



# Quarterly Investment Performance Analysis

Wyoming State Treasurer's Office

Period Ended: September 30, 2018



# WYOMING STATE TREASURER'S OFFICE

THIRD QUARTER 2018

## TABLE OF CONTENTS

### QUARTERLY COMMENTARY

- This two-page memo provides a written summary of significant observations regarding performance of the State's Funds, and provides an overview of performance during the quarter for each of the asset classes the State is invested in.

#### **MARKET ENVIRONMENT ..... PAGE 5-14**

- This section is intended to review capital markets in general (i.e. not specific to Wyoming), and includes a written summary of events during the quarter, including economic influences and review of equity and bond markets as a whole. This section also includes various charts and exhibits displaying key characteristics of major market indices representing the broad range of available asset classes, including alternative investments such as absolute return and real estate. Also included is an asset class summary that describes the structure of each of the State's composites. Lastly, this section includes a review of the benchmarks referenced within the quarterly report.

#### **PERFORMANCE SUMMARY ..... PAGE 15-21**

- These 7 pages provide all the market value, asset allocation, and performance information for the State's investments, in summary form.

#### **INVESTMENT POLICY OBJECTIVE REVIEW ..... PAGE 22-39**

- This section provides a compliance check for the Total Fund, and for each individual manager portfolio, versus the guidelines and expectations outlined in the State's Master Investment Policy and Sub-Policies.

#### **APPENDIX..... PAGE 40-47**

- The appendix includes a glossary, giving definitions and other information on data included throughout the report, including financial terms and ratios, indices, peers groups. The addendum page in the appendix includes important comments specific to Wyoming regarding market value, performance, and allocation information provided throughout the report.



## Memorandum

To	Wyoming State Loan and Investment Board
From	RVK, Inc.
Subject	Investment Performance Analysis Commentary
Date	September 30, 2018

Outlined below please find a summary of significant observations regarding performance of the State's Funds for the period ended September 30, 2018. We hope this summary will facilitate your review of our Investment Performance Analysis Report.

The Total Fund returned 1.1% net of fees during the third quarter as the State's US equity and fixed income assets produced positive returns during the quarter. Long-term performance for the Total Fund remains strong, with the State earning returns of 5.3% and 5.3% per annum over the trailing seven- and ten-year periods.

The Total Fund outperformed its custom benchmark over the quarter, with most risk assets generating positive results. The State has lower strategic exposure to equities relative to the All Master Trust Universe and subsequently underperformed the peer group in the quarter. Relative to the Universe, the State continues to generate more return for each unit of risk exposure, with risk-adjusted returns ranking in the top 21% and 11% of all Plans over the trailing five- and ten-year time periods, respectively.

Absolute results were positive for all nine of the State's investment pools, with all nine outperforming or keeping pace with their respective benchmarks during the quarter. The State's non-permanent funds with larger strategic allocations to fixed income investments generated lower absolute returns than the State's permanent funds, but higher returns on a relative basis.

Interest rates continued to increase during the quarter, leading to relatively flat returns for the broad US bond market, and the Bloomberg US Aggregate Bond Index increased by 2 bps over the third quarter. Diversification away from core US bonds was beneficial as the State's total fixed income portfolio (excluding convertibles) outperformed the broad market index. The core and credit fixed income segments outperformed the broad market index, while TIPS and emerging markets debt underperformed. The opportunistic credit fund (Grosvenor Silvery Lupine Fund) generated the highest return among the State's fixed income managers, returning 2.1%. Emerging markets debt generated the lowest absolute return among fixed income sectors, returning -2.8% and underperforming its benchmark by 1.0%, as global bonds suffered from a strengthening US dollar. Bank loans, the largest component of the State's credit composite, generated positive returns due to their

**PORTLAND OFFICE**  
1211 SW 5th Avenue  
Suite 900  
Portland, Oregon 97204  
MAIN 503.221.4200

**CHICAGO OFFICE**  
30 N LaSalle Street  
Suite 3900  
Chicago, Illinois 60602  
MAIN 312.445.3100

**NEW YORK OFFICE**  
1 Penn Plaza  
Suite 2128  
New York, New York 10119  
MAIN 646.805.7075



floating rate structure, but composite performance slightly underperformed its benchmark. The State's core fixed income managers also outperformed the broad market index, collectively returning 0.2%.

US equity markets delivered broad-based gains across market capitalizations and styles during the third quarter. Major US equity indices finished the quarter in positive territory, with the Russell 3000 Index returning 7.1% for the quarter. The State's US equity composite returned 6.4% during the third quarter, underperforming the broad market index. State Street All Cap trailed the broad market index by 0.2%, keeping pace with its custom index. Epoch returned 6.2%, underperforming the Russell 3000 Index by 0.9%, as holdings within consumer discretionary and financials detracted from results.

Developed international markets outperformed emerging markets during the quarter, with the MSCI EAFE Index returning 1.4% and the MSCI Emerging Markets Index returning -1.1%. The State's international equity composite returned 1.2% during the quarter, outperforming the MSCI ACW Ex US Index by 0.5%. Passive strategies within the State's international equity portfolio kept pace with their respective benchmarks, while Fisher and Arrowstreet outperformed their respective benchmarks by 0.6% and 2.1%, respectively.

Preferred stock was positive during the quarter, with Cohen & Steers returning 1.6%, outperforming its benchmark by 1.3%. Exposure to convertibles was beneficial to absolute and relative performance, with Allianz earning 5.4% in the third quarter. The MLPs asset class was funded during the quarter, but does not yet have a full quarter of performance.

Core real estate continued a trend of delivering modest, positive returns. Real estate valuations remain elevated, supported by continued strength in the overall economy with increases from personal consumption and business investment. Between the State's two core real estate managers, Clarion and UBS, returns earned during the third quarter were 1.9% and 1.2%, respectively.

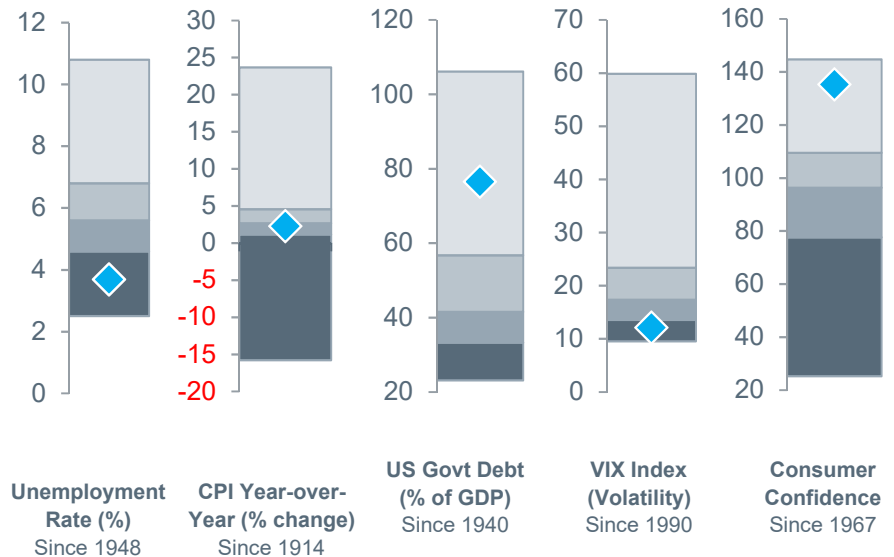
The Diversified Hedge Funds composite returned 0.2% during the quarter, matching the return of the HFRI FOF Comp Index. Grosvenor Diversified Hedge Funds and Internal Diversified Hedge Funds both outperformed the HFRI FOF Comp Index, returning 0.8% and 0.9%, respectively. The PAAMCO - Jackalope Fund returned -0.3% during the quarter and underperformed the index.

Third Quarter Economic Environment

Key Economic Indicators

Continued US economic growth and monetary policy divergence from global trade partners drove domestic equity and interest rate markets higher during the third quarter of 2018, while international growth broadly continued to slow. Geopolitical risks, particularly those driven by newly imposed trade tariffs, were cited as dampening near-term expectations for economic growth outside the US. The FOMC continued to raise policy rates, increasing the target range for the federal funds rate to 2.0% - 2.25% at the September meeting. The committee again cited both realized and expected labor market inflation conditions as major drivers behind their decision. The committee forecasted stable but slightly lower growth than previously anticipated, with annual GDP growth in 2018 expected to be 2.0% followed by a decrease in 2019 to 1.8%. US economic fundamentals broadly continued to strengthen over the third quarter. Hiring activity in August was revised higher, and hiring remained strong in September, resulting in a decline of the unemployment rate to 3.7%; the lowest level since 1969. In addition to strong employment, hourly earnings increased 2.8% year-over-year.

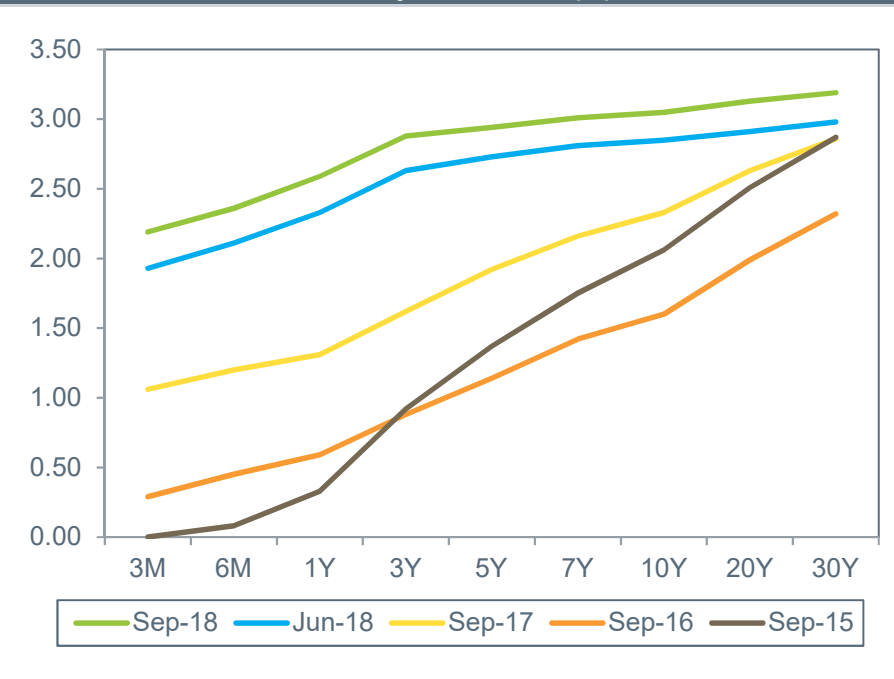
Key Economic Indicators



Economic Indicators

	Sep-18	Jun-18	Sep-17	Sep-15	20 Yr
Federal Funds Rate (%)	2.18 ▲	1.91	1.06	0.07	1.97
Breakeven Infl. - 1 Yr (%)	1.18 ▼	1.42	1.24	-1.75	N/A
Breakeven Infl. - 10 Yr (%)	2.14 ▲	2.13	1.85	1.43	N/A
CPI YoY (Headline) (%)	2.3 ▼	2.9	2.2	0.0	2.2
Unemployment Rate (%)	3.7 ▼	4.0	4.2	5.0	5.9
Real GDP YoY (%)	3.0 ▲	2.9	2.3	2.4	2.3
PMI - Manufacturing	59.8 ▼	60.2	60.2	50.1	52.7
USD Total Wtd Idx	90.11 ▲	89.97	88.10	92.10	86.31
WTI Crude Oil per Barrel (\$)	73.3 ▼	74.2	51.7	45.1	59.5
Gold Spot per Oz (\$)	1,193 ▼	1,253	1,280	1,115	868

Treasury Yield Curve (%)



Market Performance (%)

	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	7.71	10.56	17.91	13.95	11.97
Russell 2000	3.58	11.51	15.24	11.07	11.11
MSCI EAFE (Net)	1.35	-1.43	2.74	4.42	5.38
MSCI EAFE SC (Net)	-0.88	-2.19	3.73	7.96	9.68
MSCI Emg Mkts (Net)	-1.09	-7.68	-0.81	3.61	5.40
Bloomberg US Agg Bond	0.02	-1.60	-1.22	2.16	3.77
ICE BofAML 3 Mo US T-Bill	0.49	1.30	1.59	0.52	0.34
NCREIF ODCE (Gross)	2.09	6.48	8.68	10.72	5.58
FTSE NAREIT Eq REIT (TR)	0.79	1.81	3.35	9.16	7.44
HFRI FOF Comp	0.19	0.92	3.01	3.16	2.55
Bloomberg Cmdb (TR)	-2.02	-2.03	2.59	-7.18	-6.24

Treasury data courtesy of the US Department of the Treasury. Economic data courtesy of Bloomberg Professional Service. Breakeven Inflation does not have 20 years of history; therefore, its 20-year average is shown as N/A.



Third Quarter Review

**Broad Market**

US equity markets delivered broad-based gains across market capitalizations and styles during the third quarter. Despite lingering trade war tensions, the S&P 500 Index posted its best single quarter return since Q4 2013 amidst a period of strong corporate earnings and broad-based economic growth. The S&P 500 Index returned 7.7% during the third quarter, led by health care, industrials, and the re-classified communication services sector.

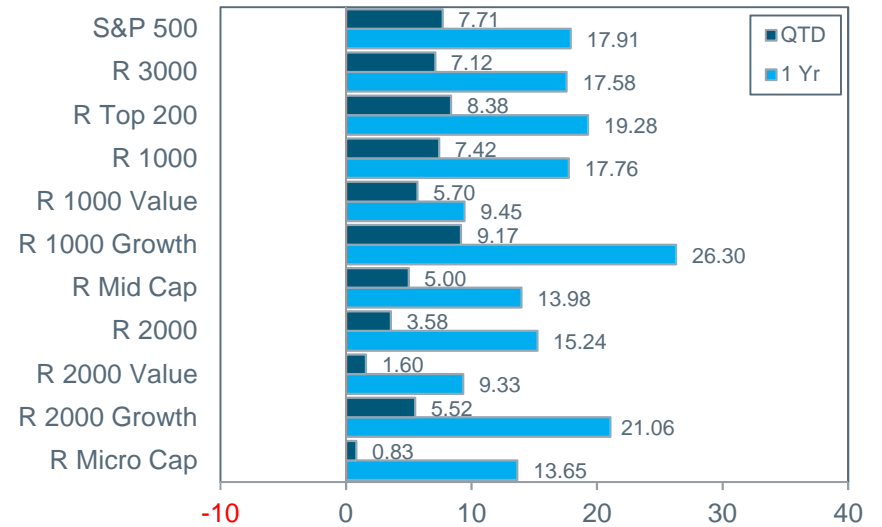
**Market Cap**

Despite continuing global trade tension, markets generally favored larger cap, multinational companies within the US equity markets, a reversal of last quarter.

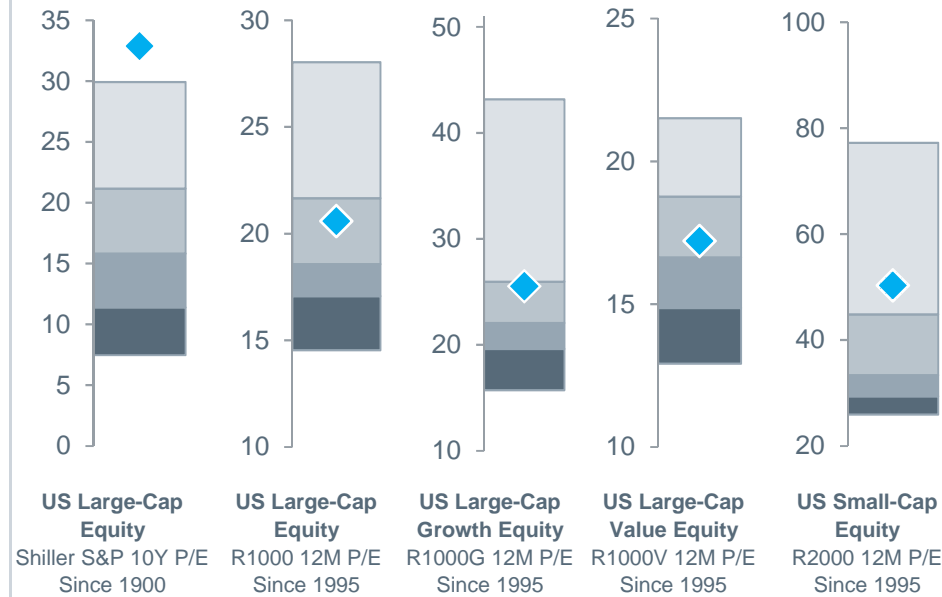
**Style and Sector**

Active management generally struggled in large cap equity in the third quarter, though active small cap managers fared better than their counterparts in the large cap space.

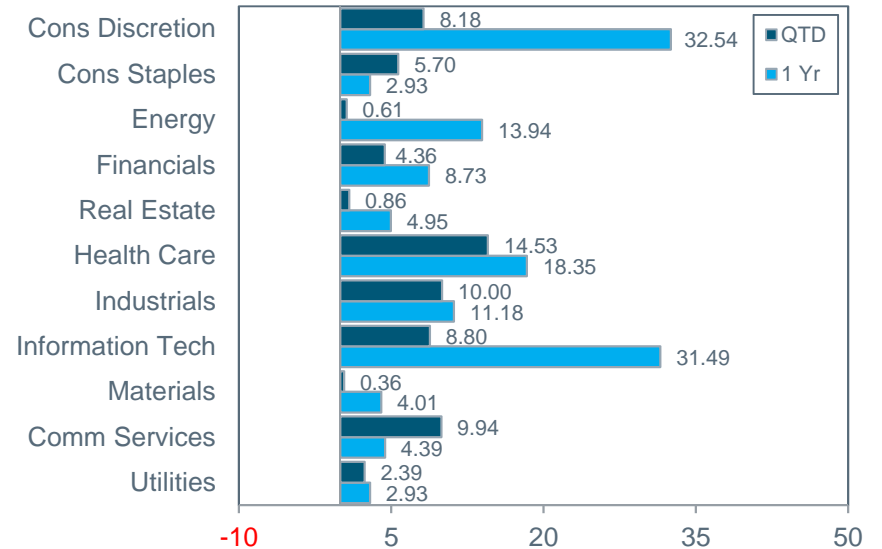
Style and Capitalization Market Performance (%)



Valuations



S&P 500 Index Sector Performance (%)



Valuation data courtesy of Bloomberg Professional Service and Robert J. Shiller, Irrational Exuberance, Second Edition. P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers.



Third Quarter Review

Developed Markets

Developed international markets are still in negative territory year-to-date, despite large cap stocks generating positive returns in Q3. Geopolitical risks, particularly those driven by newly imposed trade tariffs, were cited as dampening near-term expectations for growth outside the US.

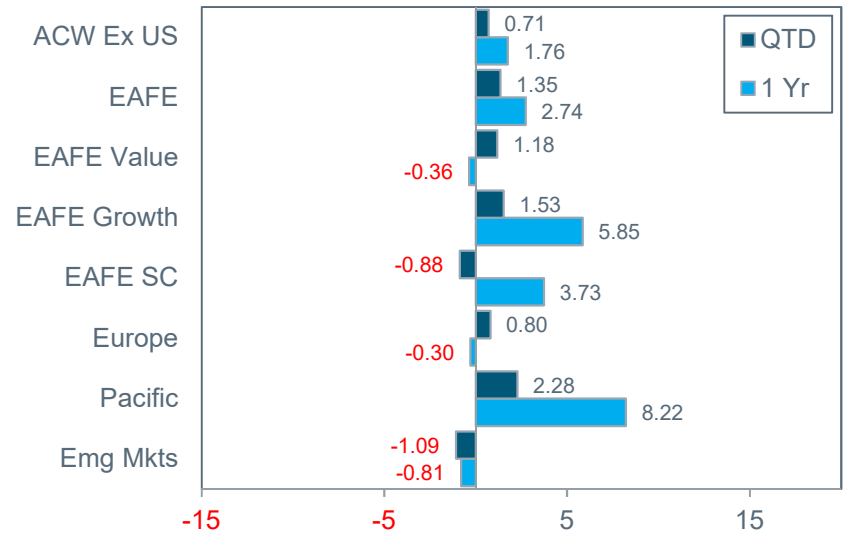
Emerging Markets

Emerging markets were hit harder than their developed market counterparts ending the third quarter with losses. Across most emerging markets, weakening currencies took their toll on dollar-based equity returns.

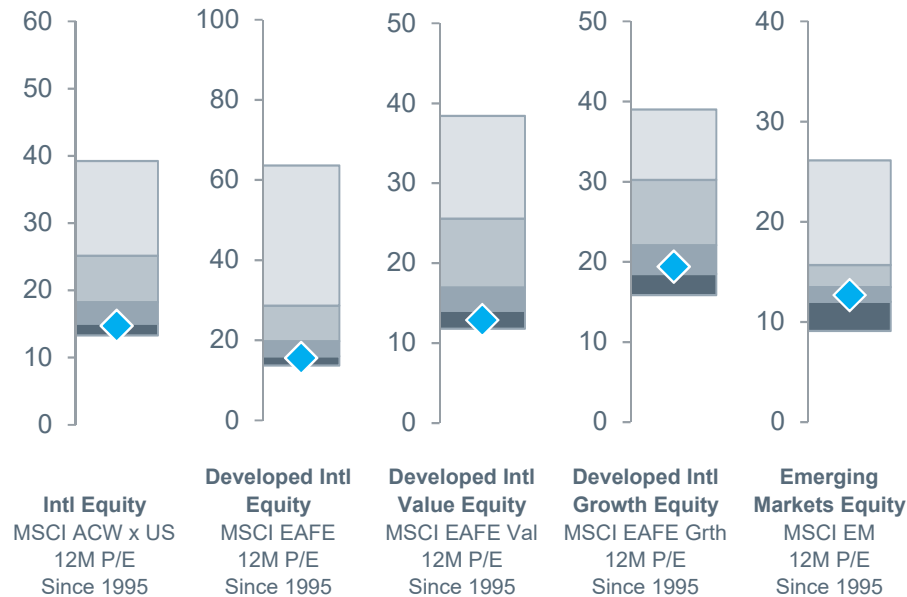
Market Cap & Style

While developed international growth stocks were positive in the quarter, value stocks, continuing to underperform growth stocks, brought down the overall market in the same time period. Small cap stocks trail large cap stocks for the year-to-date period after underperforming again in the third quarter.

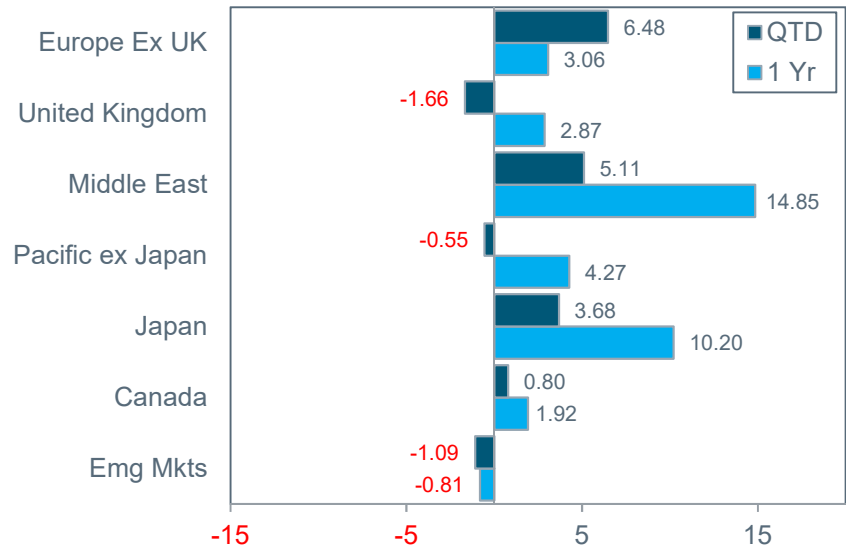
MSCI Style and Capitalization Market Performance (%)



Valuations



MSCI Region Performance (%)



Valuation data courtesy of Bloomberg Professional Service.

P/E metrics shown represent the 5th through 95th percentiles to minimize the effect of outliers. All returns are shown net of foreign taxes on dividends.

Third Quarter Review

**Broad Market**

The Federal Open Market Committee increased the target range for the federal funds rate to 2.00% - 2.25% at the September meeting. The Bloomberg US Agg Bond Index was effectively flat for the quarter with a 0.02% return. US government bonds faced greater headwinds than their corporate counterparts, as an increase in rates across the Treasury yield curve led to negative performance for Treasuries.

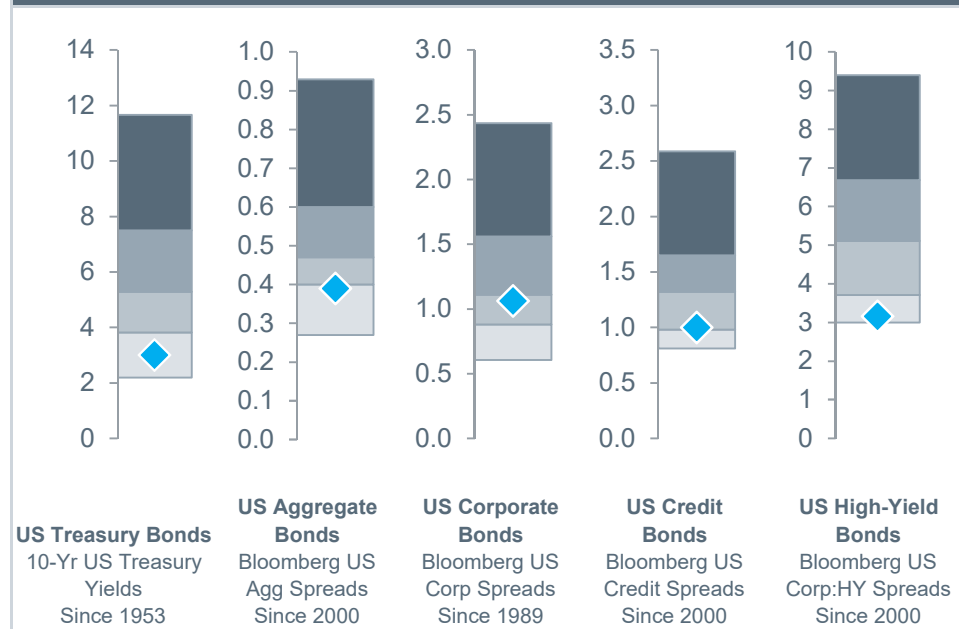
**Credit Market**

In a reversal of the first half of the year, investment grade corporate spreads tightened from 1.3% to 1.1% and the Bloomberg US Corporate Investment Grade Index returned 0.97%. Non-investment grade bonds similarly experienced a spread tightening. The Bloomberg Corporate High Yield Index returned 2.4%.

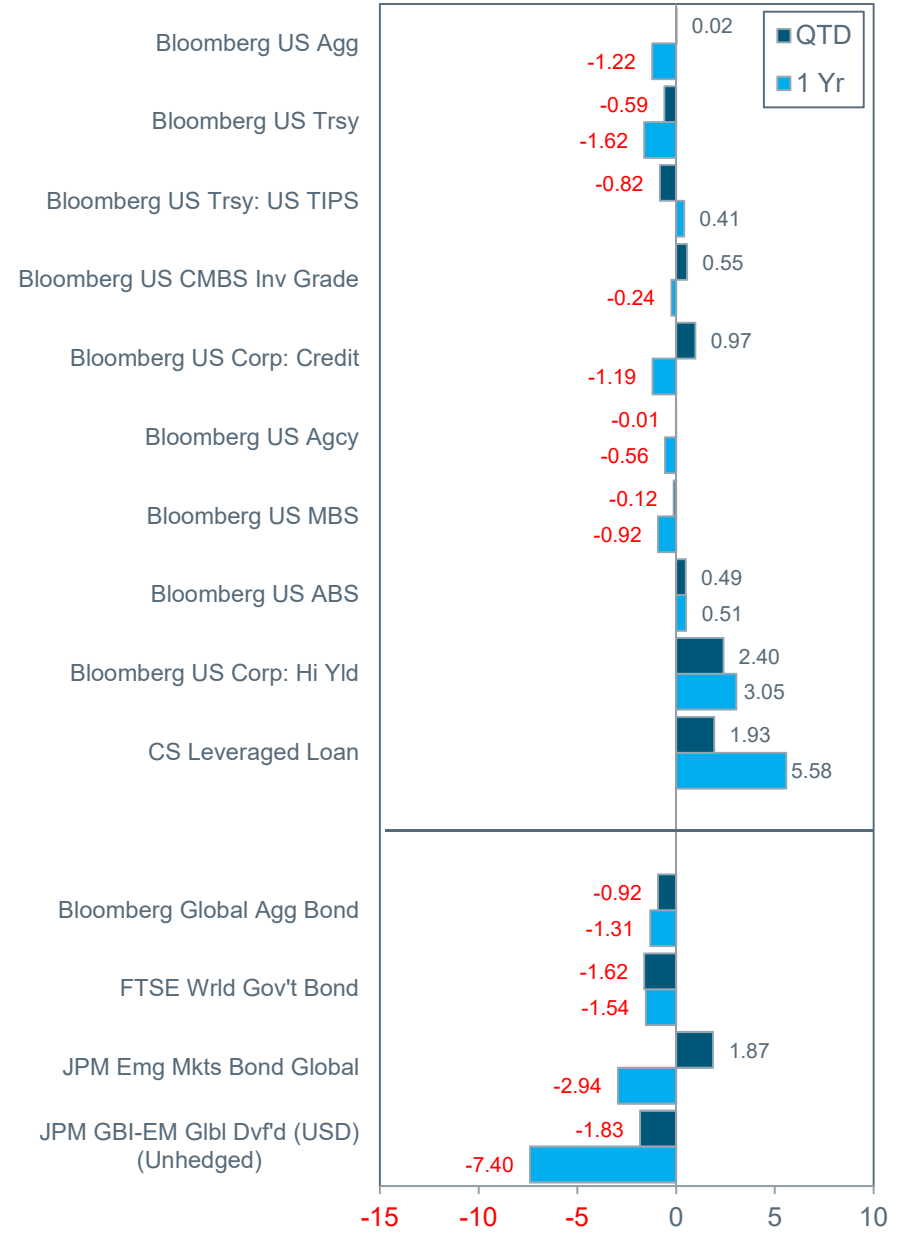
**Emerging Market Debt**

The continued strengthening of the dollar pushed local currency returns lower with a -1.8% return for the JPM GBI-EM Global Diversified Index.

Valuations



Fixed Income Performance (%)



Valuation data courtesy of Bloomberg Professional Service. Valuations shown represent the 5th through 95th percentiles to minimize the effect of outliers.





**Third Quarter Review - Absolute Return**

**General Market - Hedge Funds**

Hedge funds produced modestly positive returns during Q3. However, funds did not generally keep pace with US equity market gains during the months of July and August, even on a beta-adjusted basis. Several Fund of Hedge Fund (FoHF) managers continue to benefit from outsized allocations to a few specific funds within the macro discretionary thematic and multi-strategy relative value spaces.

**General Market - Global Tactical Asset Allocation (GTAA)**

GTAA managers provided mixed results and a wide dispersion of returns during Q3. Most significantly underperformed a static, undiversified blend of 60% US equity and 40% fixed income. Top-down, value-oriented GTAA managers have posted negative returns in a year where value oriented equity holdings have significantly underperformed those with a growth orientation. Many GTAA managers experiencing the worst performance held idiosyncratic exposure to weak, currency-driven markets such as Turkey.

**Third Quarter Review - Real Assets**

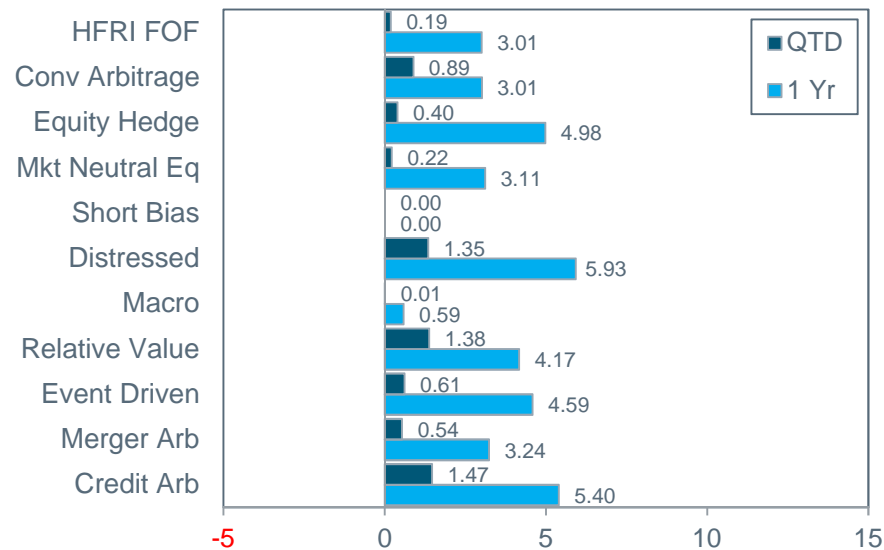
**General Market - Diversified Inflation Strategies (DIS)**

Nearly all DIS managers posted negative returns during Q3. Headline CPI decreased over the quarter from 2.8% in June to 2.3% at the end of Q3, which coincide with headwinds across several inflation sensitive asset classes. Managers with larger exposure to TIPS, commodities and emerging markets currencies performed least favorably as all three asset classes were simultaneously negative amid rising yields in the US and a stronger US dollar.

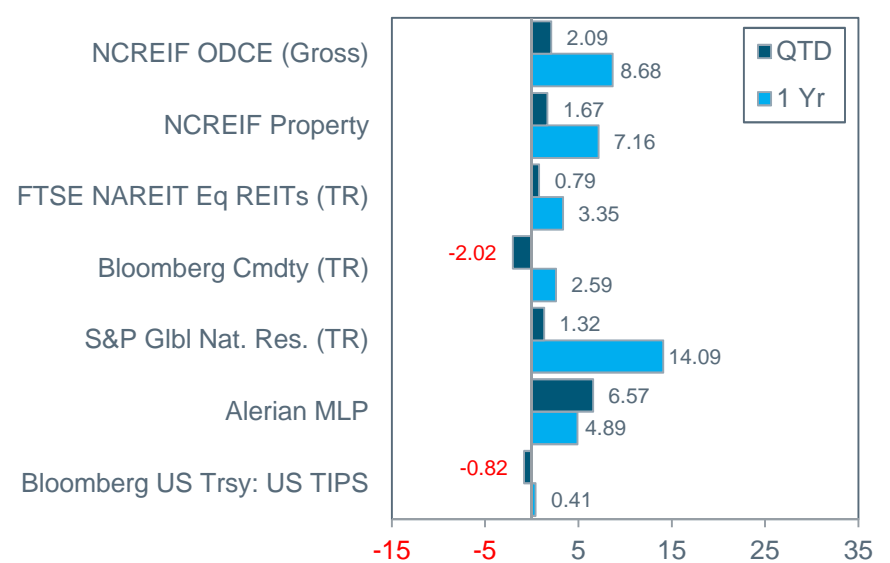
**General Market - Real Estate**

Core private real estate returned 2.1% during Q3 as tracked by the NCREIF-ODCE Index. Investors in publicly traded real estate generally underperformed their private market counterparts during Q3, as measured by FTSE NAREIT Eq REITs Index return of 0.8%. Publicly traded real estate continued to experience price volatility during Q3, but managed to maintain a positive total return year-to-date.

**HFRI Hedge Fund Performance (%)**



**Real Asset Performance (%)**



Calendar Year Performance												Annualized Statistics (01/2006 - 09/2018)			
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	CYTD (As of 09/18)	Return	Standard Deviation	Sharpe Ratio	
Best	5.24	78.79	35.17	15.99	18.64	38.82	14.07	15.02	21.95	27.19	11.51	US Equity Custom Index - US All Cap	9.10	13.86	0.61
	3.06	49.13	26.85	14.47	16.83	32.39	13.88	13.33	21.31	21.83	10.57	S&P 500 Index - US Large Cap	9.15	13.85	0.62
	-5.22	45.12	21.74	14.26	16.76	32.39	13.69	5.65	13.11	21.13	10.56	Russell 2000 Index - US Small Cap	8.99	18.43	0.50
	-6.46	45.01	16.77	11.11	16.35	29.75	12.50	5.47	12.74	17.52	10.47	International Equity Custom Index - International	3.68	16.97	0.23
	-10.01	32.46	16.36	7.84	16.00	24.96	11.82	1.38	11.96	15.21	8.22	Cambridge US PE Index - Private Equity	11.92	9.68	1.10
	-21.37	27.17	15.68	3.49	16.00	21.08	11.22	0.55	10.69	14.65	7.46	NCREIF ODCE Index - Core Real Estate	6.92	8.22	0.72
	-22.61	26.46	15.06	2.11	14.96	15.29	9.42	0.48	10.44	13.70	6.48	NCREIF Property Index - Value-Added Real Estate	7.67	6.15	1.06
	-23.62	26.46	15.06	2.11	13.36	13.94	7.66	0.18	9.94	9.11	5.27	HFRI FOF Comp Index	2.49	5.04	0.28
	-26.11	21.98	14.99	0.66	10.94	10.98	5.97	-0.27	8.77	7.77	2.48	ICE BofAML All Cnvrts Index (All Qual) - Convertibles	7.91	11.58	0.62
	-33.79	13.41	13.11	-1.16	10.77	8.96	4.89	-1.47	7.97	7.62	1.48	S&P U.S. Preferred Stock Index	5.01	17.05	0.31
	-35.73	11.47	10.82	-1.75	10.54	4.22	3.37	-3.24	4.50	6.96	1.21	S&P MLP Index (TR)	8.43	18.60	0.47
	-37.00	5.93	9.28	-4.18	4.95	0.12	2.95	-4.41	2.65	5.20	0.92	Bloomberg US Agg Bond Index - Fixed Income	3.89	3.12	0.86
	-37.00	1.17	6.54	-5.18	4.79	-0.17	0.18	-5.66	1.94	3.54	-1.60	Credit Custom Index - Fixed Income	5.40	6.55	0.65
	-37.46	-16.85	5.70	-5.72	4.21	-2.02	-3.87	-14.92	0.51	0.84	-3.09	JPM GBI-EM Gbl Dvf'd Index (USD) - EMD	4.60	12.52	0.33
Worst	-43.06	-29.76	0.73	-13.71	0.26	-8.98	-5.72	-35.07	0.38	-5.58	-8.15	JP Morgan Cash Custom Index - Cash Equiv	1.48	0.57	1.24

The Cambridge US Private Equity Index is shown for informational purposes only. Due to availability of data, current quarter performance assumes a 0.00% return. Calculations are based on a quarterly periodicity.



## ASSET CLASS SUMMARY

**US Equity:** The **US Equity** structure employs a core-satellite approach, which gains passive, low-cost beta exposure at its core and active management only where the highest conviction strategies can add value – All Cap. The core component of the portfolio utilizes passive management coupled with low beta, minimum volatility strategies that are intended to outperform a market-capitalization weighted index at a similar absolute risk level. Active management in the All Cap space provides investment managers the flexibility to adjust for valuations across market capitalizations. The single Small Cap investment manager is an exchange-traded fund designed to track the Small Cap market benchmark.

**International Equity:** The **International Equity** structure follows an ACWI Ex US approach, which offers coverage of the broad international equity market, including developed and emerging markets. The International Equity portfolio is comprised of both passive and active management styles. The mix of passive and active management helps to minimize costs, while striving to maximize the probability of alpha generation at a similar absolute risk level.

**Private Equity:** The **Private Equity** asset class has primarily been accessed through fund of funds and customized fund of one structures. Investments also include exposure to direct co-investments and secondaries. Recent commitments within this asset class have added global diversification to the portfolio.

**Real Estate:** The **Real Estate** portfolio currently consists of Core and Non-Core Real Estate investments. The overall asset class structure has remained relatively conservative with regard to asset types and the use of financial leverage. Core Real Estate has historically been focused on diversified US markets, while Non-Core Real Estate investments allow the portfolio to take advantage of real estate market fundamentals. Recent commitments within Non-Core Real Estate have added global diversification through European-focused investments.

**Diversified Hedge Funds:** The **Diversified Hedge Funds** structure historically consisted of multi-Hedge Fund of Fund investments. In 2015, the portfolio began a transition to a core-satellite approach, utilizing a single Fund of Fund manager and satellite direct Hedge Funds. Initial funding was completed in July 2018 for a custom fund of one, consisting of a discretionary multi-strategy FoF portfolio and a non-discretionary portfolio of direct hedge funds managed by the Treasurer's Office. An increase in the use of direct Hedge Funds is anticipated to lower external management expenses and allow for greater control over the program.

**Convertible Bonds:** The **Convertible Bonds** portfolio consists of a single, specialized investment manager. The portfolio focuses on convertible issuers that demonstrate the ability to improve fundamental characteristic and attempts to participate in the majority of the upside, while limiting the downside of the underlying equity to nearly half.

**Preferred Stock:** The **Preferred Stock** portfolio consists of a single, specialized preferred stock investment manager. The portfolio invests in a diversified portfolio of preferred securities including exchange-traded and over-the-counter preferreds and contingent convertibles (CoCos). The investment team seeks to take advantage of the various term structures of preferreds in order to optimize the yield and interest rate sensitivity of the portfolio.

**MLPs:** The **MLPs** portfolio consists of a single, specialized investment manager. The portfolio investment objective is to deliver both high yield and stable growth through the disciplined application of its fundamental bottom-up analysis as well as its trading strategies and investments in MLP and energy infrastructure assets.

**Fixed Income:** The **Fixed Income** portfolio employs a core-satellite approach. Serving as “the anchor” to the portfolio, Core Fixed Income aims to preserve capital, by providing relatively “safe” investments and stable income. The Internally Managed Portfolio also provides liquidity and safety of capital. Treasury Inflation Protected Securities (“TIPS”) provide passive protection against expected changes in inflation. The satellite portfolios serve as dedicated specialists. Credit Fixed Income provides diversification from traditional fixed income investments and the potential for enhanced return. The custom credit portfolios are largely driven by allocations to bank loans, high yield fixed income securities, and investment grade credit. Investments in Emerging Market Debt (Local Currency) diversify US Dollar exposure and provide opportunities to capitalize on global growth trends. Opportunistic Fixed Income is employed to capitalize on severe market dislocations, such as European Debt.

## INDEX GLOSSARY

**Total Equity Custom Index:** The **Total Equity Custom Index** consists of the MSCI World Index through July 2010 and the MSCI All Country World Index thereafter.

**MSCI World:** The **MSCI World Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets. The index consists of the following developed market countries: *Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States.*

**MSCI ACW:** The **MSCI All Country World Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. The index consists of the 23 developed countries that make up the MSCI World Index as well as the following emerging market countries: *Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey, and United Arab Emirates.*

**US Equity Custom Index:** The **US Equity Custom Index** consists of the S&P 500 Index (Cap Wtd) through September 2014 and the Russell 3000 Index thereafter.

**S&P 500:** The **S&P 500 Index (Cap Wtd)** is a commonly recognized, market-capitalization weighted index of 500 widely held equity securities designed to measure broad US equity performance.

**S&P MLP:** The **S&P MLP Index** is a float-adjusted, cap-weighted index of energy MLPs and publicly traded limited liability companies, which have a similar legal structure to MLPs and share the same tax benefits. Constituents must have a minimum float-adjusted market cap of USD 300 million.

**S&P U.S. Preferred Stock:** The **S&P U.S. Preferred Stock Index** covers the US market of capital stock that pays dividends at a specified rate and has a preference over common stock in the payment of dividends and the liquidation of assets.

**S&P/LSTA Leveraged Loan:** The **S&P/LSTA Leveraged Loan Index** reflects the market-weighted performance of institutional leveraged loans in the U.S. loan market.

**Russell 3000:** The **Russell 3000 Index** is a market-capitalization weighted index of 3,000 widely held equity securities designed to measure performance of the entire U.S. stock market.

**State Street All Cap Custom Index:** The **State Street All Cap Custom Index** consists of 69% Russell 3000 Index, 24% FTSE RAFI US 1000 Index, and 7% MSCI USA Minimum Volatility Index.

**Russell 2000:** The **Russell 2000 Index** measures the performance of the small-cap segment of the US equity market. It includes approximately 2,000 of the smallest securities by market cap from the Russell 3000 Index.

**International Equity Custom Index:** The **International Equity Custom Index** consists of the MSCI EAFE Index through July 2010 and the MSCI ACW Ex US Index thereafter.

**MSCI EAFE:** The **MSCI EAFE (Europe, Australasia, Far East) Index** is designed to measure equity market performance of 21 developed countries, excluding the US & Canada: *Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom.*

**MSCI ACW Ex US:** The **MSCI ACW (All Country World) Ex US Index** consists of large cap and mid cap representation within the same countries that comprise the MSCI ACW Index, excluding the United States.

**MSCI ACW Ex US IM:** The **MSCI ACW (All Country World) Ex US Investable Market Index** consists of large cap, mid cap, and small cap representation within the same countries that comprise the MSCI ACW Index, excluding the United States.

**FTSE All World Ex US:** The **FTSE All World Ex US Index** is a free float-adjusted market capitalization weighted index that is comprised of large- and mid-cap stocks providing coverage of Developed and Emerging Markets excluding the US. The index is derived from the FTSE Global Equity Index Series (GEIS), which covers 98% of the world's investable market capitalization.

**NCREIF ODCE:** The **NCREIF ODCE (Open End Diversified Core) Index** is an index of investment returns reporting on both a historical and current basis the results of 16 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NCREIF ODCE Index is capitalization-weighted and performance is time-weighted.

**NCREIF Property:** The **NCREIF Property Index** prepared by the National Council of Real Estate Investment Fiduciaries is a quarterly time series composite return measure for over 6,000 individual commercial real estate properties acquired in the private market for investment purposes. Total performance represents returns from appreciation and income, and includes multi-family, office, retail, and industrial properties.

**HFRI FOF Comp Index:** The **HFRI FOF (Fund of Funds) Comp Index** average is created by Hedge Fund Research, Inc. and contains over 800 funds of hedge funds that are each invested in multiple investment strategies.

**ICE BofAML All Convertibles:** The **ICE BofA Merrill Lynch All Convertibles Index (All Qualities)** is a market capitalization-weighted index of domestic corporate convertible securities that are convertible to common stock.

**Bloomberg US Agg Bond:** The **Bloomberg US Aggregate Bond Index** covers the US dollar-denominated, investment-grade, fixed-rate, taxable bond market of SEC-registered securities: US Treasury and agency bonds, domestic corporate debt, and mortgage-backed securities.

**Bloomberg US Agg Int Index:** The **Bloomberg US Aggregate Intermediate Index** covers the subsection of the Bloomberg US Aggregate Bond Index with remaining maturities between one and ten years.

**Credit Custom Index:** The **Credit Custom Index** consists of 20% Bloomberg US Credit Index, 20% ICE BofA Merrill Lynch US High Yield Master II Constrained Index, and 60% S&P/LSTA Leveraged Loan Index.

**CS Western European Hi Yld:** The **Credit Suisse Western European High Yield Index** is designed to mirror the investable universe of the Western European high yield debt market. The index includes issues denominated in \$US and Western European currencies.

**JPMorgan GBI-EM Gbl Dvf'd:** The **JPMorgan GBI-EM Global Diversified Total Return Index (Unhedged)** is a global emerging markets index that consists of regularly traded, liquid fixed-rate, domestic currency government bonds.

**Bloomberg US Trsy: US TIPS:** The **Bloomberg US Treasury: US TIPS Index** is an unmanaged index that consists of inflation-protected securities issued by the U.S. Treasury.

**Bloomberg US Govt: Int Trm Bond:** The **Bloomberg US Gov't Intermediate Term Bond Index** covers public US government obligations with remaining maturities between one and ten years.

**Bloomberg US Gov't/Credit 1-3 Yr Bond Index:** The **Bloomberg US Gov't/Credit 1-3 Year Bond Index** covers all medium and larger issues of U.S. government, investment-grade corporate, and investment-grade international dollar-denominated bonds that have maturities of between one and three years and are publicly issued.

**Bloomberg US Gov't 1-3 Yr Bond Index:** The **Bloomberg US Gov't 1-3 Year Bond Index** covers public US government obligations with remaining maturities between one and three years.

**Bloomberg US Gov't/Credit Bond:** The **Bloomberg US Gov't/Credit Bond Index** covers the non-securitized component of the US Aggregate Index. It includes investment grade, US dollar denominated, fixed-rate Treasuries, government-related and corporate securities.

**C.S. McKee Custom Index:** The **C.S. McKee Custom Index** consists of the Bloomberg US Agg Bond Index through January 2018 and the Bloomberg US Agg Int Index thereafter.

**PIMCO Custom Index:** The **PIMCO Custom Index** consists of the Bloomberg US Agg Bond Index through February 2018 and the Bloomberg US Agg Int Index thereafter.

**ICE BofAML 3 Mo US T-Bill:** The **ICE BofA Merrill Lynch 3-Month US T-Bill Index** consists of newly issued 90-day Treasury bills.

**JP Morgan Blended Index:** The **JP Morgan Blended Index** consists of an equal-weighted allocation to the ICE BofAML 1-3 Year US Treasury Index, ICE BofAML 1-3 Year Agencies Index, and ICE BofAML 0-3 Year Weighted Average Life Mortgage Index.

**Wyoming State Treasurer's Office**  
**Investment Performance**  
September 30, 2018

**Investment Policy:**

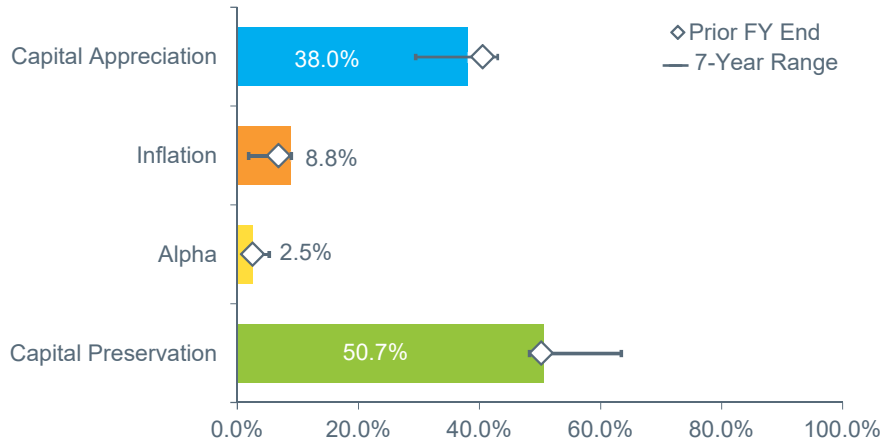
It is the investment policy for the State Loan and Investment Board to invest public funds of the State of Wyoming in a manner that strives for maximum safety, provides adequate liquidity to meet all operating requirements, and achieves the highest possible investment return consistent with the primary objectives of safety and liquidity.

**Investment Objectives and Priorities:**

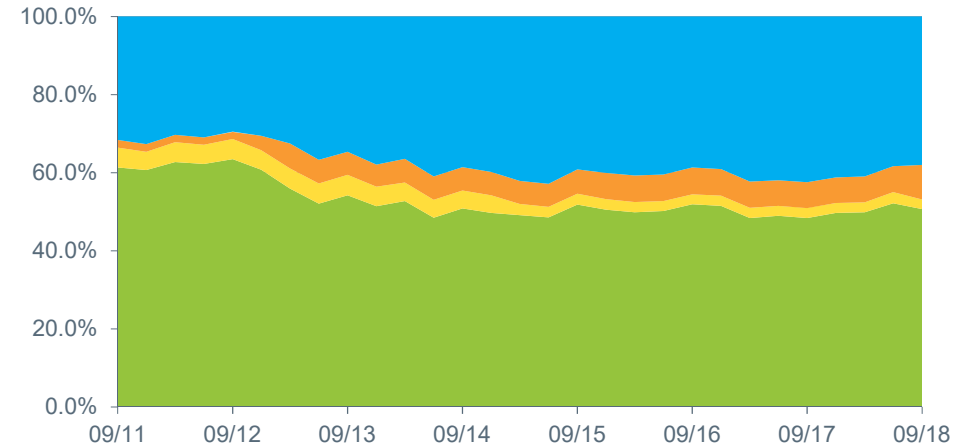
All available funds shall be invested with the following objectives and priorities:

- a) Safety of principal. Investments shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio.
- b) Liquidity requirements of anticipated and unanticipated expenditures.
- c) Yield.
- d) Recognition of differing objectives and needs of various fund portfolios.
- e) Conformance with State law and other pertinent legal restrictions.
- f) Maximization of the total rate of return on investment consistent with the foregoing objectives.
- g) Diversification by asset type, security, and investment manager in order to smooth the volatility of quarterly returns.

**Current Asset Allocation:**



**Historical 7-Year Asset Allocation:**



**Historical Performance:**

	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,770.53</b>	<b>\$20,599.86</b>	<b>\$20,666.86</b>	<b>100.0%</b>	<b>1.07%</b>	<b>1.07%</b>	<b>3.05%</b>	<b>5.25%</b>	<b>4.38%</b>	<b>5.34%</b>
<i>Wyoming State Actual Allocation Index</i>					<i>0.90%</i>	<i>0.90%</i>	<i>2.49%</i>	<i>4.77%</i>	<i>4.27%</i>	<i>4.98%</i>
<b>Permanent Funds</b>	<b>\$14,001.75</b>	<b>\$14,755.75</b>	<b>\$14,933.63</b>	<b>72.3%</b>	<b>1.13%</b>	<b>1.13%</b>	<b>3.47%</b>	<b>6.33%</b>	<b>5.15%</b>	<b>5.96%</b>
<b>Non-Permanent Funds</b>	<b>\$5,768.78</b>	<b>\$5,844.12</b>	<b>\$5,733.24</b>	<b>27.7%</b>	<b>0.57%</b>	<b>0.57%</b>	<b>1.01%</b>	<b>2.27%</b>	<b>2.18%</b>	<b>3.75%</b>

Note[1]: Performance shown is net of fees.  
Note[2]: Pooled investment performance and market values shown reflect State Agency participation and are calculated on a capital-weighted basis using beginning-period allocations.  
Note[3]: Thematic allocations shown exclude Public Purpose Investments.  
Note[4]: The Wyoming State Actual Allocation Index is calculated using beginning-month asset class weights applied to the appropriate asset class benchmark return.  
Note[5]: Market Value and Total Investment Value are shown in (\$) Millions.



**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**  
September 30, 2018

	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,770,526,832</b>	<b>\$20,599,864,561</b>	<b>\$20,666,862,451</b>	<b>100.0%</b>	<b>1.07%</b>	<b>1.07%</b>	<b>3.05%</b>	<b>5.25%</b>	<b>4.38%</b>	<b>5.34%</b>
<i>Wyoming State Actual Allocation Index</i>					<i>0.90%</i>	<i>0.90%</i>	<i>2.49%</i>	<i>4.77%</i>	<i>4.27%</i>	<i>4.98%</i>
<b>Investment Funds:</b>										
Permanent Mineral Trust	\$7,321,942,294	\$7,807,061,216	\$7,880,039,927	38.1%	1.17%	1.17%	3.78%	6.68%	5.38%	5.90%
Common School Perm Land Fund	\$3,801,262,045	\$3,989,288,968	\$4,066,706,808	19.7%	1.15%	1.15%	3.62%	6.69%	5.43%	6.12%
Permanent Land Fund	\$180,019,952	\$198,047,815	\$193,817,701	0.9%	1.09%	1.09%	3.65%	6.52%	5.27%	5.74%
University Permanent Land Fund	\$20,527,095	\$23,206,526	\$23,612,128	0.1%	1.56%	1.56%	4.94%	7.46%	5.81%	5.85%
Hathaway Scholarship	\$558,321,307	\$582,413,022	\$591,309,254	2.9%	1.16%	1.16%	3.13%	5.91%	4.84%	6.17%
Higher Education	\$114,253,025	\$120,117,913	\$120,807,617	0.6%	1.17%	1.17%	3.01%	5.87%	4.79%	6.11%
Workers Compensation Fund	\$2,005,420,148	\$2,035,610,128	\$2,057,333,271	10.0%	0.90%	0.90%	2.09%	4.51%	3.91%	5.75%
Pool A*	\$237,901,809	\$238,849,216	\$245,796,842	1.2%	0.45%	0.45%	0.55%	2.47%	2.48%	4.33%
State Agency Pool*	\$5,530,879,156	\$5,605,269,757	\$5,487,438,903	26.6%	0.57%	0.57%	1.03%	2.27%	2.18%	3.75%
<b>Asset Class Performance:</b>										
US Equity US Equity Custom Index	\$1,222,959,500	\$1,579,557,486	\$1,656,433,893	8.0%	6.41%	6.41%	14.69%	15.49%	12.68%	11.78%
International Equity International Equity Custom Index	\$1,831,125,104	\$2,083,396,150	\$2,088,230,910	10.1%	1.19%	1.19%	1.33%	10.02%	4.16%	5.25%
Preferred Stock S&P US Preferred Stock Index	\$85,000,000	\$85,000,000	\$86,139,590	0.4%	1.55%	1.55%	N/A	N/A	N/A	N/A
MLPs S&P MLP Index (TR)	\$450,000,000	\$0	\$442,256,551	2.1%	N/A	N/A	N/A	N/A	N/A	N/A
Private Equity S&P 500 + 5%	\$388,962,173	\$641,124,533	\$624,340,309	3.0%			See Note[6]			
Core Real Estate NCREIF ODCE	\$507,607,260	\$624,001,639	\$628,888,982	3.0%	1.61%	1.61%	8.00%	7.77%	9.64%	4.23%
Value-Added Real Estate NCREIF Property	\$261,224,422	\$299,988,420	\$293,172,244	1.4%			See Note[6]			
Diversified Hedge Funds HFRI FOF Comp Index	\$498,662,402	\$586,408,113	\$501,548,021	2.4%	0.23%	0.23%	2.77%	2.11%	2.65%	3.88%
Convertible Bonds ICE BofAML All Quality Convertible	\$486,668,624	\$546,160,344	\$574,646,540	2.8%	5.45%	5.45%	16.39%	12.03%	8.90%	11.08%
Fixed Income Bloomberg US Aggregate	\$11,345,068,382	\$11,279,881,593	\$11,076,360,096	53.6%	0.28%	0.28%	0.00%	2.19%	2.30%	4.24%
Public Purpose Investments	\$425,861,487	\$324,211,740	\$425,861,487	2.1%	N/A	N/A	N/A	N/A	N/A	N/A
Cash Equivalents JP Morgan Cash Custom Index	\$2,267,387,478	\$2,550,134,544	\$2,268,983,827	11.0%	0.47%	0.47%	1.42%	0.83%	0.57%	0.62%

\* Denotes Non-Permanent Fund.

Note[1]: Performance shown is net of fees. Investment performance is calculated on invested assets only.

Note[2]: Pooled investment performance and market values shown reflect State Agency participation and are calculated on a capital-weighted basis using beginning-period allocations.

Note[3]: US Equity Custom Index consists of S&P 500 (Cap Wtd) through September 2014 and the Russell 3000 thereafter.

Note[4]: International Equity Custom Index consists of MSCI EAFE (Gross) through July 2010 and the MSCI ACW Ex US (Net) thereafter.

Note[5]: Market values for non-core real estate and private equity are as of the most recent valuation, adjusted for subsequent cash flows. Investment (Cost) Values are not lagged.

Note[6]: Performance for Private Equity and Value-Added Real Estate investments is calculated on an IRR basis. For further analysis, please refer to the supplementary alternatives performance report.

Note[7]: Cash Equivalents performance includes Extended Cash performance.

Note[8]: Market values shown for Public Purpose Investments reflect cost value of the investments.

Note[9]: The Arrowstreet mandate was converted from global equity to international equity on March 1, 2018.

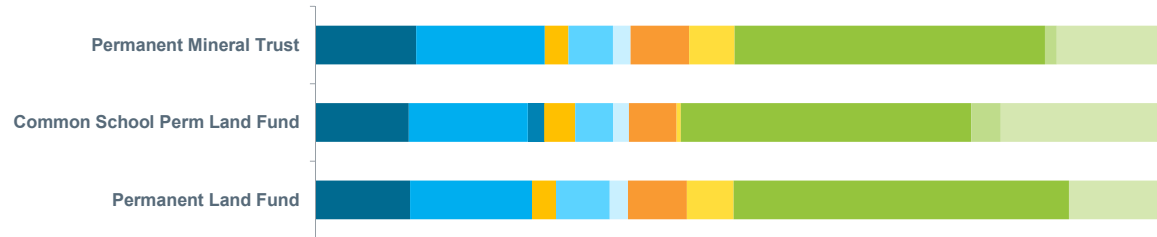
Note[10]: Composite performance shown for Fixed Income is historically exclusive of convertibles.





**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**  
September 30, 2018

	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,770,526,832</b>	<b>\$20,599,864,561</b>	<b>\$20,666,862,451</b>	<b>100.0%</b>	<b>1.07%</b>	<b>1.07%</b>	<b>3.05%</b>	<b>5.25%</b>	<b>4.38%</b>	<b>5.34%</b>
<b>Investment Funds:</b>										
<b>Permanent Mineral Trust</b>	<b>\$7,321,942,294</b>	<b>\$7,807,061,216</b>	<b>\$7,880,039,927</b>	<b>100.0%</b>	<b>1.17%</b>	<b>1.17%</b>	<b>3.78%</b>	<b>6.68%</b>	<b>5.38%</b>	<b>5.90%</b>
US Equity	\$699,688,431	\$902,200,321	\$946,882,904	12.0%						
International Equity	\$1,053,947,839	\$1,195,656,643	\$1,198,445,544	15.2%						
MLPs	\$225,632,594	\$0	\$221,749,984	2.8%						
Private Equity	\$263,963,253	\$427,185,212	\$417,142,176	5.3%						
Real Estate	\$465,872,035	\$547,895,605	\$546,566,516	6.9%						
Diversified Hedge Funds	\$424,565,726	\$350,380,482	\$426,561,093	5.4%						
Convertible Bonds	\$137,484,327	\$154,560,618	\$162,622,068	2.1%						
Fixed Income	\$2,983,634,552	\$2,942,548,132	\$2,900,414,458	36.8%						
Public Purpose Investments	\$112,451,750	\$123,953,002	\$112,451,750	1.4%						
Cash (invested in State Agency Pool)	\$954,701,788	\$1,162,681,202	\$947,203,435	12.0%						
<i>Actual Allocation Index</i>					1.22%	1.22%	3.89%	6.53%	5.43%	5.54%
<b>Common School Perm Land Fund</b>	<b>\$3,801,262,045</b>	<b>\$3,989,288,968</b>	<b>\$4,066,706,808</b>	<b>100.0%</b>	<b>1.15%</b>	<b>1.15%</b>	<b>3.62%</b>	<b>6.69%</b>	<b>5.43%</b>	<b>6.12%</b>
US Equity	\$334,062,955	\$431,979,724	\$452,746,822	11.1%						
International Equity	\$501,869,894	\$570,972,998	\$572,307,830	14.1%						
Preferred Stock	\$78,121,884	\$78,121,884	\$79,169,259	1.9%						
MLPs	\$152,291,163	\$0	\$149,670,588	3.7%						
Private Equity	\$106,989,325	\$190,648,126	\$183,498,658	4.5%						
Real Estate	\$191,950,443	\$229,728,008	\$229,277,720	5.6%						
Diversified Hedge Funds	\$19,547,378	\$127,081,061	\$19,973,797	0.5%						
Convertible Bonds	\$65,130,000	\$72,514,640	\$76,296,801	1.9%						
Fixed Income	\$1,443,219,802	\$1,234,096,745	\$1,401,692,339	34.5%						
Public Purpose Investments	\$143,359,738	\$18,359,738	\$143,359,738	3.5%						
Cash (invested in State Agency Pool)	\$764,719,464	\$1,035,786,044	\$758,713,256	18.7%						
<i>Actual Allocation Index</i>					1.17%	1.17%	3.58%	6.49%	5.46%	5.59%
<b>Permanent Land Fund</b>	<b>\$180,019,952</b>	<b>\$198,047,815</b>	<b>\$193,817,701</b>	<b>100.0%</b>	<b>1.09%</b>	<b>1.09%</b>	<b>3.65%</b>	<b>6.52%</b>	<b>5.27%</b>	<b>5.74%</b>
US Equity	\$16,263,935	\$20,864,116	\$21,903,872	11.3%						
International Equity	\$24,410,296	\$27,838,662	\$27,902,846	14.4%						
MLPs	\$5,667,855	\$0	\$5,570,324	2.9%						
Private Equity	\$8,082,341	\$12,731,523	\$12,335,528	6.4%						
Real Estate	\$11,567,143	\$13,616,536	\$13,587,718	7.0%						
Diversified Hedge Funds	\$10,625,218	\$8,710,560	\$10,693,455	5.5%						
Convertible Bonds	\$3,549,159	\$3,962,941	\$4,169,637	2.2%						
Fixed Income	\$79,187,347	\$78,264,960	\$77,149,983	39.8%						
Cash (invested in State Agency Pool)	\$20,666,657	\$32,058,517	\$20,504,338	10.6%						
<i>Actual Allocation Index</i>					1.12%	1.12%	3.78%	6.33%	5.31%	5.35%

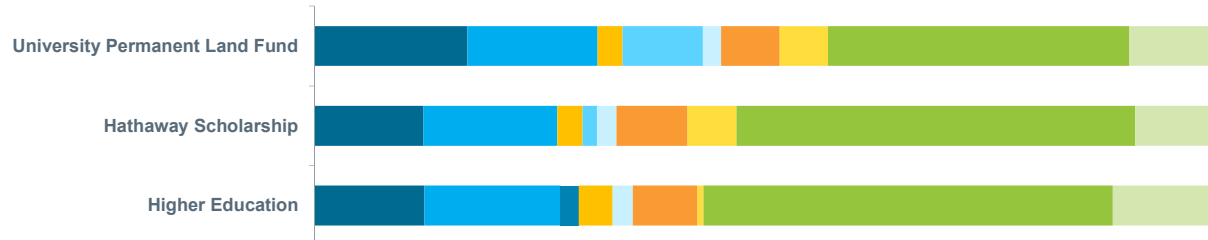


Note[1]: Performance shown is net of fees.  
Note[2]: Pooled investment performance and market values shown reflect State Agency participation.  
Note[3]: Pooled investment and Actual Allocation Index performance is calculated on a capital-weighted basis using beginning-period allocations.  
Note[4]: Market values shown for Public Purpose Investments reflect cost value of the investments.  
Note[5]: The Arrowstreet mandate was converted from global equity to international equity on March 1, 2018.



**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**  
September 30, 2018

	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Investment Funds:</b>										
<b>University Permanent Land Fund</b>	<b>\$20,527,095</b>	<b>\$23,206,526</b>	<b>\$23,612,128</b>	<b>100.0%</b>	<b>1.56%</b>	<b>1.56%</b>	<b>4.94%</b>	<b>7.46%</b>	<b>5.81%</b>	<b>5.85%</b>
US Equity	\$2,735,139	\$3,734,945	\$3,967,650	16.8%						
International Equity	\$2,918,490	\$3,370,941	\$3,378,833	14.3%						
MLPs	\$663,254	\$0	\$651,840	2.8%						
Private Equity	\$697,342	\$2,055,536	\$2,085,285	8.8%						
Real Estate	\$1,355,755	\$1,524,457	\$1,519,850	6.4%						
Diversified Hedge Funds	\$1,249,963	\$1,050,152	\$1,257,930	5.3%						
Convertible Bonds	\$396,770	\$448,651	\$472,052	2.0%						
Fixed Income	\$8,037,669	\$7,942,943	\$7,825,396	33.1%						
Cash (invested in State Agency Pool)	\$2,472,712	\$3,078,901	\$2,453,291	10.4%						
<i>Actual Allocation Index</i>					1.51%	1.51%	5.02%	7.32%	5.88%	5.66%
<b>Hathaway Scholarship</b>	<b>\$558,321,307</b>	<b>\$582,413,022</b>	<b>\$591,309,254</b>	<b>100.0%</b>	<b>1.16%</b>	<b>1.16%</b>	<b>3.13%</b>	<b>5.91%</b>	<b>4.84%</b>	<b>6.17%</b>
US Equity	\$52,251,339	\$67,496,921	\$70,862,560	12.0%						
International Equity	\$75,304,883	\$86,862,174	\$87,053,179	14.7%						
MLPs	\$16,699,750	\$0	\$16,412,386	2.8%						
Private Equity	\$9,229,912	\$8,504,136	\$9,278,662	1.6%						
Real Estate	\$36,017,456	\$46,159,970	\$46,081,613	7.8%						
Diversified Hedge Funds	\$31,715,722	\$27,941,928	\$31,863,993	5.4%						
Convertible Bonds	\$10,710,409	\$12,172,394	\$12,807,272	2.2%						
Fixed Income	\$268,123,200	\$262,978,800	\$259,138,602	43.8%						
Cash (invested in State Agency Pool)	\$58,268,637	\$70,296,700	\$57,810,987	9.8%						
<i>Actual Allocation Index</i>					1.22%	1.22%	3.21%	5.80%	4.98%	5.80%
<b>Higher Education</b>	<b>\$114,253,025</b>	<b>\$120,117,913</b>	<b>\$120,807,617</b>	<b>100.0%</b>	<b>1.17%</b>	<b>1.17%</b>	<b>3.01%</b>	<b>5.87%</b>	<b>4.79%</b>	<b>6.11%</b>
US Equity	\$10,779,886	\$13,902,792	\$14,597,115	12.1%						
International Equity	\$15,620,167	\$18,032,477	\$18,072,689	15.0%						
Preferred Stock	\$2,376,100	\$2,376,100	\$2,407,956	2.0%						
MLPs	\$4,594,537	\$0	\$4,515,475	3.7%						
Real Estate	\$6,722,146	\$8,593,415	\$8,586,408	7.1%						
Diversified Hedge Funds	\$770,010	\$5,006,285	\$786,875	0.7%						
Convertible Bonds	\$2,248,679	\$2,562,780	\$2,696,448	2.2%						
Fixed Income	\$56,268,425	\$55,192,176	\$54,388,391	45.0%						
Cash (invested in State Agency Pool)	\$14,873,074	\$14,451,888	\$14,756,259	12.2%						
<i>Actual Allocation Index</i>					1.22%	1.22%	3.03%	5.75%	4.92%	5.76%

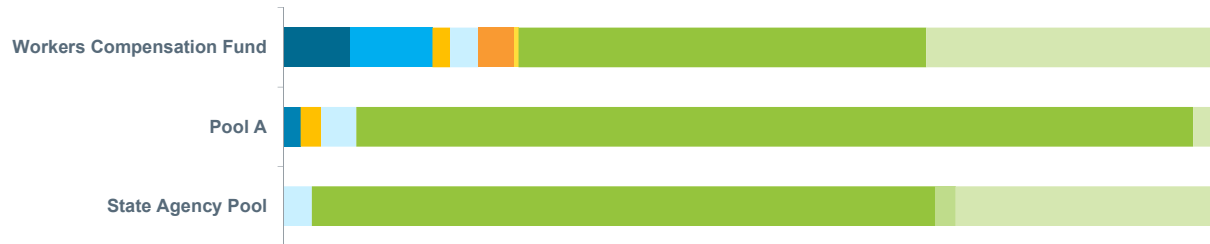


Note[1]: Performance shown is net of fees.  
Note[2]: Pooled investment performance and market values shown reflect State Agency participation.  
Note[3]: Pooled investment and Actual Allocation Index performance is calculated on a capital-weighted basis using beginning-period allocations.  
Note[4]: Market values shown for Public Purpose Investments reflect cost value of the investments.  
Note[5]: The Arrowstreet mandate was converted from global equity to international equity on March 1, 2018.



**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**  
September 30, 2018

	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Investment Funds:</b>										
<b>Workers Compensation Fund</b>	<b>\$2,005,420,148</b>	<b>\$2,035,610,128</b>	<b>\$2,057,333,271</b>	<b>100.0%</b>	<b>0.90%</b>	<b>0.90%</b>	<b>2.09%</b>	<b>4.51%</b>	<b>3.91%</b>	<b>5.75%</b>
US Equity	\$107,177,815	\$139,378,668	\$145,472,969	7.1%						
International Equity	\$157,053,534	\$180,662,255	\$181,069,989	8.8%						
MLPs	\$38,950,848	\$0	\$38,280,595	1.9%						
Real Estate	\$55,346,703	\$76,472,069	\$76,441,400	3.7%						
Diversified Hedge Funds	\$10,188,384	\$66,237,645	\$10,410,880	0.5%						
Convertible Bonds	\$53,256,782	\$59,806,289	\$62,925,618	3.1%						
Fixed Income	\$927,251,599	\$1,096,150,945	\$891,691,175	43.3%						
Cash (invested in State Agency Pool)	\$656,194,482	\$416,902,257	\$651,040,645	31.6%						
<i>Actual Allocation Index</i>					0.82%	0.82%	1.66%	4.16%	3.97%	5.36%
<b>Pool A</b>	<b>\$237,901,809</b>	<b>\$238,849,216</b>	<b>\$245,796,842</b>	<b>100.0%</b>	<b>0.45%</b>	<b>0.45%</b>	<b>0.55%</b>	<b>2.47%</b>	<b>2.48%</b>	<b>4.33%</b>
Preferred Stock	\$4,502,016	\$4,502,016	\$4,562,374	1.9%						
MLPs	\$5,500,000	\$0	\$5,405,358	2.2%						
Convertible Bonds	\$8,077,226	\$8,673,658	\$9,126,052	3.7%						
Fixed Income	\$211,696,886	\$219,578,995	\$218,641,197	89.0%						
Cash (invested in State Agency Pool)	\$8,125,681	\$6,094,547	\$8,061,861	3.3%						
<i>Actual Allocation Index</i>					0.18%	0.18%	-0.74%	1.64%	2.38%	3.86%
<b>State Agency Pool</b>	<b>\$5,530,879,156</b>	<b>\$5,605,269,757</b>	<b>\$5,487,438,903</b>	<b>100.0%</b>	<b>0.57%</b>	<b>0.57%</b>	<b>1.03%</b>	<b>2.27%</b>	<b>2.18%</b>	<b>3.75%</b>
Convertible Bonds	\$142,098,786	\$155,438,565	\$168,138,162	3.1%						
Fixed Income	\$3,705,927,088	\$3,615,102,242	\$3,635,345,308	66.2%						
Public Purpose Investments	\$117,405,760	\$122,156,392	\$117,405,760	2.1%						
Cash Equivalents	\$1,565,447,522	\$1,712,572,558	\$1,566,549,672	28.5%						
<i>Actual Allocation Index</i>					0.27%	0.27%	-0.18%	1.60%	2.13%	3.35%



Note[1]: Performance shown is net of fees.  
Note[2]: Pooled investment performance and market values shown reflect State Agency participation.  
Note[3]: Pooled investment and Actual Allocation Index performance is calculated on a capital-weighted basis using beginning-period allocations.  
Note[4]: Market values shown for Public Purpose Investments reflect cost value of the investments.  
Note[5]: The Arrowstreet mandate was converted from global equity to international equity on March 1, 2018.

**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**  
September 30, 2018

Allocation by  
Asset Class



	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Wyoming State Total Fund</b>	<b>\$19,770,526,832</b>	<b>\$20,599,864,561</b>	<b>\$20,666,862,451</b>	<b>100.0%</b>	<b>1.07%</b>	<b>1.07%</b>	<b>3.05%</b>	<b>5.25%</b>	<b>4.38%</b>	<b>5.34%</b>
<i>Wyoming State Actual Allocation Index</i>										
<b>US Equity</b>										
State Street All Cap	\$838,501,734	\$1,137,708,518	\$1,198,109,469	6.90%	6.90%	16.45%	16.53%	N/A	N/A	N/A
State Street All Cap Custom Index Russell 3000				6.93%	6.93%	16.45%	16.60%	13.17%	12.19%	
Epoch	\$218,530,785	\$269,713,108	\$282,833,235	6.19%	6.19%	12.93%	14.89%	N/A	N/A	N/A
Russell 3000				7.12%	7.12%	17.58%	17.07%	13.46%	12.01%	
UW Portfolio Management Program S&P 500	\$1,000,000	\$1,466,053	\$1,586,905	8.78%	8.78%	16.54%	16.20%	13.30%	7.99%	
S&P 500				7.71%	7.71%	17.91%	17.31%	13.95%	11.97%	
Internal Equity Russell 2000	\$164,926,982	\$0	\$173,901,378	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Russell 2000				3.58%	3.58%	15.24%	17.12%	11.07%	11.11%	
RBC	\$0	\$170,669,808	\$2,905	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Total US Equity</b>	<b>\$1,222,959,500</b>	<b>\$1,579,557,486</b>	<b>\$1,656,433,893</b>	<b>8.0%</b>						
<b>International Equity</b>										
Internal International Equity Portfolio FTSE All World Ex US	\$135,000,000	\$166,293,614	\$165,854,958	0.90%	0.90%	1.67%	N/A	N/A	N/A	N/A
FTSE All World Ex US				0.87%	0.87%	2.13%	10.19%	4.51%	5.61%	
Northern Trust MSCI ACW Ex US	\$971,736,341	\$1,101,957,364	\$1,101,228,175	0.75%	0.75%	1.99%	10.05%	4.25%	N/A	5.18%
MSCI ACW Ex US				0.71%	0.71%	1.76%	9.97%	4.12%		
Fisher Investments MSCI ACW Ex US [3]	\$356,542,575	\$437,594,475	\$437,066,516	1.31%	1.31%	-0.16%	10.26%	5.24%	6.42%	
MSCI ACW Ex US [3]				0.71%	0.71%	1.76%	9.97%	4.12%	4.64%	
Arrowstreet MSCI ACW Ex US IM	\$367,846,188	\$377,550,696	\$384,081,260	2.44%	2.44%	N/A	N/A	N/A	N/A	N/A
MSCI ACW Ex US IM				0.39%	0.39%	1.79%	10.14%	4.39%	5.60%	
<b>Total International Equity</b>	<b>\$1,831,125,104</b>	<b>\$2,083,396,150</b>	<b>\$2,088,230,910</b>	<b>10.1%</b>						
<b>Preferred Stock</b>										
Cohen & Steers S&P US Preferred Stock Index	\$85,000,000	\$85,000,000	\$86,139,590	0.4%	1.55%	1.55%	N/A	N/A	N/A	N/A
S&P US Preferred Stock Index				0.21%	0.21%	1.57%	5.25%	6.42%	11.33%	
<b>MLPs</b>										
Harvest S&P MLP Index (TR)	\$450,000,000	\$0	\$442,256,551	2.1%	N/A	N/A	N/A	N/A	N/A	N/A
S&P MLP Index (TR)				6.39%	6.39%	7.15%	4.90%	-1.73%	9.97%	
<b>Private Equity</b>										
Access Venture Partners II	\$3,801,445	\$14,384,623	\$4,623,906				See Note[5]			
Cheyenne Capital Fund, L.P.	\$138,184,362	\$287,701,522	\$287,701,522				See Note[5]			
Hamilton Lane Nowood Fund, L.P.	\$122,876,365	\$147,715,242	\$143,196,712				See Note[5]			
Neuberger Berman Sauger Fund, L.P. S&P 500 + 5%	\$124,100,000	\$191,323,146	\$188,818,169		9.03%	9.03%	23.81%	23.17%	19.65%	17.56%
<b>Total Private Equity</b>	<b>\$388,962,173</b>	<b>\$641,124,533</b>	<b>\$624,340,309</b>	<b>3.0%</b>						
<b>Real Estate</b>										
Clarion Lion	\$266,303,630	\$342,217,898	\$346,033,608	1.92%	1.92%	8.97%	8.98%	10.77%	3.56%	
UBS Trumbull NCREIF ODCE	\$241,303,630	\$281,783,741	\$282,855,374	1.24%	1.24%	6.82%	6.35%	8.10%	4.64%	
NCREIF ODCE				1.87%	1.87%	7.71%	7.83%	9.71%	4.62%	
<b>Core Real Estate</b>	<b>\$507,607,260</b>	<b>\$624,001,639</b>	<b>\$628,888,982</b>	<b>3.0%</b>						
Cornerstone	\$4,679,734	\$4,827,296	\$4,833,788				See Note[5]			
Heltman	\$1,759,375	\$67,199	\$17,473				See Note[5]			
M&G	\$65,894,755	\$54,156,241	\$49,809,830				See Note[5]			
Northwood	\$112,678,737	\$145,919,605	\$144,042,445				See Note[5]			
SC Capital	\$44,563,765	\$46,068,794	\$46,070,237				See Note[5]			
TA Realty	\$2,275,635	\$2,622,422	\$747,023				See Note[5]			
WestRiver	\$29,372,420	\$46,326,863	\$47,551,448				See Note[5]			
NCREIF Property					1.67%	1.67%	7.16%	7.75%	9.57%	6.42%
<b>Value-Added Real Estate</b>	<b>\$261,224,422</b>	<b>\$299,988,420</b>	<b>\$293,172,244</b>	<b>1.4%</b>						
<b>Total Real Estate</b>	<b>\$768,831,682</b>	<b>\$923,990,059</b>	<b>\$922,061,226</b>	<b>4.5%</b>						

Note[1]: Returns are stated in traditional total return terms and do not specify realized income.  
Note[2]: State Street All Cap Custom Index consists of 69% R 3000, 24% FTSE RAFI US 1000, 7% MSCI USA Minimum Volatility.  
Note[3]: Fisher Index consists of MSCI EAFE (Gross) through July 2010 and the MSCI ACW Ex US (Net) thereafter.  
Note[4]: Market values for non-core real estate and private equity are as of the most recent valuation, adjusted for subsequent cash flows. Investment (Cost) Values are not lagged.  
Note[5]: Performance for Private Equity and Value-Added Real Estate investments is calculated on an IRR basis. For further analysis, please refer to the supplementary alternatives report.  
Note[6]: Market values for M&G are converted from British Pounds using the noon New York City Federal exchange rate. Cost values are converted using the 5pm London WM Benchmark rate.  
Note[7]: The Arrowstreet mandate was converted from global equity to international equity on March 1, 2018.



**Wyoming State Treasurer's Office**  
**Investment Performance - Total Performance**  
September 30, 2018

Allocation by  
Asset Class

	Total Investment Value	Fiscal Year Ending 06/30/18 Market Value	Current Market Value	% of MV	QTD Return	FYTD Return	1 Year Return	3 Year Return	5 Year Return	10 Year Return
<b>Diversified Hedge Funds</b>										
PAAMCO - Jackalope Fund	\$78,662,402	\$511,408,113	\$80,380,458		-0.26%	-0.26%	2.24%	1.93%	2.54%	3.41%
Grosvenor Diversified Hedge Funds	\$250,000,000	\$31,000,000	\$250,260,374		0.80%	0.80%	N/A	N/A	N/A	N/A
Internal Diversified Hedge Funds	\$170,000,000	\$44,000,000	\$170,907,190		0.86%	0.86%	N/A	N/A	N/A	N/A
HFRI FOF Comp Index					0.19%	0.19%	3.01%	3.27%	3.16%	2.55%
<b>Total Diversified Hedge Funds</b>	<b>\$498,662,402</b>	<b>\$586,408,113</b>	<b>\$501,548,021</b>	<b>2.4%</b>						
<b>Convertible Bonds</b>										
Allianz Global Investors	\$486,668,624	\$546,160,344	\$574,646,540	2.8%	5.45%	5.45%	16.39%	12.03%	8.90%	11.08%
ICE BofAML All Quality Convertible					3.93%	3.93%	12.19%	11.74%	9.26%	10.98%
<b>Fixed Income</b>										
C.S. McKee	\$1,252,716,830	\$1,239,782,750	\$1,236,325,057		0.25%	0.25%	-0.18%	1.69%	2.37%	N/A
C.S. McKee Custom Index					0.11%	0.11%	-0.65%	1.51%	2.28%	3.83%
JP Morgan Core	\$1,417,935,089	\$1,398,403,539	\$1,388,966,565		0.01%	0.01%	-1.08%	1.20%	2.31%	N/A
Bloomberg US Aggregate					0.02%	0.02%	-1.22%	1.31%	2.16%	3.77%
PIMCO Core	\$2,178,236,902	\$2,160,523,241	\$2,153,747,336		0.23%	0.23%	-0.44%	1.85%	2.33%	N/A
PIMCO Custom Index					0.11%	0.11%	-1.07%	1.36%	2.19%	3.79%
Neuberger Berman Credit	\$804,936,901	\$922,183,704	\$806,235,331		1.56%	1.56%	2.84%	4.16%	3.74%	N/A
Seix	\$943,160,037	\$948,736,474	\$956,620,121		1.82%	1.82%	3.12%	5.50%	4.25%	N/A
Credit Custom Index					1.77%	1.77%	3.47%	5.43%	4.29%	6.82%
Grosvenor Silvery Lupine Fund	\$185,952,340	\$281,156,865	\$243,884,437		2.09%	2.09%	8.05%	8.12%	N/A	N/A
CS Western European HY					2.30%	2.30%	3.14%	7.66%	6.32%	10.32%
Investec	\$297,714,010	\$197,847,664	\$190,837,048		-2.15%	-2.15%	-7.89%	4.01%	-2.26%	N/A
Stone Harbor	\$297,712,381	\$186,907,000	\$177,762,409		-3.54%	-3.54%	-10.84%	3.69%	-3.42%	N/A
JPM GBI-EM Gbl Dvfd					-1.83%	-1.83%	-7.40%	5.17%	-1.68%	2.70%
State Street TIPS	\$724,413,700	\$723,229,173	\$714,432,865		-0.90%	-0.90%	0.39%	2.13%	1.47%	N/A
Bloomberg US Trsy: US TIPS (Series B)					-0.92%	-0.92%	0.41%	2.14%	1.49%	3.40%
Internal Intermediate Gov't Fixed Income Portfolio	\$1,869,154,319	\$1,852,289,491	\$1,842,480,877		0.07%	0.07%	-0.33%	0.86%	1.78%	2.37%
Bloomberg US Gov't: Int. Term Bond Index					-0.11%	-0.11%	-1.18%	0.19%	0.93%	2.72%
Internal Low Duration Portfolio	\$1,373,135,874	\$1,368,821,692	\$1,365,068,051		0.29%	0.29%	N/A	N/A	N/A	N/A
Bloomberg US Gov't 1-3 Yr Bond Index					0.20%	0.20%	-0.01%	0.38%	0.57%	1.20%
Neuberger Berman Core	\$0	\$1	\$0		N/A	N/A	N/A	N/A	N/A	N/A
<b>Total Fixed Income</b>	<b>\$11,345,068,382</b>	<b>\$11,279,881,593</b>	<b>\$11,076,360,096</b>	<b>53.6%</b>						
<b>Public Purpose Investments</b>										
	\$425,861,487	\$324,211,740	\$425,861,487	2.1%	N/A	N/A	N/A	N/A	N/A	N/A
<b>Cash &amp; Cash Equivalents</b>										
JP Morgan Cash Composite	\$2,267,387,478	\$2,550,134,544	\$2,268,983,827	11.0%	0.47%	0.47%	1.42%	0.83%	0.57%	0.62%
JP Morgan Cash Custom Index					0.47%	0.47%	1.45%	0.81%	0.57%	0.66%

Note[1]: Performance shown is net of fees.

Note[2]: Returns are stated in traditional total return terms and do not specify realized income.

Note[3]: The Credit Custom Index consists of 20% Bloomberg US Credit, 20% ICE BofAML US HY Master II Constrained, 60% S&P/LSTA Leveraged Loan.

Note[4]: Internal Intermediate Gov't Fixed Income Portfolio performance excludes distressed securities taken in from dismissed managers (market value includes distressed securities).

Note[5]: Internal Intermediate Gov't Fixed Income Portfolio Index consists of the Bloomberg US Gov't: Int. Term Bond Index; prior to December 2009 the index consisted of the Bloomberg US Gov't/Credit Bond Index.

Note[6]: Market values shown for Public Purpose Investments reflect cost value of the investments.

Note[7]: The C.S. McKee Custom Index consists of the Bloomberg US Agg Bond Index through January 2018 and the Bloomberg US Agg Int Index thereafter.

Note[8]: The PIMCO Custom Index consists of the Bloomberg US Agg Bond Index through February 2018 and the Bloomberg US Agg Int Index thereafter.

Note[9]: The Arrowstreet mandate was converted from global equity to international equity on March 1, 2018.



Investment Policy Guidelines	Meeting Objective			Explanation
	Yes	No	N/A	
<b>1. Total Fund</b>				
Exceed the rate of inflation (C.P.I.) over a market cycle of 5-years.	✓			Wyoming returned 4.4% vs. 1.5% for the C.P.I. for the current 5-year period
Exceed a weighted index of the total fund's asset allocation and component benchmarks over rolling 5-year periods by an appropriate amount.	✓			Wyoming returned 4.4% vs. 4.3% for the Actual Allocation Index for the current 5-year period
Not more than 1% of the outstanding common shares of any corporation shall be owned by the State. An exception may be made for Alternative Investments.	✓			
Not more than 1.5% of the total book value of permanent funds shall be invested in the common stock of any corporation. An exception may be made for Alternative Investments.	✓			

	Yes	No	N/A	Explanation
<b>2. Investment Funds</b>				
<b>a) Permanent Mineral Trust Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Permanent Mineral Trust Fund return was 5.4% vs. 5.4% for the Actual Allocation Index
<b>b) Common School Permanent Land Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Common School Permanent Land Fund return was 5.4% vs. 5.5% for the Actual Allocation Index
<b>c) Permanent Land Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Permanent Land Fund return was 5.3% vs. 5.3% for the Actual Allocation Index
<b>d) University Permanent Land Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: University Permanent Land Fund return was 5.8% vs. 5.9% for the Actual Allocation Index
<b>e) Hathaway Scholarship Endowment Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Hathaway Scholarship Endowment Fund return was 4.8% vs. 5.0% for the Actual Allocation Index
<b>f) Higher Education Endowment Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Higher Education Endowment Fund return was 4.8% vs. 4.9% for the Actual Allocation Index
<b>g) Workers Compensation Fund</b>				
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Workers Compensation Fund return was 3.9% vs. 4.0% for the Actual Allocation Index
<b>h) Pool A</b>				
At least 5% to 10% of the fund balance should be invested in securities with maturities of less than one year.	✓			
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: Pool A return was 2.5% vs. 2.4% for the Actual Allocation Index
<b>i) State Agency Pool</b>				
At least 10% to 15% of the fund balance should be invested in securities with maturities of less than one year.	✓			
No public and/or private equities are permitted.	✓			
Exceed a weighted index of the Fund's asset allocation and component benchmarks over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: State Agency Pool return was 2.2% vs. 2.1% for the Actual Allocation Index

	Yes	No	N/A	Explanation
<b>3. US Equity Portfolios</b>				
<b>a) State Street Global Advisors – All Cap – Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Apple Inc = 3.25%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the State Street All Cap Custom Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 01/2015
<b>b) Epoch – All Cap</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Apple Inc = 5.90%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the Russell 3000 Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 11/2014
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 11/2014



	Yes	No	N/A	Explanation
<b>c) Internal Equity Russell 2000 – Small Cap - Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Five Below Inc = 0.31%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the Russell 2000 Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 09/2018

	Yes	No	N/A	Explanation
<b>4. International Equity Portfolios</b>				
<b>a) Internal International Equity Portfolio – Int’l – Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Nestle SA = 1.17%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the FTSE All World Ex US Index (Net), net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception Date: 02/2016
<b>b) Northern Trust – Int’l – Passive</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Nestle SA = 1.25%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Meet performance of the MSCI ACW Ex US Index (Net), before fees, over a full market cycle, approximated by the most recent five-year period.	✓			5-year: Northern Trust gross of fees return was 4.3% vs. 4.1% for the MSCI ACW Ex US Index (Net)

	Yes	No	N/A	Explanation
<b>c) Fisher – Int'l Active</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: ASML Holding NV = 3.93%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the MSCI ACW Ex US Index (Net)*, net of fees, over a full market cycle, approximated by the most recent five-year period.	✓			5-year: Fisher net of fees return was 5.2% vs. 4.1% for the MSCI ACW Ex US Index (Net)
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: Fisher ranked in the 56th percentile for International Equity

\*Fisher Index consists of MSCI EAFE Index (Gross) through July 2010 and the MSCI ACW Ex US Index (Net) thereafter.

<b>d) Arrowstreet – Int'l Active</b>				
A maximum of the greater of five percent (5%), or the benchmark weighting plus two percent (2%), of the total stock portfolio of a manager may be invested in any one security.	✓			Largest Holding: Samsung Electronics Co = 3.03%
A maximum of one percent (1%) of the outstanding float of shares of one company may be held in companies with market capitalizations of \$5 Billion or greater at the time of purchase. A maximum of five percent (5%) of the outstanding float of shares of one company may be held in companies with market capitalizations of less than \$5 Billion at the time of purchase.	✓			
The maximum allowable in any sector, as defined as Global Industry Classification System Level 1, is two and one-half (2.5) times the respective benchmark weighting, unless the contract with the investment manager specifically provides otherwise.	✓			
A minimum number of twenty (20) securities shall be held.	✓			
Outperform the MSCI ACW Ex US IM Index (Net), net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 03/2018
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 03/2018

	Yes	No	N/A	Explanation
<b>5. Preferred Stock</b>				
<b>a) Cohen &amp; Steers</b>				
Minimum issue credit rating for preferred stock at the time of purchase will be BB or equivalent.	✓			The portfolio currently holds securities which are rated below BB. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
A maximum of 35% of the total portfolio of the investment manager may be invested in securities rated below investment grade.	✓			
A maximum of 10% of the total portfolio of the investment manager may be invested in any one issuer.	✓			
Outperform the S&P U.S. Preferred Stock Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 07/2018
<b>6. MLPs</b>				
<b>a) Harvest</b>				
A maximum of 15% or the benchmark weighting + 2%, whichever is greater, of the total portfolio may be invested in any one company.	✓			
Outperform the S&P MLP Index, net of fees, over a full market cycle, approximated by the most recent five-year period.			N/A	Inception date: 08/2018

	Yes	No	N/A	Explanation
<b>7. Alternative Strategies</b>				
<b>Core Real Estate</b>				
<b>a) Clarion Lion</b>				
Outperform the NCREIF Fund Index – Open-End Diversified Core Equity (ODCE), net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: Clarion Lion net of fees return was 10.8% vs. 9.7% for the NCREIF ODCE Index (Net) (AWA)
<b>b) UBS Trumbull</b>				
Outperform the NCREIF Fund Index – Open-End Diversified Core Equity (ODCE), net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: UBS Trumbull net of fees return was 8.1% vs. 9.7% for the NCREIF ODCE Index (Net) (AWA)
<b>Absolute Return</b>				
<b>c) PAAMCO</b>				
Outperform the 90-Day T-Bills by 300 basis points, net of all fees (including underlying fund manager fees), over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: PAAMCO net of fees return was 2.5% vs. 0.5% for the ICE BofAML 3 Mo US T-Bill Index
Outperform the HFRI FOF Comp Index, net of all fees (including underlying fund manager fees), over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: PAAMCO net of fees return was 2.5% vs. 3.2% for the HFRI FOF Comp Index
<b>d) Grosvenor Diversified Hedge Funds</b>				
Outperform the HFRI FOF Comp Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 07/2018
<b>e) Internal Diversified Hedge Funds</b>				
Outperform the HFRI FOF Comp Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 07/2018

	Yes	No	N/A	Explanation
<b>8. Convertible Bond Portfolios</b>				
<b>a) Allianz Global Investors</b>				
Outperform the BofA ML All Quality Convertible Bond Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		X		5-year: Allianz Global Investors net of fees return was 8.9% vs. 9.3% for the ICE BofAML All Quality Convertible Bond Index

	Yes	No	N/A	Explanation
<b>9. Fixed Income Portfolios</b>				
<b>a) C.S. McKee – Core</b>				
Obligations not issued or guaranteed by the US government, US agencies, or US government-sponsored corporations and agencies are subject to a five percent (5%) per issuer limit excluding investments in commingled vehicles.	✓			
Non-US dollar denominated securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Private mortgage-backed and asset-backed securities are limited to ten percent (10%) of the portfolio market value.	✓			
Commercial mortgage-backed securities are permitted but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Commercial paper of all issuers shall not exceed \$500 million.	✓			
Duration must fall in the range of plus or minus twenty percent (20%) of the Bloomberg Barclays US Aggregate Bond Index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 or equivalent for commercial paper BBB- for Corporate Bonds BBB- for Mortgage-Backed Securities BBB- for Commercial Mortgage-Backed Securities BBB- for Asset-Backed Securities BBB- for Non-US Dollar Denominated Securities BBB- for Dollar Denominated Emerging Market Securities	✓			
Average portfolio credit quality must be A- or better.	✓			
Dollar denominated emerging market securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
A minimum number of 25 securities shall be held.	✓			
Investments in mortgage interest only and principal only securities or their derivations are permitted, but shall comprise no more than five percent (5%) of the portfolio market value.	✓			
Private placements, including 144A securities are not permitted.	✓			
Outperform its Custom Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: C.S. McKee net of fees return was 2.4% vs. 2.3% for the C.S. McKee Custom Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: C.S. McKee ranked in the 57th percentile for Core Fixed Income

	Yes	No	N/A	Explanation
<b>b) JP Morgan – Core</b>				
Obligations not issued or guaranteed by the US government, US agencies, or US government-sponsored corporations and agencies are subject to a five percent (5%) per issuer limit excluding investments in commingled vehicles.	✓			
Non-US dollar denominated securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.			N/A	
Private mortgage-backed and asset-backed securities are limited to ten percent (10%) of the portfolio market value.	✓			
Commercial mortgage-backed securities are permitted but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Commercial paper of all issuers shall not exceed \$500 million.			N/A	
Duration must fall in the range of plus or minus twenty percent (20%) of the Bloomberg US Aggregate Bond Index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 or equivalent for commercial paper BBB- for Corporate Bonds BBB- for Mortgage-Backed Securities BBB- for Commercial Mortgage-Backed Securities BBB- for Asset-Backed Securities BBB- for Non-US Dollar Denominated Securities BBB- for Dollar Denominated Emerging Market Securities	✓			
Average portfolio credit quality must be A- or better.	✓			
Dollar denominated emerging market securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.			N/A	
A minimum number of 25 securities shall be held.	✓			
Investments in mortgage interest only and principal only securities or their derivations are permitted, but shall comprise no more than five percent (5%) of the portfolio market value.	✓			
Private placements, including 144A securities are not permitted.	✓			
Outperform the Bloomberg US Aggregate Bond Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: JP Morgan net of fees return was 2.3% vs. 2.2% for the Bloomberg US Aggregate Bond Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: JP Morgan ranked in the 62nd percentile for Core Fixed Income



	Yes	No	N/A	Explanation
<b>c) PIMCO – Core</b>				
Obligations not issued or guaranteed by the US government, US agencies, or US government-sponsored corporations and agencies are subject to a five percent (5%) per issuer limit excluding investments in commingled vehicles.	✓			
Non-US dollar denominated securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Private mortgage-backed and asset-backed securities are limited to ten percent (10%) of the portfolio market value.	✓			
Commercial mortgage-backed securities are permitted but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
Commercial paper of all issuers shall not exceed \$500 million.	✓			
Duration must fall in the range of plus or minus twenty percent (20%) of the Bloomberg US Aggregate Bond Index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 or equivalent for commercial paper BBB- for Corporate Bonds BBB- for Mortgage-Backed Securities BBB- for Commercial Mortgage-Backed Securities BBB- for Asset-Backed Securities BBB- for Non-US Dollar Denominated Securities BBB- for Dollar Denominated Emerging Market Securities	✓			
Average portfolio credit quality must be A- or better.	✓			
Dollar denominated emerging market securities are permitted, but shall comprise no more than ten percent (10%) of the portfolio market value.	✓			
A minimum number of 25 securities shall be held.	✓			
Investments in mortgage interest only and principal only securities or their derivations are permitted, but shall comprise no more than five percent (5%) of the portfolio market value.	✓			
Private placements, including 144A securities are not permitted.	✓			
Outperform its Custom Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: PIMCO net of fees return was 2.3% vs. 2.2% for the PIMCO Custom Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: PIMCO ranked in the 59th percentile for Core Fixed Income

	Yes	No	N/A	Explanation
<b>d) Neuberger Berman – Credit</b>				
Duration must not exceed plus two (2) years of the custom index.	✓			
Minimum Issue Credit Rating for commercial paper will be A1.	✓			
Average portfolio credit quality must be B or better.	✓			
Obligations of specific issuers are subject to five percent (5%) per issuer limit, excluding investments in commingled vehicles.	✓			
Standalone purchases of private placements, including 144A securities, are not allowed.	✓			
Outperform the State's custom benchmark as measured by twenty percent (20%) Bloomberg US Credit Index, twenty percent (20%) BofA Merrill Lynch US High Yield Master II Constrained Index and sixty percent (60%) S&P/LSTA Leveraged Loan Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Neuberger Berman net of fees return was 3.7% vs. 4.3% for the Credit Custom Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.	✓			5-year: Neuberger Berman ranked in the 32nd percentile for US Fixed Income
<b>Investment Grade Credit Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: BBB- for individual securities.	✓			
Minimum of ten percent (10%) of the total portfolio must be invested in investment grade rated securities and a maximum of sixty percent (60%) of the total portfolio can be invested in investment grade rated securities.	✓			
<b>High Yield Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: CCC- for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Maximum of forty percent (40%) of the total portfolio can be invested in high yield bonds.	✓			
<b>Bank Loan Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: CCC for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Minimum of forty percent (40%) of the total portfolio must be invested in bank loans and a maximum of eighty percent (80%) of the total portfolio can be invested in bank loans.	✓			

	Yes	No	N/A	Explanation
<b>e) Seix – Credit</b>				
Duration must not exceed plus two (2) years of the custom index.	✓			
Minimum Issue Credit Rating for commercial paper will be A1.	✓			
Average portfolio credit quality must be B or better.	✓			
Obligations of specific issuers are subject to five percent (5%) per issuer limit, excluding investments in commingled vehicles.	✓			
Standalone purchases of private placements, including 144A securities, are not allowed.	✓			
Outperform the State’s custom benchmark as measured by twenty percent (20%) Bloomberg US Credit Index, twenty percent (20%) BofA Merrill Lynch US High Yield Master II Constrained Index and sixty percent (60%) S&P/LSTA Leveraged Loan Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Seix net of fees return was 4.3% vs. 4.3% for the Credit Custom Index
Performance should rank in the top 40th percentile of peer manager universe as measured by the State’s Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.	✓			5-year: Seix ranked in the 26th percentile for US Fixed Income
<b>Investment Grade Credit Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be: BBB- for individual securities.	✓			
Minimum of ten percent (10%) of the total portfolio must be invested in investment grade rated securities and a maximum of sixty percent (60%) of the total portfolio can be invested in investment grade rated securities.	✓			
<b>High Yield Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be:  CCC- for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Maximum of forty percent (40%) of the total portfolio can be invested in high yield bonds.	✓			
<b>Bank Loan Sleeve:</b>				
Minimum Issue Credit Rating at the time of purchase will be:  CCC for individual securities. Securities that are not rated shall be, in the judgement of the investment manager, of credit quality equal or superior to the standards described above.	✓			
Minimum of forty percent (40%) of the total portfolio must be invested in bank loans and a maximum of eighty percent (80%) of the total portfolio can be invested in bank loans.	✓			

	Yes	No	N/A	Explanation
<b>f) Grosvenor Silvery Lupine Fund – Opportunistic Fixed Income</b>				
Outperform the CS Western European Hi Yld Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.			N/A	Inception date: 07/2014
<b>g) Investec – Emerging Market Debt (Local Currency)</b>				
Duration must fall in the range of plus or minus twenty percent (20%) of the index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 for commercial paper B- for individual securities Where a security is not rated at the issue level, the issuer rating will be relied upon.	✓			
Average portfolio credit quality must be BB+ or better.	✓			
Obligations of individual sovereign/quasi-sovereign issuer are subject to a twenty-five percent (25%) per issuer limit.	✓			
Private placements, including 144A securities are not allowed.	✓			There are four 144A securities held by this portfolio. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
The investment manager, as part of managing the account, can take net investment positions of up to twenty percent (20%) of the portfolio in currency and currency forwards.	✓			
Outperform the JPM GBI-EM Gbl Dvf'd Index (USD) (TR) (Unhedged), net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Investec net of fees return was -2.3% vs. the return of -1.7% for the JPM GBI-EM Gbl Dvf'd Index (USD) (TR) (Unhedged)
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: Investec ranked in the 92nd percentile for Emerging Market Debt (Local Currency)

	Yes	No	N/A	Explanation
<b>h) Stone Harbor – Emerging Market Debt (Local Currency)</b>				
Duration must fall in the range of plus or minus twenty percent (20%) of the index.	✓			
Minimum Issue Credit Rating at the time of purchase will be: A1 for commercial paper B- for individual securities	✓			The portfolio currently holds securities which are rated below B-. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
Where a security is not rated at the issue level, the issuer rating will be relied upon.				
Average portfolio credit quality must be BB+ or better.	✓			
Obligations of individual sovereign/quasi-sovereign issuer are subject to a twenty-five percent (25%) per issuer limit.	✓			
Private placements, including 144A securities are not allowed.	✓			The portfolio holds private placement and 144A securities. Retention of these securities in the portfolio is permitted pursuant to Section 7.2 of the Investment Policy.
The investment manager, as part of managing the account, can take net investment positions of up to twenty percent (20%) of the portfolio in currency and currency forwards.	✓			
Outperform the JPM GBI-EM Gbl Dvf'd Index (USD) (TR) (Unhedged), net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: Stone Harbor net of fees return was -3.4% vs. return of -1.7% for the JPM GBI-EM Gbl Dvf'd Index (USD) (TR) (Unhedged)
Performance should rank in the top 40th percentile of peer manager universe as measured by the State's Consultant, gross of fees, over a full market cycle, approximated by the most recent five-year period.		✗		5-year: Stone Harbor ranked in the 100th percentile for Emerging Market Debt (Local Currency)
<b>i) State Street – US TIPS – Passive</b>				
Meet the performance of the Bloomberg US TIPS Index with minimal tracking error, gross of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: State Street gross of fees return was 1.5% vs. 1.5% for the Bloomberg US TIPS Index and a tracking error of 0.3%

	Yes	No	N/A	Explanation
<b>10. Cash and Cash Equivalents Portfolios</b>				
<b>JP Morgan Cash Composite*</b>				
<b>a) JP Morgan Treasury Cash</b>				
Portfolio's weighted average maturity is not to exceed 90 days.	✓			
Portfolio's maximum average cash flow weighted duration of the portfolio must not exceed 90 days.	✓			
The market value of the portfolio must remain within plus or minus one-half percent (0.5%) of one percent (1%) of amortized cost.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment in any single issuer must not exceed 5% of the outstanding issues of that issuer except for government securities.	✓			
Investment performance must exceed Monitored Repurchase Agreement Rate and the cash equivalents allocation by the 90-day T-Bill rate, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: JP Morgan Treasury Cash net of fees return was 0.5% vs. 0.5% for the ICE BofAML 3 Mo US T-Bill Index
<b>b) JP Morgan Treasury Extended Cash</b>				
Portfolio's average cash flow weighted duration is not to exceed 3 years.	✓			
Average cash flow weighted duration is not to exceed 3 years.	✓			
Individual securities must not exceed cash flow weighted duration of greater than 5-years.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment Performance must exceed an Equal Weighted Blend of the BofA Merrill Lynch 1-3 Year Agency, 1-3 Year Treasury, and a 0-3 Year Mortgage Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.	✓			5-year: JP Morgan Treasury Extended Cash net of fees return was 0.9% vs. 0.7% for the Blended Index
The extended portfolio must not exceed 35% of the total JP Morgan managed portfolio.	✓			

\*During the fourth quarter of 2011, JP Morgan Treasury Cash and JP Morgan Treasury Extended Cash were combined. Net of fees performance shown consists of performance calculated by RVK, Inc. prior to 12/31/2011 and performance calculated by JP Morgan thereafter.

	Yes	No	N/A	Explanation
<b>JP Morgan Wyo-Star Cash Composite*</b>				
<b>c) JP Morgan Wyo-Star Cash</b>				
Portfolio's weighted average maturity is not to exceed 90 days.	✓			
Portfolio's maximum average cash flow weighted duration of the portfolio must not exceed 90 days.	✓			
The market value of the portfolio must remain within plus or minus one-half percent (0.5%) of one percent (1%) of amortized cost.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment in any single issuer must not exceed 5% of the outstanding issues of that issuer.	✓			
Investment performance must exceed Monitored Repurchase Agreement Rate and the cash equivalents allocation by the 90-day T-Bill rate, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: JP Morgan Wyo-Star Cash net of fees return was 0.5% vs. 0.5% for the ICE BofAML 3 Mo US T-Bill Index
<b>d) JP Morgan Wyo-Star Extended Cash</b>				
Portfolio's average cash flow weighted duration is not to exceed 3 years.	✓			
Average cash flow weighted duration is not to exceed 3 years.	✓			
Individual securities must not exceed cash flow weighted duration of greater than 5-years.	✓			
A maximum of 5% of total assets shall be placed in the securities of one issuer except for government securities.	✓			
Investment Performance must exceed an Equal Weighted Blend of the BofA Merrill Lynch 1-3 Year Agency, 1-3 Year Treasury, and a 0-3 Year Mortgage Index, net of fees, over a full market cycle, approximated by the most recent 5-year period.		✗		5-year: JP Morgan Wyo-Star Extended Cash net of fees return was 0.7% vs. 0.7% for the Blended Index
The extended portfolio must not exceed 35% of the total JP Morgan managed portfolio.	✓			

\*During the fourth quarter of 2011, JP Morgan Wyo-Star Cash and JP Morgan Wyo-Star Extended Cash were combined. Net of fees performance shown consists of performance calculated by RVK, Inc. prior to 12/31/2011 and performance calculated by JP Morgan thereafter.

**Custom Benchmark Comments**

The Wyoming State Actual Allocation Index is calculated using beginning month asset class weights applied to the appropriate asset class benchmark return, using the US Equity Custom Index for US equities, MSCI ACW Ex US Index (Net) for international equities, Bloomberg US Aggregate Bond Index for fixed income, ICE BofA Merrill Lynch All Convertibles Index (All Qualities) for convertible bonds, NCREIF Open-End Diversified Core Equity Index (Gross) (AWA) for core real estate, NCREIF Property Index for value-added real estate, the State's actual private equity investment returns for private equity, HFRI FOF Comp Index for Diversified Hedge Funds, and ICE BofA Merrill Lynch 90 day US T-Bill rate for cash equivalents.

Pooled Fund actual allocation indices are calculated using beginning month asset class weights applied to the appropriate asset class benchmark return, using the US Equity Custom Index for US equities, MSCI ACW Ex US Index (Net) for international equities, Bloomberg US Aggregate Bond Index for fixed income, ICE BofA Merrill Lynch All Convertibles Index (All Qualities) for convertible bonds, NCREIF Open-End Diversified Core Equity Index for core real estate, NCREIF Property Index for value-added real estate, the State's actual private equity investment returns for private equity, HFRI FOF Comp Index for Diversified Hedge Funds, and the State Agency Pool Custom Index for the State Agency Pool allocation.

The Total Equity Custom Index consists of the MSCI World Index (USD) (Net) through July 2010 and the MSCI All Country World Index (USD) (Net) thereafter.

The US Equity Custom Index consists of the S&P 500 Index (Cap Wtd) through September 2014 and the Russell 3000 Index thereafter.

The State Street All Cap Custom Index consists of 69% Russell 3000 Index, 24% FTSE RAFI US 1000 Index and 7% MSCI USA Minimum Volatility Index (Net).

The International Equity Custom Index and the Fisher Custom Benchmark both consist of MSCI EAFE Index (Gross) through July 2010 and the MSCI ACW Ex US Index (Net) thereafter.

The Credit Custom Index consists of 20% Bloomberg US Credit Index, 20% ICE BofA Merrill Lynch US High Yield Master II Constrained Index, and 60% S&P/LSTA Leveraged Loan Index.

The Internal Intermediate Govt Fixed Income Portfolio Custom Index consists of the Bloomberg US Gov't: Int. Term Bond Index; prior to December 2009 the index consists of the Bloomberg US Gov't/Credit Bond Index.

The C.S. McKee Custom Index consists of the Bloomberg US Agg Bond Index through January 2018 and the Bloomberg US Agg Int Index thereafter.

The PIMCO Custom Index consists of the Bloomberg US Agg Bond Index through February 2018 and the Bloomberg US Agg Int Index thereafter.

The JP Morgan Blended Index consists of an equal-weighted allocation to the ICE BofA Merrill Lynch 1-3 Year US Treasury Index, ICE BofA Merrill Lynch 1-3 Year US Agencies Index, and ICE BofA Merrill Lynch 0-3 Year Weighted Average Life Mortgage Index.

The JP Morgan Cash Custom Index is calculated monthly using beginning of the month investment weights applied to each corresponding primary benchmark return. Currently, the primary benchmark for JP Morgan Cash is the ICE BofAML 3 Mo US T-Bill Index and for JP Morgan Extd is the JP Morgan Blended Index.

The Wyo-Star Cash Custom Index is calculated monthly using beginning of the month investment weights applied to each corresponding primary benchmark return. Currently, the primary benchmark for Wyo-Star Cash is the ICE BofAML 3 Mo US T-Bill Index and for Wyo-Star Extd is the JP Morgan Blended Index.

**Performance & Holding Comments**

RVK, Inc. shows performance beginning with the first full month following inception. Inception date shown for the Int'l Equity and JP Morgan Cash Composites represents the first date of performance calculated by RVK, Inc.

Performance shown for Pooled Funds is calculated on a capital-weighted basis using beginning-period allocations and does not reflect net cash flows.

Performance shown for the UW Portfolio Management Program prior to 07/01/2009 includes their participation in the State Agency Pool. Performance calculated for the UW Portfolio Management Program after 02/01/2013 has not been verified by RVK as the assets have been moved to a platform in which the custodian does not provide a reconcilable return.

Performance for the Internal Intermediate Govt Fixed Income Portfolio excludes distressed securities taken in-kind following the liquidation of WAMCO Core Plus.

Performance shown for the JP Morgan Cash Composite and the Wyo-Star Cash Composite consists of the respective operating and extended cash accounts.

Due to portfolio turnover, buy and hold attribution may not accurately represent quarterly performance relative to the benchmark.

Composite performance shown for Fixed Income is historically exclusive of convertibles.



**Alternative Investment Comments**

Reporting for Private Equity performance was changed from cost basis to the latest portfolio valuation adjusted for cash flows, consistent with the supplementary alternatives report. This methodology change involved reflecting the difference between cost value and the most recent valuation, resulting in a significant positive performance impact on the total fund during 2nd quarter 2008.

Valuations for value-added real estate and private equity were changed from a one-quarter lag to as of the most recent valuation, adjusted for subsequent cash flows. This methodology change involved reflecting all cash flows occurring during 4th quarter 2011 as of January 2012, resulting in a minor positive performance impact on the total fund during 1st quarter 2012. Investment (Cost) Values are not lagged.

Performance for value-added real estate and private equity investments is calculated on an IRR basis. For further analysis, please refer to the supplementary alternatives performance report.

Cheyenne Capital Fund valuations set forth herein could be materially different once underlying investments are realized. Market conditions at the time of exit could be substantially different than at the reporting period, resulting in valuations different than those represented above.

**Miscellaneous Comments**

Wyoming State Treasurer's Office fiscal year ends on June 30th.

Fixed Income style peer groups have low populations, and may cause ranks to change significantly from quarter to quarter.

"IM" is the acronym for Investment Metrics, the provider of peer group data used in ranking investment manager and asset class performance.

During the 4th quarter of 2012, WAMCO Core Plus, Neuberger Berman Core Plus, PIMCO Core Plus, PIMCO Mortgages, JP Morgan Mortgages, WAMCO Corporates, Logan Circle, and PIMCO Global/EM began the liquidation process to transition assets to the State's new fixed income asset class structure. The proceeds were used to fund State Street TIPS, C.S. McKee, JP Morgan Core, MacKay Shields, Neuberger Berman Core, PIMCO Core, and Wells Capital. During the 1st quarter of 2013, additional assets were transitioned to Neuberger Berman Credit, Seix, Investec, and Stone Harbor.

During the 4th quarter of 2014, State Street S&P 500 and Gabelli began the liquidation process to transition assets to the State's new US equity asset class structure. The proceeds were used to fund State Street All Cap, Epoch, Lazard, and RBC. During the 1st quarter of 2015, additional assets were transitioned to Arrowstreet.

During the 4th quarter of 2015, the Workers Compensation Fund was reclassified as a Permanent Fund.

During the 1st quarter of 2016, the State funded the Internal International Equity Portfolio, using proceeds from the liquidation of The Boston Company.

During the 3rd quarter of 2016, Bloomberg acquired the Barclays Global Family of Fixed Income Indices. Naming conventions have been updated to "Bloomberg" to reflect the acquisition.

During the 3rd quarter of 2016, MacKay Shields began the liquidation process, with proceeds used to increase allocations to C.S. McKee and the Internal Intermediate Govt Fixed Income Portfolio.

During the 1st quarter of 2017, Neuberger Berman Core and Wells Capital began their respective liquidation processes.

During the 2nd quarter of 2017, Manning & Napier began the liquidation process.

During the 4th quarter of 2017, Lazard began the liquidation process.

During the 4th quarter of 2017, Intercontinental Exchange (ICE) acquired the BofA Merrill Lynch Global Research FICC index platform. As a result, all BofA Merrill Lynch indices have been rebranded to "ICE BofA Merrill Lynch".

During the 1st quarter of 2018, Arrowstreet was reclassified as International Equity and the Internal Low Duration portfolio was funded.

During the 2nd quarter of 2018, Cohen & Steers, Grosvenor Diversified Hedge Funds, and Internal Diversified Hedge Funds were funded.

**Miscellaneous Comments (Continued)**

During the 2nd quarter of 2018, the Hybrid Assets Composite was created for convertibles, preferred stock, and MLPs.

During the 2nd quarter of 2018, RBC began the liquidation process.

During the 3rd quarter of 2018, Internal Equity Russell 2000 was funded.

During the 3rd quarter of 2018, Harvest was funded.

## Glossary

**Active Return** - The difference between the investment manager/composite performance relative to the performance of an appropriate market benchmark.

**Active Share** - Measures the degree to which the holdings of a fund differ from the holdings of the benchmark. Active share is calculated by taking the sum of the absolute value of the differences of the weight of each holding in the fund versus the weight of each holding in the benchmark and dividing by two.

**Alpha** - A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market or a portfolio's non-systematic return.

**Alpha Ratio** - A measure of a portfolio's non-systematic return per unit of downside risk. It is measured by dividing the alpha of a portfolio by the downside risk. The non-systematic return is a measure of a portfolio's historical performance not explained by movements of the market.

**Average Quality** - Bond quality ratings are reported using the investment managers' and the index providers' preferred rating agency. *Average Quality for managers unable to provide this statistic is instead provided by Morningstar; if unavailable on Morningstar, it has been estimated using a credit quality distribution provided by the manager.* There are two primary rating agencies in the US. *Moody's* assigns ratings on a system that employs up to four symbols (consisting of letters and numbers) such as, Aaa, Aa2, etc., with Aaa being the highest or safest rating. *Standard & Poor's (S&P)* employs a system that uses + and - along with letters such as AAA, AA+, etc. The two rating agencies' systems are summarized below:

<u>S&amp;P</u>	<u>Moody's</u>	<u>Explanation</u>	<u>S&amp;P</u>	<u>Moody's</u>	<u>Explanation</u>
<b>Higher Credit Quality – Investment Grade</b>			<b>Lower Credit Quality – Below Investment Grade</b>		
AAA	Aaa	Prime/Highest credit quality	BB+	Ba1	Speculative/Low credit quality
AA+	Aa1	High credit quality	BB	Ba2	
AA	Aa2		BB-	Ba3	
AA-	Aa3		B+	B1	Highly speculative
A+	A1	Upper-medium credit quality	B	B2	
A	A2		B-	B3	
A-	A3		CCC+	Caa1	Substantial credit/default risk
BBB+	Baa1	Lower-medium credit quality	CCC	Caa2	Extremely speculative
BBB	Baa2		CCC-	Caa3	
BBB-	Baa3		CC	Ca	Vulnerable to default
			C	Ca	
			D	C	In default

**Benchmark Effect** - The difference between the blended return of each respective managers' benchmark within a composite and the composite's benchmark return.

**Beta** - A measure of the sensitivity of a portfolio to the movements in the market. It is a measure of a portfolio's non-diversifiable or systematic risk.

**Box Plots** - A graphical representation of the distribution of observations. From top to bottom, the four boxes represent the spread between the maximum value and the minimum value in each quartile. A quartile represents the values that divide the observations into four quarters (i.e., 1<sup>st</sup> quartile, 2<sup>nd</sup> quartile, 3<sup>rd</sup> quartile, and 4<sup>th</sup> quartile). The median observation is where the 2<sup>nd</sup> quartile and 3<sup>rd</sup> quartile meet.

**Buy and Hold Attribution** - At the beginning of the time period under analysis, the manager and benchmark portfolios are broken down into segments (i.e., styles, sectors, countries, and regions) based on the desired type of attribution. The formula assumes zero turn-over to the manager and benchmark portfolios throughout the period and calculates the segment returns ("buy and hold returns") to arrive at performance attribution. Due to portfolio turnover, buy and hold attribution may not accurately represent quarterly performance relative to the benchmark. Country, region, sector, and style allocations are as of the date one quarter prior to the reporting date, and the returns shown are for those segments throughout the quarter reported. Due to disclosure guidelines set by each investment manager, equity characteristics shown are as of the most recent date available. The following is the methodology for segment classification:

**Sector** - Attribution is calculated using the Global Industry Classification Standard (GICS) which is a detailed and comprehensive structure for sector and industry analysis. Stocks are classified by their primary sector, as defined by S&P Capital IQ data.

**Country/Region** - Attribution is calculated using the Morgan Stanley Capital International (MSCI) region standards. Stocks are classified by their domicile country/region, as defined by S&P Capital IQ data.

**Style** - Stocks are classified into the following style boxes: large/mid/small vs. growth/neutral/value. Stocks are classified along large/mid/small categories at the time of the Russell index rebalancing, using the index market cap boundaries as cutoff points. Stocks are classified along growth/neutral/value categories at the time of the Russell index rebalancing, using the price/book ratio as supplied by S&P Capital IQ. Stocks in the Russell 3000 Index portfolio are sorted by price/book ratio; names with the highest price/book ratio that make up 1/3 of the total market capitalization are assigned to the growth category, names that make up the subsequent 1/3 of the total market capitalization are assigned to the neutral category, while the balance of the names are assigned to the value category.

Portfolio Characteristics and Buy and Hold Attribution reports utilize product-specific data for all mutual funds and commingled funds.

### Capital Markets Review -

**Breakeven Inflation** - Measures the expected inflation rate at each stated maturity by taking the difference between the real yield of the inflation-linked maturity curve and the yield of the closest nominal Treasury maturity.

**Consumer Confidence** - Measures domestic consumer confidence as defined by the degree of optimism on the state of the economy that consumers express through saving and spending.

**Consumer Price Index (CPI)** - Measures the change in the price level of consumer goods and services.

**Federal Funds Rate** - The interest rate at which a depository institution lends funds maintained at the Federal Reserve to another depository institution overnight. It is one of the most influential interest rates in the US economy, since it affects monetary and financial conditions, which in turn have a bearing on key aspects of the broad economy including employment, growth and inflation.

**Option-Adjusted Spread** - Measures the flat spread of an index or bond to the Treasury yield curve after removing the effect of any embedded options.



## Glossary

**Purchasing Managers Index (PMI)** - Measures economic activity by surveying purchasing managers on a monthly basis as to whether business conditions have improved, worsened, or stayed the same.

**Real Gross Domestic Product (Real GDP)** - An inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year.

**US Dollar Total Weighted Index** - Measures the value of the US Dollar relative to a basket of other world currencies. It is calculated as the weighted geometric mean of the dollar's value versus the EUR, GBP, CAD, SEK, CHF, and JPY.

**Unemployment Rate** - The percentage of the total labor force that is unemployed but actively seeking employment.

**VIX** - Measures the implied volatility of S&P 500 Index options by looking at the market's expectation of the S&P 500 Index volatility over the next 30 day period. Commonly referred to as the "fear index" or the "fear gauge."

**Cash Flow Effect** - The composite's active return minus the sum of each managers' active return minus the benchmark effect.

**Consistency** - The percentage of quarters that a product achieved a rate of return higher than that of its benchmark. The higher the consistency figure, the more value a manager has contributed to the product's performance.

**Convexity** - A measure of the shape of the curve that describes the relationship between bond prices and bond yields.

**Correlation** - A statistical measure of the relationship between asset class returns. A value of 1.00 is a perfect correlation; that is, the asset classes always move in the same direction. A value of -1.00 indicates a perfect negative correlation, in which the asset classes always move in opposite directions of each other. A value of 0 indicates there is no relationship between the direction of returns of the two asset classes. Correlation calculations only consider the direction of changes relative to two variables and not the magnitude of those changes.

**Coupon Rate** - The percentage rate of interest paid on a bond or fixed income security; it is typically paid twice per year.

**Current Yield** - The annual income of a security divided by the security's current price.

**Down Market Capture** - Down market by definition is negative benchmark return and down market capture represents the ratio in % terms of the average portfolios return over the benchmark during the down market period. The lower the value of the down market capture the better the product's performance.

**Downside Risk** - A measure similar to standard deviation, but focuses only on the negative movements of the return series. It is calculated by taking the standard deviation of the negative monthly returns. The higher the factor, the riskier the product.

**Earnings Per Share** - It is backward looking, calculated using the one year current EPS divided by the one year EPS five years ago.

**Effective Duration** - The approximate percentage change in a bond's price for a 100 basis point change in yield.

**Excess Return vs. Market** - Average of the monthly arithmetic difference between the manager's return and the benchmark return over a specified time period, shown on an annualized basis.

**Excess Return vs. Risk Free** - Average of the monthly arithmetic difference between the manager's return and the risk-free return (i.e., ICE BofAML 3 Mo US T-Bill Index unless specified otherwise) over a specified time period, shown on an annualized basis.

**Excess Risk** - A measure of the standard deviation of a portfolio's performance relative to the risk free return.

**Expense Ratios** - Morningstar is the source for mutual fund expense ratios.

**Gain/Loss** - The net increase or decrease in the market value of a portfolio excluding its Net Cash Flow for a given period.

**Indices** - All indices and related information are considered intellectual property and are licensed by each index provider. The indices may not be copied, used or distributed without the index provider's prior written approval. Index providers make no warranties and bear no liability with respect to the indices, any related data, their quality, accuracy, suitability and/or completeness.

**Information Ratio** - Measured by dividing the active rate of return by the tracking error. The higher the information ratio, the more value-added contribution by the manager.

**Liability Driven Investing (LDI)** - A method to optimally structure asset investments relative to liabilities. The change in liabilities is estimated by the Ryan Labs Generic PPA Index of appropriate duration for that Plan. This benchmark is based on generic data and is therefore an approximation. RVK is not an actuarial firm, and does not have actuarial expertise.

**Estimated Funded Status** - The estimated ratio of a Plan's assets relative to its future liabilities. This is calculated by dividing the Plan's asset market value by the estimated present value of its liabilities. The higher the estimated funded status, the better the Plan's ability to cover its projected benefit obligations. An estimated funded status of 100% indicates a Plan that is fully funded.

**Estimated PV of Liabilities** - An estimate of a Plan's future liabilities in present value terms. The beginning of the period liability is provided by the Plan's actuary. The period-end present value liability estimate provided in this report is derived by applying the estimated percentage change generated using the Ryan Labs Generic PPA Index with duration similar to that reported on the most recent actuarial valuation report.

**Duration of Liabilities** - The sensitivity of the value of a Plan's liabilities to changes in interest rates, as calculated by the Plan's actuary.

**Duration of Assets** - The dollar-weighted average duration of all the individual Plan assets.

**Estimated Plan Hedge Ratio** - The estimate of how well a Plan's investment portfolio is hedged against changes in interest rates - a primary driver of funded status movements. This is calculated by dividing the dollar-weighted values of both the Plan asset duration by the liability duration and multiplying by the estimated funded status. An estimated plan hedge ratio of zero indicates that the Plan's liabilities have not been hedged, whereas a value of one indicates fully hedged.

**Modified Duration** - The approximate percentage change in a bond's price for a 100 basis point change in yield, assuming the bonds' expected cash flows do not change.



## Glossary

**Mutual Fund Performance** - Whenever possible, manager performance is extended for any share class that does not have 10 years of history. Using Morningstar's methodology, a single ticker within the same fund family (often the oldest share class) is chosen to append historical performance.

**Net Cash Flow** - The sum, in dollars, of a portfolio's contributions and withdrawals. This includes all management fees and expenses only when performance shown is gross of fees.

### Peer Groups -

**Plan Sponsor Peer Groups** - RVK utilizes the Mellon Analytical Solutions Trust Universe along with the Investment Metrics Plan Sponsor Universe. The combined Mellon Analytical Solutions Trust Universe and Investment Metrics Plan Sponsor Universe is used for comparison of total fund composite results and utilizes actual client performance compiled from consultant and custodian data. The Plan Sponsor Peer Group database includes performance and other quantitative data for over 2,100 plans which include corporate, endowment, foundation, public, and Taft Hartley plans. Plan Sponsor Peer Groups are gross of fees.

**Investment Manager Peer Groups** - RVK utilizes Investment Metrics' Peer Groups for investment manager peer comparison and ranking. The Investment Metrics Peer Group database includes performance and other quantitative data for over 840 investment management firms and 29,000 investments products, across more than 160 standard peer groups. Mutual Fund Peer Groups are net of fees. For more information on Peer Groups, visit <https://www.invmetrics.com/style-peer-groups>.

**Percentile Rankings** - Percentile rank compares an individual fund's performance with those of other funds within a defined peer group of managers possessing a similar investment style. Percentile rank identifies the percentage of a fund's peer group that has a higher return (or other comparative measurement) than the fund being ranked. Conversely, 100 minus the individual fund's ranking will identify the percentage of funds within the peer group that have a lower return than the fund being ranked.

1 - Highest Statistical Value

100 - Lowest Statistical Value

*Example: American Funds AMCP;R-4 (RAFEX) is ranked in the 4<sup>th</sup> percentile within the IM US Equity Large-Cap Growth Funds (MF) Peer Group for the Sharpe Ratio. Within the IM US Equity Large-Cap Growth Funds peer group, 4% of the other funds performed better than American Funds AMCP;R-4 (RAFEX), while 96% of the funds performed worse.*

**Performance Methodology** - RVK calculates performance for investment managers and composites using different methodologies.

**Investment Managers** - Performance is calculated for interim periods between all large external cash flows for a given month and geometrically linked to calculate period returns. An external cash flow is defined as cash, securities, or assets that enter or exit a portfolio. RVK defines a "large cash flow" as a net aggregate cash flow of  $\geq 10\%$  of the beginning-period portfolio market value or any cash flow that causes RVK calculated performance to deviate from manager/custodian reported performance in excess of 5 basis points for a given month.

**Composites** - The Modified Dietz methodology is utilized to calculate asset class, sub-asset class, and total fund composite performance. The Modified Dietz method calculates a time-weighted total rate of return that considers the timing of external cash flows; however, it does not utilize interim period performance to mitigate the impact of significant cash in- and outflows to the composite.

RVK calculates performance beginning with the first full month following inception. Since inception performance may vary from manager reported performance due to RVK using the first full month of returns as the inception date. Performance for both managers and composites is annualized for periods greater than one year.

**Portfolio Characteristics** - Due to disclosure guidelines set by each investment manager, portfolio characteristics shown are as of the most recent date available.

**Price to Earnings Ratio** - The ratio of a company's share price to its per-share earnings

**Private Equity Quartile Ranks** - Private Equity quartile ranks are generated using vintage year peer group data provided by Thomson Reuters, and are based on each fund's annualized, since inception internal rate of return (IRR). Three Private Equity peer groups are available via Thomson Reuters: Buyout, Venture, and All Private Equity. Ranks are available quarterly, at a one-quarter lag.

**Return** - Compounded rate of return for the period.

**% Return** - The time-weighted rate of return of a portfolio for a given period.

**R-Squared** - The percentage of a portfolio's performance explained by the behavior of the appropriate benchmark. High R-Squared means a higher correlation of the portfolio's performance to the appropriate benchmark.

**Risk Free Benchmark** - ICE BofAML 3 Mo US T-Bill Index unless specified otherwise.

## Glossary

**RVK Liquidity Rating** - A qualitative method for determining the relative amount of liquidity in a portfolio. The characteristics considered when determining relative liquidity include trading volume, gates for redemption, leverage, nature of transactions, and pricing mechanisms. The RVK Liquidity Rating is calculated using beginning of month investment weights applied to each corresponding asset class liquidity rating.

<u>Asset Class</u>	<u>RVK Liquidity Rating</u>	<u>Asset Class</u>	<u>RVK Liquidity Rating</u>
<u>Liquid Investments</u>		<u>Less Liquid Investments</u>	
T-Bills and Treasuries	100	Fixed Income Plus Sector	50
Cash Equivalents	98	Bank Loans	50
TIPS	95	Stable Value (Plan Sponsor Directed)	50
US Large Cap Equity	95	Absolute Return Strategies	35
Diversified Real Return	93		
Stable Value (Participant Directed)	91		
Non-US Large Cap Equity	90	<u>Not Liquid Investments</u>	
Global Tactical Asset Allocation	88	Core Real Estate	25
US Small Cap Equity	85	Core Plus Real Estate	15
REITS	85	Non-Core Real Estate	5
Non-US Small Cap Equity	85	Private Equity Funds of Funds	5
Emerging Markets Equity	85		
Core Fixed Income	85		
Core Plus Fixed Income	80		

**Sector Allocation** - Negative fixed income sector allocation reflects manager's use of derivatives, short selling, or interest rate swaps.

**Sharpe Ratio** - Represents the excess rate of return over the risk-free return (i.e., ICE BofAML 3 Mo US T-Bill Index unless specified otherwise), divided by the standard deviation of the excess return to the risk free asset. The result is the absolute rate of return per unit of risk. The higher the value, the better the product's historical risk-adjusted performance.

**Simple Alpha** - The difference between the manager's return and the benchmark's return.

**Spread Duration** - The approximate percentage change in a bond's price for a 100 basis point change in its spread over a Treasury of the same maturity.

**Standard Deviation** - A statistical measure of the range of a portfolio's performance. The variability of a return around its average return over a specified time period.

**Time Period Abbreviations** - **QTD** - Quarter-to-Date. **CYTD** - Calendar Year-to-Date. **FYTD** - Fiscal Year-to-Date. **YOY** - Year Over Year.

**Thematic Classification** - Represents dedicated manager allocations; as such, thematic allocations are approximations. RVK categorizes the following asset classes as Alpha, Capital Appreciation, Capital Preservation, and Inflation:

<u>Alpha</u>	<u>Capital Appreciation</u>	<u>Capital Preservation</u>	<u>Inflation</u>
Absolute Return Strategies	Public Equity	Core Fixed Income	TIPS
Currency Overlay	Private Equity	CMBS Fixed Income	Bank Loans
	Preferred Securities	Asset Backed Fixed Income	Core Real Estate
	High Yield	Domestic Core Plus Fixed Income	Real Return
	Convertible Fixed Income	Mortgage Backed Fixed Income	Inflation Hedges
	TALF Funds	International Developed Fixed Income	REITS
	Distressed Debt	Cash Equivalents	Commodities
	Emerging Market Fixed Income	Stable Value	
	Value Added Real Estate		
	Opportunistic Real Estate		

**Total Fund Attribution** – The Investment Decision Process (IDP) model provides an approach to evaluating investment performance that applies to all asset classes and investment styles. The IDP model is based on a top-down hierarchy framework of investment decisions, with each decision contributing to the overall profit or loss. The IDP approach starts from the strategic asset allocation and follows the flow of the investments down to the manager's skill.

**Strategic Asset Allocation (SAA)** – The percentage return gained or lost from the long-term strategic asset allocation decision, the most significant determinant of long-term performance. SAA is the product of the target asset allocation multiplied by the corresponding benchmark returns.

**Tactical Asset Allocation (TAA)** – The percentage return gained or lost from not having been precisely allocated at the target asset allocation mix, whether by deviations that are tactical in nature or a by-product of moving towards the target mix. TAA is the product of the actual asset allocation multiplied by the broad asset class benchmarks, less the SAA.

**Style Selection (SS)** – The percentage return gained or lost from intentional style biases within each asset class (e.g. value rather than core or overweight to emerging markets relative to benchmark). SS is the product of the actual manager allocation within each asset class multiplied by their specific benchmark, less TAA.

**Manager's Skill (MS)** – The percentage return gained or lost from manager value added relative to their specific benchmark. MS is the product of the actual manager allocation multiplied by their achieved excess return.

**Total Fund Beta** - Total Fund Beta is calculated using the S&P 500 as the benchmark. It represents a measure of the sensitivity of the total fund to movements in the S&P 500 and is a measure of the Total Fund's non-diversifiable or systematic risk.

**Tracking Error** - A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.

## Glossary

**Treynor Ratio** - Similar to Sharpe ratio, but focuses on beta rather than excess risk (standard deviation). Treynor ratio represents the excess rate of return over the risk-free rate (i.e., ICE BofAML 3 Mo US T-Bill Index unless specified otherwise) divided by the beta. The result is the absolute rate of return per unit of risk. The higher the value, the better historical risk-adjusted performance.

**Unit Value** - The dollar value of a portfolio, assuming an initial nominal investment of \$100, growing at the compounded rate of %Return for a given period.

**Up Market Capture** - Up market by definition is positive benchmark return and up market capture represents the ratio in % terms of the average portfolios return over the benchmark during the up market period. The higher the value of the up market capture the better the product's performance.

**Yield to Maturity** - The rate of return achieved on a bond or other fixed income security assuming the security is bought and held to maturity and that the coupon interest paid over the life of the bond will be reinvested at the same rate of return. The 30-Day SEC Yield is similar to the Yield to Maturity and is reported for mutual funds.

**Yield to Worst** - The bond yield calculated by using the worst possible yield taking into consideration all call, put, and optional sink dates.

PORTLAND

CHICAGO

NEW YORK

**Disclaimer of Warranties and Limitation of Liability** - This document was prepared by RVK, Inc. (RVK) and may include information and data from some or all of the following sources: client staff; custodian banks; investment managers; specialty investment consultants; actuaries; plan administrators/record-keepers; index providers; as well as other third-party sources as directed by the client or as we believe necessary or appropriate. RVK has taken reasonable care to ensure the accuracy of the information or data, but makes no warranties and disclaims responsibility for the accuracy or completeness of information or data provided or methodologies employed by any external source. This document is provided for the client's internal use only and does not constitute a recommendation by RVK or an offer of, or a solicitation for, any particular security and it is not intended to convey any guarantees as to the future performance of the investment products, asset classes, or capital markets.

