoothed and are recognized in the year in which they occur. This results in greater volatility in investment gains or losses. The Variable Fund ended 2018 with a return

of -7.9 percent (on a gross of fee basis). The Variable Fund's market value was approximately \$7 billion as of December 31, 2018.

By law, the Variable Fund invests in stocks, as shown in the chart entitled **Variable Fund Asset Allocation**. When setting the Variable Fund asset allocation, Trustees evaluate the risk/return trade-off of various combinations of U.S. and non-U.S. exposures. The benchmark is a weighted blend of U.S., international and emerging market stock indexes. The investment strategy for the Variable Fund is to achieve returns equal to or above that of similar stock portfolios over a market cycle.

Variable Fund Asset Allocation	
U.S. Stock	70%
International Stock	30%
Total	100%

Long-Term Strategies

The Investment Board has been, and continues to be, a long-term investor. Historically, markets tend to be cyclical and decline after a few years of strong performance. Because SWIB is a long-term investor, it can be more patient than many other investors. However, it must also be responsible and committed to a well-thought-out plan that provides the best value to all WRS participants in the long run across all market environments, both strong and weak.

The shared risk and reward of the system creates some tension when market conditions result in significant losses because pension payments are impacted directly, both positively and negatively, by annual returns. It should be remembered that success is measured by the overall long-term health of the system rather than individual peaks and valleys. For that reason, managing investment risk is a constant consideration for the trust funds.

SWIB's long-term goal is to provide prudent and cost-effective management of funds held in trust.

This is achieved through policies, people, and processes for setting asset allocation in a diversified portfolio, estimating expected investment returns and risk, and evaluating investment performance. SWIB has developed a disciplined, prudent, and innovative investment strategy designed to help provide moderate protection to members' pensions from another major market downturn, keep contributions stable, and generate reasonable returns.

Asset allocation – the distribution of investments across stocks, bonds, and other assets to maximize returns and minimize risk – is the primary driver of long-term investment returns and is determined by the Board of Trustees using an independent investment asset allocation consultant. Because the mix of assets is the largest driver of returns, when comparing SWIB's returns with other pension plans, one must consider differences in asset allocation, assumed rate of return, objectives, funding ratios, and risk tolerance.

SWIB has slowly reduced the variability of the Core Fund returns by investing a modest allocation of assets in volatility-reducing strategies. These strategies help smooth returns year-over-year to help lessen the impacts of significant market downturns and include multi-asset strategies.

Measured alone or over the short-term, these multi-asset strategies may underperform the market. Measured within the context of the entire trust fund over the long-term, however, these strategies provide diversification and allow the overall plan to be well-suited to a variety of future market conditions which should help mitigate the impact of severe market downturns. SWIB uses investment performance targets that are tied to benchmarks – usually market indexes against which portfolio and fund returns are

evaluated. An example is the Russell 3000 Index, which measures the performance of the largest 3,000 U.S. companies, or about 98 percent of the U.S. equity market. The Core Fund is measured against a blend of benchmarks representing broader markets for stocks, bonds, and other asset classes that reflect the blend of the Core Fund's individual portfolios.

Peer Comparison

Numerous differences in plan structure should be considered when reviewing peer comparisons including asset allocation, cash flow needs, investment styles, funding levels, return assumptions, risk tolerance levels, and statutory or other restrictions on allowable investments. In short, differences in plan structure often result in different goals, which result in different asset allocations that then drive overall returns.

When a plan is not fully funded, its effective rate of return will decrease because a portion of the assets are not available to earn investment returns. Given the WRS's fully funded status and unique risk-sharing design, SWIB invests differently than its peers, who are underfunded, generally have higher investment targets, and need to have greater risk tolerances. In addition, because investment risks and rewards are shared with participants, SWIB typically takes a more conservative approach than its peers, who have an average target return of 7.6 percent compared with 7.0 percent (reduced from 7.2 percent as of December 31, 2018) for the Core Fund.

According to Callan Associates, Inc., a firm that provides independent research, education, decision support, and advice to public pension plans and other institutional investors, the Core Fund's gross investment returns, when adjusted for asset allocation risk, performed at or above a peer median group over the last one-, three-, and ten-year periods as of December 31, 2018.

More than **632,000** individuals participate in the WRS.

Asset allocation adjusted ranking adjusts peers' to match SWIB's more risk-balanced asset allocation (including leverage and conservative fixed income). This gives a fairer, more relevant risk-adjusted peer ranking reflecting quality of program implementation.

SWIB's more conservative investment approach is expected to outperform this group during more challenging market conditions. Further, SWIB's gross of fees performance over the last ten years is at Callan's peer median. While Callan's comparisons are only shown gross of fees, Callan expressed that SWIB would likely rank slightly above the median over this period, if shown net of fees, because it consistently had some of the lowest costs of its peer group.

Callan presents peer comparison data to the Board of Trustees every December. Reports are available on SWIB's website.

Diversification Reduces Risk

Diversification of assets at the fund level is the primary tool for managing risk; because in a more diversified fund risks are often offset by one another. This is because market conditions affect different asset classes differently, so returns in one asset class may be positive while another asset class may be negative in the same market environment.

SWIB continues to find ways to better diversify the Core Fund as a way to address market volatility. Every year, as part of the process in developing the Core Fund's asset allocation, SWIB and its asset allocation consultant discuss what is referred to as a "Goldilocks Zone." This is an allocation in which the asset mix targeted is not "too hot" or "too cold" in terms of risk and expected returns but is appropriate for the Core Fund.

Managing risk becomes even more important in the WRS because its retirees' annuity payments are directly impacted by returns because of the shared risks and rewards design. Lowering volatility helps stabilize contribution rates and benefit adjustments by trading modest reductions in expected returns during positive stock markets for some protection in down markets.

SWIB Manages Risk in Many Ways

In addition to diversification, SWIB monitors and manages risk through an enterprise-wide process. Each portfolio follows guidelines that specify the types of allowable investments and other requirements consistent with policies established by the Trustees. Portfolio managers are responsible for complying with these guidelines, as well as Wisconsin Statutes and Administrative Code.

As part of its risk management, SWIB has conducted robust investment stress testing since 2013 to evaluate and strengthen its investment strategy and make it more risk aware. The stress testing evaluates market downturns, liquidity risks, and multiple return environments. Routine testing and modeling is reviewed regularly by SWIB's Investment Committee, and bi-annually, an in-depth stress testing study is conducted with the WRS's actuaries and presented to the Board of Trustees.

SWIB's compliance staff continuously monitors investments and reports any exceptions and their resolution. Many monitoring tools are used to detect, and in some cases prevent, investment activities that would violate the investment guidelines. Portfolios out of compliance with guidelines will be brought into compliance immediately, or a plan for doing so or a waiver must be approved by the Executive Director/Chief Investment Officer.

Investments account for about **75%** of the income needed to fund the WRS.

Enterprise Risk Management provides a structured and continuous process across the whole organization for identifying, assessing, advising, responding to, and reporting on opportunities and threats that affect the achievement of objectives.

SWIB's Internal Audit Group enhances and protects organizational value by providing risk-based and objective assurance, advice, and insight through regular audits, consulting, and other activities.

SWIB Optimizes Strategy Implementation

Staff is responsible for making investment decisions subject to its fiduciary duty, Board-approved asset allocation, and other restrictions. Assets can be managed passively as an index, which seeks to replicate the returns of the market or benchmark, or with active management, which attempts to exceed the performance of a particular market index using independent decisions. Active strategies are expected to produce higher returns than passive strategies over time; however, additional costs and risk associated with active management are considered when determining implementation strategies.

Hedge Funds

SWIB's investment strategy includes investments in hedge funds. SWIB's use of hedge funds is different from many other public pension funds that have decreased or eliminated their hedge fund portfolios. Many of those plans seek hedge fund returns similar to the stock market and are paying hedge fund managers for both stock market performance and active returns generated. SWIB looks to access general market returns in the lowest cost and most efficient manner possible, preferring to replicate market exposures internally. SWIB's hedge fund portfolio, which is generally designed to have

minimal correlation with the stock market, is then combined with this exposure for a more efficient and cost-effective approach.

Leverage

At the end of 2018, the Core Fund included leverage of 10 percent. While the word "leverage" might imply additional risk, SWIB actually employs leverage to help reduce risk by supporting a higher allocation to lower-risk fixed income securities and a lower allocation to equities at the same target return. Leverage is achieved through reverse repurchase agreements and derivatives exposures.

SWIB gains leverage, in part, through the use of reverse repurchase agreements. These contracts essentially sell securities to a counterparty with a simultaneous promise to repurchase the securities at a fixed price on a future date. This provides SWIB with exposure to the underlying fixed income securities while also receiving additional cash to invest.

Derivatives

All derivative instruments are subjected to risk analysis and monitoring processes at the portfolio, asset class, and fund levels. Investment guidelines define allowable derivative activity for each portfolio and are based on the investment policy objectives which have been approved by Trustees. The following are the types of derivatives that SWIB uses in its portfolios. SWIB also invests in derivative instruments indirectly through several commingled funds, which have not been included in the following narrative.

Foreign Currency Spot and Forward Contracts

Foreign currency spot and forward contracts are uncleared over-the-counter agreements between two counterparties to exchange designated currencies at a specific time in the future. No cash is exchanged when a foreign currency exchange

SWIB manages more than **\$100 billion** in WRS assets.

spot or forward contract is initiated. SWIB may employ discretionary currency overlay strategies at the total fund and asset class level when currency market conditions suggest such strategies are warranted. Only the currencies of developed market countries in the MSCI World Index may be used to implement a currency overlay. SWIB executes spot and forward contracts with various counterparties. Guidelines have been established which provide minimum credit ratings for counterparties. Additionally, policies have been established which seek to implement master netting arrangements with counterparties to over-the-counter derivative transactions.

Futures Contracts

A futures contract is an exchange traded agreement to buy or sell a financial instrument at an agreed upon price and time in the future. Upon entering into a futures contract, collateral is deposited with the broker, in SWIB's name, in accordance with the agreement. Collateral for futures contracts can be in the form of cash, U.S. Treasuries, and equity securities. Futures contracts are marked to market daily, based upon the closing market price of the contract at the board of trade or exchange on which they are traded. The resulting gain/loss is typically received/paid the following day until the contract expires. Futures contracts involve, to varying degrees, risk of loss in excess of the collateral deposited with the broker. Losses may arise from future changes in the value of the underlying instrument.

Options

An option contract gives the purchaser of the contract the right, but not the obligation, to buy (call) or sell (put) the security or index underlying the contract at an agreed upon price on or before the expiration of the option contract. The seller of the contract is subject to market risk, while the purchaser is subject to credit risk and market risk, to the extent of the premium paid to enter into the contract.

Swap

A swap is a negotiated contractual agreement in which counterparties exchange cash flows of one party's financial instrument for those of the other party's financial instrument. Both parties to the swap contract are subject to market and credit risk of the underlying contract payments. Market risk results from the variability of payments and credit risk results from the parties' obligations to make payments. Collateralization of payments and market value variations mitigates the credit risk.

To Be Announced Securities

To Be Announced (TBA) mortgage backed securities (MBS) are over-the-counter forward contracts on mortgage-backed securities issued by Fannie Mae, Freddie Mac, and Ginnie Mae where the seller agrees to deliver the MBS for an agreed upon price on an agreed upon date. The TBA market provides mortgage lenders with a means of hedging interest rate risk between the time a loan rate is locked by a borrower and when the loan is funded. At settlement, TBA securities are exchanged for mortgage pools. However, SWIB's strategy is not typically expected to take in a mortgage pool. Instead, those TBA securities will usually be sold prior to that exchange occurring.

Internal Management Is Cost Effective

SWIB optimizes its costs, invests in its infrastructure, and spends less than its peers, according to CEM Benchmarking, an independent provider of objective benchmarking for public pensions plans.

SWIB's expenses have increased 21.7 percent from 2013 to 2017. This increase was expected given a 15.5 percent increase in assets under management over this same period and heavy investment in infrastructure and leading technology systems to help position SWIB for the future. SWIB will continue to invest in its people, processes, and technology because those investments provide the greatest edge in achieving

long-term goals and delivering added returns. While SWIB's total costs have increased since 2013, they have remained consistently and materially lower than its peers. For example, compared to peers, SWIB saved approximately \$90 million in 2017 and \$1.3 billion from 2008 to 2017, which is more than it spent in fiscal years 2016, 2017, and 2018 combined. The savings are driven by SWIB having fewer high cost assets and more internal management. In 2007, SWIB managed 21 percent of its assets internally. As of December 31, 2018, SWIB was managing approximately 56 percent of WRS assets internally. This has been a key contributor to SWIB's cost advantage.

Reducing costs, along with negotiating lower fees and investing in low-cost assets combined with performance of investment strategies, has contributed to value added above market returns to the trust funds, which, after costs, has been significant, generating \$2.7 billion over the past ten years, ending December 31, 2018.

Qualified Staff and Systems Are Critical

SWIB competes for staff with investment firms in the private sector throughout the country. A successful internal management program requires experienced and qualified staff. Because SWIB manages so many assets internally, it must also invest in its people. With assistance from an independent compensation consultant, SWIB annually reviews the investment industry employment market to set compensation at appropriate levels. In addition to hiring and retaining qualified staff, SWIB seeks to develop information technology, trading, accounting, and monitoring systems adequate to accommodate new and more complex investment strategies. When considering an investment strategy, SWIB compares the cost and return potential associated with internal or external management.

Maintaining a lower-cost internal management program requires the ability to attract, hire, and retain qualified staff. Over the past few years, Trustees have worked with a consultant

to maintain an incentive compensation program that motivates staff to earn the highest possible returns at reasonable costs and controlled levels of risk and aligns with the interest of the WRS. SWIB's incentive compensation plan is explicitly authorized by s.25.16 of the Wisconsin Statutes. This statute was created in the 1987 session of the Legislature, after SWIB reported it was unable to attract and retain investment staff needed to manage the trust funds in a cost-effective manner. SWIB's compensation plan focuses on pay for performance and five year-returns. A competitive compensation plan is critical to SWIB's ability to attract and retain a talented and skilled workforce.

To adequately and efficiently process trades, measure risk, and manage investments, SWIB must continually enhance its systems and processes. Over the past four years, SWIB's team has worked diligently to implement major components of a new enterprise investment management system that improves accounting, trading, risk, and portfolio management activities. While investments in SWIB's technology are ongoing, these components will provide staff better access to high quality and timely data and improve SWIB's ability to monitor and manage risk.

Staff Qualifications	
MBA	50
Masters Degree other than MBA	35
Juris Doctor Degree (JD)	9
Doctor of Philosophy (PhD)	6
Chartered Financial Analyst (CFA)	52
Certified Public Accountant (CPA)	22
Total Credentials	174
Total Employees	171
* As of December 2018: CFAs typically have advanced degrees, so the total credentials exceed the number of employees.	

Goals & Strategies

To achieve continued success in the future, SWIB works to stay at the forefront of institutional investment practices that are continually evolving. SWIB staff, along with the Board of Trustees, regularly assesses strengths and opportunities to improve, and then chart a course for the future.

Staff accomplished the following 2018 objectives that centered on investment strategy, operations and technology, and people and culture.

2018 Goals

Goal 1: Investment Strategy

In 2018, SWIB continued to focus on increasing active return in part by growing SWIB's ability to support additional investments in hedge funds, in making select investments to external equities managers, and expanding its counterparties to trade with.

Goal 2: Operations, Technology, and Data

In 2018, SWIB completed an assessment of people, processes and systems to identify the steps needed to develop, implement, and maintain robust service and operating models. The information gathered was used to develop a new organizational wide process used to prioritize work efforts and to address needs for continuing to upgrade its technology infrastructure. In addition, SWIB identified new objectives, defined initial projects and developed tools to manage the required activities and progress.

Goal 3: People and Culture

In 2018, managers at SWIB continued to enhance their leadership and managerial skills through a newly launched learning and development training series. In addition, SWIB reviewed its long-term space strategy to ensure it supports the agency's long-term growth needs.

In 2019, SWIB has set the following objectives:

2019 Goals

Goal 1: Investment Strategy Increase Active Return

With industry experts predicting a lower return environment, SWIB's mission of earning the required returns will be more challenging in the future. Generating alpha, or returns above the market, will be more important for SWIB to meet the objectives of the WRS. In 2019, SWIB will continue to work on increasing active return through targeted market opportunities and innovative investment strategies.

Goal 2: Upgrade Technology Infrastructure & Informatics

In 2019, SWIB will enhance the accounting and portfolio management capabilities for private equity and venture capital investments by implementing a technology platform to support SWIB's private market portfolios. SWIB will also continue to upgrade technology infrastructure and informatics for the agency. The upgrades will reduce reliance on spreadsheets, provide better tools to share information across the agency and enhance cross collaboration.

Goal 3: Enhance Talent Acquisition, Retention and Management

In 2019, SWIB will work to enhance talent acquisition, retention, and management. This includes making SWIB a destination for talent and increasing industry talent and expertise. In addition, SWIB will implement a new strategy to improve SWIB's succession planning and employee development.

Goal 4: Enhance Communication Strategy

To enhance its outreach, SWIB will work to increase communication internally among staff and externally with constituents, participants, employers, legislators, and the media.

State Investment Fund

SWIB also manages the SIF, which consists of commingled cash balances of the state and its agencies, local governments, and the WRS. The SIF investment goals are safety of principal, liquidity, and competitive rates of return. The fund's shorter-term cash management objectives reflect these goals.

State agencies deposit tax revenues, fees, federal funds, and other revenues from over 50 state funds with the SIF until needed for state operating expenditures. WRS cash assets are invested in the SIF for transition and cash flow purposes, and in some cases, until longer-term investment opportunities with more favorable rates of return become available. Over 1,400 local government units deposit funds in the commingled Local Government Investment Pool (LGIP) until needed for operating expenditures. SIF earnings are calculated and distributed

monthly based on the participant's average daily balance as a percent of the fund. Participants may deposit and withdraw funds daily. SIF assets were valued at \$9.6 billion on December 31, 2018.

Investment Strategy

To effectively achieve its objectives for safety of principal, liquidity, and then competitive money market returns, the investment strategy of the SIF positions the portfolio to earn additional alpha by monitoring and analyzing market and economic expectations and the market return of short-term government securities. Investment staff constantly monitor global market and economic events and position the fund accordingly. The SIF ended 2018 with a one-year return of 1.90 percent, trailing its benchmark of 1.94 percent, but has outperformed its five-, and ten-year benchmarks.



Investments in Wisconsin

Through targeted and strategic investments, SWIB has been able to help several businesses across the state that have benefitted Wisconsin's economy. At the same time, those investments have generated solid returns with acceptable levels of risk for the trust funds SWIB manages.

Through two dedicated portfolios that provide debt financing and venture capital to growing businesses, SWIB has made significant investments in Wisconsin-based companies, in addition to SWIB's public equity investment in Wisconsin public companies. As of June 30, 2018, through all of its portfolios, SWIB has total investments over \$21 billion in companies with some level of employment and operations in the state. In the last five years ended June 30, 2018, new public and private investments in Wisconsin companies totaled over \$1 billion.

In 2015, SWIB's Private Debt Portfolio expanded its investment region from Wisconsin, Illinois, Iowa, and Michigan to include Indiana, Ohio, and Pennsylvania. However, about 80 percent of the Private Debt Portfolio remains invested in Wisconsin opportunities. SWIB can be a good partner with the company's banks, providing the long-term loan that compliments the bank's short-term financing, but does not compete with the bank to provide other financial services. The program offers flexibility with loans that mature in five to fifteen years and feature a fixed interest rate for the life of the loan.

SWIB's Private Debt Portfolio started in the late 1960s and, at one time, had a national and global focus before switching its attention to investments in the state in 1983. Since the start of the dedicated Wisconsin strategy, there

have been over \$2.2 billion in investments in companies like Organic Valley, Jockey International, Copps, National Guardian Life and Harley Davidson.

SWIB's primary objective for investing in early stage start-up companies through its Wisconsin Venture Capital Portfolio is to generate reasonable investment returns for the beneficiaries of the WRS on a risk-adjusted basis. A secondary benefit, many times, comes from potential jobs these investments can create.

Private equity consists of equity securities in companies not publicly traded on a stock exchange. These investments carry higher risks than publicly-traded investments but offer the potential for a higher rate of return. Venture capital is one form of private equity investment. The Wisconsin Venture Capital Portfolio, which began in 2000, targets venture capital investments in Wisconsin and the Midwest.

The Wisconsin Venture Capital Portfolio had active commitments to ten venture capital funds as of June 30, 2018. The portfolio also has active direct investments, called side-by-side commitments, in numerous venture stage companies in Wisconsin. As of June 30, 2018, SWIB has committed a total of approximately \$320 million to venture capital funds and companies in the Wisconsin Venture Capital Portfolio.

The portfolio capitalizes on the imbalance between the high amount of research and development in the Wisconsin region, entrepreneurial talent, low cost to operate a business within the state, and relatively low amount of venture capital dollars seeking investments here.

SWIB believes it can make money on this imbalance because venture capital investing requires time-intensive and hands-on attention to each company. The high costs can be prohibitive for long-distance investments giving an advantage both to local investors with established

connections to the research conducted here and to business leaders with skills to build companies that can commercialize this research. The lack of competition gives local investors the opportunity to invest at attractive valuations and select the best opportunities.

Total Wisconsin Investments by Asset Class June 30, 2018

Asset Class	Headquartered or Significant Presence ² in WI	Not Headquartered in WI - But 20+ WI Employees	Total Investment in WI
Private Equity/Private Debt	\$ 290,355,392	\$ 404,406,416	\$ 694,761,808
Fixed Income	19,131,550	1,851,530,720	1,870,662,270
Public Equities ³	241,057,716	16,418,780,716	16,659,838,432
Real Estate	13,906,658	49,008,306	62,914,964
Multi Asset	6,527,166	1,043,964,804	1,050,491,970
Short-Term Funds ¹	<u>72,145,794</u>	<u>602,438,713</u>	<u>674,584,507</u>
Total	\$ <u>643,124,276</u>	\$ <u>20,370,129,675</u>	\$ <u>21,013,253,951</u>

¹ Includes commercial paper, certificates of deposit, and bankers' acceptances valued at par.

² "Significant Presence" is defined as a company with 30% or more of their operation in Wisconsin.

³ Does not include liability exposure due to shorting.

Goals for Investing in Wisconsin

SWIB is required by state statutes to report biennially to the Governor and the Legislature on a five-year plan for making investments in Wisconsin. The Goals for Investing in Wisconsin Report for fiscal years 2019-2023 can be found on SWIB's website www.swib.state.wi.us under the Investing in Wisconsin tab.



Awards & Recognition

SWIB is recognized as a world-class investment leader. Throughout the year, SWIB has been honored for its work by peers and various industry publications. These achievements and recognition reinforce SWIB's position as a trusted and skilled global investment organization.

SWIB Wins Change Maker of the Year Allocators' Choice Award

For the second time in as many years, SWIB was chosen by its peers as Institutional Investor Allocators' Choice Award winner. SWIB brought home top honors in the category of Change Maker of the Year. At last year's inaugural Allocators' Choice Awards, SWIB won the Team of the Year and Technology User of the Year awards.

SWIB was recognized this year for the work staff is doing to generate returns above the market through active management. SWIB's work is starting to influence the way other public pension funds are investing. In voting for the Change Maker of the Year award, industry peers acknowledged SWIB's strategy could be a model for other public pension systems.

The Allocators' Choice Awards are new financial awards given by Institutional Investor -- a leading international financial publication -- to recognize industry leaders.

SWIB Executive Director/CIO Wins Lifetime Achievement Award

SWIB Executive Director and Chief Investment Officer David Villa was named the recipient of the 2018 Institutional Investor Lifetime Achievement Award. David was recognized for having created a model for creating a successful hedge fund investing strategy at a U.S. public pension.

Trusted Insight Honors SWIB Managing Analysts

Beth Puleo, managing analyst on SWIB's Private Equity Team, was named to Trusted Insight's list of Top 30 Institutional Investors in the Midwest for 2018.

Trusted Insight is the world's biggest network of institutional investors, connecting investment decision-makers. Trusted Insight's list highlights 30 senior-level investment professionals tasked with incorporating long-term investment strategies at sophisticated university endowments, private foundations, health care systems, and public pensions.

Chris Eckerman, private equity senior managing analyst, was named to Trusted Insight's list of Top 30 Private Equity and Venture Capital Investors for 2018. In compiling the 30-standout private equity and venture capital investors for 2018, Trusted Insight looked back at 2017, which had incredible fundraising rounds, significant returns and healthy exit markets in the private equity industry as well as record levels for yearly institutional capital and number of funds raised in venture capital. This is the second time in as many years that Chris has been recognized for his outstanding work. Last year, Trusted Insight named him to the list of Top 30 Public Pension Rising Stars.

Appendix A

CORE and VARIABLE FUND HOLDINGS BY ASSET CLASS

The following tables compare how the various categories of investments for the Core and Variable Funds were managed within each asset class as of December 31, 2017 and 2018. Totals include exposure to futures and may not add correctly due to rounding.

Core Trust Fund				
Holdings By Portfolio				
	12/31/2017		12/31/2018	
	\$ in Millions	% of Total	\$ in Millions	% of Total
<u>Equities</u>				
Developed Global	\$ 43,463	43%	\$ 39,533	42%
U.S. Small Cap	1,972	2	1,841	2
Emerging Market Equity	5,609	6	4,585	5
Total Equities	\$ <u>51,045</u>	51%	<u>45,958</u>	<u>49%</u>
<u>Fixed Income</u>				
Investment Grade	20,178	20%	17,564	19%
High Yield	1,272	1	1,240	1
Global	2,559	3	2,533	3
Emerging Market Debt	<u>1,932</u>	<u>2</u>	<u>1,894</u>	<u>2</u>
Total Fixed Income	\$ 25,940	26%	\$ 23,232	25%
<u>Inflation Sensitive</u>				
TIPS	12,559	13%	14,354	15%
Commodities	<u>1,969</u>	<u>2</u>	<u>0</u>	<u>0</u>
Total Inflation Sensitive	\$ 14,528	15%	\$ 14,354	15%
<u>Private Markets</u>				
Real Estate Equity	6,401	6%	7,384	8%
Private Equity	5,547	6	5,922	6
Private Equity Co-Invest	367	0	491	1
Venture Capital	939	1	1,126	1
Private Equity Legacy	24	0	17	0
Current Return	772	1	927	1
Private Debt	<u>513</u>	<u>1</u>	<u>503</u>	<u>1</u>
Total Private Markets	\$ 14,563	15%	\$ 16,370	18%
<u>Multi-Asset</u>	\$ 2,635	3%	\$ 2,395	3%
<u>Cash/Leverage/Overlays</u>	\$ <u>(8,383)</u>	<u>(8%)</u>	\$ <u>(8,759)</u>	<u>(10%)</u>
<u>Total</u>	\$ <u>100,329</u>	100%	\$ <u>93,550</u>	100%

Variable Trust Fund

Holdings By Portfolio

	12/31/2017		12/31/2018	
	<u>\$ in Millions</u>	<u>% of Total</u>	<u>\$ in Millions</u>	<u>% of Total</u>
<u>Equities</u>				
Domestic	\$ 5,698	70%	\$ 4,952	70%
International	\$ 1,856	23	1,588	22
Emerging Markets	<u>605</u>	<u>7</u>	<u>543</u>	<u>8</u>
Total Equities	\$ 8,160	100%	\$ 8,160	100%
<u>Multi-Asset</u>	\$0	0	\$0	0
<u>Cash</u>	\$19	0%	\$19	0%
<u>Total</u>	<u>\$ 8,179</u>	100%	<u>\$ 7,102</u>	100%

Appendix B

RISK MANAGEMENT

As part of SWIB's ongoing risk management activities, SWIB routinely monitors risk within the areas outlined below.

Funding WRS Liabilities: The most basic measure of risk for WRS trust funds under management is the ability to pay promised benefits. The WRS actuary and SWIB's asset allocation consultant both agree that the WRS is well-positioned to meet its current and future obligations.

Volatility: Minimizing year-to-year fluctuation in the Core Fund's returns helps to stabilize required contributions to the WRS and dividends paid to retirees.

Interest Rate Risk: Risk that changes in interest rates affects the value of a bond SWIB holds. SWIB uses multiple methods to monitor and mitigate interest rate risk. One example is an investment in Treasury Inflation Protected Securities (TIPS).

Currency Risk: Currency risk is the potential risk of loss from fluctuating foreign exchange rates. Foreign currency exposure in the trust funds occurs primarily in the international stock and bond holdings and, to a lesser extent, from private markets. International and global portfolio managers make currency hedging decisions. International currency risk is further managed by diversifying across international regions, economies, sectors and individual investments.

Tracking Error/Active Risk: Tracking error measures the volatility of excess return versus the benchmark. It is an indication of how the fund or portfolio is positioned relative to the benchmark. This also helps measure the extent to which the performance of any one portfolio within the trust fund could affect the performance of the entire fund. The Trustees have adopted an active risk objective of 120 basis points, plus or minus 60 basis points, for both Core and Variable Funds. SWIB staff monitor tracking error on an ongoing basis and perform attribution analysis to understand in detail where deviations from the benchmark are occurring.

Soft Risk Parameters: Investment guidelines include "soft risk parameters," supplementary guidelines within which a portfolio is expected to operate over time. The Investment Committee, composed of SWIB executive and investment staff, monitors portfolios on a regular basis for compliance with parameters. The Investment Committee discusses the rationale and outlook for any exceptions.

Credit Risk: Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations to SWIB. Fixed income credit risk investment guidelines outline the minimum ratings required at the time of purchase by individual portfolios, or groups of portfolios, based on the portfolios' investment objectives. In addition, some fixed income portfolios are required to carry a minimum weighted average rating at all times. SWIB's Credit Team reviews overall credit risks.

Appendix C

SEPARATELY MANAGED FUNDS

Goals and strategies for the following funds are set by the various fund administrators. SWIB takes guidance from the administrators of the funds on how the assets should be managed, and SWIB executes the investment strategies.

Historical Society Endowment Fund: The Historical Society Endowment Fund supports current and anticipated initiatives and operations of the Wisconsin Historical Society. The investment objective of the Historical Society Endowment Fund is to maintain a mix of equities and fixed income providing long-term growth in capital and income generation.

State Life Insurance Fund: The State Life Insurance Fund offers low cost life insurance to Wisconsin residents. The investment objective of the fund is to maintain a diversified portfolio of high quality public bonds which will preserve principal, maximize investment income, and minimize costs to policyholders. Liabilities from the fund's insurance contracts are factored into investment decisions.

Injured Patients and Families Compensation Fund: The Injured Patients and Families Compensation Fund provides excess medical malpractice coverage for Wisconsin health care providers and to compensate injured claimants. SWIB is responsible for managing the fund's assets to meet the maturity and liquidity needs established by the Board of Governors. The investment objective of the fund includes a balance between capital appreciation, preservation of capital, and current income.

UW System Trust Funds: The University of Wisconsin System trust funds consist primarily of monies that have been gifted directly to a UW institution, rather than one of the separate, supporting foundations. The Trust Funds Office works externally with donors and other related parties, and internally with the benefiting campuses and colleges, to facilitate the receipt and proper use (compliant with donor terms and conditions) of all gifts and bequests. The majority of the trust funds are invested by SWIB. The system's spending policy target annual expenditures of 4 percent of the market value of the assets (calculated using a three-year rolling average) for payments to beneficiaries. The investment objective is to achieve, net of administrative and investment expenses, reasonable, attainable, and sustainable returns over and above the rate of inflation. SWIB seeks to achieve this objective through use of passive, externally-managed, public markets funds.



121 E. Wilson St., P.O. Box 7842 Madison WI 53707 / (p) 608.266.2381 / (f) 608.266.2436 / www.swib.state.wi.us