MINNESOTA STATE BOARD OF INVESTMENT

MINNESOTA STATE BOARD
OF INVESTMENT
MEETING
December 11, 2018

Governor Mark Dayton

State Auditor Rebecca Otto

Secretary of State Steve Simon

Attorney General Lori Swanson

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STATE BOARD OF INVESTMENT

AGENDA AND MINUTES

December 11, 2018

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AGENDA
STATE BOARD OF INVESTMENT MEETING
Tuesday, December 11, 2018
10:00 A.M.
G23 Senate Committee Room
State Capitol
75 Rev. Dr. Martin Luther King Jr. Boulevard
St. Paul, MN

	TAB
1. Approval of Minutes of September 14, 2018	
2. Report from the Executive Director (Mansco Perry)	
A. Quarterly Performance Summary (July 1, 2018 – September 30, 2018)	**A**
B. Administrative Report 1. Reports on Budget and Travel 2. FY18 Audit Report 3. Draft of FY18 Annual Report 4. Meeting Dates for Calendar 2019 5. Sudan Update 6. Iran Update 7. Litigation Update	**B**
3. Update Regarding SBI Staffing and Salary Administration Plan	**C**
INVESTMENT ADVISORY COUNCIL REPORT	
4. Proposed Private Markets Commitments (Gary Martin)	**D**
5. Public Markets, Non-Retirement, and Participant Directed Investment Programs	**E**
REPORTS	
6. AON Market Environment Report	**F**
7. PCA Investment Market Risk Metrics	**G**
8. Comprehensive Performance Report	**H**
9. Other Items	

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Minutes
State Board of Investment
September 14, 2018

The State Board of Investment (SBI) met at 10:38 A.M. Thursday, September 14, 2018 in G23 Senate Committee Room of the State Capitol, St. Paul, Minnesota. Governor Mark Dayton, State Auditor Rebecca Otto, Secretary of State Steve Simon, and Attorney General Lori Swanson were present. The minutes of the June 14, 2018 meeting were approved.

Executive Director's Report

Mr. Perry referred members to Tab A of the meeting materials and stated that, as of June 30, 2018, the SBI was responsible for managing over $96.2 billion of assets. Mr. Perry reported that the Combined Funds had outperformed its Composite Index over the ten-year period ending June 30, 2018 (Combined Funds 7.8% vs. Combined Funds-Composite Index 7.4%) and had provided a real rate of return of 4.6 percentage points above inflation over the latest 20 year period (Combined Funds 6.8% vs. CPI 2.2%).

Mr. Perry stated that the assets increased over the quarter (Combined Funds ending value of $68.3 billion versus a beginning value of $67.8 billion). Mr. Perry stated that the Combined Funds outperformed the benchmark for the quarter (Combined Funds 1.5% vs. Combined Funds-Composite Index 1.4%) and was ahead of the benchmark for the year (Combined Funds 10.3% vs. Combined Funds-Composite Index 9.7%). The Combined Funds matched the benchmark over the three-year period and outperformed in all other time periods reported.

Mr. Perry reported that the asset mix, was close to target. He reported that public equity outperformed the benchmark during the quarter (Public Equity 2.0% vs. Public Equity Benchmark 1.7%) and the year (Public Equity 12.8% vs. Public Equity Benchmark 12.3%). Breaking it down between domestic and international equities, the domestic equity manager group outperformed its benchmark for the quarter (Domestic Equity 4.2% vs. Domestic Equity Benchmark 3.9%) and outperformed for the year (Domestic Equity 15.4% vs. Domestic Equity Benchmark 14.8%) has underperformed or matched the benchmark over all other time periods. The international equity manager group outperformed its target for the quarter (International Equity -2.4% vs. International Equity Benchmark -2.6%) and outperformed for the year (International Equity 7.5% vs. International Equity Benchmark 7.3%) and outperformed over all remaining time periods reported. Mr. Perry indicated that the fixed income segment outperformed its benchmark for the quarter (Fixed Income 0.0% vs. Fixed Income Benchmark -0.2%) and the year (Fixed Income 0.1% vs. Fixed Income Benchmark -0.4%) as well as over all other time periods reported. He reported that the Treasury portfolio underperformed the target (Treasuries 0.0% vs. Treasuries Benchmark 0.1%) for its first full quarter of performance. He stated that the private market investments contributed to performance for the quarter and the year (Total Private Markets return of 2.4% and 14.8%, respectively) and also over the longer time periods. He concluded his report noting that, within the Strategic Allocation Category Framework, the assets were within the category ranges. He also noted that relative to the volatility equivalent benchmark, the total fund had added value in all periods. Mr. Perry noted that the Combined Funds had achieved first quartile performance within the TUCS universe for each of the periods over the last 10 years.

Mr. Perry referred members to Tab B for the Administrative Report and indicated that the report included the current administrative budget and staff travel for the quarter and fiscal year 2018. He stated that Tab B also included summary information with respect to updates on restrictions for Iran and Sudan and stated that the SBI was not involved in any litigation.

Mr. Perry referred members to Tab C for the Investment Programs report containing five items. The first item was a recommendation to modify the public equity asset class targets with the goals of measuring the program in the way in which it is managed and gaining operational flexibility. He recommended that the Domestic Equity Program asset class target be changed from the Russell 3000 Index, to a static component weighting of the Russell 1000 and the Russell 2000 indices and that the International Equity Program asset class target be changed from the MSCI All Country World Index (ACWI) ex USA, to a static component weighting of the MSCI World ex USA and the MSCI Emerging Markets indices. He recommended that, within the Domestic Equity Program, the initial weights for the Russell 1000 Index and the Russell 2000 Index be set at 90% and 10% respectively and that, within the International Equity Program, the initial weights for the MSCI World ex USA Index and the MSCI Emerging Markets Index be set at 75% and 25%, respectively. Further, Mr. Perry recommended a +/- 20% rebalancing range for the small-cap and emerging markets allocations. Attorney General Swanson moved approval of the first recommendation in Tab C which reads: **"The Investment Advisory Council concurs with Staff's recommendation that the Board approve the changes to the Domestic Equity and the International Equity asset class targets as follows:**

1) **Domestic Equity - change from the Russell 3000 Index as the domestic equity target to the Russell 1000 Index (large-cap) representing 90% of the domestic equity target and the Russell 2000 Index (small-cap) representing 10% of the domestic equity target; and**

2) **International Equity - change from the MSCI ACWI ex USA as the international equity target to the MSCI World ex USA Index (developed markets) representing 75% of the international equity target and the MSCI Emerging Markets Index (emerging markets) representing 25% of the international equity target.**

The rebalancing range guidelines for assets are +/-10% of the respective allocation targets of each asset class. However, the rebalancing range for small-cap domestic equity and emerging markets will now be +/-20% of their respective allocation targets.

Staff will additionally review the small-cap and large-cap allocations within the Russell 3000 as well as the developed and emerging markets allocations within the MSCI ACWI ex USA on an annual basis and recommend additional changes to the Domestic Equity and International Equity asset class targets if warranted." The motion passed unanimously.

Mr. Perry referred members to the second item in Tab C and the recommendation, following the granting in the past year of the requisite legislative authority, to move certain Participant Directed Investment Programs, including the Unclassified Retirement Plan, the Health Care Savings Plan, and the Hennepin County Supplemental Retirement Plan, from the Supplemental Investment Funds to external mutual funds. He confirmed that the MSRS Board (MSRS administers the plans previously listed) approved this change. Mr. Perry referred members to page 7 of Tab C to show how the assets in the Supplemental Investment Fund would be mapped to the mutual fund options available in the State's 457 Deferred Compensation Plan. He stated that the fee impact to participants would be minimal. State Auditor Rebecca Otto moved approval of the second recommendation in Tab C which reads: **"The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director to transition the assets of the Unclassified Retirement Plan, the Health Care Savings Plan, and the Hennepin County Supplemental Retirement Plan as outlined in the summary provided in Table A and B."** The motion passed unanimously.

Mr. Perry referred members to the third item referenced in Tab C "Revised Recommendation for the BlackRock Long-Term Private Capital Fund" which was not included in the meeting materials but had been handed out at the meeting. He reminded members that at the last Board meeting a recommendation was presented to commit up to two billion dollars to this fund. However, members had concerns regarding the size of the commitment as well as questions about the terms of the fund. Mr. Perry stated that he had further discussions with BlackRock and that the manager had agreed, given the size of the overall relationship, to the SBI participating as a "Cornerstone" investor with a one billion dollar commitment. BlackRock further agreed that at that commitment level, the SBI would receive the favorable terms extended to Cornerstone investors, including a reduced management fee, a reduced carry fee, as well as a rebate from that carry fee for the first eight years of the fund. Responding to questions from members, Mr. Perry stated that the SBI already had approximately 27 billion dollars invested with BlackRock in U.S. equity passive and semi-passive strategies, a fixed income strategy, and in a couple of private market funds. State Auditor Rebecca Otto moved approval of the third recommendation in Tab C which reads: **"The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $1 billion, or 20% of BlackRock Long Term Private Capital Fund (LTPC) whichever is less. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by BlackRock upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on BlackRock or reduction or termination of the commitment."** The motion passed unanimously.

Mr. Perry referred members to an issue discussed at the last meeting regarding the Board's resolution to suspend future commitments to KKR funds and noted that a package of information had been distributed to the members at the meeting. He stated that since the last meeting, there had been communication between the Board, its staff, and KKR with respect to the situation at Toys "R" Us. In addition, during this time frame, KKR had set up an Employee Support Fund to provide monetary relief and other support for employees of Toys "R" Us. Mr. Perry requested that the Board reverse its resolution of suspending commitments to new KKR funds passed by the Board at the June 14, 2018 meeting. The Governor stated that it would be appropriate to hear from

Jim Baker, with the Private Equity Stakeholder Project and the United for Respect organizations, before the Board took action on this item. Joining Mr. Baker was Tyler Dziendiel and Michelle Perez who both had been employees at Toys "R" Us until the shutdown of the retailer. Both Ms. Perez and Mr. Dziendiel addressed the Board sharing the hardships they faced since losing their jobs at Toys "R" Us. Mr. Baker ended by thanking the Board for its attention to this matter and requested that the Board encourage Oaktree and Angelo Gordon to follow the lead of KKR and Bain Capital in supporting the laid off Toys "R" Us workers.

State Auditor Rebecca Otto reminded the Board that the SBI, as a Limited Partner (LP), was not able to direct the General Partners in any of these Funds. Auditor Otto made a motion to **"Rescind the Board's Resolution from the June 14, 2018 meeting suspending commitments to new KKR funds**." The motion passed unanimously.

Lastly, Mr. Perry referred members to the fifth item in Tab C which included a cover page entitled "Remarks on State Board of Investment (SBI) Administration". No memo was included in the meeting materials. He indicated that now, at the five-year mark of his tenure, he has been giving considerable thought to the near and longer-term future of the SBI's staffing and operations. Mr. Perry stated that he was pursuing an initiative to address three areas for the future of the organization: organizational structure (staffing), the SBI salary plan, and the SBI's statutory investment authority. Regarding the first item, he stated that he was reviewing the investment and administrative functions of the agency and that he is working with Commissioner Frans at Minnesota Management & Budget (MMB) to determine what changes are needed to allow the SBI's Executive Director to have the flexibility needed to appropriately staff the SBI. This will include review of the SBI's Salary Plan which has not been reviewed since 2008. Mr. Perry stated that he thinks it's necessary to look at a broader variety of positions both at the top of the organization and at the lower end of the organization. He also indicated that the SBI's authorized investment authority under *Minnesota Statutes*, Chapter 11A, drafted in the '70's and '80's, had not evolved with the investment options now available. Mr. Perry confirmed that any changes will ensure that the policies provide for the strong guidance and oversight provided by the Board and Investment Advisory Council (IAC). He expects to bring forth a proposal at the December 2018 meeting.

Mr. Perry concluded by saying that there were no additional private market recommendations this quarter. He also noted that the reporting for the remainder of the public assets, which represent over 80% of the fund, are included at the end of the meeting materials along with various other market reports.

The meeting adjourned at 11:25 a.m.

Respectfully submitted,

Mansco Perry III
Executive Director and
Chief Investment Officer

TAB A

Report from the Executive Director

Quarterly
Performance Summary

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Performance Summary

September 30, 2018

Description of SBI Investment Programs

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

Combined Funds

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

Participant Directed Investment Program

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

Non-Retirement

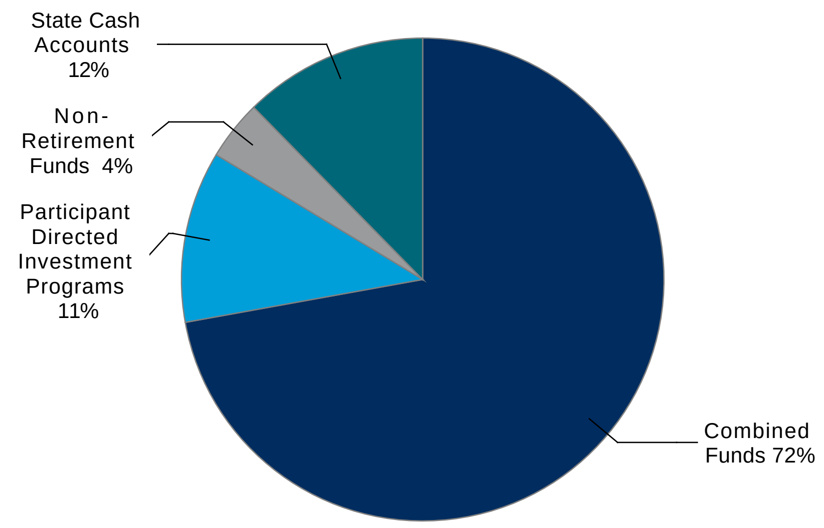
The Non-Retirement Funds are funds established by the State of Minnesota and other government entities for various purposes which include the benefit of public schools, the environment, other post-employment benefits, workers compensation insurance, and other purposes.

State Cash

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

Funds Under Management

	$ Millions
COMBINED FUNDS	
Combined Funds	$70,023
PARTICIPANT DIRECTED INVESTMENT PROGRAMS	
Supplemental Investment Fund*	3,839
State Deferred Compensation Plan**	5,874
Minnesota College Savings Plan	1,433
Achieve a Better Life Experience	3
NON-RETIREMENT FUNDS	
Assigned Risk Account	274
Permanent School Fund	1,444
Environmental Trust Fund	1,173
Closed Landfill Investment Fund	93
Miscellaneous	248
Other Post Employement Benefits	655
STATE CASH ACCOUNTS	
Treasurer's Cash	11,706
Other State Cash Accounts	281
TOTAL	
SBI AUM	97,045



* Includes assets of smaller retirement funds which are invested with the SBI but are not included in the Combined Funds

** Does not include the Stable Value and Money Market accounts that are used by Deferred Compensation and Supplemental Investment Fund

Note: Differentials within column amounts may occur due to rounding

Combined Funds Long Term Objectives

Comparison to Objective

Match or Exceed Composite Index (10 yr.)

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

	10 Year
COMBINED FUNDS	9.1%
COMBINED FUNDS - COMPOSITE INDEX	8.6
Excess	0.5

Provide Real Return (20 yr.)

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

	20 Year
COMBINED FUNDS	7.4%
CPI-U	2.2
Excess	5.2

Note:

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

STATE STREET.

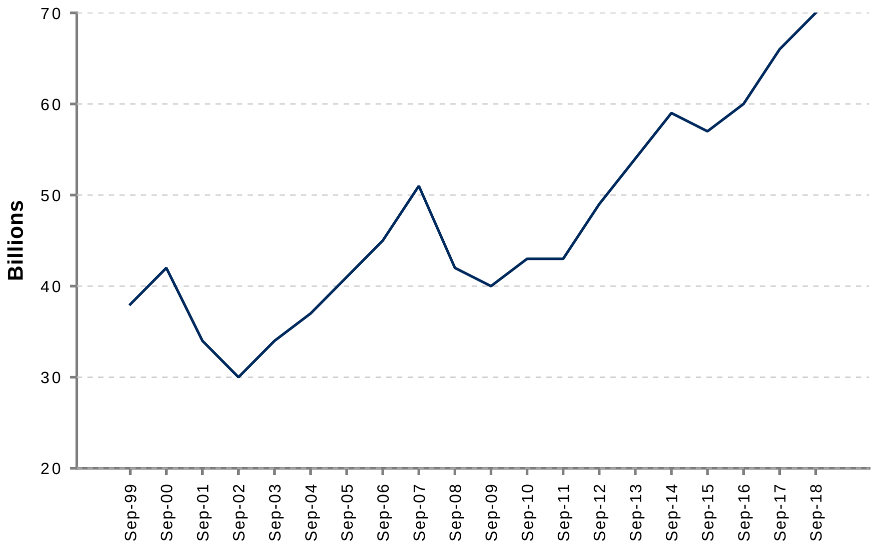
Combined Funds Summary

Combined Funds Change in Market Value ($Millions)

	One Quarter
COMBINED FUNDS	
Beginning Market Value	$68,288
Net Contributions	-654
Investment Return	2,389
Ending Market Value	70,023

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

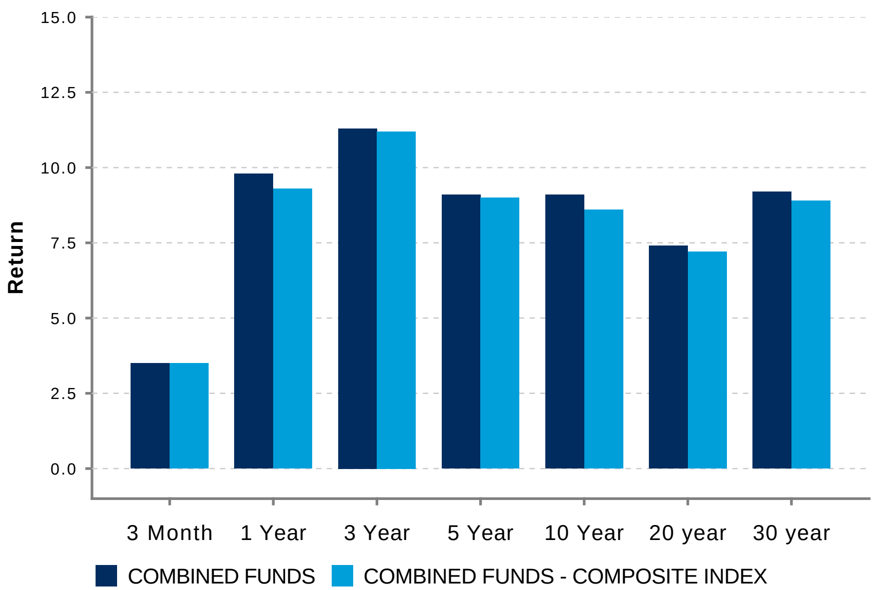
Asset Growth



Performance (Net of Fees)

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

	Qtr	FYTD	1 Yr	3 Yr	5 Yr	10 Yr	20 Yr	30 Yr
COMBINED FUNDS	3.5%	3.5%	9.8%	11.3%	9.1%	9.1%	7.4%	9.2%
COMBINED FUNDS - COMPOSITE INDEX	3.5	3.5	9.3	11.2	9.0	8.6	7.2	8.9
Excess	0.1	0.1	0.5	0.1	0.1	0.5	0.2	0.3



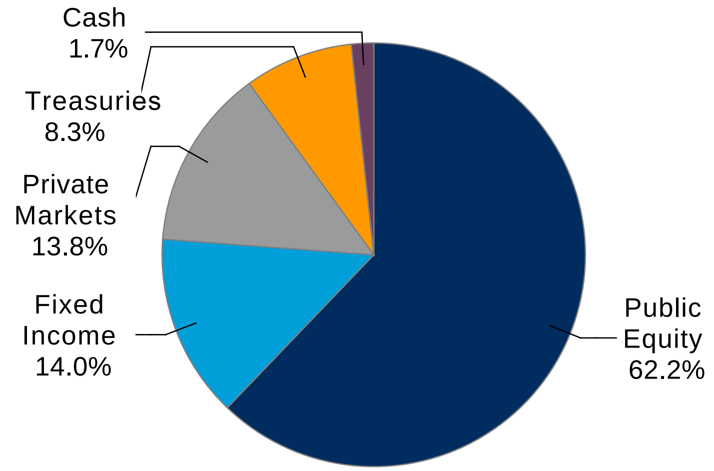
STATE STREET

Combined Funds Summary

Asset Mix

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

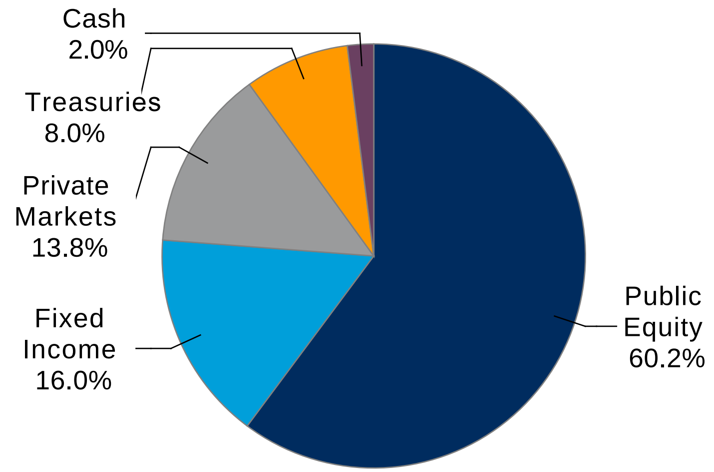
	(Millions)	Actual Mix	Transitional Policy Target
Public Equity	$43,490	62.1%	49.0%
Fixed Income	9,822	14.0	16.0
Private Markets	9,698	13.8	25.0
Treasuries	5,792	8.3	8.0
Cash	1,220	1.7	2.0
TOTAL	70,023	100.0	



Composite Index Comparison

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

	Policy Weight	Market Index
Public Equity	60.3%	67% Russell 3000/33% MSCI ACWI ex US BB
Fixed Income	16.0	Barclays U.S. Aggregate
Private Markets	13.8	Private Markets
Treasuries	8.0	BB Barclays Treasury 5+ Years
Cash	2.0	3 Month T-Bills



STATE STREET

Combined Funds Asset Class Performance Summary

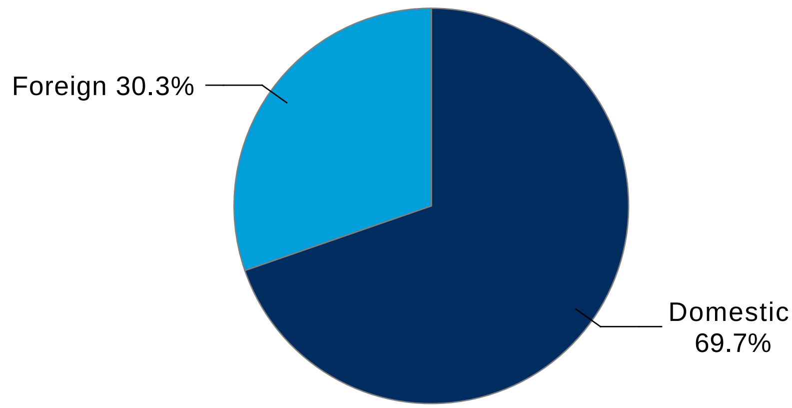
Public Equity

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

The Public Equity benchmark is 67% Russell 3000 and 33% MSCI ACWI ex USA.

The Russell 3000 measures the performance of the 3000 largest U.S. companies based on total market capitalization.

The Morgan Stanley Capital International All Country World Index ex U.S. (net) is a free float-adjusted market capitalization index that is designed to measure equity market performance in developed and emerging markets other than the United States.



	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Public Equity	5.0%	5.0%	12.5%	14.8%	10.9%	10.5%	7.2%	9.7%
Public Equity Benchmark	5.0	5.0	12.2					
Excess	-0.0	-0.0	0.3					
Domestic Equity	7.0	7.0	18.0	16.8	13.3	12.1	7.5	10.2
Domestic Equity Benchmark	7.1	7.1	17.6	17.1	13.5	12.0	7.7	10.4
Excess	-0.1	-0.1	0.4	-0.3	-0.2	0.1	-0.2	-0.1
International Equity	0.5	0.5	1.5	9.7	4.5	5.7	6.1	
International Equity Benchmark	0.7	0.7	1.8	10.0	4.1	5.2	5.8	
Excess	-0.2	-0.2	-0.3	-0.3	0.4	0.5	0.3	

Note:

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

Combined Funds Asset Class Performance Summary

Fixed Income

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

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

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

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Fixed Income	0.2%	0.2%	-0.7%	2.1%	2.7%	4.8%	4.9%	6.4%
Fixed Income Benchmark	0.0	0.0	-1.2	1.3	2.2	3.8	4.5	6.1
Excess	0.2	0.2	0.5	0.8	0.5	1.0	0.4	0.3
Treasuries	-1.5	-1.5						
BBG BARC 5Y + Us Tsy Idx	-1.5	-1.5						
Excess	-0.0	-0.0						

Cash

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

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Cash	0.5%	0.5%	1.7%	1.0%	0.7%	0.7%	2.4%	3.9%
90 DAY T-BILL	0.5	0.5	1.6	0.8	0.5	0.3	1.9	3.2

Note:
For additional information regarding historical asset class performance and benchmarks, please refer to the Combined Funds Performance Report.

Combined Funds Asset Class Performance Summary

Private Markets

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 year	30 year
Private Markets	4.2%	4.2%	16.3%	11.7%	12.5%	9.3%	12.3%	13.6%	12.2%
Private Equity	4.9%	4.9%	19.8%	15.8%	16.0%	12.4%	12.9%	15.7%	
Private Credit	4.4	4.4	17.5	14.1	14.8	11.8	12.5		
Resources	2.7	2.7	8.3	0.1	1.3	2.6	14.3	14.6	
Real Estate	2.6	2.6	12.3	9.3	13.1	5.1	9.0	9.2	

Private Markets

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

Private Equity Investments

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

Private Credit Investments

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

Resource Investments

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

Real Estate Investments

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

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

ATTACHMENT A

SBI Combined Funds Strategic Allocation Category Framework

	9/30/18 ($ millions)	9/30/18 Weights	Category Ranges	
Growth - Appreciation				
Public Equity	$ 43,490	62.1%		
Private Equity	$ 5,026	7.2%		
Non-Core Real Assets	$ 2,286	3.3%		
Distressed/Opportunistic	$ 1,189	1.7%		
	$ 51,990	**74.2%**	*50%*	*75%*
Growth - Income-oriented				
Core Fixed Income	$ 9,822	14.0%		
Private Credit	$ 520	0.7%		
Return-Seeking Fixed Income		0.0%		
	$ 10,343	**14.8%**	*15%*	*30%*
Real Assets				
Core Real Estate		0.0%		
Real Assets	$ 633	0.9%		
	$ 633	**0.9%**	*0%*	*10%*
Inflation Protection				
TIPS		0.0%		
Commodities		0.0%		
		0.0%	*0%*	*10%*
Protection				
U.S. Treasuries	$ 5,792	8.3%		
	$ 5,792	**8.3%**	*5%*	*20%*
Liquidity				
Cash	**$ 1,264**	1.8%		
	$ 1,264	**1.8%**	*0%*	*5%*
Total	**$ 70,023**	**100.0%**		
Illiquid Asset Exposure	**$ 9,654**	**13.8%**	*0%*	*30%*

ATTACHMENT B

Volatility Equivalent Benchmark

Comparison Periods Ending 9/30/2018

As of (Date):	9/30/2018							
	1-year	*3-year*	*5-year*	*10-year*	*15-year*	*20-year*	*25-year*	*30-year*
SBI Combined Funds Return	**9.8%**	**11.3%**	**9.1%**	**9.1%**	**8.6%**	**7.4%**	**8.4%**	**9.2%**
Volatility Equivalent Benchmark Return	**5.5%**	**8.7%**	**6.2%**	**6.6%**	**6.6%**	**5.9%**	**6.6%**	**7.7%**
Value Added	**4.4%**	**2.6%**	**2.9%**	**2.4%**	**2.1%**	**1.5%**	**1.8%**	**1.5%**

Standard Deviation: Benchmark = Combined Funds			**6.0%**	**9.3%**	**8.7%**	**9.3%**	**9.2%**	**9.1%**
Benchmark Stock Weight	**61%**	**61%**	**61%**	**57%**	**58%**	**61%**	**62%**	**62%**
Benchmark Bond Weight	**39%**	**39%**	**39%**	**43%**	**42%**	**39%**	**38%**	**38%**

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

Combined Funds Summary

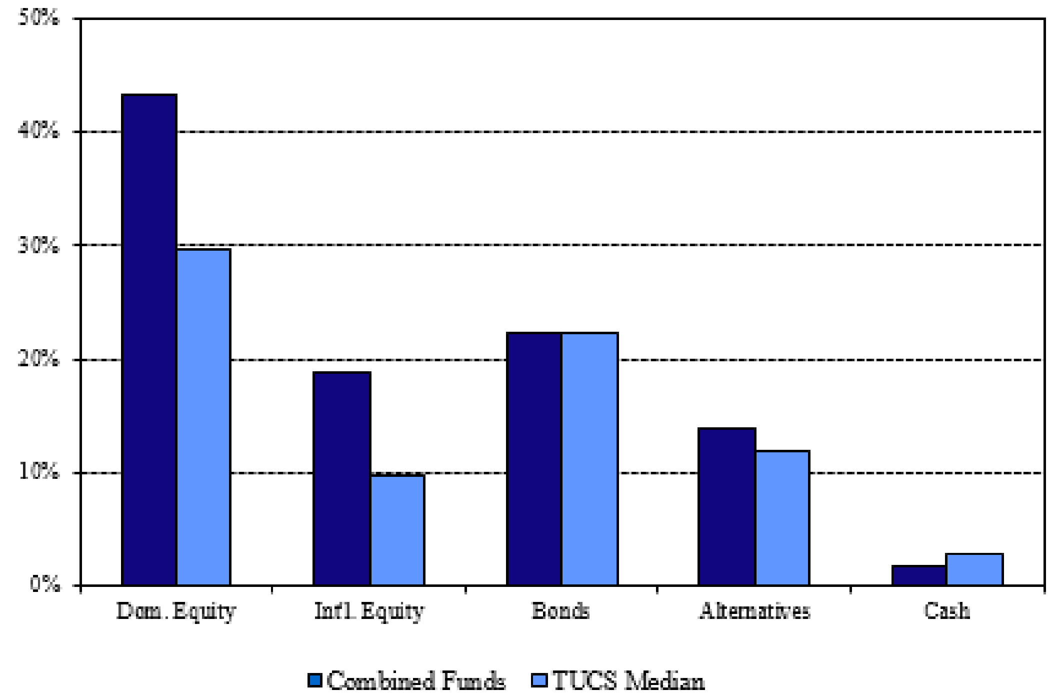
Asset Mix Compared to Other Pension Funds

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

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

Combined Funds Asset Mix

	($Millions)	Actual Mix
Public Equity	43,490	62.1
Fixed Income	9,822	14.0
Treasuries	5,792	8.3
Private Markets	9,698	13.8
Cash	1,220	1.7
TOTAL	70,023	100.0



	Domestic Equity	International Equity	Bonds	Alternatives	Cash
Combined Funds	43.3%	18.8%	22.3%	13.8%	1.7%
Median in TUCS	29.6%	9.7%	22.3%	11.9%	2.8%

Combined Funds Summary

Performance Compared to Other Pension Funds

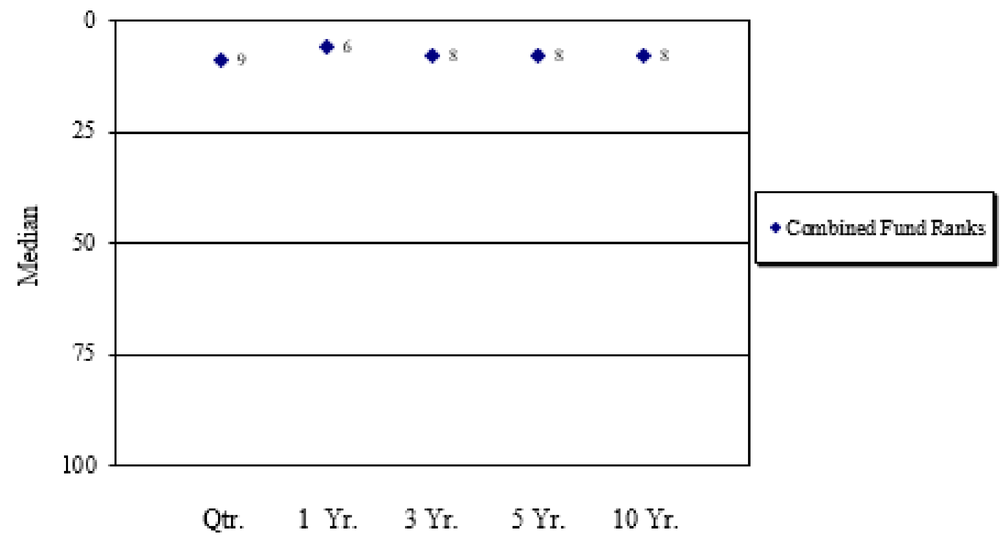
While the SBI is concerned with how its returns compare to other pension investors, universe comparisons should be used with great care. There are several reasons why such comparisons will provide an "apples to oranges" look at performance:

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

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

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

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



Periods Ended 09/30/2018

	Quarter	1 Year	3 Years	5 Years	10 Years
Combined Funds Percentile Rank in TUCS	9th	6th	8th	8th	8th

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TAB B

Report from the Executive Director

Administrative Report

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EXECUTIVE DIRECTOR'S ADMINISTRATIVE REPORT

DATE: December 4, 2018

TO: Members, State Board of Investment

FROM: Mansco Perry III

1. Reports on Budget and Travel

A report on the SBI's administrative budget for the fiscal year to date through September 30, 2018 is included as **Attachment A**.

A report on travel for the period from July 1, 2018 – September 30, 2018 is included as **Attachment B**.

2. FY18 Auditor Report

The Legislative Auditor is working on the financial audit of SBI operations for FY18. We will inform you of the results upon completion of the audit.

3. Draft of FY18 Annual Report

A draft of the SBI's annual report for FY18 will be distributed to the Board members/designees and IAC members upon completion of the FY18 audit. We would anticipate distribution in December or January.

4. Meeting Dates for Calendar 2019.

IAC	SBI
Tuesday, February 19, 2019	Thursday, February 28, 2019
Monday, May 20, 2019	Thursday, May 30, 2019
Monday, August 12, 2019	Thursday, August 22, 2019
Monday, November 18, 2019	Thursday, December 5, 2019

5. Sudan Update

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

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

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

- at least 50% shall be sold within nine months after the company appeared on the scrutinized list; and
- 100% shall be sold within fifteen months after the company appeared on the list.

In the third quarter, SBI managers sold 360,586 shares in seven companies on the divestment list.

On September 28, 2018, staff sent a letter to each international equity manager and domestic equity manager containing the most recent restricted list and the list of stocks to be divested in compliance with Minnesota law.

6. Iran Update

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

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

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

- at least 50% shall be sold within nine months after the company appeared on the scrutinized list; and
- 100% within fifteen months after the company appeared on the scrutinized list.

In the third quarter, SBI managers sold 316,814 shares in seven companies on the divestment list.

On September 28, 2018, staff sent a letter to each international equity manager, domestic equity manager and fixed income manager containing the most recent restricted list and the list of companies to be divested in compliance with Minnesota law.

7. Litigation Update

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

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ATTACHMENT A

STATE BOARD OF INVESTMENT
FISCAL YEAR 2019 ADMINISTRATIVE BUDGET REPORT
FISCAL YEAR TO DATE THROUGH SEPTEMBER 30, 2018

ITEM	FISCAL YEAR 2019 BUDGET	FISCAL YEAR 2019 9/30/2018
PERSONNEL SERVICES		
FULL TIME EMPLOYEES	$ 5,031,000	$ 969,695
PART TIME EMPLOYEES	0	0
MISCELLANEOUS PAYROLL	100,000	0
SUBTOTAL	**$ 5,131,000**	**$ 969,695**
STATE OPERATIONS		
RENTS & LEASES	285,000	93,470
REPAIRS/ALTERATIONS/MAINTENANCE	14,000	2,396
PRINTING & BINDING	10,000	1,277
PROFESSIONAL/TECHNICAL SERVICES	145,000	66,782
COMPUTER SYSTEMS SERVICES	162,500	93,828
COMMUNICATIONS	36,000	7,538
TRAVEL, IN-STATE	1,000	30
TRAVEL, OUT-STATE	125,000	17,312
SUPPLIES	30,000	7,238
EQUIPMENT	17,500	17,469
EMPLOYEE DEVELOPMENT	117,000	9,181
OTHER OPERATING COSTS	140,000	29,548
INDIRECT COSTS	250,000	64,520
SUBTOTAL	**$ 1,333,000**	**$ 410,589**
TOTAL ADMINISTRATIVE BUDGET	**$ 6,464,000**	**$ 1,380,284**

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ATTACHMENT B

STATE BOARD OF INVESTMENT

Travel Summary by Date
SBI Travel July 1, 2018 - September 30, 2018

Purpose	Name	Destination and Date	Total Cost
Manager Monitoring **International Manager:** McKinley Capital Mgmt.	M. Perry	Anchorage, AK 7/9-7/10	$ 1,152.79
Conference: Gopher/Badger Conference sponsored by American Family Insurance	P. Ammann	Madison, WI 7/26-7/27	422.20
Manager Monitoring **Private Markets Manager:** Adams Street Partners **Conference:** Institutional Limited Partners Association (ILPA) Level II, Module 1	P. Ammann	Chicago, IL 8/13-8/15	1,053.53
Manager Monitoring **Private Markets Manager:** The Carlyle Group	A. Krech	Washington, DC 9/11-9/13	1,576.33
Manager Monitoring **Private Markets Manager:** KKR Credit Days **Manager Search** **Private Markets Managers:** Antalya Capital Mgmt.; Marathon Asset Mgmt.	C. Boll	New York, NY 9/11-9/13	1,601.65
Manager Monitoring **Private Markets Managers:** EnCap; Energy and Minerals Group; EnerVest; Sheridan	N. Blumenshine	Houston, TX 9/11-9/14	959.79

ATTACHMENT B

STATE BOARD OF INVESTMENT

Travel Summary by Date
SBI Travel July 1, 2018 - September 30, 2018

Purpose	Name	Destination and Date	Total Cost
Conference: Asia Alternatives Annual Meeting and LP Program KKR Asia Annual Meeting	M. Perry	Hong Kong 9/17-9/21	$ 4,258.31
Manager Monitoring **Private Markets Managers:** Angelo Gordon & Co; Advent International; Avenue Capital; Apax Partners; Blackstone Capital; Bridgepoint Capital; CVC Advisers; Hellman & Friedman; IK Investment Partners; Nordic Capital; Permira; KKR; Varde; Warburg Pincus	P. Ammann	London, England 9/21-9/29	4,095.84
Manager Monitoring **Private Markets Managers:** Angelo Gordon & Co; Advent International; Avenue Capital; Apax Partners; Blackstone Capital; Bridgepoint Capital; CVC Advisers; Hellman & Friedman; IK Investment Partners; Nordic Capital; Permira; KKR; Varde; Warburg Pincus	A. Krech	London, England 9/22-9/29	3,762.67
Manager Monitoring **Private Markets Managers:** Windjammer; Oaktree Capital **Manager Search** **Private Markets Manager:** Clearlake Capital	J. Stacy	Los Angeles, CA 9/25-9/27	694.76

ATTACHMENT B

STATE BOARD OF INVESTMENT

Travel Summary by Date
SBI Travel July 1, 2018 - September 30, 2018

Purpose	Name	Destination and Date	Total Cost
Manager Search **Private Markets Manager:** Walton Street **Conference:** Institutional Limited Partners Association (ILPA) Level II, Module 3	C. Boll	Chicago, IL 9/26-9/28	$ 1,185.34

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TAB C

Report from the Executive Director

Update Regarding SBI Staffing and Salary Administration Plan

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EXECUTIVE DIRECTOR'S REPORT

DATE: December 4, 2018

TO: Members, State Board of Investment

FROM: Mansco Perry III

SUBJECT: Update Regarding SBI Staffing and Salary Administration Plan

The Executive Director has been working with the Commissioner of Management and Budget regarding SBI Staffing and the SBI Salary Administration Plan. A presentation and recommendation will be discussed at the Board Meeting.

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TAB D

Investment Advisory Council Report

Proposed
Private Markets
Commitments

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INVESTMENT ADVISORY COUNCIL REPORT

DATE: December 4, 2018

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

SUBJECT: Private Markets Commitments for Consideration

Staff has reviewed the following action agenda item:

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

Existing Managers:

Real Estate	Blackstone	Real Estate Partners IX	$300 Million
Real Estate	TA Realty	Realty Associates XII	$100 Million
Private Equity	Strategic Partners	Fund VIII	$150 Million
Private Credit	TCW	Direct Lending VII	$100 Million
Private Credit	Energy Capital Partners	Credit Solutions II	$100 Million
Real Assets	Merit	Energy Partners K	$150 Million

SBI action is required on item B.

A. Status of SBI Current Private Markets Commitments

Minnesota State Board of Investment

Combined Funds
September 30, 2018

Combined Funds Market Value	$70,022,578,623
Amount Available for Investment	**$6,644,257,463**

	Current Level	Target Level	Difference
Market Value (MV)	$9,653,778,291	$17,505,644,656	$7,851,866,365
MV +Unfunded	$17,863,645,055	$24,507,902,518.05	$6,644,257,463

Asset Class	Market Value	Unfunded Commitment	Total
Private Equity	$5,025,546,865	$4,749,816,190	$9,775,363,055
Private Credit	$520,452,342	$873,100,215	$1,393,552,557
Real Assets	$2,178,865,164	$877,518,546	$3,056,383,710
Real Estate	$740,272,958	$893,252,813	$1,633,525,771
Distressed/Opportunistic	$1,188,640,962	$816,179,000	$2,004,819,962
Total	$9,653,778,291	$8,209,866,764	$17,863,645,055

Cash Flows
September 30, 2018

Calendar Year	Capital Calls	Distributions	Net Invested
2018 (thru Sept)	$1,370,978,647	($1,502,687,285)	($131,708,638)
2017	$2,021,595,780	($2,383,863,711)	($362,267,931)
2016	$1,874,320,138	($1,728,367,357)	$145,952,781
2015	$1,541,161,769	($2,128,301,645)	($587,139,876)
2014	$1,378,984,263	($2,133,698,037)	($754,713,774)

B. Consideration of New Investment Commitments

ACTION ITEMS:

1) Investment with an existing Real Estate manager, The Blackstone Group ("Blackstone"), in Blackstone Real Estate Partners IX ("BREP IX").

Blackstone is forming BREP IX to make a broad range of opportunistic real estate and real estate-related investments. BREP IX will focus primarily on the U.S. and Canada, but the Fund will also participate in 20% of the amount of each real estate investment to be made by each of BREP Europe and BREP Asia. Blackstone intends to continue its successful "buy it, fix it, sell it" strategy of targeting complicated assets and situations, creating value through hands-on ownership, and selling assets once it's achieved its asset management objectives.

In addition to reviewing the attractiveness of the BREP IX investment offerings, staff has conducted on-site due diligence, reference checks, a literature database search, and reviewed the potential investor base for the funds.

More information on BREP IX is included as **Attachment A beginning on page 7.**

RECOMMENDATION:

The Investment Advisory Council concurs with Staff's recommendation that the SBI authorize the Executive Director, with assistance from the SBI's legal counsel, to negotiate and execute a commitment of up to $300 million, or 20% of Blackstone Real Estate Partners IX, whichever is less. Approval of this potential commitment is not intended to be, and does not constitute in any way, a binding or legal agreement or impose any legal obligations on the State Board of Investment and neither the State of Minnesota, the Investment Advisory Council, the State Board of Investment nor its Executive Director have any liability for reliance by The Blackstone Group upon this approval. Until the Executive Director on behalf of the SBI executes a formal agreement, further due diligence and negotiations may result in the imposition of additional terms and conditions on The Blackstone Group or reduction or termination of the commitment.

2) Investment with an existing Real Estate manager, TA Realty, in The Realty Associates Fund XII ("Fund XII").

TA Realty is forming Fund XII to continue its strategy of making real estate investments in the U.S. diversified by property type, geography, industry exposure, and tenancy. The Firm's three decades of experience in acquiring, managing, and selling real estate across the U.S. provides the firm with a unique perspective and ability to identify opportunities and execute an investment strategy focused on adding value. TA Realty seeks real estate investments with characteristics that allow them to dynamically add value over time, maximizing both income and property value while also protecting cash flow and moderating overall portfolio risk.

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

More information on Fund XII is included as **Attachment B beginning on page 11.**

RECOMMENDATION:

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

3) **Investment with an existing private equity manager, Strategic Partners, in Strategic Partners Fund VIII ("SP VIII").**

Strategic Partners is seeking investors for a new private equity fund dedicated to secondary private equity investing. SP VIII will seek significant capital appreciation primarily through the purchase of secondary interests in mature, high-quality leveraged buyout funds from investors seeking liquidity prior to the termination of these funds, with secondary interests in mezzanine, venture capital, distressed securities, fund of funds, and other asset classes. SP VIII will invest opportunistically in cases where a prospective seller's original commitment ranges in size from $100,000 for a single fund holding to $1 billion or more for a portfolio of funds. While SP VIII will have a global investment mandate, it is anticipated that its portfolio will mainly be comprised of funds managed by U.S. and Western European sponsors.

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

More information on SP VIII is included as **Attachment C beginning on page 15**.

RECOMMENDATION:

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

4) **Investment with an existing private credit manager, TCW Direct Lending Group ("TCW"), in TCW Direct Lending VII ("Fund VII").**

TCW has formed the Fund to originate and invest in loans to middle market companies. The Fund is a direct lending investment company that will elect to be treated as a business development company under the Investment Company Act of 1940. TCW will pursue its investment objectives by adhering to a proactive strategy of exerting influence throughout each stage of the investment process from origination to exit. The tactics utilized in this strategy will include selective origination, rigorous due diligence, customized structuring, and active monitoring of the investment portfolio.

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

More information on TCW Direct Lending VII is included as **Attachment D beginning on page 19.**

RECOMMENDATION:

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

5) **Investment with an existing real assets manager, Energy Capital Partners ("ECP"), in Energy Capital Partners Credit Solutions II ("Fund II").**

ECP is forming Fund II to make credit-oriented investments in existing and new-build energy infrastructure assets and companies, primarily in North America. Energy Capital Partners intends to utilize a disciplined investment approach for Fund II focused on primarily credit-oriented opportunities in high quality assets and business across the entire energy infrastructure value chain, including: traditional and renewable power generation; midstream pipeline, storage, processing, and transportation assets; environmental infrastructure; and energy/natural resource related assets and equipment.

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

More information on Energy Capital Partners Credit Solutions II is included as **Attachment E beginning on page 23.**

RECOMMENDATION:

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

6) **Investment with an existing real assets manager, Merit Energy Company ("Merit") in Merit Energy Partners K ("Merit K").**

Merit is forming Merit K to invest in oil and gas producing properties in North America. Merit's goal is to provide low-risk energy exposure and attractive long term returns to its partners. Merit maintains a long-term view towards efficient operations and concentrates on buying mature, producing long-life assets. Merit is not constrained by deal size; Merit's acquisitions have ranged in value from $1 million to over $1 billion. Merit's large operational footprint across the U.S. gives them the scale to improve operations, reduce costs, and enhance development.

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

More information on Merit K is included as **Attachment F beginning on page 27**.

RECOMMENDATION:

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

ATTACHMENT A

REAL ESTATE MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Blackstone Real Estate Partners IX L.P.
Type of Fund:	Real Estate Limited Partnership
Target Fund Size:	$18 billion
Fund Manager:	The Blackstone Group L.P.
Manager Contact:	Andrew Fenet 345 Park Avenue New York, NY 10154

II. Organization and Staff

Blackstone Real Estate, part of The Blackstone Group L.P. ("Blackstone" or the "Firm"), is forming Blackstone Real Estate Partners IX L.P. ("BREP IX" or the "Fund") to make a broad range of opportunistic real estate and real estate-related investments. BREP IX will focus primarily on the U.S. and Canada, but the Fund will also participate in 20% of the amount of each real estate investment to be made by each of BREP Europe and BREP Asia.

The Firm was founded in 1985 and became a public company in 2007. Within the Blackstone Group, Blackstone's Real Estate Group was established in 1991 and is one of the largest private equity real estate investment managers in the world with $119 billion of investor capital under management across Opportunistic, Core Plus, and debt strategies (as of June 30, 2018).[1] Blackstone Real Estate currently has 473 professionals located in 13 offices globally and operates as a one integrated business. The investment committee meets weekly and includes Jon Gray, President and Chief Operating Officer of Blackstone as the Chairman of the Blackstone Real Estate Investment Committee, and Ken Caplan and Kathleen McCarthy, Global Co-Heads of Blackstone Real Estate. The Investment Committee also includes all Senior Managing Directors in the Real Estate group as well as senior executives of Blackstone, including Stephen Schwarzman, Chairman and Chief Executive Officer, and Hamilton ("Tony") James, Executive Vice Chairman.

III. Investment Strategy

Blackstone intends to continue its successful "buy it, fix it, sell it" strategy of targeting complicated assets and situations, creating value through hands-on ownership, and selling assets once asset management objectives are achieved. By being one of the largest global owners and operators of virtually all property types, the scale of their holdings provides timely insights on changing market conditions and trends. Blackstone believes its seasoned

[1] As used herein, "investor capital" includes GP and side-by-side commitments, as applicable.

investment team utilizes its real-time proprietary market data to identify patterns more rapidly than its competitors. Blackstone believes the size of the BREP Funds and the breadth of their team continue to be Blackstone's greatest competitive advantages, enabling their professionals to execute large, complicated transactions with speed and certainty at attractive pricing.

Once an asset is acquired, Blackstone Real Estate's experienced asset management professionals proactively seek to drive value at the asset level to generate the most value for limited partners. The global team of 109 asset management professionals takes a hands-on approach while working closely with its portfolio companies and/or operating partners to seek to ensure business plans are executed seamlessly. Blackstone is relentlessly results oriented and hones its business plans through frequent formalized asset management meetings, including weekly asset management updates, detailed monthly review sessions, and multiple meetings surrounding Blackstone's robust quarterly valuation process.

Once Blackstone has achieved its asset management objectives and the asset is stabilized, Blackstone leverages its broad experience to identify the optimal exit strategy. Typically Blackstone has multiple exit options, which may include, for example, individual asset sales, portfolio company sales to private buyers, or public market offerings. Blackstone continually evaluates its portfolio for disposition opportunities and believes the strategic harvesting of investments is an important factor in the success of its funds.

As was the case with prior funds, BREP IX will seek opportunities to invest in high-conviction asset classes and geographies where Blackstone expects outsized growth, and complex situations where it believes it is uniquely positioned to generate outperformance. Key investment themes may include:

- Global logistics: Online retailers are under increasing pressure to provide customers with next-day and same-day service in order to stay competitive, driving demand for "last mile" distribution centers in infill locations across the U.S. and around the world.

- Innovation cities: The growth of technology and creative industries continues to drive demand for office space in cities with highly educated workers, or knowledge centers. These centers often are in close proximity to major universities, creating a virtuous cycle whereby access to highly educated workers attracts companies to the city, and the jobs these companies provide attract additional workers.

- Rental housing: Strong urbanization trends coupled with limited new supply in many major U.S. cities has created a structural housing shortage. Blackstone's strategy has focused on acquiring Class B/B+ apartments with operational upside potential that are located in supply constrained markets with growing populations and demand for value-oriented housing.

- Global travel and leisure: The combination of a rising middle class globally, advancements in digital technology and a shift in consumer preferences towards experiential spend has driven significant growth in global leisure tourism. Large resort hotels offer a wide range of recreational and culinary experiences, as well as meeting space for group travelers.

IV. Investment Performance

Previous fund performance as of June 30, 2018 for Blackstone Real Estate Partners is shown below:

Fund	Vintage Year	Total Committed Capital	SBI Investment	Net IRR	Net MOIC*
BREP I	1994	$381 million	--	40%	2.4
BREP II	1996	$1,198 million	--	19%	1.8
BREP III	1999	$1,523 million	--	21%	2.0
BREP IV	2003	$2,199 million	--	12%	1.5
BREP V	2006	$5,539 million	$100 million	11%	2.0
BREP VI	2007	$11,060 million	$100 million	13%	2.1
BREP VII	2011	$13,495 million	$100 million	18%	1.7
BREP VIII	2015	$16,420 million	$150 million	17%	1.3
BREP Asia I	2013	$5,097 million	--	16%	1.4
BREP Asia II	2018	$7,106 million	$75 million	n/m	n/m
BREP Int'l	2001	€824 million	--	23%	1.8
BREP Int'l II**	2006	€1,630 million	--	8%	1.8
BREP Europe III	2009	€3,205 million	--	16%	1.8
BREP Europe IV	2013	€6,709 million	--	18%	1.6
BREP Europe V	2016	€7,856 million	--	19%	1.1

* Previous fund investments are not indicative of future results. Net IRR and Net MOIC were provided in Blackstone's public filings.

** The 8% Net IRR excludes investors that opted out of the Hilton investment opportunity. Overall BREP International II performance reflects a 6% Net IRR.

V. Investment Period and Term

The Fund will have a 5.5-year investment period and a term of approximately 10 years.

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

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ATTACHMENT B

REAL ESTATE MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	The Realty Associates Fund XII, L.P.
Type of Fund:	Real Estate Limited Partnership
Target Fund Size:	$1.25 billion
Fund Manager:	TA Realty LLC
Manager Contact:	Tom Landry TA Realty LLC 28 State Street, 10th Floor Boston, MA 02109

II. Organization and Staff

TA Realty LLC ("TA Realty" or the "Firm") has formed The Realty Associates Fund XII ("Fund XII" or the "Fund") to continue its strategy of making real estate investments in the U.S. diversified by property type, geography, industry exposure, and tenancy. The Firm's three decades of experience in acquiring, managing, and selling real estate across the U.S. provides the firm with a unique perspective and ability to identify opportunities and execute an investment strategy focused on adding value.

TA Realty was founded in 1982 and currently has offices in Newport Beach, California; Palm Beach Gardens, Florida; Dallas, Texas; and its headquarters in Boston, MA. The Firm has approximately 82 employees, including 23 Partners who have an average of 16 years with the Firm. TA Realty is majority owned by a subsidiary of Rockefeller Group International, Inc. ("RGI"), a global property owner, developer, and investment manager and a wholly-owned subsidiary of Mitsubishi Estate Co., Ltd. ("MEC"). RGI/MEC owns 70% of the Firm and 16 TA Realty Partners own the remaining 30%.

III. Investment Strategy

TA Realty is a value investor focused on pursuing the steady growth of income produced by real estate investments while minimizing downside risk. Since inception, it has maintained a consistent investment philosophy during multiple real estate and economic cycles. The Firm is focused on creating diversified real estate portfolios that generate strong cash flow, benefit from an active asset management approach, and result in the long-term creation of value over the life of the Fund. TA Realty seeks real estate investments with characteristics that allow them to dynamically add value over time, maximizing both income and property value while also protecting cash flow and moderating overall portfolio risk.

The Firm constructs its portfolios to achieve a complementary balance between capital-intensive properties (primarily office) and less capital-intensive properties (industrial, multi-family, and retail). By developing portfolios comprised of these four property types with their unique tenancy and return characteristics, TA Realty creates the flexibility needed to respond to varying capital market and real estate cycles. While the Firm does not set specific targets for property type allocations, their funds have historically been more heavily weighted towards industrial and office properties. Similarly, the Firm does not establish geographic targets in constructing its funds; however, the funds typically have coastal concentrations with approximately 70-75% of the funds invested on the coasts.

TA Realty believes that creating, growing, and distributing income is a critical component to achieving its return objectives. As the Firm constructs portfolios, the focus is on establishing a balance of assets that provide current income along with other assets that deliver a value-add component, but are also expected to substantially increase income as the strategies are implemented and executed. The value-add component is generated via active, hands-on asset management and execution of the business plan developed at acquisition.

TA Realty abides by a prudent approach to leverage where leverage is applied at the portfolio level, maintaining flexibility and not encumbering individual properties. The Firm's experience over multiple economic cycles has informed its view that leverage can be either advantageous or detrimental, so it targets a loan-to-value of approximately 45%. The debt program is designed and implemented to be compatible with the evolving life cycle of the Fund, considering pricing, terms, and risk to the portfolio.

TA Realty uses the disposition process as another way to add value. The Firm's dispositions team, in conjunction with asset level and portfolio level analysis, identifies strategies to maximize value upon an asset's disposition. Some examples are property-level decision-making that attractively positions the asset for prospective buyers (i.e., staggered lease expirations, tenant diversification, contractual rent increases, etc.) and maximizing exit pricing by exploiting a wide range of exit strategies (portfolio sales, tenant/user sales, accommodating 1031 exchanges, etc.).

IV. *Investment Performance*

Previous fund performance as of June 30, 2018, TA Realty is shown below:

Fund	Vintage Year	Total Committed Capital	SBI Investment	Net IRR*	Net MOIC*
Advent Realty L.P.	1987	$164 million	$0	2.3%	1.2
Advent Realty II L.P.	1990	$333 million	$0	12.0%	2.1
Realty Associates Fund III	1994	$488 million	$40 million	11.4%	2.1
Realty Associates Fund IV	1996	$450 million	$50 million	13.4%	2.2
Realty Associates Fund V	1999	$563 million	$50 million	10.3%	1.8
Realty Associates Fund VI	2002	$739 million	$50 million	8.6%	1.5
Realty Associates Fund VII	2004	$917 million	$75 million	0.3%	1.0
Realty Associates Fund VIII	2006	$1,742 million	$100 million	-0.1%	1.0
Realty Associates Fund IX	2008	$1,493 million	$100 million	10.4%	1.6
Realty Associates Fund X	2012	$1,562 million	$100 million	12.4%	1.5
Realty Associates Fund XI	2015	$879 million	$100 million	6.5%	1.1

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

V. *Investment Period and Term*

The fund will have a two-year investment period from the date of the final closing, and a seven-year term, with the possibility of up to three one-year extensions.

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

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ATTACHMENT C

PRIVATE EQUITY MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Strategic Partners Fund VIII, L.P.
Type of Fund:	Private Equity
Target Fund Size:	$8.0 billion
Fund Manager:	Strategic Partners
Administrative Contact:	Josh Blaine Strategic Partners Fund Solutions The Blackstone Group L.P. 345 Park Avenue New York, NY 10154

II. Organization and Staff

Strategic Partners was established in 2000 as Donaldson, Lufkin and Jenrette's ("DLJ") dedicated secondary private equity manager prior to the acquisition of DLJ by Credit Suisse. Since its founding in 2000, Strategic Partners has raised over $31 billion dedicated to secondary private equity investing. Strategic Partners VIII will be the third secondary private equity fund sponsored by Blackstone and the eighth managed and led by the Strategic Partners team members. With over 18 years of experience, Strategic Partners is recognized as an innovative and market-leading secondary private equity investor, with broad transaction capabilities on a global scale through its network of strong relationships, as well as a leading reputation for executing transactions on a fair, timely and confidential basis.

In 2013, Blackstone acquired the Strategic Partners business from Credit Suisse. Blackstone has created an independent division for Strategic Partners to focus on its core business. Strategic Partners expects Blackstone's global capabilities, relationships and expertise to provide significant competitive advantages in sourcing and executing secondary transactions and ultimately strengthen Strategic Partners' investment platform. Strategic Partners believes that leveraging its partnership with Blackstone, while still preserving its investment philosophy and focus, should translate into enhanced investment returns for its limited partners.

Strategic Partners is headquartered in New York and also has offices in London and San Francisco. The team is comprised of 49 dedicated investment professionals and is led by Founder and Co-Head Stephen Can and Co-Head Verdun Perry, each of whom has been with Strategic Partners since its inception in 2000. Mr. Can has announced that he will transition to Executive Chairman of Strategic Partners in February 2019 and will continue as a member of each of Strategic Partner's Investment Committees after February 2019.

III. Investment Strategy

Like its predecessor funds, SP VIII will seek significant capital appreciation primarily through the purchase of secondary interests in mature, high-quality leveraged buyout funds from investors seeking liquidity prior to the termination of these funds, with secondary interests in mezzanine, venture capital, distressed securities, fund of funds and other asset classes also considered. The Fund may also, to a lesser extent, make primary investments in underlying funds and direct equity, equity-like and debt investments. SP VIII will invest opportunistically in cases where a prospective seller's original commitment ranges in size from $100,000 for a single fund holding to $1 billion or more for a portfolio of funds. While SP VIII will have a global investment mandate, it is anticipated that most of its commitments will be made to funds and assets located in the U.S. and Western Europe.

Strategic Partners is able to underwrite wide-ranging and complex transactions comprised of multi-asset portfolios across leveraged buyout, venture/growth capital, fund of funds, real estate and infrastructure funds. Strategic Partners believes their strategy allows them to not only provide top performance but also capitalize on the benefits of secondary investing such as a reduction in blind pool risk, expected earlier returns of capital, reduced duration profile, diversification, and enhanced risk and volatility mitigation.

SP VIII expects to seek opportunities in both non-competitive and competitive transactions. Strategic Partners believes that the team's in-depth secondary market expertise and relationships with both limited partners and fund managers will enable it to source, evaluate and close attractive secondary investments for the Fund. Historically, only 5% of the capital invested by the SP Funds has been invested in competitive, broadly auctioned transactions. Roughly 44% of all Strategic Partners' 2017 deals were with sellers who previously had transacted with Strategic Partners.

Blackstone is one of the world's largest alternatives managers across private equity, real estate, credit, hedge fund solutions, energy and tactical opportunities. Strategic Partners believes that it benefits significantly from the position that Blackstone occupies as a leading global alternative asset manager. Blackstone's scale and institutional reputation and franchise should allow Strategic Partners to gain access to incremental and proprietary opportunities.

IV. *Investment Performance*

Previous fund performance as of June 30, 2018 for Strategic Partners and the SBI's investments with previous funds and SBI's specific performance, where applicable, is shown below:

Fund	Vintage Year	Total Commitments	SBI Investment	Net IRR*	Net MOIC*
SP I	2001	$ 832 million	$100 million	17.0%	1.6
SP II	2003	$ 1,625 million	$100 million	34.8%	1.8
SP III	2005	$ 1,900 million	$100 million	6.7%	1.4
SP IV	2008	$ 2,073 million	$100 million	13.2%	1.6
SP V	2011	$ 2,429 million	$100 million	19.9%	1.6
SP VI	2014	$ 4,363 million	$150 million	21.2%	1.5
SP VII	2016	$7,490 million	$150 million	56.3%	1.3

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net IRR and Multiple of Invested Capital (MOIC) were provided by the General Partner for SBI's specific fund performance.

V. *Investment Period and Term*

The fund will have a four year investment period from the final closing subject to a one year extension. The term of the fund will be ten years after the final closing, subject to two, one-year extensions at the discretion of the General Partner and two additional one-year extensions with the consent of the Advisory Committee or a majority in interest of Combined Limited Partners.

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

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ATTACHMENT D

PRIVATE CREDIT MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	TCW Direct Lending LLC
Type of Fund:	Yield-Oriented Business Development Company
Total Fund Size:	$2.5 billion
Fund Manager:	TCW Direct Lending Group LLC
Manager Contact:	James S. Bold 1251 Avenue of the Americas Suite 4700 New York, NY 10020

II. Organization and Staff

The direct lending team (the "Direct Lending Team") at TCW Asset Management Company ("TCW") has formed TCW Direct Lending VII (the "Fund" or "Direct Lending VII") to originate and invest in loans to middle market companies. The Fund is a direct lending investment company that will elect to be treated as a business development company ("BDC") under the Investment Company Act of 1940 (the "1940 Act"). A BDC is a specialized investment vehicle regulated under the 1940 Act as an investment company. The Fund is offering Limited Liability Company units ("Units") to Fund investors.

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

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

The Direct Lending Team, previously with Regiment Capital Advisors, moved to TCW in January 2013. The Direct Lending Team began managing its first Fund in 2001 and has been led by Richard Miller since its inception. Currently the team includes a group of 18 investment professionals who have nearly 300 years of collective experience with substantial investing, corporate finance, and merger and acquisition expertise in addition to significant experience in leveraged transactions, high yield financing and debt restructurings.

III. Investment Strategy

The Direct Lending Strategy has been developed, honed and tested over the Direct Lending Group's 17- year history of investing in the middle market. Over this time period, they have successfully deployed over $8.2 billion across seven flagship funds, multiple cycles and volatile credit environments.

Their Strategy was designed to take advantage of the attributes of middle market lending including the following:

- Unique underlying investments not accessible via traditional means of investing
- Senior-secured assets: priority liens on borrower collateral ahead of junior and equity capital
- Floating-rate; embedded inflation and interest rate protection
- Cash paying interest
- Structural protection via negotiated loan agreements including covenants

The Direct Lending Group seeks to deliver these attributes to investors through a diversified portfolio that targets net returns of 9-12% (the Fund's hurdle rate is 9%).

The Direct Lending Group will pursue its investment objectives by adhering to a proactive strategy of exerting influence throughout each stage of the investment process from origination to exit. The tactics utilized in this strategy will include selective origination, rigorous due diligence, customized structuring, and active monitoring of the investment portfolio.

<u>Selective Origination</u>
The Direct Lending Team has a long-term presence in the public and private capital markets and, as a result, has developed an extensive network of strategic relationships. These relationships include capital market intermediaries such as broker-dealers, investment bankers, commercial bankers, private equity sponsors, mergers and acquisitions bankers, restructuring professionals, accountants and other financial professionals. The Direct Lending Team's network also extends to the corporate community and includes senior management teams, independent industry consultants and other business executives who often refer opportunities to the members of the Direct Lending Team.

Rigorous Due Diligence
Given the Direct Lending Team's approach to selectively originating transactions, its investment professionals will typically be in a position to be directly involved with each step of the investment process, beginning with due diligence. The Direct Lending Team's philosophy is to perform a rigorous due diligence investigation designed to better understand a potential portfolio company's risks and opportunities. The investigation will typically include comprehensive quantitative and qualitative analyses to identify and address risks.

Customized Structuring
The Direct Lending Team will design a customized financial solution to address the requirements of both Fund VII and each portfolio company. Through due diligence, the Direct Lending Team will strive to better understand a portfolio company being financed in order to develop an appropriate form of investment with an acceptable capital structure. The pricing associated with the investment will reflect the risk inherent in each portfolio company, its capital structure and the type of investment.

Active Monitoring
The Direct Lending team will actively monitor and manage Fund VII's investment portfolio by thoroughly and continuously analyzing all outstanding investments. The investment professionals will monitor each portfolio company's compliance with the terms and conditions of its financing agreement, including reporting requirements and financial covenants. The reported information will be gathered, analyzed and used to measure the portfolio company's performance and potential impact of Fund VII's investment. The investment professionals also will maintain ongoing contact with each portfolio company's management in order to understand and anticipate opportunities and issues. If the portfolio company violates any of the terms, conditions or covenants of the financing agreement or other investment documentation, Fund VII typically will be in a position to take action to attempt to protect the investment and influence the actions of the portfolio company, if necessary.

IV. *Investment Performance*

Previous fund performance as of June 30, 2018 for TCW Direct Lending LLC is shown below:

Fund	Vintage Year	Total Committed Capital	SBI Investment	Net IRR*	Net MOIC*
Direct Lending I	2000	$181 million	0	10.00%	1.16x
Direct Lending II	2002	$275 million	0	11.85%	1.15x
Direct Lending III	2004	$643 million	0	2.68%	1.08x
Direct Lending IV	2007	$767 million**	0	11.16%	1.16x
Direct Lending V	2011	$1.2 billion**	0	9.00%	1.14x
Direct Lending VI	2014	$2.0 billion	$100 million	6.91%	1.12x

Note: DL I – IV are realized; DL V and VI are active.

* Previous fund investments are not indicative of future results. Net IRR and Net MOIC were provided by TCW
** Represents Common LP interests only

V. Investment Period and Term

The fund will have a three-year investment period and a 6-year term, subject to two, one-year extensions.

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

ATTACHMENT E

PRIVATE CREDIT MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Energy Capital Partners Credit Solutions II, L.P.
Type of Fund:	Private Credit
Target Fund Size:	$800 million
Fund Manager:	Energy Capital Partners Management, LP
Manager Contact:	Paul Parshley 51 JFK Parkway, Suite 200 Short Hills, NJ 07078

II. Organization and Staff

Energy Capital Partners ("ECP" or "the Firm") is forming Energy Capital Partners Capital Solutions Fund II, LP ("Fund II" or "the Fund) to make credit-oriented investments in existing and new-build energy infrastructure assets and companies, primarily in North America.

ECP was established in 2005 and is led by a team of experienced investment professionals, many of whom have been investing together over the last 20 years or more. ECP's senior professionals collectively average approximately 20 years of energy industry experience, possess deep industry relationships, and have a successful track record of investing in energy infrastructure assets. The Firm has raised more than $16 billion of committed capital across three prior private equity funds, one credit fund, and several co-investment vehicles. Since 2005, Energy Capital Partners has grown to a team of 35 investment professionals, 24 additional professionals across compliance, accounting, investor relations and administrative functions, and two senior advisors. ECP is headquartered in Short Hills, New Jersey, and has offices in San Diego, Houston and New York.

The Firm is led by founder Douglas Kimmelman, who will sit on the Fund's investment committee along with Partners Schuyler Coppedge, Rahman D'Argenio, Matt DeNichilo, Trent Kososki, Peter Labbat, Tyler Reeder and Andrew Singer. Mr. DeNichilo and Mr. Kososki will serve as Fund co-heads, and will lead a dedicated team of investment professionals at the Vice President and Associate levels.

III. Investment Strategy

Energy Capital Partners intends to utilize a disciplined investment approach for Fund II focused on primarily credit-oriented opportunities in high quality assets and business across the entire energy infrastructure value chain, including:

- Traditional and renewable power generation
- Midstream pipeline, storage, processing, and transportation assets
- Environmental infrastructure; and
- Energy / natural resource related assets and equipment

Fund II will not invest in the upstream (exploration and production, or "E&P") segment of the energy value chain. Additionally the Fund will not invest in any company in which other ECP investment vehicles, individually or collectively, maintain a controlling interest.

The Firm anticipates that the Fund's investments will be predominantly focused on opportunities in North America, with some involvement in stable and growing markets outside of the region, particularly when opportunities arise to partner with companies with an established local presence.

The investment strategy for Fund II represents a refinement of the strategy employed by ECP Credit Fund I. Fund I made both senior and subordinated debt investments. Fund II's core focus is expected to be on directly originated senior private credit investments, with a first or second lien on collateral. Loan documentation will be structured to mitigate downside risks. The Fund may also opportunistically participate in liquid debt and structured capital solutions. At times the Fund may purchase liquid securities, including term loans and high yield bonds, relying upon ECP's knowledge of specific assets and companies, and/or capitalizing on market dislocations. Finally, the Fund may invest a portion of the portfolio in customized, credit-oriented, and structured capital solutions (including, in certain cases, equity) for energy companies seeking non-traditional sources of financing.

Based on the Firm's previous credit investing experience and evaluation of a multitude of opportunities in the energy industry, ECP believes that the aforementioned targeted investments will offer attractive risk-adjusted opportunities on both an Internal Rate of Return (IRR) and multiple of invested capital (MOIC) basis. The Fund intends to target investments that have the potential to generate an overall annualized gross IRR of 12-15% and a gross MOIC of 1.5x – 1.7x. The return profile of investments is expected to include (i) a target 5% - 7% cash yield, (ii) a combination of upfront fees and issuer discounts, and (iii) upside from an equity component of ownership. The Firm anticipates that the Fund's commitment per transaction generally will be in the range of $25 to $100 million and the Fund intends to target between 15 and 20 discrete investments.

Although Fund II does not intend to invest in companies or assets that have significant direct exposure to commodity prices (oil and gas production companies, for example), the business and assets of the Fund's borrowers may nonetheless be influenced by the direction of energy commodity prices. ECP intends to mitigate these risk in several ways:

- Construct a balanced portfolio by concentrating investments in ECP's core areas of focus, with an emphasis on the power & renewable generation and midstream sectors;
- Focus on industries that have a history of entering into contracts that enhance reliability measures and mitigate end users' exposure to energy price volatility;
- Pursue assets that are supported by fee-based contracts, minimum volume commitments or long term contracts for capacity; and
- Seek to invest at attractive loan-to-value levels with a margin of safety providing downside protection.

IV. *Investment Performance*

Previous fund performance as of June 30, 2018 is shown below:

Fund	**Vintage Year**	**Total Committed Capital**	**SBI Investment**	**Net IRR***	**Net MOIC***
ECP I	2006	$2.3 billion	--	-3%	0.7
ECP II	2009	$4.3 billion	$100 million	13%	1.6
ECP III	2013	$5.1 billion	$200 million	12%	1.2
ECP IV	2018	$6 billion target	$150 million	52%	1.1
ECP Credit I	2012	$800 million	--	5%	1.1
ECP Credit I – Senior Investments Only		*$377 million*		*25% (gross)*	*1.5x (gross)*

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

V. *Investment Period and Term*

The commitment period will last three years, and the term of the fund will be 7 years, subject to a one year extension at the General Partner's discretion and two additional two-year extensions with the approval of either the LP Advisory Committee or a majority of the LPs by capital commitments.

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

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ATTACHMENT F

RESOURCE MANAGER SUMMARY PROFILE

I. Background Data

Name of Fund:	Merit Energy Partners K
Type of Fund:	Resource Limited Partnership
Total Fund Size:	$750 million
Fund Manager:	Merit Energy Company
Manager Contact:	Meghan Cuddihy Merit Energy 13727 Noel Rd. Dallas Texas, 75240

II. Organization and Staff

Merit Energy Company ("Merit") is forming Merit Energy Partners K ("Merit K") to invest in oil and gas producing properties. Merit K will be the 19th U.S. partnership sponsored by Merit. Dating back to 1996, the SBI has participated in 7 of the previous Merit funds.

Merit was formed in 1989 by William Gayden. Mr. Gayden remains Chairman of the company. Terry Gottberg, President & CEO since 2011, has been with Merit for 24 years and leads a senior management team that have been at Merit an average of 19 years. Key members of the senior management team include Kevin Ryan, Jay Prudhomme, Chad Brister, Jason Lindmark, and Neil Nadrash. Merit is the operator of the oil and gas properties it owns, thus it employs 58 technical staff and over 540 field staff located in 19 field offices across the United States.

III. Investment Strategy

Merit's goal is to provide low-risk energy exposure and attractive long term returns to its partners. Merit has used the same strategy for the last 29 years: acquire, develop, and operate high quality, mature producing oil and gas properties. This approach places a high priority on control of physical operations, and has been successful in producing attractive overall returns for Merit's existing and prior funds. Its diverse portfolios of assets, with operations across North America, has given Merit valuable experience operating all types of assets in various environments.

Merit focuses on acquiring assets that fit its long-term operational profile of generating returns via production rather than attempting to "time the market." Merit maintains a long-term view towards efficient operations and concentrates on buying mature, producing long-lived assets. Merit is not constrained by deal size. Merit's acquisitions have ranged in value from $1 million to over $1 billion. Merit's large operational footprint across the U.S.

gives it insight into opportunities to improve operations, reduce costs, and enhance development. Merit focuses on long reserve to production life assets with a development inventory that can be executed over an extended period of time to generate value and investment multiples. Merit does not seek a quick asset flip and exit.

Merit expects that its reputation, ability to close transactions, operational expertise, and integrity will continue to allow it to be competitive on deals it targets. As an equity-driven company, Merit's ability to pay for assets with cash and close acquisitions quickly has proven to be a significant competitive advantage. Taking over field operations at the time of closing is another competitive advantage for Merit. Merit maintains a consistent presence in the acquisitions market and has a reputation as a credible and reliable buyer. Merit performs a rigorous due diligence process on each acquisition to fully understand the scope of the assets. In addition, Merit benefits from strong relationships with publicly traded oil and gas companies, large private companies, as well as investment banks and asset brokers.

Merit maintains a low risk approach to capital development, historically reinvesting approximately 25-35% of its operating cash flow annually. Merit's annual capital programs emphasize drilling for proven reserves, wellbore re-completions, stimulations, and facility upgrades. Merit implements capital projects that are appropriate for the current operating environment and have the potential to add to the long-term value of the assets over the life of its portfolio. Merit generally seeks to divest approximately 5-7% of its portfolio annually with assets that are either scattered from core operations or are not performing as expected. In addition, Merit regularly reviews its portfolio and considers strategic divestitures when market valuations are attractive.

IV. Investment Performance

The historical investment performance of Merit Energy Funds as of June 30, 2018 is presented below:

Fund	Vintage Year	Total Committed Capital	SBI Investment	Net IRR*	Net MOIC*
Merit Fund A	1994	$13.7 million	$0	20%	6.2x
Merit Fund B	1996	$130 million	$24 million	24%	7.8x
Merit Fund C	1998	$300 million	$50 million	30%	9.6x
Merit Fund D	2000	$465 million	$88 million	21%	3.6x
Merit Fund E	2004	$825 million	$100 million	15%	2.2x
Merit Fund F	2005	$1,300 million	$100 million	-5%	0.7x
Merit Fund G	2008	$575 million	$0	-6%	0.7x
Merit Fund H	2010	$903 million	$100 million	0%	1.0x
Merit Fund I	2014	$840 million	$170 million	25%	1.5x
Merit Fund J	2016	$790 million	$0	25%	1.3x

* Previous Fund investments may be relatively immature and, therefore, returns may not be indicative of future results. Net IRR and Multiple of Invested Capital (MOIC) were provided by Merit.

IX. Investment Period and Term

Capital may be called for six years after the first closing of the Merit K. The term of the Partnership is 15 years after the first closing.

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

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TAB E

Investment Advisory Council Report

Public Markets, Non-Retirement and Participant Directed Investment Programs

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INVESTMENT ADVISORY COUNCIL REPORT

DATE: December 4, 2018

TO: Members, State Board of Investment

FROM: Members, Investment Advisory Council and SBI Staff

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

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

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

The report includes the following sections:

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Review of SBI Public Markets Program
Third Quarter 2018

SBI Portfolio - Quarter and Year Attribution
In the third quarter, the SBI's overall portfolio, the Combined Funds, met the composite benchmark return (3.5% Combined Funds versus 3.5% Composite Benchmark). Domestic equities slightly underperformed the Russell 3000 Index return (7.0% Domestic Equity versus 7.1% Domestic Equity Benchmark), while international equities underperformed the MSCI ACWI ex USA Index (net) return (International Equity 0.5% versus 0.7% International Equity Benchmark). The core fixed income portfolio exceeded the Bloomberg Barclays U.S. Aggregate Index return (Fixed Income 0.2% versus 0.0% Fixed Income Benchmark), while the U.S. Treasury portfolio matched the Bloomberg Barclays Treasury 5+ Year Index of -1.5%. Lastly, private markets contributed positively to absolute performance, returning 4.2%. For the quarter, domestic equity contributed 3.0 percentage points of the combined funds 3.5% return. For the year ending September 30, domestic equity contributed 7.8 percentage points of the 9.8% net return, while private markets contributed 2.0 percentage points of the total.

Domestic Equity
The large-cap growth managers trailed the Russell 1000 Growth benchmark by 1.7 percentage points for the quarter. Stock selection in Consumer Discretionary and Technology led the underperformance. All three managers underperformed for the quarter.

The large-cap value managers outperformed the Russell 1000 Value benchmark by 0.5 percentage point for the quarter. Overall stock selection, led by the Consumer Discretionary sector, helped the returns for the quarter. Barrow Hanley and Earnest Partners outperformed for the quarter while LSV underperformed.

The small-cap growth managers outperformed the Russell 2000 Growth benchmark by 1.8 percentage points for the quarter. Stock selection in the Technology and Health Care sectors helped the quarterly returns. Two of the four small-cap growth managers, ArrowMark and Hood River, outperformed for the quarter.

The small-cap value managers trailed the Russell 2000 Value benchmark by 0.1 percentage point for the quarter. Stock selection was slightly negative for the quarter. Two of the four managers, Goldman and Hotchkis and Wiley, outperformed for the quarter.

For the quarter, the semi-passive managers in aggregate outperformed the Russell 1000 index by 30 basis points. Stock selection overall contributed positively, especially in the Producer Durables, Consumer Discretionary, and Healthcare sectors. The passive Russell 3000 and Russell 1000 index managers tracked their respective indices within expectation.

Developed International Equity
The active developed markets managers underperformed the MSCI World ex USA Standard Index (net) by 50 basis points over the quarter. From a country perspective, stock selection in the United Kingdom and Japan contributed to the underperformance, which was partially offset by positive stock selection in Canada. Among the active developed managers, stock selection in both the Healthcare and Information Technology contributed negatively to performance.

The semi-passive manager, AQR, underperformed the MSCI World ex USA Standard Index (net) by 0.9 percentage point during the quarter. Stock selection in the Information Technology, Consumer Discretionary, and Industrials sectors as well as stock selection overall in Japan, Hong Kong, Germany and the United Kingdom contributed negatively to performance. Both the passive developed markets manager and the passive emerging markets manager tracked their respective indices within expectation.

Emerging Markets Equity

Following a difficult second quarter, emerging markets equities (EME) were relatively flat in third quarter, with the SBI program returning -1.7%. While uncertainty stemming from a trade war between U.S. and China weighed on EME capital expenditures, energy producing companies rallied on the global increase in commodity prices. In addition, losses due to weakening local currencies (foreign exchange risk) were isolated to countries such as Turkey and Argentina with limited index exposure. On a relative basis, the active program underperformed its benchmark as active emerging markets equity composite returned -1.9% vs. MSCI EM benchmark of -1.1% for the quarter. Four managers in the active program underperformed while three managers outperformed. The overall emerging markets equity program, including passive, underperformed the benchmark by 0.6 percentage points over the same period. Stock selection in China and Brazil detracted from returns, partially offset by positive stock selection in Mexico. From a sector point of view, negative stock selection in Industrials and Healthcare were the primary detractors of performance. Across the program, the SBI's slight under-benchmark weight to China consists of predominantly (95%) China Hong Kong (H) shares. As the MSCI benchmark composition gradually increases its weight to China mainland (A) shares, the SBI program is keeping pace by offering an A share trading channel called Stock Connect to its emerging markets managers.

Fixed Income – Core

All four active SBI fixed income managers supporting the core fixed income pool outperformed the Bloomberg Barclays Aggregate benchmark this quarter. In total, the active managers returned 0.4% vs. 0.0% for the benchmark. The three semi-passive managers' combined performance exceeded the benchmark 0.1% vs. 0.0%. Yields rose across all maturities along the curve during the quarter due to broadly positive economic indicators, with the front end increases more directly tied to FOMC rate hikes. Managers with shorter overall duration positions outperformed managers with longer positions, as did those who were underweight the long end of the curve. During the quarter, narrowing credit spreads in the corporate and CMBS sectors were secondary contributors to relative outperformance. Security selection in ABS, CMBS, non-agency MBS, and dollar denominated emerging market debt added to performance. As the absolute level of yields increase, we are seeing managers re-deploy Treasuries, Agency MBS and corporates to the belly of the curve (5-10 yr.) where reasonable all-in yields can be earned while limiting duration exposure.

Fixed Income – Protection Portfolio

Since the completed funding of the Protection Portfolio in March 2018, the three managers responsible for the mandate (Goldman Sachs, BlackRock and Neuberger Berman) have performed in-line with the Bloomberg Barclays Treasury 5+ Year Index, with the composite and benchmark both returning -1.5% for the quarter. As a proxy for the long end, U.S. 10 Year Treasury yields rose from 2.9% to 3.1%, and the resulting negative price effect due to duration outweighed positive income return, resulting in a negative absolute return for the quarter.

Public Markets Managers' Organizational Update
Third Quarter 2018

Domestic Equity Managers

Goldman Sachs Asset Management

Sean Gallagher, Co-CIO of Fundamental Equity at Goldman Sachs retired September 30, 2018. There is no impact to the investment team. Staff will monitor the change.

J.P. Morgan

Bartjan van Hulten, joined J.P. Morgan as an analyst in the U.S. Equity Research Group covering Pharmaceuticals & Biotech, following the departure last quarter of Dr. Charles Silberman who had coverage of this area. Since 2011, Bartjan has been running Medex Capital, a global healthcare fund he founded. Prior to founding Medex, Bartjan was a healthcare team leader at Fidelity Investments and, prior to that, at MeesPierson (ABN Amro). Staff has no concerns at this time.

Developed International Equity Managers

AQR

In September 2018, Marcos Lopez de Prado joined AQR as a Principal and Head of Machine Learning. Marcos is part of the firm's research and portfolio management teams and focuses on further developing the machine learning tools and techniques used at AQR.

J.P. Morgan

In the third quarter Alexei Kapkin joined the Global Sector Specialist team replacing Jeremy Kelton who retired in the second quarter. Alexei, with 21 years of industry experience, will be covering the banking sector. Staff has no concerns at this time.

Marathon

Toma Kobayashi was hired in August as an analyst for the Japanese team. Also William Macleod, a portfolio manager for the European team, resigned in the third quarter. The responsibility for his 10% European allocation was divided equally between Charles Carter, Nick Longhurst and Neil Ostrer. Staff has no concerns at this time.

McKinley

Robert B. Gillam, McKinley's founder and CEO passed away in September. Robert A. Gillam, McKinley's CIO and President, will also take over the CEO role. Robert B. Gillam held 100% of the voting shares and approximately 65% of the non-voting shares held in trust. As of October Robert A. Gillam was appointed Chief Executive Officer of the trust and now has control of the voting trust. Staff has no concerns at this time.

Emerging Market Equity Managers

Pzena
During the quarter, Pzena lost two analysts, Evie Raikh and Eli Rabinowich. Coverage for both analysts was assumed by remaining staff. The staffing changes are consistent with the normal life cycle and attrition of analysts within Pzena culture, and staff has no concerns but will monitor the impact of these changes.

Martin Currie
In October, Martin Currie hired Colin Dishington from Mathews Asia, where he was a Senior Research Analyst based in San Francisco. Colin, who had previously worked at Martin Currie in 2010 as an assistant research analyst, will join the team responsible for the Communications sector.

Fixed Income Managers

Columbia
Gene Tannuzzo, Senior Portfolio Manager, is assuming the role of Deputy Global Head of Fixed Income, reporting to Colin Lundgren. In this role, Gene will share leadership and management roles with Colin, including representing the Global Fixed Income business to senior leadership committees. He will continue to co-lead multi-sector U.S. Fixed Income strategies, and there are no changes to Gene's current portfolio management responsibilities resulting from the promotion.

Brian Lavin, Senior Portfolio Manager, will assume the role of Head of U.S. High Yield, who is replacing Jennifer Ponce de Leon, who is on a medical leave of absence. Brian has been a member of the team since 1994, and there are no changes to the established investment philosophy or process. Staff has no concerns with these changes.

Goldman Sachs Asset Management (GSAM)
Jonathan Beinner, Chief Investment Officer and co-head of Global Fixed Income & Liquidity Solutions, has decided to retire from the firm effective March 2019. Andrew Wilson will become the sole head of Global Fixed Income and Liquidity Solutions, and will assume Jon's responsibilities for running the business. Sam Finkelstein and Ashish Shah, deputy co-CIO's of Fixed Income, will become co-CIO's for the global Fixed Income business and assume Jon's CIO responsibilities effective January 2019. As the transition affects senior leadership within GSAM Fixed Income, SBI will monitor the changes for any differences in strategy, style or other top-down staffing effects.

2018 Manager Meetings

The third quarter manager reviews are noted below.

Investment Manager	Asset Class
• ArrowMark Colorado Holdings, LLC	Domestic Equity
• Columbia Management Investment Advisers, LLC	Fixed Income
• Dodge & Cox	Fixed Income
• Goldman Sachs Asset Management	Fixed Income
• Macquarie Investment Management Advisers	International Equity
• Morgan Stanley Investment Management Inc.	International Equity
• Neuberger Berman Investment Advisers LLC	Fixed Income
• Pzena Investment Management, LLC	International Equity
• TIAA	529 College Savings Plan
• Western Asset Management Company	Fixed Income
• Galliard Capital Management, Inc.	Deferred Compensation
• RBC Global Asset Management (U.S.) Inc.	Non-Retirement

Non-Retirement Manager Update
Third Quarter 2018

Fixed Income

RBC Global Asset Management
The fixed income portfolio return of -0.1% for the quarter matched the benchmark return, the Barclays Intermediate Government Index.

Prudential Fixed Income
The fixed income portfolio return of 0.2% for the quarter outperformed the benchmark return, the Bloomberg Barclays U.S. Aggregate by 20 basis points. The portfolio's allocation to Investment Grade corporate and CMBS sectors added to returns, as spreads narrowed during the quarter, while security selection within those sectors generally detracted from returns. Top down effects (duration and curve positioning) had minimal impact on performance for the quarter.

Equity

BNY Mellon
Mellon tracked the benchmark for the quarter.

Deferred Compensation Manager Update
Third Quarter 2018

Domestic Equities

Vanguard Dividend Growth Fund

The Fund returned 8.1% for the quarter, which underperformed its benchmark, the NASDAQ US Dividend Achievers Select Index return of 9.5%. Non-benchmark holdings in real estate drove most of the underperformance. Uncertainty in revenue growth and recent outflows among self-storage REITs hurt Public Storage, and expectations were lowered.

Vanguard Institutional Index Plus

The domestic equity portfolio tracked the return of the S&P 500 Index for the quarter with a 7.7% return.

Vanguard Mid-Cap Index

The mid-cap equity portfolio tracked the benchmark, CRSP US Mid Cap Index, for the quarter with a 4.7% return.

T. Rowe Price

The small-cap equity portfolio outperformed the Russell 2000 for the quarter with a 6.3% return versus the benchmark return of 3.6%. Stock selection in Industrials, Information Technology and Consumer Discretionary benefited return for the quarter.

International Equities

Fidelity Diversified International

The international equity portfolio reported a 1.4% return for the quarter, which matched the MSCI EAFE Free benchmark return. The portfolio benefited from stock selection in Information Technology and lagged from holdings in Industrials and Health Care. Regionally, positions in Asia Pacific Ex Japan and a non-index holdings in the U.S. benefited. Conversely, stocks in Japan and non-index holdings in emerging markets detracted from performance.

Vanguard Total International Stock Index

The portfolio matched the benchmark, the FTSE Global All Cap ex US Index, for the quarter with a 0.5% return.

Fixed Income

Dodge & Cox Income Fund

The fixed income portfolio outperformed the benchmark, the Bloomberg Barclays Aggregate, for the quarter with a 0.6% return versus the benchmark return of 0.0%. The portfolio's shorter duration and higher allocation to corporate credit contributed to relative outperformance.

Vanguard Total Bond Market Index

The fixed income portfolio matched the benchmark, the Bloomberg Barclays Aggregate Index, for the quarter with a 0.0% return. Small deviations in the fund's performance relative to the benchmark may occur given the fund's sampling approach to approximate the index.

Balanced and Conservative Options

Vanguard Balanced

The portfolio returned 4.3%, which outperformed the customized benchmark return of 4.2% for the quarter. The benchmark is a combined return of 60% CRSP US total Market and 40% Barclays Aggregate.

Galliard Capital Management

The stable value portfolio underperformed the benchmark, the 3 Year Constant Maturity Treasury plus 0.45%, for the quarter with a 0.6% return versus 0.8% for the benchmark. An allocation to TIPS detracted modestly from performance during the quarter, as did issue selection in corporates which emphasized higher quality, shorter duration names.

TAB F

Report

AON Market Environment Report

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Market Environment

Third Quarter 2018

Aon

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

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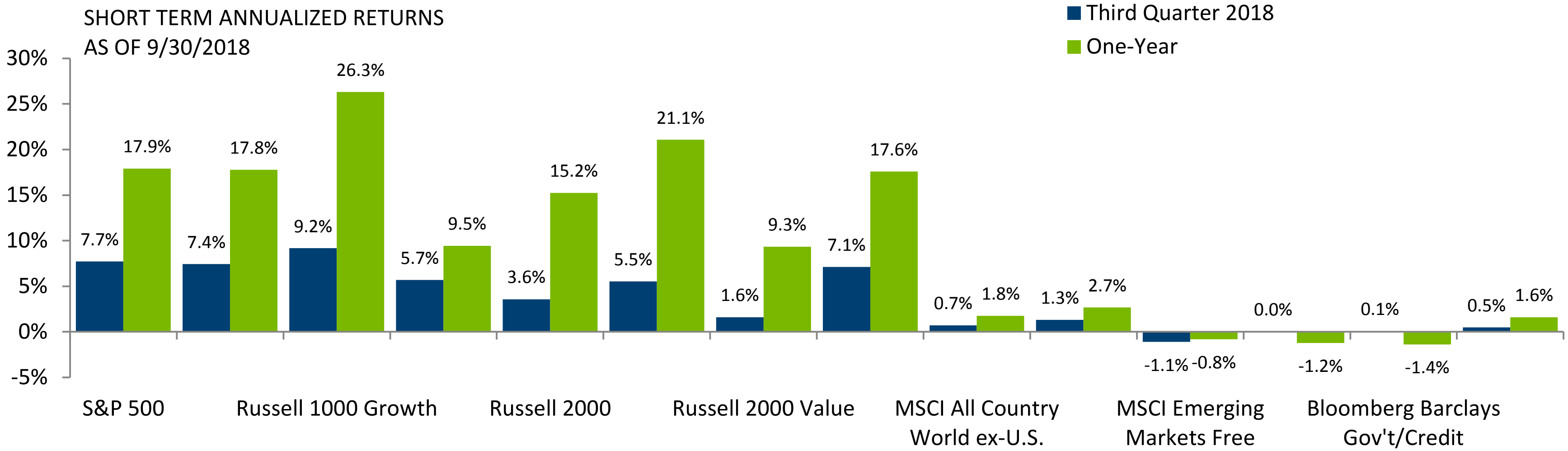
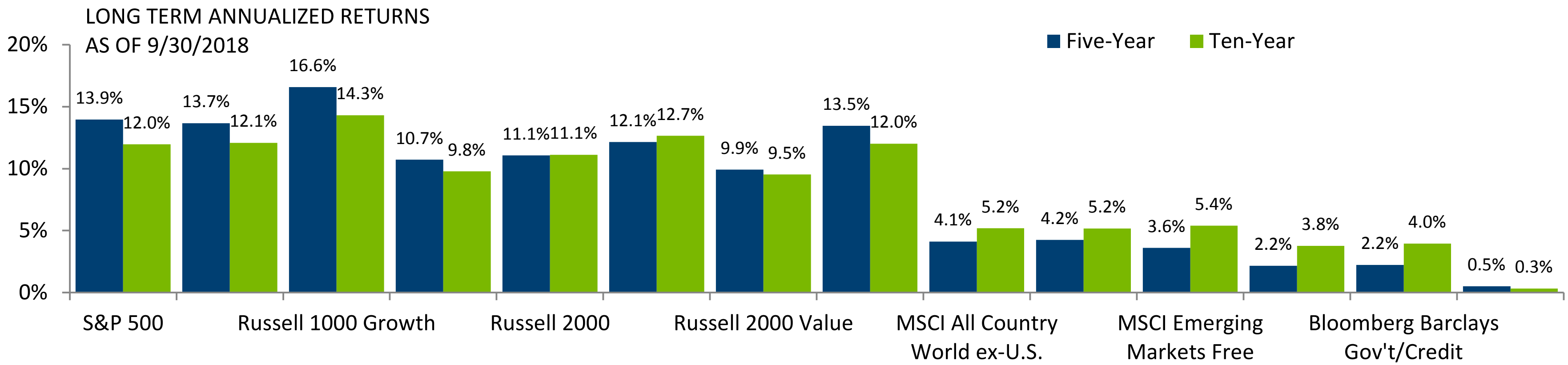
Market Highlights



Source: Russell, MSCI, Barclays



Source: Russell, MSCI, Barclays

Market Highlights

Returns of the Major Capital Markets

Periods Ending 9/30/2018

	Third Quarter	1-Year	3-Year[1]	5-Year[1]	10-Year[1]
Domestic Equity					
S&P 500	7.7%	17.9%	17.3%	13.9%	12.0%
Russell 1000	7.4%	17.8%	17.1%	13.7%	12.1%
Russell 1000 Growth	9.2%	26.3%	20.6%	16.6%	14.3%
Russell 1000 Value	5.7%	9.5%	13.6%	10.7%	9.8%
Russell 2000	3.6%	15.2%	17.1%	11.1%	11.1%
Russell 2000 Growth	5.5%	21.1%	18.0%	12.1%	12.7%
Russell 2000 Value	1.6%	9.3%	16.1%	9.9%	9.5%
Russell 3000	7.1%	17.6%	17.1%	13.5%	12.0%
International Equity					
MSCI All Country World ex-U.S.	0.7%	1.8%	10.0%	4.1%	5.2%
MSCI World ex USA	1.3%	2.7%	9.3%	4.2%	5.2%
MSCI Emerging Markets Free	-1.1%	-0.8%	12.4%	3.6%	5.4%
Fixed Income					
Bloomberg Barclays U.S. Aggregate	0.0%	-1.2%	1.3%	2.2%	3.8%
Bloomberg Barclays Gov't/Credit	0.1%	-1.4%	1.4%	2.2%	4.0%
3 Mo U.S. T-Bills	0.5%	1.6%	0.8%	0.5%	0.3%
Inflation					
CPI-U	0.5%	2.3%	2.0%	1.5%	1.4%

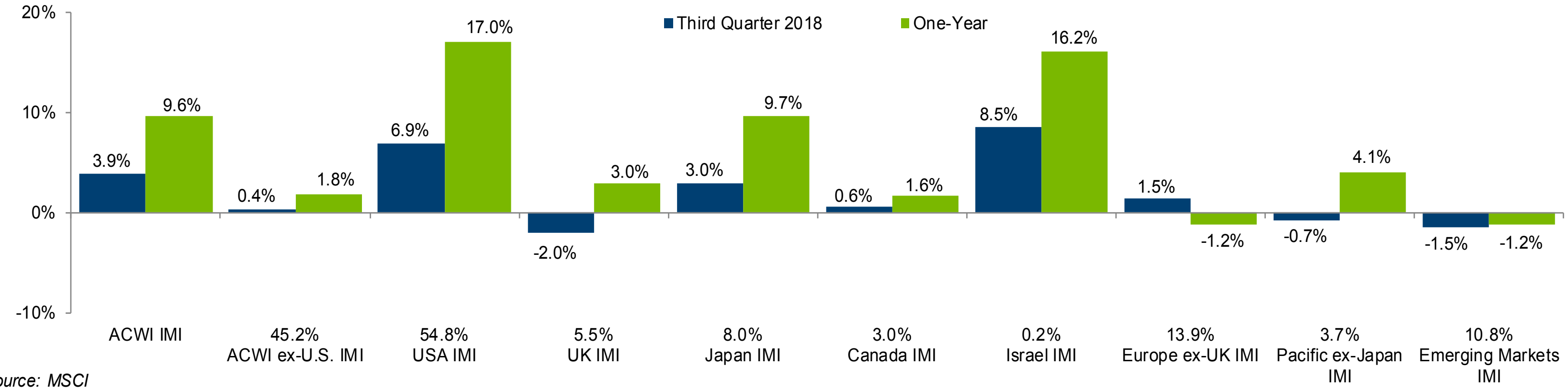
MSCI Indices show net returns.

All other indices show total returns.

[1] Periods are annualized.

Global Equity Markets

GLOBAL MSCI IMI INDEX RETURNS
AS OF 09/30/2018

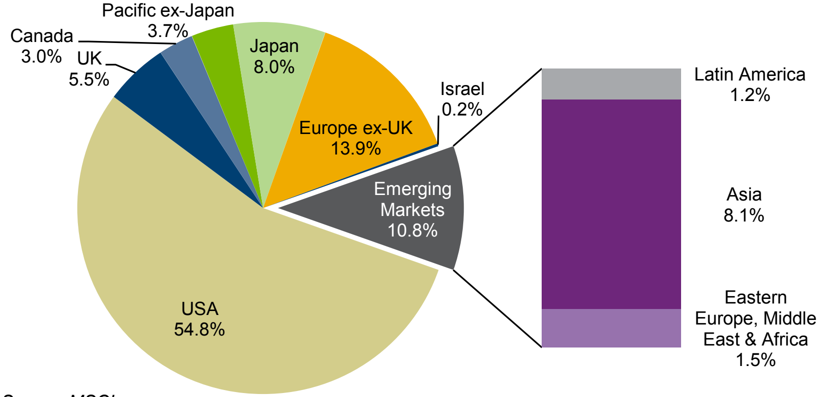


Source: MSCI

- Trade negotiation developments were keenly watched in Q3 2018. A last-minute compromise in the U.S.-Canada trade negotiations late in the quarter looks set to pave the way for the U.S.-Mexico-Canada (USMCA) agreement to be ratified by all three member governments towards the end of this year. However, U.S.-China trade relations continued to deteriorate. Despite this, global equities returned 3.9% in Q3 2018.
- U.S. equities continued to perform well in Q3 2018. This was supported by encouraging earnings and upbeat US economic data, with real GDP growth hitting 4.2% (year-on-year) and the Institute of Supply Management's (ISM) manufacturing index topping 60 once more in September. The combination of strong U.S. economic performance and robust corporate earnings growth elevated U.S. equity markets to new heights with the S&P 500 index hitting record levels.
- UK equities fell the most over the quarter is U.S. Dollar terms in a quarter where Brexit negotiations became increasingly anxious after several key elements of the UK Government's so-called "Chequers" plan for Brexit negotiations were rejected by the European Union (EU). European equities only modestly increased with concerns over the Italian budget and European banks' exposure to Turkey, which was exposed to a currency and debt crisis, weighing on the market.
- Trade war escalations, a strengthening U.S. dollar and concerns over the Chinese economy–all prominent features from the second quarter–were mainstays over Q3 for Emerging Markets (EM) equities. Consequently, EM equities fell 1.5% in U.S. dollar terms over the quarter.

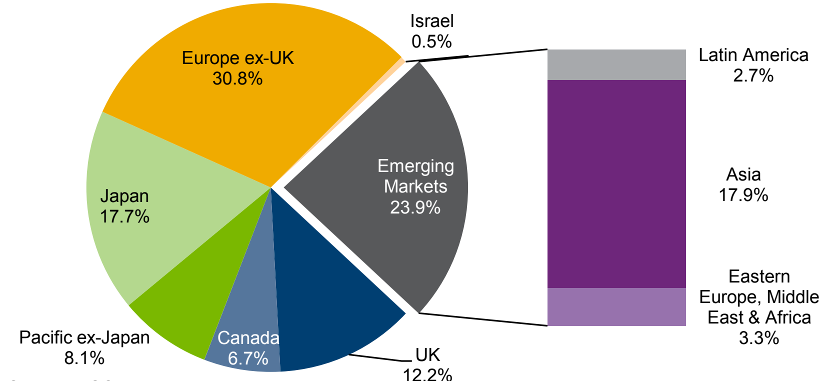
Global Equity Markets

MSCI ALL COUNTRY WORLD IMI INDEX GEOGRAPHIC ALLOCATION AS OF 09/30/2018



Source: MSCI

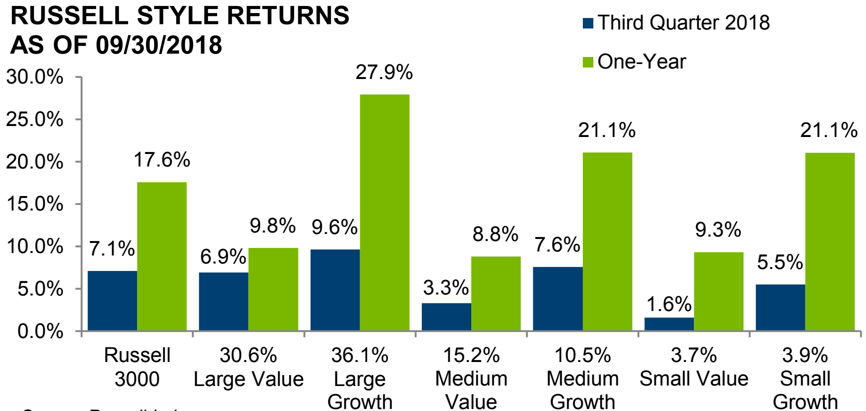
MSCI ALL COUNTRY WORLD EX-U.S. IMI INDEX GEOGRAPHIC ALLOCATION AS OF 09/30/2018



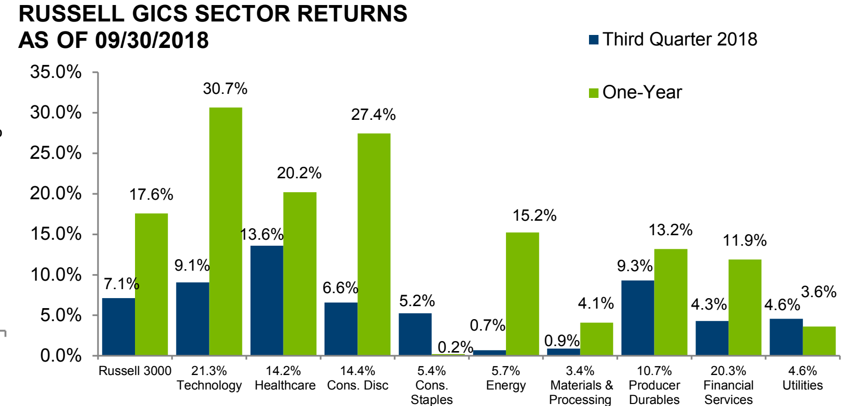
Source: MSCI

- The two exhibits on this slide illustrate the percentage that each country/region represents of the global and international equity markets as measured by the MSCI All Country World IMI Index and the MSCI All Country World ex-U.S. IMI Index, respectively.

U.S. Equity Markets



Source: Russell Indexes

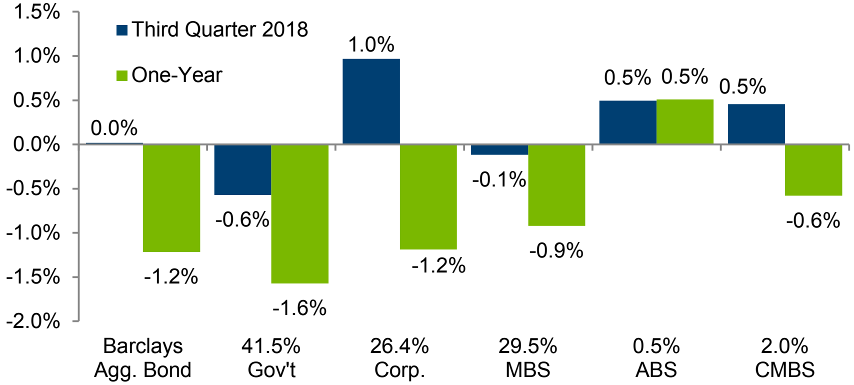


Source: Russell Indexes

- The Russell 3000 Index returned 7.1% during the third quarter and 17.6% over the one-year period.
- All sectors generated positive returns over the quarter. In particular, Healthcare (13.6%) and Producer Durables (9.3%) were the strongest performing sectors in Q3 2018. The Technology sector continued to perform strongly (9.1%) over the quarter supported by very strong earnings for mega-cap technology stocks, such as Amazon, Apple and Microsoft.
- Performance was positive across the market capitalization spectrum over the quarter. In general, large cap stocks outperformed both medium and small cap stocks over the quarter. Small cap stocks were led lower by poor performance of Financial and Healthcare stocks.
- Growth stocks outperformed their Value counterparts in Q3 2018. Over the last 12 months, Value stocks continued to lag their Growth stock equivalents significantly. The underperformance of Value stocks can be partly attributed to the lower exposure to Technology stocks, which have performed strongly over the last year.

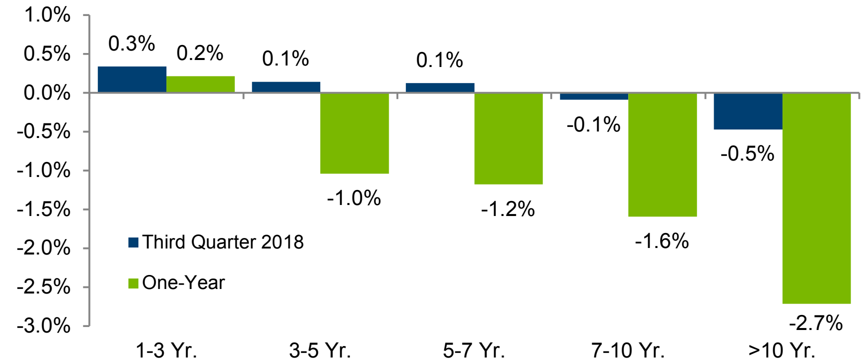
U.S. Fixed Income Markets

BLOOMBERG BARCLAYS AGGREGATE RETURNS BY SECTOR AS OF 09/30/2018



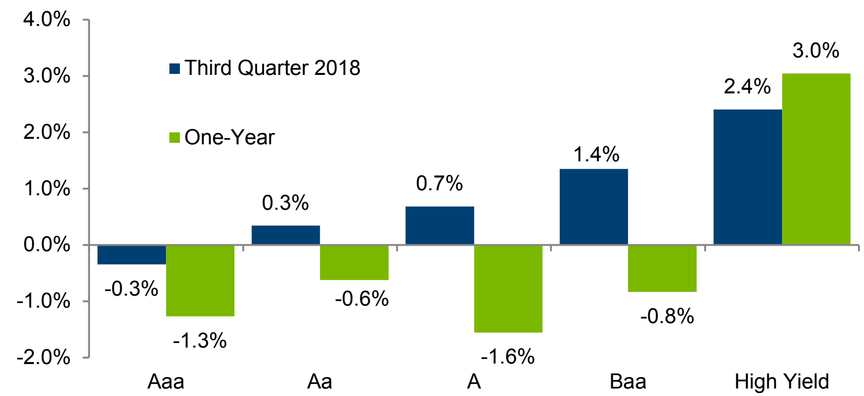
Source: FactSet

BLOOMBERG BARCLAYS AGGREGATE RETURNS BY MATURITY AS OF 09/30/2018



Source: FactSet

BLOOMBERG BARCLAYS U.S. AGGREGATE RETURNS BY QUALITY AND HIGH YIELD RETURNS AS OF 09/30/2018

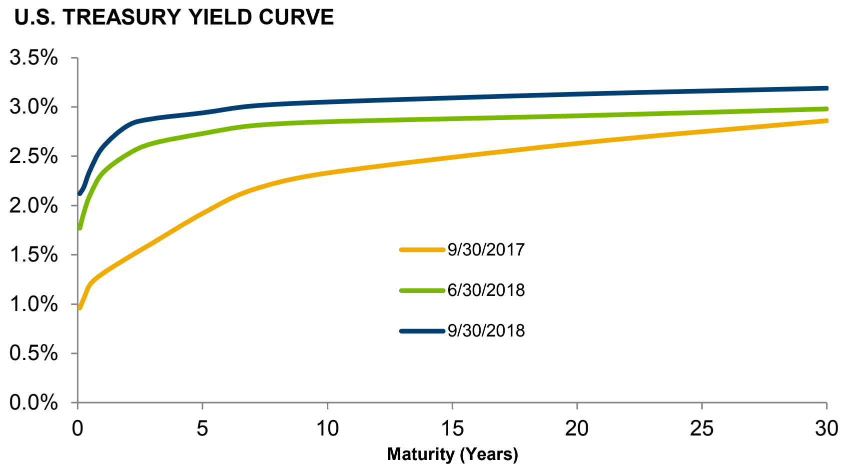


Source: FactSet

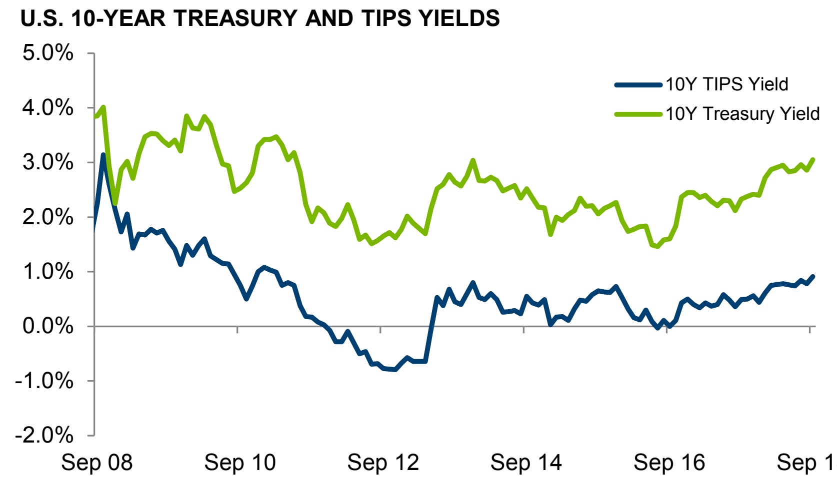
- The Bloomberg Barclays U.S. Aggregate Bond Index remained flat in the third quarter. Investment grade corporate bonds was the best performer over the quarter at 1.0% whilst government bonds was the worst performer at -0.6%.
- Performance was positive across all credit qualities, with the exception of AAA bonds which fell 0.3%, as spreads tightened over the quarter. High yield bonds returned the most at 2.4%. In investment grade bonds, Baa bonds were the major outperformer with a return of 1.4%.
- Short maturity bonds outperformed intermediate and long maturity bonds over the quarter. Short maturity bonds returned 0.3% while long maturity bonds fell 0.5% in Q3 2018.

Empower Results®

U.S. Fixed Income Markets



Source: U.S. Department of Treasury

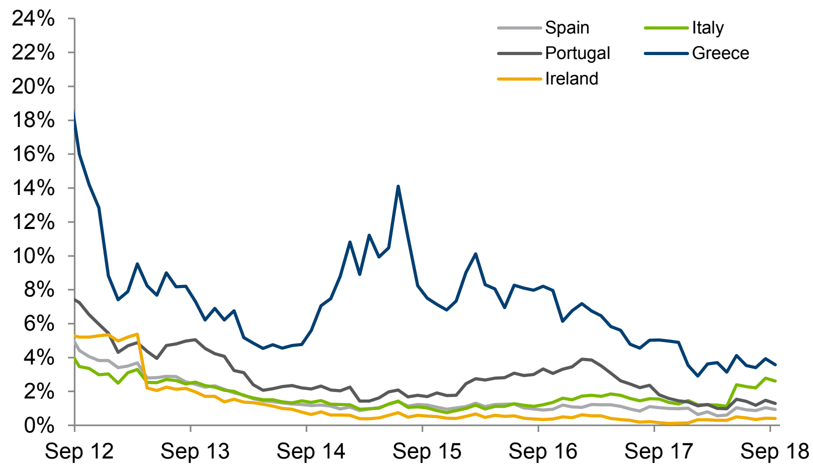


Source: U.S. Department of Treasury

- The yield curve flattened over the quarter with yields rising across maturities. The spread between the 10-year and 2-year U.S. Treasury yield narrowed to 24bps from 33bps. This flattening is very likely signalling bond market caution on economic growth prospects once the U.S. tax stimulus has flowed through.
- The US Federal Reserve (Fed) continued to tighten monetary policy, increasing the federal funds rate by 25bps to a range of 2.0-2.25%. While this rate hike now puts U.S. monetary policy above the Fed's preferred measure of inflation, the core Personal Consumption Expenditure price index, for the first time since the financial crisis, the real Fed funds rate (see chart below) is still very low historically and still broadly accommodative.
- The recent move in U.S. nominal government bond yields has primarily been driven by real yields, rather than market-implied expectations of future inflation. The 10-year U.S. treasury yield rose by 20bps to 3.05% with 18bps attributable to the increase in the duration-equivalent TIPS yield.

European Fixed Income Markets

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



Source: Factset

- Changes in bond spreads over 10-year German bunds were mixed across the eurozone. The European Central Bank (ECB) reiterated its expectations that any tightening to conventional monetary policy would only take place in the second half of 2019. We are, however, drawing nearer to the end of quantitative easing in the Eurozone which could ease downward pressure on bond yields that has prevailed for several years and potentially remove support for risk assets.
- Italian bond yields rose by 49bps to 3.18%, as the country's populist coalition agreed a budget with a fiscal deficit of 2.4%, significantly higher than finance minister Giovanni Tria's preferred target of a 1.6% deficit. The spread between Italian 10-year government bonds and German bunds widened by 32bps. Spanish government bond yields rose by 19bps to 1.51% over the quarter.
- Greek government bond yields rose by 20bps to 4.14% as the ECB confirmed it would stop providing liquidity to Greek banks, by accepting Greek government bonds as collateral, after Greece's bail-out deal. Over the quarter, the S&P improved its credit rating for Greece to positive from stable.

Credit Spreads

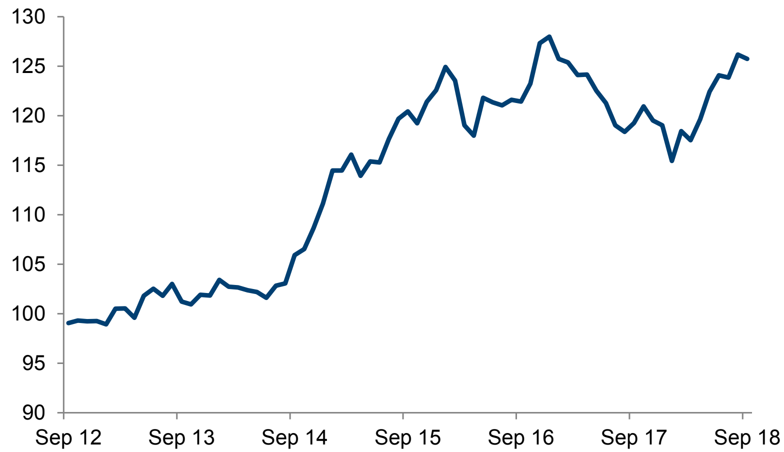
Spread (bps)	9/30/2018	6/30/2018	9/30/2017	Quarterly Change (bps)	1-Year Change (bps)
U.S. Aggregate	39	44	38	-5	1
Gov't	0	0	1	0	-1
Credit	100	116	96	-16	4
Gov't/Credit	43	50	43	-7	0
MBS	28	28	22	0	6
CMBS	60	70	71	-10	-11
ABS	38	47	44	-9	-6
Corporate	106	123	101	-17	5
High Yield	316	363	347	-47	-31
Global Emerging Markets	273	288	235	-15	38

Source: Barclays Live

- Credit spreads whipsawed over the third quarter, as initial narrowing over July was offset by spreads blowing out in August, before contracting again in September. Overall, spreads were down over the three months supporting credit market outperformance over government bonds.
- U.S. Corporate bond spreads and Government/Credit bond spreads narrowed by 17bps and 7bps, respectively.
- The strong relative performance of high yield bonds persisted; spreads on the Bloomberg Barclays US High Yield Index dropped by 47bps to 316bps, and primarily drove the 2.4% quarterly return. High yield also benefitted from lower interest rate sensitivity relative to the broader credit index.

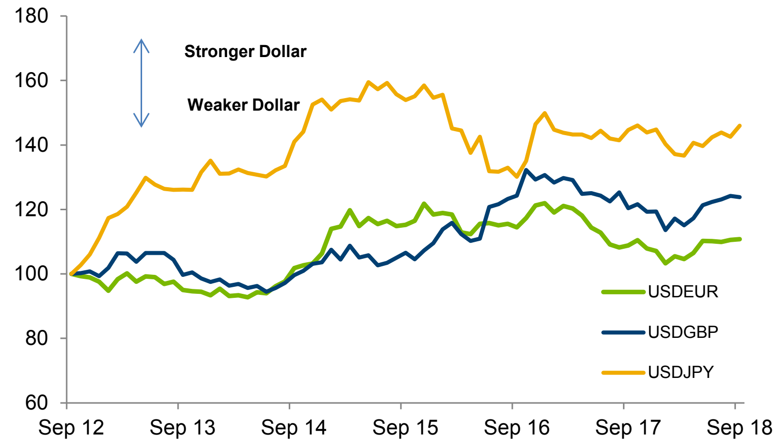
Currency

TRADE WEIGHTED U.S. DOLLAR INDEX
(1997 = 100)



Source: Federal Reserve

U.S. DOLLAR RELATIVE TO EUR, GBP AND JPY
REBASED TO 100 AT 09/28/2012

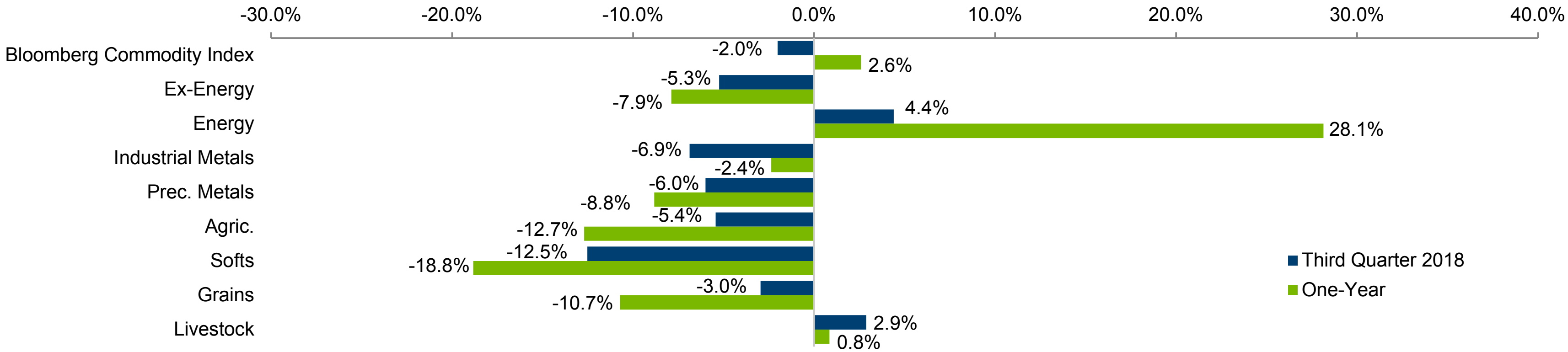


Source: Factset

- The U.S. dollar continued on an upward trend albeit to a lesser extent compared to the previous two quarters as it rose 1.3% on a trade-weighted basis over the quarter. Tightening U.S. monetary policy and strong economic fundamentals led the U.S. dollar higher.
- The U.S. dollar appreciated against all the major currencies. Brexit uncertainty in the UK, Italian budget uncertainty in the Eurozone and widening interest rate differentials with the Bank of Japan (BoJ) contributed to the strong U.S. dollar performance. During the quarter, the BoJ loosened its yield curve control policy; the yield on 10-year Japanese government bonds will now be able to fluctuate by 0.2% around zero, up from the previous range of 0.1%.
- The Canadian dollar performed strongly against a wide range of currencies, most notably against the Japanese yen (an appreciation of 4.4% in Q3 2018). Uncertainty surrounding the future of the Canadian economy was allayed late in the quarter as concessions were made with the late save in the form of the USMCA agreement.

Commodities

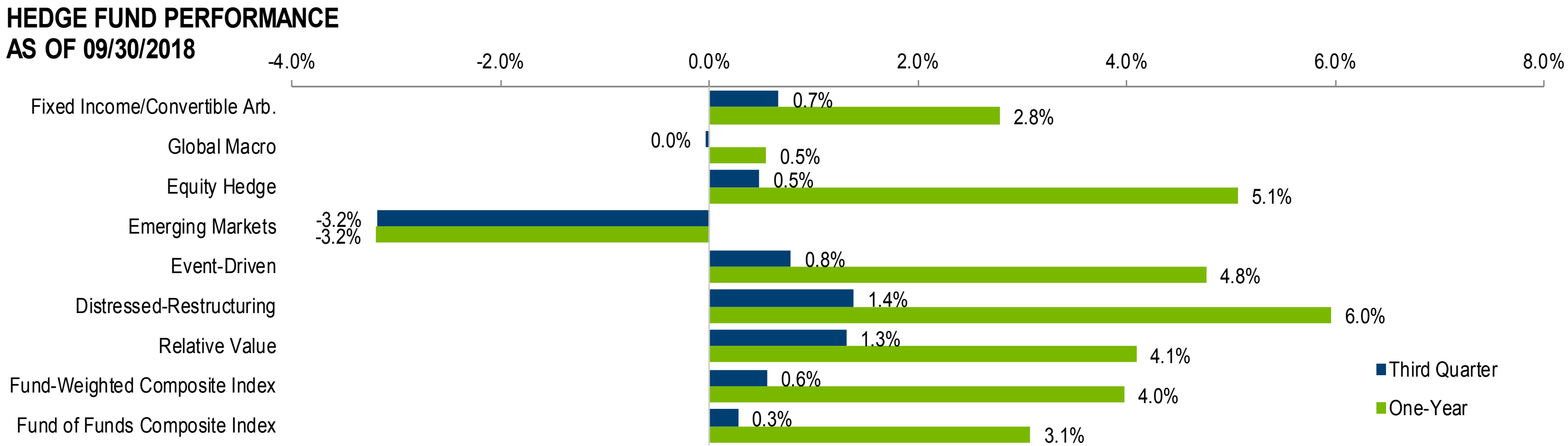
COMMODITY RETURNS AS OF 09/30/2018



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

- The Bloomberg Commodity Index returned -2.0% during a weak quarter for commodities.
- Energy was the best performing sector over the quarter with a return of 4.4%. The uncertainty of the impact on U.S. sanctions against Iran and OPEC's response, helped send Brent crude oil prices higher. However, the glut of U.S. crude oil supplies dragged down the price of WTI crude oil to US$73.16/bbl – the price spread relative to Brent crude oil widened to just under US$10/bbl.
- Other than Energy, the other notable increase was Livestock, which rose by 2.9% in Q3 2018.
- Meanwhile, agriculture and industrial metal commodities, which are more impacted by global trade uncertainty, detracted from the overall index return. Industrial metals (-6.9%) were particularly affected with the price of copper dropping by 7.0% over the quarter to US$6,180/bbl.
- The detrimental impact of a stronger U.S. dollar on commodities was noticeable in other markets with declines in Softs, Grains, and Precious Metals.

Hedge Fund Markets Overview

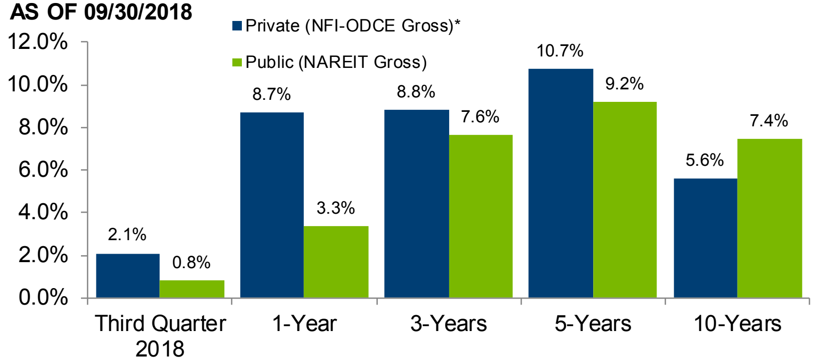


Note: Latest 5 months of HFR data are estimated by HFR and may change in the future.
Source: HFR

- Hedge fund performance was positive across all strategies (except for Emerging Markets) in the third quarter. Distressed-Restructuring and Relative Value were the best performers with a return of 1.4% and 1.3% respectively whilst Emerging Market hedge funds continued to be the worst performer with a return of -3.2%.
- July performance was positive across most strategies with Relative Value and Equity Hedge leading the way. August performance was led by Macro hedge funds, snapping a 3-month decline. Driven by currency exposure, Macro sub-strategy performance was led by quantitative, trend-following CTA strategies. September strategy performance was led by Relative Value funds mainly due to Sovereign bond and Asset Backed exposures.
- HFRI Fund-Weighted Composite Index and the HFRI Fund of Funds Composite Index produced returns of 0.6% and 0.3% respectively.

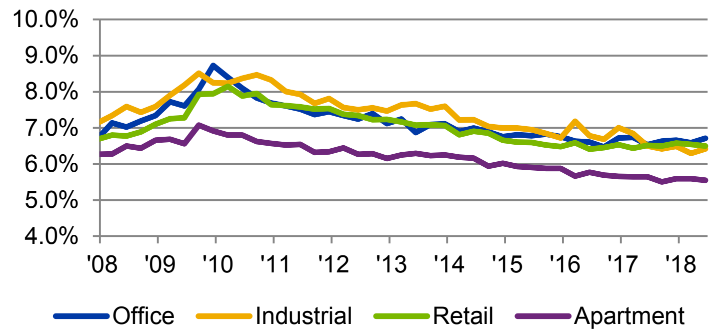
U.S. Commercial Real Estate Markets

PRIVATE VS. PUBLIC REAL ESTATE RETURNS
AS OF 09/30/2018



**Second quarter returns are preliminary*
Sources: NCREIF. Factset

CAP RATES BY SECTOR
SOURCE: RCA, AON HEWITT 6/30/2018



- U.S. Core real estate returned 2.09%* over the third quarter, equating to 8.7% total gross return year-over-year, with 4.3% made up of income. Net income growth is expected to be the larger driver of the total return going forward given the current point of the real estate cycle.
- After posting positive gains early in the quarter, global property stocks (FTSE EPRA/NAREIT Developed Index) ended Q3 with a slight loss (-0.2%) and are up 4.6% for the trailing year. U.S. REITs led the way with a marginal gain of 0.8%, as both the Europe and Asia/Pacific regions fell during the quarter. Although positive for the quarter, the U.S. REIT market (FTSE NAREIT Equity REITs Index) suffered the biggest loss in September among the major asset classes, down 2.5% compared with a 7.6% return for S&P 500. The Federal Reserve lifted short-term interest rates during the month which sparked investor concerns over the future performance of REITs. This marked the first monthly setback for US securitized real estate since February. The 10-year U.S. Treasury bond yield stood at 3.1% as of quarter end, compared to the U.S. REIT dividend yield of 4.2%. Transaction market volume and pricing remains healthy across property types.
- According to RCA, through August 2018, the U.S. property market has experienced price growth of 7.7% year-over-year across major sectors. Further, transaction volume is up 46% over the same period, primarily driven by large portfolio deals and foreign capital sources.
- Real Estate fundamentals remain healthy, but valuations across real estate and other asset classes are rich. Return expectations have normalized , with go forward expectations in line with historical norms. Rising interest rates have led to asset value correction fears across various asset classes; within real estate, investors can mitigate these risks by shifting preference to investments that can participate and benefit from economic growth, with downside protection offered by current income. Aon prefers investments that offer relatively strong rental income growth, or value-add potential with near-term income generation potential.
- It is critical to identify sub-sector and sub-market driven themes in the current environment; Unlike the last 6-7 year period, as assets are no longer trading at deep discounts to replacement value. Real estate investments should seek levers of NOI growth that are not predicated on continued market uplift. For example, an investment thesis can focus towards sectors benefiting from secular changes (e.g. Industrial and e-commerce), acquiring in-place rents below current market terms, and improving operational efficiency.

*Indicates preliminary NFI-ODCE data gross of fees

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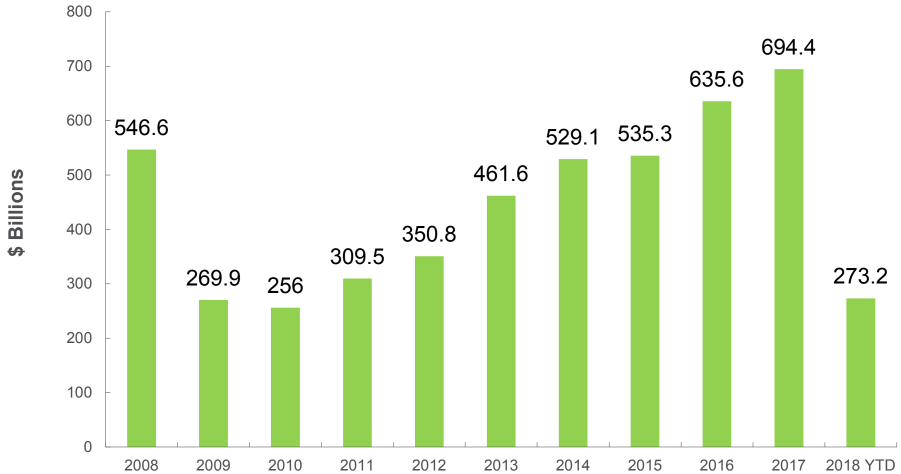
Appendix A:

Global Private Equity Market Overview
2Q 2018

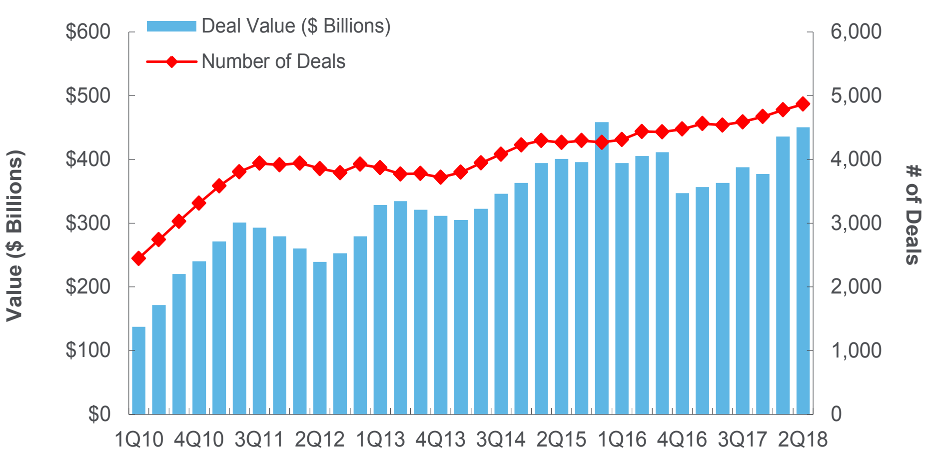
Private Equity Overview

Total Funds Raised



Source: Preqin

LTM Global Private Equity-Backed Buyout Deal Volume



Source: Preqin

Fundraising

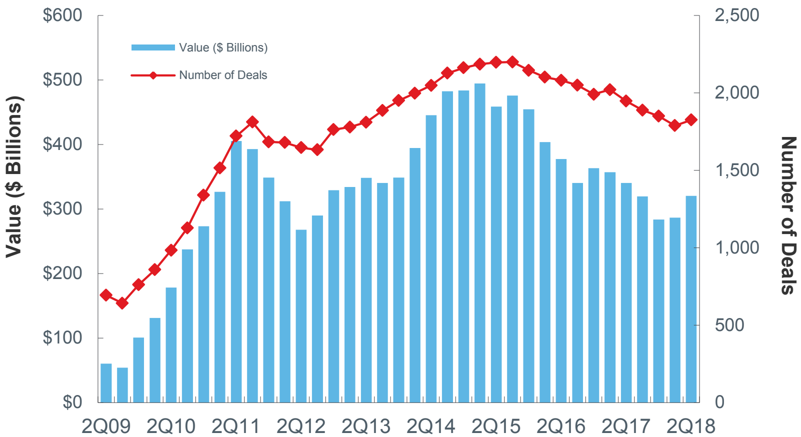
- In 2Q 2018, $147.8 billion was raised by 343 funds, which was up 17.1% on a capital basis and 3.9% by number of funds from the prior quarter.[1] However, this marks a decline of 29.3% and 20.2% by number of funds and by capital raised, respectively, over Q2 2017.
  - About half of 2Q 2018 capital was raised by funds with target geographies in North America, comprising 61.2% of the quarterly total. Capital targeted for Europe made up 25.5% of the total funds raised during the quarter, while the remainder was attributable to managers targeting Asia and other parts of the world.[1]
- Dry powder stood at $1.72 trillion at the end of the quarter, up 7.2% and 26.8% compared to year-end 2017 and the five year average, respectively.[1]

Activity

- On an LTM basis, 4,867 deals were completed for an aggregate deal value of $450.4 billion as of 2Q 2018 compared to 4,538 transactions totaling $363.1 billion as of Q2 2017.[1]
  - Average deal size was $92.5 million on an LTM basis, up 1.5% and 6.2% from the prior quarter and the five-year quarterly average level, respectively.
- European LBO transaction volume totaled €40.1 billion through 2Q 2018 and €86.9 billion on an LTM basis, compared to 2Q 2017's quarterly and 2017 full year totals of €18.0 billion and €78.6 billion, respectively. 2Q 2018's total was up 51.5% from the five-year quarterly average.[3]
- At the end of 2Q 2018, the average purchase price multiple for all U.S. LBOs was 9.8x EBITDA, down from 10.2x as of the end of Q1 2018. However, we do not believe this to be a trend as multiples as of 07/31/2018 were marked at 10.3x.[3]
  - This was 0.1x lower than the five-year year-end average and 0.6x turns (multiple of EBITDA) above the ten-year year-end average level.
- European multiples were up 0.4x quarter-over-quarter, averaging 10.8x EBITDA for all transaction sizes, with large and medium transactions each running at 11.7x and 10.8x, respectively.[3]
  - In Europe, the average senior debt/EBITDA level through 2Q 2018 was 5.5x, slightly higher than the 5.4x observed in full year 2017. This was also higher than the five-year and ten-year average levels of 5.1x and 4.8x, respectively.
- Debt remained broadly available in the U.S.
  - U.S. average leverage levels in 2Q 2018 were 5.5x compared to the five and ten year averages of 5.6x and 5.1x, respectively.[3]
  - The amount of debt issued supporting new transactions increased compared to year-end 2017 from 60.3% to 60.6% and remains above the 55.5% five-year average level.[3]

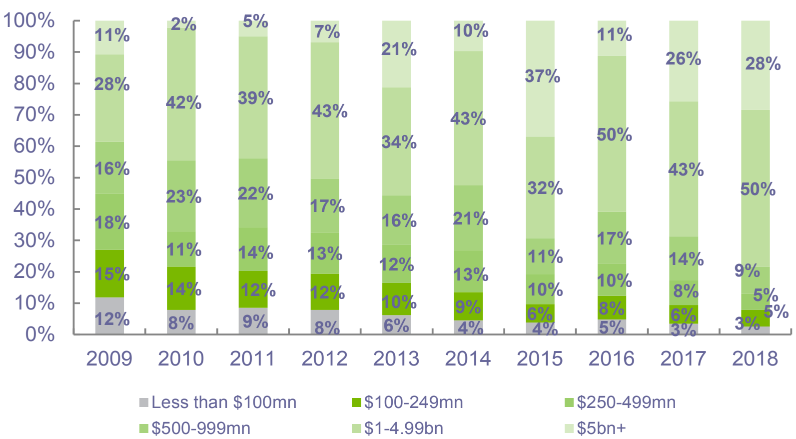
Buyouts / Corporate Finance

LTM PE Exit Volume and Value



Source: Preqin

M&A Deal Value by Deal Size



Source: Preqin

Fundraising

- $58.5 billion was closed on by 82 buyout and growth funds in 2Q 2018, compared to $63.4 billion raised by 95 funds the quarter before.[1]
  - This was down compared to the five-year quarterly average of $71.6 billion.
  - Carlyle Asia Partners V was the largest partnership raised during the quarter, having raised $6.6 billion at final close.
- Buyout and growth equity dry powder was estimated at $798.6 billion, which was above the record level of $752.9 billion observed at year-end 2017 and was substantially higher than the five-year average level of $608.8 billion. However, this was lower than the $824.9 billion of dry powder observed in Q1 2018.[1]
  - Dry powder for mega, large, and mid cap funds decreased 5.5%, 5.7%, and 1.5% quarter-over-quarter, respectively, while small cap funds saw a slight increase of 0.5%. Mega fund dry powder finished the quarter up 3.4% from year end 2017.[1]
  - An estimated 53.8% of buyout dry powder was targeted for North America, while 31.3% was targeted for Europe.[1]

Activity

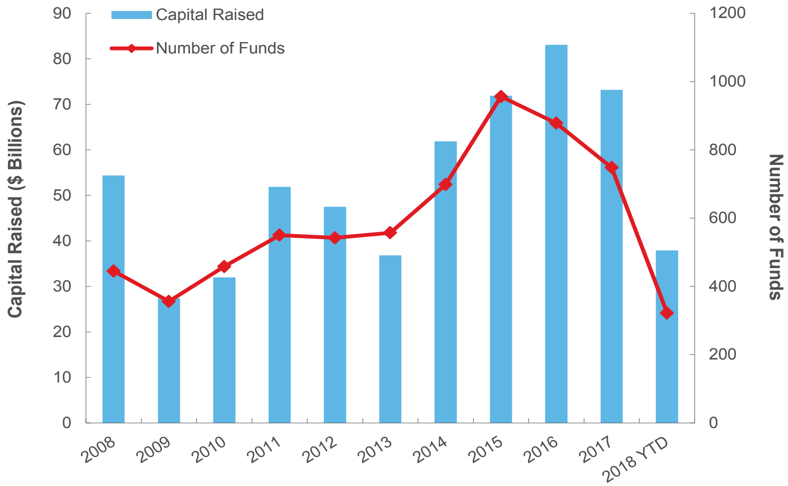
- Global private equity-backed buyout deals totaled $129.3 billion in 2Q 2018, which was up 5.8% and 33.2% from the prior quarter and five year average, respectively.[1]
  - 1,271 deals were completed during the quarter, which was up 3.8% from 1Q 2018 and an increase of 15.3% compared to the five-year quarterly average.
  - Deals valued at $5.0 billion or greater accounted for an estimated 28.4% of total deal value during the quarter compared to 25.7% in 2017 and 11.3% in 2016.[1]
- Entry multiples for all transaction sizes in 2Q 2018 stood at 9.8x EBITDA, down from year-end 2017 (10.6x). We do not believe this to be a trend, however, as 07/31/2018 data shows multiples returning to 10.3x EBITDA.[3]
  - Large cap U.S. purchase price multiples stood at 9.8x, down compared to a full year 2017 level of 10.4x.[3]
  - The weighted average purchase price multiple across all European transaction sizes averaged 10.8x EBITDA in 2Q 2018, up from 10.5x at the end of Q1 2018. Purchase prices for transactions of €1.0 billion or more increased from 11.3x at Q1 2018 to 11.6x in 2Q 2018.[3]
  - Transactions between €500.0 million and €1.0 billion were up 0.4x from the end of 1Q 2018, and stood at 10.8x.[3]
  - The portion of average purchase prices financed by equity for U.S. deals was 42.5% in 2Q 2018, down from 45.7% at year-end 2017; this remained lower than the five and ten-year full year averages of 42.8% and 43.3%, respectively.[3]
- Buyout exit value totaled $117.4 billion during the quarter, significantly higher than the $64.1 billion exit value seen in 1Q 2018. This was primarily driven by trade sales ($58.7 billion) and through sales to GPs ($33.7 billion).[1]

Opportunity

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

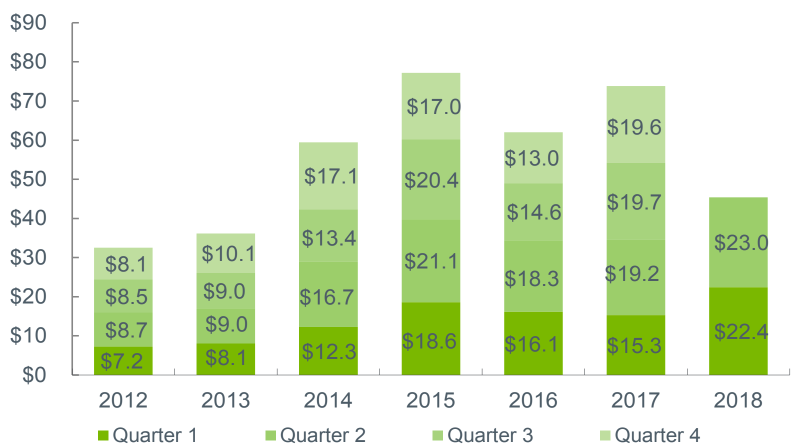
Venture Capital

Venture Capital Fundraising



Source: Preqin

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



Source: PwC/CB Insights Report

Fundraising

- $25.4 billion of capital closed in 2Q 2018, up from the prior quarter and 2Q 2017 totals of $12.5 billion and $20.9 billion, respectively.[1]
  - 177 funds closed during the quarter, up 22.1% from the prior quarter but down 9.1% from the five year quarterly average.[1]
  - Sequoia Capital Global Growth Fund III was the largest fund raised during the quarter, closing on $6.0 billion in its first close.[16]
- The average fund size raised during the quarter was approximately $156.0 million, which was higher than both the prior quarter and five year quarterly average of $107.0 million and $109.6 million, respectively. The majority of funds in market are seeking commitments of $200.0 million or less.[1]
- Dry powder was estimated at $210.0 billion at the end of 2Q 2018, which was up from 1Q 2018's total of $200.9 billion. This was 54.5% higher than the five year average. An estimated 49.8% of dry powder was targeted for North America, followed by approximately 32.7% earmarked for Asia.[1]

Activity

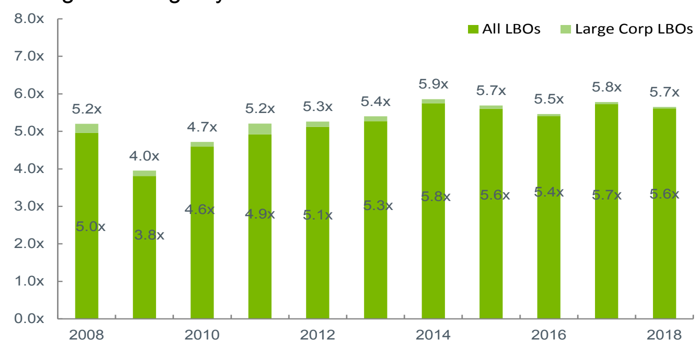
- During the first quarter, 1,416 venture backed transactions totaling $23.0 billion were completed, up from 1Q 2018's total value of $22.4 billion for 1,297 deals completed. This was the strongest quarter on a capital investment basis in the last five years, and marks the fourth consecutive quarter of $19.5 billion or more invested into venture-backed companies.[7]
  - The number of unicorns in the U.S., or companies with valuations of $1.0 billion or more, increased dramatically by 7 in 2Q 2018.[7]
- Median pre-money valuations increased across Series B and C financings, but dipped in Series A and Series D+ transactions during Q2. Seed stage pre-money valuations were flat quarter-over-quarter. Series C and Series B increased by 52.8% and 13.7%, respectively, to valuations of $137.5 million and $73.9 million, respectively. Series D+ deal valuations were down 20.0% quarter-over-quarter and are currently valued at $216.0 million. Series A pre-money valuations decreased by 12.8% quarter-over-quarter, ending at $20.5 million.[9]
- Total U.S. venture backed exit activity totaled $12.9 billion across 201 completed transactions in 2Q 2018, down on a capital basis from $15.7 billion in 1Q 2018.[8]
  - There were 28 venture-backed initial public offerings during the quarter, nearly double the 15 completed in 1Q 2018.[8]
  - The number of M&A transactions totaled 134 deals in 2Q 2018, representing a decrease of 17.8% from 1Q 2018.[8]

Opportunity

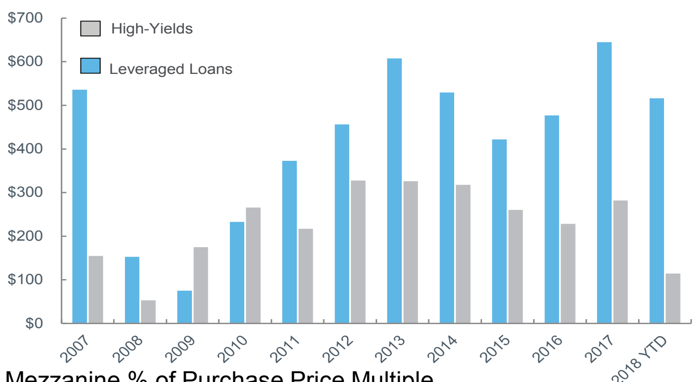
- Early stage continues to be attractive, although we are monitoring valuation increases.
- Smaller end of growth equity.
- Technology sector.

Leveraged Loans & Mezzanine

Average Leverage by Deal Size



Debt Issuance ($ Billions)



Mezzanine % of Purchase Price Multiple

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

Leveraged Loans

Fundraising

- New CLO issuance totaled $66.7 billion throughout the first six months of 2018, up 27% compared to 2Q 2017's six month total.[5]
- High-yield debt issuance totaled $51.7 billion in 2Q 2018, down from $62.8 billion in 1Q 2018.[2]
- Mutual fund net inflows stood at $8.6 billion at the end of 2Q 2018, which continues the 19-week inflow streak to $7.9 billion.[2]

Activity

- The average leverage level for large cap LBOs was 5.7x during the quarter, down from 5.8x seen at year-end 2017. Leverage for all LBO transactions ended the quarter at 5.6x, compared to 5.7x at year-end 2017 and continues to be comprised primarily of senior debt. Subordinated debt levels remained at 0.0x during the quarter.[3]
- New leveraged loan issuances in 2Q totaled $349.0 billion, up from the prior quarter's total of $167.0 billion. This represents 80.0% of 2017's full year total.[2]
- 60.6% of new leveraged loans were used to support M&A and growth activity during the quarter, up from 56.9% during Q1 2018 and above the prior five year average of 54.8%.[3]
- European leveraged loan issuance decreased by 7.0% quarter-over-quarter to €22.4 billion.[3]
  - However, this was significantly above the five-year and ten-year average levels of €14.5 billion and €10.5 billion, respectively.
- Leveraged loan spreads for B rated issues widened by 25 bps quarter-over-quarter, ending 2Q 2018 at 5.40%. BB index spreads increased slightly by 16 bps ending the quarter at 6.59%.[2]
- With the supply side of the US Leveraged Loan market remaining strong, issuers are starting to see pushback on both pricing and terms. [2]
- Despite solid loan issuance, the predominance of covenant-lite loans coupled with a general trend of loosening loan terms continue to raise questions about expected recovery rates in a downturn. [2]

Opportunity

- Funds with the ability to originate deals directly and the ability to scale for larger transactions.
- Funds focused on the highest quality opportunities and structuring deals in the highest part of the capital structure.

Mezzanine

Fundraising

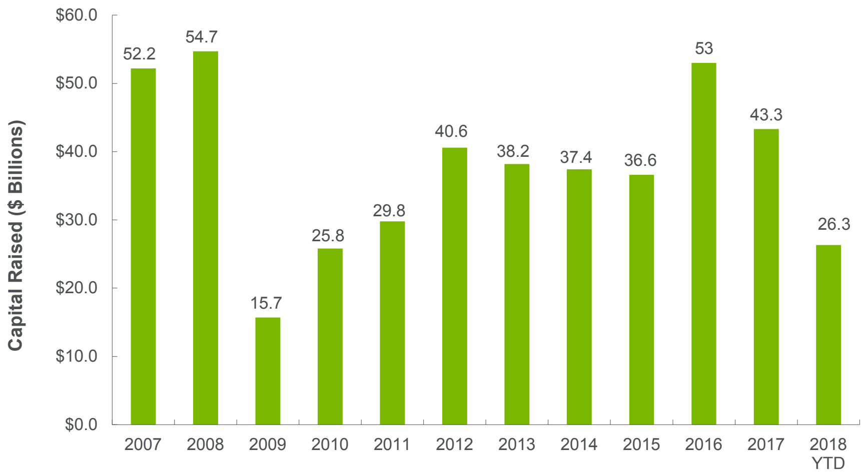
- Eight funds closed on $15.3 billion during the quarter, up from 1Q 2018's total of $5.8 billion raised by eighteen funds and the five year quarterly average of $4.9 billion.[1]
- Estimated dry powder was $45.5 billion at the end of 2Q 2018, down by $4.9 billion from 4Q 2017 and lower than the $53.1 billion high seen at year-end 2016.[1]
- Fundraising remains robust with an estimated 76 funds in market targeting $30.6 billion of commitments.[1]

Opportunity

- Subordinated debt continues to evaporate in the US middle-market space to the benefit of the unitranche offering. [2]
- Demand for subordinated debt remains in the larger end of the market.

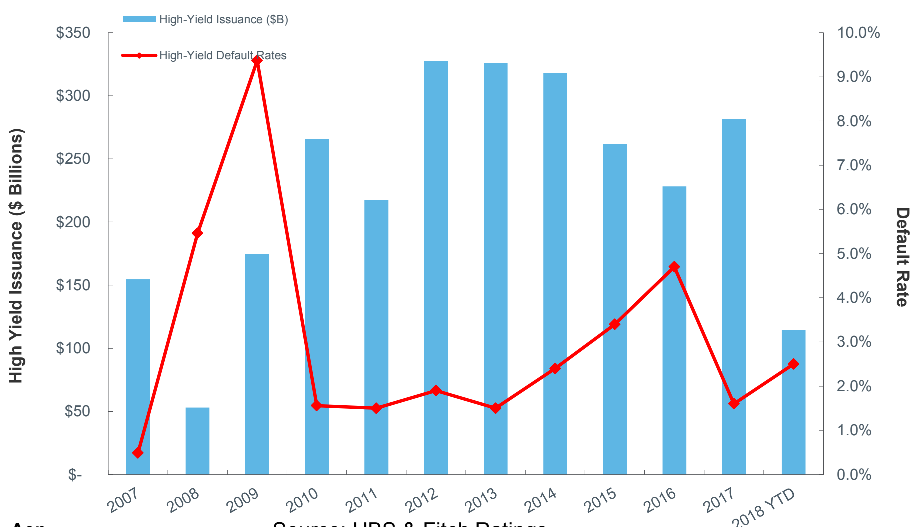
Distressed Private Markets

Distressed Debt, Turnaround, & Special Situations Fundraising



Source: Thomson Reuters

High-Yield Bond Volume vs Default Rates



Source: UBS & Fitch Ratings

Fundraising

- During the quarter, $17.9 billion was raised by 12 funds, significantly higher than the $8.4 billion raised during 1Q 2018. This was the largest amount raised since Q4 2016.[1]
  - This was above the five-year quarterly average of $10.5 billion.
  - GSO Capital Solutions Fund III was the largest partnership raised during the quarter, closing on $7.4 billion to invest in distressed debt.
- Dry powder was estimated at $117.7 billion at the end 2Q 2018, which was up 12.2% from 4Q 2017. This remained above the five-year annual average level of $97.5 billion.[1]
- Roughly 109 funds were in the market at the end of 2Q 2018, seeking an aggregate $63.6 billion in capital commitments.[1]
  - Fortress Investment Group V and GSO Energy Select Opportunities Fund II were the largest funds in market seeking $5.0 billion of capital, each.

Activity

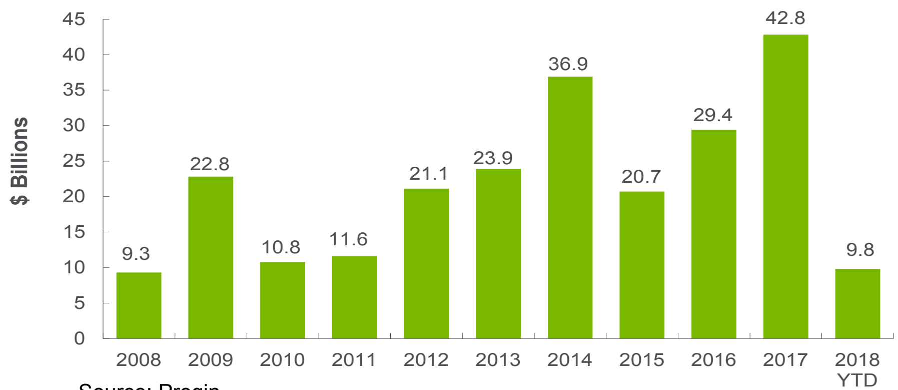
- The TTM U.S. high-yield default rate was 2.5% as of June 2018, which was down from March 2018's LTM rate of 2.7%.[6]
- Default rates are at an all-time low and appear to be headed lower as easy access to credit keeps companies from defaulting. However, the amount of junk-rated paper issued in the U.S. over the past few years suggests something may give in the near term.
- The credit risk environment remains benign, but the impact of rising interest rates is becoming more and more pertinent, and further positive returns driven by multiple expansion will be limited.[4]
- The ECB recently announced plans to end its stimulus program by the end of 2018, while holding interest rates level for at least a year if the European economy remains resilient. Similar to the US, Europe has experienced a spike in loan issuance over the past several years that could lead to distressed opportunities should the economy falter.
- Consistently high purchase prices and elevated levels of leverage may result in an increase in distressed opportunities looking out over the next two to three years, or sooner if there is a stall in the economy.

Opportunity

- Funds focused on niche opportunities where the manager has the ability to quickly move on opportunities as they arise.
- Funds with the ability to perform operational turnarounds.

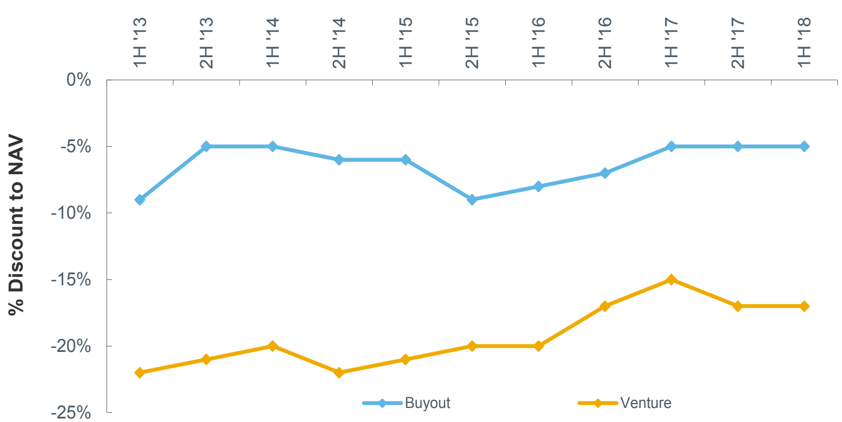
Secondaries

Secondary Fundraising



Source: Preqin

Secondary Pricing



Source: Evercore

Fundraising

- Twelve funds raised $3.1 billion during the second quarter, down from $6.7 billion raised by ten funds in 1Q 2018 and lower than the $6.6 billion raised in 2Q 2017.[1]
  - 2Q 2018's aggregate capital raised represents 7.2% of 2017's full year total.
  - Montana Capital Partners' Annual Secondary Program Fund IV was the largest fund raised during the quarter, closing on $982.1 million.[1]
- As of 2Q 2018, dry powder was estimated to be at $64.0 billion, which was lower 4Q 2017's level of 77.0 billion[17]. The top 14 secondary buyers are estimated to command more than 80.0% of the market's capital reserves. The top 20 buyers are estimated to hold more than 90.0% of the market's dry powder.[17]
- At the end of 2Q 2018, there were an estimated 41 secondary and direct secondary funds in market, targeting approximately $49.2 billion. Lexington Capital Partners IX and Ardian's ASF VIII were the largest funds in the market, each targeting $12.0 billion.[1]
  - Over 61.5% of secondary funds are targeting North America and seek 48.1% of capital being raised.

Activity

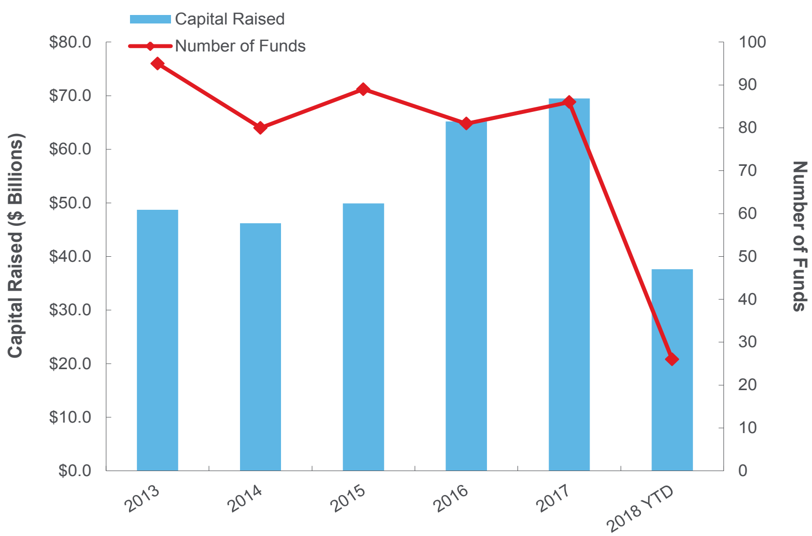
- More than 900 potential buyers and nearly 886 potential sellers of secondary interests have been identified.[1]
  - Banks represent the largest proportion of potential sellers at 20.0%.
- Transaction and fund leverage and deferred payment structures continue to be prevalent and are used as a means to improve pricing in an increasingly competitive environment.[17]
- 81.0% of 2018 year-to-date secondary transactions have occurred within private equity (with the rest in real estate and infrastructure). The average buyout pricing discount ended at 5.0% for 2Q 2018, while venture ended at a discount of 17.0%.[17]
- Pricing is expected to remain attractive for sellers given the continued high levels of dry powder and competition for secondary transactions.[17]

Opportunity

- Funds that are able to execute complex and structured transactions.
- Niche strategies.
- Fund restructurings.

Infrastructure

Global Infrastructure Fundraising



Source: Preqin

Number of Deals Completed

Source: Preqin

Fundraising

- $24.7 billion of capital was raised by 17 funds in 2Q 2018 compared to $10.3 billion of capital closed on by 22 partnerships in 2Q 2017.[1]
  - Funds raised during the quarter averaged 125.2% of their target size, which was up from 119.8% in Q1 2018.[1]
  - ISQ Global Infrastructure Fund held its final close on $6.5 billion and was the largest fund closed during Q2 2018.[1]
- As of the end of 2Q 2018, there were an estimated 180 funds in the market seeking roughly $126.7 billion.[1]
  - Funds focused on infrastructure assets in the U.S. were targeting an estimated $52.1 billion in capital, while European focused funds were targeting approximately $39.7 billion.[1] The remainder of capital targets Asia and the rest of the world.
  - KKR Global Infrastructure Investors III was the largest fund in the market as of the end of 2Q 2018, targeting $7.0 billion.
- At the end of the quarter, dry powder stood at an estimated $161.0 billion, up from Q1 2018 at $160.0 billion.[1] Based on fund classifications by Preqin, an estimated 49.3% of the dry powder was held by in Mega Funds (funds with commitments of $2.0 billion or more), compared to 20.1% for Large Funds ($1.0 billion to $1.9 billion in size) and 15.7% for Medium Funds ($500.0 million to 999.9 million in size).[1]
- Concerns surrounding the relative availability and pricing of assets remain. Fundraising continues to be very competitive given the number of funds and aggregate target level of funds in market. Investor appetite for the asset class persists despite the record levels of dry powder and increased investment activity from strategic and corporate buyers as well as institutional investors.

Activity

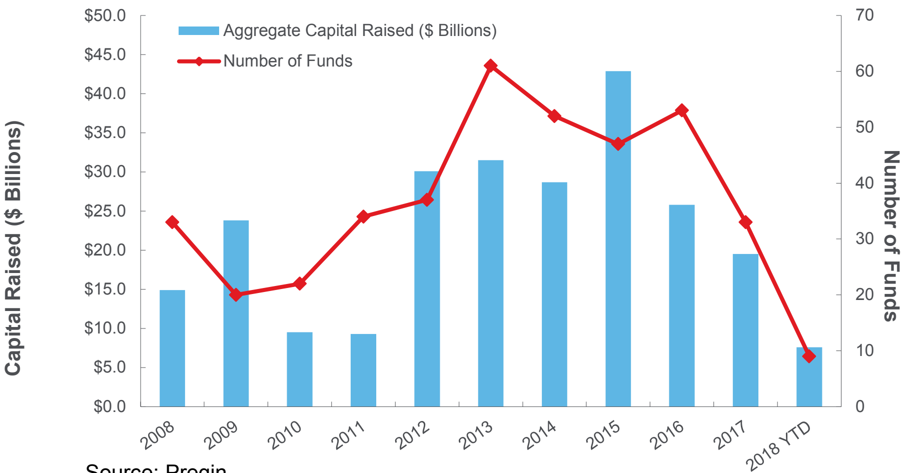
- Infrastructure managers completed 569 deals with an estimated aggregate deal value of $209.4 billion in 2Q 2018 compared to 630 deals totaling $249.8 billion a quarter ago[1]. The average deal value during the quarter was $410.8 million, down compared to the five-year average of $422.0 million.
  - North America accounted for 35.1% of the deals in 2Q 2018, while 31.5% and 15.1% of deals were transacted in Europe and Asia, respectively.[1]
  - Renewable energy was the dominant industry during the quarter with 57.5% of transactions, followed by the utilities sector, which accounted for 13.9% of the quarter's deals. Energy accounted for 10.9% of transactions.[1]

Opportunity

- Greenfield infrastructure is less competitive and offers a premium for managers willing to take on construction risk.
- Mid-market and core-plus brownfield infrastructure is relatively less competitive and may offer better relative value to investors.

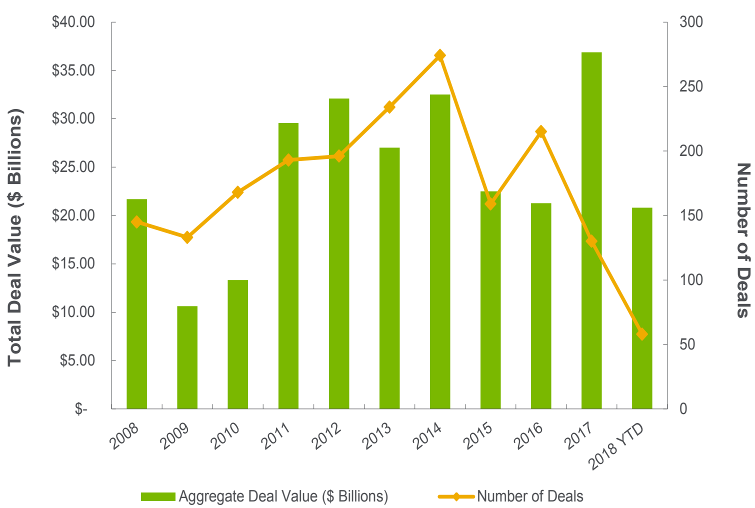
Natural Resources

Natural Resources Fundraising



Source: Preqin

Energy & Utilities Deal Activity



Source: Preqin

Fundraising

- During 2Q 2018, six funds closed on $2.3 billion compared to 11 funds totaling $7.9 billion in 1Q 2018.[1]
- At the end of 2Q 2018, there were roughly 288 funds in the market targeting an estimated $145.2 billion in capital, compared to 258 funds seeking an estimated $130.8 billion in 1Q 2018.[1]
  - Energy Capital Partners IV was seeking the most capital with a target fund size of $6.0 billion.
- Dry powder was estimated at $62.9 billion at the end of 2Q 2018, which was down 2.2% from 1Q 2018's level, and remains below the record level of $78.5 billion observed in 4Q 2016.[1]

Activity

- Energy and utilities industry managers completed 35 deals totaling a reported $12.0 billion in 2Q 2018, up 52.2% and 36.4% over 1Q 2018's total deal activity and total deal value, respectively.
- Crude oil prices increased during the quarter.
  - WTI crude oil prices increased 8.2% during the quarter to $67.87/bbl.[11]
  - Brent crude oil prices ended the quarter at $74.41/bbl, up 12.7% from 1Q 2018.[11]
- Natural gas prices (Henry Hub) increased by 10.4% during the first quarter, ending at $2.97 per MMBtu.[11]
- A total of 1,047 crude oil and natural gas rotary rigs were in operation in the U.S. at the end of 2Q 2018, up 5.7% from the prior quarter. Crude oil rigs represented 81.9% of the total rigs in operation.[15]
- The price of iron ore (Tianjin Port) ended the second quarter at $65.04 per dry metric ton, down 9.0% quarter-over-quarter.[12]

Opportunity

- Acquire and exploit existing oil and gas strategies preferred over early stage exploration in core U.S. and Canadian basins.
- Select midstream opportunities.

Notes

1. Preqin
2. UBS
3. Standard & Poor's
4. Aon Hewitt Investment Consulting
5. Thomson Reuters
6. Fitch Ratings
7. PriceWaterhouseCoopers/National Venture Capital Association MoneyTree Report
8. PitchBook/National Venture Capital Association Venture Monitor
9. Cooley Venture Financing Report
10. Federal Reserve
11. U.S. Energy Information Administration
12. Bloomberg
13. Setter Capital Volume Report: Secondary Market FY 2016
14. KPMG and CB Insights
15. Baker Hughes
16. Dow Jones Venture Capital Report
17. Evercore

Notes:
FY: Fiscal year ended 12/31
YTD: Year to date
YE: Year end
LTM: Last twelve months (aka trailing twelve months or TTM)
PPM: Purchase Price Multiples: Total Purchase Price / EBITDA
/bbl: Price per barrel
MMBtu: Price per million British thermal units

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Appendix B:

Real Estate Market Update

2Q 2018

United States Real Estate Market Update (2Q18)

General

- The S&P 500 produced a gross total return of 3.4% during the Quarter, as markets rebounded from tightening monetary policy and trade war rhetoric on the back of strong economic data. The MSCI US REIT index produced a return of 10.1%. REITS outperformed the broader equities market for the Quarter, but continue to lag by 10.8% over the TTM period. Consumer Sentiment declined slightly during the Quarter to 98.2.

- Macro indicators for U.S. real estate continue to be positive; GDP grew at an annualized rate of 2.8% in the Second Quarter and headline CPI rose by 2.7% YoY, above the Fed's 2% target. As of Quarter-end, the economy has now experienced 93 consecutive months of job growth. The Federal Reserve has continued to tighten their policy, and, in June 2018, raised base rates to 1.75-2.0%. In 2018, consensus expectations have increased to four rate hikes.

Commercial Real Estate

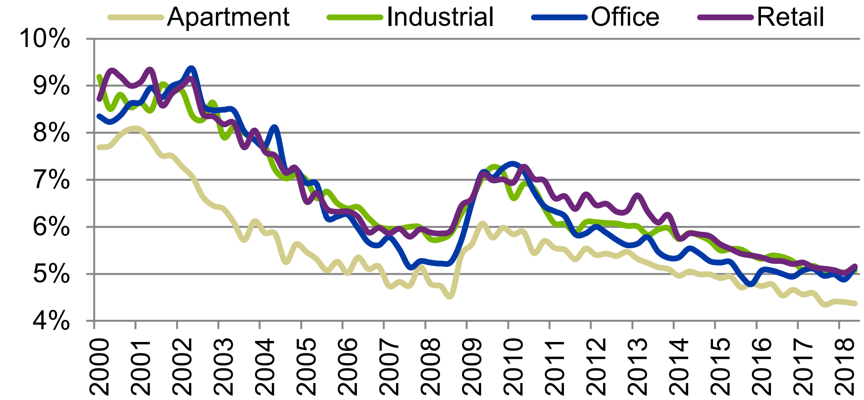
- Private Real Estate Market values have remained flat for another quarter. Transaction cap rates (5.49%) contracted 16 bps on average during the Second Quarter of 2018. At the same time, current valuation cap rates were primarily flat across property sectors, with the exception of office and retail cap rates expanding 25 bps and 14 bps, respectively.

- NOI growth by sector continued to deviate during the Quarter, with retail NOI growth continuing to lag other sectors. Positive momentum continued in the industrial sector, benefiting from e-commerce and global trade growth. The sector experienced 8.3% NOI Growth over the last year.

- In the First Quarter of 2018, $32bn of aggregate capital was raised by US Real Estate Funds. To date in 2018, Private Equity Real Estate Funds have raised $78.5bn.

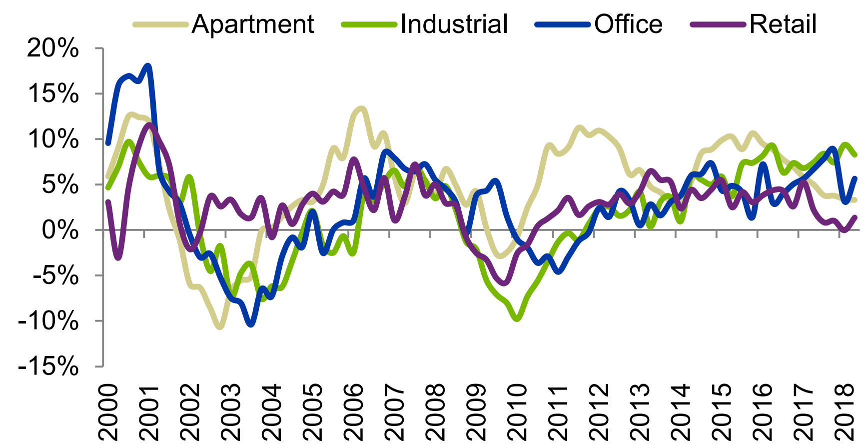
- 10 year treasury bond yields expanded 12 bps to 2.86% during the quarter and, subsequent to quarter end have essentially remained flat. A combination of expansionary fiscal policy and tightening monetary policy have led to increasing short-term interest rates and a flattening yield curve.

Current Value Cap Rates by Property Type



Source: NCREIF

4 Qtr Rolling NOI Growth



Source: NCREIF

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

United States Property Matrix (2Q18)

TOWNSEND® GROUP
an Aon company

INDUSTRIAL

- As of 2Q18, industrial properties returned 3.6% and outperformed the NPI by 179 bps.
- Net absorption increased to 64.1 million sqft in 2Q18, up 4.9% from the second quarter of 2017. Net absorption as a % of inventory was 1.9%.
- Transaction volumes reached $30.5 billion, marking a 20% year-over-year increase. Large-scale portfolio sales are expected make 2018 the largest overall historic year in terms of total activity.
- New deliveries were 48.9 million sqft for the quarter, with the active pipeline increasing by 3.0% quarter-over-quarter to 239.1 million sqft.
- Vacancy remained stable quarter-over-quarter at 4.8% continuing to be at an all-time historic low. Strong demand has pushed asking rents up 6.2% year-over-year.

MULTIFAMILY

- The apartment sector delivered a 1.5% return during the Quarter, underperforming the NPI by 27 bps.
- Sales volumes decreased 4.8% compared to the second quarter of 2017, totaling $32.6 billion. The drop in volume was due to a 52.2% reduction in portfolio transactions. Transaction volume is 10.2% higher on an annualized basis.
- Primary market transaction activity represented 42.5% of activity, down from 43.0% in 2017. The decrease is a result of the continued growth of capital flows into secondary and tertiary markets with a combined share increasing from 43.3% to 57.5%.
- Private investors continue to dominate the investment activity accounting for 62.5% of transactions whereas REITs have seen their proportion of transaction activity fall to 6%, less than half of their share four years ago.
- Annual rent growth rose to 2.4% percent during the second quarter of 2018, a 10 bps increase after three quarters of no change. Vacancy increased a modest 7 bps over the 12-month period ending 2Q18.

OFFICE

- The office sector returned 1.5% in 2Q18, 27 bps below the NPI return over the period.
- Occupancy growth increased with net absorption totaling 12.9 million sqft. Although net absorption improved in the second quarter, it is expected to be one-third lower in 2018 than in 2017.
- Total vacancy rose by 10 bps to 14.9% quarter-over-quarter due to the rising deliveries. Class A CBD vacancy declined by 30 bps to 11.6%, while vacancy in Class A suburban office increased 30 bps to 16.9%.
- Construction activity has remained strong with 27.4 million square feet delivered in the first two quarters and 36 million square feet to be delivered by year's end. In 2019, the office market will continue to see top-quality space delivered as 57.4 million square feet of deliveries is scheduled for completion.
- Asking rents increased 2.3% to $33.82/sqft. This was driven by suburban rent growth of 3.7%, while CBD remained virtually unchanged. Concession packages continue to increase leading to an overall decline in effective rents.

RETAIL

- As of 1Q18, the retail sector delivered a quarterly return of 1.3%, performing 49 bps below the NPI.
- Transaction volumes for the first half of 2018 declined 3.6% year-over-year to $28.7 billion. REIT acquisition activity declined 17.9% year-over-year, remaining net sellers and divesting both non-strategic and underperforming assets.
- Despite the continued announcement of store closures, 12-month rental growth was 5.4%, largely driven by grocery-anchored centers.
- Average cap rates remain at 4.3%. Premier assets continue to trade aggressively, driven by foreign demand, while mall and lifestyle centers struggle to agree on terms.
- Vacancy declined to 4.5%, a compression of 10 bps compared to the first quarter of 2018. Investors are starting to apply more stringent underwriting standards and evaluating shopping center tenants more cautiously.

Sources: Real Capital Analytics, Bloomberg LP, Green Street, US Census Bureau, NCREIF, Jones Lang LaSalle, REIS, Cushman and Wakefield

Global Real Estate Market Update (2Q18)

TOWNSEND® GROUP
an Aon company

GLOBAL

- Global investment activity during 2Q 2018 totaled $173 billion, representing a 10% increase as compared to 2Q 2017 levels. Total first half 2018 activity was $341 billion, a 13% increase from first half 2017 and the highest first half volume since 2007. Investors' demand for real estate has remained strong, with a growing number increasing their real estate allocations due to its defensive nature and steady income returns. Further, shifting demographics and technological trends are driving an increased demand for the logistics and alternatives sectors. 2018 global investment commercial real estate volumes are projected to approximately match 2017 volumes of $715 billion. London held the top global investment position for the quarter, followed by New York and Hong Kong in second and third place, respectively.

Direct Commercial Real Estate Investment - Regional Volumes, 2017 - 2018

$ US Billions	Q1 2018	Q2 2018	% Change Q1 18 - Q2 18	Q2 2017	% Change Q2 17 - Q2 18	H1 2017	H1 2018	% Change H1 17 - H1 18
Americas	69	63	-9%	64	-2%	122	132	8%
EMEA	61	67	10%	61	10%	117	128	9%
Asia Pacific	39	42	8%	33	27%	63	81	29%
Total	169	172	2%	158	9%	302	341	13%

Source: Jones Lang LaSalle, July 2018

EUROPE

- European investment totaled $67.5 billion in 2Q 2018, an 11% increase from the prior quarter. First half 2018 volumes totaled $128.1 billion, marking the highest half-year volumes recorded in the current cycle. 2Q 2018 volumes were up from 2017 volumes in the UK, Germany, and France by 21%, 30%, and 114%, respectively. The Benelux countries saw mixed performance during the quarter, with the Nordics' volume down 17% and Southern Europe volumes down 28%. While Central and Eastern Europe's 2Q 2018 volumes declined by 22%, the region's strong first quarter enabled it to still show positive investment growth for the first half 2018. Exchange rates continued to affect European investment volumes as relative dollar weaknesses have driven up the level of investing.

ASIA

- Asia Pacific saw strong y/y performance, with volumes increasing 26% and reaching $41.7 billion during 2Q 2018. First half 2018 activity totaled $81.0 billion, a 29% increase y/y and the highest level on record. The growth was largely driven by the following: a 17% y/y increase in Australia, a 234% y/y increase in Hong Kong, a 155% y/y increase in New Zealand, a 108% y/y increase in South Korea, and a 231% y/y increase in Taiwan. However, China and Japan overall saw a decrease in total first half 2018 volumes, with 47% and 14% decreases, respectively. Specifically, Tokyo accounted for only 46% of Japanese transaction volumes this quarter, with most of the activity coming from smaller surrounding cities. Australian investment volumes totaled $5.7 billion in 2Q 2018, a 17% y/y increase. Cross-border investment activity accounted for 27% of total transaction volumes.

Global Outlook - GDP (Real) Growth % pa, 2017-2019

	2017	2018	2019
Global	**3.7**	**3.8**	**3.6**
Asia Pacific	**5.5**	**5.5**	**5.2**
Australia	2.2	2.8	2.5
China	6.9	6.4	6.1
India	6.2	7.5	7.1
Japan	1.7	1.2	1.1
North America	**2.0**	**2.5**	**2.4**
US	2.3	3.0	2.3
MENA*	**1.8**	**2.9**	**3.2**
European Union	**3.1**	**2.4**	**2.0**
France	2.3	1.7	1.6
Germany	2.5	2.0	1.8
UK	1.7	1.3	1.4

*Middle East North Africa

Source: Jones Lang LaSalle (Oxford Economics), July 2018

Sources: Jones Lang LaSalle Research, Bloomberg LP

TAB G

Report

PCA Investment Market Risk Metrics

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PCA INVESTMENT MARKET RISK METRICS

Monthly Report

November 2018
(as of 10/31/18)

Takeaways

- October was a challenging month across the board, with broad U.S. equity markets down nearly 7% as geopolitical fears and interest rates both picked up as we head into November. Other asset types and regions were more challenged, with MLPs and Emerging Markets equity producing negative returns in the high single digits.

- Implied equity market volatility (i.e., VIX) spent the majority of October above its long-term average level of 19.3, ending the month at 21.2.

- PCA's U.S. Market sentiment indicator (page 4) switched to neutral (**gray**) as the year-over-year changes in bond spreads dipped into negative territory. Holding the bond spread indicator constant, it would require an ~-7% U.S. equity decline in November or ~-3% decline through year end to turn the indicator to red.

- U.S. Treasury interest rates increased by roughly 10-20 basis points across the yield curve during October. The yield curve is currently fairly flat, with the spread between 30-year and 3-month U.S. Treasury yields at 1.1% as of month-end.

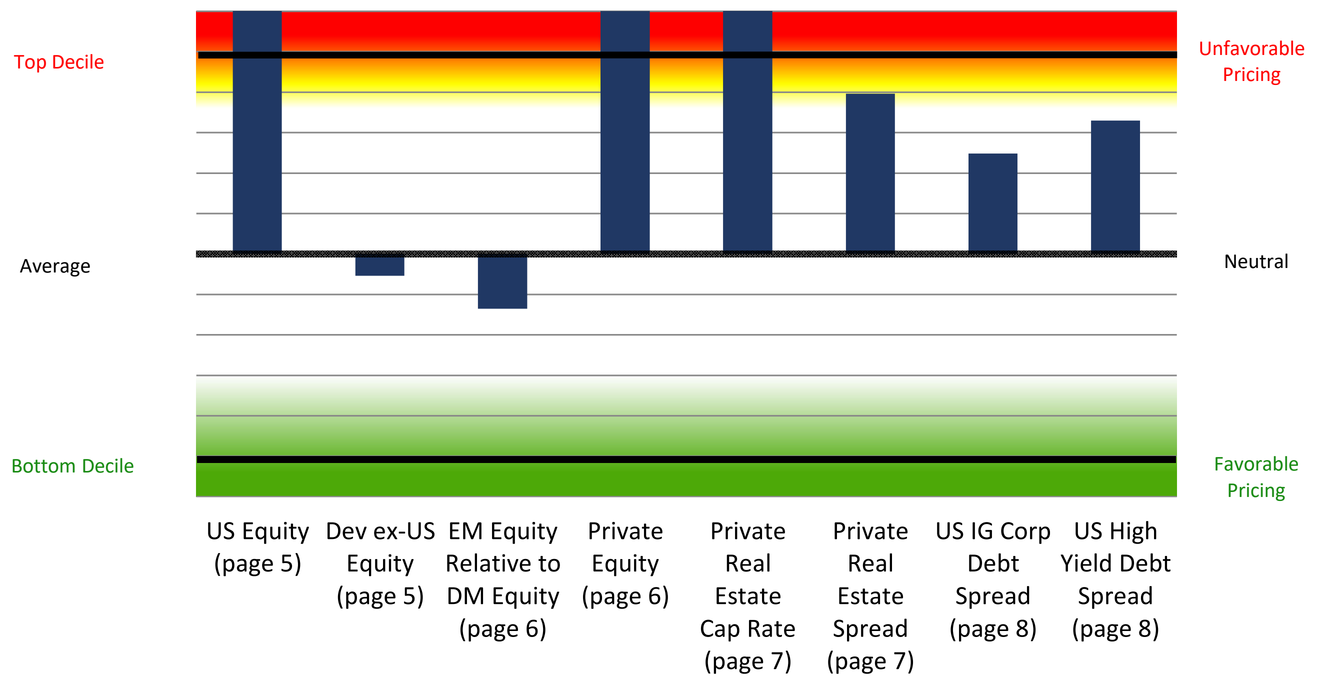
- Non-U.S. Developed and Emerging Markets equity valuations are currently below their long-term averages, and still remain cheap relative to U.S. levels.

- The global economic system is in the early stages of a transition. This change is from an environment of easy monetary policy, strong asset returns, and robust growth to a period of tighter monetary policy, heightened return uncertainty, and more disparate and challenging growth. Monitoring this transition will be crucial to institutional portfolio management.

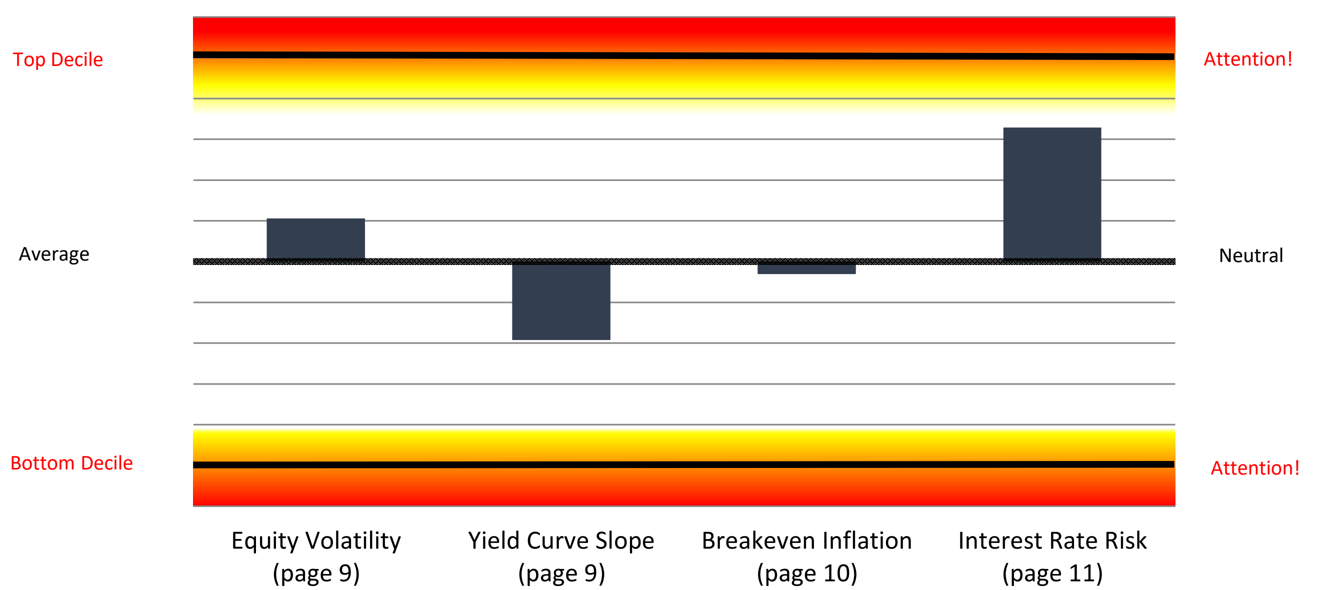
[1]See Appendix for the rationale for selection and calculation methodology used for the risk metrics.

Risk Overview

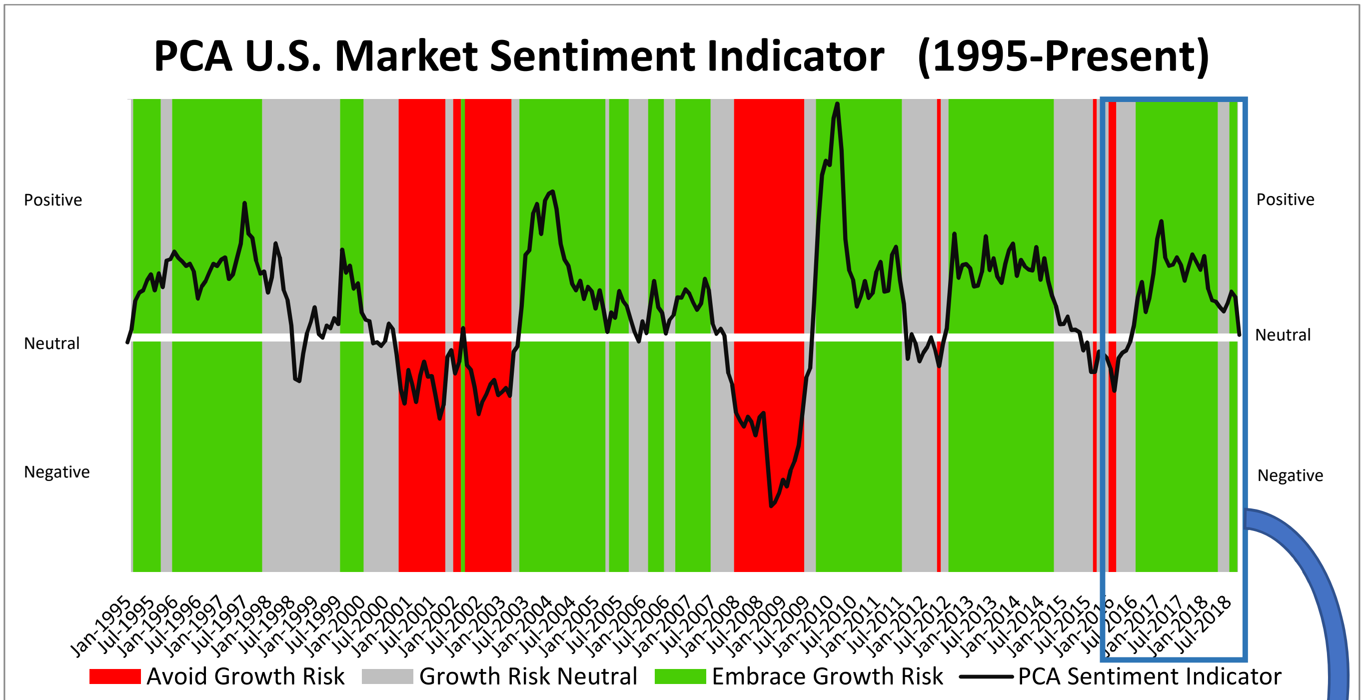
Valuation Metrics versus Historical Range
A Measure of Risk

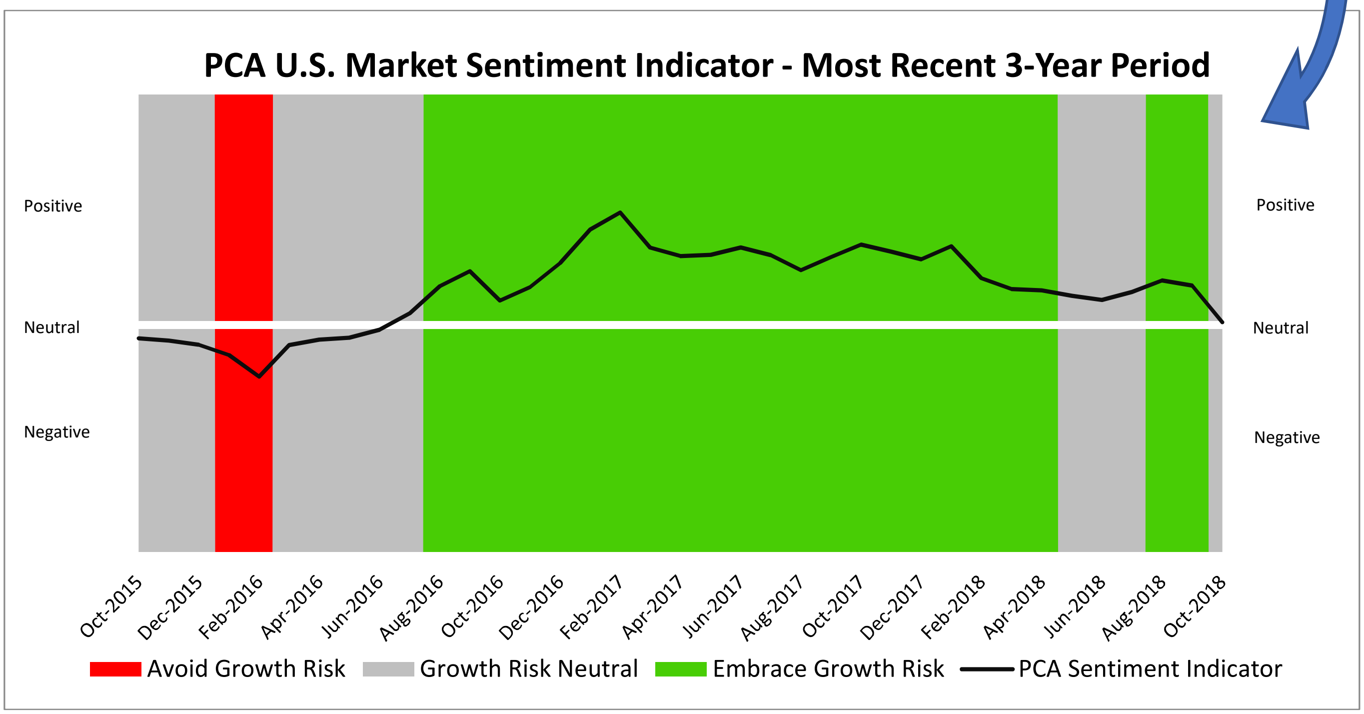


Other Important Metrics within their Historical Ranges
Pay Attention to Extreme Readings



U.S. Market Sentiment



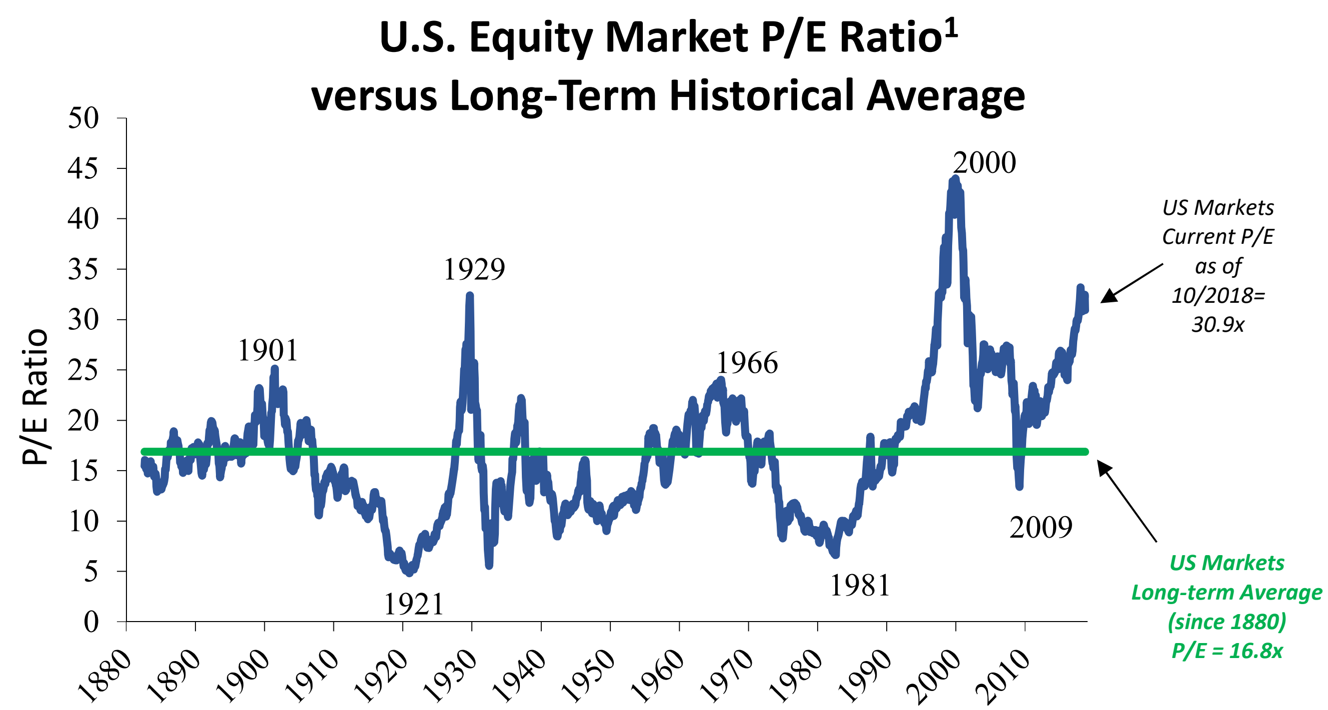


Information Behind Current Sentiment Reading

Bond Spread Momentum Trailing-Twelve Months	Negative	
Equity Return Momentum Trailing-Twelve Months	Positive	
Agreement Between Bond Spread and Equity Spread Momentum Measures?	Disagree	

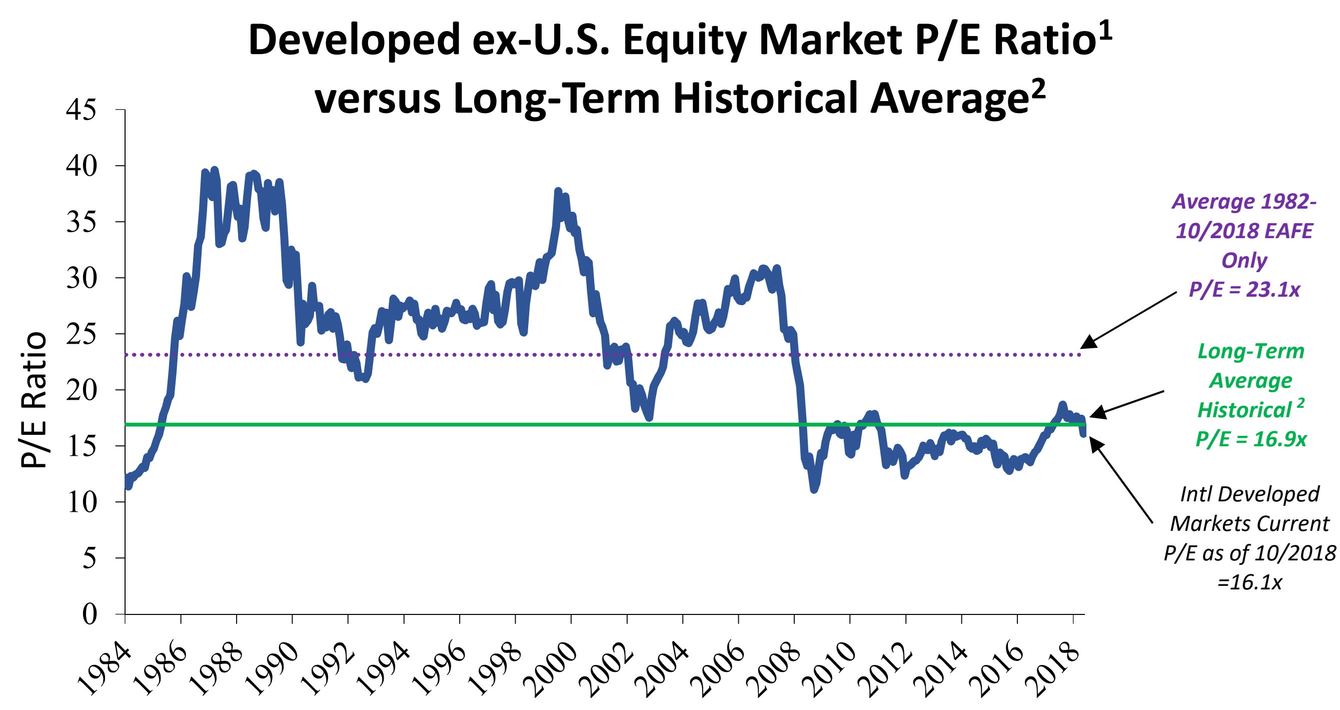
Growth Risk Visibility (Current Overall Sentiment)	**Neutral**	

Developed Public Equity Markets



[1] P/E ratio is a Shiller P/E-10 based on 10 year real S&P 500 earnings over S&P 500 index level.

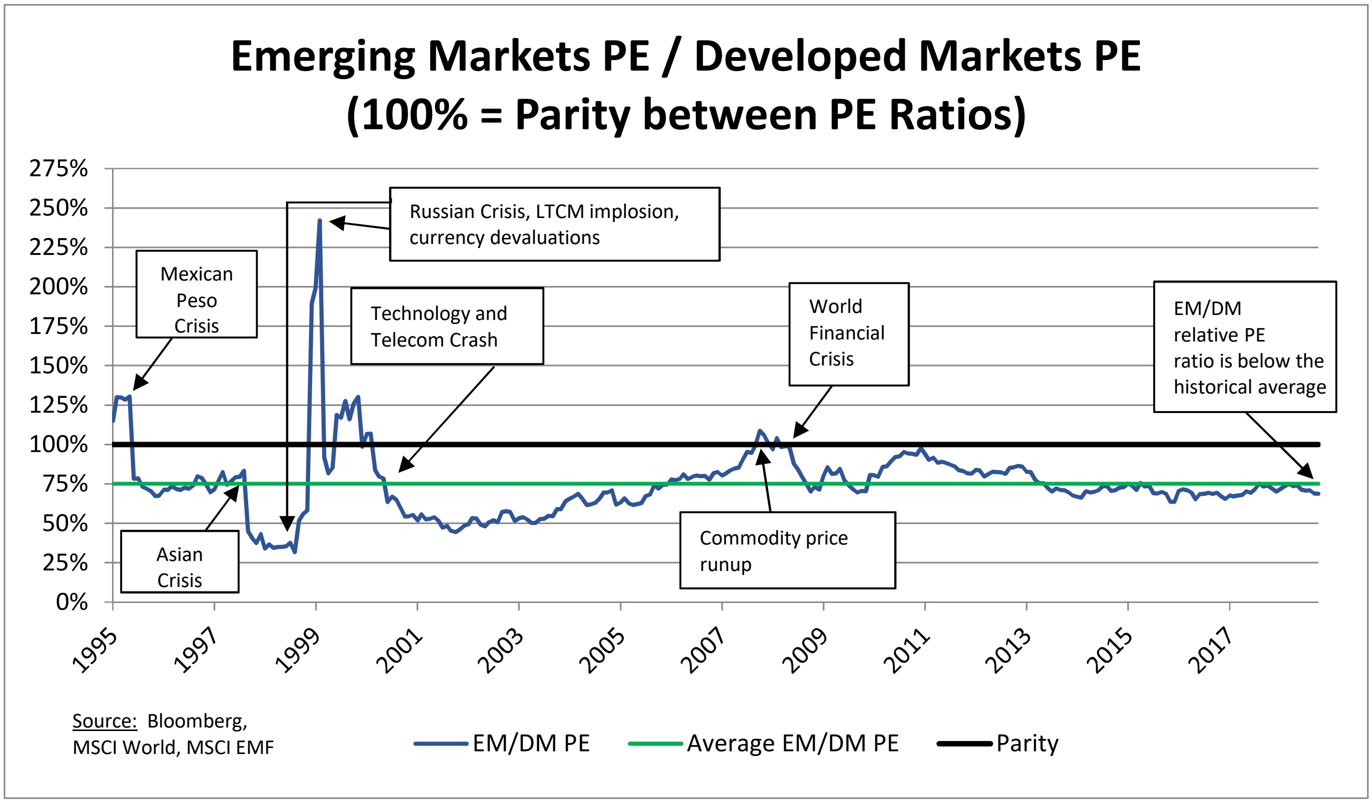
(Please note the difference in time scales)



[1] P/E ratio is a Shiller P/E-10 based on 10 year real MSCI EAFE earnings over EAFE index level.

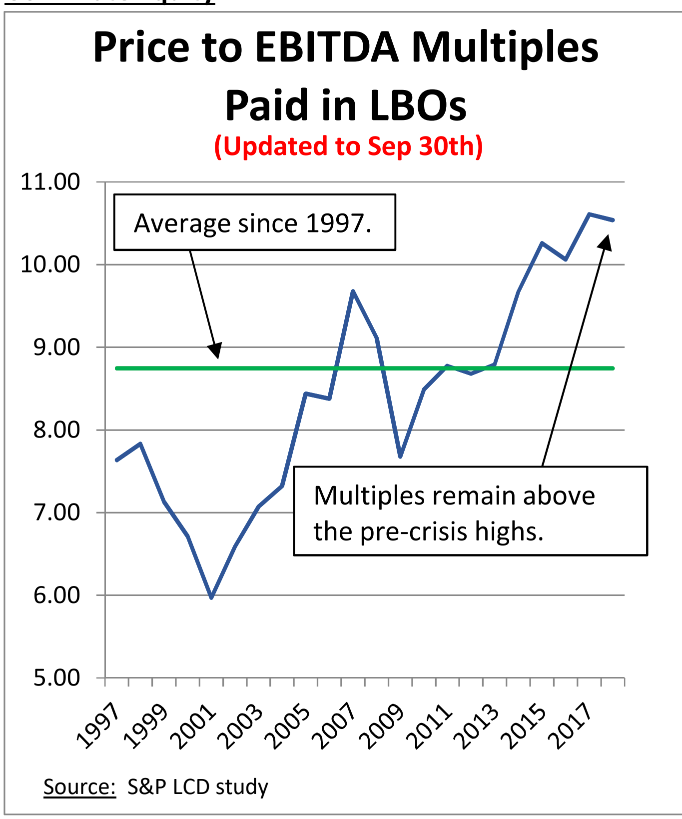
[2] To calculate the LT historical average, from 1881 to 1982 U.S. data is used as developed market proxy. From 1982 to present, actual developed ex-US market data (MSCI EAFE) is used.

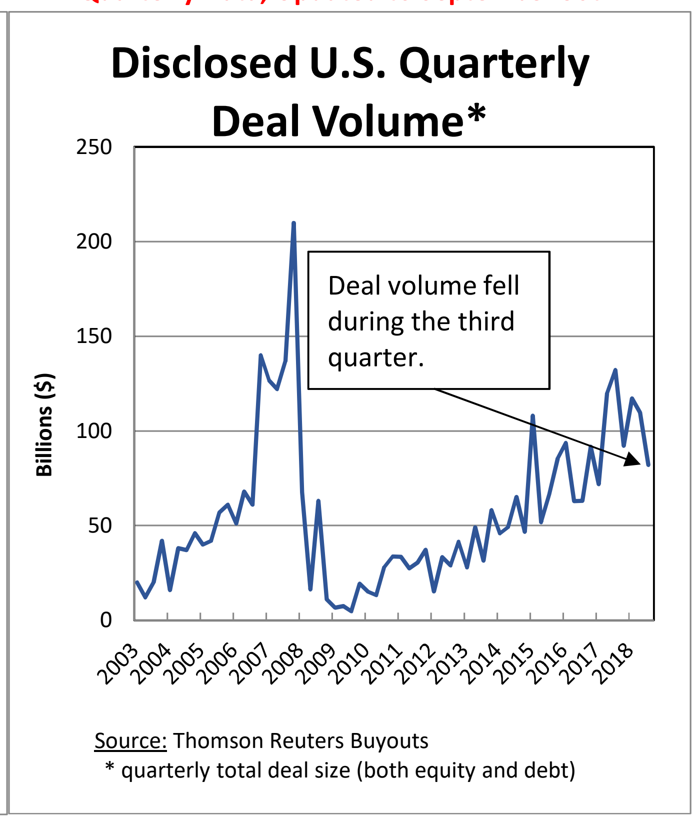
Emerging Market Public Equity Markets



US Private Equity

Quarterly Data, Updated to September 30th

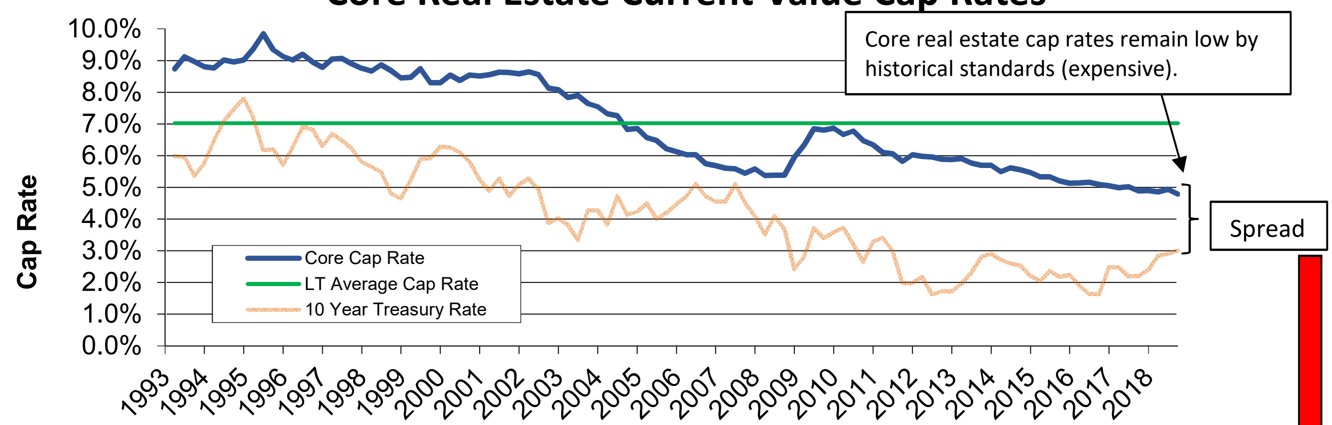




Private Real Estate

Quarterly Data, Updated to September 30th.

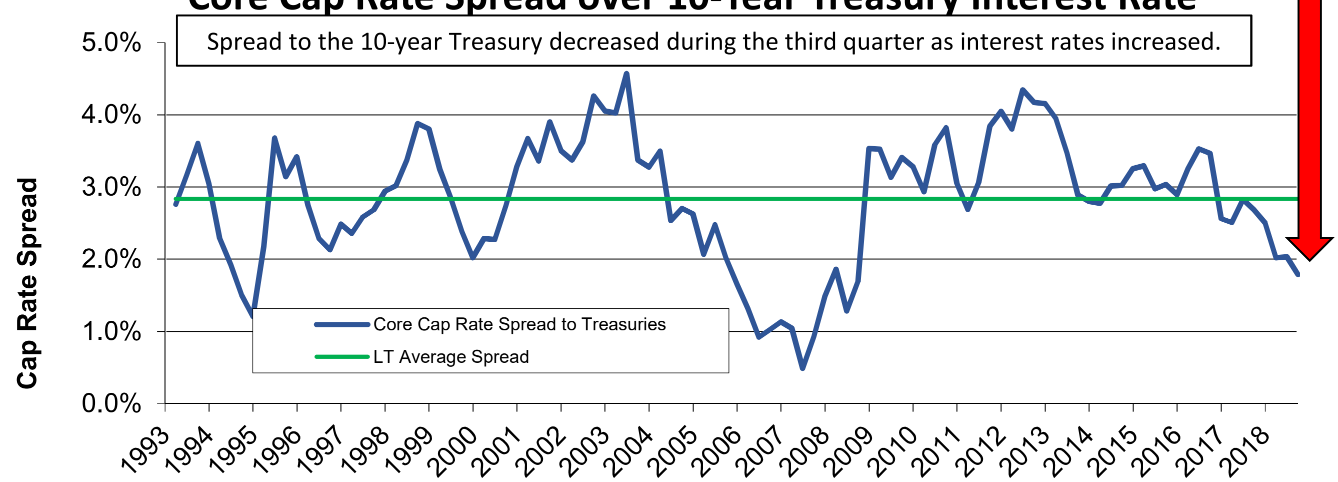
Core Real Estate Current Value Cap Rates[1]



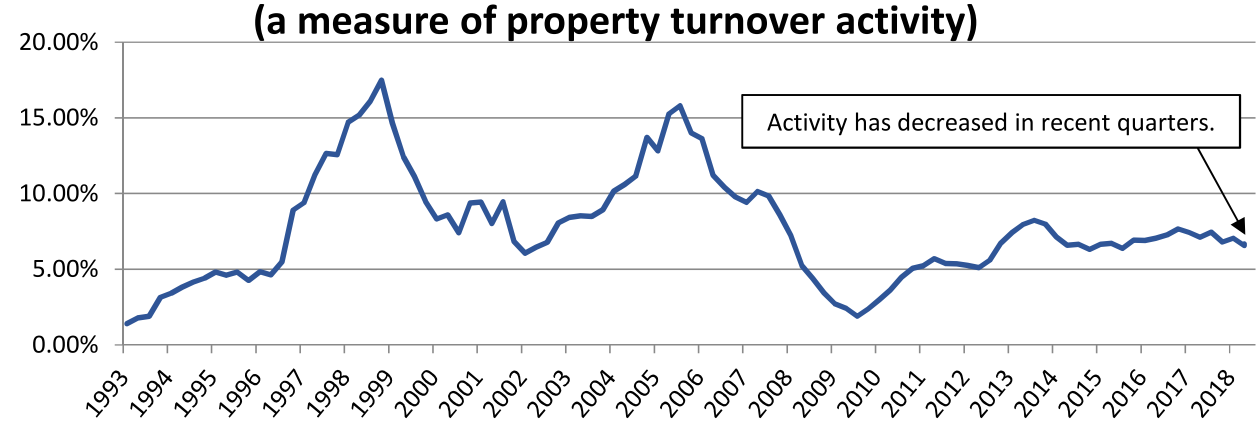
Sources: NCRIEF, www.ustreas.gov

[1]A cap rate is the current annual income of the property divided by an estimate of the current value of the property . It is the current yield of the property. Low cap rates indicate high valuations.

Core Cap Rate Spread over 10-Year Treasury Interest Rate

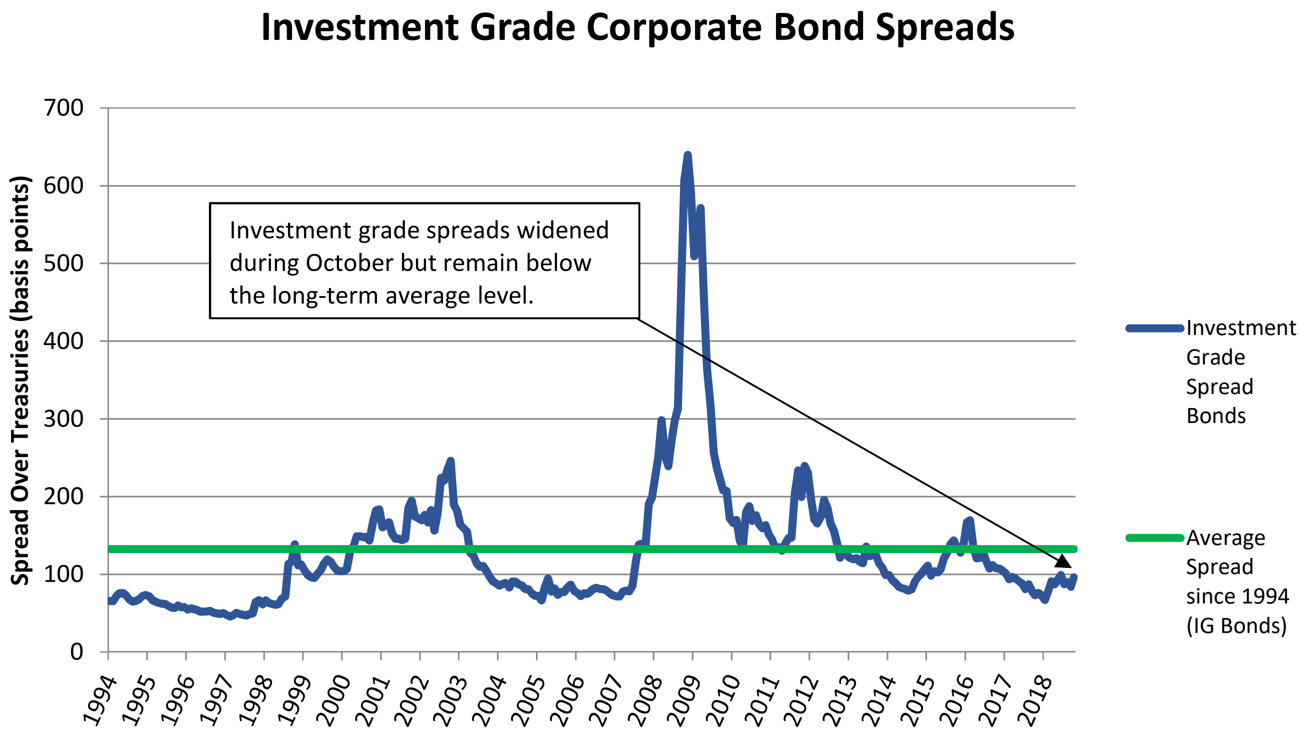


Transactions as a % of Market Value Trailing-Four Quarters (a measure of property turnover activity)

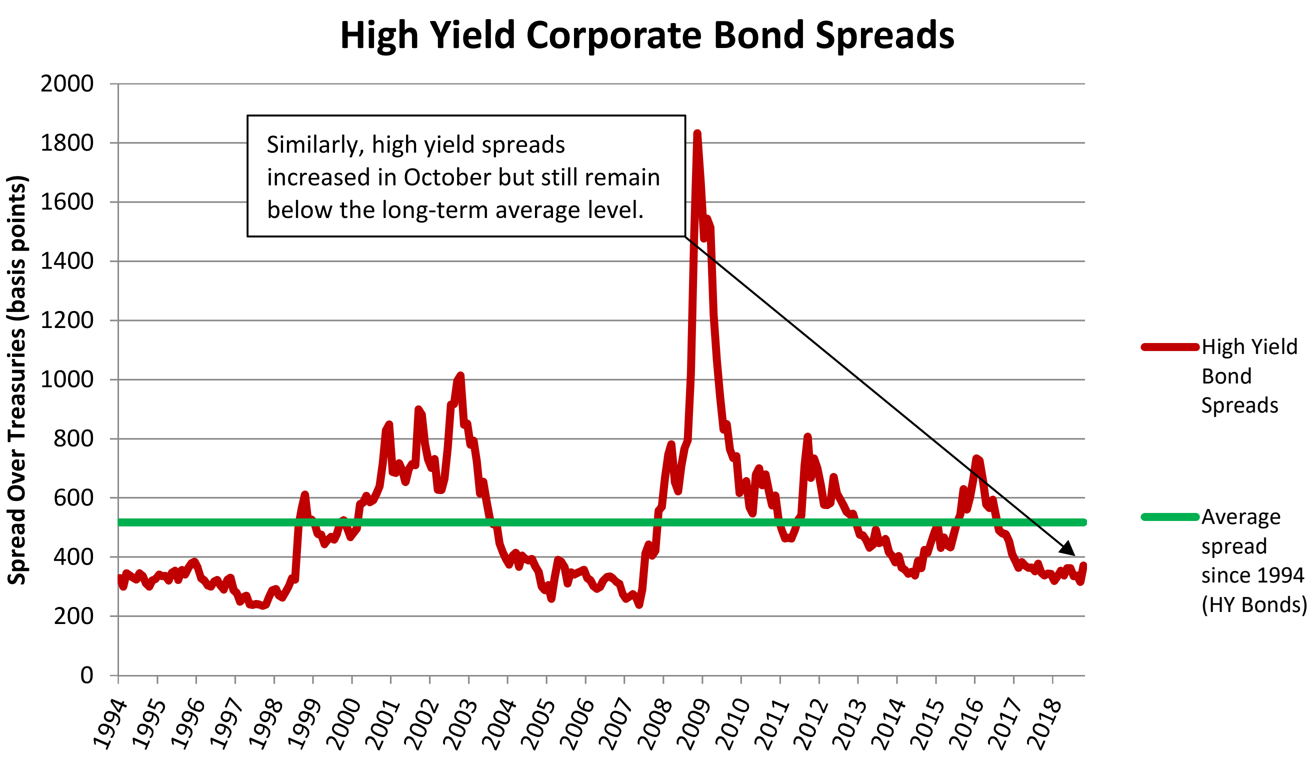


Source: NCREIF, PCA calculation

Credit Market US Fixed Income

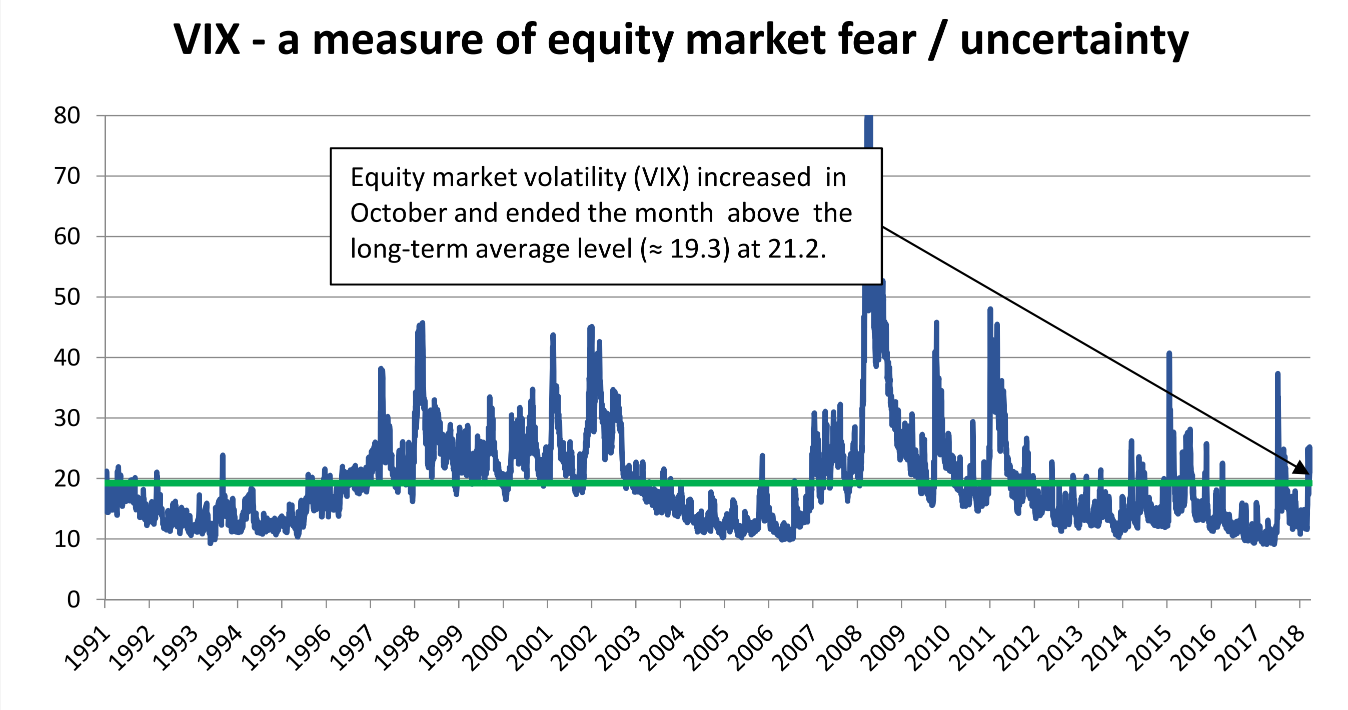


Source: LehmanLive: Barclays Capital US Corporate Investment Grade Index Intermediate Component.



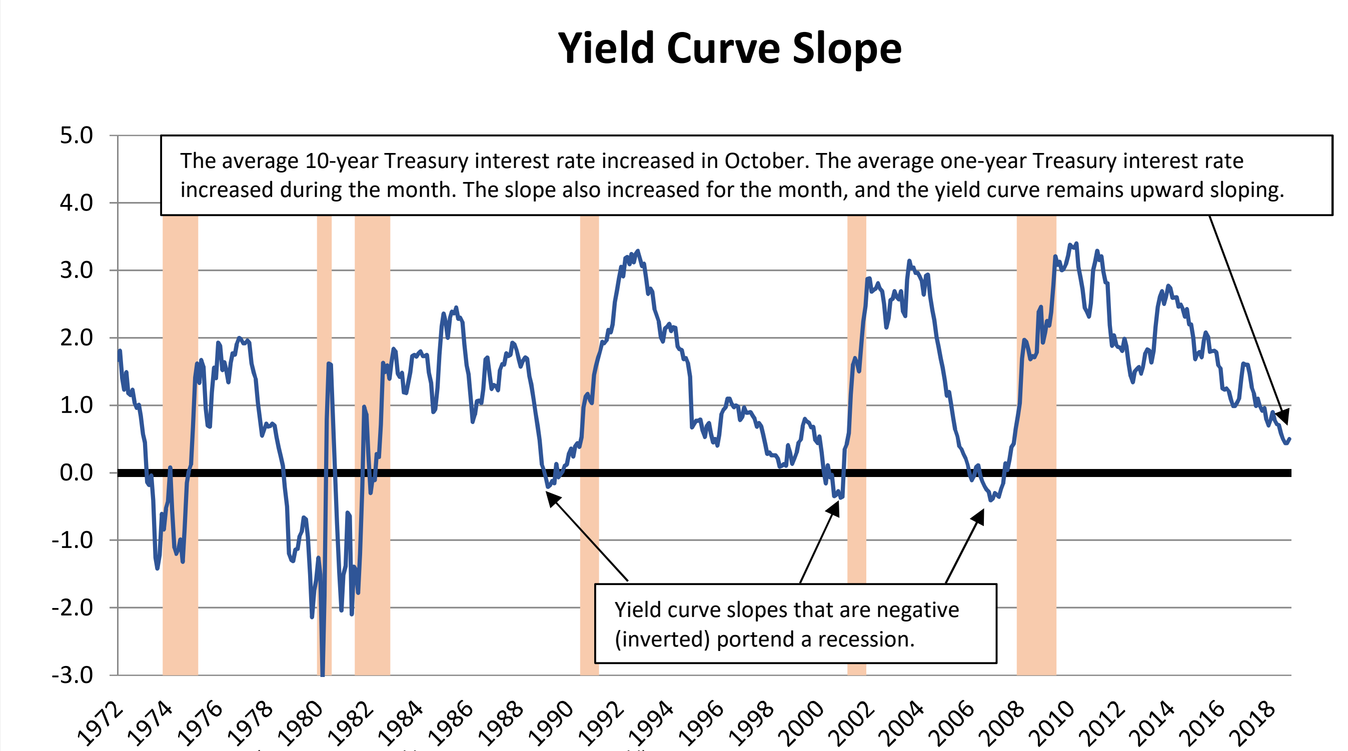
Source: LehmanLive: Barclays Capital U.S. Corporate High Yield Index.

Other Market Metrics



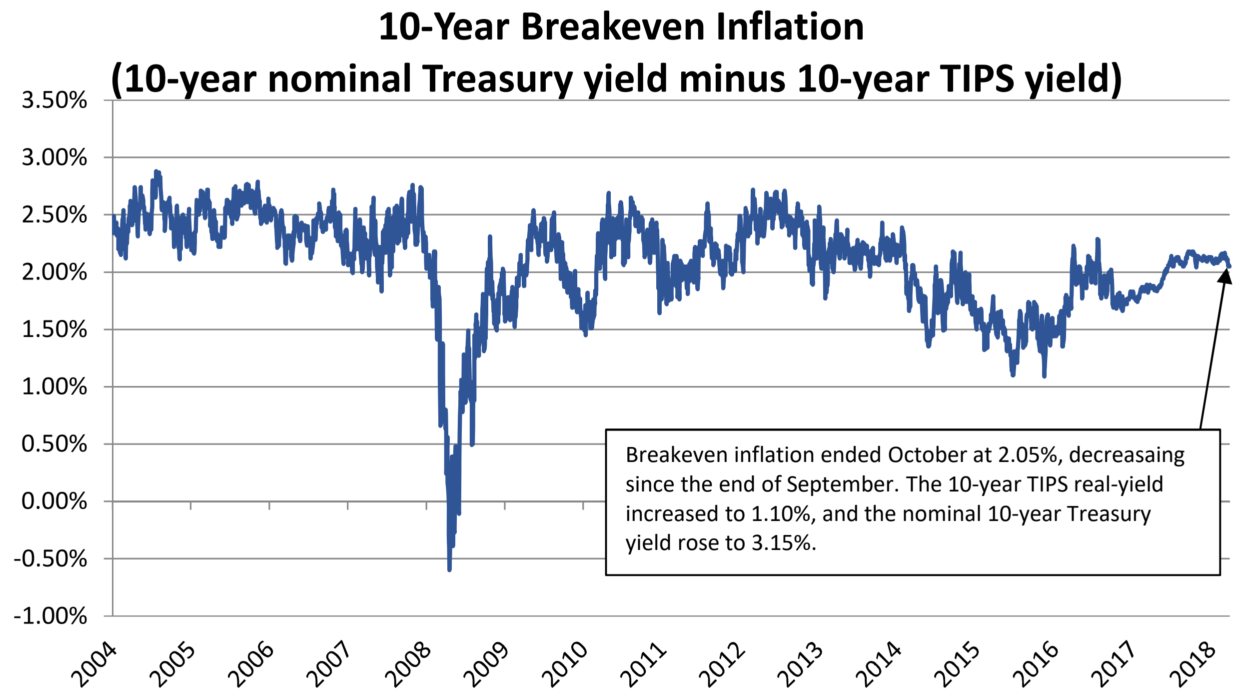
Source: http://www.cboe.com/micro/vix/historical.aspx

(Please note the difference in time scales)



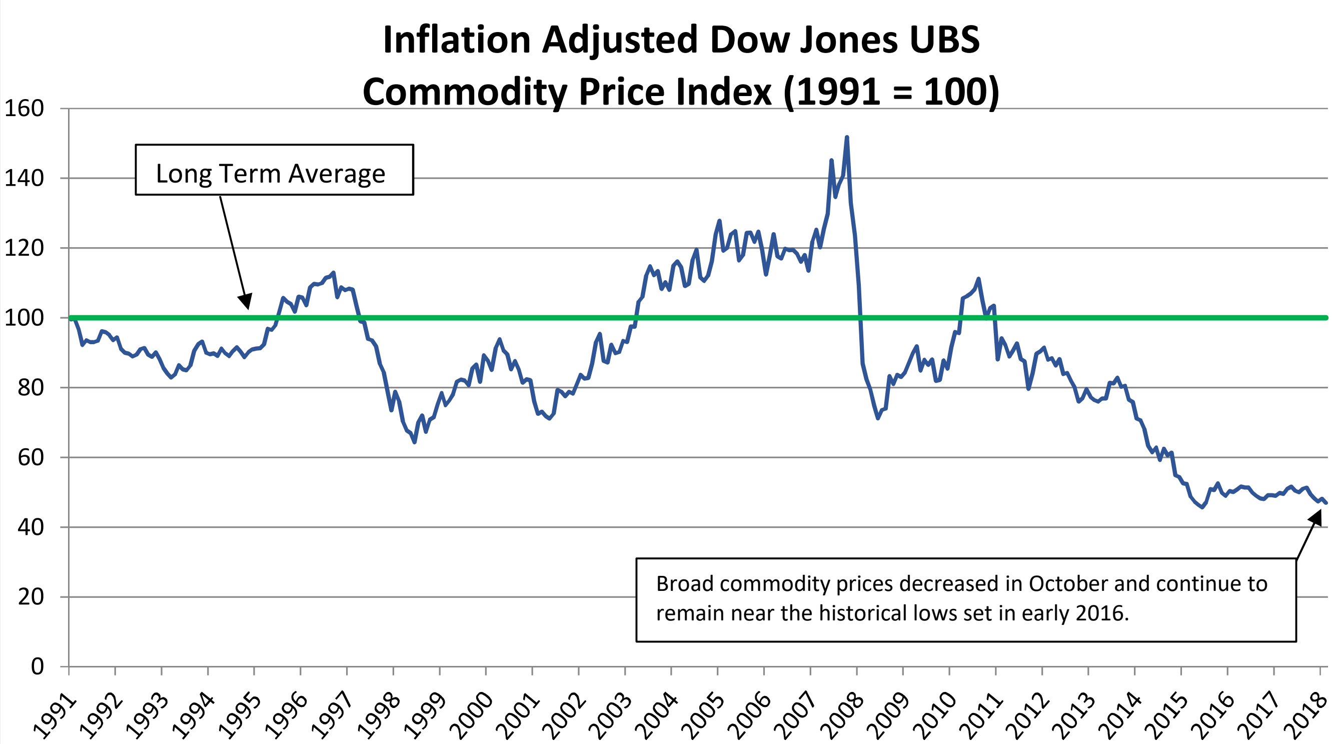
Source: www.ustreas.gov (10 yr treasury yield minus 1 year treasury yield)

Measures of Inflation Expectations



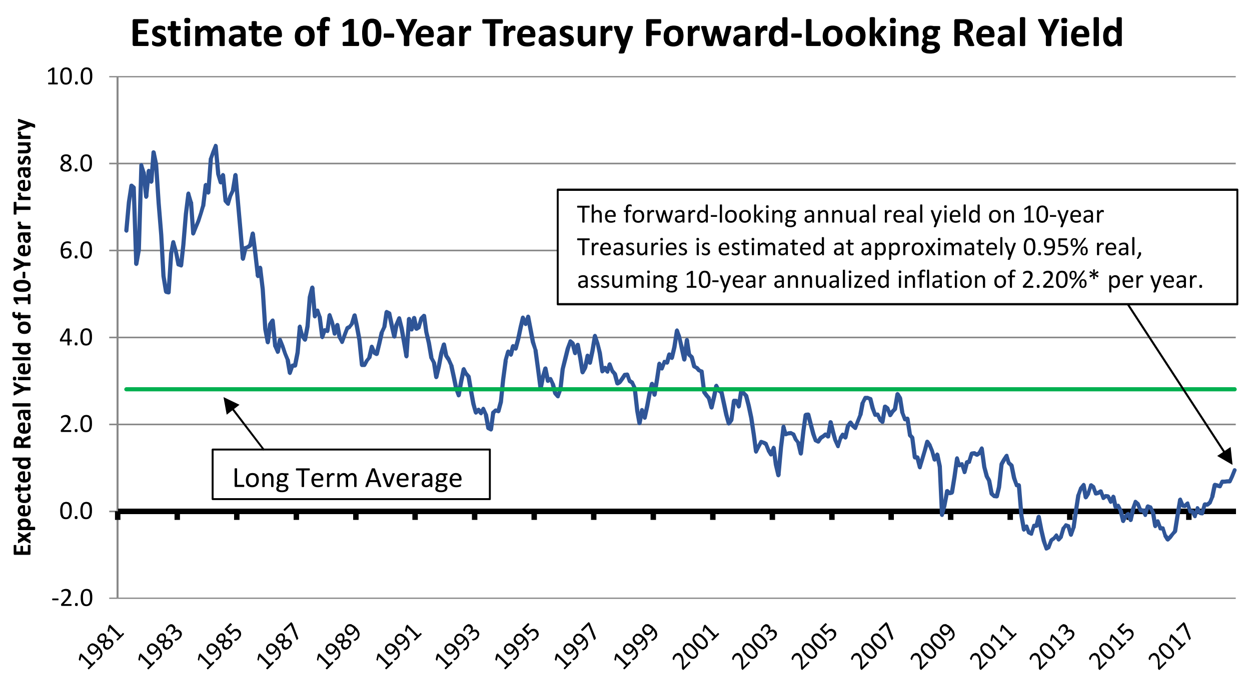
Source: www.ustreas.gov

(Please note the difference in time scales)

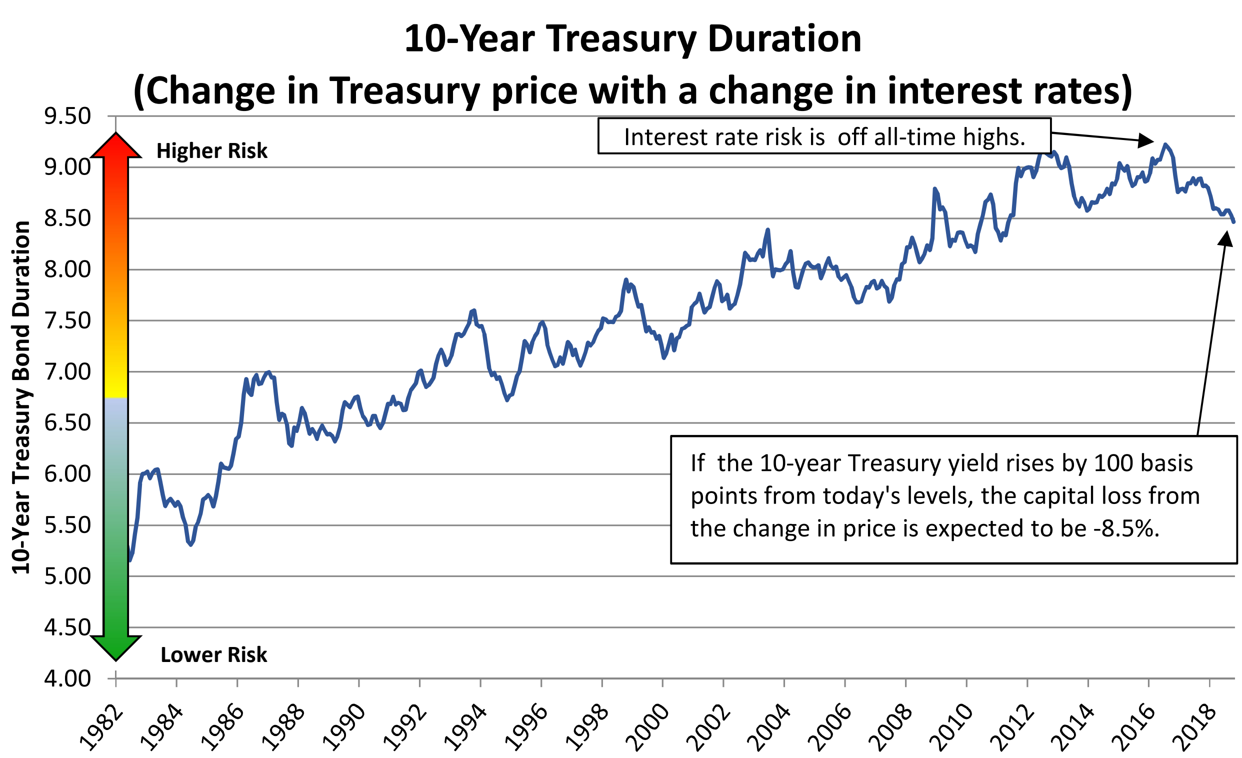


Source: Bloomberg Commodity Index, St. Louis Fed for US CPI all urban consumers.

Measures of U.S. Treasury Interest Rate Risk



Sources: www.ustreas.gov for 10-year constant maturity rates
*Federal Reserve Bank of Philadelphia survey of professional forecasts for inflation estimates



Source: www.ustreas.gov for 10-year constant maturity rates, calculation of duration

Appendix

Appendix

METRIC DESCRIPTION, RATIONALE FOR SELECTION AND CALCULATION METHODOLOGY

US Equity Markets:
Metric: P/E ratio = Price / "Normalized" earnings for the S&P 500 Index

To represent the price of US equity markets, we have chosen the S&P 500 index. This index has the longest published history of price, is well known, and also has reliable, long-term, published quarterly earnings. The price=P of the P/E ratio is the current price of the market index (the average daily price of the most recent full month for the S&P 500 index). Equity markets are very volatile. Prices fluctuate significantly during normal times and extremely during periods of market stress or euphoria. Therefore, developing a measure of earnings power (E) which is stable is vitally important, if the measure is to provide insight. While equity prices can and do double, or get cut in half, real earnings power does not change nearly as much. Therefore, we have selected a well known measure of real, stable earnings power developed by Yale Professor Robert Shiller known as the Shiller E-10. The calculation of E-10 is simply the average real annual earnings over the past 10 years. Over 10 years, the earnings shenanigans and boom and bust levels of earnings tend to even out (and often times get restated). Therefore, this earnings statistic gives a reasonably stable, slow-to-change estimate of average real earnings power for the index. Professor Shiller's data and calculation of the E-10 are available on his website at http://www.econ.yale.edu/~shiller/data.htm. We have used his data as the base for our calculations. Details of the theoretical justification behind the measure can be found in his book *Irrational Exuberance* [Princeton University Press 2000, Broadway Books 2001, 2nd ed., 2005].

Developed Equity Markets Excluding the US:
Metric: P/E ratio = Price / "Normalized" earnings for the MSCI EAFE Index

To represent the price of non-US developed equity markets, we have chosen the MSCI EAFE index. This index has the longest published history of price for non-US developed equities. The price=P of the P/E ratio is the current price of the market index (the average daily price of the most recent full month for the MSCI EAFE index). The price level of this index is available starting in December 1969. Again, for the reasons described above, we elected to use the Shiller E-10 as our measure of earnings (E). Since 12/1972, a monthly price earnings ratio is available from MSCI. Using this quoted ratio, we have backed out the implied trailing-twelve month earnings of the EAFE index for each month from 12/1972 to the present. These annualized earnings are then inflation adjusted using CPI-U to represent real earnings in US dollar terms for each time period. The Shiller E-10 for the EAFE index (10 year average real earnings) is calculated in the same manner as detailed above.

However, we do not believe that the pricing and earnings history of the EAFE markets are long enough to be a reliable representation of pricing history for developed market equities outside of the US. Therefore, in constructing the Long-Term Average Historical P/E for developed ex-US equities for comparison purposes, we have elected to use the US equity market as a developed market proxy, from 1881 to 1982. This lowers the Long-Term Average Historical P/E considerably. We believe this methodology provides a more realistic historical comparison for a market with a relatively short history.

Appendix

METRIC DESCRIPTION, RATIONALE FOR SELECTION AND CALCULATION METHODOLOGY

Emerging Market Equity Markets:
Metric: Ratio of Emerging Market P/E Ratio to Developed Market P/E Ratio

To represent the Emerging Markets P/E Ratio, we have chosen the MSCI Emerging Market Free Index, which has P/E data back to January 1995 on Bloomberg. To represent the Developed Markets PE Ratio, we have chosen the MSCI World Index, which also has data back to January 1995 on Bloomberg. Although there are issues with published, single time period P/E ratios, in which the denominator effect can cause large movements, we feel that the information contained in such movements will alert investors to market activity that they will want to interpret.

US Private Equity Markets:
Metrics: S&P LCD Average EBITDA Multiples Paid in LBOs and US Quarterly Deal Volume

The Average Purchase Price to EBITDA multiples paid in LBOs is published quarterly by S&P in their LCD study. This is the total price paid (both equity and debt) over the trailing-twelve month EBITDA (earnings before interest, taxes, depreciation and amortization) as calculated by S&P LCD. This is the relevant, high-level pricing metric that private equity managers use in assessing deals. Data is published monthly.

US quarterly deal volume for private equity is the total deal volume in $ billions (both equity and debt) reported in the quarter by Thomson Reuters Buyouts. This metric gives a measure of the level of activity in the market. Data is published quarterly.

U.S Private Real Estate Markets:
Metrics: US Cap Rates, Cap Rate Spreads, and Transactions as a % of Market Value

Real estate cap rates are a measure of the price paid in the market to acquire properties versus their annualized income generation before financing costs (NOI=net operating income). The data, published by NCREIF, describes completed and leased properties (core) on an unleveraged basis. We chose to use current value cap rates. These are capitalization rates from properties that were revalued during the quarter. This data relies on estimates of value and therefore tends to be lagging (estimated prices are slower to rise and slower to fall than transaction prices). The data is published quarterly.

Spreads between the cap rate (described above) and the 10-year nominal Treasury yield, indicate a measure of the cost of properties versus a current measure of the cost of financing.

Transactions as a % of Market Value Trailing-Four Quarters is a measure of property turnover activity in the NCREIF Universe. This quarterly metric is a measure of activity in the market.

Credit Markets US Fixed Income:
Metric: Spreads

The absolute level of spreads over treasuries and spread trends (widening / narrowing) are good indicators of credit risk in the fixed income markets. Spreads incorporate estimates of future default, but can also be driven by technical dislocations in the fixed income markets. Abnormally narrow spreads (relative to historical levels) indicate higher levels of valuation risk, wide spreads indicate lower levels of valuation risk and / or elevated default fears. Investment grade bond spreads are represented by the Barclays Capital US Corporate Investment Grade Index Intermediate Component. The high yield corporate bond spreads are represented by the Barclays Capital US Corporate High Yield Index.

Appendix

METRIC DESCRIPTION, RATIONALE FOR SELECTION AND CALCULATION METHODOLOGY

Measure of Equity Market Fear / Uncertainty

Metric: VIX – Measure of implied option volatility for U.S. equity markets

The VIX is a key measure of near-term volatility conveyed by implied volatility of S&P 500 index option prices. VIX increases with uncertainty and fear. Stocks and the VIX are negatively correlated. Volatility tends to spike when equity markets fall.

Measure of Monetary Policy

Metric: Yield Curve Slope

We calculate the yield curve slope as the 10 year treasury yield minus the 1 year treasury yield. When the yield curve slope is zero or negative, this is a signal to pay attention. A negative yield curve slope signals lower rates in the future, caused by a contraction in economic activity. Recessions are typically preceded by an inverted (negatively sloped) yield curve. A very steep yield curve (2 or greater) indicates a large difference between shorter-term interest rates (the 1 year rate) and longer-term rates (the 10 year rate). This can signal expansion in economic activity in the future, or merely higher future interest rates.

Measures of US Inflation Expectations

Metrics: Breakeven Inflation and Inflation Adjusted Commodity Prices

Inflation is a very important indicator impacting all assets and financial instruments. Breakeven inflation is calculated as the 10 year nominal treasury yield minus the 10 year real yield on US TIPS (treasury inflation protected securities). Abnormally low long-term inflation expectations are indicative of deflationary fears. A rapid rise in breakeven inflation indicates an acceleration in inflationary expectations as market participants sell nominal treasuries and buy TIPs. If breakeven inflation continues to rise quarter over quarter, this is a signal of inflationary worries rising, which may cause Fed action and / or dollar decline.

Commodity price movement (above the rate of inflation) is an indication of anticipated inflation caused by real global economic activity putting pressure on resource prices. We calculate this metric by adjusted in the Dow Jones UBS Commodity Index (formerly Dow Jones AIG Commodity Index) by US CPI-U. While rising commodity prices will not necessarily translate to higher US inflation, higher US inflation will likely show up in higher commodity prices, particularly if world economic activity is robust.

These two measures of anticipated inflation can, and often are, conflicting.

Measures of US Treasury Bond Interest Rate Risk

Metrics: 10-Year Treasury Forward-Looking Real Yield and 10-Year Treasury Duration

The expected annualized real yield of the 10 year U.S. Treasury Bond is a measure of valuation risk for U.S. Treasuries. A low real yield means investors will accept a low rate of expected return for the certainly of receiving their nominal cash flows. PCA estimates the expected annualized real yield by subtracting an estimate of expected 10 year inflation (produced by the Survey of Professional Forecasters as collected by the Federal Reserve Bank of Philadelphia), from the 10 year Treasury constant maturity interest rate.

Duration for the 10-Year Treasury Bond is calculated based on the current yield and a price of 100. This is a measure of expected percentage movements in the price of the bond based on small movements in percentage yield. We make no attempt to account for convexity.

Definition of "extreme" metric readings

A metric reading is defined as "extreme" if the metric reading is in the top or bottom decile of its historical readings. These "extreme" reading should cause the reader to pay attention. These metrics have reverted toward their mean values in the past.

PCA Market Sentiment Indicator

Explanation, Construction and Q&A

By:

Pension Consulting Alliance, LLC.

PCA has created the PCA Market Sentiment Indicator (PMSI) to complement our valuation-focused PCA Investment Market Risk Metrics. This measure of sentiment is meant to capture significant and persistent shifts in long-lived market trends of economic growth risk, either towards a risk-seeking trend or a risk-aversion trend.

This paper explores:

- What is the PCA Market Sentiment Indicator (PMSI)?
- How do I read the indicator graph?
- How is the PCA Market Sentiment Indicator (PMSI) constructed?
- What do changes in the indicator mean?

PCA Market Sentiment Indicator

PCA has created a market sentiment indicator for monthly publication (the PMSI – see below) to complement PCA's Investment Market Risk Metrics.

PCA's Investment Market Risk Metrics, which rely significantly on standard market measures of relative valuation, often provide valid early signals of increasing long-term risk levels in the global investment markets. However, as is the case with numerous valuation measures, the Risk Metrics may convey such risk concerns long before a market corrections take place. The PMSI helps to address this early-warning bias by measuring whether the markets are beginning to acknowledge key Risk Metrics trends, and / or indicating non-valuation based concerns. Once the PMSI indicates that the market sentiment has shifted, it is our belief that investors should consider significant action, particularly if confirmed by the Risk Metrics. Importantly, PCA believes the Risk Metrics and PMSI should always be used in conjunction with one another and never in isolation. The questions and answers below highlight and discuss the basic underpinnings of the PCA PMSI:

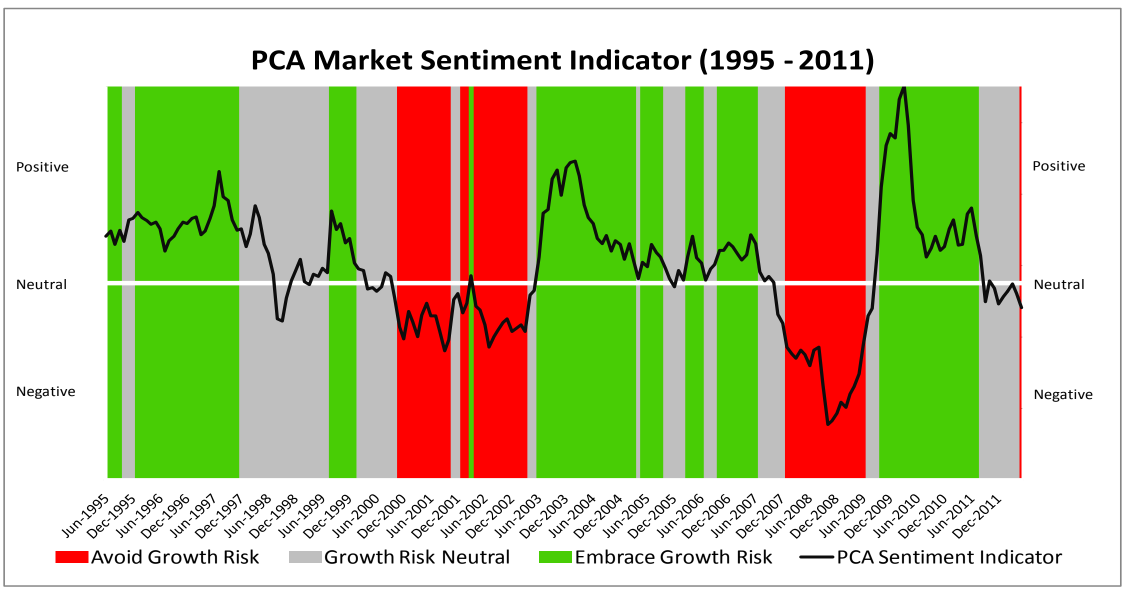
What is the PCA Market Sentiment Indicator (PMSI)?

The PMSI is a measure meant to gauge the market's sentiment regarding economic growth risk. Growth risk cuts across most financial assets, and is the largest risk exposure that most portfolios bear. The PMSI takes into account the momentum (trend over time, positive or negative) of the economic growth risk exposure of publicly traded stocks and bonds, as a signal of the future direction of growth risk returns; either positive (risk seeking market sentiment), or negative (risk averse market sentiment).

How do I read the PCA Market Sentiment Indicator (PMSI) graph?

Simply put, the PMSI is a color coded indicator that signals the market's sentiment regarding economic growth risk. It is read left to right chronologically. A green indicator on the PMSI indicates that the market's sentiment towards growth risk is positive. A gray indicator indicates that the market's sentiment towards growth risk is neutral or inconclusive. A red indicator indicates that the market's sentiment towards growth risk is negative. The black line on the graph is the level of the PMSI. The degree of the signal above or below the neutral reading is an indication the signal's current strength.

Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.



PCA Market Sentiment Indicator

How is the PCA Market Sentiment Indicator (PMSI) Constructed?

The PMSI is constructed from two sub-elements representing investor sentiment in stocks and bonds:

1. Stock return momentum: Return momentum for the S&P 500 Equity Index (trailing 12-months)
2. Bond yield spread momentum: Momentum of bond yield spreads (excess of the measured bond yield over the identical duration U.S. Treasury bond yield) for corporate bonds (trailing 12-months) for both investment grade bonds (75% weight) and high yield bonds (25% weight). The scale of this measure is adjusted to match that of the stock return momentum measure.

The black line reading on the graph is calculated as the average of the stock return momentum measure and the bonds spread momentum measure. The color reading on the graph is determined as follows:

1. If both stock return momentum and bond spread momentum are positive = GREEN (positive)
2. If one of the momentum indicators is positive, and the other negative = GRAY (inconclusive)
3. If both stock return momentum and bond spread momentum are negative = RED (negative)

What does the PCA Market Sentiment Indicator (PMSI) mean? Why might it be useful?

There is strong evidence that time series momentum is significant and persistent. In particular, across an extensive array of asset classes, the sign of the trailing 12-month return (positive or negative) is indicative of future returns (positive or negative) over the next 12 month period. The PMSI is constructed to measure this momentum in stocks and corporate bond spreads. A reading of green or red is agreement of both the equity and bond measures, indicating that it is likely that this trend (positive or negative) will continue over the next 12 months. When the measures disagree, the indicator turns gray. A gray reading does not necessarily mean a new trend is occurring, as the indicator may move back to green, or into the red from there. The level of the reading (black line) and the number of months at the red or green reading, gives the user additional information on which to form an opinion, and potentially take action.

[i] Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.

[ii] "Time Series Momentum" Moskowitz, Ooi, Pedersen, August 2010
http://pages.stern.nyu.edu/~lpederse/papers/TimeSeriesMomentum.pdf

TAB H

Report

Comprehensive Performance Report

September 30, 2018

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Comprehensive Performance Report

September 30, 2018

Description of SBI Investment Programs

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

Combined Funds

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

Participant Directed Investment Program

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

Non-Retirement

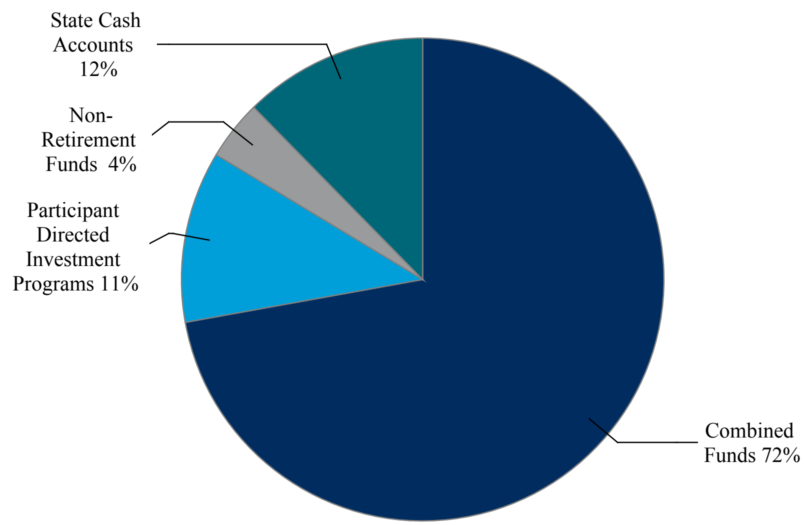
The Non-Retirement Funds are funds established by the State of Minnesota and other government entities for various purposes which include the benefit of public schools, the environment, other post-employment benefits, workers compensation insurance, and other purposes.

State Cash

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

Funds Under Management

	$ Millions
COMBINED FUNDS	
Combined Funds	$70,023
PARTICIPANT DIRECTED INVESTMENT PROGRAMS	
Supplemental Investment Fund*	3,839
State Deferred Compensation Plan**	5,874
Minnesota College Savings Plan	1,433
Achieve a Better Life Experience	3
NON-RETIREMENT FUNDS	
Assigned Risk Plan	274
Permanent School Fund	1,444
Environmental Trust Fund	1,173
Closed Landfill Investment Fund	93
Miscellaneous	248
Other Post Employment Benefits Accounts	655
STATE CASH ACCOUNTS	
Treasurer's Cash	11,706
Other State Cash Accounts	281
TOTAL	
SBI AUM	97,045



* Includes assets of smaller retirement funds which are invested with the SBI but are not included in the Combined Funds

** Does not include the Stable Value and Money Market accounts that are used by Deferred Compensation and Supplemental Investment Fund

Note: Differentials within column amounts may occur due to rounding

Quarterly Report

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Performance Reporting Legend

Manager Level Data
Aggregate Level Data
Sub-Asset Class Level Data
Asset Class Level Data

Note:
Throughout this report performance is calculated net of investment management fees, aggregates include terminated managers, and returns for all periods greater than one year are annualized. Inception Date and Since Inception Returns refer to the date of retention by the SBI. FYTD refers to the return generated by an account since July 1 of the most recent year. For historical benchmark details, please refer to the addendum of this report. Inception to date return information is included for manager accounts and total asset class but not other aggregates becuase of portfolio management decisions to group managers in different aggregates over time.

STATE STREET

Combined Funds

September 30, 2018

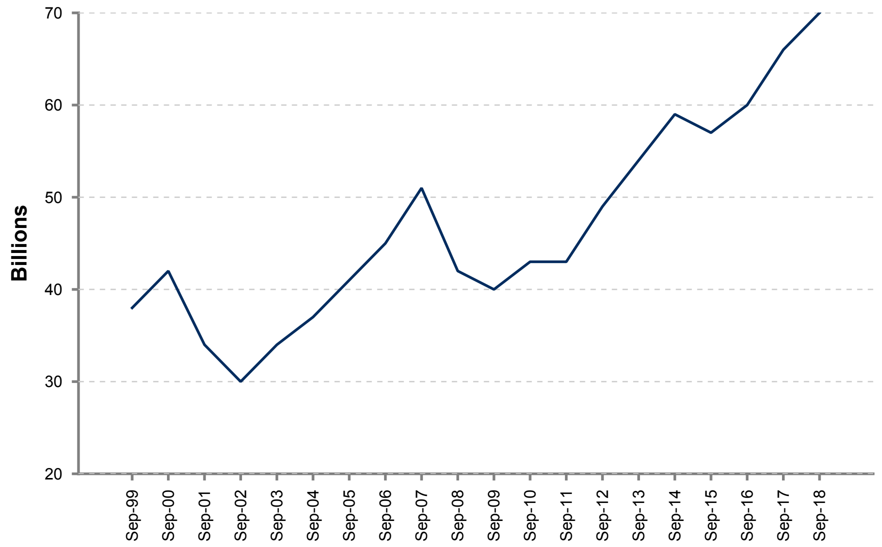
Combined Funds Summary

Combined Funds Change in Market Value ($Millions)

	One Quarter
COMBINED FUNDS	
Beginning Market Value	$68,288
Net Contributions	-654
Investment Return	2,389
Ending Market Value	70,023

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

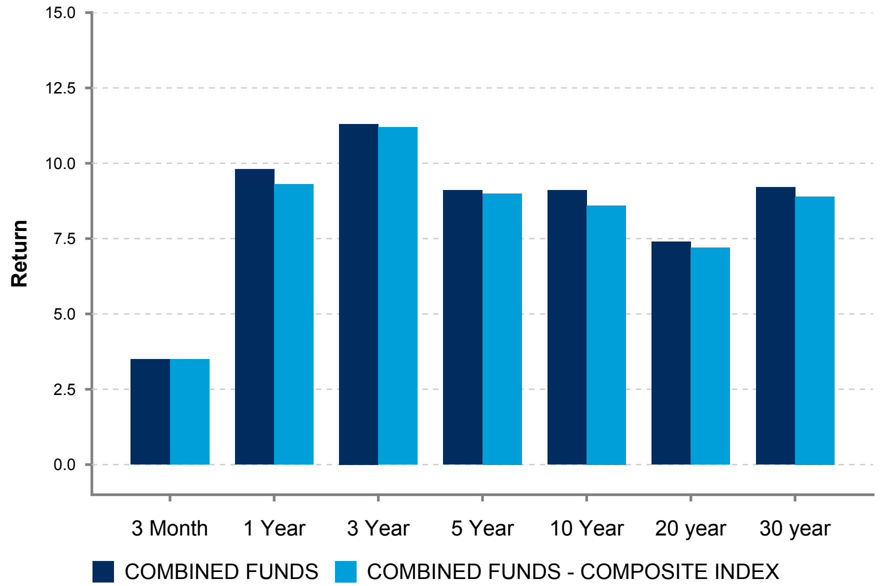
Asset Growth



Performance (Net of Fees)

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

	Qtr	FYTD	1 Yr	3 Yr	5 Yr	10 Yr	20 Yr	30 Yr
COMBINED FUNDS	3.5%	3.5%	9.8%	11.3%	9.1%	9.1%	7.4%	9.2%
COMBINED FUNDS - COMPOSITE INDEX	3.5	3.5	9.3	11.2	9.0	8.6	7.2	8.9
Excess	0.1	0.1	0.5	0.1	0.1	0.5	0.2	0.3



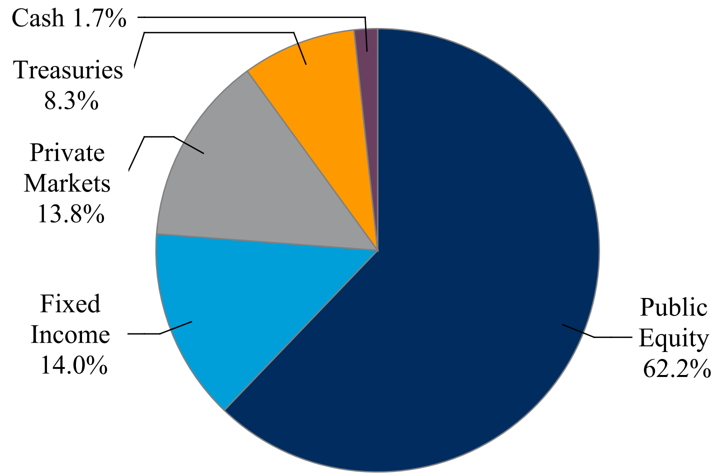
STATE STREET.

Combined Funds Summary

Asset Mix

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

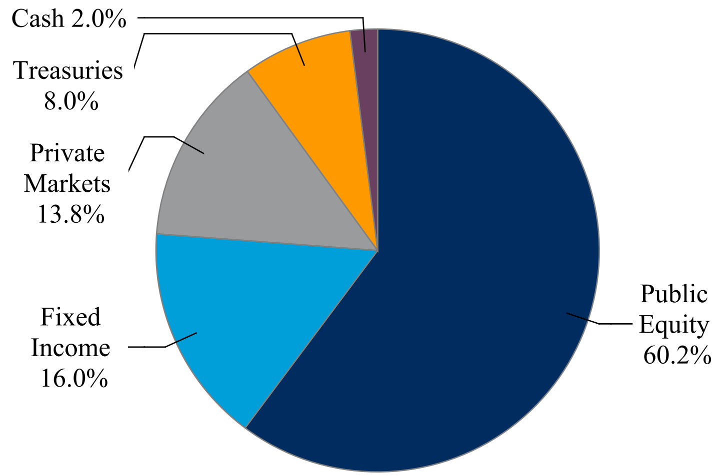
	(Millions)	Actual Mix	Transitional Policy Target
Public Equity	$43,490	62.1%	49.0%
Fixed Income	9,822	14.0	16.0
Private Markets	9,698	13.8	25.0
Treasuries	5,792	8.3	8.0
Cash	1,220	1.7	2.0
TOTAL	70,023	100.0	



Composite Index Comparison

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

	Policy Weight	Market Index
Public Equity	60.3%	67% Russell 3000/33% MSCI ACWI ex US
Fixed Income	16.0	BB Barclays U.S. Aggregate
Private Markets	13.8	Private Markets
Treasuries	8.0	BB Barclays Treasury 5+ Years
Cash	2.0	3 Month T-Bills



Combined Funds Asset Class Performance Summary

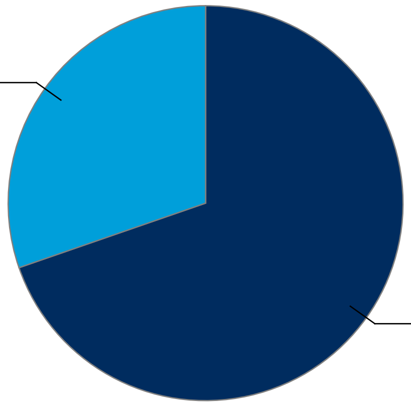
Public Equity

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

The Public Equity benchmark is 67% Russell 3000 and 33% MSCI ACWI ex USA.

The Russell 3000 measures the performance of the 3000 largest U.S. companies based on total market capitalization.

The Morgan Stanley Capital International All Country World Index ex U.S. (net) is a free float-adjusted market capitalization index that is designed to measure equity market performance in developed and emerging markets other than the United States.



	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Public Equity	5.0%	5.0%	12.5%	14.8%	10.9%	10.5%	7.2%	9.7%
Public Equity Benchmark	5.0	5.0	12.2					
Excess	-0.0	-0.0	0.3					
Domestic Equity	7.0	7.0	18.0	16.8	13.3	12.1	7.5	10.2
Domestic Equity Benchmark	7.1	7.1	17.6	17.1	13.5	12.0	7.7	10.4
Excess	-0.1	-0.1	0.4	-0.3	-0.2	0.1	-0.2	-0.1
International Equity	0.5	0.5	1.5	9.7	4.5	5.7	6.1	
International Equity Benchmark	0.7	0.7	1.8	10.0	4.1	5.2	5.8	
Excess	-0.2	-0.2	-0.3	-0.3	0.4	0.5	0.3	

Note:

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

STATE STREET.

Combined Funds Asset Class Performance Summary

Fixed Income

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

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

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

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Fixed Income	0.2%	0.2%	-0.7%	2.1%	2.7%	4.8%	4.9%	6.4%
Fixed Income Benchmark	0.0	0.0	-1.2	1.3	2.2	3.8	4.5	6.1
Excess	0.2	0.2	0.5	0.8	0.5	1.0	0.4	0.3
Treasuries	-1.5	-1.5						
BBG BARC 5Y + Us Tsy Idx	-1.5	-1.5						
Excess	-0.0	-0.0						

Cash

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

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	30 year
Cash	0.5%	0.5%	1.7%	1.0%	0.7%	0.7%	2.4%	3.9%
90 DAY T-BILL	0.5	0.5	1.6	0.8	0.5	0.3	1.9	3.2

Note:
For additional information regarding historical asset class performance and benchmarks, please refer to the Combined Funds Performance Report.

STATE STREET

Combined Funds Asset Class Performance Summary

Private Markets

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 year	30 year
Private Markets	4.2%	4.2%	16.3%	11.7%	12.5%	9.3%	12.3%	13.6%	12.2%
Private Equity	4.9%	4.9%	19.8%	15.8%	16.0%	12.4%	12.9%	15.7%	
Private Credit	4.4	4.4	17.5	14.1	14.8	11.8	12.5		
Resources	2.7	2.7	8.3	0.1	1.3	2.6	14.3	14.6	
Real Estate	2.6	2.6	12.3	9.3	13.1	5.1	9.0	9.2	

Private Markets

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

Private Equity Investments

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

Private Credit Investments

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

Resource Investments

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

Real Estate Investments

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

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

Asset Class & Manager Performance
September 30, 2018

The assets of the Combined Funds are allocated to public equity, fixed income, private markets, and cash. Each asset class may be further differentiated by geography, management style, and/or strategy. Managers are hired to manage the assets accordingly. This diversification is intended to reduce wide fluctuations in investment returns on a year-to-year basis and enhances the Funds' ability to meet or exceed the actuarial return target over the long-term.

The Combined Funds consist of the assets of active employees and retired members of the statewide retirement plans. The SBI commingles the assets of these plans into the Combined Funds to capture investment efficiencies. This sharing is accomplished by grouping managers by asset class, geography, and management style, into several Investment Pools. The individual funds participate in the Investment Pools by purchasing units which function much like the shares of a mutual fund.

While the vast majority of the units of these pools are owned by the Combined Funds, the Supplemental Investment Fund also owns units of these pools. The Supplemental Investment Funds are mutual fund-like investment vehicles which are used by investors in the Participant Directed Investment Program. Please refer to the Participant Directed Investment Program report for more information.

The performance information presented on the following pages for Public Equity and Fixed Income includes both the Combined Funds and Supplemental Investment Fund. The Private Markets is Combined Funds only. All assets in the Combined Funds are managed externally by investment management firms retained by contract.

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Domestic Equity

September 30, 2018

Total Domestic Equity

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
ACTIVE DOMESTIC EQUITY AGGREGATE (1)	**$5,140,992,210**	**16.3%**	**5.5%**	**5.5%**	**20.1%**	**17.3%**	**12.9%**	**12.1%**		
Active Domestic Equity Benchmark			5.5	5.5	16.2	17.1	12.9	11.8		
Excess			0.0	0.0	3.9	0.3	-0.1	0.3		
SEMI PASSIVE DOMESTIC EQUITY AGGREGATE (2)	**2,796,875,470**	**8.9**	**7.7**	**7.7**	**18.1**	**17.0**	**13.9**	**12.3**		
Semi Passive Domestic Equity Benchmark			7.4	7.4	17.8	17.1	13.7	12.1		
Excess			0.3	0.3	0.3	-0.1	0.2	0.2		
PASSIVE DOMESTIC EQUITY AGGREGATE (3)	**23,632,369,073**	**74.8**	**7.3**	**7.3**	**17.6**	**17.1**	**13.5**	**12.0**		
Passive Domestic Equity Benchmark			7.3	7.3	17.7	17.1	13.5	12.0		
Excess			0.0	0.0	-0.1	-0.0	-0.0	-0.0		
TRANSITION AGGREGATE DOMESTIC EQUITY (4)	3,931,132	0.0								
TOTAL DOMESTIC EQUITY (5)	**31,574,167,884**	**100.0**	**7.0**	**7.0**	**18.0**	**16.8**	**13.3**	**12.0**	**10.6**	**01/1984**
Domestic Equity Benchmark			7.1	7.1	17.6	17.1	13.5	12.0	10.8	01/1984
Excess			-0.1	-0.1	0.5	-0.3	-0.2	0.0	-0.2	

(1) The Active Domestic Equity Benchmark is a weighted composite each of the individual active domestic equity manager’s benchmarks.
(2) The current Semi-Passive Domestic Equity Benchmark is the Russell 1000 index.
(3) The current Passive Domestic Equity Benchmark is a weighted average of the Russell 1000 and Russell 3000.
(4) The Transition Domestic Equity Aggregate contains Domestic Equity securities that are being transitioned to a different manager.
(5) The current Domestic Equity Benchmark is the Russell 3000.
Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

STATE STREET

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Total Domestic Equity					
ACTIVE DOMESTIC EQUITY AGGREGATE (1)	**20.6%**	**10.9%**	**-0.4%**	**9.3%**	**40.2%**
Active Domestic Equity Benchmark	18.3	15.7	-0.6	11.0	34.7
Excess	2.3	-4.8	0.3	-1.7	5.5
SEMI PASSIVE DOMESTIC EQUITY AGGREGATE (2)	**22.5**	**11.1**	**0.5**	**14.2**	**33.2**
Semi Passive Domestic Equity Benchmark	21.7	12.1	0.9	13.2	33.1
Excess	0.8	-1.0	-0.4	1.0	0.1
PASSIVE DOMESTIC EQUITY AGGREGATE (3)	**21.3**	**12.6**	**0.5**	**12.6**	**33.5**
Passive Domestic Equity Benchmark	21.5	12.5	0.5	12.6	33.6
Excess	-0.2	0.1	0.0	0.0	-0.0
TRANSITION AGGREGATE DOMESTIC EQUITY (4)					
TOTAL DOMESTIC EQUITY (5)	**21.4%**	**11.5**	**0.3**	**12.3**	**35.1**
Domestic Equity Benchmark	21.1%	12.7	0.5	12.6	33.6
Excess	0.2%	-1.3	-0.2	-0.2	1.6

(1) The Active Domestic Equity Benchmark is a weighted composite each of the individual active domestic equity manager's benchmarks.

(2) The current Semi-Passive Domestic Equity Benchmark is the Russell 1000 index.

(3) The current Passive Domestic Equity Benchmark is a weighted average of the Russell 1000 and Russell 3000.

(4) The Transition Domestic Equity Aggregate contains Domestic Equity securities that are being transitioned to a different manager.

(5) The current Domestic Equity Benchmark is the Russell 3000.

Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Large Cap Growth										
SANDS	**$639,606,683**	**2.0%**	**6.9%**	**6.9%**	**34.6%**	**22.0%**	**15.1%**	**17.5%**	**11.9%**	**01/2005**
Russell 1000 Growth			9.2	9.2	26.3	20.6	16.6	14.3	10.4	01/2005
Excess			-2.3	-2.3	8.3	1.4	-1.5	3.2	1.5	
WINSLOW	**260,361,198**	**0.8**	**8.4**	**8.4**	**31.2**	**20.7**	**16.3**	**14.3**	**11.3**	**01/2005**
Russell 1000 Growth			9.2	9.2	26.3	20.6	16.6	14.3	10.4	01/2005
Excess			-0.8	-0.8	4.9	0.1	-0.3	-0.0	0.9	
ZEVENBERGEN	**611,707,470**	**1.9**	**7.9**	**7.9**	**39.7**	**23.6**	**15.5**	**15.5**	**11.4**	**04/1994**
Russell 1000 Growth			9.2	9.2	26.3	20.6	16.6	14.3	10.1	04/1994
Excess			-1.3	-1.3	13.4	3.0	-1.1	1.2	1.4	
RUSSELL 1000 GROWTH AGGREGATE	**1,511,675,351**	**4.8**	**7.5**	**7.5**	**36.0**	**23.7**	**17.2**	**15.5**		
Russell 1000 Growth			9.2	9.2	26.3	20.6	16.6	14.3		
Excess			-1.6	-1.6	9.7	3.1	0.6	1.2		

STATE STREET

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Active Large Cap Growth					
SANDS	**35.3%**	**-6.9%**	**2.9%**	**9.1%**	**42.4%**
Russell 1000 Growth	30.2	7.1	5.7	13.0	33.5
Excess	5.1	-13.9	-2.8	-3.9	8.9
WINSLOW	**33.2**	**-1.9**	**6.7**	**11.0**	**37.4**
Russell 1000 Growth	30.2	7.1	5.7	13.0	33.5
Excess	3.0	-9.0	1.0	-2.0	3.9
ZEVENBERGEN	**35.1**	**-2.8**	**6.4**	**3.4**	**60.6**
Russell 1000 Growth	30.2	7.1	5.7	13.0	33.5
Excess	4.9	-9.9	0.7	-9.6	27.1
RUSSELL 1000 GROWTH AGGREGATE	**33.4%**	**1.0**	**4.6**	**9.6**	**42.0**
Russell 1000 Growth	30.2%	7.1	5.7	13.0	33.5
Excess	3.2%	-6.1	-1.1	-3.4	8.5

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Large Cap Value										
BARROW HANLEY	**$410,679,014**	**1.3%**	**7.4%**	**7.4%**	**13.9%**	**13.7%**	**11.1%**	**10.6%**	**8.4%**	**04/2004**
Russell 1000 Value			5.7	5.7	9.5	13.6	10.7	9.8	8.0	04/2004
Excess			1.7	1.7	4.4	0.1	0.4	0.9	0.4	
EARNEST PARTNERS	**291,861,585**	**0.9**	**6.9**	**6.9**	**15.8**	**15.4**	**12.7**	**11.1**	**7.3**	**07/2000**
Russell 1000 Value			5.7	5.7	9.5	13.6	10.7	9.8	7.3	07/2000
Excess			1.2	1.2	6.3	1.8	2.0	1.3	-0.0	
LSV	**438,437,470**	**1.4**	**4.6**	**4.6**	**10.7**	**14.4**	**12.2**	**11.2**	**9.4**	**04/2004**
Russell 1000 Value			5.7	5.7	9.5	13.6	10.7	9.8	8.0	04/2004
Excess			-1.1	-1.1	1.2	0.9	1.5	1.5	1.4	
RUSSELL 1000 VALUE AGGREGATE	**1,140,978,069**	**3.6**	**6.2**	**6.2**	**13.1**	**14.4**	**11.5**	**10.7**		
Russell 1000 Value			5.7	5.7	9.5	13.6	10.7	9.8		
Excess			0.5	0.5	3.7	0.9	0.8	0.9		

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Active Large Cap Value

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
BARROW HANLEY	**14.6%**	**12.8%**	**-2.1%**	**13.0%**	**35.5%**
Russell 1000 Value	13.7	17.3	-3.8	13.5	32.5
Excess	0.9	-4.5	1.7	-0.5	3.0
EARNEST PARTNERS	**19.9**	**16.2**	**-2.7**	**14.0**	**32.0**
Russell 1000 Value	13.7	17.3	-3.8	13.5	32.5
Excess	6.2	-1.1	1.1	0.5	-0.5
LSV	**18.6**	**17.0**	**-2.2**	**14.0**	**41.2**
Russell 1000 Value	13.7	17.3	-3.8	13.5	32.5
Excess	4.9	-0.4	1.6	0.6	8.7
RUSSELL 1000 VALUE AGGREGATE	**17.3%**	**15.3**	**-3.2**	**13.1**	**36.5**
Russell 1000 Value	13.7%	17.3	-3.8	13.5	32.5
Excess	3.7%	-2.1	0.6	-0.4	3.9

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	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Semi-Passive Large Cap										
BLACKROCK	**$1,145,326,455**	**3.6%**	**8.0%**	**8.0%**	**19.7%**	**18.6%**	**14.8%**	**12.7%**	**10.3%**	**01/1995**
Semi Passive Domestic Equity Benchmark			7.4	7.4	17.8	17.1	13.7	12.1	9.8	01/1995
Excess			0.6	0.6	2.0	1.5	1.1	0.6	0.5	
J.P. MORGAN	**1,651,549,014**	**5.2**	**7.5**	**7.5**	**17.0**	**17.0**	**14.1**	**12.8**	**10.1**	**01/1995**
Semi Passive Domestic Equity Benchmark			7.4	7.4	17.8	17.1	13.7	12.1	9.8	01/1995
Excess			0.1	0.1	-0.8	-0.1	0.4	0.7	0.3	
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE	**2,796,875,470**	**8.9**	**7.7**	**7.7**	**18.1**	**17.0**	**13.9**	**12.3**		
Semi Passive Domestic Equity Benchmark			7.4	7.4	17.8	17.1	13.7	12.1		
Excess			0.3	0.3	0.3	-0.1	0.2	0.2		

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	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Semi-Passive Large Cap					
BLACKROCK	**24.6%**	**12.5%**	**0.8%**	**14.2%**	**33.3%**
Semi Passive Domestic Equity Benchmark	21.7	12.1	0.9	13.2	33.1
Excess	2.9	0.5	-0.1	1.0	0.2
J.P. MORGAN	**21.8**	**12.3**	**0.8**	**15.0**	**33.7**
Semi Passive Domestic Equity Benchmark	21.7	12.1	0.9	13.2	33.1
Excess	0.1	0.2	-0.1	1.8	0.6
SEMI-PASSIVE DOMESTIC EQUITY AGGREGATE	**22.5%**	**11.1**	**0.5**	**14.2**	**33.2**
Semi Passive Domestic Equity Benchmark	21.7%	12.1	0.9	13.2	33.1
Excess	0.8%	-1.0	-0.4	1.0	0.1

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Small Cap Growth										
ARROWMARK	**$254,245,974**	**0.8%**	**7.9%**	**7.9%**	**28.1%**				**31.5%**	**11/2016**
Russell 2000 Growth			5.5	5.5	21.1				26.2	11/2016
Excess			2.4	2.4	7.0				5.3	
HOOD RIVER	**283,488,994**	**0.9**	**11.8**	**11.8**	**25.6**				**28.5**	**11/2016**
Russell 2000 Growth			5.5	5.5	21.1				26.2	11/2016
Excess			6.3	6.3	4.5				2.3	
RICE HALL JAMES	**258,369,338**	**0.8**	**5.0**	**5.0**	**30.0**				**32.6**	**11/2016**
Russell 2000 Growth			5.5	5.5	21.1				26.2	11/2016
Excess			-0.5	-0.5	9.0				6.4	
WELLINGTON	**269,939,333**	**0.9**	**4.6**	**4.6**	**17.9**				**25.3**	**11/2016**
Russell 2000 Growth			5.5	5.5	21.1				26.2	11/2016
Excess			-0.9	-0.9	-3.2				-0.9	
RUSSELL 2000 GROWTH AGGREGATE	**1,066,043,639**	**3.4**	**7.3**	**7.3**	**24.2**	**15.7**	**9.7**	**10.9**		
Russell 2000 Growth			5.5	5.5	21.1	18.0	12.1	12.7		
Excess			1.8	1.8	3.2	-2.2	-2.4	-1.7		

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	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Active Small Cap Growth					
ARROWMARK	**26.2%**				
Russell 2000 Growth	22.2				
Excess	4.1				
HOOD RIVER	**21.3**				
Russell 2000 Growth	22.2				
Excess	-0.9				
RICE HALL JAMES	**27.9**				
Russell 2000 Growth	22.2				
Excess	5.8				
WELLINGTON	**22.6**				
Russell 2000 Growth	22.2				
Excess	0.4				
RUSSELL 2000 GROWTH AGGREGATE	**22.0%**	**4.7**	**1.0**	**-3.4**	**47.2**
Russell 2000 Growth	22.2%	11.3	-1.4	5.6	43.3
Excess	-0.1%	-6.6	2.4	-9.0	3.9

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Small Cap Value										
GOLDMAN SACHS	**$383,341,200**	**1.2%**	**3.3%**	**3.3%**	**9.5%**	**15.0%**	**10.5%**	**11.6%**	**10.0%**	**01/2004**
Russell 2000 Value			1.6	1.6	9.3	16.1	9.9	9.5	8.5	01/2004
Excess			1.7	1.7	0.2	-1.2	0.6	2.1	1.5	
HOTCHKIS AND WILEY	**333,396,927**	**1.1**	**2.2**	**2.2**	**10.0**	**12.9**	**10.2**	**13.2**	**9.0**	**01/2004**
Russell 2000 Value			1.6	1.6	9.3	16.1	9.9	9.5	8.5	01/2004
Excess			0.6	0.6	0.7	-3.3	0.3	3.7	0.5	
MARTINGALE	**311,360,718**	**1.0**	**0.6**	**0.6**	**6.7**	**15.4**	**11.3**	**10.6**	**8.5**	**01/2004**
Russell 2000 Value			1.6	1.6	9.3	16.1	9.9	9.5	8.5	01/2004
Excess			-1.0	-1.0	-2.6	-0.8	1.4	1.1	-0.1	
PEREGRINE	**394,196,305**	**1.2**	**-0.0**	**-0.0**	**10.8**	**14.7**	**9.7**	**11.2**	**10.7**	**07/2000**
Russell 2000 Value			1.6	1.6	9.3	16.1	9.9	9.5	10.0	07/2000
Excess			-1.6	-1.6	1.5	-1.4	-0.2	1.7	0.6	
RUSSELL 2000 VALUE AGGREGATE	**1,422,295,151**	**4.5**	**1.5**	**1.5**	**9.4**	**14.5**	**10.3**	**11.5**		
Russell 2000 Value			1.6	1.6	9.3	16.1	9.9	9.5		
Excess			-0.1	-0.1	0.0	-1.7	0.4	2.0		

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	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Active Small Cap Value					
GOLDMAN SACHS	**12.6%**	**24.6%**	**-5.2%**	**7.4%**	**39.3%**
Russell 2000 Value	7.8	31.7	-7.5	4.2	34.5
Excess	4.7	-7.1	2.3	3.1	4.8
HOTCHKIS AND WILEY	**7.9**	**19.9**	**-8.5**	**13.0**	**46.0**
Russell 2000 Value	7.8	31.7	-7.5	4.2	34.5
Excess	0.0	-11.8	-1.0	8.8	11.5
MARTINGALE	**6.9**	**34.3**	**-5.2**	**7.3**	**43.1**
Russell 2000 Value	7.8	31.7	-7.5	4.2	34.5
Excess	-0.9	2.5	2.3	3.1	8.5
PEREGRINE	**12.5**	**27.8**	**-6.7**	**4.1**	**37.3**
Russell 2000 Value	7.8	31.7	-7.5	4.2	34.5
Excess	4.7	-3.9	0.8	-0.1	2.8
RUSSELL 2000 VALUE AGGREGATE	**10.2%**	**26.5**	**-6.5**	**7.5**	**40.8**
Russell 2000 Value	7.8%	31.7	-7.5	4.2	34.5
Excess	2.3%	-5.2	1.0	3.3	6.3

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	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Total Passive Domestic Equity										
BLACKROCK RUSSELL 1000	**$13,535,597,493**	**42.9%**	**7.4%**	**7.4%**	**17.7%**				**20.2%**	**11/2016**
Russell 1000			7.4	7.4	17.8				20.3	11/2016
Excess			-0.0	-0.0	-0.0				-0.0	
BLACKROCK RUSSELL 3000 (1)	**10,096,771,580**	**32.0**	**7.1**	**7.1**	**17.6**	**17.1%**	**13.5%**	**12.0%**	**9.5**	**07/1995**
Passive Manager Benchmark			7.1	7.1	17.6	17.1	13.5	12.0	9.5	07/1995
Excess			0.0	0.0	0.0	0.0	0.0	0.0	0.1	
PASSIVE DOMESTIC EQUITY AGGREGATE	**23,632,369,073**	**74.8**	**7.3**	**7.3**	**17.6**	**17.1**	**13.5**	**12.0**		
Passive Domestic Equity Benchmark			7.3	7.3	17.7	17.1	13.5	12.0		
Excess			0.0	0.0	-0.1	-0.0	-0.0	-0.0		

(1) The current Passive Manager Benchmark is the Russell 3000. For historical benchmark details please refer to the addendum of this report.

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Total Passive Domestic Equity					
BLACKROCK RUSSELL 1000	**21.7%**				
Russell 1000	21.7				
Excess	-0.0				
BLACKROCK RUSSELL 3000 (1)	**21.1**	**12.7%**	**0.5%**	**12.6%**	**33.5%**
Passive Manager Benchmark	21.1	12.7	0.5	12.6	33.6
Excess	0.0	0.0	0.0	0.0	-0.0
PASSIVE DOMESTIC EQUITY AGGREGATE	**21.3%**	**12.6**	**0.5**	**12.6**	**33.5**
Passive Domestic Equity Benchmark	21.5%	12.5	0.5	12.6	33.6
Excess	-0.2%	0.1	0.0	0.0	-0.0

(1) The current Passive Manager Benchmark is the Russell 3000. For historical benchmark details please refer to the addendum of this report.

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International Equity
September 30, 2018

Total International Equity

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
DEVELOPED MARKETS (1)	**$10,210,167,835**	**76.3%**	**1.2%**	**1.2%**	**3.1%**	**9.4%**	**4.9%**	**5.9%**		
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2		
Excess			-0.1	-0.1	0.4	0.1	0.7	0.8		
EMERGING MARKETS (2)	**3,164,548,910**	**23.7**	**-1.7**	**-1.7**	**-3.0**	**10.8**	**3.0**	**5.0**		
BENCHMARK EM			-1.1	-1.1	-0.8	12.4	3.6	5.4		
Excess			-0.6	-0.6	-2.2	-1.6	-0.6	-0.4		
TRANSITION AGGREGATE INTERNATIONAL EQUITY (3)	3,971,682	0.0								
TOTAL INTERNATIONAL EQUITY (4)	**13,378,688,427**	**100.0**	**0.5**	**0.5**	**1.5**	**9.6**	**4.5**	**5.7**	**6.6**	**10/1992**
International Equity Benchmark			0.7	0.7	1.8	10.0	4.1	5.2	6.1	10/1992
Excess			-0.2	-0.2	-0.3	-0.3	0.4	0.5	0.5	

(1) The current benchmak for Developed Markets, Benchmark DM, is the Standard (large + mid) MSCI World ex USA (net).

(2) The current benchmark for Emerging Markets, Benchmark EM, is the Standard (large + mid) MSCI Emerging Markets Free (net).

(3) The Transition Aggregate International Equity contains International Equity securities that are being transitioned to a different manager.

(4) Does not includes impact of currency overlay on the passive EAFE portfolio from 12/1/95-10/31/00. This impact is included in the return for the Combined Funds portion of the International Equity portfolio. The current International Equity Benchmark is the Standard (large + mid) MSCI ACWI ex U.S. (net).

Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Total International Equity					
DEVELOPED MARKETS (1)	**24.9%**	**1.3%**	**-0.3%**	**-4.1%**	**23.3%**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	0.7	-1.5	2.8	0.2	2.2
EMERGING MARKETS (2)	**37.7**	**7.5**	**-13.1**	**-3.8**	**0.2**
BENCHMARK EM	37.3	11.2	-14.9	-2.2	-2.6
Excess	0.4	-3.7	1.9	-1.6	2.9
TRANSITION AGGREGATE INTERNATIONAL EQUITY (3)					
TOTAL INTERNATIONAL EQUITY (4)	**27.6%**	**2.6**	**-2.9**	**-4.0**	**17.8**
International Equity Benchmark	27.2%	4.5	-5.7	-3.9	15.3
Excess	0.4%	-1.8	2.8	-0.2	2.5

(1) The current benchmak for Developed Markets, Benchmark DM, is the Standard (large + mid) MSCI World ex USA (net).

(2) The current benchmark for Emerging Markets, Benchmark EM, is the Standard (large + mid) MSCI Emerging Markets Free (net).

(3) The Transition Aggregate International Equity contains International Equity securities that are being transitioned to a different manager.

(4) Does not includes impact of currency overlay on the passive EAFE portfolio from 12/1/95-10/31/00. This impact is included in the return for the Combined Funds portion of the International Equity portfolio. The current International Equity Benchmark is the Standard (large + mid) MSCI ACWI ex U.S. (net).

Note: All aggregates include the performance of terminated managers. For historical benchmark details please refer to the addendum of this report.

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Developed Markets										
ACADIAN	**$456,266,357**	**3.4%**	**0.8%**	**0.8%**	**6.8%**	**16.8%**	**10.3%**	**7.8%**	**7.1%**	**07/2005**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	5.1	07/2005
Excess			-0.5	-0.5	4.1	7.5	6.0	2.7	2.0	
COLUMBIA	**349,418,450**	**2.6**	**0.6**	**0.6**	**5.9**	**9.9**	**5.8**	**7.0**	**3.1**	**03/2000**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	3.5	03/2000
Excess			-0.7	-0.7	3.2	0.6	1.5	1.8	-0.4	
FIDELITY	**436,287,859**	**3.3**	**1.2**	**1.2**	**4.2**	**10.1**	**5.1**	**6.8**	**6.7**	**07/2005**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	5.1	07/2005
Excess			-0.1	-0.1	1.6	0.8	0.9	1.6	1.5	
JP MORGAN	**258,030,140**	**1.9**	**-0.6**	**-0.6**	**0.9**	**9.8**	**4.0**	**5.7**	**5.1**	**07/2005**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	5.1	07/2005
Excess			-1.9	-1.9	-1.8	0.5	-0.3	0.5	0.0	
MARATHON	**840,925,397**	**6.3**	**1.1**	**1.1**	**3.8**	**8.9**	**6.0**	**7.7**	**8.3**	**11/1993**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	5.2	11/1993
Excess			-0.2	-0.2	1.1	-0.4	1.8	2.6	3.1	
MCKINLEY	**268,746,180**	**2.0**	**0.9**	**0.9**	**5.3**	**8.3**	**5.3**	**5.3**	**5.1**	**07/2005**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	5.1	07/2005
Excess			-0.4	-0.4	2.6	-1.0	1.1	0.1	-0.1	
ACTIVE DEVELOPED MARKETS AGGREGATE	**2,609,674,383**	**19.5**	**0.8**	**0.8**	**4.6**	**10.6**	**6.2**	**6.9**		
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2		
Excess			-0.5	-0.5	1.9	1.2	2.0	1.7		

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Active Developed Markets					
ACADIAN	**37.0%**	**8.1%**	**2.4%**	**-1.7%**	**26.1%**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	12.8	5.4	5.4	2.6	5.1
COLUMBIA	**32.7**	**-5.6**	**6.4**	**-5.6**	**23.9**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	8.5	-8.3	9.4	-1.2	2.9
FIDELITY	**25.9**	**1.2**	**0.1**	**-5.6**	**26.7**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	1.7	-1.5	3.2	-1.3	5.7
JP MORGAN	**28.3**	**4.0**	**-4.7**	**-5.1**	**19.5**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	4.1	1.2	-1.6	-0.7	-1.5
MARATHON	**23.1**	**-1.1**	**6.7**	**-4.0**	**28.5**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	-1.1	-3.8	9.7	0.3	7.5
MCKINLEY	**28.5**	**-7.5**	**3.1**	**-2.7**	**28.0**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	4.3	-10.2	6.2	1.6	7.0
ACTIVE DEVELOPED MARKETS AGGREGATE	**28.4%**	**-0.2**	**3.2**	**-4.1**	**25.4**
BENCHMARK DM	24.2%	2.7	-3.0	-4.3	21.0
Excess	4.2%	-3.0	6.2	0.2	4.4

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	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Semi-Passive Developed Markets										
AQR	**$405,781,317**	**3.0%**	**0.4%**	**0.4%**	**-1.6%**	**8.0%**	**4.3%**	**6.1%**	**5.5%**	**07/2005**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	5.1	07/2005
Excess			-0.9	-0.9	-4.3	-1.4	0.1	1.0	0.4	
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**405,781,317**	**3.0**	**0.4**	**0.4**	**-2.4**	**6.6**	**3.5**	**5.1**		
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2		
Excess			-0.9	-0.9	-5.1	-2.7	-0.7	-0.1		

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Semi-Passive Developed Markets					
AQR	**25.1%**	**0.8%**	**0.9%**	**-4.4%**	**24.1%**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	0.9	-2.0	3.9	-0.1	3.1
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**23.3%**	**-0.4**	**-0.3**	**-4.4**	**24.0**
BENCHMARK DM	24.2%	2.7	-3.0	-4.3	21.0
Excess	-0.9%	-3.1	2.7	-0.1	3.0

Total Developed Markets

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
ACTIVE DEVELOPED MARKETS AGGREGATE	**$2,609,674,383**	**19.5%**	**0.8%**	**0.8%**	**4.6%**	**10.6%**	**6.2%**	**6.9%**		
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2		
Excess			-0.5	-0.5	1.9	1.2	2.0	1.7		
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**405,781,317**	**3.0**	**0.4**	**0.4**	**-2.4**	**6.6**	**3.5**	**5.1**		
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2		
Excess			-0.9	-0.9	-5.1	-2.7	-0.7	-0.1		
SSgA DEVELOPED MARKETS PASSIVE	**7,194,712,136**	**53.8**	**1.4**	**1.4**	**2.9**	**9.7**	**4.7**	**5.5**	**6.3**	**10/1992**
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2	6.0	10/1992
Excess			0.0	0.0	0.3	0.4	0.4	0.4	0.3	
DEVELOPED MARKETS TOTAL	**10,210,167,835**	**76.3**	**1.2**	**1.2**	**3.1**	**9.4**	**4.9**	**5.9**		
BENCHMARK DM			1.3	1.3	2.7	9.3	4.2	5.2		
Excess			-0.1	-0.1	0.4	0.1	0.7	0.8		

Total Developed Markets

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
ACTIVE DEVELOPED MARKETS AGGREGATE	**28.4%**	**-0.2%**	**3.2%**	**-4.1%**	**25.4%**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	4.2	-3.0	6.2	0.2	4.4
SEMI-PASSIVE DEVELOPED MARKETS AGGREGATE	**23.3**	**-0.4**	**-0.3**	**-4.4**	**24.0**
BENCHMARK DM	24.2	2.7	-3.0	-4.3	21.0
Excess	-0.9	-3.1	2.7	-0.1	3.0
SSgA DEVELOPED MARKETS PASSIVE	**24.7%**	**3.2**	**-2.6**	**-3.9**	**21.4**
BENCHMARK DM	24.2%	2.7	-3.0	-4.3	21.0
Excess	0.5%	0.4	0.5	0.4	0.4
DEVELOPED MARKETS TOTAL	**24.9%**	**1.3**	**-0.3**	**-4.1**	**23.3**
BENCHMARK DM	24.2%	2.7	-3.0	-4.3	21.0
Excess	0.7%	-1.5	2.8	0.2	2.2

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Emerging Markets										
EARNEST PARTNERS	**$293,015,899**	**2.2%**	**-0.3%**	**-0.3%**	**-2.6%**				**7.3%**	**04/2017**
MSCI EMERGING MARKETS			-1.1	-1.1	-0.8				8.9	04/2017
Excess			0.8	0.8	-1.8				-1.6	
MARTIN CURRIE	**325,522,501**	**2.4**	**-3.4**	**-3.4**	**-1.2**				**13.1**	**04/2017**
BENCHMARK EM			-1.1	-1.1	-0.8				8.9	04/2017
Excess			-2.4	-2.4	-0.4				4.2	
MACQUARIE	**315,628,394**	**2.4**	**0.3**	**0.3**	**-2.9**				**10.5**	**04/2017**
BENCHMARK EM			-1.1	-1.1	-0.8				8.9	04/2017
Excess			1.4	1.4	-2.1				1.6	
MORGAN STANLEY	**582,296,788**	**4.4**	**-2.5**	**-2.5**	**-6.7**	**9.0%**	**3.2%**	**5.6%**	**9.4**	**01/2001**
BENCHMARK EM			-1.1	-1.1	-0.8	12.4	3.6	5.4	9.3	01/2001
Excess			-1.4	-1.4	-5.9	-3.3	-0.5	0.2	0.1	
NEUBERGER BERMAN	**301,859,607**	**2.3**	**-5.2**	**-5.2**	**-4.9**				**7.5**	**04/2017**
BENCHMARK EM			-1.1	-1.1	-0.8				8.9	04/2017
Excess			-4.1	-4.1	-4.1				-1.5	
PZENA	**299,001,191**	**2.2**	**3.2**	**3.2**	**0.5**				**7.5**	**04/2017**
BENCHMARK EM			-1.1	-1.1	-0.8				8.9	04/2017
Excess			4.3	4.3	1.3				-1.5	
ROCK CREEK	**285,225,591**	**2.1**	**-4.1**	**-4.1**	**-5.9**				**4.0**	**04/2017**
BENCHMARK EM			-1.1	-1.1	-0.8				8.9	04/2017
Excess			-3.0	-3.0	-5.1				-4.9	

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Active Emerging Markets					
EARNEST PARTNERS					
MSCI EMERGING MARKETS					
Excess					
MARTIN CURRIE					
BENCHMARK EM					
Excess					
MACQUARIE					
BENCHMARK EM					
Excess					
MORGAN STANLEY	**37.9%**	**6.1%**	**-9.4%**	**-2.5%**	**0.5%**
BENCHMARK EM	37.3	11.2	-14.9	-2.2	-2.6
Excess	0.6	-5.1	5.5	-0.3	3.1
NEUBERGER BERMAN					
BENCHMARK EM					
Excess					
PZENA					
BENCHMARK EM					
Excess					
ROCK CREEK					
BENCHMARK EM					
Excess					

Total Emerging Markets

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
ACTIVE EMERGING MARKETS AGGREGATE	**$2,402,549,971**	**18.0%**	**-1.9%**	**-1.9%**	**-3.8%**	**9.8%**	**2.4%**	**4.7%**		
BENCHMARK EM			-1.1	-1.1	-0.8	12.4	3.6	5.4		
Excess			-0.8	-0.8	-3.0	-2.6	-1.2	-0.7		
SSGA EMERGING MARKETS PASSIVE	**761,998,938**	**5.7**	**-1.1**	**-1.1**	**-1.0**	**12.3**	**3.7**		**4.7**	**01/2012**
BENCHMARK EM			-1.1	-1.1	-0.8	12.4	3.6		4.6	01/2012
Excess			0.0	0.0	-0.1	-0.0	0.1		0.1	
EMERGING MARKETS TOTAL	**3,164,548,910**	**23.7**	**-1.7**	**-1.7**	**-3.0**	**10.8**	**3.0**	**5.0**		
BENCHMARK EM			-1.1	-1.1	-0.8	12.4	3.6	5.4		
Excess			-0.6	-0.6	-2.2	-1.6	-0.6	-0.4		

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Total Emerging Markets					
ACTIVE EMERGING MARKETS AGGREGATE	**37.2%**	**5.3%**	**-12.7%**	**-4.1%**	**0.6%**
BENCHMARK EM	37.3	11.2	-14.9	-2.2	-2.6
Excess	-0.1	-5.9	2.2	-2.0	3.2
SSGA EMERGING MARKETS PASSIVE	**37.4%**	**11.1**	**-14.6**	**-2.1**	**-2.5**
BENCHMARK EM	37.3%	11.2	-14.9	-2.2	-2.6
Excess	0.1%	-0.1	0.3	0.0	0.1
EMERGING MARKETS TOTAL	**37.7%**	**7.5**	**-13.1**	**-3.8**	**0.2**
BENCHMARK EM	37.3%	11.2	-14.9	-2.2	-2.6
Excess	0.4%	-3.7	1.9	-1.6	2.9

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Fixed Income

September 30, 2018

Total Fixed Income

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
ACTIVE FIXED INCOME AGGREGATE	**$5,515,249,977**	**54.1%**	**0.4%**	**0.4%**	**-0.3%**	**2.6%**	**3.0%**	**5.2%**		
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8		
Excess			0.3	0.3	0.9	1.3	0.9	1.4		
SEMI PASSIVE FIXED INCOME AGGREGATE	**4,672,769,332**	**45.9**	**0.1**	**0.1**	**-1.0**	**1.5**	**2.4**	**4.3**		
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8		
Excess			0.1	0.1	0.2	0.2	0.2	0.6		
TRANSITION AGGREGATE FIXED INCOME (1)	40,956	0.0								
TOTAL FIXED INCOME (2)	**10,188,060,264**	**100.0**	**0.2**	**0.2**	**-0.7**	**2.1**	**2.7**	**4.7**	**7.5**	**07/1984**
Fixed Income Benchmark			0.0	0.0	-1.2	1.3	2.2	3.8	7.1	07/1984
Excess			0.2	0.2	0.5	0.8	0.5	1.0	0.4	

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

(2) The current Fixed Income Benchmark is the Bloomberg Barclays U.S. Aggregate calculated daily: BBG BARC Agg (Dly). For historical benchmark details please refer to the addendum of this report.

Note: All aggregates include the performance of terminated managers. Inception refers to the date of retention by the SBI.

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Total Fixed Income					
ACTIVE FIXED INCOME AGGREGATE	**4.7%**	**4.4%**	**0.6%**	**6.2%**	**-0.8%**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	1.2	1.7	0.0	0.2	1.2
SEMI PASSIVE FIXED INCOME AGGREGATE	**3.7**	**2.8**	**0.8**	**6.1**	**-1.8**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	0.2	0.2	0.2	0.1	0.2
TRANSITION AGGREGATE FIXED INCOME (1)					
TOTAL FIXED INCOME (2)	**4.2%**	**3.6**	**0.7**	**6.1**	**-1.3**
Fixed Income Benchmark	3.5%	2.6	0.5	6.0	-2.0
Excess	0.7%	0.9	0.1	0.2	0.7

(1) The Transition Aggregate Fixed Income includes fixed income securities that are being transition to a different manager.
(2) The current Fixed Income Benchmark is the Bloomberg Barclays U.S. Aggregate calculated daily: BBG BARC Agg (Dly). For historical benchmark details please refer to the addendum of this report.

Note: All aggregates include the performance of terminated managers. Inception refers to the date of retention by the SBI.

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Active Fixed Income Managers										
COLUMBIA	**$1,172,822,757**	**11.5%**	**0.3%**	**0.3%**	**-0.1%**	**2.9%**	**3.1%**	**4.8%**	**5.3%**	**07/1993**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	5.1	07/1993
Excess			0.3	0.3	1.1	1.6	0.9	1.0	0.2	
DODGE & COX	**1,666,678,408**	**16.4**	**0.7**	**0.7**	**0.1**	**2.9**	**3.2**	**5.5**	**5.9**	**02/2000**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	4.9	02/2000
Excess			0.6	0.6	1.3	1.6	1.0	1.8	1.0	
PIMCO	**1,076,748,988**	**10.6**	**0.1**	**0.1**	**-0.7**	**1.9**	**2.4**	**5.2**	**5.2**	**10/2008**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	3.8	10/2008
Excess			0.1	0.1	0.5	0.6	0.2	1.4	1.4	
WESTERN	**1,598,999,824**	**15.7**	**0.3**	**0.3**	**-0.5**	**3.0**	**3.4**	**5.6**	**8.3**	**07/1984**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	7.1	07/1984
Excess			0.3	0.3	0.7	1.7	1.3	1.8	1.1	
ACTIVE FIXED INCOME AGGREGATE	**5,515,249,977**	**54.1**	**0.4**	**0.4**	**-0.3**	**2.6**	**3.0**	**5.2**		
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8		
Excess			0.3	0.3	0.9	1.3	0.9	1.4		

STATE STREET.

	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Active Fixed Income Managers					
COLUMBIA	**4.8%**	**5.2%**	**0.2%**	**5.8%**	**-1.0%**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	1.2	2.6	-0.4	-0.2	1.0
DODGE & COX	**4.2**	**4.8**	**0.3**	**6.0**	**0.9**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	0.7	2.2	-0.3	0.0	3.0
PIMCO	**4.4**	**2.8**	**1.0**	**5.5**	**-1.3**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	0.8	0.2	0.4	-0.4	0.7
WESTERN	**5.6**	**4.9**	**0.7**	**7.0**	**-1.4**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	2.1	2.2	0.1	1.0	0.7
ACTIVE FIXED INCOME AGGREGATE	**4.7%**	**4.4**	**0.6**	**6.2**	**-0.8**
BBG BARC Agg (Dly)	3.5%	2.6	0.5	6.0	-2.0
Excess	1.2%	1.7	0.0	0.2	1.2

Semi Passive Fixed Income Managers	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
BLACKROCK	**$1,511,514,960**	**14.8%**	**0.1%**	**0.1%**	**-1.2%**	**1.5%**	**2.3%**	**4.0%**	**5.1%**	**04/1996**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	5.0	04/1996
Excess			0.1	0.1	0.1	0.2	0.1	0.3	0.1	
GOLDMAN SACHS	**1,610,732,795**	**15.8**	**0.1**	**0.1**	**-0.8**	**1.7**	**2.5**	**4.4**	**5.4**	**07/1993**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	5.1	07/1993
Excess			0.1	0.1	0.4	0.4	0.3	0.6	0.3	
NEUBERGER	**1,550,521,577**	**15.2**	**0.1**	**0.1**	**-1.1**	**1.4**	**2.3**	**4.5**	**6.3**	**07/1988**
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8	6.1	07/1988
Excess			0.1	0.1	0.1	0.1	0.1	0.7	0.2	
SEMI PASSIVE FIXED INCOME	**4,672,769,332**	**45.9**	**0.1**	**0.1**	**-1.0**	**1.5**	**2.4**	**4.3**		
BBG BARC Agg (Dly)			0.0	0.0	-1.2	1.3	2.2	3.8		
Excess			0.1	0.1	0.2	0.2	0.2	0.6		

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Semi Passive Fixed Income Managers	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
BLACKROCK	**3.7%**	**2.8%**	**0.9%**	**6.0%**	**-1.8%**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	0.1	0.1	0.3	0.0	0.2
GOLDMAN SACHS	**3.9**	**3.0**	**0.8**	**6.1**	**-1.7**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	0.4	0.3	0.2	0.1	0.3
NEUBERGER	**3.6**	**2.7**	**0.7**	**6.1**	**-2.0**
BBG BARC Agg (Dly)	3.5	2.6	0.5	6.0	-2.0
Excess	0.0	0.1	0.2	0.2	0.1
SEMI PASSIVE FIXED INCOME	**3.7%**	**2.8**	**0.8**	**6.1**	**-1.8**
BBG BARC Agg (Dly)	3.5%	2.6	0.5	6.0	-2.0
Excess	0.2%	0.2	0.2	0.1	0.2

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Treasuries
September 30, 2018

	Ending Market Value	Portfolio Weight	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
Treasuries Managers										
BLACKROCK	**$1,931,359,924**	**33.3%**	**-1.5%**	**-1.5%**					**-1.3%**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			-1.5	-1.5					-1.2	02/2018
Excess			-0.0	-0.0					-0.1	
GOLDMAN SACHS	**1,919,657,641**	**33.1**	**-1.5**	**-1.5**					**-1.2**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			-1.5	-1.5					-1.2	02/2018
Excess			-0.0	-0.0					0.0	
NEUBERGER	**1,941,274,928**	**33.5**	**-1.5**	**-1.5**					**-1.3**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			-1.5	-1.5					-1.2	02/2018
Excess			0.0	0.0					-0.0	
TREASURIES TRANSITION ACCOUNT	338	0.0								03/2018
TOTAL TREASURIES	**5,792,292,832**	**100.0**	**-1.5**	**-1.5**					**-1.2%**	**02/2018**
BBG BARC 5Y + Us Tsy Idx			-1.5	-1.5					-1.2%	02/2018
Excess			-0.0	-0.0					-0.0%	

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	2017 Calendar Return	2016 Calendar Return	2015 Calendar Return	2014 Calendar Return	2013 Calendar Return
Treasuries Managers					
BLACKROCK					
BBG BARC 5Y + Us Tsy Idx					
Excess					
GOLDMAN SACHS					
BBG BARC 5Y + Us Tsy Idx					
Excess					
NEUBERGER					
BBG BARC 5Y + Us Tsy Idx					
Excess					
TOTAL TREASURIES					
BBG BARC 5Y + Us Tsy Idx					
Excess					

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Private Markets
September 30, 2018

Combined Funds Asset Class Performance Summary

Private Markets

	Last Qtr	FYTD	1 Year	3 Year	5 Year	10 Year	20 Year	25 year	30 year
Private Markets	4.2%	4.2%	16.3%	11.7%	12.5%	9.3%	12.3%	13.6%	12.2%
Private Equity	4.9%	4.9%	19.8%	15.8%	16.0%	12.4%	12.9%	15.7%	
Private Credit	4.4	4.4	17.5	14.1	14.8	11.8	12.5		
Resources	2.7	2.7	8.3	0.1	1.3	2.6	14.3	14.6	
Real Estate	2.6	2.6	12.3	9.3	13.1	5.1	9.0	9.2	

Private Markets

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

Private Equity Investments

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

Private Credit Investments

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

Resource Investments

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

Real Estate Investments

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

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

Minnesota State Board of Investment
- Alternative Investments -

As of September 30, 2018

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
I. PRIVATE EQUITY								
Adams Street Partners								
Adams Street Global Secondary Fund 5	100,000,000	76,529,750	57,561,184	32,828,987	23,470,250	6.25	**1.18**	**6.29**
Adams Street Global Secondary Fund 6	100,000,000	6,200,000	6,390,043	1,214,007	93,800,000	0.00	**1.23**	**1.50**
Advent International								
Advent International GPE VI	50,000,000	52,993,313	13,300,780	96,384,804	0	17.26	**2.07**	**10.51**
Advent International GPE VII	90,000,000	84,690,641	93,839,021	62,732,078	5,400,000	19.11	**1.85**	**6.04**
Advent International GPE VIII	100,000,000	64,900,000	69,892,043	0	35,100,000	7.87	**1.08**	**2.65**
Affinity Ventures								
Affinity Ventures IV	4,000,000	4,000,000	540,362	1,541,970	0	-13.00	**0.52**	**14.26**
Affinity Ventures V	5,000,000	5,000,000	2,294,209	1,706,245	0	-4.28	**0.80**	**10.25**
APAX Partners								
Apax VIII - USD	200,000,000	207,707,702	218,950,003	84,680,064	28,571,096	13.51	**1.46**	**5.57**
Apax IX - USD	150,000,000	66,417,205	71,968,544	1,422,626	85,005,421	10.88	**1.11**	**2.37**
Asia Alternatives								
Asia Alternatives Capital Partners V	99,000,000	6,126,473	4,506,801	164,250	93,041,082	-36.88	**0.76**	**1.25**
Banc Fund								
Banc Fund VII	45,000,000	45,000,000	1,189,875	67,151,725	0	3.93	**1.52**	**13.51**
Banc Fund VIII	98,250,000	98,250,000	111,282,123	116,129,973	0	15.28	**2.31**	**10.44**
Banc Fund IX	107,205,932	107,205,932	133,926,475	12,045,322	0	14.96	**1.36**	**4.31**
Banc Fund X	67,890,909	3,937,091	3,900,842	0	63,953,818	-1.17	**0.99**	**0.42**
Blackstone Capital Partners								
Blackstone Capital Partners IV	70,000,000	84,400,319	5,061,050	194,956,414	1,891,866	37.02	**2.37**	**16.23**
Blackstone Capital Partners V	140,000,000	152,134,545	13,529,422	232,306,040	7,027,560	8.10	**1.62**	**12.67**
Blackstone Capital Partners VI	100,000,000	101,751,156	100,481,557	60,548,151	14,603,148	13.96	**1.58**	**10.19**
Blackstone Capital Partners VII	130,000,000	54,322,477	56,323,322	2,721,965	82,184,789	10.70	**1.09**	**3.25**
Blackstone Strategic Partners (CSFB/ DLJ)								
Strategic Partners III VC	25,000,000	24,984,172	4,587,918	30,105,199	1,080,010	6.37	**1.39**	**13.34**
Strategic Partners III-B	100,000,000	79,434,495	10,237,567	109,852,621	14,975,739	6.56	**1.51**	**13.34**
Strategic Partners IV VC	40,500,000	40,825,844	10,680,267	51,489,199	2,670,977	9.36	**1.52**	**10.52**
Strategic Partners IV-B	100,000,000	98,927,397	13,946,699	140,449,601	17,885,718	12.43	**1.56**	**10.29**
Strategic Partners V	100,000,000	83,142,342	25,480,669	108,559,541	38,917,864	19.62	**1.61**	**7.13**
Strategic Partners VI	150,000,000	90,181,969	70,254,367	67,052,421	65,284,445	19.98	**1.52**	**4.46**
Strategic Partners VII	150,000,000	73,965,318	85,581,857	12,304,121	82,363,906	39.59	**1.32**	**1.77**
Bridgepoint								
Bridgepoint Europe VI	174,224,925	0	0	0	174,224,925	0.00	**0.00**	**0.53**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Brookfield Asset Management								
Brookfield Capital Partners Fund IV	100,000,000	85,092,234	96,172,998	73,591,222	28,693,973	63.97	**2.00**	**3.05**
Cardinal Partners								
DSV Partners IV	10,000,000	10,000,000	30,949	39,196,082	0	10.61	**3.92**	**33.77**
Carlyle Group								
Carlyle Partners VII	150,000,000	0	0	0	150,000,000	0.00	**0.00**	**0.79**
Chicago Growth Partners (William Blair)								
William Blair Capital Partners VII	50,000,000	48,150,000	964,594	69,201,191	1,650,000	8.59	**1.46**	**17.58**
Chicago Growth Partners I	50,000,000	52,441,998	3,538,485	54,532,745	300,000	2.32	**1.11**	**13.19**
Chicago Growth Partners II	60,000,000	58,347,626	4,647,054	120,959,703	1,652,374	19.86	**2.15**	**10.56**
Court Square Capital Partners								
Court Square Capital Partners	100,000,000	80,927,616	22,761	182,498,392	185,289	28.92	**2.26**	**16.81**
Court Square Capital Partners II	175,000,000	169,640,433	40,505,112	270,864,470	16,168,354	13.03	**1.84**	**12.08**
Court Square Capital Partners III	175,000,000	155,571,481	123,949,372	72,740,719	34,510,202	13.08	**1.26**	**6.33**
Court Square Capital Partners IV	150,000,000	0	0	0	150,000,000	0.00	**0.00**	**0.15**
Crescendo								
Crescendo IV	101,500,000	103,101,226	9,293,473	44,348,592	0	-5.52	**0.52**	**18.57**
CVC Capital Partners								
CVC European Equity Partners V	133,975,161	153,756,444	47,087,347	236,098,099	1,658,899	16.45	**1.84**	**10.52**
CVC Capital Partners VI	258,478,806	228,896,999	222,884,092	59,209,328	33,449,868	11.57	**1.23**	**5.23**
Elevation Partners								
Elevation Partners	75,000,000	73,237,580	151,393	113,492,106	799,634	11.82	**1.55**	**13.38**
Fox Paine & Company								
Fox Paine Capital Fund II	50,000,000	46,541,161	1,943	90,994,335	0	18.88	**1.96**	**18.26**
GHJM Marathon Fund								
TrailHead Fund	20,000,000	16,070,803	29,165,115	2,406,955	3,935,813	16.14	**1.96**	**6.61**
Glouston Capital Partners**								
Glouston Private Equity Opportunities Fund IV	5,337,098	4,329,561	1,445,364	3,265,487	1,090,000	4.09	**1.09**	**3.76**
GS Capital Partners								
GS Capital Partners V	100,000,000	74,319,006	543,568	191,435,136	1,041,099	18.24	**2.58**	**13.51**
GS Capital Partners VI	100,000,000	109,383,740	14,394,075	127,996,560	3,047,591	7.26	**1.30**	**11.67**
GS Vintage VII	100,000,000	51,979,212	47,995,848	11,282,171	49,032,437	25.76	**1.14**	**2.26**
West Street Capital Partners	150,000,000	46,500,000	42,898,203	0	103,500,000	-9.26	**0.92**	**1.78**
GTCR								
GTCR IX	75,000,000	71,414,933	0	128,764,150	3,585,067	13.75	**1.80**	**12.26**
GTCR X	100,000,000	103,577,386	28,087,854	184,472,272	6,751,396	22.27	**2.05**	**7.81**
GTCR Fund XI	110,000,000	94,420,726	90,828,905	47,832,372	16,741,556	21.00	**1.47**	**4.88**
HarbourVest**								
Dover Street VII Cayman Fund	2,198,112	2,071,558	492,029	1,447,510	132,416	-3.46	**0.94**	**3.76**
HarbourVest Intl PE Partners V-Cayman US	3,526,445	3,343,761	953,485	3,217,255	185,840	12.28	**1.25**	**3.76**
Harbourvest Intl PE Partners VI-Cayman	4,242,300	3,968,652	3,992,243	1,961,414	274,404	17.09	**1.50**	**3.76**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
HarbourVest Partners VIII Cayman Buyout	4,506,711	4,298,488	1,929,316	3,864,201	234,000	15.15	**1.35**	**3.76**
HarbourVest Partners VIII-Cayman Venture	7,190,898	7,079,986	4,208,535	4,677,367	140,000	9.04	**1.26**	**3.76**
Hellman & Friedman								
Hellman & Friedman Capital Partners V	160,000,000	146,165,961	2,239,070	387,466,707	8,070,303	27.89	**2.67**	**13.84**
Hellman & Friedman Capital Partners VI	175,000,000	171,037,755	13,162,573	307,008,677	5,084,864	13.07	**1.87**	**11.51**
Hellman & Friedman Capital Partners VII	50,000,000	49,688,391	67,988,020	48,100,535	2,413,964	23.97	**2.34**	**9.45**
IK Investment Partners								
IK Fund VII	180,499,798	174,772,091	173,109,635	67,809,109	8,290,876	10.42	**1.29**	**5.05**
IK Fund VIII	173,659,049	105,074,802	107,160,254	2,213,957	70,730,150	4.63	**1.08**	**2.20**
Kohlberg Kravis Roberts								
KKR Millennium Fund	200,000,000	205,167,570	161,382	424,946,028	0	16.37	**2.07**	**15.82**
KKR 2006 Fund	200,000,000	218,951,111	56,511,270	311,356,209	3,360,223	8.80	**1.68**	**12.02**
KKR Americas Fund XII	150,000,000	21,752,873	21,268,968	0	128,805,235	-3.55	**0.98**	**2.58**
KKR Asian Fund III	100,000,000	14,129,292	12,221,315	0	85,870,708	-22.73	**0.86**	**1.50**
Leonard Green & Partners								
Green Equity Investors VI	200,000,000	215,247,049	208,333,329	127,544,472	21,246,903	15.86	**1.56**	**6.55**
Lexington Capital Partners								
Lexington Capital Partners VI	100,000,000	98,374,022	11,447,908	133,703,405	1,634,703	7.95	**1.48**	**12.77**
Lexington Capital Partners VII	200,000,000	170,805,743	61,299,992	206,204,541	39,472,501	14.93	**1.57**	**9.72**
Lexington Capital Partners VIII	150,000,000	95,228,763	94,060,421	36,418,460	66,431,457	25.41	**1.37**	**4.58**
Lexington Co-Investment Partners IV	200,000,000	90,069,725	92,431,622	2,810,160	112,740,435	12.84	**1.06**	**2.16**
Lexington Middle Market Investors IV	100,000,000	0	0	1,458,011	100,000,000	0.00	**0.00**	**1.78**
Madison Dearborn Capital Partners								
Madison Dearborn Capital Partners VII	100,000,000	57,296,558	55,596,200	5,815,300	48,490,944	6.36	**1.07**	**2.79**
Neuberger Berman								
Dyal Capital Partners III	175,000,000	138,016,717	87,329,280	83,848,421	118,604,658	32.78	**1.24**	**3.45**
Dyal Capital Partners IV	250,000,000	12,500,000	11,486,400	6,632	237,500,000	-8.13	**0.92**	**0.48**
Nordic Capital								
Nordic Capital Fund VIII	181,800,326	184,858,192	193,292,223	58,635,734	11,413,787	13.70	**1.36**	**5.05**
Nordic Capital IX Beta	174,224,925	0	0	0	174,224,925	0.00	**0.00**	**1.20**
North Sky Capital**								
North Sky Capital LBO Fund III	1,070,259	720,259	402,300	646,714	350,000	16.98	**1.46**	**3.76**
North Sky Capital Venture Fund III	1,384,080	1,277,830	360,960	1,190,311	106,250	9.87	**1.21**	**3.76**
Oak Hill Capital Management, Inc.								
Oak Hill Capital Partners IV	150,000,000	51,944,746	34,682,491	27,790,584	119,848,480	46.34	**1.20**	**1.81**
Paine Schwartz								
Paine Schwartz IV	75,000,000	51,684,432	47,267,312	14,823,737	24,388,722	9.88	**1.20**	**3.81**
Paine Schwartz V	150,000,000	0	0	0	150,000,000	0.00	**0.00**	**0.16**
Permira								
Permira V	178,134,695	168,845,099	161,819,732	70,444,874	28,286,341	10.65	**1.38**	**4.75**
Permira VI	138,811,588	61,246,651	68,007,447	0	77,564,937	13.46	**1.11**	**2.18**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Public Pension Capital Management								
Public Pension Capital	150,000,000	61,346,194	67,400,612	10,338,851	97,311,442	13.95	**1.27**	**4.38**
RWI Ventures								
RWI Ventures I	7,603,265	7,603,265	454,150	6,122,274	0	-4.16	**0.86**	**12.26**
Silver Lake Partners								
Silver Lake Partners II	100,000,000	90,189,563	6,050,000	166,323,156	11,769,157	11.06	**1.91**	**14.26**
Silver Lake Partners III	100,000,000	91,667,586	56,245,086	154,935,944	10,559,311	19.46	**2.30**	**11.51**
Silver Lake Partners IV	100,000,000	102,804,422	130,340,508	37,111,366	12,471,973	26.05	**1.63**	**6.01**
Silver Lake Partners V	135,000,000	26,745,372	25,927,739	0	108,254,628	-5.03	**0.97**	**1.50**
Split Rock Partners								
Split Rock Partners	50,000,000	47,890,906	6,483,652	56,816,177	2,109,094	3.46	**1.32**	**13.42**
Split Rock Partners II	60,000,000	59,165,000	36,193,060	44,774,545	835,000	7.12	**1.37**	**10.43**
Summit Partners								
Summit Partners Growth Equity Fund VIII	100,000,000	113,625,327	74,475,224	133,400,329	24,614,439	24.05	**1.83**	**7.41**
Summit Partners Growth Equity Fund IX	100,000,000	47,380,000	45,233,879	9,973,626	62,593,626	31.67	**1.17**	**3.09**
Thoma Bravo								
Thoma Bravo Fund XII	75,000,000	68,776,888	71,762,840	2,298,018	8,592,365	7.43	**1.08**	**2.06**
Thoma Bravo Fund XIII	150,000,000	0	0	0	150,000,000	0.00	**0.00**	**0.50**
Thoma Cressey								
Thoma Cressey Fund VII	50,000,000	50,000,000	467,204	107,057,940	0	23.59	**2.15**	**18.11**
Thoma Cressey Fund VIII	70,000,000	69,577,712	103,933	202,471,763	770,000	18.25	**2.91**	**12.42**
Thomas H. Lee Partners								
Thomas H. Lee Equity Fund VII	100,000,000	81,459,754	82,085,194	30,607,993	27,306,608	29.88	**1.38**	**3.06**
Thomas H. Lee Equity Fund VIII	150,000,000	0	0	0	150,000,000	0.00	**0.00**	**0.50**
Thomas, McNerney & Partners								
Thomas, McNerney & Partners I	30,000,000	30,000,000	2,974,788	15,087,143	0	-8.33	**0.60**	**15.91**
Thomas, McNerney & Partners II	50,000,000	48,125,000	7,328,220	99,448,037	1,875,000	16.23	**2.22**	**12.26**
TPG Capital								
TPG Partners VII	100,000,000	74,264,402	79,346,114	6,837,318	31,814,859	12.97	**1.16**	**3.06**
Vestar Capital Partners								
Vestar Capital Partners IV	55,000,000	55,652,024	876,903	102,249,550	57,313	14.66	**1.85**	**18.81**
Vestar Capital Partners V	75,000,000	76,359,971	17,088,389	83,187,957	0	3.96	**1.31**	**12.79**
Vestar Capital Partners VI	100,000,000	105,963,034	76,538,791	116,079,327	491,377	30.82	**1.82**	**7.02**
Vestar Capital Partners VII	150,000,000	2,528,600	1,545,991	0	147,471,400	-57.59	**0.61**	**0.79**
Warburg Pincus								
Warburg Pincus Equity Partners	100,000,000	100,000,000	296,524	163,542,253	0	10.03	**1.64**	**20.28**
Warburg Pincus Private Equity VIII	100,000,000	100,380,464	11,041,412	221,518,351	0	14.86	**2.32**	**16.47**
Warburg Pincus Private Equity IX	100,000,000	100,000,000	8,443,999	167,130,501	0	9.88	**1.76**	**13.19**
Warburg Pincus Private Equity X	150,000,000	150,000,000	71,103,371	171,890,352	0	8.73	**1.62**	**10.94**
Warburg Pincus Private Equity XI	200,000,000	200,299,952	189,295,387	121,958,086	0	14.34	**1.55**	**5.78**
Warburg Pincus Private Equity XII	131,000,000	86,067,000	93,549,803	2,844,665	44,933,000	9.75	**1.12**	**2.87**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Warburg Pincus China	45,000,000	28,215,000	28,384,955	1,935,000	18,720,000	9.62	**1.07**	**1.80**
Warburg Pincus Financial Sector	90,000,000	17,928,308	12,347,876	4,590,000	76,590,000	-9.65	**0.94**	**0.79**
Wellspring Capital Partners								
Wellspring Capital Partners VI	125,000,000	6,372,571	4,210,797	0	118,627,429	-34.10	**0.66**	**2.05**
Welsh, Carson, Anderson & Stowe								
Welsh, Carson, Anderson & Stowe X	100,000,000	98,786,269	358,358	167,690,637	1,792,197	8.15	**1.70**	**12.80**
Welsh, Carson, Anderson & Stowe XI	100,000,000	100,000,000	38,749,433	128,607,602	0	13.06	**1.67**	**10.20**
Welsh, Carson, Anderson & Stowe XII	150,000,000	90,421,217	103,526,868	17,723,566	59,578,783	17.35	**1.34**	**3.78**
Welsh, Carson, Anderson & Stowe XIII	250,000,000	0	0	0	250,000,000	0.00	**0.00**	**0.27**
Windjammer Capital Investors								
Windjammer Mezzanine & Equity Fund II	66,708,861	55,215,684	66,037	84,876,800	10,139,363	8.94	**1.54**	**18.51**
Windjammer Senior Equity Fund III	75,000,000	62,684,411	305,893	154,618,016	13,380,380	19.54	**2.47**	**12.75**
Windjammer Senior Equity Fund IV	100,000,000	85,908,628	91,412,654	18,763,896	22,013,255	8.51	**1.28**	**6.60**
Windjammer Senior Equity Fund V	100,000,000	0	0	0	100,000,000	0.00	**0.00**	**0.87**
Private Equity Total	**12,871,924,143**	**8,669,750,909**	**5,025,546,865**	**8,761,750,775**	**4,749,816,190**	**12.60**	**1.58**	
II. PRIVATE CREDIT								
Audax Group								
Audax Mezzanine Fund III	100,000,000	94,170,241	23,085,826	96,700,532	7,467,100	9.10	**1.27**	**8.49**
Audax Mezzanine Fund IV	100,000,000	32,090,816	24,857,391	10,442,886	71,444,109	13.08	**1.10**	**3.48**
BlackRock								
BlackRock Middle Market Senior Fund	250,000,000	0	0	0	250,000,000	0.00	**0.00**	**0.47**
Crescent Capital Group								
TCW/Crescent Mezzanine Partners III	75,000,000	79,161,593	2,476,473	156,868,939	29,733,852	35.87	**2.01**	**17.52**
GS Mezzanine Partners								
GS Mezzanine Partners 2006	100,000,000	113,445,143	861,432	134,654,263	9,858,563	4.99	**1.19**	**12.49**
GS Mezzanine Partners V	150,000,000	147,682,304	2,341,837	177,988,948	37,594,230	8.98	**1.22**	**10.95**
Gold Hill Venture Lending								
Gold Hill Venture Lending	40,000,000	40,000,000	785,842	65,077,862	0	10.76	**1.65**	**14.02**
Gold Hill 2008	25,852,584	25,852,584	14,026,988	44,745,145	0	17.43	**2.27**	**10.25**
Kohlberg Kravis Roberts								
KKR Lending Partners II	75,000,000	85,579,885	41,705,499	58,583,138	8,802,924	10.29	**1.17**	**3.58**
KKR Lending Partners III	192,000,000	38,955,000	44,296,042	0	153,045,000	20.65	**1.14**	**1.48**
LBC Credit Partners								
LBC Credit Partners IV	100,000,000	52,471,851	48,990,490	9,917,756	52,854,716	12.52	**1.12**	**2.42**
Merit Capital Partners								
Merit Mezzanine Fund IV	75,000,000	70,178,571	23,035,187	109,445,558	4,821,429	11.07	**1.89**	**13.80**
Merit Mezzanine Fund V	75,000,000	70,665,306	43,751,532	57,316,133	4,334,694	9.54	**1.43**	**8.79**
Merit Mezzanine Fund VI	100,000,000	32,302,603	35,237,816	1,865,672	67,630,597	9.96	**1.15**	**2.52**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Portfolio Advisors								
DLJ Investment Partners II	27,375,168	24,490,887	86,563	34,829,566	0	10.37	**1.43**	**18.76**
DLJ Investment Partners III	100,000,000	82,719,050	630,339	96,478,980	509,988	6.85	**1.17**	**12.28**
Prudential Capital Partners								
Prudential Capital Partners II	100,000,000	96,907,384	6,350,035	135,880,175	11,176,857	8.94	**1.47**	**13.26**
Prudential Capital Partners III	100,000,000	99,499,227	15,161,401	151,179,148	15,438,477	13.62	**1.67**	**9.46**
Prudential Capital Partners IV	100,000,000	103,813,300	70,113,554	60,492,874	5,930,097	10.12	**1.26**	**6.70**
Prudential Capital Partners V	150,000,000	56,665,376	61,134,256	5,798,518	94,863,215	23.16	**1.18**	**2.12**
Summit Partners								
Summit Subordinated Debt Fund III	45,000,000	44,088,494	5,731,965	58,922,343	2,250,000	9.10	**1.47**	**14.63**
Summit Subordinated Debt Fund IV	50,000,000	55,837,807	10,436,726	65,364,087	20,014,959	10.23	**1.36**	**10.52**
TCW Asset Management								
TCW Direct Lending	100,000,000	83,599,652	45,355,148	47,674,870	25,329,409	6.30	**1.11**	**4.03**
Private Credit Total	**2,230,227,752**	**1,530,177,074**	**520,452,342**	**1,580,227,393**	**873,100,215**	**12.17**	**1.37**	
III. REAL ASSETS								
BlackRock								
BlackRock Global Renewable Power Fund II	98,500,000	58,906,799	57,244,584	946,779	41,594,943	-1.55	**0.99**	**2.85**
EIG Global Energy Partners								
EIG Energy Fund XIV	100,000,000	113,177,137	14,132,712	93,823,032	2,761,129	-1.60	**0.95**	**11.46**
EIG Energy Fund XV	150,000,000	157,800,506	80,211,343	106,577,808	22,871,323	4.83	**1.18**	**8.32**
EIG Energy Fund XVI	200,000,000	167,529,872	149,533,653	54,779,101	67,030,902	9.48	**1.22**	**5.05**
EnCap Energy								
EnCap Energy Capital Fund VII	100,000,000	105,344,451	6,053,732	133,001,117	0	14.50	**1.32**	**11.26**
EnCap Energy Capital Fund VIII	100,000,000	96,694,912	36,859,406	52,671,359	7,110,899	-2.32	**0.93**	**8.00**
Encap Energy Capital Fund IX	100,000,000	108,266,085	70,241,953	74,573,103	8,146,171	14.04	**1.34**	**5.82**
EnCap Energy Capital Fund X	100,000,000	81,601,015	75,493,182	16,769,138	26,185,728	9.71	**1.13**	**3.58**
EnerVest Energy								
EnerVest Energy Institutional Fund XIV	100,000,000	93,403,263	67,233,968	38,920,651	14,689,803	6.32	**1.14**	**3.31**
Energy Capital Partners								
Energy Capital Partners II	100,000,000	85,152,089	28,993,692	102,587,105	29,749,110	11.93	**1.55**	**8.21**
Energy Capital Partners III	200,000,000	188,345,465	196,427,490	26,599,217	34,549,031	10.00	**1.18**	**4.78**
Energy Capital Partners IV	96,737,493	31,094,432	29,813,765	2,378,600	67,902,587	4.06	**1.04**	**0.75**
Energy & Minerals Group								
NGP Midstream & Resources	100,000,000	102,829,196	58,230,440	134,013,054	230,871	14.41	**1.87**	**11.51**
The Energy & Minerals Group Fund II	100,000,000	103,411,804	115,358,383	72,424,438	2,488,395	15.64	**1.82**	**7.02**
The Energy & Minerals Group Fund III	200,000,000	191,127,181	152,878,037	12,634,280	10,892,760	-4.19	**0.87**	**4.57**
The Energy & Minerals Group Fund IV	150,000,000	120,636,107	143,554,935	25,648,892	50,047,061	20.47	**1.40**	**2.93**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
First Reserve								
First Reserve Fund X	100,000,000	100,000,000	343,051	182,429,002	0	31.05	**1.83**	**13.92**
First Reserve Fund XI	150,000,000	150,292,121	10,187,015	94,066,313	0	-7.74	**0.69**	**11.78**
First Reserve Fund XII	150,000,000	165,617,044	31,261,353	80,719,259	0	-9.17	**0.68**	**9.92**
First Reserve Fund XIII	200,000,000	113,094,024	77,957,299	59,261,520	108,424,261	12.42	**1.21**	**4.92**
Kohlberg, Kravis, Roberts & Co.								
KKR Global Infrastructure Investors III	149,850,000	0	0	0	149,850,000	0.00	**0.00**	**0.51**
Merit Energy Partners								
Merit Energy Partners B	24,000,000	24,000,000	6,084,460	186,741,940	0	24.29	**8.03**	**21.70**
Merit Energy Partners C	50,000,000	50,000,000	12,594,475	509,189,770	0	31.23	**10.44**	**19.93**
Merit Energy Partners D	88,000,000	70,938,303	18,915,580	328,483,253	0	23.91	**4.90**	**17.36**
Merit Energy Partners E	100,000,000	39,983,197	14,120,111	76,654,528	0	17.00	**2.27**	**14.01**
Merit Energy Partners F	100,000,000	59,522,861	15,660,167	27,898,557	0	-5.18	**0.73**	**12.53**
Merit Energy Partners H	100,000,000	100,000,000	75,961,625	24,238,423	0	0.05	**1.00**	**7.67**
Merit Energy Partners I	169,721,518	161,099,999	215,608,345	24,839,059	8,621,519	22.64	**1.49**	**3.96**
NGP								
Natural Gas Partners IX	150,000,000	173,372,658	2,568,286	244,359,789	1,153,855	11.98	**1.42**	**10.95**
NGP Natural Resources X	150,000,000	141,804,796	78,611,797	94,628,121	8,195,204	6.31	**1.22**	**6.98**
Natural Gas Capital Resources XI	150,000,000	129,441,690	155,717,414	19,584,340	26,753,646	21.15	**1.35**	**3.81**
NGP Natural Resources XII	149,500,000	30,377,249	31,081,958	0	119,119,349	2.75	**1.02**	**1.17**
Sheridan								
Sheridan Production Partners I	100,000,000	116,552,260	67,055,993	82,750,000	0	5.53	**1.29**	**11.51**
Sheridan Production Partners II	100,000,000	103,500,000	45,765,957	7,000,000	3,500,000	-12.59	**0.51**	**8.00**
Sheridan Production Partners III	100,000,000	34,353,005	37,109,005	15,200,000	65,650,000	24.21	**1.52**	**3.81**
Real Assets Total	**4,276,309,011**	**3,569,269,520**	**2,178,865,164**	**3,006,391,547**	**877,518,546**	**15.46**	**1.45**	

IV. REAL ESTATE

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Angelo, Gordon & Co.								
AG Realty Fund IX	100,000,000	77,721,345	85,982,171	8,000,000	26,150,000	12.42	**1.21**	**3.81**
AG Asia Realty Fund III	50,000,000	47,607,645	49,284,512	7,500,000	6,196,250	18.17	**1.19**	**2.00**
AG Europe Realty Fund II	75,000,000	27,375,000	26,569,025	28,384	47,625,000	-6.34	**0.97**	**1.28**
AG Europe Realty Fund X	150,000,000	0	0	0	150,000,000	0.00	**0.00**	**0.16**
Blackstone Real Estate Partners								
Blackstone Real Estate Partners V	100,000,000	104,213,007	13,996,128	194,457,306	4,174,052	10.93	**2.00**	**12.43**
Blackstone Real Estate Partners VI	100,000,000	109,459,163	10,567,952	207,572,569	4,907,906	13.10	**1.99**	**11.51**
Blackstone Real Estate Partners VII	100,000,000	106,004,855	76,491,341	107,138,214	15,096,665	17.36	**1.73**	**6.84**
Blackstone Real Estate Partners VIII	150,000,000	109,737,576	97,179,608	37,857,296	72,705,641	14.28	**1.23**	**3.52**
Blackstone Real Estate Partners Asia II	74,500,000	3,411,788	2,932,790	0	71,088,212	-16.18	**0.86**	**1.02**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Blackstone Strategic Partners (CSFB)								
Strategic Partners III RE	25,000,000	25,976,722	2,032,960	13,470,676	9,006	-6.42	**0.60**	**13.26**
Strategic Partners IV RE	50,000,000	51,328,562	7,174,444	44,208,094	1,211,806	0.02	**1.00**	**10.29**
Carlyle Group								
Carlyle Realty Partners VIII	150,000,000	10,181,523	8,793,325	4,054	139,831,398	-68.88	**0.86**	**1.41**
Colony Capital								
Colony Investors III	100,000,000	99,660,860	4,269,300	172,642,105	0	14.52	**1.78**	**20.76**
Landmark Partners								
Landmark Real Estate Partners VIII	149,500,000	28,240,589	25,868,469	8,573,504	121,546,241	43.74	**1.22**	**1.79**
Lubert Adler								
Lubert-Adler Real Estate Fund VII	74,147,868	32,364,976	31,420,984	1,250,230	42,635,024	1.42	**1.01**	**1.98**
Rockpoint								
Rockpoint Real Estate Fund V	100,000,000	65,597,166	65,008,380	9,022,211	48,107,508	10.14	**1.13**	**3.73**
Rockwood								
Rockwood Capital RE Partners X	100,000,000	45,265,937	46,779,819	1,500,000	54,657,123	5.32	**1.07**	**3.21**
Silverpeak Real Estate Partners								
Silverpeak Legacy Pension Partners II	75,000,000	72,924,170	3,040,275	89,530,830	7,640,900	4.24	**1.27**	**13.17**
Silverpeak Legacy Pension Partners III	150,000,000	70,334,469	13,461,209	12,094,039	79,670,081	-11.61	**0.36**	**10.42**
T.A. Associates Realty								
Realty Associates Fund VIII	100,000,000	100,000,000	1,694,557	97,574,802	0	-0.08	**0.99**	**12.26**
Realty Associates Fund IX	100,000,000	100,000,000	613,162	160,006,699	0	10.47	**1.61**	**10.10**
Realty Associates Fund X	100,000,000	100,000,000	63,362,445	86,792,011	0	12.12	**1.50**	**6.59**
Realty Associates Fund XI	100,000,000	100,000,000	103,750,100	4,064,273	0	6.07	**1.08**	**3.25**
Real Estate Total	**2,273,147,868**	**1,487,405,353**	**740,272,958**	**1,263,287,297**	**893,252,813**	**8.01**	**1.35**	

V. DISTRESSED/ OPPORTUNISTIC

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Avenue Capital Partners								
Avenue Energy Opportunities Fund	100,000,000	100,977,328	128,537,000	934,495	0	9.08	**1.28**	**4.25**
Avenue Energy Opportunities Fund II	100,000,000	61,950,117	64,640,301	417,420	38,049,883	7.61	**1.05**	**1.41**
BlackRock**								
BlackRock Tempus Fund	1,774,870	1,774,870	599,289	1,384,701	0	7.70	**1.12**	**3.31**
Carlyle Group								
Carlyle Strategic Partners IV	100,000,000	23,229,220	18,992,605	7,194,710	83,923,599	14.38	**1.13**	**2.50**
Carval Investors								
CVI Global Value Fund	200,000,000	190,000,000	13,048,255	307,454,938	10,000,000	9.56	**1.69**	**11.72**
CVI Credit Value Fund I	100,000,000	95,000,000	11,732,794	200,243,104	5,000,000	18.73	**2.23**	**8.01**
CVI Credit Value Fund A II	150,000,000	142,500,000	54,693,495	151,168,855	7,500,000	9.05	**1.44**	**5.92**
CVI Credit Value Fund A III	150,000,000	142,500,000	175,065,810	0	7,500,000	11.28	**1.23**	**3.33**
CVI Credit Value Fund IV	150,000,000	37,703,333	38,270,588	60	112,500,000	2.40	**1.02**	**0.99**

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years
Merced Capital								
Merced Partners II	75,000,000	63,768,881	278,721	130,393,875	0	23.97	**2.05**	**11.51**
Merced Partners III	100,000,000	100,000,000	42,441,427	92,497,107	0	6.35	**1.35**	**8.41**
Merced Partners IV	125,000,000	124,968,390	95,503,482	63,122,049	0	6.99	**1.27**	**5.22**
Merced Partners V	53,737,500	53,915,358	60,157,035	0	0	10.07	**1.12**	**1.25**
MHR Institutional Partners								
MHR Institutional Partners IV	75,000,000	33,371,892	29,280,711	2,014,108	43,583,636	-3.85	**0.94**	**4.28**
Oaktree Capital Management								
Oaktree Principal Fund VI	100,000,000	74,456,317	79,269,686	13,606,490	37,951,405	21.53	**1.25**	**3.76**
Oaktree Opportunities Fund X	50,000,000	40,000,000	44,736,055	5,619,660	15,000,000	19.00	**1.26**	**3.64**
Oaktree Opportunities Fund Xb	100,000,000	5,000,000	5,000,000	0	95,000,000	0.00	**1.00**	**3.64**
Oaktree Special Situations Fund II	100,000,000	0	0	0	100,000,000	0.00	**0.00**	**0.44**
Pimco Bravo**								
Pimco Bravo Fund OnShore Feeder I	3,958,027	3,958,027	236,189	3,937,010	2,306,448	5.06	**1.05**	**3.76**
Pimco Bravo Fund OnShore Feeder II	5,243,670	4,670,656	3,857,882	2,136,017	2,707,161	6.91	**1.28**	**3.76**
TSSP								
TSSP Adjacent Opportunities Partner	50,000,000	8,763,132	8,774,069	0	41,236,868	0.15	**1.00**	**0.50**
TSSP Adjacent Opportunities Contingent	100,000,000	0	0	0	100,000,000	0.00	**0.00**	**0.32**
TSSP Opportunities Partners IV	50,000,000	0	0	0	50,000,000	0.00	**0.00**	**0.14**
Varde Fund								
Varde Fund IX	100,000,000	100,000,000	3,062,247	214,628,019	0	15.10	**2.18**	**10.28**
Varde Fund X	150,000,000	150,000,000	59,782,090	233,102,582	0	12.23	**1.95**	**8.45**
Varde Fund XI	200,000,000	200,000,000	212,252,220	73,365,042	0	8.13	**1.43**	**5.23**
Wayzata								
Wayzata Opportunities Fund	100,000,000	93,180,000	480,166	156,425,778	18,920,000	8.42	**1.68**	**12.79**
Wayzata Opportunities Fund II	150,000,000	174,750,000	5,968,522	321,928,453	30,000,000	16.45	**1.88**	**10.95**
Wayzata Opportunities Fund III	150,000,000	68,415,000	31,980,322	34,378,882	15,000,000	-1.09	**0.97**	**6.30**
Distressed/Opportunistic Total	**2,889,714,067**	**2,094,852,521**	**1,188,640,962**	**2,015,953,354**	**816,179,000**		**1.53**	
Private Markets Total	**24,541,322,840**	**17,351,455,378**	**9,653,778,289**	**16,627,610,366**	**8,209,866,764**	**12.45**	**1.51**	

Private Markets Portfolio Status	Investment Manager Count	Investments Count
PRIVATE EQUITY	50	122
PRIVATE CREDIT	12	23
REAL ASSETS	11	35
REAL ESTATE	11	23
DISTRESSED/ OPPORTUNISTIC	11	29
Total	95	232

Investment	Total Commitment	Total Contribution	Market Value	Distributions	Unfunded Commitment	IRR %	MOIC*	Period Years

Notes

None of the data presented herein has been reviewed or approved by either the general partner or investment manager. The performance and valuation data presented herein is not a guarantee or prediction of future results. Ultimately, the actual performance and value of any investment is not known until final liquidation. Because there is no industry-standardized method for valuation or reporting comparisons of performance and valuation data among different investments is difficult.

Data presented in this report is made public pursuant to Minn. Stat. Chs. 13 and 13D, and Minn. Stat. § 11A.24, subd. 6(c). Additional information on private markets investments may be classified as non-public and not subject to disclosure.

* MOIC: Multiple of Invested Capital
**Partnership interests transferred to the MSBI during 1Q2015. All data presented as of the transfer date.

Participant Directed Investment Program

September 30, 2018

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Participant Directed Investment Program

The Participant Directed Investment Program (PDIP) provides investment vehicles for a variety of retirement or other tax-advantaged savings plans. The objective of the Plan is to be competitive in the marketplace by providing quality investment options with low fees to its participants. Investment goals among the PDIP's many participants are varied.

- The Supplemental Investment Fund (SIF) is a program which provides individuals the opportunity to invest in many of the same investment pools as the Combined Funds. Participation in the SIF is accomplished through the purchase or sale of shares in each Fund. The SIF is structured much like a family of mutual funds. Participants may allocate their investments among one or more accounts that are appropriate for their needs within statutory requirements and rules established by the participating organizations. It provides some or all of the investment options for the Unclassified Employees Retirement Plan, Minnesota Deferred Compensation Plan, Public Employees Defined Contribution Plan, Hennepin County Supplemental Retirement Plan, and Health Care Savings Plan. All Funds in the SIF program, except the Stable Value Fund, are available to local volunteer fire relief associations who invest their assets with the SBI. The Volunteer Firefighter Account is available only for those local firefighter entities that participate in the Statewide Volunteer Firefighter Plan. Local entities that participate in this Plan must have all their assets invested in the Volunteer Firefighter Account.
- The Minnesota Deferred Compensation Plan offers plan participants three sets of investment options. The first is a set of actively and passively managed options that includes four mutual funds, a Money Market Fund, a Stable Value Fund and five passively managed mutual funds. The second is a set of target date funds called Minnesota Target Retirement Funds. The third is a self-directed brokerage account window which offers thousands of mutual funds. The SBI has no direct management responsibilities for funds within the self-directed brokerage account window. The Minnesota Deferred Compensation Plan uses two of the SIF investment options, the Stable Value Fund and the Money Market Fund, for its participants.
- The Minnesota College Savings Plan is an education savings plan designed to help families set aside funds for future college costs. It is established under the provisions of the Internal Revenue Code Section 529, which authorized these types of savings plans to help families meet the costs of qualified colleges nationwide. The SBI is responsible for the investments and the Minnesota Office of Higher Education (OHE) is responsible for the overall administration of the Plan. The SBI and OHE have contracted jointly with TIAA-CREF Tuition Financing, Inc. to provide administrative, marketing, communication, recordkeeping and investment management services.
- The Minnesota Achieve a Better Life Experience Plan (ABLE) is a savings plan designed to help individuals save for qualified disability expenses without losing eligibility for certain assistance programs. The plan is administered by the Department of Human Services (DHS). The SBI and DHS have jointly contracted with Ascensus to provide recordkeeping, administrative, and investment management services for the plan.

The investment returns shown in this report are calculated using a time-weighted rate of return formula. These returns are net of investment management fees and transaction costs. They do not, however, reflect administrative expenses that may be deducted by the retirement systems or other agencies to defray administrative costs.

Supplemental Investment Fund Summary

The Minnesota Supplemental Investment Fund (SIF) is a multi-purpose investment program that offers a range of investment options to state and local public employees. The SIF provides some or all of the investment options to the Unclassified Employees Retirement Plan, Minnesota Deferred Compensation Plan, Public Employees Defined Contribution Plan, Hennepin County Supplemental Retirement Plan, Health Care Savings Plan, local police and firefighter retirement plans and the Statewide Volunteer Firefighter plan.

A wide diversity of investment goals exists among the Fund's participants. In order to meet those needs, the Fund has been structured much like a "family of mutual funds." Participants may allocate their investments among one or more accounts that are appropriate for their needs, within the statutory requirements and rules established by the participating organizations. Participation in the Fund is accomplished through the purchase or sale of shares in each account. All returns are net of investment management fees.

Investment Option Descriptions

- Balanced Fund - a balanced portfolio utilizing both common stocks and bonds.
- U.S. Stock Actively Managed Fund - an actively managed, U.S. common stock portfolio.
- U.S. Stock Index Fund - a passively managed, common stock portfolio designed to broadly track the performance of the U.S. stock market.
- Broad International Stock Fund - a portfolio of non-U.S. stocks that incorporates both active and passive management.
- Bond Fund - an actively managed, bond portfolio.
- Money Market Fund - a portfolio utilizing short-term, liquid debt securities.
- Stable Value Fund - a portfolio of stable value instruments, including security backed contracts and insurance company and bank investment contracts.
- Volunteer Firefighter Account - a balanced portfolio only used by the Statewide Volunteer Firefighter Plan.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year	Option Since
BALANCED FUND	$465,631,693	4.4%	10.3%	10.9%	9.1%	9.3%	01/1980
U.S. ACTIVELY MANAGED FUND	278,814,330	7.1	20.6	17.7	13.8	12.4	07/1986
U.S. STOCK INDEX FUND	655,096,968	7.1	17.6	17.1	13.5	12.0	07/1986
BROAD INTERNATIONAL STOCK FUND	195,636,562	0.5	1.5	9.7	4.5	5.7	09/1994
BOND FUND	171,675,882	0.2	-0.7	2.1	2.7	4.8	07/1986
MONEY MARKET FUND	424,213,416	0.6	1.8	1.0	0.7	0.5	07/1986
STABLE VALUE FUND	1,558,059,730	0.6	2.3	2.1	2.0	2.8	11/1994
VOLUNTEER FIREFIGHTER ACCOUNT	89,751,681	2.7	6.0	8.4	6.7		01/2010
TOTAL SUPPLEMENTAL INVESTMENT FUND	3,838,880,263						

Note:

The Market Values for the Money Market Fund, the Stable Value Fund, and the Total Supplemental Investment Fund also include assets held through the Deferred Compensation Plan.

Supplemental Investment Fund Performance

Balanced Fund

The primary investment objective of the Balanced Fund is to gain exposure to publicly traded U.S. equities, bond and cash in a diversified investment portfolio. The Fund seeks to maximize long-term real rates of return, while limiting short-run portfolio return volatility. The Balanced Fund is invested in a balanced portfolio of common stocks and bonds. Common stocks provide the potential for significant capital appreciation, while bonds act as a deflation hedge and provide portfolio diversification. The benchmark is a blend of 60% Russell 3000/35% Barclays Aggregate Bond Index/5% T-Bills Composite.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
BALANCED FUND	**$465,631,693**	**4.4%**	**10.3%**	**10.9%**	**9.1%**	**9.3%**
SIF BALANCED FUND BENCHMARK		4.3	9.9	10.6	8.9	8.8
Excess		0.1	0.3	0.3	0.2	0.5

U.S. Actively Managed Fund

The U.S. Stock Actively Managed Fund's investment objective is to generate above-average returns from capital appreciation on common stocks. The U.S. Stock Actively Managed Fund is invested primarily in the common stocks of U.S. companies. The managers in the account also hold varying levels of cash.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
U.S. ACTIVELY MANAGED FUND	**278,814,330**	**7.1**	**20.6**	**17.7**	**13.8**	**12.4**
Russell 3000		7.1	17.6	17.1	13.5	12.0
Excess		-0.1	3.0	0.6	0.3	0.4

STATE STREET

Supplemental Investment Fund Performance

U.S. Stock Index Fund

The investment objective of the U.S. Stock Index Fund is to generate returns that track those of the U.S. stock market as a whole. The Fund is designed to track the performance of the Russell 3000 Index, a broad-based equity market indicator. The Fund is invested 100% in common stock.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
U.S. STOCK INDEX FUND	**$655,096,968**	**7.1%**	**17.6%**	**17.1%**	**13.5%**	**12.0%**
Russell 3000		7.1	17.6	17.1	13.5	12.0
Excess		0.0	0.0	0.0	0.0	0.0

Broad International Stock Fund

The investment objective of the Broad International Stock Fund is to earn a high rate of return by investing in the stock of companies outside the U.S. Portions of the Fund are passively managed and semi-passively managed. These portions of the Fund are designed to track and modestly outperform, respectively, the return of developed markets included in the MSCI World ex USA Index. A portion of the Fund is "actively managed" by several international managers and emerging markets specialists who buy and sell stocks in an attempt to maximize market value. The International Equity Benchmark is currently the MSCI ACWI ex USA (net).

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
BROAD INTERNATIONAL STOCK FUND	**195,636,562**	**0.5**	**1.5**	**9.7**	**4.5**	**5.7**
International Equity Benchmark		0.7	1.8	10.0	4.1	5.2
Excess		-0.2	-0.3	-0.3	0.4	0.6

Supplemental Investment Fund Performance

Bond Fund

The investment objective of the Bond Fund is to exceed the return of the broad domestic bond market by investing in fixed income securities. The Bond Fund invests primarily in high-quality, government and corporate bonds that have intermediate to long-term maturities, usually 3 to 20 years. The Bond Fund benchmark is the Bloomberg Barclays U.S. Aggregate.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
BOND FUND	**$171,675,882**	**0.2%**	**-0.7%**	**2.1%**	**2.7%**	**4.8%**
BBG BARC US Agg		0.0	-1.2	1.3	2.2	3.8
Excess		0.2	0.5	0.8	0.5	1.0

Money Market Fund

The investment objective of the Money Market Fund is to protect principal by investing in short-term, liquid U.S. Government securities. The Fund is invested entirely in high-quality, short-term U.S. Treasury and Agency securities. The average maturity of the portfolios is less than 90 days. Please note that the Market Value for the Money Market Fund reflects assets held through the Deferred Compensation Plan as well.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
MONEY MARKET FUND	**424,213,416**	**0.6**	**1.8**	**1.0**	**0.7**	**0.5**
90 DAY T-BILL		0.5	1.6	0.8	0.5	0.3
Excess		0.1	0.2	0.2	0.2	0.2

Supplemental Investment Fund Performance

Stable Value Fund

The investment objectives of the Stable Value Fund are to protect investors from loss of their original investment and to provide competitive interest rates using somewhat longer-term investments than typically found in a money market fund. The Fund is invested in a well-diversified portfolio of high-quality fixed income securities with strong credit ratings. The Fund also invests in contracts issued by highly rated insurance companies and banks which are structured to provide principal protection for the Fund's diversified bond portfolios, regardless of daily market changes. The Stable Value Fund Benchmark is the 3-year Constant Maturity Treasury Bill +45 basis points. Please note that the Market Value for the Stable Value Fund reflects assets held through the Deferred Compensation Plan as well.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
STABLE VALUE FUND	**$1,558,059,730**	**0.6%**	**2.3%**	**2.1%**	**2.0%**	**2.8%**
Fixed Interest Blended Benchmark		0.8	2.7	2.0	1.7	1.5
Excess		-0.2	-0.4	0.1	0.3	1.3

Volunteer Firefighter Account

The Volunteer Firefighter Account is different than other SIF program options. It is available only to the local entities that participate in the Statewide Volunteer Firefighter Plan (administered by PERA) and have all of their assets invested in the Volunteer Firefighter Account. There are other volunteer firefighter plans that are not eligible to be consolidated that may invest their assets through other SIF program options. The investment objective of the Volunteer Firefighter Account is to maximize long-term returns while limiting short-term portfolio return volatility. The account is invested in a balanced portfolio of domestic equity, international equity, fixed income and cash. The benchmark for this account is 35% Russell 3000, 15% MSCI ACWI ex USA (net), 45% Bloomberg Barclays U.S. Aggregate, 5% 3 Month T-Bills.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
VOLUNTEER FIREFIGHTER ACCOUNT	**89,751,681**	**2.7**	**6.0**	**8.4**	**6.7**	
SIF Volunteer Firefighter Account BM		2.6	5.8	8.0	6.4	
Excess		0.1	0.2	0.4	0.3	

STATE STREET

Deferred Compensation Plan Summary

The Deferred Compensation Plan provides public employees with a tax-sheltered retirement savings plan that is supplemental to their primary retirement plan. (In most cases, the primary plan is a defined benefit plan administered by TRA, PERA, or MSRS.)

Participants choose from 4 actively managed stock and bond funds, 5 passively managed stock and bond funds and a set of 10 target date retirement fund options.

Deferred Compensation Plan participants may also invest in the money market option and stable value option in the Supplemental Investment Fund program. All provide for the daily pricing needs of the plan administrator. In addition, participants may also choose from hundreds of funds available through a mutual fund brokerage window. The current plan structure became effective July 1, 2011.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year	Option Since
VANGUARD INSTITUTIONAL INDEX PLUS	$1,342,047,733	7.7%	17.9%	17.3%	13.9%	12.0%	07/1999
VANGUARD DIVIDEND GROWTH	656,374,705	8.1	16.3				10/2016
VANGUARD MID CAP INDEX	566,235,731	4.7	13.4	13.8	11.7	12.5	01/2004
T. ROWE PRICE SMALL-CAP STOCK	780,875,658	6.3	19.4	18.5	12.5	14.5	04/2000
FIDELITY DIVERSIFIED INTERNATIONAL	308,258,063	1.4	2.4	8.1	5.4	5.5	07/1999
VANGUARD TOTAL INTERNATIONAL STOCK INDEX	202,492,945	0.5	1.6	10.0	4.5		07/2011
VANGUARD BALANCED INDEX	811,050,227	4.3	9.9	10.6	8.9	9.0	12/2003
DODGE & COX INCOME	240,604,201	0.6	-0.1	3.1	3.1	5.3	07/1999
VANGUARD TOTAL BOND MARKET INDEX	208,883,727	0.0	-1.2	1.3	2.1	3.7	12/2003
2020 FUND	122,608,849	1.4	3.7	6.3	4.9		07/2011
2025 FUND	129,823,106	1.9	5.0	8.1	6.1		07/2011
2030 FUND	92,131,126	2.4	6.4	9.7	7.2		07/2011
2035 FUND	73,021,794	2.6	7.1	10.5	7.7		07/2011
2040 FUND	54,514,701	2.9	7.9	11.3	8.1		07/2011
2045 FUND	45,834,149	3.0	8.5	11.9	8.4		07/2011
2050 FUND	35,182,102	3.2	9.1	12.5	8.7		07/2011
2055 FUND	18,916,775	3.2	9.1	12.5	8.7		07/2011
2060 FUND	17,268,824	3.2	9.1	12.5	8.7		07/2011
INCOME FUND	90,460,112	1.3	3.2	5.3	3.9		07/2011
TD Ameritrade SDB	76,587,063						
TD Ameritrade SDB Roth	744,448						
Total Deferred Compensation Plan	5,873,916,040						

STATE STREET.

Deferred Compensation Plan Options

LARGE CAP EQUITY

Vanguard Index Institutional Plus (passive)

A passive domestic stock portfolio that tracks the S&P 500.

Vanguard Dividend Growth (active) (1)

A fund of large cap stocks which is expected to outperform the Nasdaq US Dividend Achievers Select Index, over time.

MID CAP EQUITY

Vanguard Mid Cap Index (passive) (2)

A fund that passively invests in companies with medium market capitalizations that tracks the CRSP US Mid-Cap Index.

SMALL CAP EQUITY

T Rowe Price Small Cap (active)

A fund that invests primarily in companies with small market capitalizations and is expected to outperform the Russell 2000 Index.

INTERNATIONAL EQUITY

Fidelity Diversified International (active)

A fund that invests primarily in stocks of companies located outside of the United States and is expected to outperform the MSCI index of Europe, Australasia and the Far East (EAFE), over time.

Vanguard Total International Stock Index (passive) (3)

A fund that seeks to track the investment performance of the FTSE Global All Cap ex US Index, an index designed to measure equity market performance in developed and emerging markets, excluding the United States.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
Large Cap US Equity						
VANGUARD INSTITUTIONAL INDEX PLUS	**$1,342,047,733**	**7.7%**	**17.9%**	**17.3%**	**13.9%**	**07/1999**
S&P 500		7.7	17.9	17.3	13.9	07/1999
Excess		-0.0	-0.0	-0.0	-0.0	
VANGUARD DIVIDEND GROWTH	**656,374,705**	**8.1**	**16.3**			**10/2016**
NASDAQ US Dividend Achievers Select		9.5	19.1			10/2016
Excess		-1.4	-2.8			
Mid Cap US Equity						
VANGUARD MID CAP INDEX	**566,235,731**	**4.7**	**13.4**	**13.8**	**11.7**	**01/2004**
CRSP US Mid Cap Index		4.7	13.4	13.8	11.7	01/2004
Excess		0.0	0.0	-0.0	-0.0	
Small Cap US Equity						
T. ROWE PRICE SMALL-CAP STOCK	**780,875,658**	**6.3**	**19.4**	**18.5**	**12.5**	**04/2000**
Russell 2000		3.6	15.2	17.1	11.1	04/2000
Excess		2.7	4.2	1.4	1.4	
International Equity						
FIDELITY DIVERSIFIED INTERNATIONAL	**308,258,063**	**1.4**	**2.4**	**8.1**	**5.4**	**07/1999**
MSCI EAFE FREE (NET)		1.4	2.7	9.2	4.4	07/1999
Excess		0.1	-0.4	-1.2	1.0	
VANGUARD TOTAL INTERNATIONAL STOCK INDEX	**202,492,945**	**0.5**	**1.6**	**10.0**	**4.5**	**07/2011**
FTSE Global All Cap ex US Index Net		0.5	1.8	10.0	4.4	07/2011
Excess		0.1	-0.2	-0.0	0.1	

Deferred Compensation Options

BALANCED

Vanguard Balanced Index (passive) (4)

A fund that passively invests in a mix of domestic stocks and bonds. The fund is expected to track a weighted benchmark of 60% CRSP US Total Market Index/40% BB Barclays U.S. Aggregate.

FIXED INCOME

Dodge & Cox Income Fund (active)

A fund that invests primarily in investment grade securities in the U.S. bond market which is expected to outperform the BB Barclays U.S. Aggregate, over time.

Vanguard Total Bond Market Index (passive)

A fund that passively invests in a broad, market weighted bond index that is expected to track the BB Barclays U.S. Aggregate.

SIF Money Market Fund (5)

A fund that invests in short-term debt instruments which is expected to outperform the return on 90-Day U.S. Treasury Bills.

STABLE VALUE

SIF Stable Value Fund (5)

A portfolio composed of stable value instruments which are primarily investment contracts and security backed contracts. The fund is expected to outperform the return of the 3 year Constant Maturity Treasury +45 basis points, over time.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
Balanced Funds						
VANGUARD BALANCED INDEX	**$811,050,227**	**4.3%**	**9.9%**	**10.6%**	**8.9%**	**12/2003**
Vanguard Balanced Fund Benchmark		4.2	9.8	10.6	8.9	12/2003
Excess		0.0	0.1	-0.0	-0.0	
Fixed Income						
DODGE & COX INCOME	**240,604,201**	**0.6**	**-0.1**	**3.1**	**3.1**	**07/1999**
BBG BARC Agg Bd		0.0	-1.2	1.3	2.2	07/1999
Excess		0.6	1.1	1.8	0.9	
VANGUARD TOTAL BOND MARKET INDEX	**208,883,727**	**0.0**	**-1.2**	**1.3**	**2.1**	**12/2003**
BBG BARC Agg Bd		0.0	-1.2	1.3	2.2	12/2003
Excess		0.0	-0.0	-0.0	-0.1	
MONEY MARKET FUND	**424,213,416**	**0.6**	**1.8**	**1.0**	**0.7**	**07/1986**
90 DAY T-BILL		0.5	1.6	0.8	0.5	07/1986
Excess		0.1	0.2	0.2	0.2	
Stable Value						
STABLE VALUE FUND	**1,558,059,730**	**0.6**	**2.3**	**2.1**	**2.0**	**11/1994**
Fixed Interest Blended Benchmark		0.8	2.7	2.0	1.7	11/1994
Excess		-0.2	-0.4	0.1	0.3	

(1) Vanguard Dividend Growth replaced the Janus Twenty Fund in the third quarter of 2016.

(2) Prior to 02/01/2013 the benchmark was the MSCI US Mid-Cap 450 Index

(3) Prior to 06/01/2013 the benchmark was MSCI ACWI ex USA IMI.

(4) Prior to 01/01/2013 the benchmark was 60% MSCI US Broad Market Index and 40% Bloomberg Barclays U.S. Aggregate.

(5) SIF Money Market and SIF Fixed Interest are Supplemental Investment Fund opitons which are also offered under the Deferred Compensation Plan.

Deferred Compensation Options

MN TARGET RETIREMENT ACCOUNTS

Target retirement funds offer a mix of investments that are adjusted over time to reduce risk and become more conservative as the target retirement date approaches. A participant only needs to make one investment decison by investing their assets in the fund that is closest to their anticipated retirement date.

Target Date Retirement Funds

SSgA

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
2020 FUND	**$122,608,849**	**1.4%**	**3.7%**	**6.3%**	**4.9%**	**07/2011**
2020 FUND BENCHMARK		1.4	3.7	6.4	4.9	07/2011
Excess		0.0	-0.0	-0.0	-0.0	
2025 FUND	**129,823,106**	**1.9**	**5.0**	**8.1**	**6.1**	**07/2011**
2025 FUND BENCHMARK		1.9	5.0	8.1	6.1	07/2011
Excess		0.0	-0.0	-0.0	-0.0	
2030 FUND	**92,131,126**	**2.4**	**6.4**	**9.7**	**7.2**	**07/2011**
2030 FUND BENCHMARK		2.4	6.4	9.7	7.2	07/2011
Excess		0.0	-0.0	-0.0	-0.0	
2035 FUND	**73,021,794**	**2.6**	**7.1**	**10.5**	**7.7**	**07/2011**
2035 FUND BENCHMARK		2.6	7.2	10.5	7.7	07/2011
Excess		-0.0	-0.0	-0.0	-0.0	
2040 FUND	**54,514,701**	**2.9**	**7.9**	**11.3**	**8.1**	**07/2011**
2040 FUND BENCHMARK		2.9	7.9	11.3	8.1	07/2011
Excess		-0.0	-0.0	-0.0	-0.0	

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	Option Since
2045 FUND	**$45,834,149**	**3.0%**	**8.5%**	**11.9%**	**8.4%**	**07/2011**
2045 FUND BENCHMARK		3.0	8.5	11.9	8.5	07/2011
Excess		-0.0	-0.0	-0.0	-0.0	
2050 FUND	**35,182,102**	**3.2**	**9.1**	**12.5**	**8.7**	**07/2011**
2050 FUND BENCHMARK		3.2	9.1	12.5	8.7	07/2011
Excess		-0.0	-0.0	-0.0	-0.0	
2055 FUND	**18,916,775**	**3.2**	**9.1**	**12.5**	**8.7**	**07/2011**
2055 FUND BENCHMARK		3.2	9.1	12.5	8.7	07/2011
Excess		0.0	-0.0	-0.0	-0.0	
2060 FUND	**17,268,824**	**3.2**	**9.1**	**12.5**	**8.7**	**07/2011**
2060 FUND BENCHMARK		3.2	9.1	12.5	8.7	07/2011
Excess		0.0	-0.0	0.0	-0.0	
INCOME FUND	**90,460,112**	**1.3**	**3.2**	**5.3**	**3.9**	**07/2011**
INCOME FUND BENCHMARK		1.3	3.2	5.3	3.9	07/2011
Excess		0.0	-0.0	-0.0	-0.1	

Note: Each SSgA Fund benchmark is the aggregate of the returns of the Fund's underlying index funds weighted by the Fund's asset allocation

MN College Savings Plan Options

The Minnesota College Savings Plan is an education savings plan designed to help families set aside funds for future college costs. The SBI is responsible for the investments and the Minnesota Office of Higher Education (OHE) is responsible for the overall administration of the Plan.

The SBI and OHE contract jointly with TIAA to provide administrative, marketing, communication, recordkeeping and investment management services. Please see the next page for the performance as reported by TIAA.

AGE-BASED MANAGED ALLOCATIONS

The Age-Based Managed Allocation Option seeks to align the investment objective and level of risk, which will become more conservative as the beneficiary ages and moves closer to entering an eligible educational institution.

RISK BASED ALLOCATIONS

The Risk Based Allocation Option offers three separate allocation investment options - Aggressive, Moderate and Conservative, each of which has a fixed risk level that does not change as the Beneficiary ages.

ASSET CLASS BASED ALLOCATIONS

U.S. LARGE CAP EQUITY INDEX - A passive domestic stock portfolio that tracks the S&P 500.

INTERNATIONAL EQUITY INDEX - A fund that passively invests in a mix of developed and emerging market equities. The fund is expected to track a weighted benchmark of 80% MSCI ACWI World ex USA and 20% MSCI Emerging Markets Free Index.

U.S. AND INTERNATIONAL EQUITY INDEX - A fund that invests in a mix of equities, both U.S. and international, across all capitalization ranges and real estate-related securities. The fund is expected to track a weighted benchmark of 60% Russell 3000, 24% International, 6% Emerging Markets, and 10% Real Estate Securities Fund.

PRINCIPAL PLUS INTEREST OPTION - A passive fund where contributions are invested in a Funding Agreement issued by TIAA-CREF Life. The funding agreement provides for a return of principal plus a guaranteed rate of interest which is made by the insurance company to the policyholder, not the account owners. The account is expected to outperform the return of the 3-month T-Bill.

EQUITY AND INTEREST ACCUMULATION - A fund that passively invests half of the portfolio in U.S. equities across all capitalization ranges and the other half in the same Funding Agreement issued by TIAA-CREF Life as described above. The fund is expected to track a weighted benchmark of 50% Russell 3000 and 50% 3-month T-Bill.

100% FIXED INCOME - A fund that passively invests in fixed income holdings that tracks the Bloomberg Barclays U.S. Aggregate and two active funds that invest in inflation-linked bonds and high yield securities. The fund is expected to track a weighted benchmark of 70% BB Barclays Aggregate, 20% inflation-linked bond, and 10% high yield.

MONEY MARKET - An active fund that invests in high-quality, short-term money market instruments of both domestic and foreign issuers that tracks the iMoneyNet Average All Taxable benchmark.

MINNESOTA COLLEGE SAVINGS PLAN
Performance Statistics for the Period Ending: September 30, 2018

Fund Name	Ending Market	3 Months	1 Year	Annualized				Inception Date
				3 Years	5 Years	10 Years	Since Inception	
Managed Ages 0-4	$32,180,279	3.73%	9.21%	11.58%			7.80%	8/12/2014
BM: Managed Ages 0-4		3.69%	9.04%	11.71%			7.85%	
Managed Ages 5-8	$70,351,920	3.44%	7.91%	10.32%			7.02%	8/12/2014
BM: Managed Ages 5-8		3.24%	7.82%	10.48%			7.09%	
Managed Ages 9-10	$66,165,136	2.96%	6.73%	9.12%			6.25%	8/12/2014
BM: Managed Ages 9-10		2.80%	6.60%	9.25%			6.34%	
Managed Ages 11-12	$99,545,658	2.47%	5.59%	7.86%			5.46%	8/12/2014
BM: Managed Ages 11-12		2.38%	5.50%	7.97%			5.52%	
Managed Ages 13-14	$131,427,951	2.11%	4.50%	6.64%			4.68%	8/12/2014
BM: Managed Ages 13-14		1.95%	4.41%	6.69%			4.69%	
Managed Age 15	$82,849,528	1.56%	3.73%	5.34%			3.85%	8/12/2014
BM: Managed Age 15		1.56%	3.54%	5.29%			3.76%	
Managed Age 16	$85,237,409	1.50%	3.41%	4.73%			3.46%	8/12/2014
BM: Managed Age 16		1.38%	3.16%	4.57%			3.26%	
Managed Age 17	$78,380,395	1.25%	2.91%	4.08%			3.04%	8/12/2014
BM: Managed Age 17		1.19%	2.78%	3.85%			2.76%	
Managed Ages 18 & Over	$195,950,806	1.09%	2.67%	3.46%			2.65%	8/12/2014
BM: Managed Ages 18 & Over		1.01%	2.40%	3.13%			2.26%	
U.S. and International Equity Option	$308,663,124	4.67%	11.57%	13.92%	10.23%	9.28%	7.22%	10/ 1/2001
BM: U.S. and International Equity Option		4.58%	11.51%	14.18%	10.38%	9.78%	8.09%	

MINNESOTA COLLEGE SAVINGS PLAN

Performance Statistics for the Period Ending: September 30, 2018

Fund Name	Ending Market	3 Months	1 Year	Annualized				Inception Date
				3 Years	5 Years	10 Years	Since Inception	
Moderate Allocation Option	$68,653,589	2.88%	6.74%	9.06%	6.98%	7.15%	5.35%	8/ 2/2007
BM: Moderate Allocation Option		2.80%	6.60%	9.25%	7.15%	7.59%	5.89%	
100% Fixed-Income Option	$14,798,825	0.21%	-0.69%	1.68%	1.87%	3.27%	3.30%	8/16/2007
BM: 100% Fixed-Income Option		0.17%	-0.56%	1.98%	2.21%	3.80%	3.94%	
International Equity Index Option	$4,916,686	0.85%	1.64%	9.52%	4.11%		5.06%	6/18/2013
BM: International Equity Index Option		0.86%	2.05%	9.92%	4.33%		5.37%	
Money Market Option	$11,083,472	0.48%	1.36%	0.61%	0.37%	0.18%	0.40%	11/ 1/2007
BM: Money Market Option		0.38%	1.13%	0.51%	0.31%	0.21%	0.42%	
Principal Plus Interest Option	$114,997,280	0.39%	1.67%	1.51%	1.39%	1.87%	2.52%	10/10/2001
Citigroup 3-Month U.S. Treasury Bill		0.50%	1.57%	0.80%	0.49%	0.32%	1.28%	
Aggressive Allocation Option	$23,346,128	3.73%	9.22%	11.52%			7.76%	8/12/2014
BM: Aggressive Allocation Option		3.69%	9.04%	11.71%			7.85%	
Conservative Allocation Option	$10,016,504	1.58%	3.67%	5.29%			3.65%	8/18/2014
BM: Conservative Allocation Option		1.56%	3.54%	5.29%			3.59%	
Equity and Interest Accumulation Option	$3,451,787	3.84%	9.53%	9.07%			6.56%	8/18/2014
BM: Equity and Interest Accumulation Option		3.79%	9.40%	8.77%			6.24%	
U.S. Large Cap Equity Option	$28,360,034	7.61%	17.57%	17.05%			12.48%	8/12/2014
BM: U.S. Large Cap Equity Option		7.71%	17.91%	17.31%			12.73%	
Matching Grant	$2,435,603	0.39%	1.67%	1.51%	1.39%	1.87%	2.54%	3/22/2002
Citigroup 3-Month U.S. Treasury Bill		0.50%	1.57%	0.80%	0.49%	0.32%	1.26%	

MINNESOTABLEplan
A member of The National ABLE Alliance

Performance as of
09/30/18

Total Market Value: $ **3,382,724**

Fund Name		Market Value	% of Plan	1 Month	3 Months	YTD	1 Year	3 Year	5 Year	10 Year	Inception	Inception Date
Aggressive Option	$	330,728	9.78%	(0.56)	3.68	5.45	10.23				12.70	12/15/16
ABLE Aggressive Custom Benchmark				(0.51)	3.79	5.67	10.71				13.45	
Variance				**(0.05)**	**(0.11)**	**(0.22)**	**(0.48)**				**(0.75)**	
Moderately Aggressive Option	$	303,329	8.97%	(0.58)	3.09	4.44	8.50				10.70	12/15/16
ABLE Moderately Aggressive Custom Benchmark				(0.49)	3.17	4.70	8.91				11.39	
Variance				**(0.09)**	**(0.08)**	**(0.26)**	**(0.41)**				**(0.69)**	
Growth Option	$	519,050	15.34%	(0.43)	2.47	3.57	6.80				8.73	12/15/16
ABLE Growth Custom Benchmark				(0.46)	2.56	3.73	7.12				9.35	
Variance				**0.03**	**(0.09)**	**(0.16)**	**(0.32)**				**(0.62)**	
Moderate Option	$	379,689	11.22%	(0.44)	1.90	2.55	5.04				6.84	12/15/16
ABLE Moderate Custom Benchmark				(0.44)	1.95	2.77	5.34				7.34	
Variance				**(0.00)**	**(0.05)**	**(0.22)**	**(0.30)**				**(0.50)**	
Moderately Conservative Option	$	331,369	9.80%	(0.27)	1.30	1.97	3.62				4.87	12/15/16
ABLE Moderately Conservative Custom Benchmark				(0.28)	1.43	2.16	3.96				5.29	
Variance				**0.01**	**(0.13)**	**(0.19)**	**(0.34)**				**(0.42)**	
Conservative Option	$	557,568	16.48%	(0.10)	0.68	1.17	1.86				2.32	12/15/16
ABLE Conservative Custom Benchmark				(0.06)	0.75	1.37	2.15				2.60	
Variance				**(0.04)**	**(0.07)**	**(0.20)**	**(0.29)**				**(0.28)**	
Checking Option	$	960,991	28.41%									03/30/17

MINNESOTA ACHIEVE A BETTER LIFE EXPERIENCE

The Minnesota Achieve a Better Life Experience Plan (ABLE) is a savings plan designed to help individuals save for qualified disability expenses without losing eligibility for certain assistance programs. The plan is administered by the Department of Human Services (DHS).

The SBI and DHS have jointly contracted with Ascensus to provide recordkeeping, administrative, and investment management services for the plan.

RISK BASED ALLOCATIONS

The plan offers seven different allocation investment options: Aggressive, Moderately Aggressive, Growth, Moderate, Moderately Conservative, Conservative, and Checking. Each allocation is based on a fixed risk level.

Non-Retirement

September 30, 2018

Non-Retirement Funds

The SBI manages funds for trusts and programs created by the Minnesota State Constitution and Legislature.

- The Permanent School Fund is a trust established for the benefit of Minnesota public schools.
- The Environmental Trust Fund is a trust established for the protection and enhancement of Minnesota's environment. It is funded with a portion of the proceeds from the state's lottery.
- The Minnesota Workers Compensation Assigned Risk Plan provides worker compensation insurance for companies unable to obtain coverage through private carriers.
- The Closed Landfill Investment Fund is a trust created by the Legislature to invest money to pay for the long-term costs of maintaining the integrity of landfills in Minnesota once they are closed.
- Other Post-Employment Benefits Accounts (OPEB) are the assets set aside by local units of government for the payment of retiree benefits trusteed by the Public Employees Retirement Association.
- Miscellanous Trust Accounts are other small funds managed by the SBI for a variety of purposes.

All equity, fixed income, and cash assets for these accounts are managed externally by investment management firms retained by the SBI.

Non-Retirement

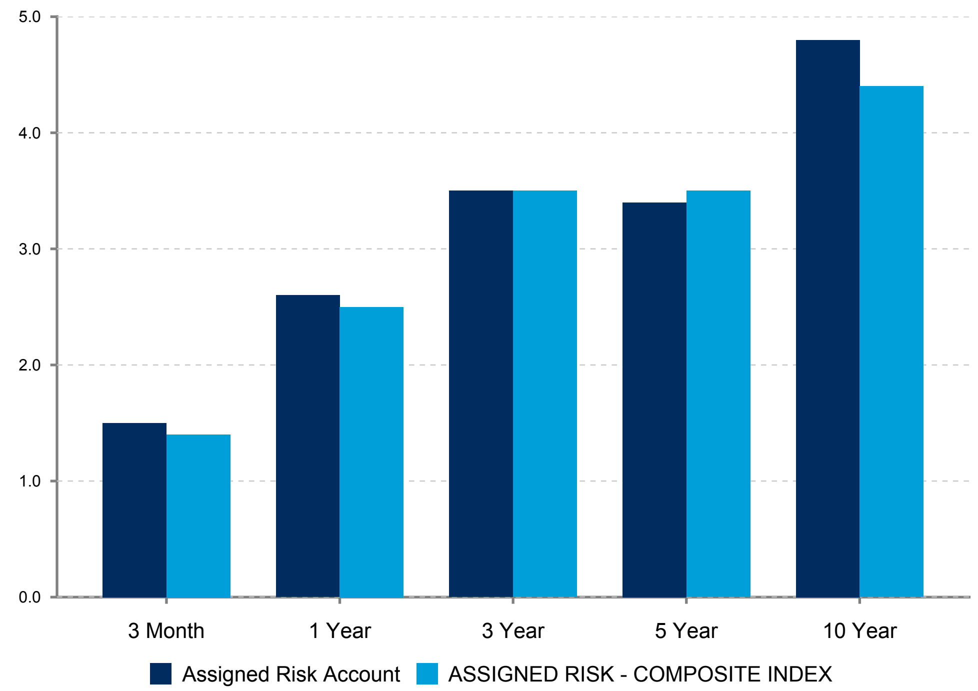
Assigned Risk Plan

The Assigned Risk plan has two investment objectives: to minimize the mismatch between assets and liabilities and to provide sufficient liquidity for the payment of ongoing claims and operating expenses.

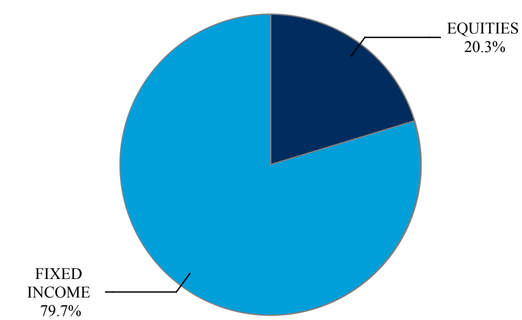
The Assigned Risk Plan is invested in a portfolio of common stocks and bonds

The equity segment is passively managed to track the performance of the S&P 500.

The fixed income benchmark is the Bloomberg Barclays Intermediate Government Index. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 80% equities and 20% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
Assigned Risk Account	$273,768,413	1.5%	2.6%	3.5%	3.4%	4.8%
EQUITIES	55,492,881	7.7	17.9	16.6	12.8	11.1
FIXED INCOME	218,275,532	-0.1	-1.1	0.3	1.0	2.9
ASSIGNED RISK - COMPOSITE INDEX		1.4	2.5	3.5	3.5	4.4
Excess		0.0	0.2	0.0	-0.1	0.4
S&P 500		7.7	17.9	17.3	13.9	12.0
BBG BARC US Gov: Int		-0.1	-1.2	0.2	0.9	2.2



Note: Since 12/1/2017 the Assigned Risk equity segment has been managed by Mellon. From 1/17/2017-11/30/2017 it was managed internally by SBI staff. Prior to 1/17/2017 the equity segment was managed by SSgA (formerly GE Investment Mgmt.). RBC manages the fixed income segment of the Fund.

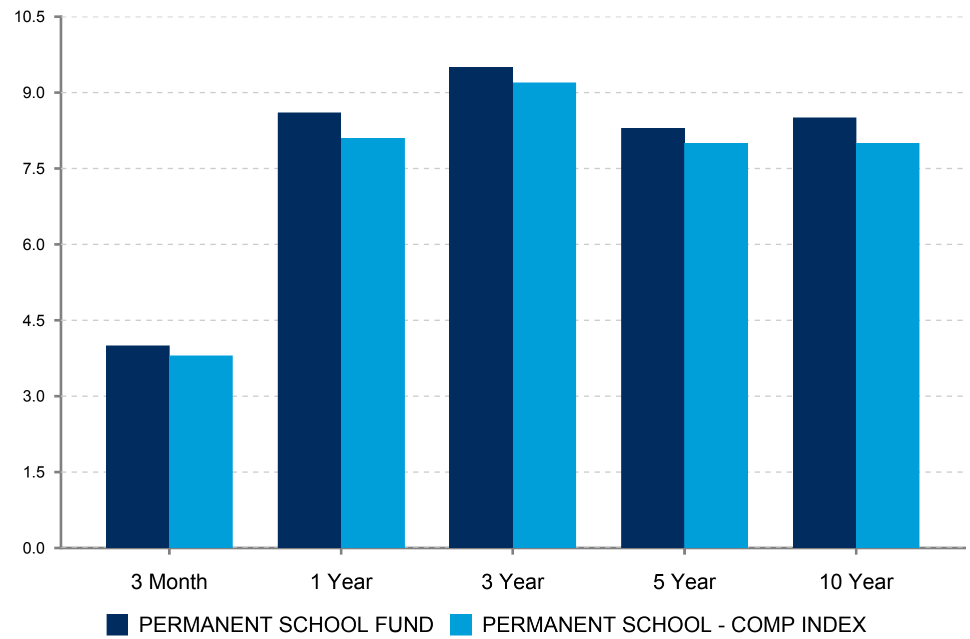
Non-Retirement

Permanent School Fund

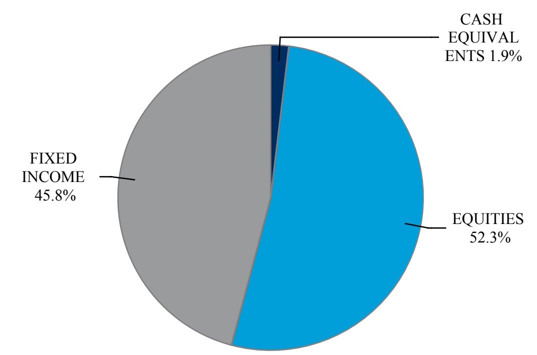
The investment objective of the Permanent School Fund is to produce a growing level of spendable income, within the constraints of maintaining adequate portfolio quality and liquidity. The income from the portfolio is transferred to the school endowment fund and distributed to Minnesota's public schools.

The Permanent School Fund is invested in a balanced portfolio of common stocks and bonds. Common stocks provide the potential for significant capital appreciation, while bonds provide portfolio diversification and a more stable stream of current income.

The stock segment is passively managed to track the performance of the S&P 500. The bond segment is actively managed to add incremental value through sector, security and yield curve decisions. The fixed income benchmark is the Bloomberg Barclays U.S. Aggregate. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 2% cash, 50% equity, and 48% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
PERMANENT SCHOOL FUND	$1,443,737,205	4.0%	8.6%	9.5%	8.3%	8.5%
CASH EQUIVALENTS	28,069,538	0.5	1.7	0.9	0.6	0.5
EQUITIES	753,957,292	7.7	17.9	17.3	13.9	12.0
FIXED INCOME	661,710,376	0.2	-0.8	1.7	2.6	4.5
PERMANENT SCHOOL - COMP INDEX		3.8	8.1	9.2	8.0	8.0
Excess		0.2	0.5	0.3	0.3	0.5
S&P 500		7.7	17.9	17.3	13.9	12.0
BBG BARC US Agg		0.0	-1.2	1.3	2.2	3.8



Note: Since 12/1/2017 the equity segment has been managed by Mellon and the fixed income segment by Prudential. Prior to 12/1/2017 both segments were managed internally by SBI staff. Prior to 7/1/97 the Fund allocation was 100% fixed income.

STATE STREET.

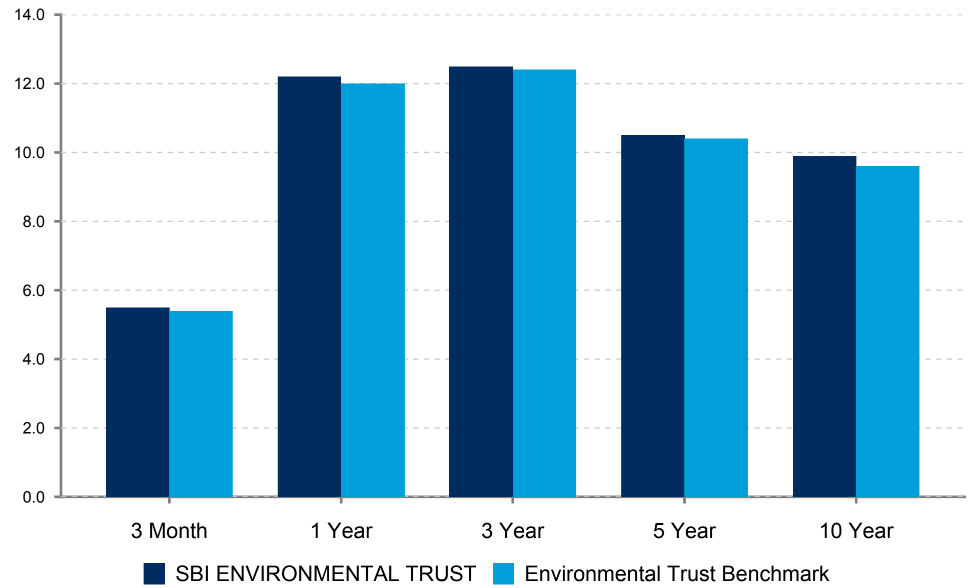
Non-Retirement

Environmental Trust Fund

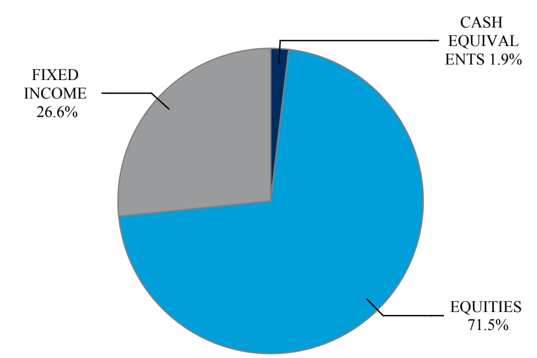
The objective of the Environmental Trust Fund is to increase the market value of the Fund over time in order to increase the annual amount made available for spending within the constraints of maintaining adequate portfolio quality and liquidity.

The Environmental Trust Fund is invested in a balanced portfolio of common stocks and bonds. Common stocks provide the potential for significant capital appreciation, while bonds act as a deflation hedge and provide portfolio diversification.

The bond segment is actively managed to add incremental value through sector, security and yield curve decisions. The stock segment is passively managed to track the performance of the S&P 500. The fixed income benchmark is the Bloomberg Barclays U.S. Aggregate. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 2% cash, 70% equities, and 28% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
SBI ENVIRONMENTAL TRUST	$1,172,647,871	5.5%	12.2%	12.5%	10.5%	9.9%
CASH EQUIVALENTS	21,842,581	0.5	1.7	0.9	0.6	0.5
EQUITIES	838,977,013	7.7	17.9	17.3	13.9	12.0
FIXED INCOME	311,828,278	0.2	-0.8	1.7	2.6	4.5
Environmental Trust Benchmark		5.4	12.0	12.4	10.4	9.6
Excess		0.1	0.2	0.1	0.1	0.3
S&P 500		7.7	17.9	17.3	13.9	12.0
BBG BARC US Agg		0.0	-1.2	1.3	2.2	3.8



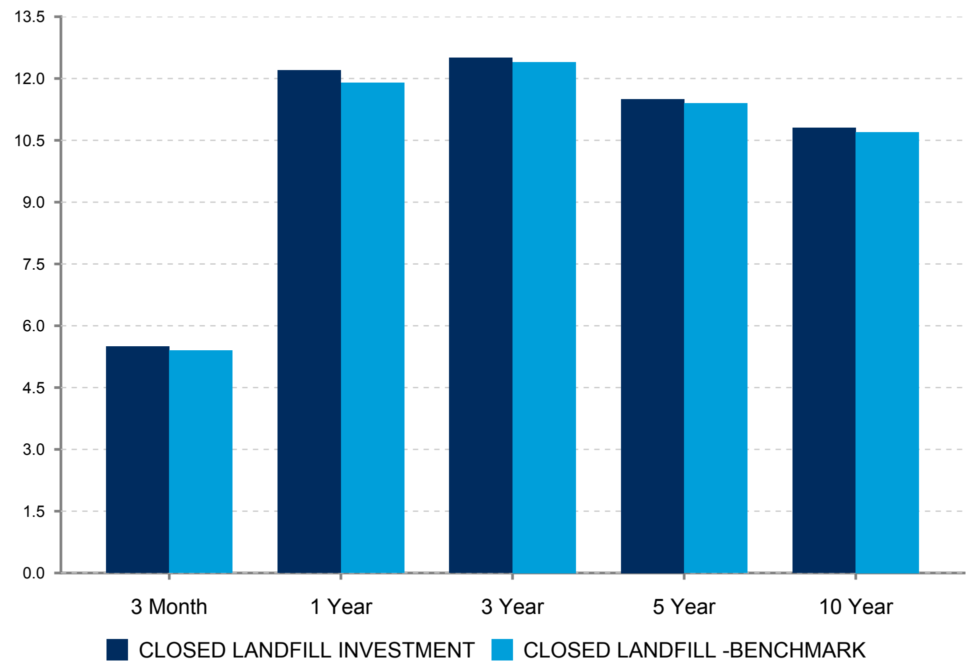
Note: Since 12/1/2017 the equity segment has been managed by Mellon and the fixed income segment by Prudential. Prior to 12/1/2017 both segments were managed internally by SBI staff. From 7/1/94 to 7/1/99, the Fund's target allocation and benchmark was 50% fixed income and 50% stock. Prior to 7/1/94 the Fund was invested entirely in short-term instruments as part of the Invested Treasurer's Cash pool.

Non-Retirement

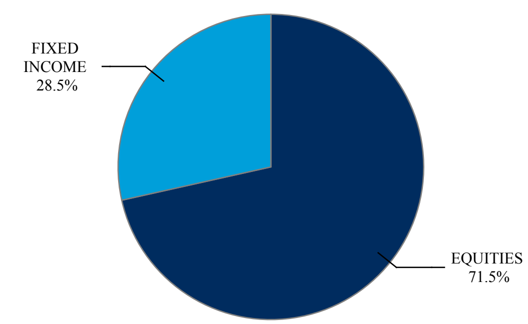
Closed Landfill Investment Fund

The investment objective of the Closed Landfill Investment Fund is to increase the market value of the Fund and to reduce volatility to meet future expenditures. By statute, the assets of the Fund are unavailable for expenditure until after the fiscal year 2020 to pay for long-term costs of maintaining the integrity of landfills in Minnesota once they are closed. In FY 2011, $48 million was transferred out of the general fund leaving a balance of $1 million in the account. Legislation was enacted in 2013 to replenish the principal and earnings back into the fund and in FY 2014 a repayment was made in the amount of $64.2 million. In 2015, legislation was passed which repealed any further repayments.

The bond segment is actively managed to add incremental value through sector, security and yield curve decisions. The stock segment is managed to passively track the performance of the S&P 500. The fixed income benchmark is the Bloomberg Barclays U.S. Aggregate. The total fund benchmark is a combination of the fixed income and equity benchmarks, weighted according to the total fund asset allocation targets of 70% equities and 30% fixed income. The actual asset mix will fluctuate and is shown in the graph below.



	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
CLOSED LANDFILL INVESTMENT	$93,403,456	5.5%	12.2%	12.5%	11.5%	10.8%
EQUITIES	66,800,003	7.7	17.9	17.3	13.9	12.0
FIXED INCOME	26,603,453	0.2	-0.8	1.7		
CLOSED LANDFILL -BENCHMARK		5.4	11.9	12.4	11.4	10.7
Excess		0.1	0.3	0.1	0.1	0.1
S&P 500		7.7	17.9	17.3	13.9	12.0
BBG BARC US Agg		0.0	-1.2	1.3	2.2	3.8



Note: Since 12/1/2017 the equity segment has been managed by Mellon and the fixed income segment by Prudential. Prior to 12/1/2017 both segments were managed internally by SBI staff. Prior to 9/10/14 the Fund's target allocation and benchmark was 100% domestic equity.

STATE STREET

	Ending Market Value	Last Qtr	Fiscal YTD	1 Year	3 Year	5 Year	10 Year	Since Inception	Inception Date
MELLON	**2,339,986,880**	**7.7**	**7.7**						**12/2017**
S&P 500 INDEX (DAILY)		7.7	7.7						12/2017
Excess		-0.0	-0.0						
SBI INTERNAL EQUITY INDEX	**224**								
NON RETIREMENT EQUITY INDEX	**2,339,987,104**	**7.7**	**7.7**	**17.9**	**17.3**	**14.0**	**12.0**	**9.9**	**07/1993**
S&P 500 INDEX (DAILY)		7.7	7.7	17.9	17.3	13.9	12.0	9.8	07/1993
Excess		0.0	0.0	-0.0	-0.0	0.0	0.0	0.1	
PRUDENTIAL	**1,159,751,229**	**0.2**	**0.2**						**12/2017**
BBG BARC Agg (Dly)		0.0	0.0						12/2017
Excess		0.2	0.2						
NON RETIREMENT FIXED INCOME	**1,159,754,505**	**0.2**	**0.2**	**-0.9**	**1.7**	**2.6**	**4.5**	**5.8**	**07/1994**
BBG BARC Agg (Dly)		0.0	0.0	-1.2	1.3	2.2	3.8	5.4	07/1994
Excess		0.2	0.2	0.3	0.4	0.4	0.7	0.5	
RBC	**218,275,620**	**-0.1**	**-0.1**	**-1.1**	**0.3**	**1.0**	**2.9**	**4.8**	**07/1991**
RBC Custom Benchmark		-0.1	-0.1	-1.2	0.2	0.9	2.3	4.9	07/1991
Excess		0.0	0.0	0.1	0.1	0.1	0.7	-0.1	

Note:

RBC is the manager for the fixed income portion of the assigned risk account. RBC changed its name from Voyageur Asset Management on 1/1/2010. The current benchmark is the Bloomberg Barclays Intermediate Government Index. Prior to 7/1/11 the Voyageur Custom Index was 10% 90 day T-Bill, 25% Merrill 1-3 Government, 15% Merrill 3-5 Government, 25% Merrill 5-10 Government, 25% Merrill Mortgage Master.

Prior to 12/1/17 the Non Retirement Equity Index and Non Retirement Fixed Income accounts were managed internally by SBI staff.

In addition to the Non-Retirement Funds listed on the previous pages, the Non Retirement Equity Index and the Non Retirement Fixed Income accounts also include the assets of various smaller Miscellaneous Trust Accounts and Other Post Employment Benefits.

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State Cash

September 30, 2018

State Cash Accounts

Invested Treasurer's Cash

The Invested Treasurer's Cash Pool (ITC) represents the balances in more than 400 separate accounts that flow through the Minnesota State Treasury. These accounts vary greatly in size. The ITC contains the cash balances of certain State agencies and non-dedicated cash in the State Treasury.

The investment objectives of the ITC, in order of priority, are as follows:

- Safety of Principal. To preserve capital.
- Liquidity. To meet cash needs without the forced sale of securities at a loss.
- Competitive Rate of Return. To provide a level of current income consistent with the goal of preserving capital.

The SBI seeks to provide safety of principal by investing all cash accounts in high quality, liquid, short term investments. These include U.S. Treasury and Agency issues, repurchase agreements, bankers acceptances, commercial paper, and certificates of deposit.

Beginning in January 2003, the Treasurer's Cash Pool is measured against the iMoneyNet, All Taxable Money Fund Report Average.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
Treasurer's Cash	11,707,127,798	0.6	1.6	1.1	0.9	1.0
iMoneyNet Money Fund Average-All Taxable		0.4	1.2	0.6	0.3	0.2

Other State Cash Accounts

Due to differing investment objectives, strategies, and time horizons, some State agencies' accounts are invested seperately. These agencies direct the investments or provide the SBI with investment guidelines and the SBI executes on their behalf. Consequently, returns are shown for informational purposes only and there are no benchmarks for these accounts.

	Ending Market Value	Last Qtr	1 Year	3 Year	5 Year	10 Year
Debt Service	143,269,364	0.2	0.2	1.6	2.3	
Housing Finance	77,340,699	0.5	1.7	1.2	1.7	
Public Facilities Authority	60,568,193	0.3	0.2	1.7	2.3	

Addendum

Benchmark Definitions

Active Domestic Equity Benchmark:

A weighted composite each of the individual active domestic equity managers’ benchmarks. Effective 3/1/2017 the calculation uses the average weight of the manager relative to the total group of active managers during the month. Prior to 3/1/2017 the beginning of the month weight relative to the total group was used.

Benchmark DM:

Since 6/1/08 the developed markets managers' benchmark, "Benchmark DM," is the Standard (large + mid) MSCI World ex USA (net). From 10/1/07 through 5/31/08 the benchmark was the Provisional Standard MSCI World ex USA (net). From 10/1/03 to 9/30/07 the benchmark was the MSCI World ex USA (net). Prior to that date, it was the MSCI EAFE Free (net), including from 10/1/01 to 5/31/02 when it was the Provisional MSCI EAFE Free (net).

Benchmark EM:

Since 6/1/08 the emerging markets managers' benchmark, "Benchmark EM,"is the Standard (large + mid) MSCI Emerging Markets Free (net). From 10/1/07 through 5/31/08 the benchmark was the Provisional Standard MSCI Emerging Markets Free (net). From 1/1/01 to 9/30/07 the benchmark was the MSCI Emerging Markets Free (net), including from 10/1/01 to 5/31/02 when it was the Provisional MSCI Emerging Markets Free (net). Prior to 1/1/01, it was the MSCI Emerging Markets Free (gross).

Combined Funds Composite Index:

The Composite Index performance is calculated by multiplying the beginning of month Composite weights by the monthly returns of the asset class benchmarks. Effective 1/1/2017, the Combined Funds Composite weight is set as the Strategic Asset Allocation Policy Target with the uninvested portion of Private Markets allocated to Public Equity. Asset class weights for Public Equity and Private Markets are reset at the start of each month. From 7/1/2016-12/31/2016 the composite weights were set to match actual allocation as the portfolio was brought into line with the new Strategic Asset Allocation Policy Target. Prior to 7/1/2016 the uninvested portion of the Private Markets was invested in Fixed Income and the Composite Index was adjusted accordingly. When the Strategic Asset Allocation Policy Target changes, so does the Composite Index.

Domestic Equity Benchmark:

Russell 3000 effective 10/1/2003. From 7/1/1999 to 9/30/2003, it was the Wilshire 5000 Investable Index. From 11/1/1993 to 6/30/1999, the target was the Wilshire 5000 as reported with no adjustments. Prior to 11/1/1993, the Wilshire 5000 was adjusted to reflect SBI mandated restrictions, which included liquor and tobacco, American Home Products and South Africa.

Fixed Income Benchmark:

In 2016, the Barclays Agg was rebranded Bloomberg Barclays Agg to reflect an ownership change. Prior to 9/18/2008 this index was called the Lehman Brothers Aggregate Bond Index. From 7/1/84-6/30/94 the asset class benchmark was the Salomon Brothers Broad Investment Grade Index.

Addendum

Benchmark Definitions (continued)

Fixed Interest Blended Benchmark:

On 6/1/2002, the benchmark was set as the 3 Year Constant Maturity Treasury Yield + 45 bps. Prior to this change it was the 3 Year Constant Maturity Treasury Yield + 30 bps.

International Equity Benchmark:

Since 6/1/08 the International Equity asset class target is the Standard (large + mid) MSCI ACWI ex U.S. (net). From 10/1/07 through 5/31/08 the benchmark was the Provisional Standard MSCI ACWI ex U.S. (net). From 10/1/03 to 9/30/07 the target was MSCI ACWI ex U.S. (net). From 1/1/01 to 9/30/03, the target was MSCI EAFE Free (net) plus Emerging Markets Free (net), and from 7/1/99 to 12/31/00 the target was MSCI EAFE Free (net) plus Emerging Markets Free (gross). From 7/1/99 to 9/30/03, the weighting of each index fluctuated with market capitalization. From 10/1/01 to 5/31/02 all international benchmarks being reported were the MSCI Provisional indices. From 12/31/96 to 6/30/99 the benchmark was fixed at 87% EAFE Free (net)/13% Emerging Markets Free (gross). On 5/1/96, the portfolio began transitioning from 100% EAFE Free (net) to the 12/31/96 fixed weights. Prior to 5/1/96 it was 100% the EAFE Free (net).

Passive Domestic Equity Benchmark:

A weighted average of the Russell 1000 and Russell 3000 effective 10/1/2016. From 10/1/2003 to 10/1/2016 it was equal to the Russell 3000. From 7/1/2000 to 9/30/2003, it was the Wilshire 5000 Investable Index. From 11/1/1993 to 6/30/2000, the target was the Wilshire 5000 as reported with no adjustments. Prior to 11/1/1993, the Wilshire 5000 was adjusted to reflect SBI mandated restrictions, which included liquor and tobacco, American Home Products and South Africa.

Passive Manager Benchmark:

Russell 3000 effective 10/1/2003. From 7/1/2000 to 9/30/2003, it was the Wilshire 5000 Investable Index. From 11/1/1993 to 6/30/2000, the target was the Wilshire 5000 as reported with no adjustments. Prior to 11/1/1993, the Wilshire 5000 was adjusted to reflect SBI mandated restrictions, which included liquor and tobacco, American Home Products and South Africa.

Public Equity Benchmark:

67% Russell 3000 and 33% MSCI ACWI ex USA effective 7/1/2017. Prior to 6/30/16 the returns of Domestic and International Equity were not reported as a total Public Equity return. From 6/30/16-6/30/17 the Public Equity benchmark adjusted by 2% each quarter from 75% Russell 3000 and 25% MSCI ACWI ex USA until it reached its current weighting.

Semi-Passive Domestic Equity Benchmark:

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