SWIB Board Materials for February 8, 2017

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Regular Meeting of the Board of Trustees

Wednesday, February 8, 2017
STATE OF WISCONSIN INVESTMENT BOARD
Offices of the Wisconsin Investment Board
121 East Wilson Street
Madison, Wisconsin
Board Room
(Conclusion of Strategic Planning and Corporate Governance Committee Meeting, approximately 9:30 a.m.)

OPEN SESSION

1. **Open Session Minutes of December 14, 2016**

2. **Election of Secretary and Assistant Secretary**

3. **Committee Report and Recommended Actions from Committee Agenda - Open Session Items**
   A. Audit Committee
   B. Strategic Planning and Corporate Governance Committee
   C. Compensation Committee

4. **Investment Performance**
   A. Preliminary Asset Allocation Summary and Portfolio Performance Evaluation Update (January 31, 2017)
   B. Asset Allocation Summary and Portfolio Performance Evaluation (December 31, 2016)
   C. Fund Level Attribution Report, Q4 2016
   D. Callan Quarterly Peer Report, Q4 2016

5. **Review of 2016 Performance and Quarterly Investment Update, Q4 2016**

6. **Chief Financial Officer's Report**
   A. New Contracts Approved (Q4 2016)

7. **Enterprise Risk Management Quarterly Report**

8. **Investment Committee Open Session Business**
   A. Approved Open Session Minutes of November 22, 2016 and December 20, 2016 Meetings
   B. Final Open Session Agenda for January 24, 2017 Meeting and Draft Open Session Agendas for February 28, 2017 and March 28, 2017 Meetings
   C. Investment Guidelines Amendments

9. **In the Absence of Questions, the Following Report will be Filed Without Comment:**
   A. Private Markets and Funds Alpha Commitments – 4th Quarter

10. **Committee Governance Considerations**

11. **Annual Committee Assignments by Board Chair**

CLOSED SESSION*

RECONVENE IN OPEN SESSION*

12. **Announcements of Board Actions Relating to Items Taken up in Closed Session**

13. **Future Items for Discussion**

14. **Motion to Adjourn**

NOTES: *Items may be taken in order other than listed.*

The meeting site is physically accessible. Upon prior request, reasonable accommodations will be provided.

* A motion to go into closed session at this meeting is authorized pursuant to § 19.36 (5) and§ 19.85 (1) (c) and (e) of the Wisconsin Statutes to approve closed session minutes, to consider confidential information relating to strategies for the investment of public funds, and to discuss performance evaluation and compensation data of SWIB staff. The Board may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the Board will subsequently reconvene in open session to cover remaining agenda items.

STATE OF WISCONSIN INVESTMENT BOARD
Board Meeting–Open Session
Wednesday, December 14, 2016
Offices of the Investment Board
121 East Wilson Street, Madison, Wisconsin

Board Members Present:

Dave Stein, Chair
Bob Conlin, Secretary
Sandra Claflin-Chalton, Trustee
Mark Doll, Trustee
Scott Neitzel, Trustee
Barb Nick, Trustee
Tim Sheehy, Trustee
Paul Stewart, Trustee

Staff and Others Present:

Michael Williamson, Executive Director
Rochelle Klaskin, Chief Legal Counsel
David Villa, Chief Investment Officer
Jennifer Schmeiser, Chief Human Resources Officer
Brandon Brickner, Internal Audit Director
Elizabeth Fadell, Strategic Planning and Transformation Director
Lori Wersal, Chief Financial Officer
Shirley Eckes, Chief Operating Officer
Chuck Carpenter, Managing Director-Private Markets & Funds Alpha
Scott Anderson, Head of Asset & Risk Allocation
Todd Ludgate, Managing Director-Fixed Income
Brian Hellmer, Managing Director-Public Equities
Nick Stanton, Portfolio Manager-Multi-Asset Strategy
Samir Datta, Financial Planning & Analysis Director
Eric Buchholtz, Investment & Management Services Director
Brad Gentert, Performance Analyst
Trish Reopelle, Asset & Risk Allocation Managing Analyst
Brian Heimsoth, Quantitative Manager
Dev Desai, Enterprise Risk Manager
Vicki Hearing Communications Manager
Heather Dobson, Financial Accountant
Kurt Petrie, Internal Auditor
Chris Preisler, Communications Specialist
Anna Vembu, Communications Specialist
Ithipol Yang, Help Desk Specialist
Janet Klosterman, Legal Assistant
Bill Ford, Consultant
Jenna Schmidt, Legislative Audit Bureau
Chris Levell, NEPC
Ivan "Butch" Cliff, Callan Associates
Bruce Hopkins, CEM Benchmarking, Inc.
Vincent DiVasta, Citisoft
Keith Amato, Citisoft

Staff and Others Present: (Continued)

Andrea Pickard, BlackRock
Bob Schaefer, Wisconsin State Engineering Association
George Mickelson, Wisconsin State Engineering Association
Michael P. McGuire, Northwest Passage Capital Advisors
(Some of those listed may have attended only portions of the meeting.)

With a quorum present, the Board Chair called the Board of Trustees meeting to order at 10:23 a.m.

1. <u>Approval of Open Session Minutes</u>

<u>Motion</u>: A motion was made by Trustee Sheehy and seconded by Trustee Nick to approve the open session minutes of the August 10, 2016 and the October 19-20, 2016 meetings, as submitted. The motion passed unanimously.

2. <u>Committee Reports</u>

The Chair announced that the Benchmark Committee Report is scheduled as agenda item #5 to follow the presentation and the Board's action on the Asset Allocation update and recommendations for 2017.

A. Audit Committee

Trustee Stewart reported that during open session, the Audit Committee approved the *2015 Retirement Funds Audited Financial Statement* and discussed the Legislative Audit Bureau's (LAB) report on internal controls. He noted that the Legislative Audit Bureau issued an "unmodified" opinion on the Retirement Funds 2015 financial statements and related notes.

Trustee Stewart reported that the Audit Committee also **(1)** received a report on an external peer review of SWIB's Internal Audit Group conducted by a team of experienced pension auditors during 2016; **(2)** was updated by the Internal Audit Director on open audit issues and the status of the 2016 Audit Plan; **(3)** approved the 2017 Audit Plan; **(4)** approved the Tableau Audit Report and the Interim Trade Operations Audits Report; and **(5)** received other routine reports.

B. Compensation Committee

Trustee Stein reported that the Compensation Committee met with Adam Barnett of McLagan Partners, SWIB's Compensation Consultant, to discuss the results of McLagan's annual compensation review and review of SWIB's Incentive Compensation Plan design. Trustee Stein stated that the Committee would continue to study the design of the Incentive Compensation Plan during 2017.

Trustee Stein further reported that the Committee discussed several proposed amendments to SWIB's Compensation Plans that they recommend for approval by the full Board. He noted that most of the Trustees were present for the Committee's discussion and hearing no desire to discuss further, offered motions for each of the proposed amendments, as follows.

(1) Compensation Plan for Unclassified Employees-Recommended Amendments

<u>Motion</u>: A motion was made by Trustee Stein and seconded by Trustee Neitzel to amend the

Compensation Plan for Unclassified Employees, as reflected in the Committee meeting materials and as recommended by the Compensation Committee. The motion passed unanimously.

(2) Salary Band Range Recommendation

Motion: A motion was made by Trustee Stein and seconded by Trustee Sheehy to amend the salary band ranges, as reflected in the Committee meeting materials and as recommended by the Compensation Committee. The motion passed unanimously.

(3) Investment Managements Staff's Incentive Compensation Plan-Recommended Amendments

Motion: A motion was made by Trustee Stein and seconded by Trustee Claflin-Chalton to amend the Investment Management Staff's Incentive Compensation Plan, as reflected in the Committee meeting materials and as recommended by the Compensation Committee. The motion passed unanimously.

C. Strategic Planning & Corporate Governance Committee

Trustee Nick reported that Strategic Planning and Corporate Governance (SPCG) Committee received updates from staff on **(1)** the ARIES Project; **(2)** 2017 Strategic Planning Priorities; **(3)** the preview of some policies for SWIB's investment guidelines; **(4)** development of the new Board report to replace the AASPE; and, **(5)** continued their discussion about SWIB's Corporate Governance program.

Trustee Nick further reported that the SPCG Committee discussed several proposed contract renewal provisions for Board and Staff Consultant contracts and some proposed amendments to the SPCG Committee Charter, as outlined in the Committee materials. Trustee Nick stated that most of the Trustees were present for the Committee's discussion and hearing no desire for further discussion, she offered motions for each proposed amendment, as follows.

(1) Recommended Amendments to Strategic Planning & Corporate Governance Committee Charter

Motion: A motion was made by Trustee Nick and seconded by Trustee Conlin to amend the Committee's Charter, as reflected in the Committee meeting materials and as recommended by the Strategic Planning & Corporate Governance Committee. The motion passed unanimously.

(2) Board and Staff Consultant Contract Renewals

Motion: A motion was made by Trustee Nick and seconded by Trustee Stewart to approve renewal by the Executive Director of each applicable Board Consultant Agreement through 2018, as reflected in the Strategic Planning & Corporate Governance Committee meeting materials, subject to continued satisfactory performance by each Board Consultant listed, and to approve the selection/rebidding process for new Board Consultants to begin in 2018. The motion passed unanimously.

3. Annual Presentation on Investment Performance and Q3 Investment Performance Report

A. Asset Allocation Summary and Portfolio Performance Evaluation

Brad Gentert, Performance Analyst, referred to the *Preliminary Asset Allocation Summary and Performance Evaluation (AASPE)*, which showed a total of $103.3 billion in assets under management as of November 30, 2016. He noted that this total is up approximately $2.7 billion compared to November 30, 2015. He highlighted the following preliminary performance results for the Core and Variable Retirement Trust Funds through November 30, 2016:

Performance Results-November 30, 2016 (Preliminary)		
	Year-to-Date	**One-Year**
Core Fund (CTF)	7.0%	5.8%
Benchmark	6.5%	5.2%
Variable Fund (VTF)	8.4%	6.2%
Benchmark	8.1%	5.9%

Mr. Gentert reviewed the individual asset class performance, as shown in the summary of returns that was included in the preliminary *AASPE,* and provided data on the one-, three-, five-, and ten-year returns for SWIB's internal and external portfolios. The data reflected that, year-to-date, 70% of SWIB's internal portfolios, and 50% of SWIB's external portfolios, met or exceeded their benchmarks, and that there have been no significant changes to the internal/external management split, with SWIB managing 63% of its assets internally.

Mr. Gentert reported that the CTF is ahead of the benchmark by about 50 bps both year-to-date and for the one-year period through November 30, 2016, and is ahead for the three-, five- and ten-year periods; and, that the VTF is ahead of the benchmark by 30 bps year-to-date through November 30, 2016 and has outperformed its benchmark for the one-, three-, five-, and ten-year periods.

Mr. Gentert noted that the October 31, 2016 *AASPE* was included on pages 24-45 in the meeting materials for the Board's information.

B. Fund Level Attribution Report, Q3 2016

Mr. Gentert reviewed the Fund Level Attribution Report for Q3, which was included on pages 46-50 in the meeting materials. He walked the Trustees through the *CTF Relative Return Attribution-Gross of Fees as of September 30, 2016,* on page 49. He highlighted the following changes from Q2 to Q3 **(1)** strong Q3 performance from Public Equities and Private Equity has increased the YTD CTF return from +4.4% in Q2 to +8.5% as of Q3; **(2)** The CTF excess return increased from (-13 bps) to +36 bps; **(3)** with the exception of Multi-Asset and the Alpha Overlay, all other asset classes are now equal to, or ahead of the respective asset class benchmark; and, **(4)** Private Equity YTD excess return increased from +50 bps as of Q2 to +340 bps as of Q3.

Mr. Gentert also reported that as of Q3 the CTF has 36 basis points of outperformance relative to its benchmark. Portfolio implementation added 7 basis points of contribution. Equities contributed 11 basis points, fixed income contributed 2 basis points, and private equity/debt contributed 26 basis points. Multi-Asset and hedge funds detracted a total of 11 basis points as of Q3.

C. Callan Quarterly Report

Mr. Gentert, SWIB's Performance Analyst, introduced Ivan "Butch" Cliff, Executive Vice President and Director of Investment Research at Callan Associates. Mr. Cliff explained that Callan compares the Core Trust Fund's performance with a peer group identified because of their similarity to SWIB's circumstances, which is made up of 42 public institutional investors, each with greater than $10 billion in assets under management. He explained that Callan Associates provides SWIB with detailed quarterly reports on three categories at the end of each quarter and presents summary results annually.

Mr. Cliff stated that SWIB's asset allocation total exposures (including leverage) are somewhat similar to peers but with some notable differences that adversely affected performance rankings versus peers during 2013-2015. In particular, although SWIB had similar amounts of total equity (~50%) compared to its peers, it has less U.S. equity and more international equity. Unlike peers, SWIB does not have a home country bias. Also, SWIB has 15% more fixed income exposure than peers with overweights in both domestic (+10%) and international fixed income (+5%).

Mr. Cliff reported that over the last five years SWIB has enjoyed healthy absolute returns (9.16% annualized), and has beat its target. SWIB's implementation added little risk and produced significant excess return over target of +42 bps annualized. Over this same five-year period, the fund has never been behind target on a cumulative basis. He further highlighted SWIB's **(1)** consistent positive excess returns in 15 of the last 20 quarters; **(2)** highly-controlled tracking error relative to target; **(3)** that achieving excess return has most recently been more challenging; and, **(4)** last quarter's significant outperformance broke a short four-quarter losing streak versus target.

Mr. Cliff discussed the risk/reward tradeoff and efficiencies versus peers (Page 61) and highlighted how SWIB's strong risk control philosophy resulted in consistently lower tracking error than peers, and less active risk versus policy target. This positive excess return together with very low tracking error yields very good efficient excess return ratio results and rankings (Page 62). He went on to say that 3 of 5 asset classes outperformed their targets over five years, while International Equity and International Fixed Income underperformed their targets. For the five-year period ending September 30, 2016, SWIB scored a weighted average ranking of 54 based on the stronger performance of U.S. Equity and Real Estate asset classes against peers (Page 63).

Mr. Cliff facilitated a discussion while presenting his slides and answered questions.

4. <u>Annual Presentation on Cost Benchmarking</u>

A. 2015 Cost Effectiveness

Samir Datta, Financial Planning & Analysis Director, introduced Bruce Hopkins, Vice President at CEM Benchmarking Inc., who presented his report on SWIB's cost of asset management, referencing his report, *Core Fund Investment Benchmarking Results for the 5-Year Period Ending December 31 2016*, a copy of which was included in the meeting materials on pages 80-117. Mr. Hopkins noted that CEM compares SWIB's costs both to those of CEM's extensive database of pension funds (including 162 U.S. Public funds, 71 Canadian funds with assets totaling $1.2 billion, 51 European funds with aggregate assets of $2.7 trillion, and 7 Asia-Pacific funds with aggregate assets of $900 billion). He commented that the most meaningful comparisons for SWIB's returns and value added are a customized U.S. Public universe of 55 funds made up of 15 U.S. public sponsors ($44 billion to $288 billion with a median size of $80 billion) compared to SWIB's $88 billion. He noted that CEM's peer group is different than the Callan peer group.

Mr. Hopkins identified the following key takeaways from CEM's report and then walked the Trustees through the illustrations in his report and answered questions from the Trustees.

Returns	➢ SWIB's 5-year net total return was 6.3% and below the US. Public median of 7.2% and below the peer median of 7.3%. ➢ SWIB's 5-year policy return was 6.0% and below the U.S. Public median of 7.2% and below the peer median of 7.3%.
Value Added	➢ SWIB's 5-year net value added was 0.2%, which was above the U.S. Public median of 0.0% and above the peer median of 0.0%.
Cost and Cost Effectiveness	➢ The Core Trust Fund was low cost compared to its peers. SWIB's investment costs of 39.3 bps was below its benchmark cost of 47.9 bps. . ➢ SWIB's fund was low cost because it had a lower cost implementation style and it paid less than peers for similar services. ➢ SWIB's 5-year performance placed it in the positive value-added, low cost quadrant of the cost effectiveness chart.

Mr. Hopkins also reviewed CEM's peer FTE analysis that it conducted for SWIB. This peer group included 25 peers for 2015. The analysis showed the median FTE number was 176 and SWIB employed 165 employees. When narrowed to the 11 peers who had a similar complex investment program to SWIB the peer average was 181 employees and the peer benchmark was 190 employees compared to 165 employees at SWIB.

Mr. Hopkins discussed with the Board the drivers of investment management and investment services FTEs and concluded his presentation.

B. Staff Presentation on Total Cost of Management Plan-Annual Evaluation

Mr. Datta stated that a copy of staff's SWIB's Cost Effectiveness *Annual Evaluation (December 14, 2016)*, was included in the meeting materials on pages 121-133 as part of the Board's fiduciary duty of oversight and monitoring with respect to the budget it approves each year.

Mr. Datta then presented a summary of information from CEM's presentation, as well as SWIB's analysis on costs, highlighting pages 123, 131 and 133 and the following key points:

► **Total Cost Comparison**
Compared to its CEM peers, SWIB's costs are 12.0 bps lower (3.5 bps due to asset allocation differences and 8.5 bps because of internal and passive management). Based on SWIB's average assets under management (AUM), this represents a savings of $106 million.

► **Fee Comparison to Peers**

SWIB pays less for similar services than does its peers, which translates to $16.7 million (1.9 bps) in savings.

► **Implementation Decisions**

SWIB manages more assets internally and passively than does its peers, which translates to $58.6 million (6.6 bps) in savings.

► **Administrative and Governance Costs**

SWIB's governance costs are 1.4 bps higher than the peer median because SWIB has more internal management and allocates costs differently than its peers. More internal management requires more governance and oversight

► **Cost Trends**

SWIB's total costs have increased since 2011, primarily due to increases in AUM, but have remained materially lower than peers due to more internal management.

Note: The Board took a break for lunch from 12:10 pm to 12:26 p.m.

5. <u>Asset Allocation Update and Recommendations for 2017</u>

Scott Anderson, Head of Asset & Risk Allocation introduced Chris Levell, NEPC, who walked the Trustees through NEPC's *Asset Allocation Review*, which was included on pages 135-157 in the meeting materials, and together they facilitated the Committee's discussion and answered questions about the following points about the asset allocation recommendation outlined in the executive summary of the report: **(a)** expectations are for Fed Fund rates to remain below 1% well into 2017; **(b)** the return on cash is expected to be lower than inflation for a long time and will negatively impact asset returns; **(c)** the recommended destination portfolio will best achieve SWIB portfolio objectives in a range of market environments, in particular, during a low return environment; **(d)** reducing the fixed income allocation by 2.5% and increasing the inflation protection asset class by 2.5%; **(e)** increasing both Private Markets and Real Estate by 1%; **(f)** rebalancing the private markets allocation through the emerging market sub-asset allocation; **(g)** a recommended reduction in world government bond exposure with a corresponding increase in U.S. treasury exposure as well as a small allocation to unhedged emerging market bonds; **(h)** maintaining the 120 bps +/- 60 bps of active risk objective for the CTF for 2017; **(i)** lowering the active risk objective for the VTF to 60 bps +/- 30 bps; and **(j)** moving towards 110% leverage for the CTF.

Mr. Anderson referred to the proposed draft of *SWIB's Asset Allocation Overview and Recommendations for 2017*, shown on pages 159-164 in the meeting materials. He highlighted the following table on page 159, noting corrections to the strategic target ranges for public equities, fixed income and inflation sensitive asset classes, which have been incorporated into the below table. Mr. Anderson noted that a preliminary preview of the recommendations had been discussed during the October Workshop and then he and Mr. Levell answered questions and facilitated the discussion.

RECOMMENDED 2017 STRATEGIC TARGETS			
2017 Core Trust Fund:	**Continue on the course of implementation toward strategic asset allocation targets that include up to 110% leverage.**		
	Current	**Recommended**	**Ranges**
Public Equities	51.5%	50.0%	47.4-53.0%
Fixed Income	27.5%	24.5%	21.5-27.5%
Inflation Sensitive	12.0%	15.5%	10.5-20.5%
Private Equity	7.0%	8.0%	5.0-11.0%
Real Estate	7.0%	8.0%	5.0-11.0%
Multi-Asset	4.0%	4.0%	1.0-7.0%
Total	**109%**	**110%**	
CTF Active Risk Target	**120 bps +/- 60 bps**		

2017 Variable Trust Fund	**Retain current strategic targets.**		
	Current	**Recommended**	**Target**
U.S. Equities	70.0%	70.0%	65.0-75.0%
International Equities	30.0%	30.0%	25.0-35.0%
Total	**100%**	**100%**	
VTF Active Risk Target	**60 bps +/- 30 bps**		

Motion: A motion was made by Trustee Stein and seconded by Trustee Sheehy to adopt and approve the asset allocation and active risk targets for the Core Trust Fund and the Variable Trust Funds as set forth and further described in the Asset Allocation Overview and Recommendations for 2017, dated December 14, 2016, included in the Board materials, as modified for changes to the ranges for the public equities, fixed income, and inflation-sensitive asset classes noted during the discussion, and as recommended by the Investment Committee and the Board's asset allocation consultant, NEPC. The motion passed unanimously.

Note: Trustee Neitzel left the meeting at 1:37 p.m.

6. Benchmark Committee Report and Recommended Action from Open Session

Trustee Claflin-Chalton reported that the Benchmark Committee recommends to the Board the approval of proposed amendments to the Benchmark Committee Charter and Policies and the approval of 2017 benchmarks presented by the Benchmark Consultant, Barry Dennis, Verus Advisory, as shown in the Benchmark Committee materials. She noted that most of the Trustees were present during the Committee's discussion, and hearing no request for further discussion offered the following motions.

A. Recommended Amendments to Benchmark Committee Charter and Policies

Motion: A motion was made by Trustee Sandra Claflin-Chalton and seconded by Trustee Doll to amend the Committee's Charter and Policies, as reflected in the Committee meeting materials and as recommended by the Benchmark Committee. The motion passed unanimously.

B. Approval of 2017 Benchmarks

Motion: A motion was made by Trustee Claflin-Chalton and seconded by Trustee Stewart that the Benchmark Committee recommend to the Board **(1)** the new, revised, and continuation of the benchmarks outlined in Verus' comprehensive review, included in the Committee's materials and **(2)** that all of such benchmarks shall be effective as of the later of the following dates: January 1, 2017; the effective date of any new portfolio to which the benchmark applies or of the implementation of any new approved asset allocation; or the first date for which benchmark data is implemented and available operationally to SWIB, all as recommended by the Benchmark Consultant and Benchmark Committee. The motion passed unanimously.

7. <u>Quarterly Investment Update, Q3 2016</u>

Mr. Villa kicked off the *Quarterly Investment Update*, which was included on pages 167-203 in the meeting materials. He highlighted the illustrations on pages 169-174, which showed the Policy Portfolio adding 29% above the Reference Portfolio over the last twenty years, and the Core Trust Fund (CTF) outperforming the Policy Portfolio by 8% over the same twenty-year period.

Mr. Villa discussed that the market was late in the credit cycle and reviewed CCC bond issuances and high yield defaults. In reviewing the slide on page 173, Mr. Villa noted that he would have expected more defaults in in 2016 but that most of the spikes were energy-related. He also stated that it was not clear whether defaults would peak in 2017. He reviewed the slide on page 175 making the point that the cost to refinance speculative debt is rising and that the market does not have a lot of appetite to issue it.

Mr. Anderson reviewed the summary of returns on page 176-177 showing that **(a)** high yield and emerging markets equity lead returns through Q3; **(b)** credit and equity are priced higher than long-term historical averages; and **(c)** U.S. Treasury yields have increased. He also discussed the CTF 5-year risk contribution summary on page 178 and answered questions.

Messrs. Hellmer, Ludgate, Stanton, Carpenter, and Anderson then provided commentary and reviewed their outlook for each manager's respective asset class as they walked the Board through the materials on page 179-194, and answered questions while facilitating a Board discussion.

8. <u>Investment Committee Open Session Business</u>

A. Approved Minutes

Mr. Villa stated that the approved open session minutes of the July 26, 2016, August 23, 2016, September 27, 2016, and November 1, 2016 Investment Committee meetings were included on pages 205-229 in the meeting materials for the Board's review, and noted that he had previously reviewed the agendas for these meetings with the Board.

B. Agendas for Upcoming Meetings

Mr. Villa then reviewed the open session agenda for the November 22, 2016 meeting and draft open session agendas for the December 20, 2016, and the January 24, 2017 meetings, which were included on pages 230-235 in the meeting materials. Mr. Villa highlighted, in particular, the following upcoming presentations/discussions: **(1)** the Committee's approval of Delivery versus Payment (DVP) Repo for the State Investment Fund (SIF) on November 22, 2016; and the **(2)** preview of the Spring Investment Forum and proposal coming from the Multi-Asset staff for the Investment Committee's approval of a Commission Management Program policy on December 20, 2016.

9. Chief Financial Officer's Report

Trustee Stein noted that the Chief Financial Officer's Report of *New Contracts Approved during April-September 2016* was included on pages 237-239 in the meeting materials, for the Board's review.

10. Reports Filed Without Comment

In the absence of questions, the following report will be filed without comment **(a)** Private Markets and Funds Alpha Commitments-Q3 2016; and **(b)** Quarterly Reports of Charges to Funds-Q2 and Q3.

11. Motion to Convene in Closed Session

Motion: A motion was made by Trustee Stein and seconded by Trustee Stewart to convene in closed session as authorized by Wisconsin Statutes 19.36(5) and § 19.85(1)(c), (e) and (f) to approve closed session minutes, to consider confidential strategies for the investment of public funds, to hear a report on financial data of specific persons; and to consider confidential performance evaluation data and compensation data of individual SWIB employees.

The Chair called for a roll call vote:

Claflin-Chalton-Aye	Conlin-Aye	Doll-Aye	Nick-Aye
Sheehy-Aye	Stein-Aye	Stewart-Aye	

There being seven ayes and no nays, the Chair declared the motion passed. The Board convened in closed session at 2:14 p.m. and reconvened in open session at 2:40 p.m.

12. Announcement of Board Actions Relating to Items Taken up in Closed Session

Trustee Stein reported that during its regular closed session, staff updated the Board on confidential investment strategies and approved closed session minutes; and during executive closed session, the Board acted on a salary recommendation for SWIB's Internal Auditor from the Audit Committee.

13. Future Items for Discussion

There were no future items discussed.

14. Adjournment

Motion: A motion to adjourn was made by Trustee Sheehy and seconded by Trustee Stewart. The motion passed unanimously and the meeting adjourned at 2:43 p.m.

Date of Board Approval: ______________________________

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Signed: Robert J. Conlin, Board Secretary

Total Assets Under Management
December 31, 2016

	Value ($ Mil.)	%
CORE TRUST FUND	89,420	86%
VARIABLE TRUST FUND	7,016	7%
TOTAL RETIREMENT FUNDS	**$96,436**	**92%**
STATE INVESTMENT FUND (except Investment Board Funds)		
(Includes Float)	6,708	6%
STATE LIFE INSURANCE FUND [1]	115	
LOCAL GOVERNMENT PROPERTY INSURANCE FUND	1	
HISTORICAL SOCIETY ENDOWMENT FUND [1]	15	
INJURED PATIENTS AND FAMILIES COMPENSATION FUND[1]	1,279	1%
EDVEST FUND [1]	4	
TOTAL:	**$104,559**	**100%**

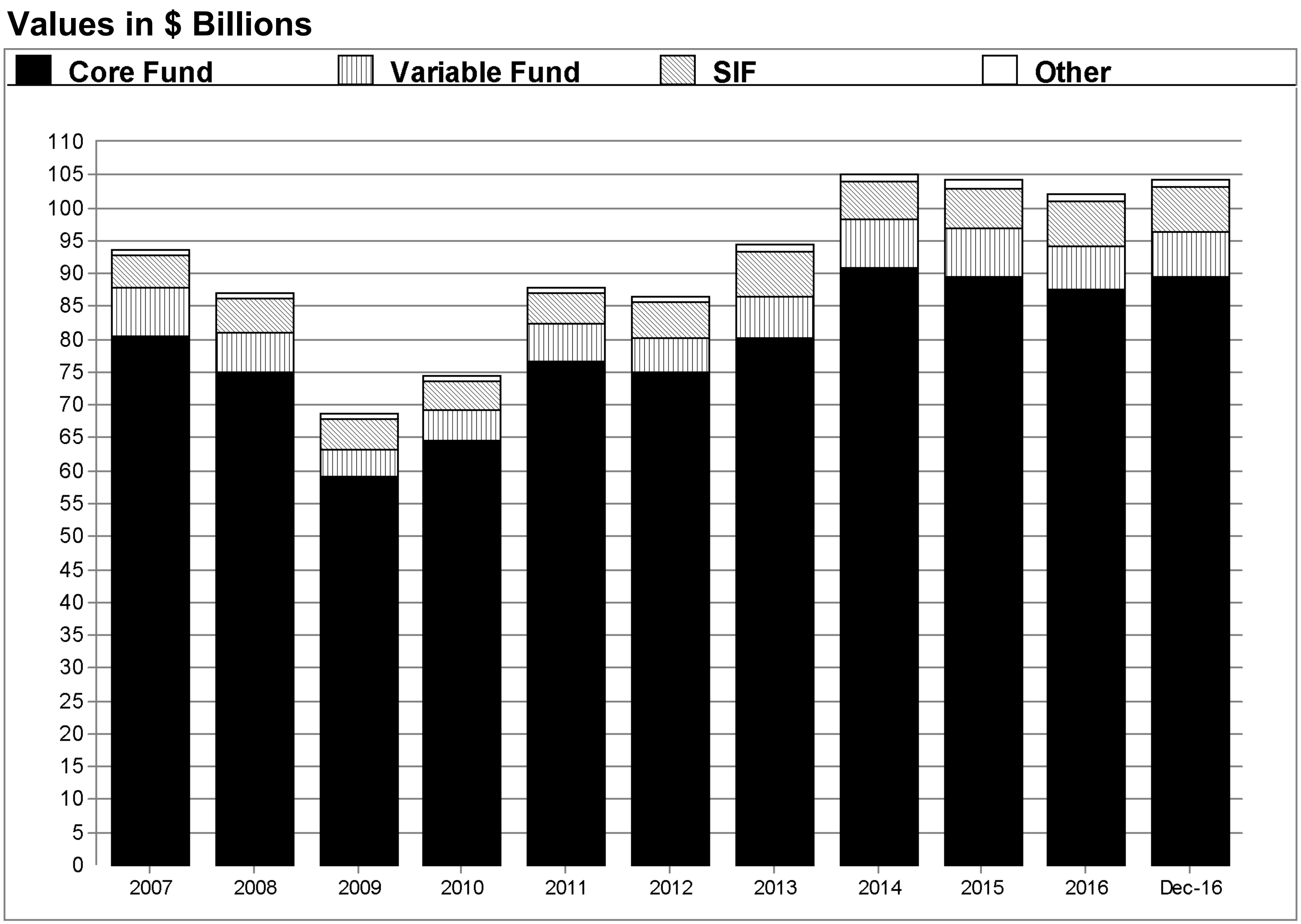
WRS Internal/External Money Management

	12/31/2016 Internal / External
Domestic Equities	96% / 4%
International Equities	67% / 33%
Fixed Income	58% / 42%
Inflation Sensitive	83% / 17%
Private Markets	19% / 81%
Multi Asset	100% / 0%
TOTAL:	**64% / 36%**

Note: Values and percentages might not add due to rounding.

1. Reflects market value plus accrued income. Prior to June 30, 2015 reported at cost or amortized cost.

Assets Under Management



Fiscal Years Ending 6/30

SIF: State Investment Fund

Other: State Life Ins., Local Property Ins., Historical Society, Injured Patients and Families Comp., Edvest

Asset Allocation and Rebalancing Summary
December 31, 2016

	CORE TRUST FUND							VARIABLE TRUST FUND			
	Market Value ($ Mil.)	Base Exposure ($ Mil.)	Policy Overlay ($ Mil.)	Total Exposure ($ Mil.)	Total Exposure (%)	Strategic Target	Target Range	Market Value ($ Mil.)	Market Value (%)	Strategic Target	Target Range
EQUITIES[1]	**$43,775**	**$42,938**	**$2,750**	**$45,688**	**51.1%**	**51.5%**	**48.4 - 54.6%**	**$7,097**	**101.2%**	**100.0%**	
Domestic [3]	22,388	21,551	2,750	24,301	27.2%	27.7%	23.6 - 31.9%	5,023	71.6%	70.0%	65.0 - 75.0%
Active	8,705	8,705		8,705	9.7%			1,056	15.1%		
Passive	13,683	12,846	2,750	15,596	17.4%			3,966	56.5%		
International [3]	21,387	21,387		21,387	23.9%	23.8%	20.2 - 27.4%	2,074	29.6%	30.0%	25.0 - 35.0%
Active	6,309	6,309		6,309	7.1%			654	9.3%		
Passive	10,319	10,319		10,319	11.5%			938	13.4%		
Emerging Markets	4,759	4,759		4,759	5.3%			483	6.9%		
FIXED INCOME[1]	**$22,847**	**$22,517**	**$3,232**	**$25,749**	**28.8%**	**28.9%**	**25.9 - 32.0%**				
Investment Grade	15,343	15,013	3,232	18,246	20.4%	20.6%	17.5 - 23.6%				
High Yield	1,442	1,442		1,442	1.6%	1.6%	0.6 - 2.6%				
Global	4,711	4,711		4,711	5.3%	5.2%	4.4 - 6.0%				
Emerging Debt[3]	1,350	1,350		1,350	1.5%	1.6%	0.6 - 2.6%				
INFLATION SENSITIVE [1]	**$7,488**	**$6,179**	**$4,379**	**$10,558**	**11.8%**	**12.0%**	**5.0 - 15.0%**				
TIPS	6,889	6,179	2,473	8,651	9.7%	10.0%					
Commodities	599	0	1,907	1,907	2.1%	2.0%					
PRIVATE MARKETS[1]	**$13,895**	**$13,895**		**$13,895**	**15.5%**	**15.5%**					
Real Estate	6,357	6,357		6,357	7.1%	7.1%	4.0 - 10.0%				
Real Estate Equity	6,357	6,357		6,357	7.1%						
Private Equity/Debt	7,538	7,538		7,538	8.4%	8.4%	4.0 - 10.0%				
Private Equity	5,188	5,188		5,188	5.8%						
Pvt Eq Co-Invest	207	207		207	0.2%						
Venture Capital	895	895		895	1.0%						
Private Equity Legacy	69	69		69	0.1%						
Current Return	696	696		696	0.8%						
Private Debt	482	482		482	0.5%						
MULTI ASSET[1]	**$709**	**$709**	**-**	**$709**	**0.8%**	**1.0%**	**1.0 - 7.0%**				
Active Beta Strategies	709	709	0	709	0.8%						
CASH & OVERLAYS	**$706**	**$706**	**$0**	**$706**	**0.8%**	**0.0%**		**($81)**	**(1.2)%**	**0.0%**	
Unallocated Cash[2]	596	596		596	0.7%			(81)			
Alpha Pool	4,751	4,751		4,751	5.3%						
Alpha Overlay Synth Cash Offset[4]	(4,641)	(4,641)		(4,641)	(5.2%)						
TOTAL FUND	**$89,420**	**$86,943**	**$10,362**	**$97,305**	**109%**	**109%**		**$7,016**	**100%**	**100%**	

1 Public and private market asset values include cash.
2 Cash is liquidity, global equity income and overlay related cash.
3 Global equity and global high yield market values and exposures are reported based on portfolio mandate.
4 Amount of cash needed to fund synthetic beta related to Alpha Pool as physical investment, adjusted for interest.
Note: Values and percentages might not add due to rounding.

Summary of Returns (%)
December 31, 2016

SWIB Total Fund and Major Division Returns	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Core Trust Fund	8.6	8.6	4.6	8.1	5.2
Core Trust Fund Benchmark	7.9	7.9	4.4	7.7	4.9
Variable Trust Fund	10.6	10.6	5.5	12.1	5.5
Variable Trust Fund Benchmark	10.4	10.4	5.4	11.8	5.3
Public Equities[1]	9.5	9.5	3.7	10.5	4.5
Public Equity Benchmark	9.2	9.2	3.8	10.3	4.3
Public Fixed Income[1]	4.4	4.4	2.6	2.5	4.9
Public Fixed Income Benchmark	3.9	3.9	2.5	2.0	4.4
Inflation Sensitive	6.4	6.4	0.5	-0.1	4.3
Inflation Sensitive Benchmark	6.3	6.3	0.5	-0.2	3.8
Real Estate Equity	10.8	10.8	13.6	14.6	5.7
Real Estate Benchmark	10.1	10.1	12.5	12.4	8.0
Private Equity [2]	10.3	10.3	12.0	13.4	9.8
Private Equity Benchmark	7.5	7.5	9.7	11.6	8.2
Multi-Asset Consolidation	5.9	5.9	3.8	5.9	5.3
Multi-Asset Benchmark	8.3	8.3	3.7	6.8	4.2
Alpha Pool Overlay[3]	2.7	2.7	3.8	5.6	4.8
Alpha Pool Overlay Benchmark	1.0	1.0	2.4	5.0	3.9
State Investment Fund (SIF) [2]	0.4	0.4	0.2	0.2	0.9
SIF Benchmark	0.3	0.3	0.2	0.1	0.7
State Life Insurance Fund	5.8	5.8	5.7	3.6	6.3
State Life Insurance Benchmark	4.6	4.6	5.1	3.2	5.8
Local Government Property Insurance Fund[4]	0.6	0.6	0.3	0.2	1.1
Local Government Property Insurance Benchmark	0.3	0.3	0.2	0.1	0.8
Historical Society Endowment Fund	10.4	10.4	7.2	11.6	6.7
Historical Society Endowment Benchmark	10.3	10.3	7.1	11.5	6.6
Injured Patients & Families Compensation Fund	5.5	5.5	4.3	4.6	5.2
Injured Patients & Families Compensation Benchmark	4.3	4.3	3.7	3.9	4.8
Edvest Fund	1.0	1.0	1.3	1.4	3.5
Edvest Benchmark	0.8	0.8	0.8	0.7	2.7

1 Includes exposure mgmt, alpha overlay, synthetic accounts and policy overlay accounts on an unlevered basis.
2 Private Equity and SIF returns are net of fees.
3 Alpha Pool Overlay Inception Date 1/31/11.
4 Fund will not match the SIF return due to methodology and timing differences of monthly accrual calculation.

Summary of Returns (%)
December 31, 2016

Economic and Market Indicators (% change, annualized) [3]	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
GDP (current dollars)	3.3	3.3	3.4	3.5	3.0
GDP Deflator	1.4	1.4	1.3	1.5	1.6
CPI	2.2	2.2	1.2	1.4	1.8
National Wage Rate Growth	3.0	3.0	3.0	2.9	2.4
S&P 500	12.0	12.0	8.9	14.7	6.9
Russell 1000	12.1	12.1	8.6	14.7	7.1
Russell 2000	21.3	21.3	6.7	14.5	7.1
Russell 3000	12.7	12.7	8.4	14.7	7.1
MSCI ACWI Gross	8.5	8.5	3.7	10.0	4.1
MSCI World ex US Equities	2.7	2.7	-1.6	6.1	0.9
MSCI World ex US Equities (Local Currency)	6.4	6.4	5.6	11.4	2.3
MSCI Emerging Markets	11.2	11.2	-2.6	1.3	1.8
Bloomberg Barclays Capital Govt/Credit	3.0	3.0	3.0	2.3	4.4
Citigroup World Govt Bonds	1.6	1.6	-0.8	-1.0	3.0
Citigroup World Gov't Bonds (Local Currency)	3.0	3.0	4.2	3.4	4.0

3 The most recent percent changes in economic indicators are estimated from the latest reported annual rates of change.

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Public Equities [1]	**12/31/92**	**52,785**	**9.5**	**9.5**	**3.7**	**10.5**	**4.5**
Benchmark: Aggregated Equities Benchmark			9.2	9.2	3.8	10.3	4.3

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Public Equities Excluding Exposure Mgmt Accounts	**52,785**	**9.5**	**9.5**	**3.7**	**10.6**	**4.5**
Benchmark: Aggregated Equities Benchmark		9.2	9.2	3.8	10.3	4.3

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Total Global Equities	**12/31/09**	**13,161**	**8.3**	**8.3**	**3.1**	**10.5**	**8.3**
Benchmark: MSCI World Custom Net			8.1	8.1	4.3	11.0	8.7

Active Portfolios:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Global Sector Portfolios	**12/31/01**	**11,355**	**8.4**	**8.4**	**3.1**	**10.4**	**4.9**
Benchmark: MSCI World Custom Net since 1/1/10			8.1	8.1	4.3	11.0	4.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Consumer Discretionary Sector	12/31/07	1,418	3.1	3.1	0.8	13.1	9.3
Benchmark: MSCI World Consumer Discretionary Custom Net since 1/1/10			3.6	3.6	4.6	14.8	8.9

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Consumer Staples Sector	12/31/09	1,148	6.3	6.3	3.1	9.6	10.6
Benchmark: MSCI World Consumer Staples Custom Net			2.2	2.2	5.7	10.4	10.7

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Global Energy Sector	2/28/13	835	28.7	28.7	-4.3	-0.4
Benchmark: MSCI World Energy Custom Net			27.4	27.4	-4.2	0.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Financial Sector	12/31/07	2,023	11.2	11.2	3.4	14.2	-0.7
Benchmark: MSCI World Financial Custom Net since 1/1/10			10.7	10.7	2.8	13.4	-1.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Global Healthcare Sector	12/31/01	1,367	-5.1	-5.1	5.6	12.9	8.2
Benchmark: MSCI World Healthcare Custom Net since 1/1/10			-6.4	-6.4	5.9	14.0	8.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Industrial Sector	12/31/07	1,266	13.6	13.6	2.3	11.0	4.5
Benchmark: MSCI World Industrial Custom Net since 1/1/10			13.5	13.5	4.1	11.8	4.2

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Information Technology Sector	12/31/07	1,694	9.4	9.4	10.0	13.9	7.2
Benchmark: MSCI World Info Tech Custom Net since 1/1/10			12.0	12.0	11.2	15.1	8.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Material Sector	12/31/07	546	24.1	24.1	-2.2	3.2	-0.9
Benchmark: MSCI World Material Custom Net since 1/1/10			23.0	23.0	-0.1	2.9	-1.1

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Global Real Estate Sector	12/31/12	364	3.8	3.8	6.4	5.2
Benchmark: MSCI World Real Estate Custom Net			3.7	3.7	6.4	5.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Global Telecom Sector	2/28/13	353	3.9	3.9	1.9	8.3
Benchmark: MSCI World Telecom Custom Net			6.5	6.5	2.8	9.1

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Global Utilities Sector	2/28/13	342	7.9	7.9	4.0	5.7
Benchmark: MSCI World Utilities Custom Net			6.8	6.8	5.3	7.0

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
AB Global	11/30/16	393	1.6
Benchmark: MSCI World Custom Net			2.4

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
DE Shaw World	10/31/16	1,033	3.3
Benchmark: MSCI World Custom Net			4.0

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Two Sigma World	2/29/16	379	15.4
Benchmark: MSCI World Custom Net			15.7

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

		Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Domestic Equities		**21,756**	**13.6**	**13.6**	**8.6**	**15.1**	**7.3**
Benchmark: Russell 3000			12.7	12.7	8.4	14.7	7.1

Active Portfolio:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Small Cap Diversified	3/31/03	2,062	22.1	22.1	9.6	16.8	10.5
Benchmark: Russell 2000			21.3	21.3	6.7	14.5	7.1

Passive Portfolios:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Internal Russell 1000 Index	7/31/08	12,074	12.1	12.1	8.7	14.7	9.5
Benchmark: Russell 1000			12.1	12.1	8.6	14.7	9.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Internal Mid Cap Equities	7/31/15	521	20.7	20.7	9.1
Benchmark: S&P 400			20.7	20.7	9.1

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Policy Overlay Domestic Equities	9/30/16	2,750	4.4
Benchmark: Russell 3000			4.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Domestic Equity Liquidity	6/30/12	521	12.5	12.5	8.3	13.7
Benchmark: Russell 3000			12.7	12.7	8.4	14.1

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Synthetic Large Cap Equities	10/31/15	3,587	13.2	13.2	10.5
Benchmark: Russell 1000			12.1	12.1	8.9

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Synthetic Small Cap Equities	10/31/15	109	24.3	24.3	18.6
Benchmark: Russell 2000			21.3	21.3	16.1

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total International Equities	**17,868**	**5.5**	**5.5**	**-1.2**	**5.5**	**1.2**
Benchmark: MSCI ACWI ex US Custom Net since 1/1/10		4.8	4.8	-1.5	5.3	1.0

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
International Developed Equities	**12,627**	**3.0**	**3.0**	**-1.0**	**7.1**	**1.6**
Benchmark: MSCI World ex US Custom Net since 1/1/10		3.2	3.2	-1.2	6.4	1.1

Active Portfolios:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Pyramis	7/31/04	1,371	1.2	1.2	-1.2	8.1	3.1
Benchmark: MSCI World ex US Custom Net since 1/1/10			3.2	3.2	-1.2	6.4	1.1

Passive Portfolios:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Internal MSCI World ex US	4/30/11	10,406	3.3	3.3	-1.1	6.6	1.8
Benchmark: MSCI World ex US Custom Net			3.2	3.2	-1.2	6.4	1.7

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
MSCI World ex US Liquidity	6/30/12	128	3.7	3.7	-2.1	5.3
Benchmark: MSCI World ex US Custom Net			3.2	3.2	-1.2	6.5

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Synthetic MSCI World ex US	6/30/16	722	7.3
Benchmark: MSCI World ex US Custom Net			6.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Emerging Market Equities	**6/30/03**	**5,241**	**12.0**	**12.0**	**-1.8**	**1.9**	**2.3**
Benchmark: MSCI Emerging Markets Free Custom Net since 1/1/10			11.3	11.3	-2.5	1.3	1.8

Active Portfolios:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Acadian Emerging	3/31/05	825	15.3	15.3	-0.2	3.7	2.9
Benchmark: MSCI Emerging Markets Free Custom Net since 1/1/10			11.3	11.3	-2.5	1.3	1.8

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
LA Capital Emerging	10/31/13	1,019	12.1	12.1	-2.0	-3.0
Benchmark: MSCI Emerging Markets Free Custom Net			11.3	11.3	-2.5	-3.3

Passive Portfolio:

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
BTC Emerging Market Index Fund	2/28/05	3,398	11.1	11.1	-2.6	1.2	1.7
Benchmark: MSCI Emerging Markets Free Custom Net since 1/1/10			11.3	11.3	-2.5	1.3	1.8

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Public Fixed Income [1]	**12/31/92**	**25,749**	**4.4**	**4.4**	**2.6**	**2.5**	**4.9**
Benchmark: Aggregated Fixed Income Benchmark			3.9	3.9	2.5	2.0	4.4

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Public Fixed Income Excluding Exposure Mgmt Accounts	**25,264**	**4.3**	**4.3**	**2.6**	**2.5**	**4.9**
Benchmark: Aggregated Fixed Income Benchmark		3.9	3.9	2.5	2.0	4.4

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total US Public Investment Grade Fixed Income	**17,760**	**3.5**	**3.5**	**3.2**	**2.7**	**4.9**
Benchmark: Bloomberg Barclays Capital Govt/Credit		3.0	3.0	3.0	2.3	4.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Government Credit	12/31/88	4,795	4.1	4.1	3.5	2.8	5.1
Benchmark: Bloomberg Barclays Capital Govt/Credit			3.0	3.0	3.0	2.3	4.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Dodge and Cox	10/31/09	1,270	5.9	5.9	4.2	4.6	5.4
Benchmark: Bloomberg Barclays Capital Govt/Credit			3.0	3.0	3.0	2.3	3.6

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
BTC Barclays Index Fund	9/30/96	5,240	5.3	5.3	3.9	2.9	5.0
Benchmark: Bloomberg Barclays Capital Custom Index			5.1	5.1	3.8	2.9	4.9

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Policy Overlay Treasuries	9/30/16	3,232	-4.0
Benchmark: Bloomberg Barclays Capital Treasury Bond Index			-3.8

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Synthetic Treasuries	10/31/15	1,766	1.0	1.0	0.0
Benchmark: Bloomberg Barclays Capital Treasury Bond Index			1.0	1.0	0.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Fixed Income Liquidity	6/30/12	1,457	0.2	0.2	2.0	0.9
Benchmark: Bloomberg Barclays Capital Treasury Bond Index			1.0	1.0	2.3	1.0

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total High Yield Fixed Income	**1/31/01**	**1,437**	**16.2**	**16.2**	**5.7**	**7.9**	**7.6**
Benchmark: BofA Merrill Lynch US High Yield since 1/1/15			17.5	17.5	4.7	7.3	6.9

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Loomis Sayles US High Yield	12/31/03	1,191	16.5	16.5	6.2	9.1	8.2
Benchmark: BofA Merrill Lynch US High Yield since 1/1/15			17.5	17.5	4.7	7.3	6.9

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Stone Harbor Global High Yield	4/30/16	246	7.9
Benchmark: BofA Merrill Lynch US High Yield			9.4

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Global Developed Fixed Income	**4,711**	**1.7**	**1.7**	**-0.7**	**-0.4**	**3.5**
Benchmark: Citigroup WGBI Unhedged (Net Tax)		1.6	1.6	-0.8	-1.0	3.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Internal Global	12/31/96	4,711	1.8	1.8	-0.7	-0.6	3.5
Benchmark: Citigroup WGBI Unhedged (Net Tax)			1.6	1.6	-0.8	-1.0	3.0

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Emerging Markets Fixed Income	**1,345**	**11.5**	**11.5**	**5.8**	**5.8**	**6.4**
Benchmark: JPM EMBI Global Diversified		10.2	10.2	6.2	5.9	6.9

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Wellington EM Debt	2/28/11	583	10.4	10.4	6.0	6.0	6.6
Benchmark: JPM EMBI Global Diversified			10.2	10.2	6.2	5.9	6.4

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Prudential EM Debt	4/30/16	763	5.3
Benchmark: JPM EMBI Global Diversified			3.0

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Inflation Sensitive	**12/31/03**	**10,558**	**6.4**	**6.4**	**0.5**	**-0.1**	**4.3**
Benchmark: Aggregated Inflation Sensitive Benchmark			6.3	6.3	0.5	-0.2	3.8

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total TIPS	**12/31/03**	**8,651**	**4.8**	**4.8**	**2.3**	**1.0**	**4.9**
Benchmark: Bloomberg Barclays Capital TIPS Index			4.7	4.7	2.3	0.9	4.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Internal TIPS Index	12/31/03	6,179	4.8	4.8	2.3	1.0	4.5
Benchmark: Bloomberg Barclays Capital TIPS Index			4.7	4.7	2.3	0.9	4.4

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Parametric Inflation Protected	4/30/12	2,473	4.7	4.7	2.2	0.4
Benchmark: Bloomberg Barclays Capital TIPS Index			4.7	4.7	2.3	0.3

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Parametric Commodities	**9/30/14**	**1,907**	**13.1**	**13.1**	**-12.3**
Benchmark: Dow Jones Commodity Index			13.3	13.3	-12.3

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
State Investment Fund [2]	**6/30/75**	**11,067**	**0.4**	**0.4**	**0.2**	**0.2**	**0.9**
Benchmark: 80% T-Bill (90-day) + 20% CD (30-day) since 1/1/12			0.3	0.3	0.2	0.1	0.7

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Short Term Credit [2]	**8/31/13**	**494**	**1.0**	**1.0**	**0.5**	**0.5**
Benchmark: 3 Month USD LIBOR			0.7	0.7	0.4	0.4

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Real Estate Equity [4]	**6,357**	**10.8**	**10.8**	**13.6**	**14.6**	**5.7**
Benchmark: 100% ODCE since 1/1/13 [5]		10.1	10.1	12.5	12.4	8.0

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Private Equity Investments	**6,332**	**10.3**	**10.3**	**12.0**	**13.4**	**9.8**
Benchmark: Aggregated Private Equity Benchmark		7.5	7.5	9.7	11.6	8.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Private Equity	3/31/04	5,163	11.4	11.4	12.4	13.8	9.6
Benchmark: Burgiss Global Buyout/Other Since 4/1/16			9.1	9.1	10.1	12.0	7.9

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Private Equity Co-Investments	6/30/14	207	6.8	6.8	9.5
Benchmark: Burgiss Buyout Weighted by Vintage Year since 1/1/16			5.9	5.9	3.6

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Total Venture Capital	6/30/00	892	2.7	2.7	18.8	12.4	9.8
Benchmark: Burgiss Ven Cap Wtd by Vintage Year since 1/1/16			-0.3	-0.3	11.7	10.7	7.7

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Wisconsin Venture Capital	6/30/00	280	7.7	7.7	20.7	13.5	10.3
Benchmark: Burgiss Ven Cap Wtd by Vintage Year since 1/1/16			-1.0	-1.0	11.4	10.5	7.6

	Inception Date	Market Value ($mil.)	ITD Thru 12/31/16
Non-Wisconsin Venture Capital	3/31/16	613	2.9
Benchmark: Burgiss Ven Cap Wtd by Vintage Year			0.1

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Private Equity Legacy	12/31/01	69	0.7	0.7	-3.1	3.3	5.6
Benchmark: Burgiss Weighted by Vintage Year since 1/1/16			6.3	6.3	8.9	10.2	8.3

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Current Return [2]	**12/31/07**	**692**	**8.7**	**8.7**	**7.4**	**9.5**	**7.6**
Benchmark: Absolute 7.9% Net of Fees since 1/1/12			7.9	7.9	7.9	7.9	8.2

NOTE: Early stage real estate and private equity is expected to earn below benchmark returns until a longer, typically five-year period has passed.

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Private Debt	**482**	**7.2**	**7.2**	**6.3**	**6.4**	**7.8**
Benchmark: Aggregated Duration Adjusted BAA Corporate + 20bps		7.0	7.0	4.1	4.5	6.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Wisconsin Private Debt	6/30/77	406	7.3	7.3	6.4	6.5	7.8
Benchmark: Duration Adjusted BAA Corporate + 20bps			6.7	6.7	4.1	4.5	6.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	ITD Thru 12/31/16
Non-Wisconsin Private Debt	4/30/15	77	6.7	6.7	2.4
Benchmark: Duration Adjusted BAA Corporate + 20bps			8.2	8.2	3.0

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Multi-Asset Consolidation	**3/31/03**	**709**	**5.9**	**5.9**	**3.8**	**5.9**	**5.3**
Benchmark: Aggregated Multi-Asset Benchmark			8.3	8.3	3.7	6.8	4.2

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Global Securities	**9/30/11**	**709**	**6.6**	**6.6**	**2.2**	**6.9**	**7.0**
Benchmark: Global Securities Custom Benchmark since 1/1/16			6.3	6.3	3.0	7.2	8.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Alpha Pool	**1/31/11**	**4,751**	**2.7**	**2.7**	**3.8**	**5.6**	**4.8**
Benchmark: 3 Month LIBOR + 30bps since 4/1/15			1.0	1.0	2.4	5.0	3.9

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	ITD Thru 12/31/16
Hedge Funds[2]	1/31/11	4,464	0.3	0.3	1.5	3.0	2.3
Benchmark: 3 Month LIBOR + 30bps since 4/1/15			1.0	1.0	1.2	3.3	2.0

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Tactical Alpha	3/31/12	286	3.3	3.3	2.5	5.7
Benchmark: 3 Month LIBOR + 30bps since 4/1/15			1.0	1.0	1.5	1.6

Division and Portfolio Annualized Returns with Benchmarks (%)
December 31, 2016

	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Core Trust Fund	**8.6**	**8.6**	**4.6**	**8.1**	**5.2**
Core Trust Fund ex Currency Overlays	8.7	8.7	4.6	8.1	5.2

	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Core Trust Fund	**8.6**	**8.6**	**4.6**	**8.1**	**5.2**
Core Trust Fund ex Options Overlays	8.6	8.6	4.6	8.1	5.2

	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Variable Trust Fund	**10.6**	**10.6**	**5.5**	**12.1**	**5.5**
Variable Trust Fund ex Currency Overlays	10.6	10.6	5.4	12.1	5.5

	Inception Date	Market Value ($mil.)	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	ITD Thru 12/31/16
Parametric Policy Overlay	**4/30/12**	**1,309**	**30.6**	**30.6**	**1.4**	**1.8**
Benchmark: Aggregated Parametric Policy Benchmark			30.3	30.3	1.2	1.2

General Notes to Performance Pages

Aggregated totals include all current and historical portfolios that have contributed to the aggregate over time.

Returns are reported gross of management fees with the exception of Private Equity, SIF, Short Term Credit, Current Return, and Hedge Funds, which are reported net of fees.

The portfolio inception date is the date by which a core investment of assets can be accomplished following initial funding, generally by the beginning of the first full month for public market portfolios, and by the beginning of the third full month for private market portfolios.

1 Includes exposure mgmt, alpha overlay, synthetic accounts and policy overlay accounts on an unlevered basis.
2 Private Equity, SIF, Short Term Credit, Current Return, and Hedge Fund returns are net of fees.
3 The most recent percent changes in economic indicators are estimated from the latest reported annual rates of change.
4 Real Estate benchmark returns are aligned with SWIB Real Estate returns for best reporting period comparability.
Real Estate and benchmark returns are net of fees through 6/99; gross thereafter.
5 ODCE - Open End Diversified Core Equity. Off-quarter benchmark returns are estimated.

EQUITIES

Global Large Cap Equities: *External Managers, AB Global, DE Shaw World, Two Sigma World*

Created:	June 30, 2010
Description:	These portfolios focus on global large-cap companies with market capitalization over approximately $5 billion.
Benchmark:	MSCI World Custom Net

Global Sector Equities: *Internal Managing Analysts, Dean Martin-Consumer Discretionary, Tom Freeman-Consumer Staples, Kirk Fox-Energy, Bob Beggs-Financials, Joe Woerner-Healthcare, Cecilia Carlsson-Industrials, Michael Harmelink-Materials, Diane Linn- Real Estate, Gaurav Kapoor-Technology, Todd Smith-Telecom, Kishor Agrawal-Utilities*

Created:	December 31, 2001
Description:	The Sector portfolios focus on their respective GICS sector stocks across the large cap market capitalization spectrum.
Benchmark:	MSCI World Custom Net respective GICS Sector

Small Cap Equities: *Internal Managing Analysts, Ian Calame and Joy Mukherjee*

Created:	December 31, 1982
Description:	This portfolio invests in a broadly diversified set of small-cap companies with market capitalization less than approximately $1.5 billion, similar to those found in the Russell 2000.
Benchmark:	Russell 2000

Passive Equities: *Internal Managers, Scott Anderson, Diane Linn*

Created:	April 30, 2005
Description:	These portfolios are passive index strategies that are designed to replicate their respective benchmarks with very little expected tracking error.
Benchmark:	Russell 1000 Index and Synthetic Large Cap: Russell 1000; Mid Cap: S&P 400; Domestic Equity Liquidity and Policy Overlay Domestic Equities: Russell 3000; Synthetic Small Cap: Russell 2000

International Equities: *External Manager, Pyramis*

Created:	September 30, 1989
Description:	This portfolio invests in non-U.S. equity instruments. This portfolio may or may not be hedged through the use of derivative instruments. Investments in emerging market countries are permitted subject to specified limits.
Benchmark:	MSCI World ex U.S. Custom Net

Passive International Equities: *Internal Managers, Scott Anderson, Diane Linn*

Created:	November 30, 1996
Description:	These portfolios invest in non-U.S. equity instruments and have passive index strategies that are designed to replicate their respective benchmarks with very little expected tracking error.
Benchmark:	MSCI World ex U.S.* Custom Net

Emerging Market Equities: *External Managers, Acadian, LA Capital*

Created: June 30, 2003
Description: The investments of these portfolios are limited to developing countries, as viewed by manager.
Benchmark: MSCI Emerging Markets Free* Custom Net

Passive Emerging Market Equities: *External Manager, BlackRock (BTC)*

Created: February 28, 2005
Description: The investments in this portfolio are limited to developing countries, as viewed by manager. It has a passive index strategy that is designed to replicate its benchmark with very little tracking error.
Benchmark: MSCI Emerging Markets Free* Custom Net

* MSCI: Morgan Stanley Capital International

FIXED INCOME

Domestic Fixed Income: *Internal Manager, Todd Ludgate*
External Manager, Dodge and Cox

Created: December 31, 1988
Description: These portfolios consist of dollar denominated primarily investment grade bonds purchased in public markets. These portfolios are broadly diversified across sectors including government, agency, corporate, and Yankee.
Benchmark: Bloomberg Barclays Capital Government/Credit Index

Passive Domestic Fixed Income: *Internal Manager, Scott Anderson*
External Manager, BlackRock (BTC)

Created: September 30, 1996
Description: These portfolios invest in investment grade U.S. fixed income instruments and have a passive index strategy that is designed to replicate its benchmark with very little tracking error.
Benchmark: BTC Barclays Index Fund: Bloomberg Barclays Capital Custom Index; Fixed Income Liquidity, Synthetic Treasuries, and Policy Overlay Treasuries: Bloomberg Barclays Capital Treasury Bond Index

High Yield Fixed Income: *External Managers, Loomis Sayles, Stone Harbor*

Created: January 31, 2001
Description: These portfolios invest in below investment grade U.S. and Canada fixed income instruments.
Benchmark: BofA Merrill Lynch US High Yield Index

Global Bonds: *Internal Manager, Chirag Gandhi*

Created: September 30, 1989; modified effective June 30, 1999
Description: This actively managed portfolio invests in Corporate, Sovereign, Agency or Supra-National Bond in the US and foreign countries.
Benchmark: Citigroup World Government Bond Unhedged Index (Net-of-Taxes)

Emerging Market Fixed Income: *External Managers, Wellington, Prudential*

Created: December 31, 1994
Description: These portfolios invest in public and private fixed income securities in developing markets as defined by the World Bank.
Benchmark: JP Morgan Emerging Market Bond Index Global Diversified

INFLATION SENSITIVE

Passive TIPS: *Internal Manager, Andrea Ruiz*
External Manager, Parametric

Created:	December 31, 2003
Description:	These portfolios invest in dollar denominated treasury inflation-indexed securities.
Benchmark:	Bloomberg Barclays Capital TIPS Index

Passive Commodities: *External Manager, Parametric*

Created:	September 30, 2014
Description:	This portfolio replicates the Dow Jones Commodity Index by investing in commodity futures.
Benchmark:	Dow Jones Commodity Index

LIQUID ASSETS

State Investment Fund: *Internal Manager, Andrea Ruiz*

Created:	June 30, 1975
Description:	The State Investment Fund invests the primary reserves of the State, agencies, pension funds, municipalities and others in a commingled fund to maximize safety, liquidity and rate of return. The investments include direct obligations of the United States and Canada, securities guaranteed by the United States, certificates of deposits issued by banks in the United States and any other investment approved by the Board of Trustees.
Benchmark:	80% T-Bill (90-day) / 20% Certificate of Deposit (30-day)

Short Term Credit: *Internal Manager, Andrea Ruiz*

Created:	August 31, 2013
Description:	The Short Term Credit portfolio is an investment vehicle of cash and short-term investments designed to achieve a return equal to USD three month LIBOR.
Benchmark:	3 Month USD LIBOR

REAL ESTATE

Real Estate Equity: *Internal Manager, Steve Spiekerman*

Created:	June 30, 1977
Description:	The Real Estate Equity portfolio consists of commercial real estate investments either with SWIB as a sole direct owner or in joint ventures, partnerships, and pooled investments.
Benchmark:	100% NFI-ODCE*

*NFI-ODCE: NCREIF Fund Index - Open End Diversified Core Equity

PRIVATE EQUITY

Private Equity: *Internal Manager, Scott Parrish*

Created:	March 31, 2004
Description:	The Private Equity portfolio invests in and with selected leveraged buy-out (LBO) and venture capital partnerships. The portfolio is well diversified across many different partnerships with different stages of development focuses. These investments are subject to higher risks of failure, but offer the prospect of higher returns.
Benchmark:	Burgiss Global Buyout/Other

Private Equity Co-Investments: *Internal Manager, Scott Parrish*

Created:	June 30, 2014
Description:	The Private Equity Co-Investment portfolio is the vehicle for SWIB to invest directly in portfolio companies alongside General Partners.
Benchmark:	Burgiss Buyout Weighted by Vintage Year

Wisconsin Venture Capital: *Internal Manager, Chris Prestigiacomo*

Created:	June 30, 2000
Description:	This portfolio is dedicated to investments in venture capital partnerships, with a concentration in firms sited primarily in Wisconsin. These investments are subject to higher risks but offer the prospect of higher returns. Each partnership commitment must meet the same due diligence as other SWIB investments.
Benchmark:	Burgiss Venture Capital Weighted by Vintage Year

Non-Wisconsin Venture Capital: *Internal Manager, Chris Prestigiacomo*

Created:	April 30, 2016
Description:	This portfolio is dedicated to investments in venture capital partnerships, with a concentration in firms sited primarily outside the Midwest. These investments are subject to higher risks but offer the prospect of higher returns. Each partnership commitment must meet the same due diligence as other SWIB investments.
Benchmark:	Burgiss Venture Capital Weighted by Vintage Year

Private Equity Legacy: *Internal Manager, Scott Parrish*

Created:	June 30, 1995; modified effective March 31, 2004
Description:	Originally Private Equity Transition, the Private Equity Legacy portfolio consists of investments in public and private, and domestic and international markets, with a concentration in private equity. The portfolio is well diversified and has significant exposure to international private equity markets.
Benchmark:	Burgiss Weighted by Vintage Year

Current Return: *Internal Manager, Scott Parrish*

Created:	December 31, 2007
Description:	The Current Return portfolio focuses on private market investments that offer a current return, and a majority of investments contain growth and appreciation characteristics to protect against unanticipated inflation.
Benchmark:	Absolute 7.9% Net of Fees

Wisconsin Private Debt: *Internal Manager, Chris Prestigiacomo*

Created:	Separated from National Private Placements effective December 31, 2001
Description:	This portfolio consists of loans or fixed income securities issued by companies or entities that are headquartered in the State of Wisconsin.
Benchmark:	Duration-Adjusted BAA Corporate Bond Index + 20 basis points

Non-Wisconsin Private Debt: *Internal Manager, Chris Prestigiacomo*

Created:	April 30, 2015
Description:	This portfolio consists of loans or fixed income securities issued by companies or entities that are headquartered in Illinois, Iowa, Minnesota, Michigan, Indiana, Ohio or Pennsylvania.
Benchmark:	Duration-Adjusted BAA Corporate Bond Index + 20 basis points

MULTI-ASSET

Global Securities: *Internal Manager, Nick Stanton*

Created:	September 30, 2011
Description:	The Global Securities portfolio is an actively managed, globally diversified portfolio that is constructed to achieve a high current yield with below policy index volatility. This portfolio invests in high dividend global equities, European investment grade bonds, and it sells domestic puts and calls.
Benchmark:	Global Securities Custom Benchmark

ALPHA POOL OVERLAY

Hedge Funds: *Internal Manager, Dominic Garcia*

Created:	January 31, 2011
Description:	A diversified portfolio of hedge fund strategies invested across multiple asset classes, which is intended to achieve a total rate of return of LIBOR + 3.5% over the long term with minimal correlation to equity markets.
Benchmark:	3 Month LIBOR + 30 basis points

Tactical Alpha: *Internal Manager, Nick Stanton*

Created:	March 31, 2012
Description:	This portfolio seeks to take advantage of unique opportunities due to market anomalies and the ability to cost-effectively capitalize on internally-generated high-conviction trade ideas within and across asset classes.
Benchmark:	3 Month LIBOR + 30 basis points

Performance and Attribution Update – Q4 2016

Board Meeting

February 8, 2017

STATE OF WISCONSIN
INVESTMENT BOARD

Q4 Summary

As of December 31, 2016

- Q4 performance was relatively flat for the Core Fund, while the Variable Fund had a quarterly return of +2.7%.

- The Core Trust Fund YTD excess return increased from +36 bps as of Q3 to +69 bps as of Q4 due to strong relative returns in October and November.

- With the exception of Multi-Asset & the Alpha Overlay (NOF), all other asset classes are ahead of their respective asset class benchmarks.

- Hedge Funds ended the year strong with five consecutive months of outperformance relative to the benchmark.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Summary of Returns (%)

As of December 31, 2016

SWIB Total Fund and Major Division Returns	Calendar YTD Thru 12/31/16	One Year Thru 12/31/16	Three Years Thru 12/31/16	Five Years Thru 12/31/16	Ten Years Thru 12/31/16
Core Trust Fund	8.6	8.6	4.6	8.1	5.2
Core Trust Fund Benchmark	7.9	7.9	4.4	7.7	4.9
Variable Trust Fund	10.6	10.6	5.5	12.1	5.5
Variable Trust Fund Benchmark	10.4	10.4	5.4	11.8	5.3
Public Equities [1]	9.5	9.5	3.7	10.5	4.5
Public Equity Benchmark	9.2	9.2	3.8	10.3	4.3
Public Fixed Income [1]	4.4	4.4	2.6	2.5	4.9
Public Fixed Income Benchmark	3.9	3.9	2.5	2.0	4.4
Inflation Sensitive	6.4	6.4	0.5	-0.1	4.3
Inflation Sensitive Benchmark	6.3	6.3	0.5	-0.2	3.8
Real Estate Equity	10.8	10.8	13.6	14.6	5.7
Real Estate Benchmark	10.1	10.1	12.5	12.4	8.0
Private Equity [2]	10.3	10.3	12.0	13.4	9.8
Private Equity Benchmark	7.5	7.5	9.7	11.6	8.2
Multi-Asset Consolidation	5.9	5.9	3.8	5.9	5.3
Multi-Asset Benchmark	8.3	8.3	3.7	6.8	4.2
Alpha Pool Overlay[3]	2.7	2.7	3.8	5.6	4.8
Alpha Pool Overlay Benchmark	1.0	1.0	2.4	5.0	3.9

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[1] Includes exposure mgmt, alpha overlay, synthetic accounts and policy overlay accounts on an unlevered basis.
[2] Private Equity and SIF returns are net of fees.
[3] Alpha Pool Overlay Inception Date is 1/31/11.

Core Trust Fund Relative Return Attribution – Gross of Fees

As of December 31, 2016

SWIB Total Fund Returns	YTD	One Year	Three Years	Five Years	Ten Years
Core Trust Fund	**8.64%**	**8.64%**	**4.59%**	**8.13%**	**5.16%**
Core Trust Fund Benchmark	**7.95%**	**7.95%**	**4.36%**	**7.67%**	**4.93%**
Portfolio Implementation	0.15%	0.15%	-0.03%	-0.02%	-0.06%
Public Equity Management	0.11%	0.11%	-0.04%	0.14%	0.08%
Public Fixed Management	0.12%	0.12%	0.04%	0.11%	0.14%
Inflation Protection Management	0.00%	0.00%	0.00%	0.00%	0.01%
Real Estate Management	0.05%	0.05%	0.07%	0.12%	-0.09%
Private Equity/Debt Mgmt	0.21%	0.21%	0.16%	0.12%	0.11%
Multi-Asset Management	-0.02%	-0.02%	0.03%	-0.03%	0.05%
Cash	-0.02%	-0.02%	0.00%	0.00%	0.00%
Overlays (alpha pool, currency)	0.09%	0.09%	0.00%	0.00%	0.00%
Total Excess Return	**0.69%**	**0.69%**	**0.23%**	**0.46%**	**0.23%**

Note: Performance attribution is not an exact science - small differences between attributes are not meaningful.

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Variable Trust Fund Relative Return Attribution – Gross of Fees

As of December 31, 2016

SWIB Total Fund Returns	YTD	One Year	Three Years	Five Years	Ten Years
Variable Trust Fund	**10.64**	**10.64**	**5.46**	**12.08**	**5.49**
Variable Trust Fund Benchmark	**10.39**	**10.39**	**5.42**	**11.84**	**5.33**
Portfolio Implementation	-0.04	-0.04	0.01	-0.03	0.00
Public Equity Management	0.29	0.29	0.02	0.27	0.16
Total Excess Return	**0.25**	**0.25**	**0.03**	**0.24**	**0.16**

Note: Performance attribution is not an exact science - small differences between attributes are not meaningful.

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SWIB

Quarterly Investment Update

Board Meeting

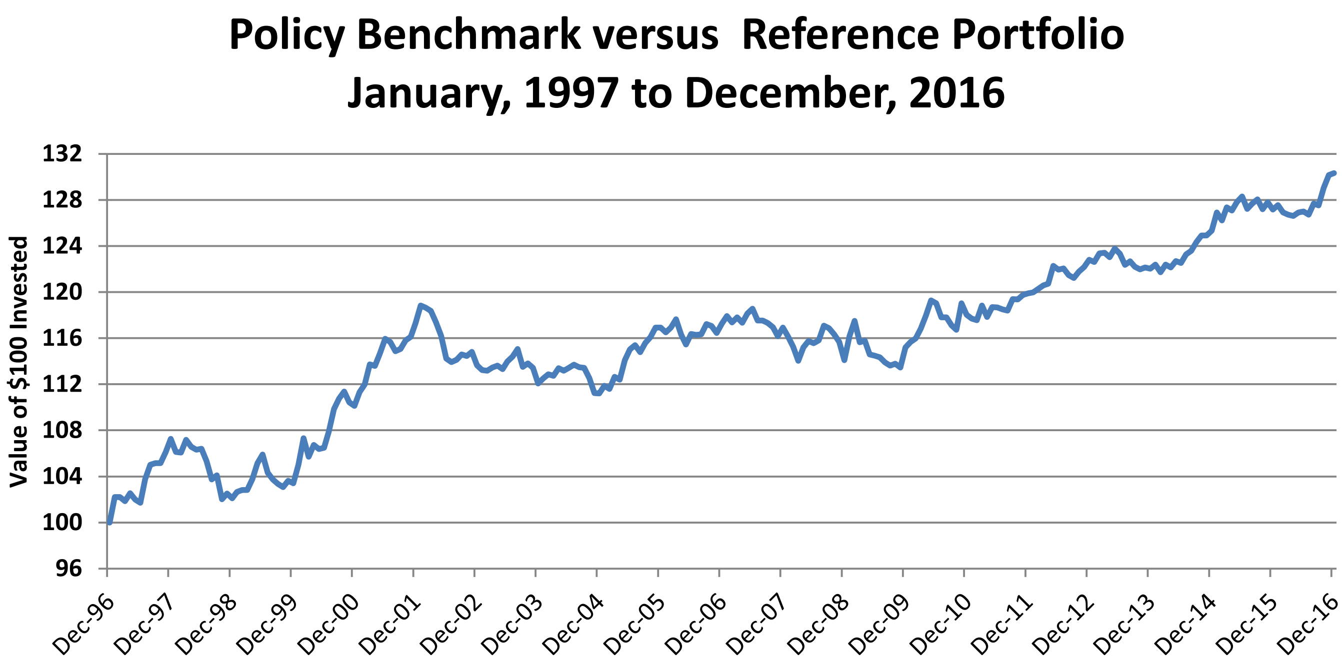
February 8, 2017

CIO Outlook

David Villa, CIO

Policy Portfolio Adds 30% with Less Risk

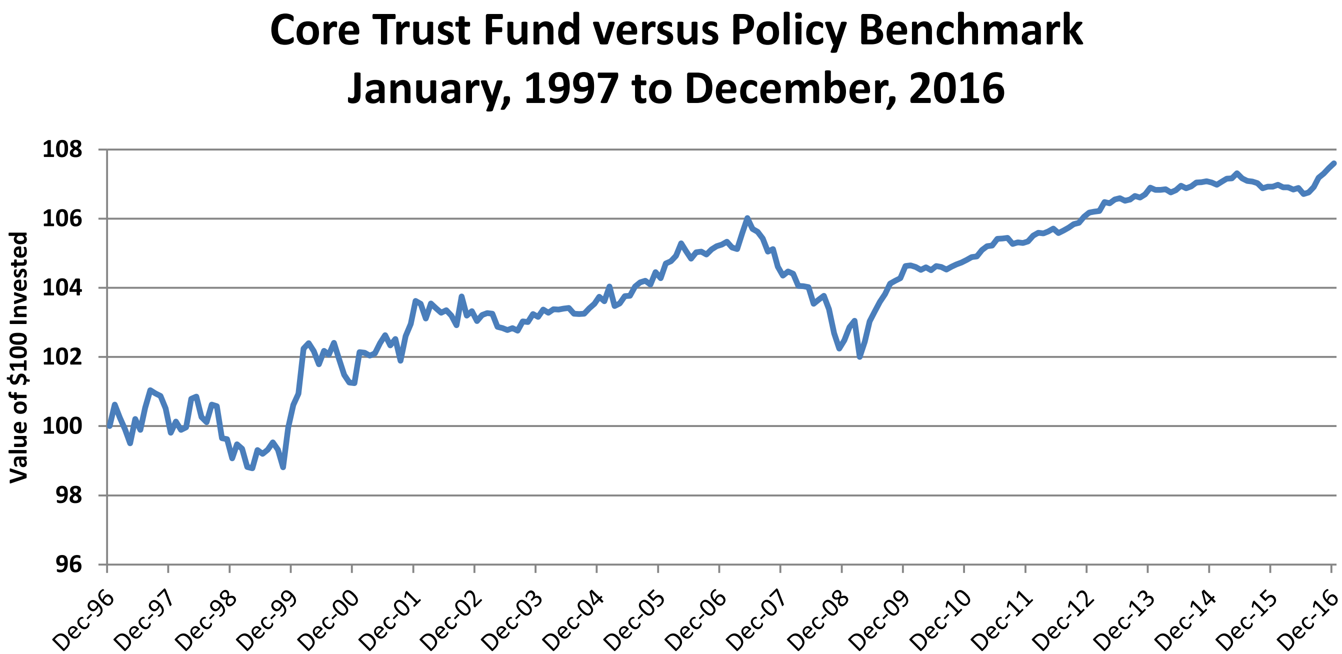
Over 20 years



Gross of Fees	1 Year	Five Years	10 Years	20 Years
Policy Benchmark	7.95%	7.67%	4.93%	6.79%
Reference Portfolio	5.33%	5.88%	3.83%	5.38%
Excess Return	2.62%	1.79%	1.10%	1.41%
Policy Risk	6.6%	6.3%	9.9%	9.4%
Reference Risk	7.6%	7.4%	10.9%	10.1%

CTF Adds 7.5% with Minimal Additional Risk

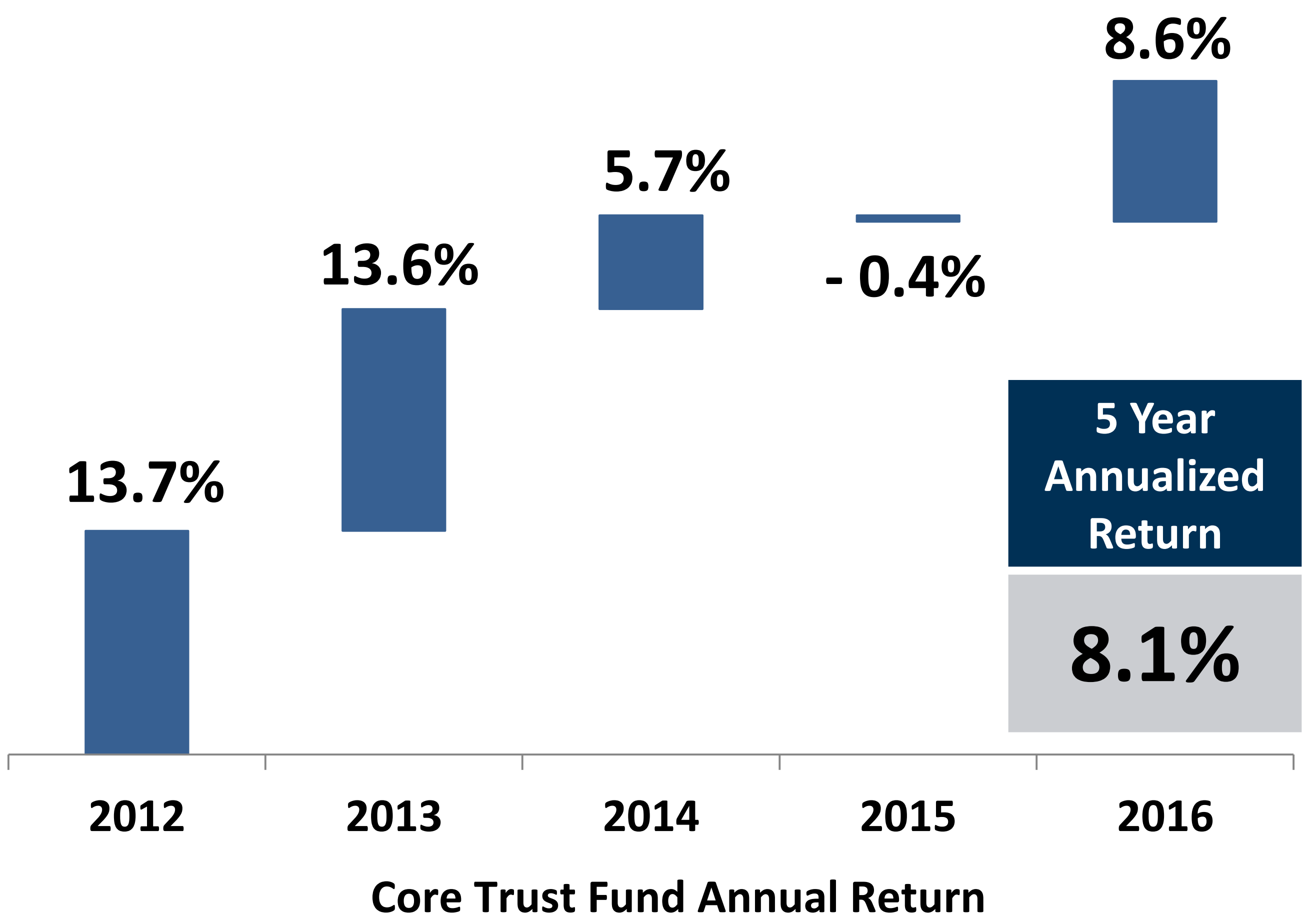
Over 20 years



Gross of Fees	1 Year	Five Years	10 Years	20 Years
Core Trust Fund	8.64%	8.13%	5.16%	7.18%
Policy Benchmark	7.95%	7.67%	4.93%	6.79%
Excess Return	0.68%	0.46%	0.23%	0.39%
Core Trust Fund Risk	6.6%	6.3%	10.2%	9.6%
Policy Risk	6.6%	6.3%	9.9%	9.4%

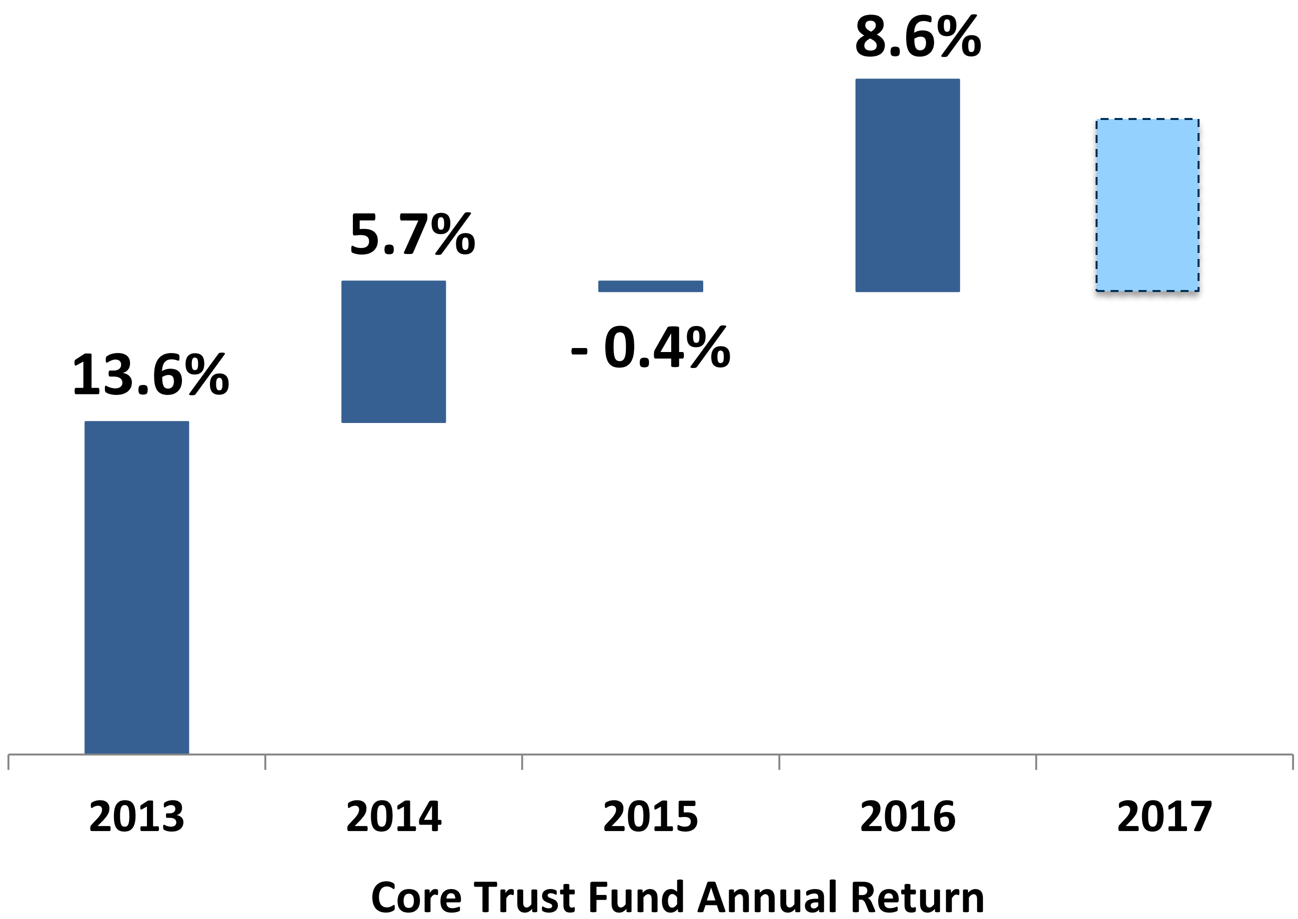
SWIB STATE OF WISCONSIN INVESTMENT BOARD

2016 CTF 5 Year Return Decomposed



Source: SWIB AASPE; 8.1% is the geometric average realized return over the past 5 years.

2017 CTF 5 Year Return - ?

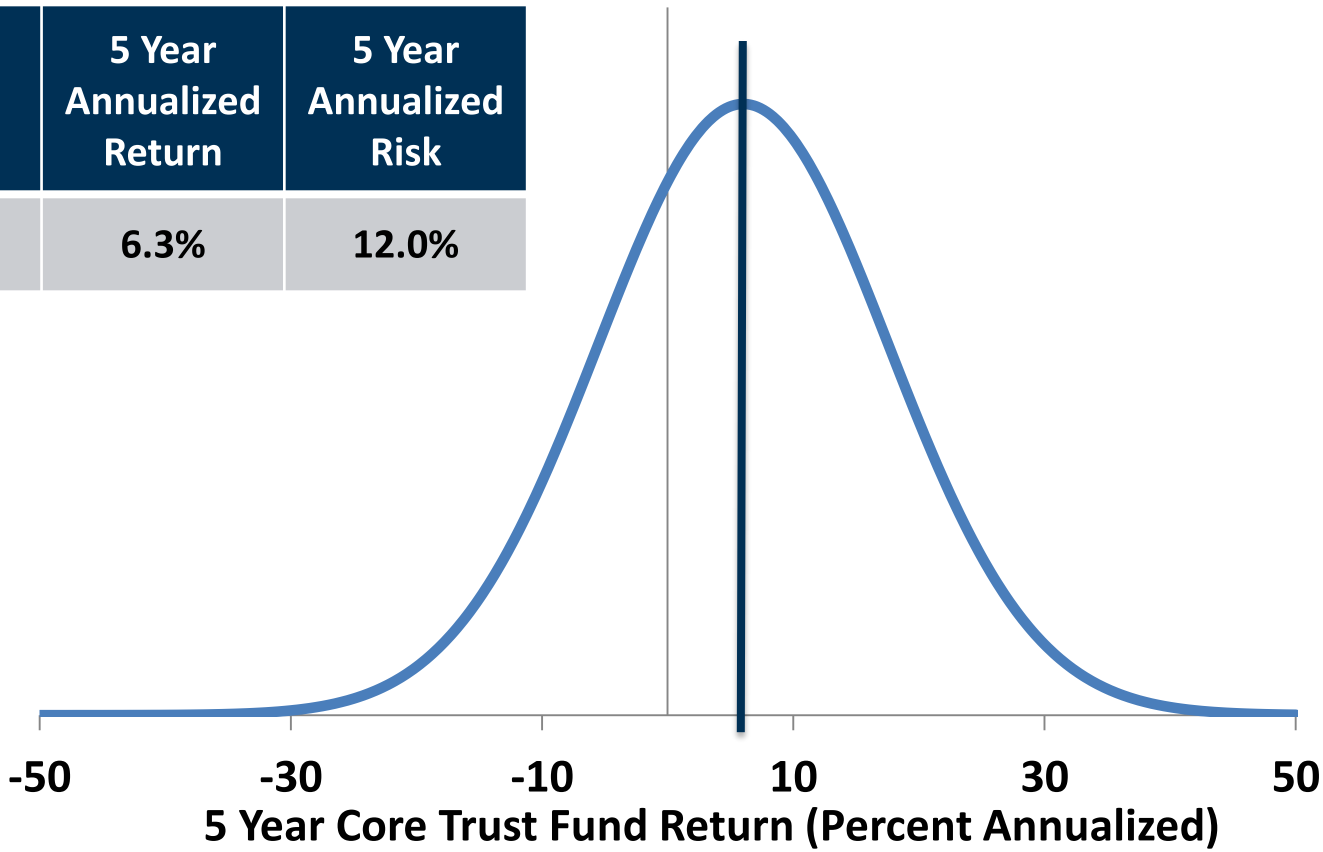


Source: SWIB AASPE, NEPC

2017 return is the 7% expected arithmetic return, based on NEPC 5-7 year forecasts.

Expectations in a "Normal" World

5 Year Horizon Ending	5 Year Annualized Return	5 Year Annualized Risk
Dec 2017	6.3%	12.0%



Source: NEPC 5-7 year forecasts

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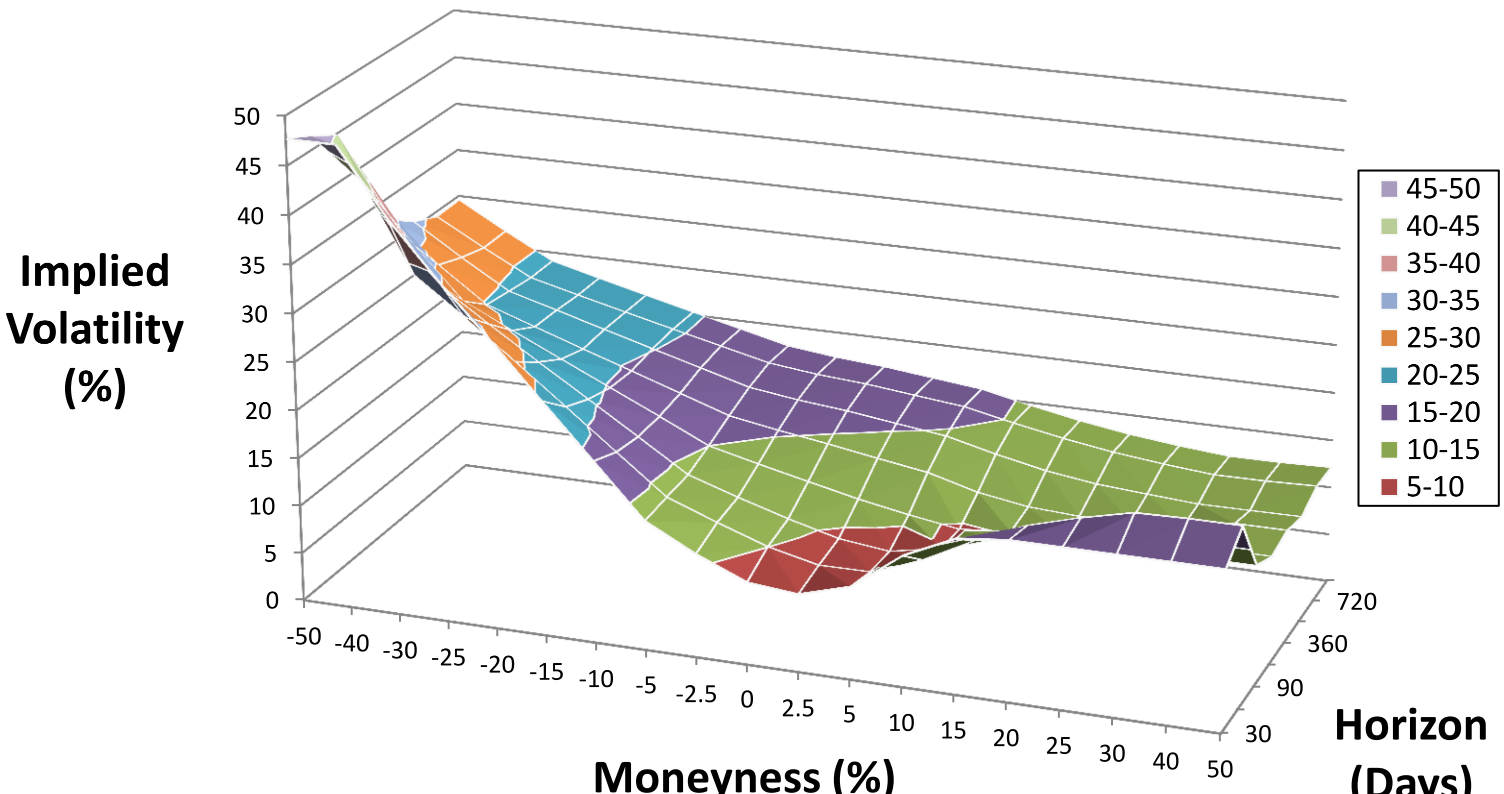
Today's Market

Expectations revealed

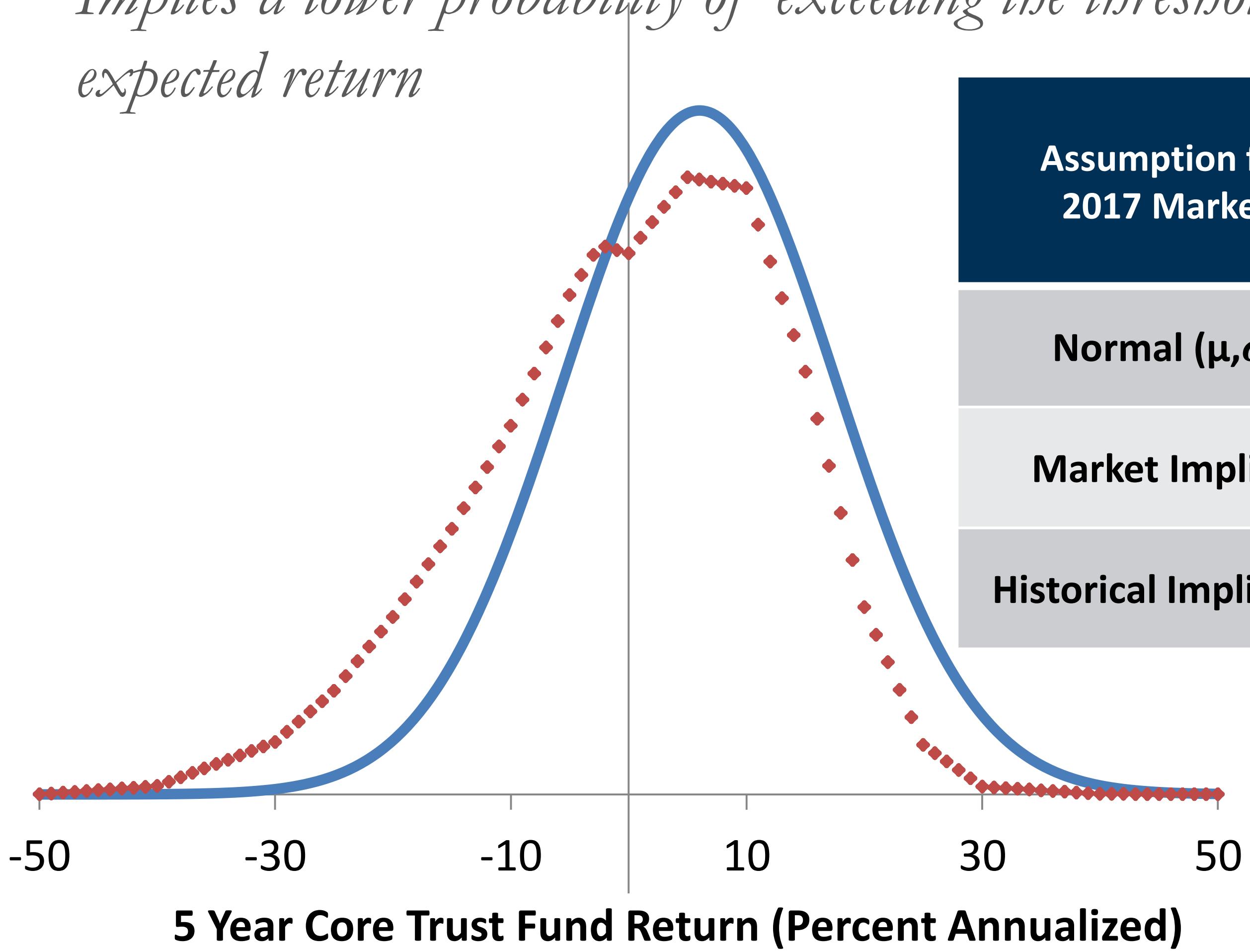
S&P Index Option Volatility Surface



Source: Bloomberg SPX Index, January 25, 2017

Today's Skew

Implies a lower probability of exceeding the threshold, and a lower expected return



Assumption for 2017 Market	Probability of 5 Year Return Exceeding Threshold*
Normal (μ,σ)	70%
Market Implied	49%
Historical Implied**	61%

*A 6.1% threshold return is assumed. This is an average of the 7.2% target for actives and 5.0% floor for retirees.

**Based on monthly sample of market implied probabilities for 60 most recent periods.

Source: Bloomberg, SWIB Volatility Model

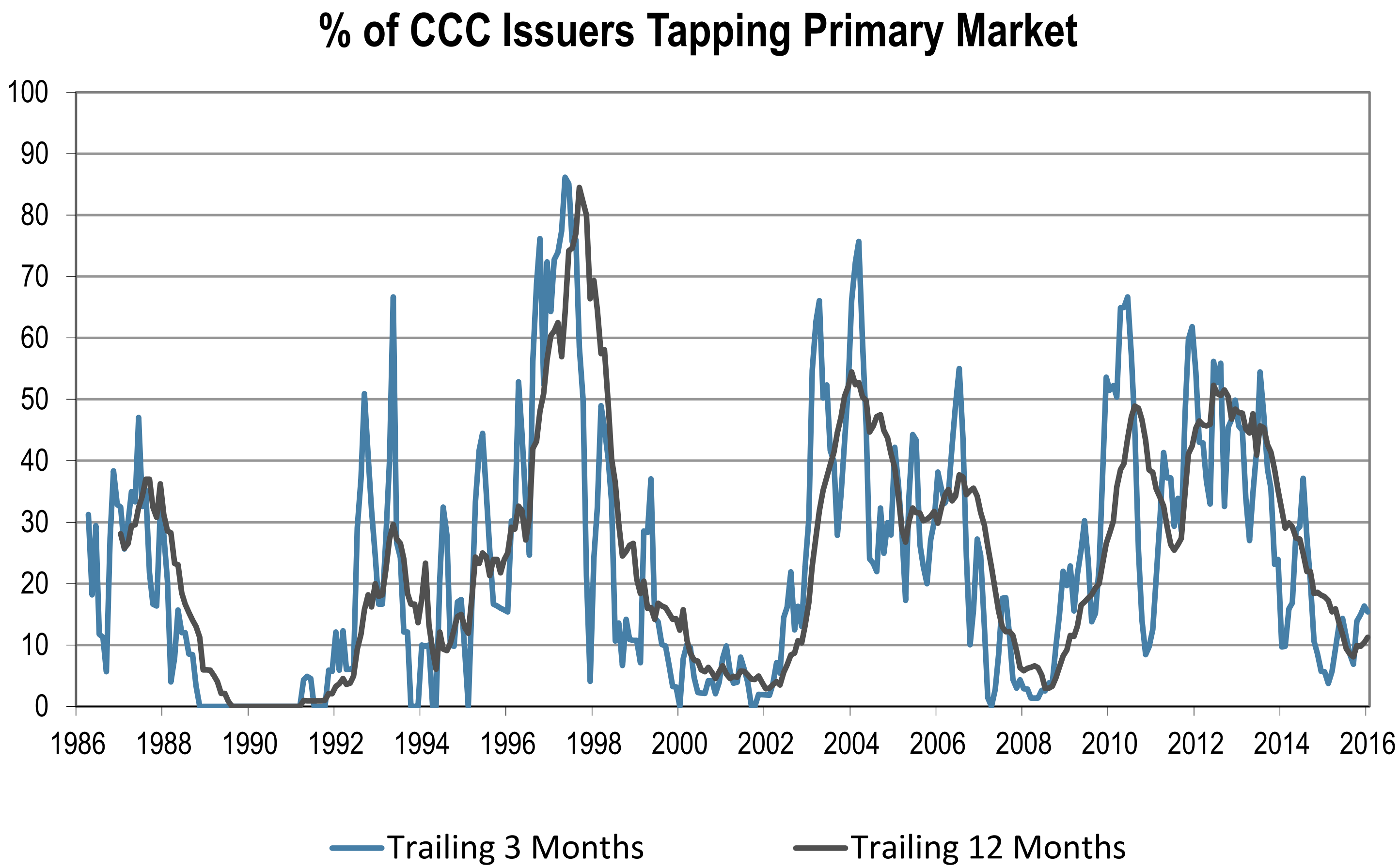
SWIB STATE OF WISCONSIN INVESTMENT BOARD

Market Outlook

STATE OF WISCONSIN INVESTMENT BOARD

CCC Issuance Appears to Have Bottomed

With recent uptick



Source: Bank of America Merrill Lynch, 1/6/17

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Leading Returns Through Q4

U.S. Small Cap Equity and High Yield Bonds

Summary of Returns (%)

December 31, 2016

Benchmark Indices (% change, annualized)	**YTD**	**1 Yr**	**5 Yr**	**10 Yr**	**10 Yr Volatility**
CTF Benchmark (GOF)	8.0%	8.0%	7.7%	4.9%	9.9%
S&P 500	12.0%	12.0%	14.7%	6.9%	15.3%
Russell 2000	21.3%	21.3%	14.5%	7.1%	20.1%
MSCI ACWI Gross	8.5%	8.5%	10.0%	4.1%	17.0%
MSCI ACWI Gross (Local)	9.7%	9.7%	12.5%	4.8%	14.6%
MSCI World ex US Equities	2.7%	2.7%	6.1%	0.9%	18.6%
MSCI World ex US Equities (Local)	6.4%	6.4%	11.4%	2.3%	14.6%
MSCI Emerging Markets	11.2%	11.2%	1.3%	1.8%	23.4%
Barclays Capital Govt/Credit	3.0%	3.0%	2.3%	4.4%	4.0%
BOFA ML High Yield	17.5%	17.5%	7.4%	7.4%	10.6%
Citigroup World Govt Bonds	1.6%	1.6%	-1.0%	3.0%	6.9%
Citigroup World Govt Bonds (Hedged)	3.8%	3.8%	3.6%	4.2%	3.1%

Source: Monthly Returns, Factset, SWIB

Credit, Equity Priced Higher Than Long Term Historical Averages, U.S. Treasury Yields Widened

Valuation Metric	Valuation Date	Current	1 Yr	5Yr	10 Yr	All Data	Earliest Data
10 Year Treasury Yield (%)	Jan-17	2.5	1.8	2.1	2.8	6.3	Jan-62
S&P 500 Forward P/E	Jan-17	17.7	17.8	16.0	15.2	16.6	Jan-90
MSCI xUS Forward P/E	Jan-17	15.4	15.6	14.5	13.9	13.9	Feb-05
Private Equity Multiple (EBITDA, Large)	Dec-16	9.8	10.3	9.8	9.5	8.6	Jan-94
Barclays Corp Investment Grade OAS (bps)	Jan-17	120	151	143	187	134	Jun-89
Barclays Corp High Yield OAS (bps)	Jan-17	380	559	499	608	521	Jan-94
US Inflation (%)	Jan-17	2.1	1.3	1.3	1.8	3.9	Jan-62
US Real GDP Growth (%)	Jan-17	1.7	1.6	2.1	1.3	3.1	Dec-61
US Volatility	Jan-17	14.0	15.3	16.0	20.9	19.7	Jan-90
Europe Volatility	Jan-17	18.1	22.8	21.9	25.1	24.9	Jan-99
UK Volatility	Jan-17	11.6	16.5	15.9	20.1	20.0	Jan-00
Japan Volatility	Jan-17	21.2	25.7	23.6	26.5	25.6	Jan-98

US 2016 GDP Growth Forecast: 1.6%
US 2016 CPI Forecast: 1.3%

Source: Factset, Bloomberg

Risk Contributors

Core Trust Fund

Contribution to Fund Volatility	Equilibrium Policy Risk	Target Tracking Error
Domestic Equities	4.8%	0.11%
Int'l Equities	5.0%	0.12%
Fixed Income	0.5%	0.06%
Inflation Sensitive	0.2%	0.00%
Real Estate	0.8%	0.21%
Private Equity/Debt	2.0%	0.15%
Multi-Asset & Cash	0.1%	0.03%
Alpha Pool Overlay	0.0%	0.12%
Active Risk Allocation Planned	0.0%	0.40%
Total Core Fund	**13.3%**	**1.2%**
Five Year Actual	**6.3%**	**0.32%**

Note: Market risk is the return variation around the expected long-term average return of 7.2%.

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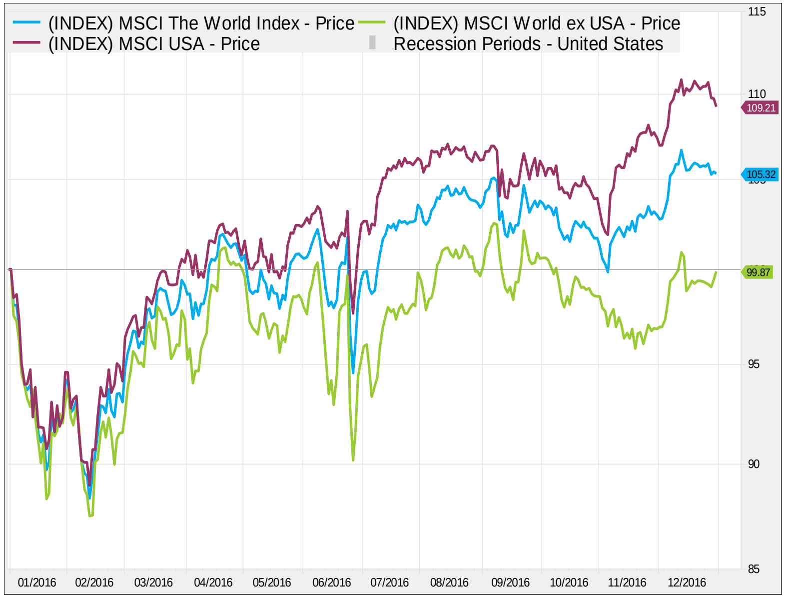
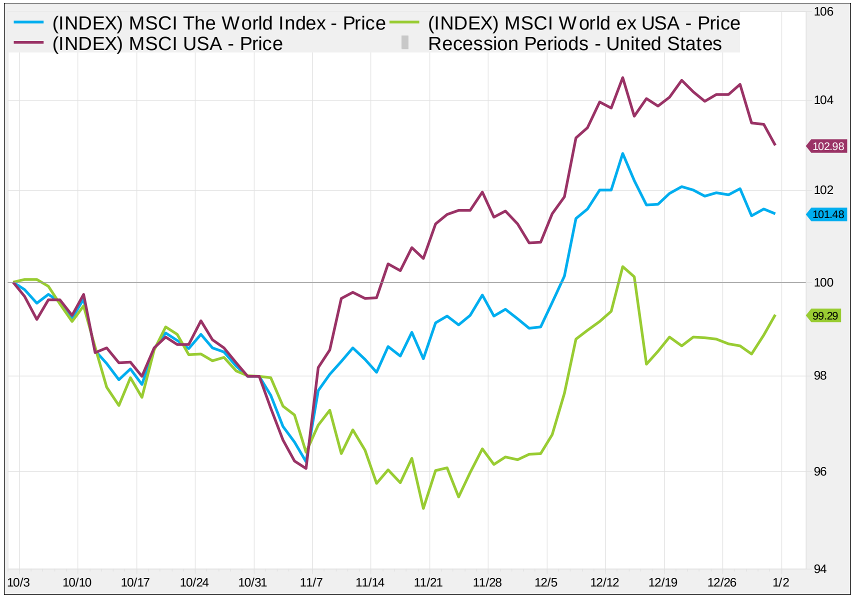
Equity Markets

Q4 Recap



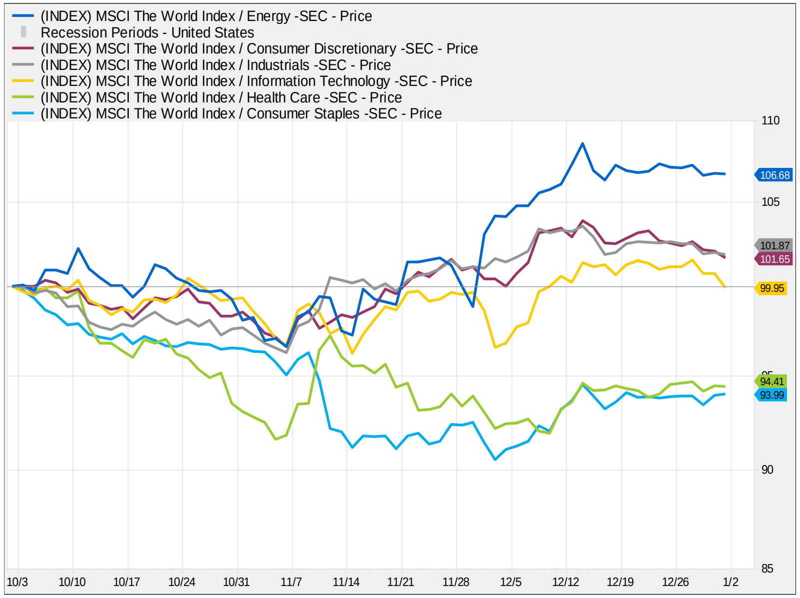


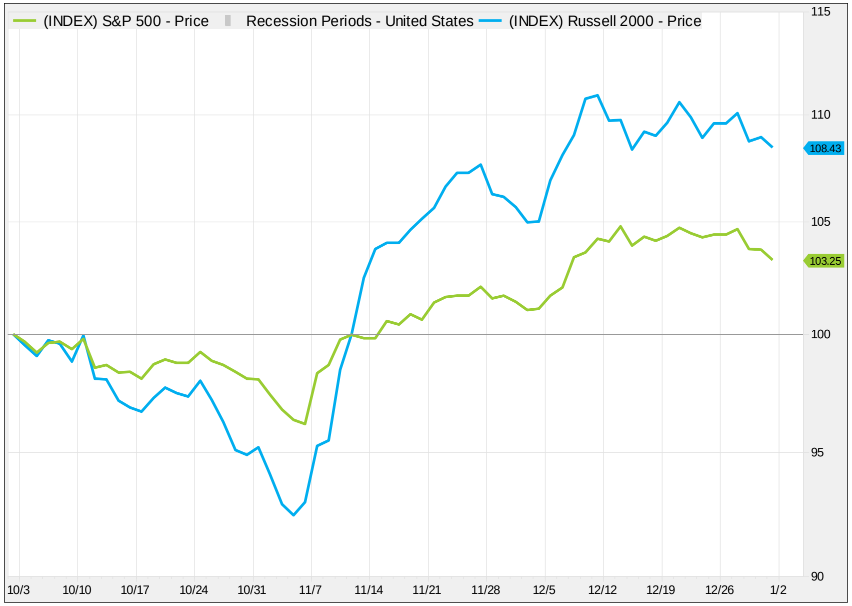
- 2016 produced a positive return for the MSCI World index, driven by US equity returns (up over 9% for the year).
- Impact of the November election on markets clearly visible in Q4 chart as US markets performed far better.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Equity Markets

Q4 Recap





- During Q4, Energy was the strongest sector performer, helped by higher oil prices and a strong dollar.
- Consumer Staples and Healthcare were worst performers as confidence in the duration of the expansion increased.
- Domestically, small cap stocks outperformed significantly as investors focused on corporate tax reform.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Equity Markets

Q4 Recap

- Global Sector portfolio relative returns remained positive as value-oriented stocks continued to be in favor.
- Domestic small-cap portfolio also outperformed a strong market.
- Q4 earnings reports coming in roughly as expected so far, expectations for growth in 2017 remain strong in both US and in overseas markets (particularly Europe).
- Valuation levels remain elevated vs. historical averages.

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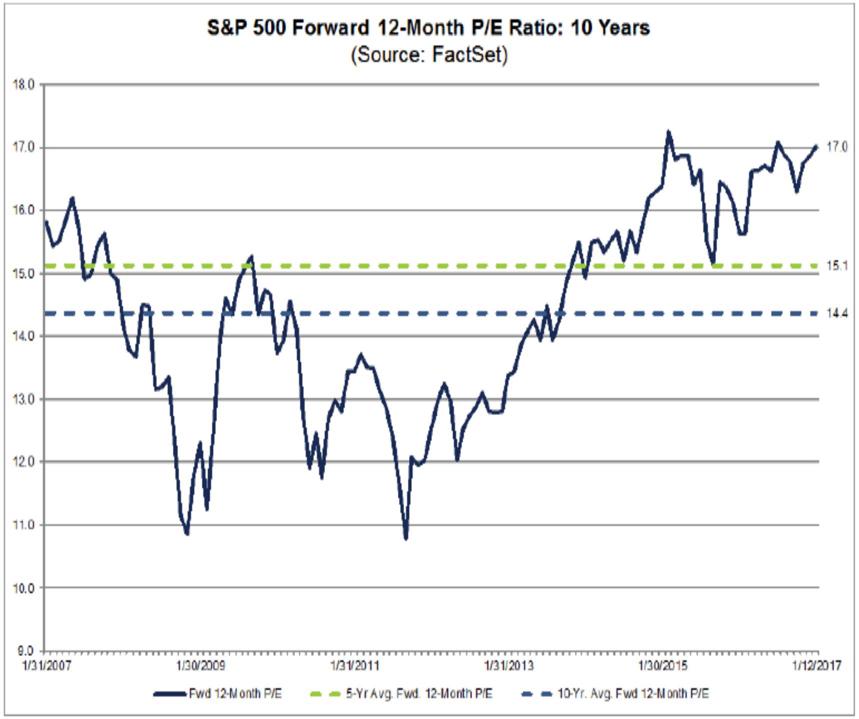
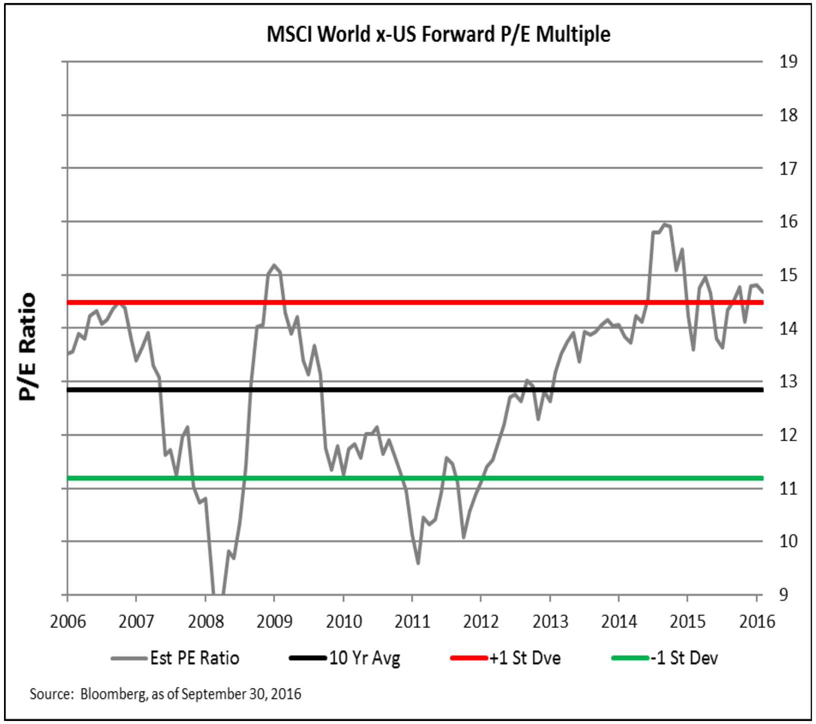
Valuation: Divergence

U.S. and the Developed World





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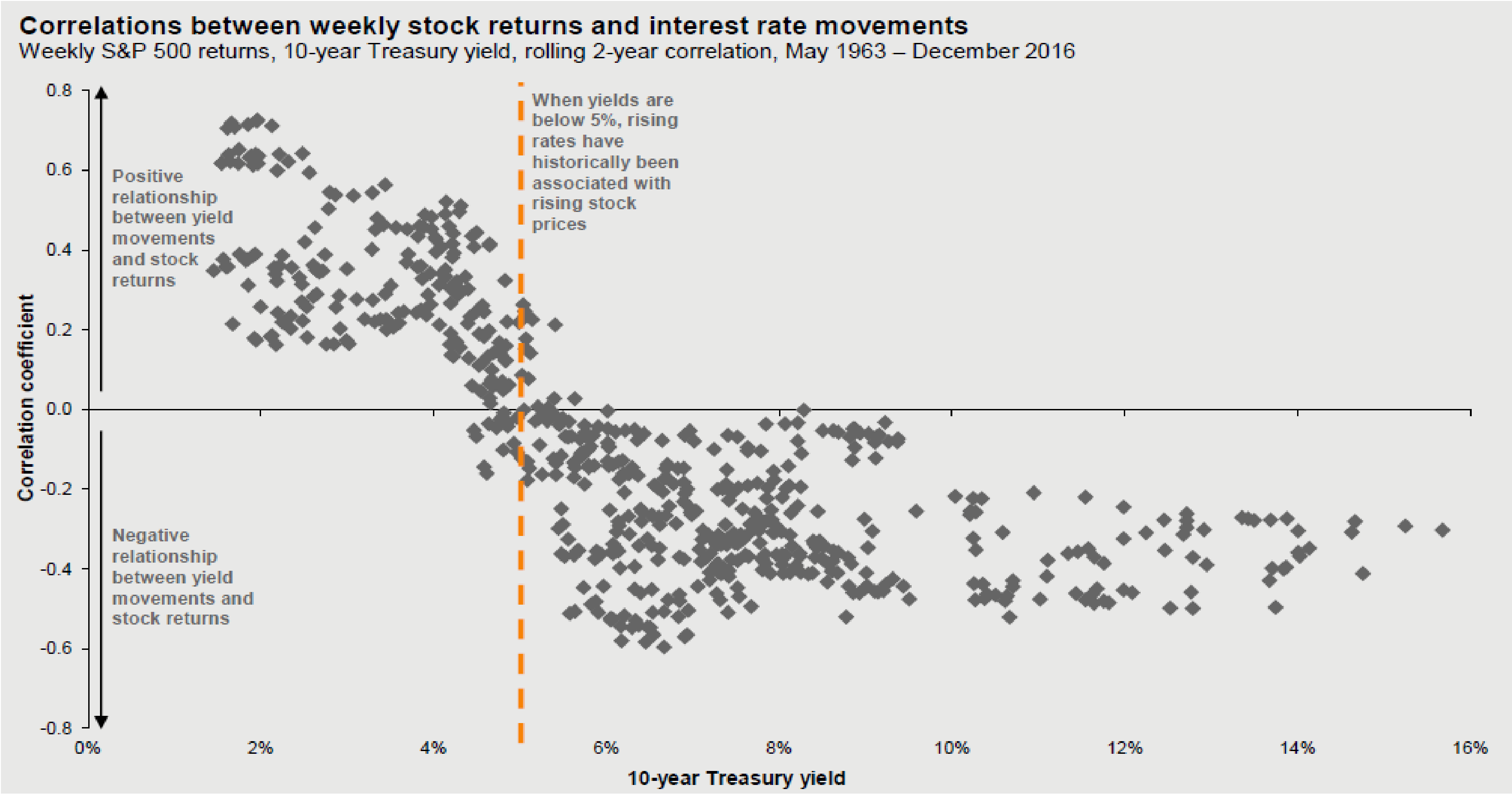
Equity Market Outlook

- Near term risks revolve around ability of politicians to deliver expected tax relief and fiscal stimulus in a reasonable timeframe.
- Also risk around trade retaliation depending on U.S. policy changes.
- Pace of European growth remains solid, likely an opportunity at some point given valuation gap.
- Higher U.S. growth likely to lead to rising rate environment – another risk for equities but probably not until we reach 3.5%+ on the 10-year bond.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Equity Markets and Interest Rates



Source: FactSet, Standard & Poor's, FRB, J.P. Morgan Asset Management.
Returns are based on price index only and do not include dividends. Markers represent monthly 2-year correlations only.
Guide to the Markets – U.S. Data are as of December 31. 2016.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

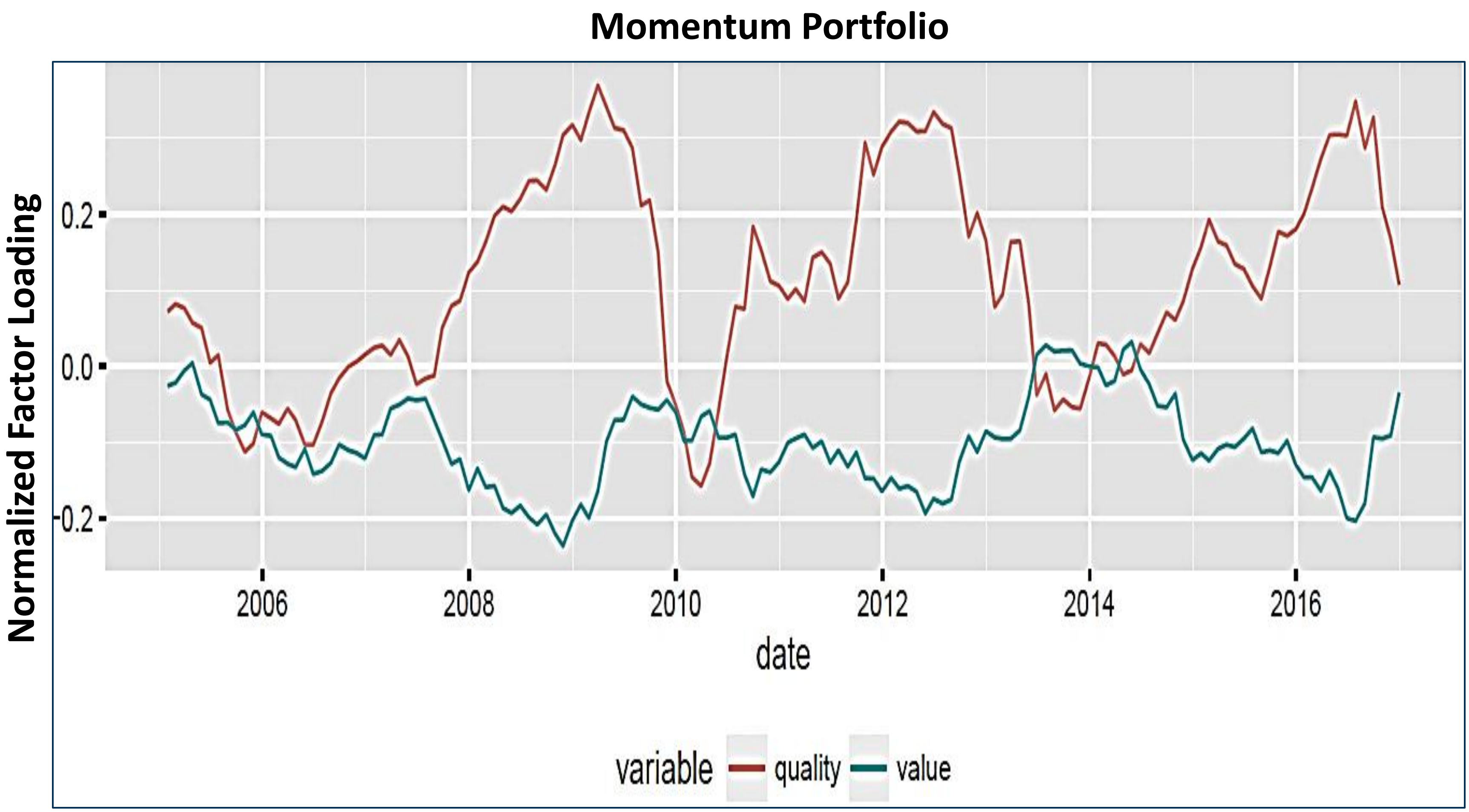
Fixed Income Outlook

- Volatility is likely to be higher because of the uncertainty related to Trump policies and the interest rate path from the Federal Reserve.
- Support from European Central Bank is expected to be less certain going forward which can upset the recent momentum in the markets.
- Growth concerns with China and economic and policy uncertainty in the UK following the Brexit vote will feed into higher volatility.
- Credit: Corporate bond spreads are near the cycle lows and are fair to rich, with little margin of safety. Leverage has been steadily increasing and new issue covenants are weak. Investment Grade is preferred over High Yield as the risk/return ratio is stronger.
- Currencies: US dollar is overvalued, particularly against select EM currencies with positive fundamentals.
- Rates: Developed market nominal government bonds are closer to neutral after the post election sell-off. US TIPS are still attractive but closer to fair value; non-US Inflation linked bonds continue to look attractive as the economic conditions continue to improve.

Multi Asset Strategy Outlook

- M&A spreads continued to narrow over the year, and more money seems to be chasing fewer deals. Alpha can still be generated in the space, but the space will likely be less fruitful than in 2016.
- Volatility has been relatively subdued in the equity markets. There may be opportunities to take advantage of market complacency on this front in the coming quarters.
- Quality and momentum factor overlap diminished significantly after reaching historical extremes. The value factor continued to outperform quality and momentum factors over the fourth quarter.

Factor Overlap



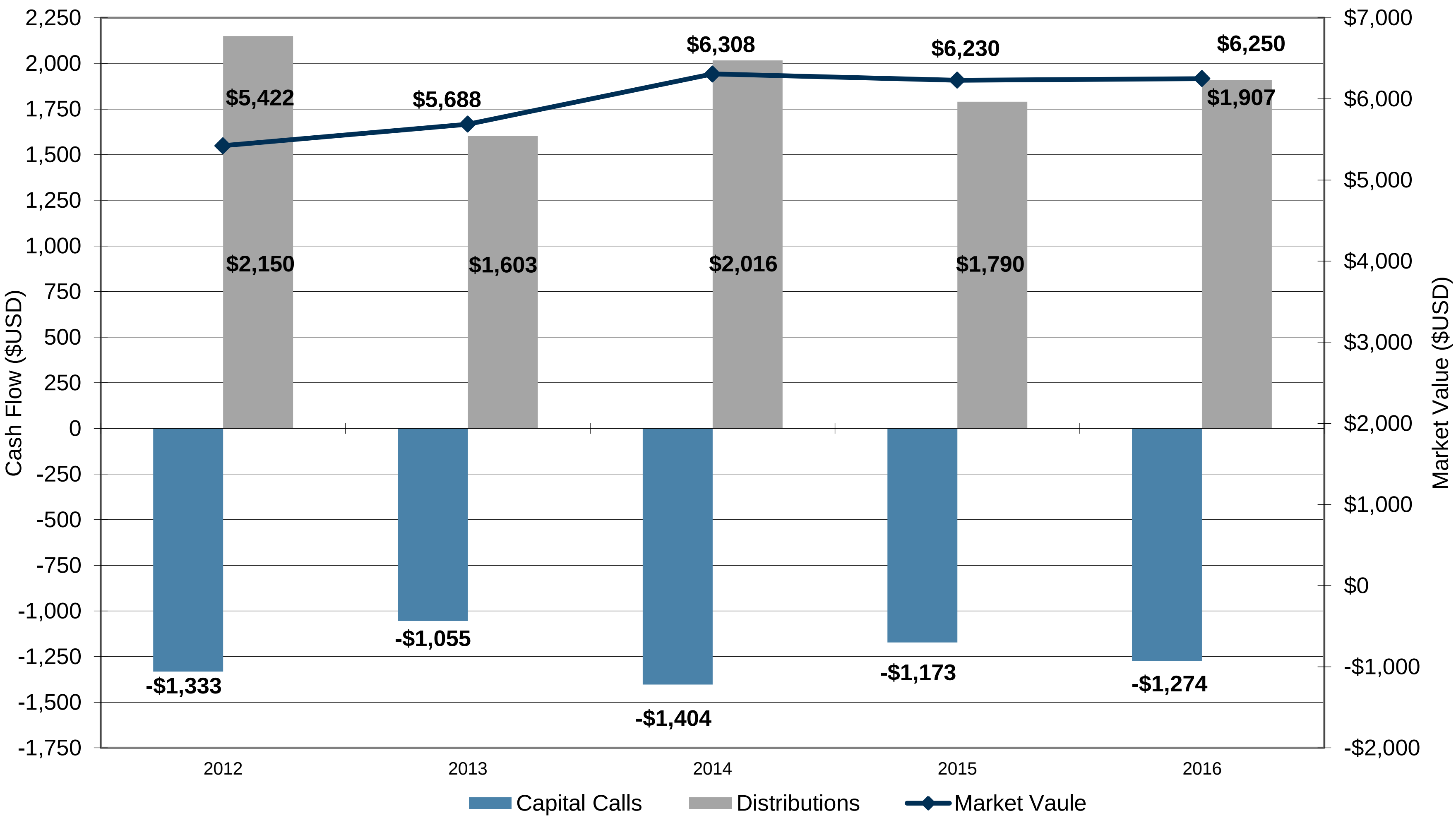
Source: SWIB

Private Markets & Funds Alpha Outlook

Private Equity

- The average purchase price multiple for large buyouts (>$50 million of EBITDA) in 2016 was 9.7x EBITDA, which is down from 10.1x EBITDA in 2015. Debt levels for large buyouts decreased from 5.7x EBITDA in 2015 to 5.5x EBITDA in 2016. The average purchase price multiple for middle-market buyouts (<$50 million of EBITDA) in 2016 was 10.2x EBITDA, which is down from 10.7x EBITDA in 2015. Debt levels for middle-market buyouts remained the same in 2016 at 5.3x EBITDA.
- According to PitchBook, Private Equity firms invested $649 billion in 3,538 deals in 2016, which is a decrease of 12% by value and 14% by volume from 2015.
- SWIB continues to add high quality managers focused on small/mid buyouts while reducing exposure to the larger end of the market.
- SWIB has committed $50 million to three new co-investments that will close in early 2017. The 2017 pipeline continues to be robust.

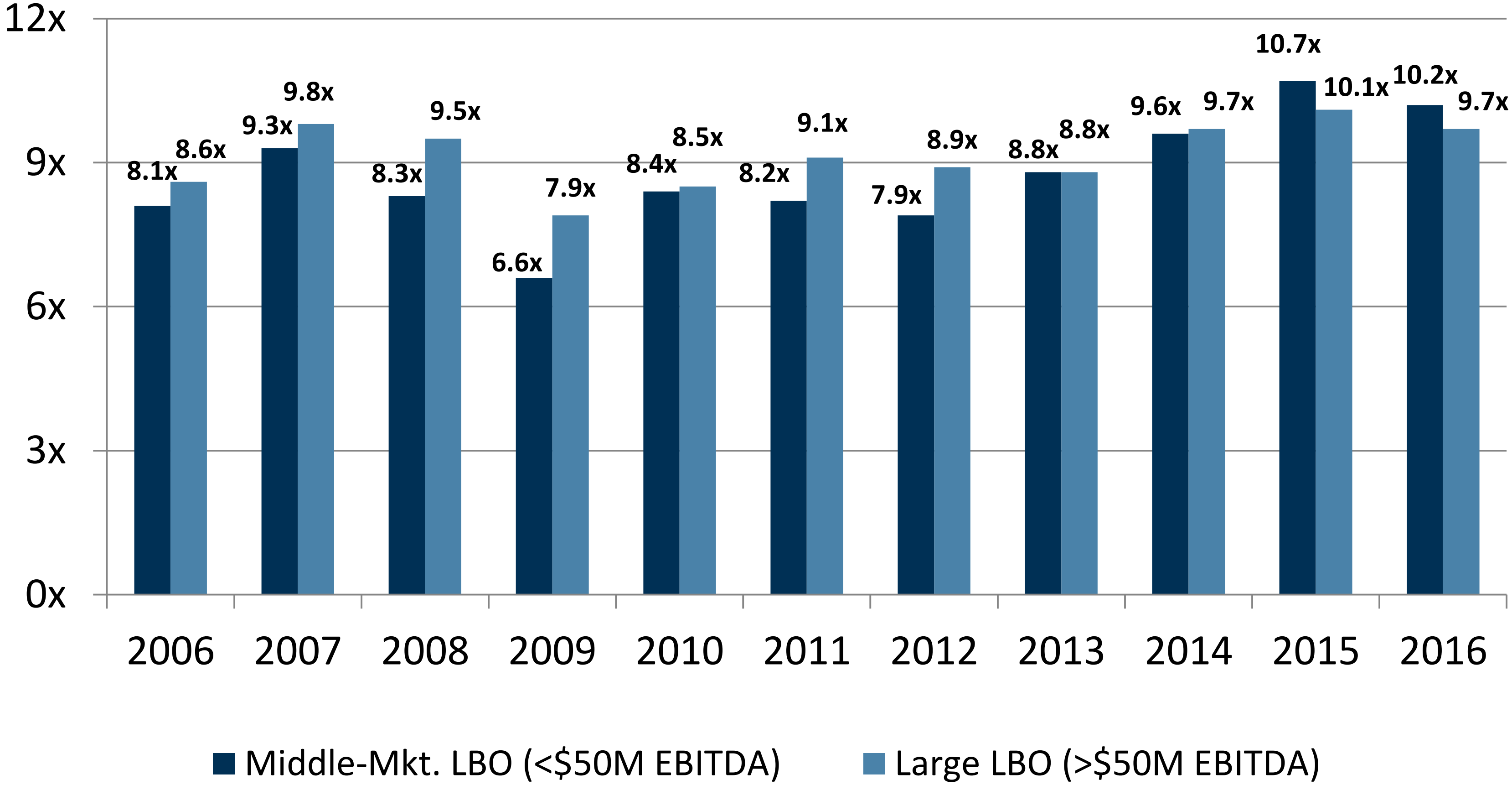
Private Equity Portfolio



Includes 304, 321, 345 and 503 Portfolios

Average Purchase Price Multiples

Multiple of EBITDA for U.S. Leveraged Buy Outs



Source: S&P Global Leveraged Buyout Review, 4Q 2016

Private Markets & Funds Alpha Outlook

Private Debt

- SWIB Private Debt portfolio ended year strong (performance and credit quality) but values declined due to rising interest rates.
- Good level of new opportunities in the 2017 private debt pipeline. Borrowers eager to place longer term debt (fear of higher rates)
- Loan covenants (financial and non-financial) remain intact.

Venture Capital

- More optimism among VCs on outlook for portfolio companies. Focus on building companies with viable business models.
- Anticipate more capital invested in ’17 resulting from record fund raising in 2016. VCs getting back to business (invest vs. fundraise).
- Snapchat public offering highly anticipated with hopes of reviving the IPO market.

Private Markets & Funds Alpha Outlook

Real Estate

- The NCREIF core fund benchmark (ODCE) finished the 2016CY at an 8.7% gross return, the first single digit year since the real estate recovery started. Lower returns are expected going forward as interest rates rise, driving cap rates higher.

- Momentum is reversing back toward suburban locations by Millennials, who will be entering prime family-raising years over the next 5-10 years, leading some to seek better schools and lower cost housing outside of gateway cities.

- Although ecommerce is negative for retailer brick and mortar demand, it has boosted the need for more logistic space to deliver goods quickly to consumers.

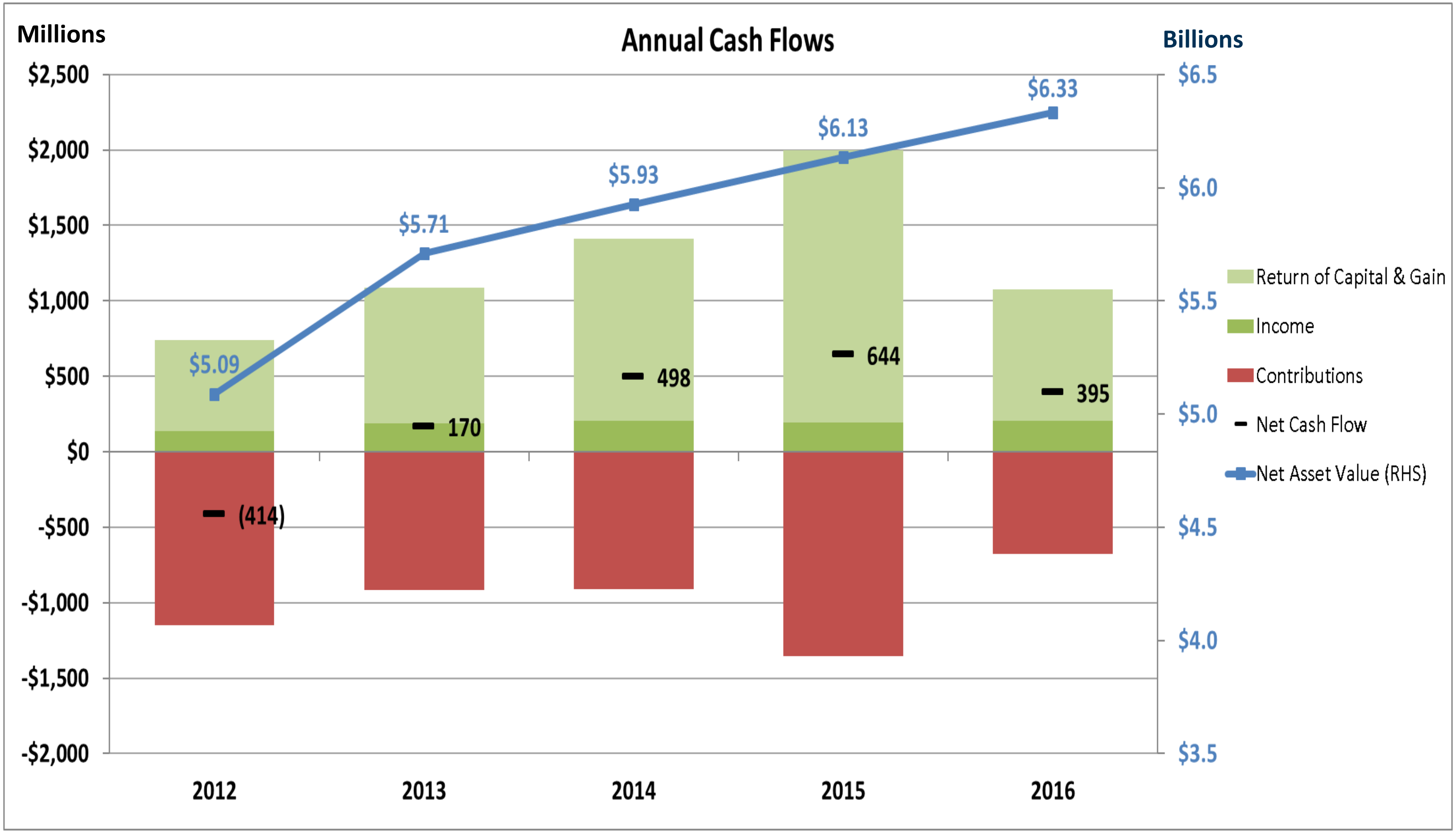
Private Markets & Funds Alpha Outlook

Real Estate (continued)

- Real estate markets will respond to the Administration’s actions. Relevant factors include: potentially higher economic growth, impacts from immigration and trade policies, and a range of Federal tax law changes.

- U.S-based banks tightened their underwriting standards for commercial real estate loans in 2016 as they faced scrutiny from bank examiners. Debt flows may pick up if regulations loosen.

Real Estate Portfolio Investment Activity



Private Markets & Funds Alpha Outlook

Funds Alpha

- Given the global macroeconomic backdrop and the stated policy intentions of the new Administration, we expect market volatility to pick up from current absolute low levels and dispersion among asset classes and within asset classes to increase.
- Additionally, due to potential changes in regulation and tax policy, we anticipate corporate activity to increase as corporate mergers and acquisitions.
- This new environment can be a positive for active management, notably, active managers that focus in a few key areas:
  1. relative value security/asset selection
  2. macro-oriented trading
  3. event and corporate action driven strategies.

Some Risks in the Outlook

- Inflation expectations may be larger than anticipated causing the fed to act more quickly and to a greater extent than anticipated.
- The dollar may strengthen as of the result of policy divergence reducing US exports and economic activity.
- Expectations for stimulative policy are not met, resulting in markets correcting.
- A slowdown in Europe spills over to the US.
- China financial/credit concerns may become critical as there is a sharper slowdown in China than expected.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Questions?

Appendix

Net Excess Value Added

Portfolio	Net Excess Return (%)				Tracking Error (%)			Info Ratio		Cumulative NEVA ($M)		
	YTD	1Y	3Y	5Y	1Y	3Y	5Y	1Y	5Y	YTD	1Y	5Y
Core Fund	0.53	0.53	0.14	0.37	0.40	0.31	0.31	1.35	1.20	428.4	428.4	1,316.8
Variable Fund	0.22	0.22	(0.02)	0.16	0.28	0.25	0.31	0.79	0.54	11.6	11.6	36.9
Global Sectors	0.33	0.33	(1.22)	(0.56)	0.82	1.02	0.91	0.40	(0.62)	29.5	29.5	(350.7)
Shareholder Opportunity	2.84	2.84	1.99	2.39	4.83	4.74	5.13	0.59	0.47	15.5	15.5	88.3
Small Cap Div	0.78	0.78	2.88	2.33	2.30	2.27	2.80	0.34	0.83	4.8	4.8	142.9
Ext. Equity Managers (Wtd Avg)	0.19	0.19	(0.19)	0.52	0.82	1.04	1.01	0.23	0.52	7.6	7.6	268.1
Gov/Credit	1.10	1.10	0.44	0.52	0.62	0.41	0.36	1.77	1.44	50.9	50.9	111.6
Global Bonds	0.19	0.19	0.17	0.41	0.34	0.31	0.42	0.57	0.98	9.2	9.2	79.6
Ext. FI Managers (Wtd Avg)	0.97	0.97	(0.19)	0.49	0.88	0.93	1.06	1.11	0.46	30.5	30.5	90.4
Risk Parity	(5.42)	(5.42)	(0.91)	(3.60)	4.25	3.79	5.24	(1.28)	(0.69)	(37.6)	(37.6)	(224.1)
Hedge Funds	(0.77)	(0.77)	0.28	(0.22)	2.49	2.49	2.61	(0.31)	(0.08)	(10.1)	(10.1)	(3.9)
Private Equities	2.81	2.81	2.37	1.48	2.63	2.56	2.09	1.07	0.71	161.8	161.8	384.8
Real Estate	1.01	1.01	1.51	2.45	1.18	1.19	1.45	0.86	1.69	56.2	56.2	584.9

Summary of Net EVA

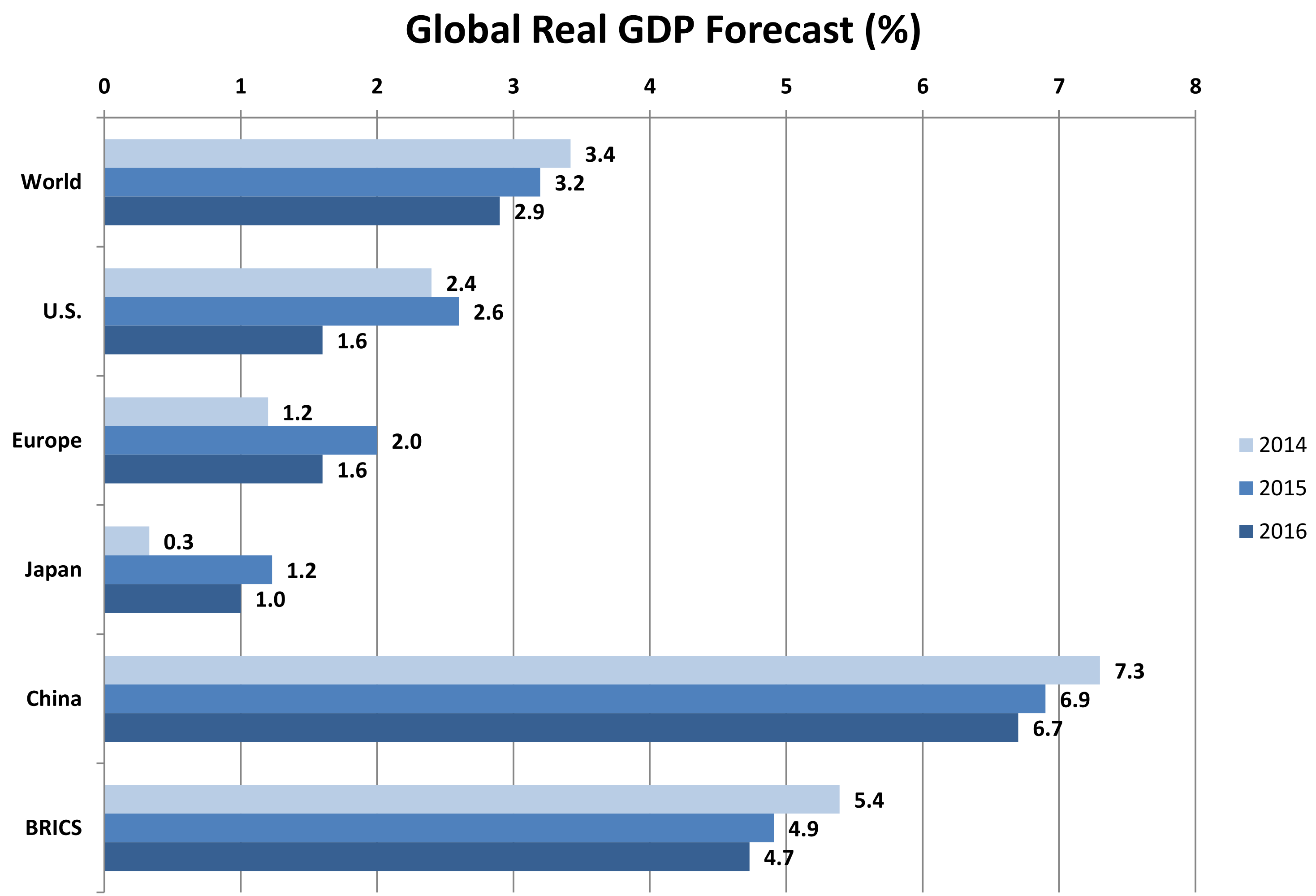
December 31, 2016

Data annualized except YTD and EVA, net of external manager fees. Excess return is positive while EVA is negative or vice versa due to the timing of the AUM build out.

SWIB STATE OF WISCONSIN INVESTMENT BOARD

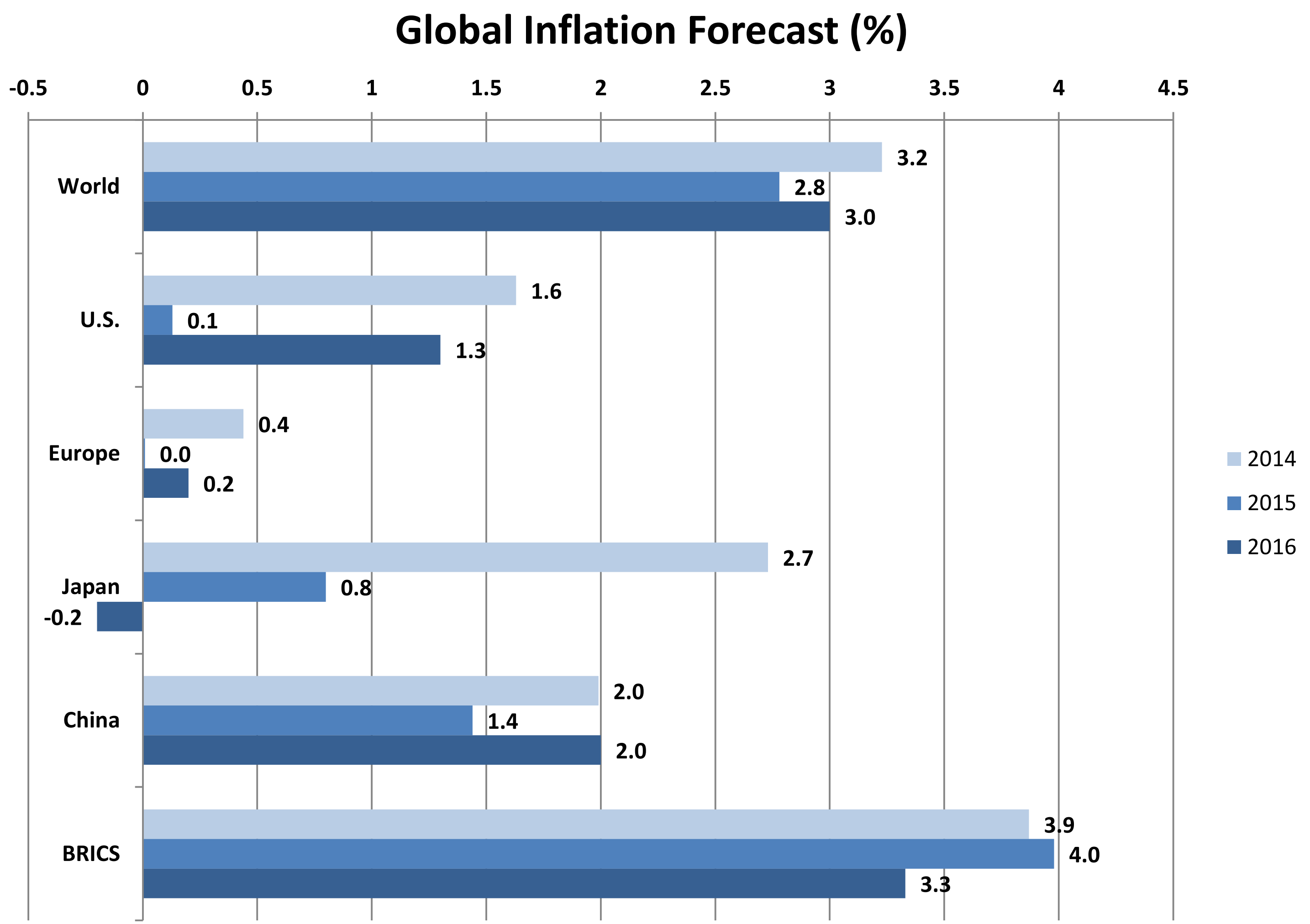
Growth Slowed in 2016

Generally



Source: Bloomberg Consensus

Indications Inflation Is Resuming



Source: Bloomberg Consensus

U.S. Employment Growth

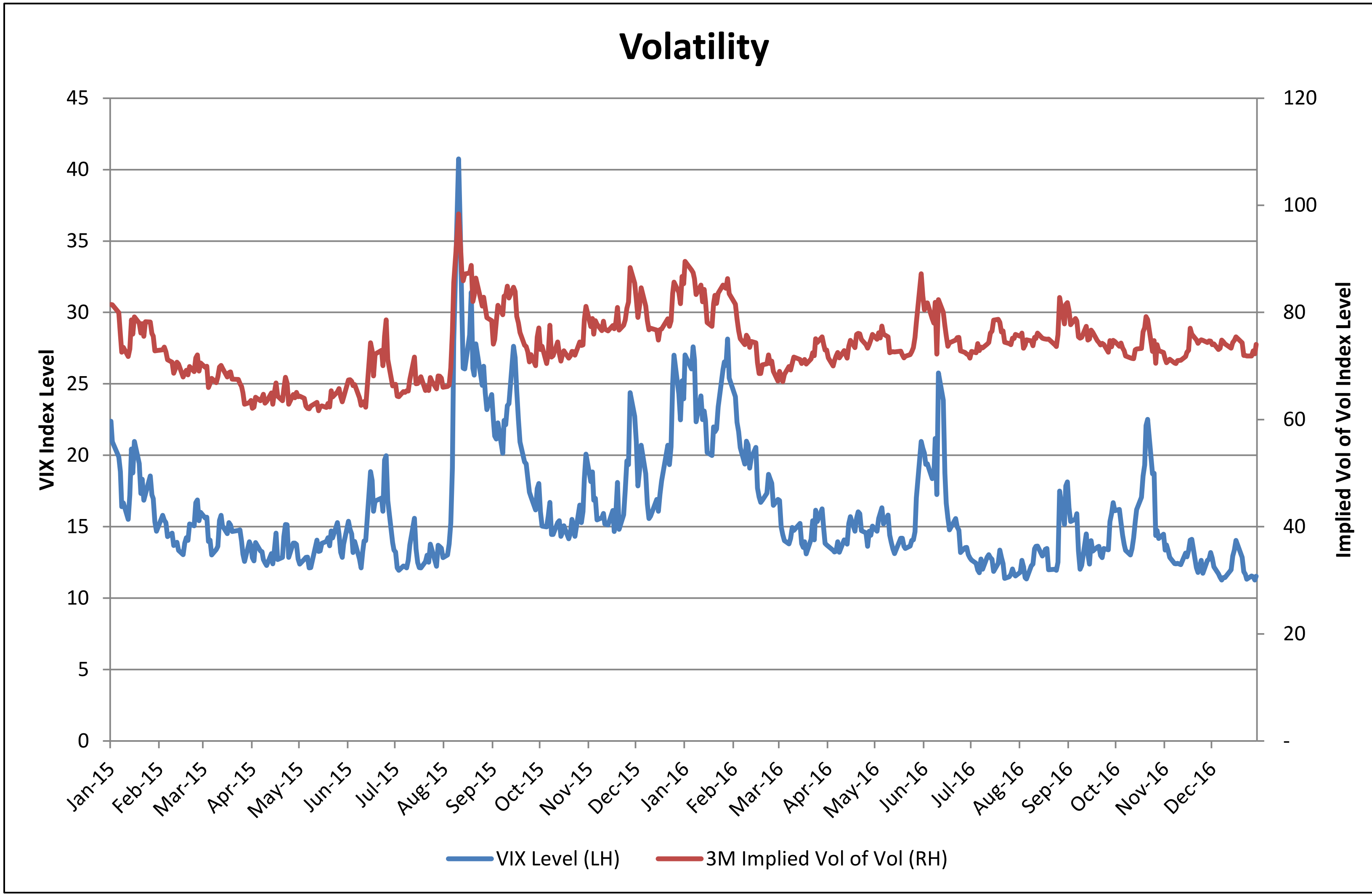
Slower in 2016

Change in Non-Farm Payrolls (1000s)

Updated: 12/31/2016	2008-09	2010-2014	2015	2016	Since 2007
Total Change in Non-Farm Payrolls	-8,639	10,628	2,744	2,157	6,890
Per Month Average	-360	177	229	180	64
Manufacturing/Mining	-2,348	1,053	-110	-125	-1,530
Construction	-1,836	647	296	102	-791
Total Private Goods Producing	-4,184	1,700	186	-23	-2,321
Professional & Business Services	-1,576	2,885	621	522	2,452
Retail/Transportation/Hospitality	-2,847	4,140	899	668	2,860
Private Health/Education	877	1,876	701	593	4,047
Financial Services	-539	298	149	159	67
Other Services	-476	264	95	55	-62
Total Private Services	-4,561	9,463	2,465	1,997	9,364
Government	106	-535	93	183	-153
Unemployment Rate	9.4%	7.2%	4.9%	4.7%	7.2%

Source: U.S. Bureau of Labor Statistics, Bloomberg

Volatility at Absolute Low Levels

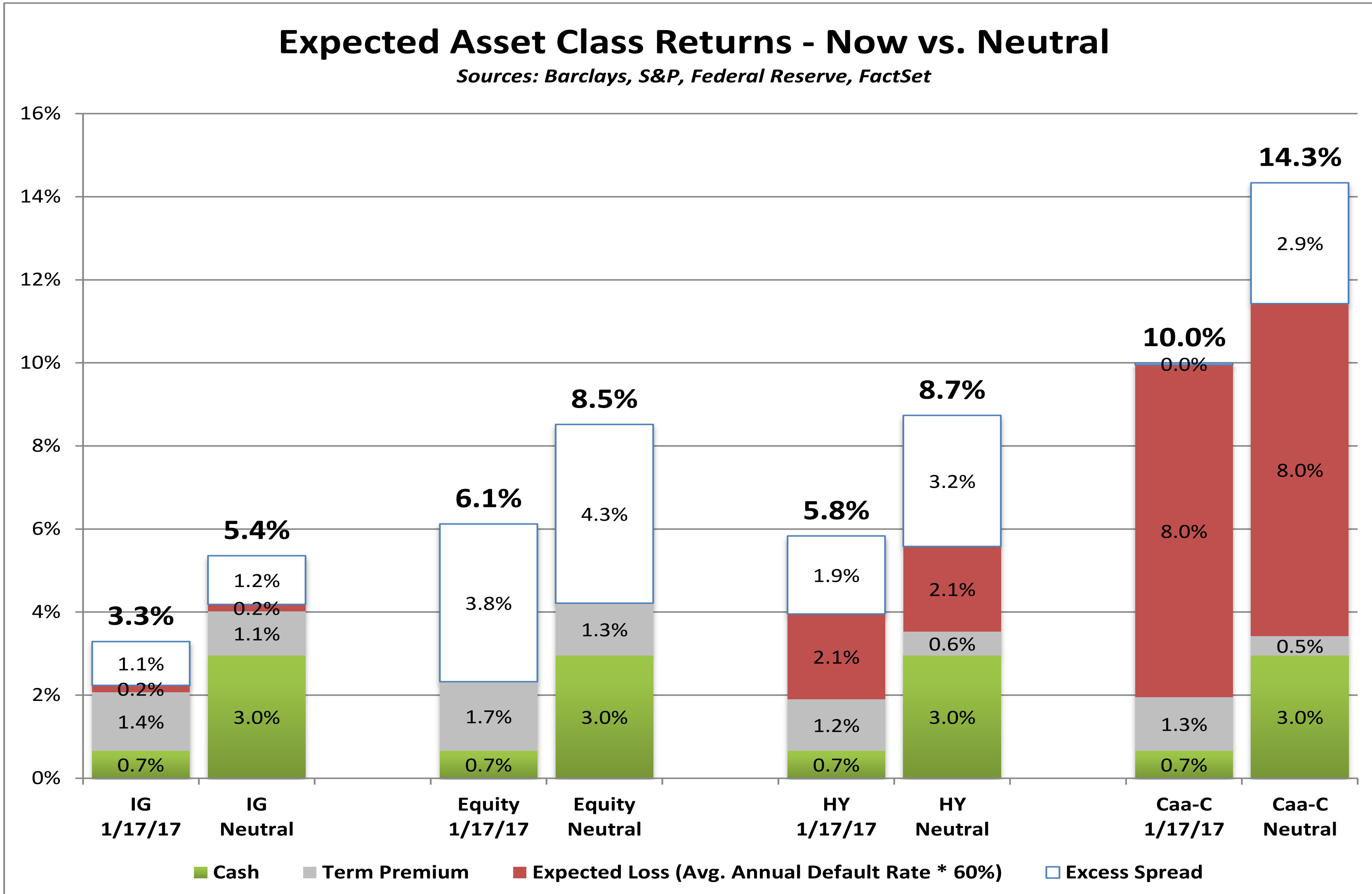


Source: Bloomberg

STATE OF WISCONSIN INVESTMENT BOARD

Risk Premiums

Tighter than long-term expectations



SWIB
STATE OF WISCONSIN INVESTMENT BOARD

New Contracts Approved
October-December 2016

Charles River

SWIB's contract with Charles River was modified to reflect updates to software, services, and the addition of a module that supports new trading strategies to be used by the Multi-Asset Strategy division. This update for the trading module, software, and advisory services will incrementally increase the cost by $294,840 annually.

Continuus Technologies

Continuus Technologies was selected from SWIB's competitively bid vendor pool of technology consultants to provide a Markit EDM Developer with investment information technology expertise to assist with ARIES-related projects. This resource will be on-site in 2016 for 3 months at a cost of $103,400.

Spherion

Spherion was selected from a State contract to provide temporary accounting services for the Finance division to assist with daily operations to allow SWIB staff to focus on project activities. This resource will be on-site for 12 months at a cost of $93,600.

V-Soft Consulting Group

V-Soft Consulting Group was selected from SWIB's competitively bid vendor pool of technology consultants to provide a Data Architect with investment information technology expertise to assist with ARIES-related projects. This resource will be on-site for 4 months at a cost of $110,000.

STATE OF WISCONSIN INVESTMENT BOARD

Date: February 08, 2017

To: SWIB Board of Trustees

From: Dev Desai, Enterprise Risk Manager
Lori Wersal, Chief Financial Officer

Re: Request to Add Quarterly Enterprise Risk Management (ERM) Reports and Reduce Frequency of Scheduled Presentations

In light of the reduction in the number of annual Board meetings from eight to six, the Enterprise Risk team proposes adding a quarterly risk report in lieu of one ERM presentation each year. For 2017, we are proposing an ERM presentation in April and August and quarterly reporting in February, April, August and December.

This will increase the risk reporting we provide to you, keep you abreast of existing or emerging risks, give you more options to discuss risk and potentially free up agenda time for other board matters. With the above schedule, we would have two scheduled presentations to the Board each year (compared to 3 currently), and the ERM team would also be available for questions or commentary during two additional meetings per year, if requested by the Board, related to the quarterly risk reports.

A sample of the quarterly reports is attached and is comprised of the latest ERM Risk Register and Dashboard.

Consistent with previous years, as part of the presentation, the Enterprise Risk Manager will discuss the status of risk activities, any emerging risks, and actions of the Enterprise Risk and Compliance Committee.

We welcome your feedback on this proposal.

ERM RISK REGISTER

FEBRUARY 2017

ID	Risk Category	Risk Description	Related Domains	Overall Rating	Trend	Comments
1	ARIES Program	Risks associated with adverse impacts to the organization (e.g., delays, budget over runs, resource drain, BAU interruption, and over-reliance on vendors, etc.) resulting from the implementation of the ARIES Program.	Business Capabilities & Planning Vendor/Service Provider Technology & Systems Mgm't Financial Systems & Controls Workforce Data Management	High	↘	- Many key projects and systems went live in late 2016. SWIB is entering the final six month period of the ARIES Program. As such, effective coordination, governance, and communication will be critical during this time period. - ERM performed the 2016 Q4 risk assessment, as scheduled. ERM updated risks and mitigations previously documented, discussed results with key project and program personnel.
2	Operational Support and Readiness	Risks associated with SWIB's ability to support the transition from ARIES Program to BAU in a manner that is both sustainable and cost effective.	Technology & Systems Mgm't Data Management Investment Operations & Controls	Moderate	↗	- Continue application of the ERM ARIES risk assessment process from the past two years to the conclusion of the ARIES project in mid-2017. - Transition the risk assessments from the Project state to Business as Usual state. - Develop and periodically maintain a database of BAU risks as the risks transition from Project phase. - Assess the risks associated with supporting SWIB's new infrastructure, investment strategy and new operating model in the post-ARIES environment.
3	Data Dependency	Risks associated with SWIB's dependence on receiving timely, accurate and complete data.	Business Capabilities & Planning Vendor/Service Provider Technology & Systems Mgm't Financial Systems & Controls Data Management	Moderate	→	- OnCore Delivery went live in November 2016. SWIB continues with post-deployment activities. Progress is being made to finalize the SLA and related KPIs. - IBOR Delivery phase 1 (which focuses on pushing data into front office systems) testing continues across SWIB systems. Project teams are closely monitoring testing as unforseen defects could potentially impact timelines.
4	Internal Control Oversight	Risks associated with inadequate control structures resulting from changes in business processes impacted by ARIES implementation.	Financial Systems & Controls Investment Operations & Controls Business Continuity Business Capabilities & Planning	Moderate	↘	- ERM is currently working with key staff and consultants to understand and identify changes to SWIB's control environment that have or will result from ARIES implementation. - ERM is also assessing how changes to SWIB business process as a result of ARIES implementation will impact risks.
5	Strategic Objectives	Risks associated with SWIB's ability to achieve strategic objectives and business goals.	Strategic	Moderate	→	- ERM will assess SWIB's operational process and controls to support the future vision of SWIB's Strategic Objectives and Asset Class Strategies. - Examples include (i) SWIB's Enterprise Wide operating model, (ii) MBS and TBA transaction capability, (iii) Liquidity Management Approach to support increased leverage, and (iv) Asset Class Strategies (eg Fixed Income, Multi-asset, Funds alpha, Private Equity, Hedge Funds, etc). - Provide Senior Management with assessment and consulting on risks and potential mitigation steps.

ERM RISK REGISTER

FEBRUARY 2017

ID	Risk Category	Risk Description	Related Domains	Overall Rating	Trend	Comments
6	Cyber-security Risk	Risks associated with cyber attacks and the extent of business interruption.	Business Continuity Vendor/Service Provider Technology & Systems Mgm't Data Management	Moderate	→	- ERM and IT are working together to evaluate industry risks and threats, and their likelihood of impacting SWIB. - ERM, IT and Business Continuity teams are also working together to ascertain SWIB readiness from an infrastructure and control standpoint (hardware and software). - ERM and IT are working together to prepare a response plan for cybersecurity events (e.g., ransomware, etc.) that impact SWIB.
7	Vendor Management	Risks associated with the outsourcing of business processes. Includes risks that may impact SWIB's ability to effectively implement, monitor and enforce the vendor management program.	Vendor/Service Provider Investment Implementation	Moderate	↘	- ERM developed an action plan to address this recommendation that was approved by SWIB's Senior Managers and was part of SWIB's 2016 Strategic Plan. Per the plan, quarterly milestones were identified, documented, and executed. - Q4 action items were accelerated into Q3 and completed. They include documenting short-term and long-term mitigations, and an estimated timeline for implementation. - The findings were documented in a white paper that was presented to the ERCC on 09/22/16. - Decisions made include implementing short-term activities in 2017, while defering long-term activities to 2018 and beyond.
8	Information Management	Risks associated with the lack of data control, governance and integrity resulting from implementation of enhanced mobile device functionality without adequate and effective data security oversight.	Data Management Governance/Leadership Business Capabilities & Planning Financial Systems & Controls	Moderate	↘	- ERM partnered with IT and Data Management Teams to drive this initiative. - A draft of the data classification policy was created and used by IT to approximate resource estimates for implementation. - Decisions made include (i) focusing short-term efforts around mitigation of information classified as PII (SS#'s) in by March 2017 and (ii) long-term efforts to build out SWIB's infrastructure to accomodate security classifications and controls being deferred to 2018.
9	End User Spreadsheets	Risks associated with the usage and reliance on complex spreadsheets, which lack control and oversight capabilities, to perform critical functions and inputs used by the organization to make decisions.	Data Management Governance/Leadership Business Capabilities & Planning Financial Systems & Controls Investment Implementation	Moderate	↘	- Numerous critical spreadsheets are being replaced with more structured and governed alternatives as a result of the systems and data capabilities from ARIES implementation. - SWIB has a End User Spreadsheet Policy that outlines appropriate procedures for handling end user developments.
10	New Instruments & Strategies	Risks associated with the implementation and use of derivative instruments by investment teams without going through adequate approvals and strategy review.	Investment Implementation Investment Operations & Controls Workforce Inherent Market Risks	Low	→	- SWIB has an Instruments Use Team, that is responsible for reviewing new instruments (e.g., derivatives) and strategies, ensuring that the appropriate staff are involved, reviewing the technological needs, etc. - Approval from the team is required for the strategy to proceed. - The team focuses on due diligence, process/workflow design and contract management.

ERM Dashboard

WORKING DOCUMENT

January 2017

Managing the External Environment

Risk Category	Prior*	Current*	Trend**
COMMUNICATIONS & EXTERNAL RELATIONS			→

Risks that may impact effective communications and relationships with key stakeholders who require a high level of confidence in SWIB.

__Risk Areas__
- Internal Communication
- External Communication (PR, Media, etc.)

Risk Category	Prior*	Current*	Trend**
SECURITY & INFRASTRUCTURE			↘

Risks that may impact appropriate levels of operational controls in place to safeguard the facility, employees, visitors, assets, and equipment. Includes risks that may impact security that protects sensitive data and loss of information assets.

__Risk Areas__
- Facilities Management
- Health & Safety

Risk Category	Prior*	Current*	Trend**
GEOPOLITICAL / EMERGING			→

Risks associated with changes in the global political and/or public pension fund environment that impact SWIB's ability to adequately and effectively fulfil its mission and vision.

__Risk Areas__
- Cybersecurity
- Worst Case Scenarios

Risk Category	Prior*	Current*	Trend**
LEGISLATIVE / REGULATORY			→

Risks that may impact SWIB and staff resulting from a failure to comply with state and federal laws, rules and regulations, monitor regulatory trends, perform contract due diligence, obtain external counsel, etc.

__Risk Areas__
- Legislative Activity
- Federal & State Regulatory Trends

Managing the Assets

Risk Category	Prior*	Current*	Trend**
INVESTMENT STRATEGY & POLICY DESIGN			→

Risks that may impact SWIB's ability to effectively and appropriately design the investment guidelines and objectives.

__Risk Areas__
- Strategic Asset Allocation Design
- Capital Market Assumptions
- Benchmarking
- Asset Liability Management

Risk Category	Prior*	Current*	Trend**
INVESTMENT RISK MANAGEMENT			→

Risks that may impact the capabilities to effectively monitor, manage and report on investment risks.

__Risk Areas__
- Monitoring & Reporting Capabilities
- Transitioning & Rebalancing
- Risk Reporting Governance
- Leverage/Overlay
- Derivatives

Risk Category	Prior*	Current*	Trend**
INVESTMENT IMPLEMENTATION			→

Risks associated with investment decisions made in an attempt to achieve investment objectives for total fund, asset class and portfolio mandates.

__Risk Areas__
- Asset Allocation
- Portfolio Management
- Operational Due Diligence (Private Mkts)

Risk Category	Prior*	Current*	Trend**
INHERENT MARKET RISKS	NR	NR	

Risks associated with exposures that are inherently present in financial instruments, and assumed when investing or managed against a benchmark.

__Risk Areas__
- Credit Risk
- Currency Risk
- Interest Rate Risk
- Liquidity Risk

Managing the Organization

Risk Category	Prior*	Current*	Trend**
BUSINESS CONTINUITY			→

Risks that may impact SWIB's ability to effectively plan for recovery and business continuity in the event of a disaster, hazard situation, or other business interruption.

__Risk Areas__
- Planning & Testing
- Disaster Recovery (IT)

Risk Category	Prior*	Current*	Trend**
INVESTMENT OPERATIONS & CONTROLS			→

Risks that may impact SWIB's investment control framework to effectively manage and oversee performance measurement and investment operations processes.

__Risk Areas__
- Cash Management
- IBOR / ABOR
- Reconciliation Oversight
- Trade Operations

Risk Category	Prior*	Current*	Trend**
WORKFORCE			↘

Risks that may impact the availability of an adequate knowledgeable workforce with sufficient training and skills to meet organizational goals and objectives.

__Risk Areas__
- Compensation & Incentive Comp.
- Employee Conduct
- Hiring & Onboarding

Risk Category	Prior*	Current*	Trend**
TECHNOLOGY & SYSTEMS MANAGEMENT			→

Risks that may impact SWIB's ability to provide a highly reliable, accessible, available technology infrastructure that meets enterprise-wide information needs.

__Risk Areas__
- Systems Management
- Design, Development & Testing
- Solution Implementation

Risk Category	Prior*	Current*	Trend**
DATA MANAGEMENT			→

Risks that business resource data might be inaccurate, incomplete, or not available for appropriate decision making due to insufficient data governance or controls.

__Risk Areas__
- Data Management Framework
- Maturity Model
- ARIES Related Projects

Risk Category	Prior*	Current*	Trend**
FINANCIAL SYSTEMS & CONTROLS			→

Risks that may impact SWIB's ability to effectively and adequately manage and oversee the accounting for plan assets, budgeting and planning, financial reporting, procurement, cost allocation, etc.

__Risk Areas__
- Procurement & Accounts Payable
- General Ledger & Financial Reporting
- Financial Planning & Analysis

Risk Category	Prior*	Current*	Trend**
COMPLIANCE			→

Risks that may impact SWIB's ability to vimplement, monitor and enforce compliance management. Includes risks that may impact compliance with policies.

__Risk Areas__
- Policies & Procedures
- Investment Guideline Compliance
- Compliance Management Framework

Risk Category	Prior*	Current*	Trend**
VENDOR / SERVICE PROVIDER			→

Risks inherently associated with outsourcing of business processes. Includes risks that may impact SWIB's ability to implement, monitor and enforce the vendor management program.

__Risk Areas__
- Reliance on Critical Vendors
- Vendor Management Lifecycle
- Service Level Quality vs Expectations

Managing the Strategy

Risk Category	Prior*	Current*	Trend**
GOVERNANCE / LEADERSHIP			→

Risks of ineffective delegations, governance committees, policies and procedures, and leadership that may impact timely decisions that guide SWIB to meet its strategic goals and objectives.

__Risk Areas__
- "Tone at the Top"
- Ethical Practices & Standards of Conduct

Risk Category	Prior*	Current*	Trend**
STRATEGIC			→

Risks of achieving strategic goals and effectively planning and implementing objectives and initiatives to meet SWIB's vision, mission, goals and objectives.

__Risk Areas__
- Mission & Vision
- Alignment of Goals with Time Horizon
- Organizational Goals & Objectives
- Strategic Objective Oversight

Risk Category	Prior*	Current*	Trend**
BUSINESS CAPABILITIES & PLANNING			→

Risks that may impact creating and achieving relevant business plan objectives and action plans that are aligned with strategic risks.

__Risk Areas__
- ARIES Program Management
- Project Management
- Process Redesign
- Transition Management

Risk Category	Prior*	Current*	Trend**
FRAUD DETECTION & PREVENTION / FIDUCIARY			→

Risks that may impact adherence to ethical standards, core values, and guiding behaviors. Includes risks that may impact the protection of assets, integrity, and credibility through fraud detection & prevention.

__Risk Areas__
- Internal Control Framework
- Fiduciary Duty
- Internal/External Audits

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* Inputs to prior and current risk ratings are the result of one or a combination of evaluation approaches determined to be appropriate by SWIB's Enterprise Risk (ERM) Division. Approaches may include application of the ERM Framework, ARIES risk assessment process, or the independent judgement of ERM supported by other material and relevant information. Ratings calculated using the ERM Framework are based on residual scores (i.e., after mitigations and controls are considered) obtained from one or more underlying risks associated with the domain.

** Trend indicates ERM's projection of category rating based on expected changes to processes, material and relevant information, and/or events that impact enterprise risks.

RISK RATINGS		TRENDS	
Critical	Low	Increasing	↗
High	Negligible	No Change	→
Moderate	Not Rated	Decreasing	↘

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting-Open Session

Tuesday, November 22, 2016
Offices of the Investment Board
121 East Wilson Street
Madison, Wisconsin

Committee Members Present: David Villa, Chief Investment Officer (Chair)
Chuck Carpenter, Managing Director-Private Markets & Funds Alpha (Vice-Chair)
Scott Anderson, Head of Asset & Risk Allocation (Secretary)
Todd Ludgate, Managing Director-Public Fixed Income
Brian Hellmer, Managing Director-Public Equities
Dominic Garcia, Funds Alpha Manager
Chirag Gandhi, Portfolio Manager-Global Bonds
Chris Prestigiacomo, Portfolio Manager-Private Debt & WI Private Equity
Nick Stanton, Portfolio Manager-Multi-Asset Strategy
Brian Heimsoth, Quantitative Manager-Asset Risk & Allocation
Michael Williamson, Executive Director

Also in Attendance: Rochelle Klaskin, Chief Legal Counsel
Elizabeth Fadell, Strategic Planning & Transformation Director
Shirley Eckes, Chief Operating Officer
Andrea Ruiz, Portfolio Manager-Liquidity, Inflation & Rates Mgmt.
Trish Reopelle, Managing Analyst-Portfolio Implementation Team
Jon Simon, Managing Analyst-Government Credit Team
Kimberly Bartz, Investment Operations Manager
Kurt Petrie, Internal Auditor
Chris Preisler, Communications Specialist
Alyssa Moore, Compliance Analyst
Janet Klosterman, Legal Assistant
Chris Levell, NEPC
Barry Dennis, Verus Advisory (by telephone)
Eileen Neill, Wilshire Associates (by telephone)
(Some individuals may have attended only portions of the meeting.)

OPEN SESSION

With a quorum present, Mr. Villa called the meeting to order at 1:30 p.m.

1. Approval of the Minutes

Mr. Villa asked if there were any comments on either the open or closed session minutes of the November 1, 2016 Investment Committee (IC) meeting. Ms. Klosterman noted that the first draft of the open session minutes that she provided for the meeting materials had been incomplete, in that the first two sections of the November 1, 2016 open session minutes were inadvertently omitted. She stated that a complete draft was reposted in Board Effect and distributed directly to each Committee member via email. All Committee members confirmed that they had received a copy of the full minutes. Hearing no further changes, Mr. Villa stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Prestigiacomo and seconded by Mr. Anderson to approve both the open session (updated draft) and the closed session minutes of November 1, 2016 IC
meeting, as presented. The motion passed unanimously.

2. Asset Allocation Recommendations

Mr. Anderson introduced Chris Levell, NEPC, who walked the Committee through NEPC's *Asset Allocation Review*, which was included on pages 9-37 in the meeting materials, and together they facilitated the Committee's discussion and answered questions about the following points about the asset allocation recommendation outlined in the executive summary of the report: **(a)** expectations are for Fed Fund rates to remain below 1% well into 2019; **(b)** cash return expectations lower than inflation will negatively impact asset returns; **(c)** risk/return tradeoffs that suggest the recommended destination portfolio because it will best achieve SWIB portfolio objectives in a range of market environments, in particular, during a low return environment; **(d)** reducing the fixed income allocation by 2.5% and increasing the inflation protection asset class by 2.5%; **(e)** increasing both Private Markets and Real Estate by 1%; **(f)** rebalancing the private markets allocation through the emerging market sub-asset allocation; **(g)** a recommended reduction in world government bond exposure with a corresponding increase in U.S. treasury exposure as well as a small allocation to unhedged emerging market bonds; **(h)** maintaining the 120 bps +/- 60 bps of active risk objective for the CTF for 2017; **(i)** lowering the active risk objective for the VTF to 60 bps +/- 30 bps; and **(j)** moving towards 110% leverage for the CTF.

Mr. Anderson referred to the proposed draft of *SWIB's Asset Allocation Overview and Recommendations for 2017*, shown on pages 38-44 in the meeting materials, which he explained will be presented to the Board for approval at the December 14, 2016 meeting, and then facilitated the Committee's discussion of the recommendations.

Motion: A motion was made by Mr. Williamson and seconded by Mr. Garcia to recommend to the Board to approve the following strategic asset allocation targets for 2017 and active risk targets, as outlined in the draft Asset Allocation Overview and Recommendations for 2017 report.

RECOMMENDED 2017 STRATEGIC TARGETS		
2017 Core Trust Fund:	**Continue on the course of implementation toward strategic asset allocation targets that include up to 10% leverage.**	
	Current	**Recommended**
Public Equities	51.5%	50.0%
Fixed Income	27.5%	24.5%
Inflation Sensitive	12.0%	15.5%
Private Equity	7.0%	8.0%
Real Estate	7.0%	8.0%
Multi-Asset	4.0%	4.0%
Total	**109%**	**110%**
CTF Active Risk Target	**120 bps +/- 60 bps**	

RECOMMENDED 2017 STRATEGIC TARGETS		
2017 Variable Trust Fund	**Retain current strategic targets.**	
	Current	**Recommended**
U.S. Equities	70.0%	70.0%
International Equities	30.0%	30.0%
Total	**100%**	**100%**
VTF Active Risk Target	**60 bps +/- 30 bps**	

The motion passed unanimously.

3. Additional Benchmark Recommendations

Barry Dennis, Verus Advisory, and Ms. Fadell explained that due to the pending change in the Global Equity benchmark, the following changes to the passive US portfolio benchmarks are necessary.

Current Portfolio	Current Benchmark	Two Separately Managed Portfolios	New Benchmark
Domestic Equity Liquidity	Russell 3000	Domestic Equity Liquidity Large Cap/Mid Cap	MSCI World USA
		Domestic Equity Liquidity Small Cap	Russell 2000
Domestic Equity Exposure Management	Russell 3000	Domestic Equity Exposure Management Large Cap/Mid Cap	MSCI World USA
		Domestic Equity Exposure Management Small Cap	Russell 2000
Policy Overlay Domestic Equity	Russell 3000	Policy Overlay Domestic Equity Large Cap/Mid Cap	MSCI World USA
		Policy Overlay Domestic Equity Small Cap	Russell 2000
Current Portfolio	**Current Benchmark**	**One Separately Managed Portfolio**	**New Benchmark**
Internal Russell 1000	Russell 1000	Domestic Equity Liquidity Large Cap/Mid Cap	MSCI World USA
Synthetic US Large Cap	Russell 1000	Domestic Equity Liquidity Large Cap/Mid Cap	MSCI World USA

Motion: A motion was made by Mr. Heimsoth and seconded by Mr. Anderson to recommend to the Board the approval of the changes to the passive US portfolio benchmarks as recommended by Verus Advisory. The motion passed unanimously.

4. Investment Guidelines Preview

Ms. Klaskin and Mr. Villa referred to the presentation on pages 46-52 in the meeting materials as they updated the Committee with their progress in incorporating recommendations from Wilshire Associates' comprehensive review of SWIB's Investment Guidelines. Ms. Klaskin walked the Committee through proposed format ideas and preliminary language clarifying roles and responsibilities, specifically for the Investment Committee, and answered questions, particular about the timing for completion of her work and for presentation again to the Committee and ultimately to the Board for adoption.

Ms. Klaskin thanked the IC members for their input during this discussion and encouraged staff to contact her if they have any additional feedback or suggestions.

5. New Investment Instrument Proposal-Delivery Versus Payment (DVP) Repo

Andrea Ruiz, Portfolio Manager-Liquidity, Inflation & Rates Management Team (LIRM) presented a proposal to engage in Delivery Versus Payment (DVP) repo within the State Investment Fund (SIF) in order to give the SIF access to additional repo sources. Ms. Ruiz noted that DVP was previously used in the SIF, but moved to using Triparty (TRP) repo many years ago.

Mr. Anderson added that technological changes have made DVP repo a more attractive option than it once was from an operational standpoint. He also confirmed that the CTF engages in DVP repo within the Parametric Capsule with funding sources that were negotiated in three bilateral Master Repurchase Agreements (MRAs) for the Core Trust Fund. He noted that the strategy fits in well with SWIB's liquidity management program.

Ms. Ruiz stated that current investment guidelines still allow for DVP repo transactions and explained that from an operational perspective, SWIB already has the infrastructure for the DVP repo trades in place. She further stated they would be able to follow the same trade flow that SWIB currently uses for TRP repos, with a couple of new steps at the end of the process that include **(a)** receiving the expected collateral list from the counterparty and verifying that all are allowable/eligible; and **(b)** providing expected collateral listing to BNYM for acceptance and trade execution.

Ms. Ruiz walked the Committee through their presentation on pages 58-62, in which she had provided further details regarding **(a)** the implementation strategy; **(b)** investments risks to be managed; and, **(c)** the operational architecture and workflow, and then she and Mr. Anderson answered questions, in particular about collateral review responsibilities associated with this strategy.

Motion: A motion was made by Mr. Ludgate and seconded by Mr. Gandhi to approve the use of DVP repo strategy, with the understanding that allocation of resources decisions is made at the senior management team level. The motion passed unanimously.

6. Funds Alpha Q3 2016

Mr. Garcia presented the 2016 Funds Alpha Strategy Q3 Update. A copy of his presentation was included in the meeting materials on pages 63-82. He reviewed the team's progress on key goals for 2016 and the market/cycle outlook, and highlighted as key takeaways, that **(a)** it is an uncertain and low return environment for risk assets (beta); **(b)** there is higher steady-state volatility and wider swings; **(c)** alpha in developed markets is more efficient; and **(d)** alternative beta is attractive. Mr. Garcia added that the team are re-evaluating the portfolio post-election and are cautiously more optimistic on economy and risk assets, but are not likely to change fundamental portfolio activities.

Referring to exhibits on page 67, Mr. Garcia reported **(a)** negative EVA year-to-date for both the Hedge Fund portfolio and the Beta One managers; **(b)**negative EVA for Beta One coming from risk parity; **(c)** higher AUM for Beta One due to market growth and new strategies; and **(d)** Hedge Fund AUM also increased substantially.

Mr. Garcia then walked the Committee through illustrations for priorities, key risks, completed allocations, new managers and tentative allocations in the pipeline, and portfolio performance for the third quarter, plus October, for both the Hedge Fund and Beta One strategies, in particular the management of the risk parity benchmark misfit, and answered questions.

Note: The Investment Committee took a break from 3:14 p.m. to 3:26 p.m.

7. Private Debt Q3 2016 Update

Mr. Prestigiacomo presented the *SWIB Private Debt Portfolio Quarterly Investment Committee Report-September 2016*. A copy of his report was included in the meeting materials on pages 83-85.

Mr. Prestigiacomo reported that, at September 30, 2016, the Private Debt Portfolio Asset Value (Par) was $468,027,938. He highlighted several exhibits in the report that provided high-level portfolio characteristics, a snapshot of the strategy allocation for SWIB's Private Debt Portfolio, and a summary of non-Wisconsin investments.

Mr. Prestigiacomo highlighted that, at the end of the third quarter, preliminary performance shows the portfolio about 66 basis points above its benchmark year-to-date and also ahead of the benchmark for the one-, two-, three-, five-, and ten-year periods.

8. Motion to Convene in Closed Session

Motion: A motion to go into closed session pursuant to § 19.85(1)(e) and § 19.36(5) of the Wisconsin Statutes to consider confidential strategies for the investment of public funds was made by Mr. Carpenter and seconded by Mr. Garcia.

The Chair called for a roll call vote.

Anderson-Aye	Carpenter-Aye	Garcia-Aye	Gandhi-Aye
Heimsoth-Aye	Hellmer-Aye	Ludgate-Aye	Prestigiacomo-Aye
Stanton-Aye	Villa-Aye	Williamson-Aye	

There being eleven ayes and no nays, the Chair declared the motion passed. The Committee then convened in closed session at 3:26 p.m. and reconvened in open session at 4:36 p.m.

9. Announcement of Committee Actions Relating to Items Taken up in Closed Session

Mr. Villa announced that, while in closed session, the Committee discussed **(a)** confidential private debt and venture capital investment strategies; **(b)** specific and confidential investment strategies in the exposure management portfolios; and **(c)** total and active risk for both the Core and Variable Trust Funds.

10. Currency Task Force Report

Mr. Gandhi referred to the Currency Task Force November 17, 2016 meeting agenda included on page 163 in the materials, as he highlighted, in particular, the *Long-run Exchange Rate*

Forecast presentation by Professor Ananth Seshadri from the UW-Madison's Department of Economics to both the Currency Task Force and the Research Task Force on November 17, 2016.

11. Credit Task Force Report

Jon Simon, newly appointed Chair of the Credit Task Force, referred to the Credit Task Force November 14, 2016 meeting agenda included on page 164 in the materials, as he highlighted the negotiations regarding new agreements with counterparties, and his plans to review and update the Task Force's mission and objective statement as a way to prepare himself to chair the group.

12. Research Task Force Report

Mr. Ludgate referred to the *Staff Research Task Force Report to Investment Committee* dated November 2016, which was included in the meeting materials on page 165. He highlighted the list of completed projects and updated the Committee on the projects in progress, including the Economic Market Cycle/Dashboard project and the Long-term Currency Valuation project.

13. Derivatives Report

Mr. Villa stated that the *Derivative Overview for September 30, 2016*, was included on page 166 in the meeting materials for the Committee's review and that there would be no formal presentation unless there were questions. There were no questions.

14. Soft Risk Parameters Report

Mr. Heimsoth stated that the report, *Soft Risk Parameters-Asset Class and Portfolio* dated October 31, 2016 was included on pages 169-172 in the meeting materials for the Committee's review and that there would be no formal presentation unless there were questions.

15. Future Meeting Topics

Mr. Villa noted that the summary of annual IC routine agenda topics was included on pages 173-174, and that copies of the proposed agendas for the December 20, 2016 and January 24, 2017 IC meetings were included on pages 175-178.

Mr. Villa asked that any items for the Committee's future consideration be shared with Ms. Wiemann or be brought directly to him.

16. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Carpenter and seconded by Mr. Ludgate. The motion passed unanimously and the meeting adjourned at 4:48 p.m.

Date of Committee Approval: 12/20/2016

Signed: */ s / Scott M. Anderson*

Scott M. Anderson
Investment Committee Secretary

STATE OF WISCONSIN INVESTMENT BOARD
Investment Committee Meeting-Open Session

Tuesday, December 20, 2016
Offices of the Investment Board
121 East Wilson Street, Madison, Wisconsin

Committee Members Present: David Villa, Chief Investment Officer (Chair)
Chuck Carpenter, Managing Director-Private Markets & Funds Alpha (Vice-Chair)
Scott Anderson, Head of Asset & Risk Allocation (Secretary)
Todd Ludgate, Managing Director-Public Fixed Income
Brian Hellmer, Managing Director-Public Equities
Dominic Garcia, Funds Alpha Manager
Chirag Gandhi, Portfolio Manager-Global Bonds
Chris Prestigiacomo, Portfolio Manager-Private Debt & WI Private Equity
Nick Stanton, Portfolio Manager-Multi-Asset Strategy
Brian Heimsoth, Quantitative Manager-Asset Risk & Allocation

Also in Attendance: Rochelle Klaskin, Chief Legal Counsel
Elizabeth Fadell, Strategic Planning & Transformation Director
Shirley Eckes, Chief Operating Officer
Andrea Ruiz, Portfolio Manager-Liquidity, Inflation & Rates Mgmt.
Brandon Brickner, Internal Audit Director
David Meyer, Head Trader
Steve Spiekerman, Portfolio Manager-Real Estate
Scott Parrish, Portfolio Manager-Private Equity
Derek Drummond, Managing Analyst-Funds Alpha
Randy Eggert, Managing Analyst-Real Estate
James Laufenberg, Managing Analyst-Real Estate
TerriJo Saarela, Corporate Governance Manager
Dev Desai, Enterprise Risk Manager
Kurt Petrie, Internal Auditor
Shana Ullsvik, Compensation Analyst
Chris Preisler, Communications Specialist
Janet Klosterman, Legal Assistant
Barry Dennis, Verus Advisory (by telephone)
Eileen Neill, Wilshire Associates (by telephone)
(Some individuals may have attended only portions of the meeting.)

OPEN SESSION

With a quorum present, Mr. Villa called the meeting to order at 1:02 p.m.

1. Approval of the Minutes

Mr. Villa asked if there were any comments on either the open or closed session minutes of the November 22, 2016 Investment Committee (IC) meeting. Hearing no comments, Mr.

Villa stated that the Committee could approve both the open and closed session minutes in open session.

Motion: A motion was made by Mr. Anderson and seconded by Mr. Hellmer to approve both the open session and the closed session minutes of November 22, 2016 IC meeting, as presented. The motion passed unanimously.

2. Spring Investment Forum Preview

Mr. Laufenberg updated the Committee on the planning underway for the 2017 Spring Investment Forum to be held at the Monona Terrace on April 19, 2017. He stated that Al Rauch is chairing the planning committee comprised of Dan Cox, Gaurav Kapoor, John Burkhartzmeyer, Pu Shen, Todd Smith, and himself. Mr. Laufenberg highlighted several planned presentation topics (behavioral finance, trading strategies, long-term debt cycle; Brexit, and artificial intelligence) and discussed potential presenters for each topic, and answered questions.

3. Approval of Commission Management Program Policy

Ms. Klaskin and Messrs. Stanton and Meyer reminded the Committee that they had discussed a proposal to implement a Commission Management Program (CMP) with the IC at the June meeting. Ms. Klaskin noted that a copy of their June presentation was included on pages 17-23 for the Committee's reference. During the June presentation, development of a CMP policy was identified as their next step.

Ms. Klaskin explained that a draft *Commission Management Program Policy & Procedures* was included on pages 11-16, for the Committee's review and discussion. The policy sets forth what types of research and brokerage services SWIB can utilize with brokerage credits under the CMP consistent with the SEC's guidance and safe harbor rules.

Ms. Klaskin explained that Messrs. Stanton and Meyer were seeking IC approval of the policy and a recommendation that the Board approve the proposed policy and procedures at the February 8, 2017 meeting.

Ms. Klaskin further explained that, in 2005, the Board determined to discontinue use of Commission Sharing Arrangements (CSAs). However, in 2006, the Securities Exchange Commission (SEC) released guidance regarding the use of CSAs and their usage is now commonplace in the industry. Because the Board took formal action in 2005 to discontinue CSA use by SWIB, formal action by the Board approving to reinstate the use of a CMP is necessary.

Ms. Klaskin and Messrs. Stanton and Meyer answered questions and facilitated the Committee's discussion, which resulted in the following motion:

Motion: A motion was made by Mr. Anderson and seconded by Mr. Hellmer that it approve the *Commission Management Program Policy & Procedures* as shown on pages 11-18 in the meeting materials and to recommend to the Board that they approve the use of a CMP at SWIB. The motion passed unanimously.

4. Private Equity Q3 2016

Scott Parrish, Portfolio Manager, presented the *Quarterly Activity Report, as of September 30, 2016 for Private Equity.* A copy of his report was included in the meeting materials on pages 24-32.

Mr. Parrish reported that, at September 30, 2016, the Private Equity Market Value[1] was $6.1 billion and total exposure was $10.4 billion (12.2% of the CTF).

Mr. Parrish highlighted several exhibits included in the report that provided a snapshot of the Private Equity Portfolio's investment activity (current and historical), the diversification of SWIB's Private Equity Portfolio by industry risk type and by geographic and sub-asset class strategy.

Mr. Parrish also reviewed **(a)** the performance results versus the benchmark for various periods for the Core Portfolio (#304) and the Current Return Portfolio (#345), which were included on page 26, reporting positive performance relative to the benchmarks for all reporting periods for both portfolios; and **(b)** the private equity commitments made during the quarter ending September 30, 2016, as shown on page 32. SWIB committed $285 million to six partnerships and $0 to new co-investments during the Q3.

The Committee asked Mr. Parrish to provide more information about and comparisons to his benchmark for future presentations.

5. Real Estate Q3 2016 Update

Steve Spiekerman, Portfolio Manager, presented the *Quarterly Activity Report as of November 30, 2016 for Real Estate.* A copy of his report was included in the meeting materials on pages 33-38.

Mr. Spiekerman noted that, in accordance with SWIB's Investment Guidelines, the asset allocation target for Real Estate is set at 7% of the Core Fund (CTF), with a policy range of 4% to 10%. He reported that, at November 30, 2016, the Real Estate Market Value[2] was 7.0% of the CTF with a real estate market value of approximately $6.2 billion with unfunded commitments of approximately $1.5 billion, and total exposure of $7.7 billion. He noted that the Board has increased the asset allocation target to 8% of the CTF for Real Estate for 2017.

Mr. Spiekerman highlighted the portfolio's annual investment activity for the prior five years and the snapshot/forecast for the Real Estate Equity Portfolio classified by three prevalent industry risk types and overall leverage ratio shown on pages 35-36. He highlighted that in accordance with the soft risk parameters in SWIB's Investment Guidelines, the Real Estate Portfolio is limited to a minimum of 50% in Core holdings, and a maximum of 30% in Value

[1] The market value is from StepStone's database as of September 30, 2016. The market value is for the Core Private Equity Portfolio (#304), the Co-Investment Portfolio (#321), the Current Return Portfolio (#345) and the Legacy Portfolio (#503). It does not include the Private Debt Portfolios and the Venture Capital Portfolios.

[2] Market value is as of June 30, 2016, adjusted for cash flows through November 30, 2016. The market value is for the Real Estate Equity Portfolio (461).

holdings and 30% in Opportunistic holdings. Mr. Spiekerman reported that as of November 30, 2016, the Core holdings were well above the 50% minimum requirement, at 72%.

Mr. Spiekerman reviewed the illustrations on page 37 comparing performance of the Real Estate Equity Portfolio (#461) and performance attribution by risk profile and property type. He also reviewed the deals currently in the pipeline and the list of Real Estate Commitments made during the quarter ending December 31, 2016 on page 38 and answered questions.

The Committee also asked Mr. Spiekerman to provide more information about and comparisons to his benchmark for future presentations.

6. Motion to Convene in Closed Session

Motion: A motion to go into closed session pursuant to § 19.85(1)(e) and § 19.36(5) of the Wisconsin Statutes to consider confidential strategies for the investment of public funds was made by Mr. Carpenter and seconded by Mr. Gandhi.

The Chair called for a roll call vote.

Anderson-Aye	Carpenter-Aye	Gandhi-Aye	Garcia-Aye
Heimsoth-Aye	Hellmer-Aye	Ludgate-Aye	Prestigiacomo-Aye
Stanton-Aye	Villa-Aye		

There being ten ayes and no nays, the Chair declared the motion passed. The Committee then convened in closed session at 1:55 p.m. and reconvened in open session at 4:12 p.m.

7. Announcement of Committee Actions Relating to Items Taken up in Closed Session

Mr. Villa announced that, while in closed session, the Committee discussed **(a)** confidential funds alpha, fixed income and multi-asset investment strategies for 2017 and also approved the same; **(b)** discussed credit terms related to a new counterparty; **(c)** specific and confidential investment strategies in the exposure management portfolios; and **(d)** total and active risk for both the Core and Variable Trust Funds.

8. Soft Risk Parameters Report

Mr. Heimsoth stated that the report, *Soft Risk Parameters-Asset Class and Portfolio* dated November 30, 2016 was included on pages 134-135 in the meeting materials for the Committee's review and that there would be no formal presentation unless there were questions. There were no questions.

9. Future Meeting Topics

Mr. Villa noted that the summary of annual IC routine agenda topics was included on pages 136-137 and that copies of the proposed open session agendas for the January 24, 2017 and February 28, 2017 IC meetings were included on pages 138-141.

Mr. Villa asked that any items for the Committee's future consideration be shared with Ms. Wiemann or be brought directly to him.

10. Adjournment

Motion: A motion to adjourn the meeting was made by Mr. Carpenter and seconded by Mr. Anderson. The motion passed unanimously and the meeting adjourned at 4:14 p.m.

Date of Committee Approval: 1/24/2016

Signed: */ s / Scott M. Anderson*

Scott M. Anderson
Investment Committee Secretary

Staff Investment Committee Meeting

Tuesday, January 24, 2017
STATE OF WISCONSIN INVESTMENT BOARD
121 East Wilson Street
Madison, Wisconsin
Presentation Room
1:00 p.m.

Est. Time (minutes) **OPEN SESSION**

1. **Approval of the Minutes - Open Session**
   A. December 20, 2016

10 2. **Quarterly Performance Review** – Brad Gentert

5 3. **Spring Investment Forum Preview –** Al Rauch

10 4. **Investment Guidelines Changes –** Nick Stanton and Rochelle Klaskin

10 5. **Fixed Income Q4 2016 Update –** Todd Ludgate

10 6. **Public Equities Q4 2016 Update –** Brian Hellmer

10 7. **Multi-Asset Q4 2016 Update** – Nick Stanton

CLOSED SESSION*

RECONVENE IN OPEN SESSION

8. **Announcement of Committee Actions Relating to Items Taken up in Closed Session**

9. **Soft Risk Parameters** (No presentation unless requested)

10. **Future Meeting Topics**

11. **Motion to Adjourn**

NOTES: Items may be taken in order other than listed.

The meeting site is physically accessible. Upon prior request,

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*A motion to go into closed session at this meeting is authorized pursuant to § 19.85(1)(e) and §19.36(5) of the Wisconsin Statutes to approve prior closed session minutes and to consider confidential strategies for the investment of public funds. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

reasonable accommodations will be provided.

FUTURE MEETINGS	Investment Committee Members:
2/28/17 – February Committee Mtg.	Chief Investment Officer: David Villa (Chair)
3/28/17 – March Committee Mtg.	Managing Director-Private Markets & Funds Alpha: Chuck Carpenter (Vice-Chair)
4/19/17 – Spring Investment Forum	Head of Asset & Risk Allocation: Scott Anderson (Secretary)
4/25/17 – April Committee Mtg.	Managing Director-Public Equities: Brian Hellmer
5/23/17 – May Committee Mtg.	Managing Director-Fixed Income: Todd Ludgate
6/27/17 – June Committee Mtg.	Portfolio Manager: Chirag Gandhi
7/25/17 – July Committee Mtg.	Portfolio Manager: Chris Prestigiacomo
8/22/17 – August Committee Mtg.	Portfolio Manager: Nick Stanton
9/26/17 – September Committee Mtg.	Funds Alpha Manager: Dominic Garcia
10/24/17 – October Committee Mtg.	Quantitative Manager: Brian Heimsoth
11/28/17 – November Committee Mtg.	Executive Director: Michael Williamson
12/21/17 – December Committee Mtg.	

Staff Investment Committee Meeting

Tuesday, February 28, 2017
STATE OF WISCONSIN INVESTMENT BOARD
121 East Wilson Street
Madison, Wisconsin
Presentation Room
1:30 p.m.

Est. Time (minutes)		
	OPEN SESSION	
	1.	**Approval of Minutes - Open Session** A. January 24, 2017
5	2.	**Spring Investment Forum Preview –** Al Rauch
5	3.	**Currency Task Force Report –** Chirag Gandhi
5	4.	**Credit Task Force Report –** Jon Simon
5	5.	**Research Task Force Report –** Todd Ludgate
10	6.	**Funds Alpha Q4 2016 Update –** Dominic Garcia
10	7.	**Private Debt Q4 2016 Update –** Chris Prestigiacomo
	CLOSED SESSION*	
	RECONVENE IN OPEN SESSION	
	2.	**Announcement of Committee Actions Relating to Items Taken up in Closed Session**
	3.	**Derivatives Report** (No presentation unless requested)
	4.	**Soft Risk Parameters** (No presentation unless requested)
	5.	**Future Meeting Topics**
	6.	**Motion to Adjourn**

NOTES: Items may be taken in order other than listed.

*A motion to go into closed session at this meeting is authorized pursuant to § 19.85(1)(e) and §19.36(5) of the Wisconsin Statutes to approve prior closed session minutes and to consider confidential strategies for the investment of public funds. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

The meeting site is physically accessible. Upon prior request, reasonable accommodations will be provided.

FUTURE MEETINGS	<u>Investment Committee Members</u>:
3/28/17 – March Committee Mtg. 4/19/17 – Spring Investment Forum 4/25/17 – April Committee Mtg. 5/23/17 – May Committee Mtg. 6/27/17 – June Committee Mtg. 7/25/17 – July Committee Mtg. 8/22/17 – August Committee Mtg. 9/26/17 – September Committee Mtg. 10/24/17 – October Committee Mtg. 11/28/17 – November Committee Mtg. 12/21/17 – December Committee Mtg.	Chief Investment Officer: David Villa (Chair) Managing Director-Private Markets & Funds Alpha: Chuck Carpenter (Vice-Chair) Head of Asset & Risk Allocation: Scott Anderson (Secretary) Managing Director-Public Equities: Brian Hellmer Managing Director-Fixed Income: Todd Ludgate Portfolio Manager: Chris Prestigiacomo Funds Alpha Manager: Dominic Garcia Portfolio Manager: Chirag Gandhi Portfolio Manager: Nick Stanton Quantitative Manager: Brian Heimsoth Executive Director: Michael Williamson

Staff Investment Committee Meeting

Tuesday, March 28, 2017
STATE OF WISCONSIN INVESTMENT BOARD
121 East Wilson Street
Madison, Wisconsin
Presentation Room
1:30 p.m.

Est. Time (minutes)		OPEN SESSION
		1. **Approval of the Minutes - Open Session**
		A. February 28, 2017
5		2. **Spring Investment Forum Preview –** Al Rauch
5		3. **Transition Update -** Kim Bartz
10		4. **Private Equity Q4 2016 Update –** Scott Parrish
10		5. **Real Estate Q4 2016 Update** – Steve Spiekerman
		CLOSED SESSION*
		RECONVENE IN OPEN SESSION
		6. **Announcement of Committee Actions Relating to Items Taken up in Closed Session**
		7. **Soft Risk Parameters** (No presentation unless requested)
		8. **Future Meeting Topics**
		9. **Motion to Adjourn**

NOTES: *Items may be taken in order other than listed.*

The meeting site is physically accessible. Upon prior request, reasonable accommodations will be provided.

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*A motion to go into closed session at this meeting is authorized pursuant to § 19.85(1)(e) and §19.36(5) of the Wisconsin Statutes to approve prior closed session minutes and to consider confidential strategies for the investment of public funds and the negotiations of contracts where the discussions require a closed session due to competitive reasons. The Committee may convene in additional closed sessions or announce additional closed session items at the meeting in accordance with the procedure outlined in the Attorney General's Opinion reported at 66 OAG 106 (1977). Whenever a closed session is held, the committee will subsequently reconvene in open session to cover remaining agenda items.

FUTURE MEETINGS

4/19/17 – Spring Investment Forum
4/25/17 – April Committee Mtg.
5/23/17 – May Committee Mtg.
6/27/17 – June Committee Mtg.
7/25/17 – July Committee Mtg.
8/22/17 – August Committee Mtg.
9/26/17 – September Committee Mtg.
10/24/17 – October Committee Mtg.
11/28/17 – November Committee Mtg.
12/21/17 – December Committee Mtg.

Investment Committee Members:

Chief Investment Officer: David Villa (Chair)
Managing Director-Private Markets & Funds Alpha: Chuck Carpenter (Vice-Chair)
Head of Asset & Risk Allocation: Scott Anderson (Secretary)
Managing Director-Public Equities: Brian Hellmer
Managing Director-Fixed Income: Todd Ludgate
Portfolio Manager: Chris Prestigiacomo
Funds Alpha Manager: Dominic Garcia
Portfolio Manager: Chirag Gandhi
Portfolio Manager: Nick Stanton
Quantitative Manager: Brian Heimsoth
Executive Director: Michael Williamson

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Date: February 8, 2017

To: Board of Trustees

From: Rochelle Klaskin, Chief Legal Counsel

Re: Proposed Change to Investment Guidelines

Paragraph 12 of SWIB's investment guidelines currently state that over-the-counter (OTC) derivatives may be traded only with counterparties with which SWIB has a current International Swap and Derivative Association (ISDA) agreement. This is an appropriate restriction with regards to swaps, options, and many other OTC products where SWIB is setting terms of the derivative with a counterparty.

However, the SEC also defines exchange-traded funds (ETFs), exchange-traded notes (ETNs), and exchange-traded vehicles (ETVs) as derivatives. The fundamental value of these securities is determined by the rules in each security's prospectus, and as the names of these products indicate, most trade over exchanges. However, SWIB may have reason to invest in these securities after they delist from exchanges.

To purchase these securities, a SWIB portfolio would use an OTC market-maker to locate sellers/buyers of the securities (just as would occur if SWIB were purchasing a stock in an OTC market, and for which there are no investment guideline restrictions). In this case, the market-maker would be considered SWIB's counterparty, and SWIB is unlikely to have signed an ISDA with these counterparties. As such, the current investment guideline language would prevent any SWIB portfolio from purchasing these securities over-the-counter. This is an unintended consequence of the language. We recommend changing the language in the investment guidelines to exclude ETFs, ETNs, and ETVs from being restricted under this rule.

We also seek to add language that clarifies that ETFs, ETNs, and ETVs should also be excluded from the restrictions in paragraph 11 of the Investment Guidelines, as that language is also meant to refer to options and futures contracts.

INVESTMENT POLICY, OBJECTIVES, AND GUIDELINES

GENERAL GUIDELINES
INTERNAL MANAGEMENT

The following compulsory guidelines are applicable to all internally managed portfolios. Individual portfolio guidelines appear subsequently. . . . .

11. Exchange-traded derivatives must be traded on a recognized exchange approved by the Investment Committee. Portfolios authorized to trade option contracts may do so as long as they are traded on an exchange, board of trade, or an over-the-counter market regulated under the laws of the United States or other developed countries. For clarity, exchange-traded funds (ETFs), exchange-traded notes (ETNs), or exchange-traded vehicles (ETVs) shall not be deemed exchange-traded derivatives for purposes of this Item 11.

12. Over-the-counter (OTC) derivatives may be traded only with counterparties with which SWIB has a current International Swap and Derivative Association (ISDA) agreement.

    OTC derivatives including swaps may only be used within public equity portfolios and other portfolios with specific authority as an alternative to physical securities when it is deemed advantageous for portfolio construction. Guideline limits and soft parameters for each portfolio will be applied to the aggregate exposures which includes both physical and synthetic securities.

    For clarity, this Item 12 does not apply to exchange-traded funds (ETFs), exchange-traded notes (ETNs), and exchange-traded vehicles (ETVs), or to over-the-counter derivatives entered into on behalf of SWIB, or a title-holding entity that is wholly-owned by SWIB, by an external manager or advisor in connection with a real estate separate account.

Private Equity Commitments*

October 2016 – December 2016

Investment	*Commitment (millions)*
Apollo European Principal Finance Fund III, L.P.	$50
Benefit Street Partners Debt Fund IV, L.P.	$100
Procuritas Capital Investors VI	$28
Vista Equity Partners Fund VI, L.P.	$50
Warburg Pincus China, L.P.	$45
Information Technology Co-Investment	$10
Materials Co-Investment	$10
Total	**$293**

**Includes Current Return Portfolio and Co-Investments*

Real Estate Commitments

October 2016 – December 2016

Investment	*Commitment (millions)*
Wilson HCF Wisconsin Holdings 6, LLC	$150
Carson Companies Industrial JV	$90
Total	**$240**

SWIB STATE OF WISCONSIN INVESTMENT BOARD

Funds Alpha Commitments*

October 1 2016 – December 31 2016

Investment	*Commitment (millions)*
Investcorp	$160
Dorsal	$10
DE Shaw	$1,250
Marshall Wace	$150
Stone Milliner	$25
Coastland	$25
AB	$375
Two Sigma	$40
Total	**$2,035**

**Includes Hedge Funds and Beta One*

STATE OF WISCONSIN INVESTMENT BOARD

Date: February 8, 2017

To: Trustees

From: Michael Williamson & Rochelle Klaskin

Re: **LAB Management Audit Governance Recommendation – Background for Board Self-evaluation**

The Legislative Audit Bureau's (LAB's) most recent management audit contained a recommendation that relates to the Board's current governance structure. The purpose of this memo is to summarize the recommendation and its context, provide added background, and to list possible options to consider.

Context for the LAB Recommendation

LAB's report referenced a study that was commissioned by the Pennsylvania State Employees' Retirement System (SERS). SERS requested a study to review to find ways to improve the effectiveness of their Board to better serve the needs of the Retirement System's participants and employers. According to the study report, the review followed a series of events that had impacted the organization including the departure of a long-time chairman of the Board after more than 20 years of service, enactment of Retirement Code changes, extensive staffing turnover in key positions, and eroding public confidence in SERS after allegations of misconduct. Although ultimately no wrong doing was found, that plus the other factors placed the entire organization under severe stress.

Unlike SWIB, SERS operates as a combined SWIB and ETF model, meaning that its responsibilities include investment management and benefit administration. It is not a dedicated investment board. SWIB currently has four standing committees and has had a trustee governance manual since 2004. Also, the majority of trustees attend all committee meetings whether or not they are committee members.

LAB's report noted the following: *"Overall, the study found that, on average, the public pension plan boards had six to seven committees.*[1] *The study also identified several committees that are typically part of a public pension plan committee structure that SWIB does not currently have a dedicated committee and that are relevant to SWIB's fiduciary responsibilities. For example, eight of the boards had a committee that focused solely on finance and budget issues. In addition, seven of the boards had a committee that focused on shareholder responsibility and corporate governance issues. Finally, 14 of the 16 public pension plan boards had an investment committee."* LAB concluded that SWIB's current Investment Committee structure appears to meet the purpose that other public pension plans meet through a dedicated board committee since the Board receives the committee agendas prior to each meeting and all committee minutes and the business of the Investment Committee is reported to the Board. In addition, the Board receives frequent and regular updates from staff and consultants and trustees attend a two-day workshop relating to investment issues. The SERS report noted that on average board investment committees meet for 25.4 hours annually. In 2016, SWIB Board members spent at least 35 hours on investment related matters during Board meetings.

LAB noted in their report that the Strategic Planning and Corporate Governance (SPCG) Committee's charter has included similar responsibilities since at least 2005. In 2014, the committee began receiving quarterly updates on the ARIES system implementation. More recently, the number of committee agenda items in addition to ARIES

[1] However, the study only recommended five standing committees for SERS, one of which would only be convened as necessary to manage securities litigation

has also increased. LAB also noted that no board committee charter includes an explicit oversight responsibility to monitor actual investment expenses.

The SPCG committee's charter currently only states that one of its functions includes "reviewing SWIB's annual budget." However, in practice, the SPCG committee reviews actual total cost of management through the budget review. Additionally, the Board receives a cost benchmarking report from a third party consultant that includes and analyzes the actual total cost of management for SWIB each year.

As part of a broader recommendation, LAB recommended that SWIB "*include in the Board's next self-evaluation an assessment of whether its existing committee structure or committee charters should be revised.*"

<u>Options to Consider for the Board's Self-evaluation</u>

- Add one or more committees
- Modify an existing committee and/or charter
- No changes

STATE OF WISCONSIN INVESTMENT BOARD

Pursuant to each committee charter, the Board Chair shall appoint members of each committee and appoint committee members to serve as committee chair, vice chair and secretary for terms not to exceed one year. These appointments for SWIB's standing committees shall be in effect until February 28, 2018**.**

Audit Committee

Norm Cummings, Chair
Bob Conlin, Vice Chair & Secretary
Tim Sheehy
Paul Stewart

Jeff Anderson, State Controller, ex-officio
Joe Chrisman, State Auditor, ex-officio

Benchmark Committee

Sandra Claflin-Chalton, Chair
Paul Stewart, Vice Chair & Secretary
Mark Doll
David Stein

Compensation Committee

David Stein, Chair
Mark Doll, Vice Chair & Secretary
Barb Nick
Tim Sheehy

Strategic Planning and Corporate Governance Committee

Barb Nick, Chair
Norm Cummings, Vice Chair & Secretary
Sandra Claflin-Chalton
Bob Conlin
Secretary Neitzel