



Quarterly Board Presentation

Texas Municipal Retirement System

Period Ended: September 30, 2020



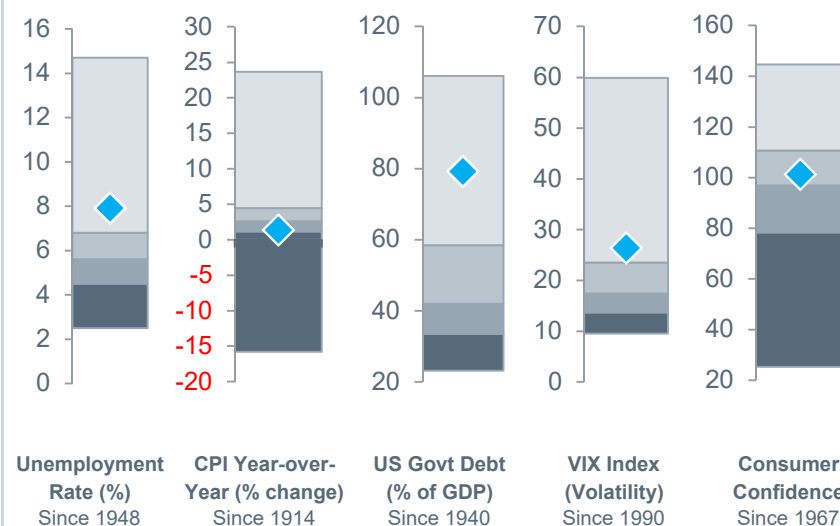
Capital Markets Update



Third Quarter Economic Environment

In the first two months of Q3, capital markets generally tracked trends stemming from the latter half of Q2. After strong results in the first two months of the quarter, returns from risk assets reversed in September due to growing concerns over a stagnating recovery and reduced confidence that the US Congress could agree to enact further fiscal stimulus. In addition, the upcoming US presidential and congressional elections offer another source of uncertainty when building expectations for the ongoing economic recovery. The Federal Open Market Committee (FOMC) maintained its accommodative stance and boosted sentiment further by announcing it will use an average inflation target indicating that it could accept levels above its stated 2% target in future periods. Market participants largely saw this as an indication that policy could remain supportive for longer than expected with a fixed inflation target. As of October 1st, the Atlanta Fed's GDPNow annualized estimate for Q3 growth stood at 34.6% which stands in stark contrast to the final reading of the Q2 GDP decline of -31.4%. On a non-annualized basis, the decline in real US GDP, peak to trough, was -10.1%, according to JP Morgan, compared to a -4.0% decline during the great financial crisis. For calendar year 2020, the OECD released a projection in September for a -4.5% contraction in global GDP, which represented an improvement from its June projection for a -6.0% contraction.

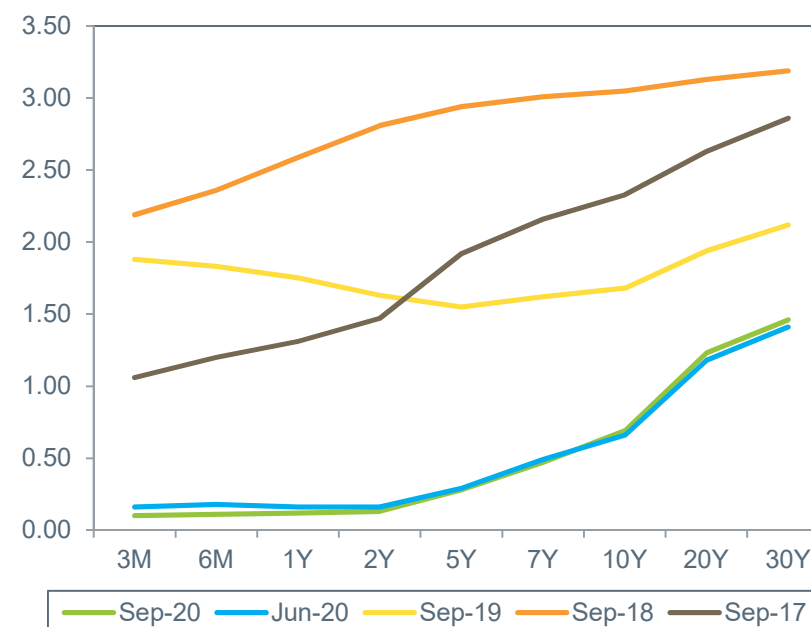
Key Economic Indicators



Economic Indicators	Sep-20	Jun-20	Sep-19	Sep-17	20 Yr
Federal Funds Rate (%)	0.09 ▲	0.08	1.90	1.06	1.57
Breakeven Infl. - 5 Yr (%)	1.49 ▲	1.17	1.35	1.78	1.82
Breakeven Infl. - 10 Yr (%)	1.63 ▲	1.34	1.52	1.85	2.01
CPI YoY (Headline) (%)	1.4 ▲	0.6	1.7	2.2	2.1
Unemployment Rate (%)	7.9 ▼	11.1	3.5	4.2	6.0
Real GDP YoY (%)	-2.9 ▲	-9.0	2.1	2.4	1.8
PMI - Manufacturing	55.4 ▲	52.6	48.2	59.9	52.5
USD Total Wtd Idx	117.35 ▼	120.86	117.99	110.08	103.23
WTI Crude Oil per Barrel (\$)	40.2 ▲	39.3	54.1	51.7	62.2
Gold Spot per Oz (\$)	1,886 ▲	1,781	1,472	1,280	989

Market Performance (%)	QTD	CYTD	1 Yr	5 Yr	10 Yr
S&P 500 (Cap Wtd)	8.93	5.57	15.15	14.15	13.74
Russell 2000	4.93	-8.69	0.39	8.00	9.85
MSCI EAFE (Net)	4.80	-7.09	0.49	5.26	4.62
MSCI EAFE SC (Net)	10.25	-4.20	6.84	7.37	7.33
MSCI Emg Mkts (Net)	9.56	-1.16	10.54	8.97	2.51
Bloomberg US Agg Bond	0.62	6.79	6.98	4.18	3.64
ICE BofAML 3 Mo US T-Bill	0.04	0.64	1.10	1.20	0.64
NCREIF ODCE (Gross)	0.48	-0.12	1.39	6.64	10.27
FTSE NAREIT Eq REIT (TR)	1.44	-17.54	-18.16	3.95	7.90
HFRI FOF Comp	4.24	2.55	5.71	3.09	2.88
Bloomberg Cmtty (TR)	9.07	-12.08	-8.20	-3.09	-6.03

Treasury Yield Curve (%)

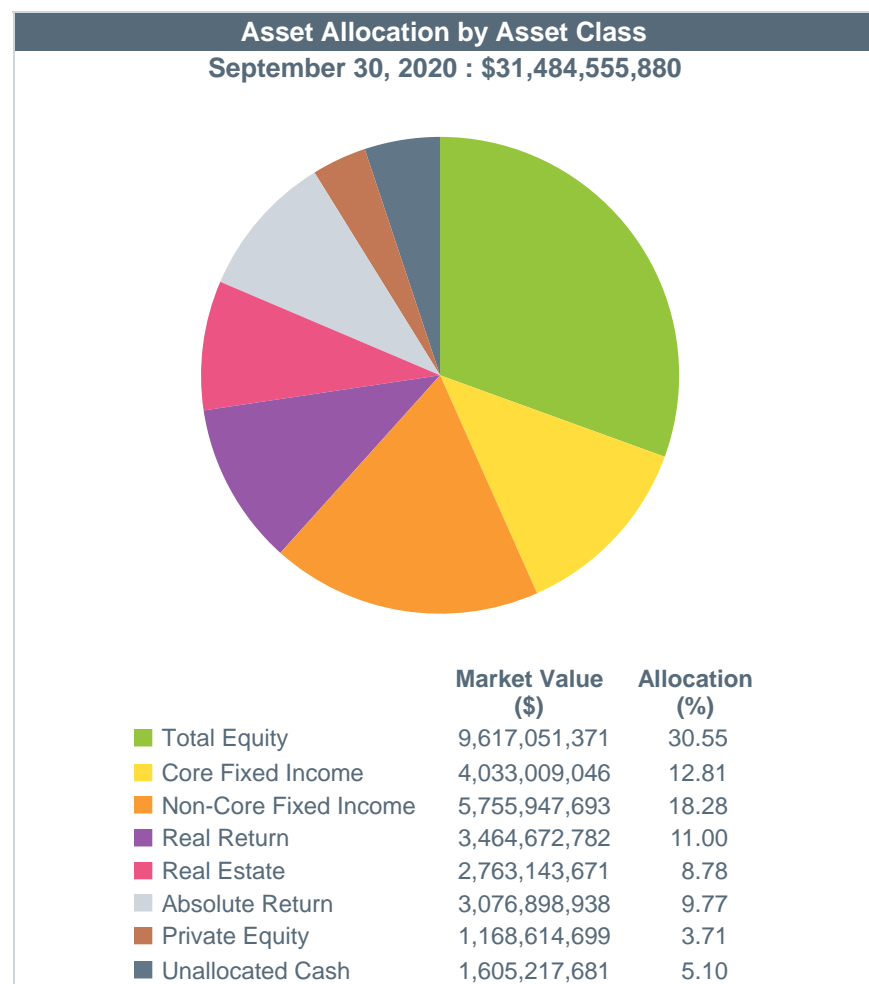


TMRS Total Fund

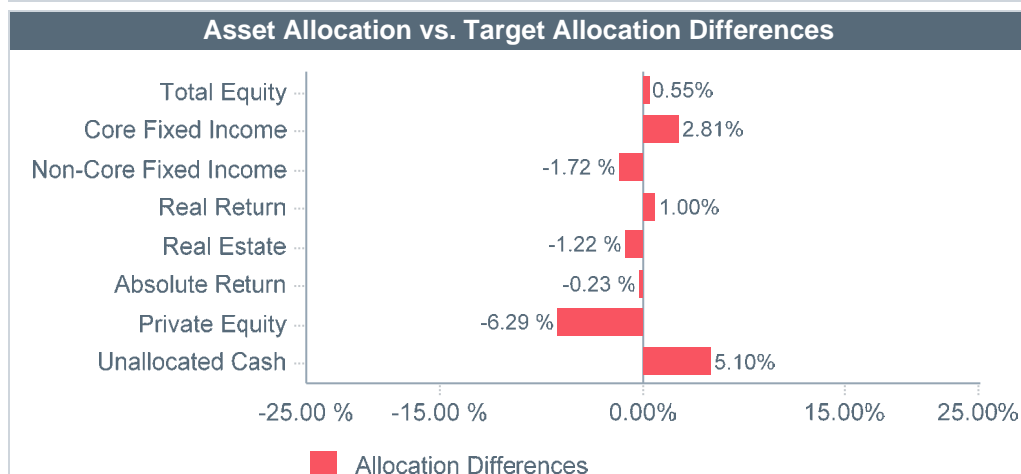


TMRS Asset Allocation and Performance

As of September 30, 2020



Asset Allocation vs. Target Allocation					
	Market Value (\$)	Allocation (%)	Target (%)	Minimum (%)	Maximum (%)
Total Fund	31,484,555,880	100.00	100.00	-	-
Total Equity	9,617,051,371	30.55	30.00	20.00	40.00
Core Fixed Income	4,033,009,046	12.81	10.00	5.00	15.00
Non-Core Fixed Income	5,755,947,693	18.28	20.00	15.00	25.00
Real Return	3,464,672,782	11.00	10.00	5.00	15.00
Real Estate	2,763,143,671	8.78	10.00	5.00	15.00
Absolute Return	3,076,898,938	9.77	10.00	5.00	15.00
Private Equity	1,168,614,699	3.71	10.00	5.00	15.00
Unallocated Cash	1,605,217,681	5.10	0.00	0.00	10.00



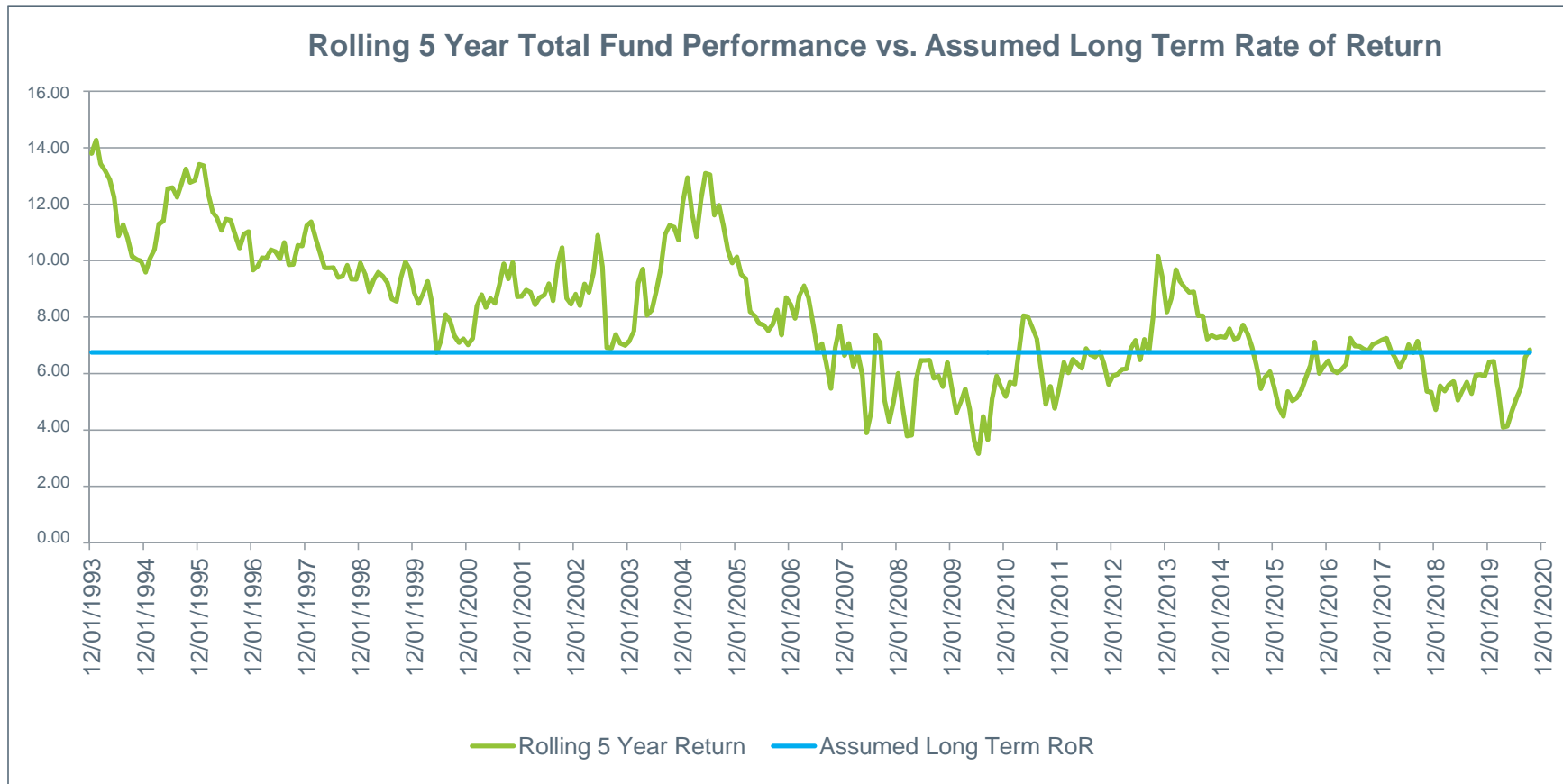
Total Fund Performance											
	Allocation	Performance (%)									
	Market Value (\$)	Quarter	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	15 Years	Since Incep.	Inception Date
Total Fund	31,484,555,880	4.62	0.13	3.87	4.99	6.84	5.92	6.15	5.80	8.25	01/01/1989
Actual Allocation Benchmark		5.85	0.60	4.59	4.97	6.75	5.80	6.03	5.73	7.74	
Difference		-1.23	-0.47	-0.72	0.02	0.09	0.12	0.12	0.07	0.51	

Performance shown is net of fees and provided by State Street. Allocations shown may not sum up to 100% exactly due to rounding.

Total Fund Objectives and Performance

As of September 30, 2020

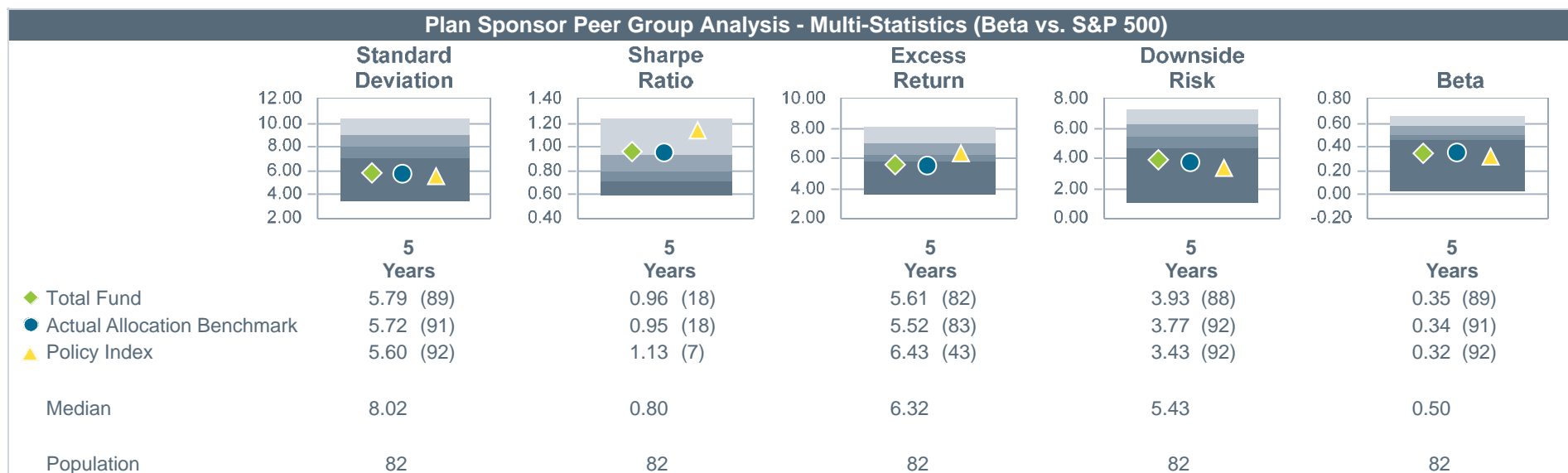
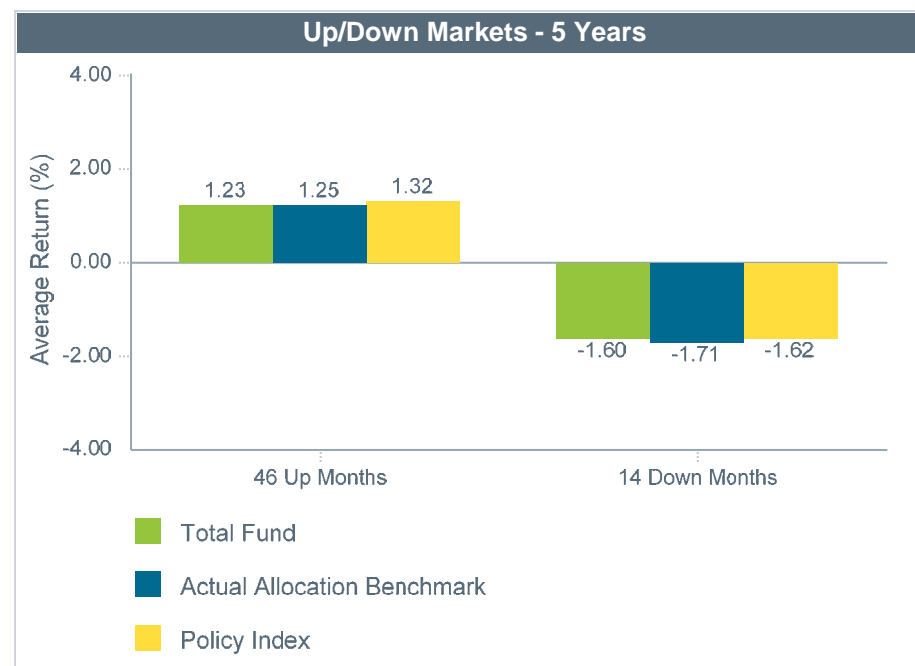
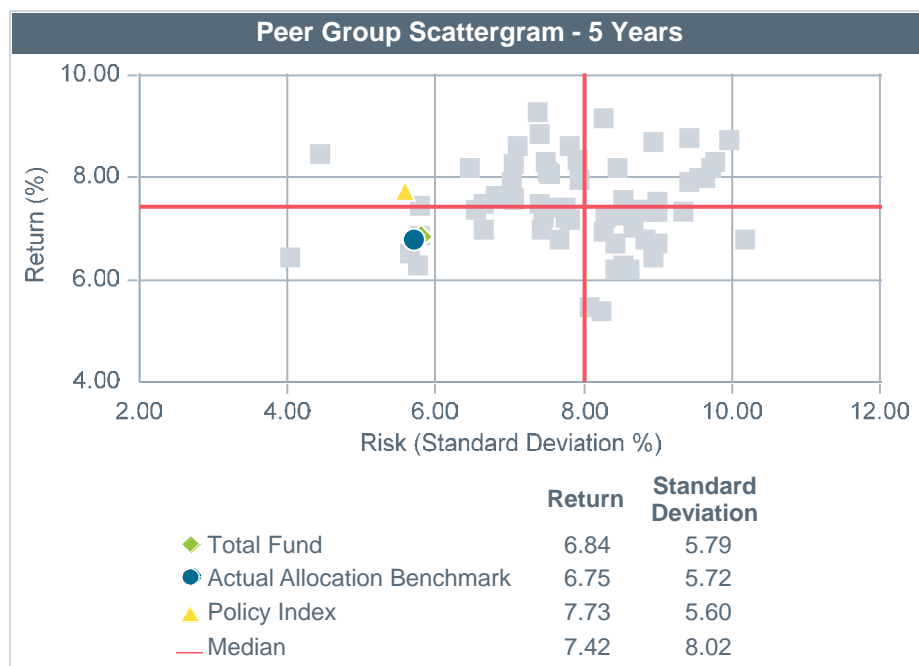
Total Fund Return Objectives				
Objective #1:	Achieve a total rate of return over rolling five-year periods consistent with the assumed long term rate of return on TMRS assets established by the actuary.			
Objective #2:	Exceed an appropriate benchmark reflective of asset class participation over rolling five-year periods.			
TMRS Composite	5 Year Total Fund Return	5 Year Benchmark Return	Benchmark Description	Meets Return Objective
Total Fund Composite (Net)	6.84	6.75	Assumed Long Term Rate of Return	Yes
Total Fund Composite (Net)	6.84	6.75	Actual Allocation Benchmark	Yes
Total Fund Composite (Net)	6.84	7.73	Policy Index	No



Performance shown is net of fees.

Total Fund vs. All Public Plans > \$1B-Total Fund

As of September 30, 2020



Performance shown is net of fees. Calculations based on monthly periodicity. Parenthesis contain percentile ranks.

Asset Class Composite Performance (Net)

As of September 30, 2020

	Allocation		Performance (%)									
	Market Value (\$)	%	Quarter	CYTD	1 Year	3 Years	5 Years	7 Years	10 Years	15 Years	Since Incep.	Inception Date
Total Fund	31,484,555,880	100.00	4.62	0.13	3.87	4.99	6.84	5.92	6.15	5.80	8.25	01/01/1989
Actual Allocation Benchmark			5.85	0.60	4.59	4.97	6.75	5.80	6.03	5.73	7.74	
Difference			-1.23	-0.47	-0.72	0.02	0.09	0.12	0.12	0.07	0.51	
Total Equity	9,617,051,371	30.55	7.91	-0.63	7.73	6.04	9.93	7.92	8.99	N/A	5.85	02/01/2008
Total Equity Benchmark			8.11	0.48	9.57	6.65	10.35	8.15	9.14	N/A	5.94	
Difference			-0.20	-1.11	-1.84	-0.61	-0.42	-0.23	-0.15	N/A	-0.09	
Core Fixed Income	4,033,009,046	12.81	0.91	7.60	7.88	5.65	4.54	4.17	3.84	4.32	7.53	01/01/1989
Fixed Income Benchmark			0.62	6.79	6.98	5.24	4.18	3.97	3.64	4.20	7.00	
Difference			0.29	0.81	0.90	0.41	0.36	0.20	0.20	0.12	0.53	
Non-Core Fixed Income	5,755,947,693	18.28	4.61	0.66	1.98	3.95	4.40	N/A	N/A	N/A	4.14	10/01/2014
Non-Core Fixed Income Benchmark			5.41	0.01	1.25	3.60	3.97	N/A	N/A	N/A	3.39	
Difference			-0.80	0.65	0.73	0.35	0.43	N/A	N/A	N/A	0.75	
Real Return	3,464,672,782	11.00	11.75	-1.51	0.23	3.80	4.30	3.02	N/A	N/A	3.56	02/01/2011
Real Return Benchmark			11.83	-0.69	0.76	3.85	4.59	3.38	3.55	4.22	3.71	
Difference			-0.08	-0.82	-0.53	-0.05	-0.29	-0.36	N/A	N/A	-0.15	
Real Estate	2,763,143,671	8.78	-1.26	-1.66	0.19	6.31	8.30	10.20	N/A	N/A	9.69	01/01/2012
Real Estate Benchmark			-1.51	0.88	2.21	5.65	7.28	9.06	10.79	7.00	9.63	
Difference			0.25	-2.54	-2.02	0.66	1.02	1.14	N/A	N/A	0.06	
Absolute Return	3,076,898,938	9.77	3.94	3.76	3.88	4.16	4.28	N/A	N/A	N/A	4.22	08/01/2014
Absolute Return Benchmark			5.70	4.35	4.94	3.31	2.63	3.28	3.17	2.78	2.55	
Difference			-1.76	-0.59	-1.06	0.85	1.65	N/A	N/A	N/A	1.67	
Private Equity	1,168,614,699	3.71	17.92	-5.15	1.04	16.92	N/A	N/A	N/A	N/A	13.25	01/01/2016
Private Equity Benchmark			17.92	-5.15	1.04	16.92	N/A	N/A	N/A	N/A	13.25	
Difference			0.00	0.00	0.00	0.00	N/A	N/A	N/A	N/A	0.00	
TMRs Unallocated Cash	1,605,217,681	5.10	0.04	0.39	1.28	1.53	1.20	0.95	0.69	N/A	0.66	06/01/2008
FTSE 30 Day T-Bill Index			0.03	0.43	0.86	1.57	1.09	0.78	0.56	1.15	0.52	
Difference			0.01	-0.04	0.42	-0.04	0.11	0.17	0.13	N/A	0.14	

Performance shown is net of fees and provided by State Street. Performance is annualized for periods greater than one year. Real Estate and Private Equity fund returns are calculated by AIS. Private Real Estate fund returns are lagged 1 quarter. Inception dates shown for Real Estate and Private Equity composite represent the first full quarter following initial funding. Inception dates for all other composites represents the first full month following initial funding. Please see Board Presentation/Executive Summary Report Addendum for custom benchmark definitions.

TMRS Composite Objectives and Performance

As of September 30, 2020

TMRS Composite Objectives - Policy Benchmarks				
Objective: Exceed its policy benchmark performance net of fees over rolling five year periods.				
TMRS Composites	Benchmark	5 Year Composite Return	5 Year Benchmark Return	Meets Objective
Total Equity	Total Equity Benchmark	9.93	10.35	No
Core Fixed Income	Fixed Income Benchmark	4.54	4.18	Yes
Non-Core Fixed Income	Non-Core Fixed Income Benchmark	4.40	3.97	Yes
Real Return	Real Return Benchmark	4.30	4.59	No
Real Estate	Real Estate Benchmark	8.30	7.28	Yes
Absolute Return	Absolute Return Benchmark	4.28	2.63	Yes
Private Equity	Private Equity Benchmark	N/A	N/A	N/A

TMRS Composite Objectives - Asset Class Goals							
Objective: Exceed its asset class goal benchmark performance net of fees over rolling five year periods.							
TMRS Composites	Benchmark	5 Year Composite Return	5 Year Asset Class Goal Return	Meets Objective	Since Inception Composite Return	Since Inception Asset Class Goal Return	Meets Objective
Total Equity	Total Equity Benchmark	9.93	10.35	No	5.85	5.94	No
Core Fixed Income	Fixed Income Benchmark	4.54	4.18	Yes	7.53	7.00	Yes
Non-Core Fixed Income	50% BofA ML US HY Constrained Index / 50% CS LL Index	4.40	5.32	No	4.14	4.21	No
Real Return	CPI + 4%	4.30	5.88	No	3.56	5.81	No
Real Estate	CPI + 5%	8.30	6.90	Yes	9.69	6.73	Yes
Absolute Return	3 Month LIBOR + 4%	4.28	5.56	No	4.22	5.31	No
Private Equity	Russell 3000 + 3% Quarter Lag	N/A	13.33	N/A	13.25	15.73	No

Performance shown is net of fees. Please see Board Presentation/Executive Summary Report Addendum for custom benchmark definitions.

TMRS Asset Class Composites

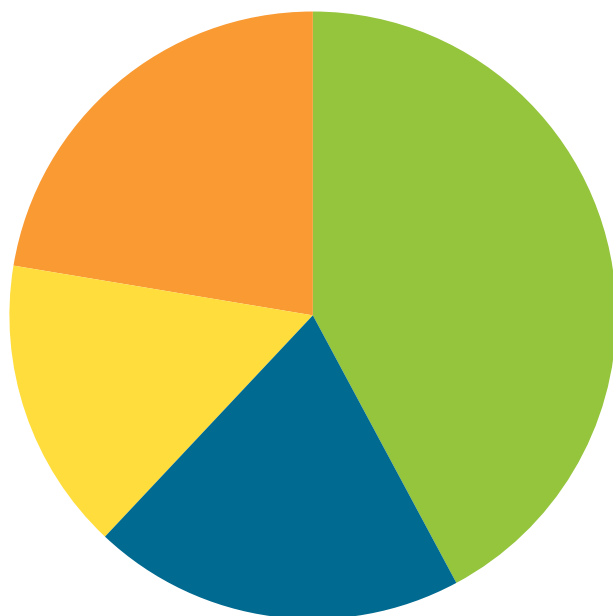


Total Equity Performance & Allocation

As of September 30, 2020

Asset Allocation by Manager

\$9,617,051,371



- Passive US Equity
- Active US Equity
- Active Non-US Equity
- Passive Non-US Equity

Market Value (\$)	Allocation (%)
4,054,329,894	42.16
1,909,586,932	19.86
1,500,303,536	15.60
2,152,831,008	22.39

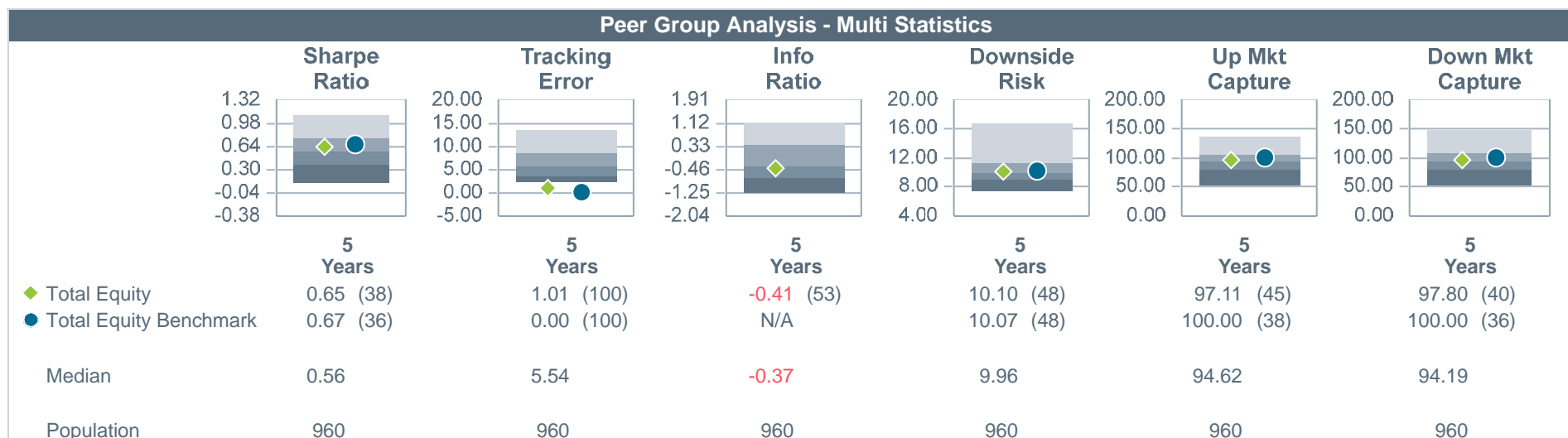
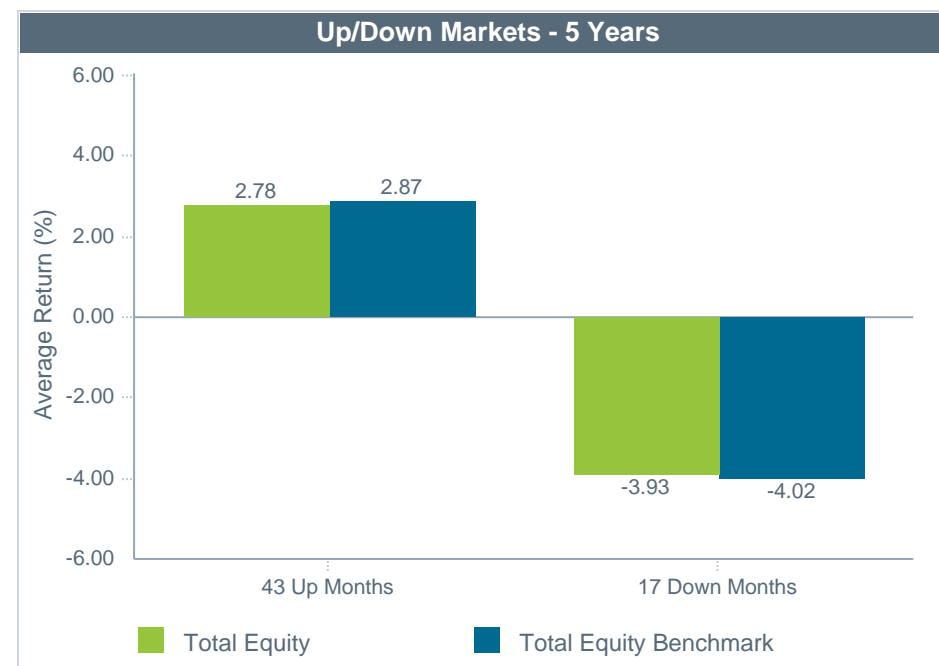
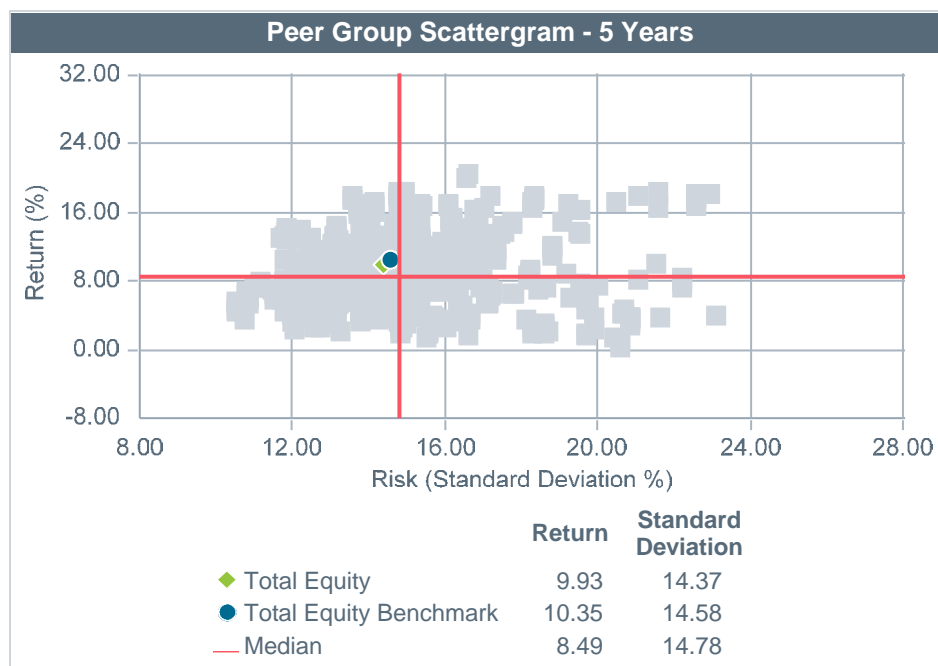
Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Total Equity	7.91	-0.63	7.73	6.04	9.93	8.99	26.41	-10.28	23.97	9.39	-1.47	5.85	02/01/2008
Total Equity Benchmark	8.11	0.48	9.57	6.65	10.35	9.14	26.35	-9.69	23.84	9.54	-1.47	5.94	
Difference	-0.20	-1.11	-1.84	-0.61	-0.42	-0.15	0.06	-0.59	0.13	-0.15	0.00	-0.09	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding.

Total Equity vs. IM Global Equity

As of September 30, 2020



Performance shown is net of fees. Calculations based on monthly periodicity. Parenthesis contain percentile ranks. Please see Board Presentation/Executive Summary Report Addendum for custom benchmark definitions.

Core Fixed Income Performance and Allocation

As of September 30, 2020

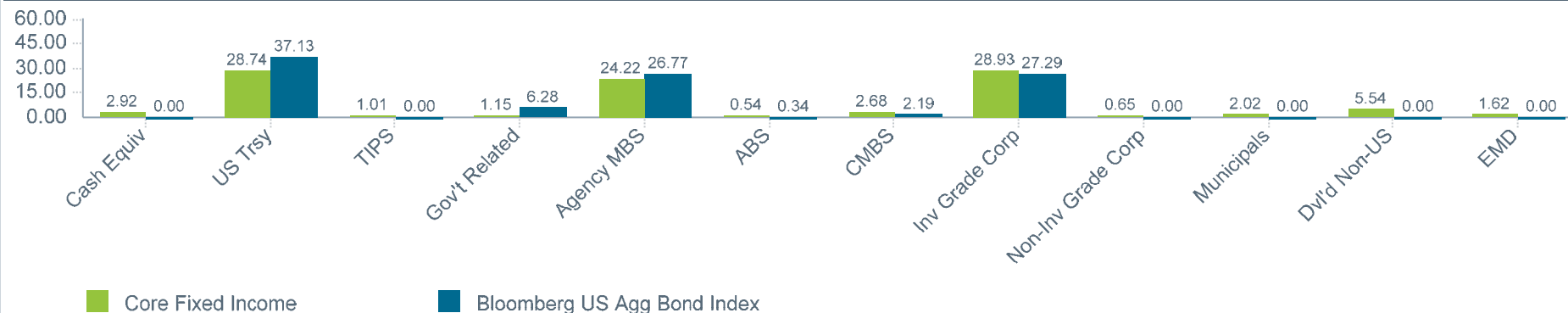
Asset Allocation by Manager

	Market Value (\$)	Allocation (%)
Core Fixed Income	3,247,214,732	80.52
Core Plus Fixed Income	785,794,314	19.48
Total Core Fixed Income	4,033,009,046	100.00

Portfolio Characteristics

	Portfolio	Benchmark
Effective Duration	5.81	6.12
Spread Duration	3.59	6.35
Convexity	0.43	0.43
Avg. Maturity	7.77	8.18
Avg. Quality	Aa3	Aa1/Aa2
Yield To Maturity (%)	1.33	1.19
Coupon Rate (%)	2.69	2.90
Current Yield (%)	2.47	N/A

Sector Distribution (%)



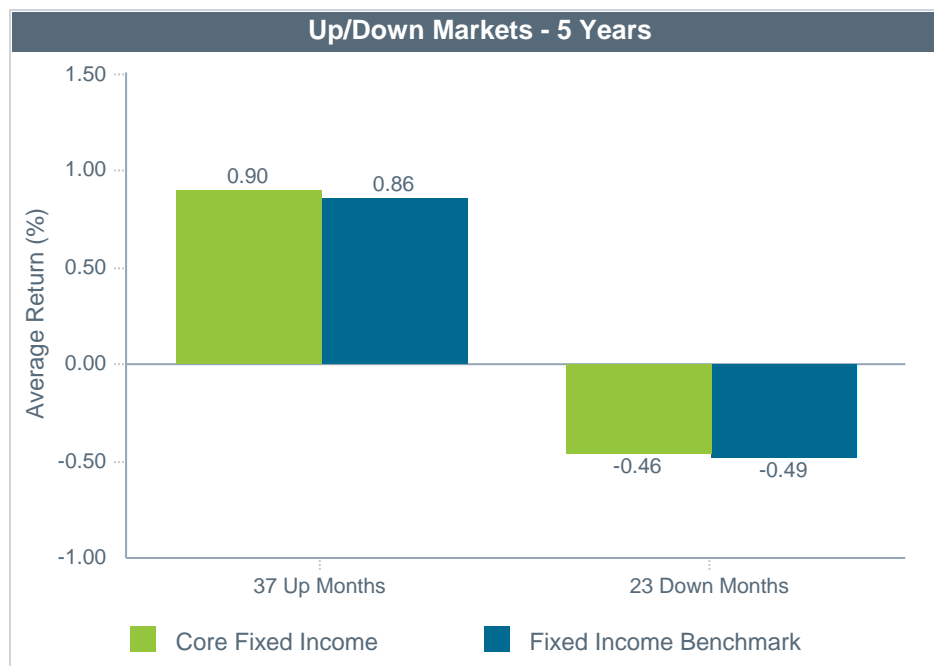
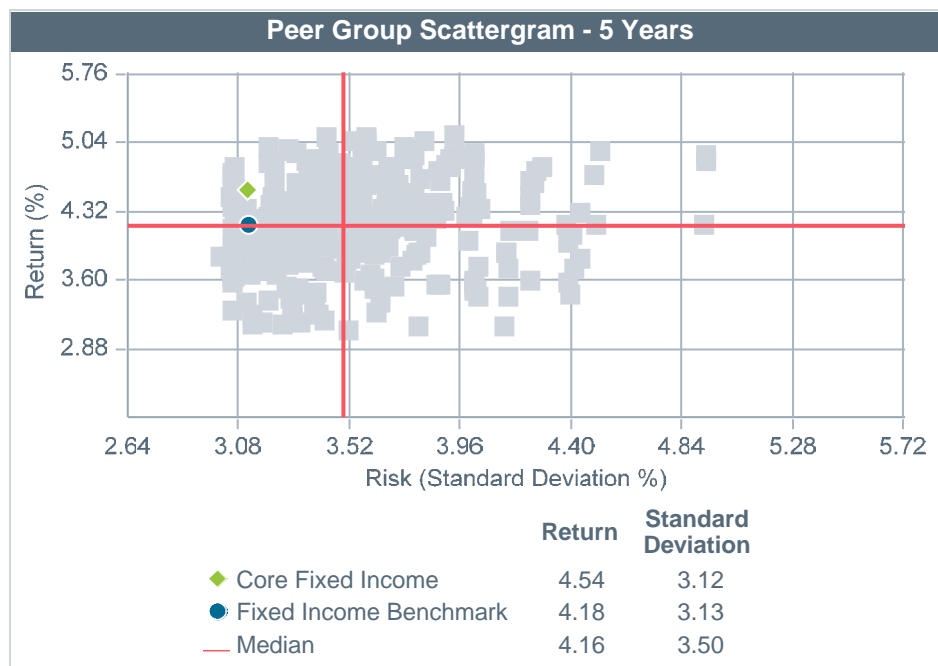
Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Core Fixed Income	0.91	7.60	7.88	5.65	4.54	3.84	9.08	0.02	3.83	2.89	0.72	7.53	01/01/1989
Fixed Income Benchmark	0.62	6.79	6.98	5.24	4.18	3.64	8.72	0.01	3.54	2.65	0.55	7.00	
Difference	0.29	0.81	0.90	0.41	0.36	0.20	0.36	0.01	0.29	0.24	0.17	0.53	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Please see Board Presentation/Executive Summary Report Addendum for custom benchmark definitions.

Core Fixed Income vs. IM U.S. Broad Market Core Fixed Income

As of September 30, 2020



Performance shown is net of fees. Calculations based on monthly periodicity. Parenthesis contain percentile ranks. Please see Board Presentation/Executive Summary Report Addendum for custom benchmark definitions.

Non-Core Fixed Income Performance & Allocation

As of September 30, 2020

Asset Allocation by Sector

\$5,755,947,693



	Market Value (\$)	Allocation (%)
Structured Credit	1,173,753,213	20.39
Opportunistic Credit	1,077,873,946	18.73
Direct Lending	1,031,603,602	17.92
Bank Loans and CLO	944,185,234	16.40
Emerging Market Debt	823,343,163	14.30
High Yield Fixed	705,188,535	12.25

Asset Class	Allocated/Committed	Drawn/Invested	Drawn/Invested (%)
Private Non-Core Fixed Income	\$3,285,000,000	\$2,243,396,854	68%

Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Non-Core Fixed Income	4.61	0.66	1.98	3.95	4.40	N/A	7.85	2.37	7.51	5.60	0.37	4.14	10/01/2014
Non-Core Fixed Income Benchmark	5.41	0.01	1.25	3.60	3.97	N/A	7.19	2.73	5.49	6.82	-2.31	3.39	
Difference	-0.80	0.65	0.73	0.35	0.43	N/A	0.66	-0.36	2.02	-1.22	2.68	0.75	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Commitment and drawdown information shown is as of 09/30/2020 and is provided by TMRS staff. Drawn/Invested figures shown represent contributed capital and do not account for fees and distributions.



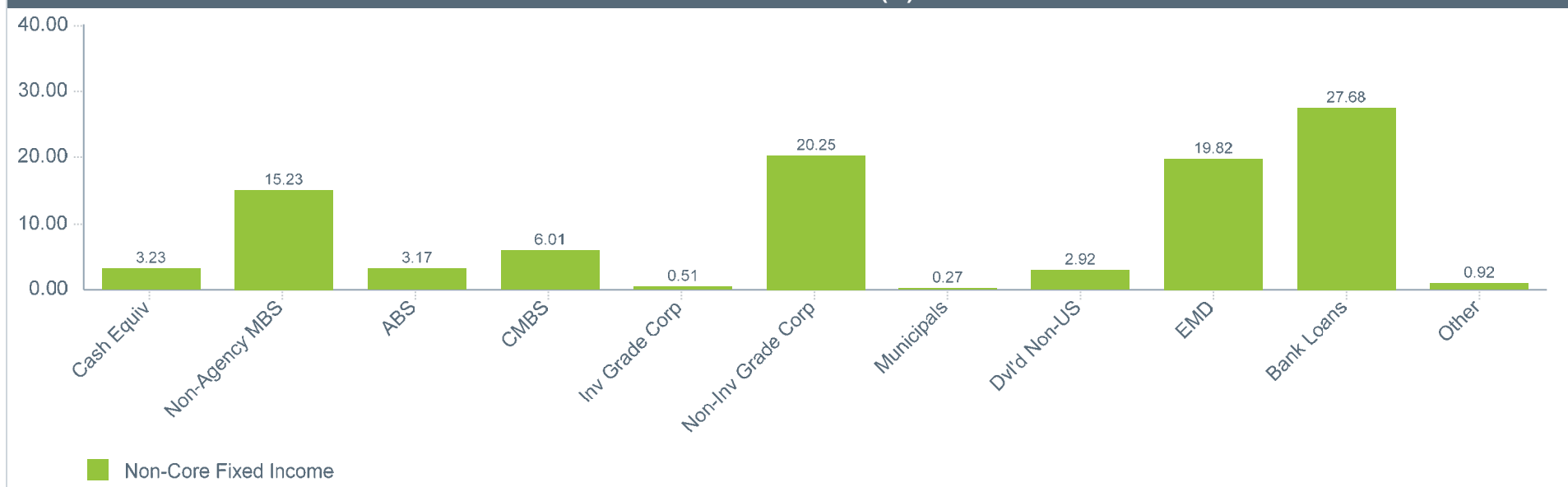
Non-Core Fixed Income

As of September 30, 2020

Portfolio Characteristics

	Portfolio
Effective Duration	3.09
Spread Duration	2.94
Avg. Maturity	8.14
Avg. Quality	Ba3
Yield To Maturity (%)	5.43
Coupon Rate (%)	4.56
Current Yield (%)	4.95

Sector Distribution (%)



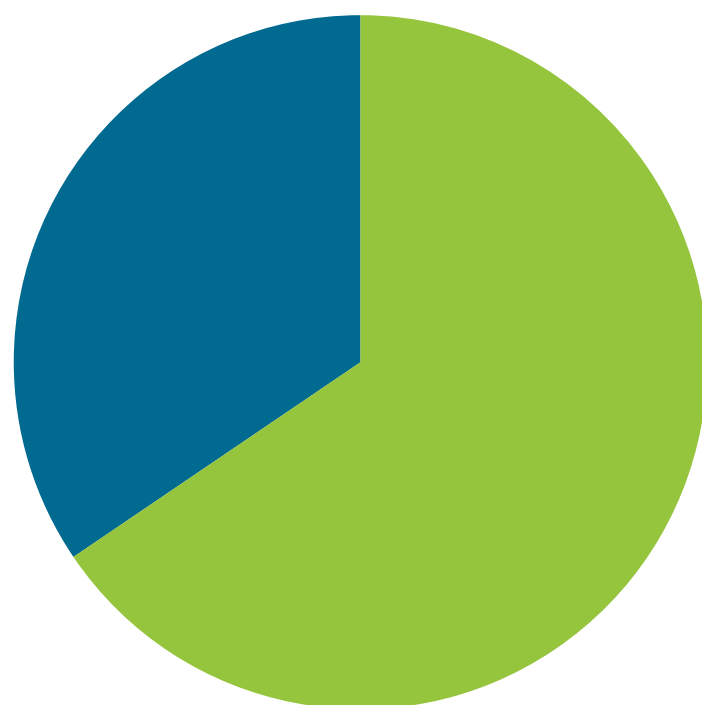
Bond characteristics exclude Private Credit and Waterfall Eden. Allocation to "Other" consists of interest rate derivatives, derivative offsets, equity, private equity, hedges, real estate, IRS, CDS, FX Forwards, accrued interest, accrued fees, unsettled trades, and structured.

Real Return Performance and Allocation

As of September 30, 2020

Asset Allocation by Sector

\$3,464,672,782



- Public Real Return
- Private Real Return

Market Value (\$)

2,269,962,362

1,194,710,420

Allocation (%)

65.52

34.48

Asset Class	Allocated/Committed	Drawn/Invested	Drawn/Invested (%)
Private Real Return	\$2,781,500,000	\$1,155,852,228	42%

Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Real Return	11.75	-1.51	0.23	3.80	4.30	N/A	15.54	-4.30	8.04	6.95	-5.71	3.56	02/01/2011
Real Return Benchmark	11.83	-0.69	0.76	3.85	4.59	3.55	14.27	-3.97	9.64	7.25	-4.70	3.71	
Difference	-0.08	-0.82	-0.53	-0.05	-0.29	N/A	1.27	-0.33	-1.60	-0.30	-1.01	-0.15	

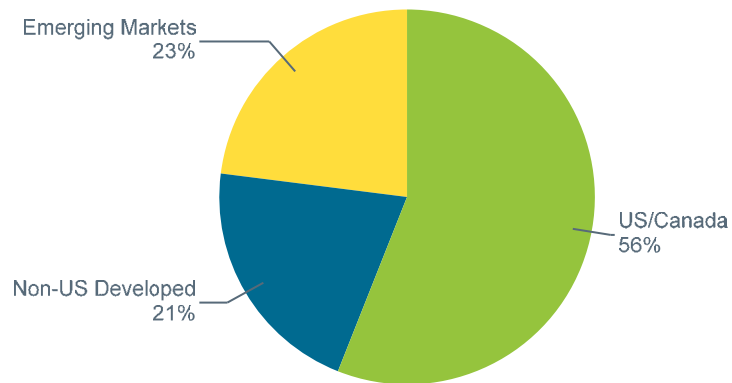
Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Commitment and drawdown information shown is as of 09/30/2020 and is provided by TMRS staff. Drawn/Invested figures shown represent contributed capital and do not account for fees and distributions.



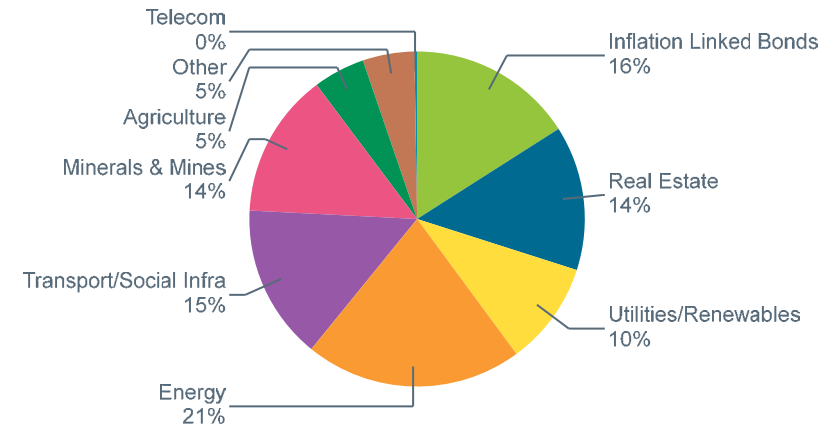
Real Return Portfolio Diversification

As of September 30, 2020

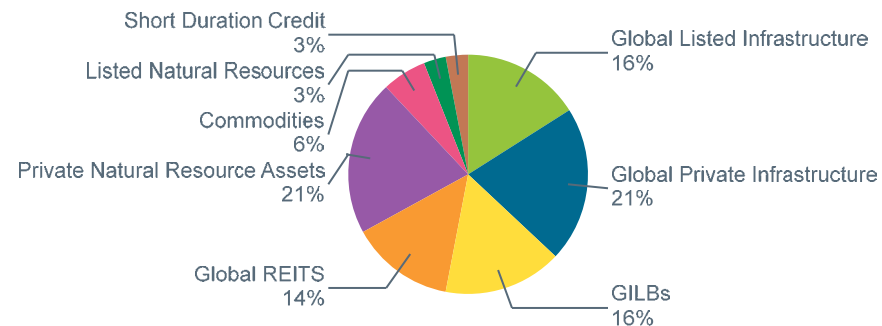
Portfolio Exposure by Geography



Portfolio Exposure by Sector



Portfolio Exposure by Asset Type



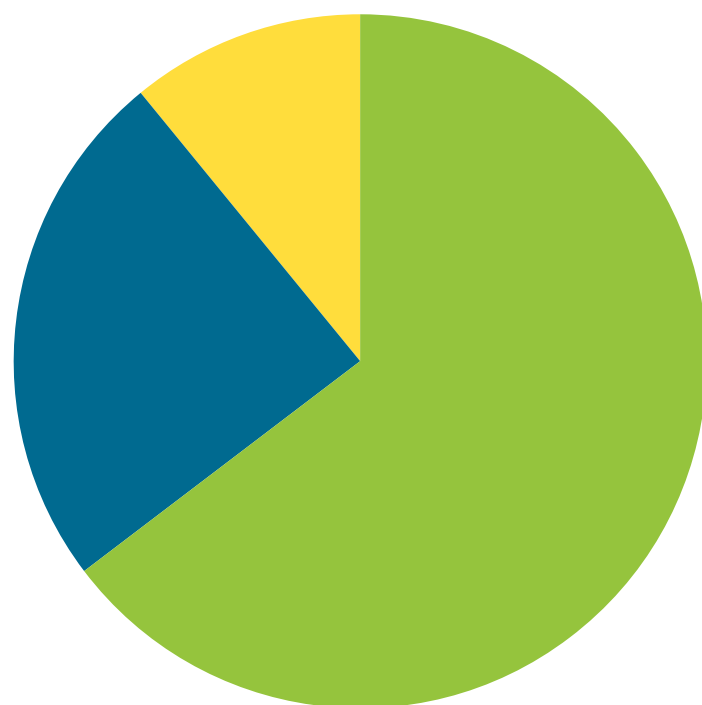
Allocations may not sum up to 100% exactly due to rounding. Allocation information is provided by TMRS and is as of 03/31/2020.

Real Estate Performance and Allocation

As of September 30, 2020

Asset Allocation by Sector

\$2,763,143,671



- Core Real Estate
- Value Add Real Estate
- Opportunistic Real Estate

Market Value (\$)	Allocation (%)
1,786,760,820	64.66
674,568,218	24.41
301,814,632	10.92

Asset Class	Allocated/Committed	Drawn/Invested	Drawn/Invested (%)
Real Estate	\$4,446,216,216	\$2,648,400,362	60%

Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Real Estate	-1.26	-1.66	0.19	6.31	8.30	N/A	7.26	10.62	10.56	12.33	12.97	9.69	01/01/2012
Real Estate Benchmark	-1.51	0.88	2.21	5.65	7.28	10.79	5.59	8.67	7.65	9.97	15.00	9.63	
Difference	0.25	-2.54	-2.02	0.66	1.02	N/A	1.67	1.95	2.91	2.36	-2.03	0.06	

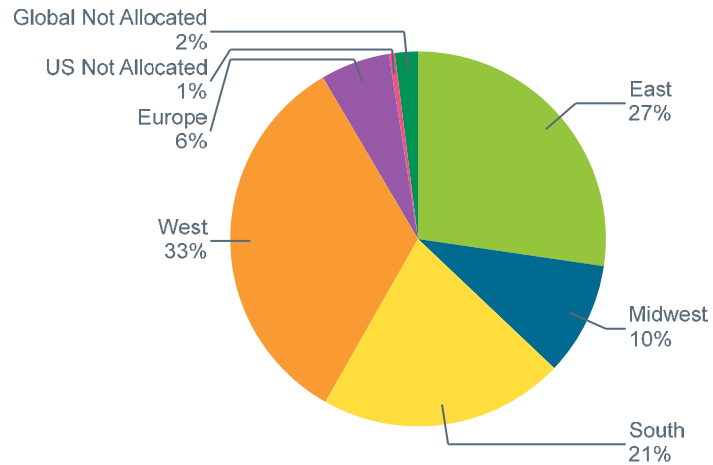
Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Commitment and drawdown information shown is as of 09/30/2020 and is provided by TMRS staff. Drawn/Invested figures shown represent contributed capital and do not account for fees and distributions.



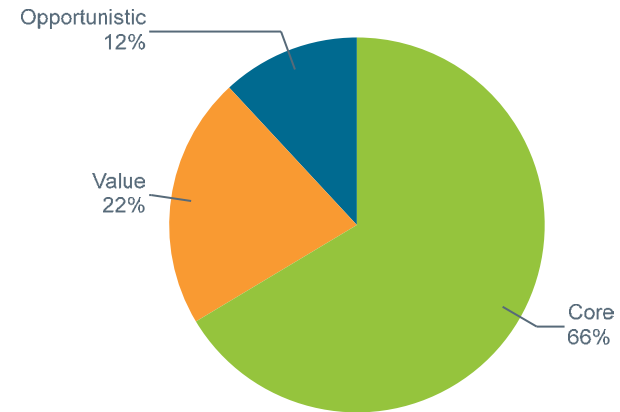
Real Estate Portfolio Diversification

As of September 30, 2020

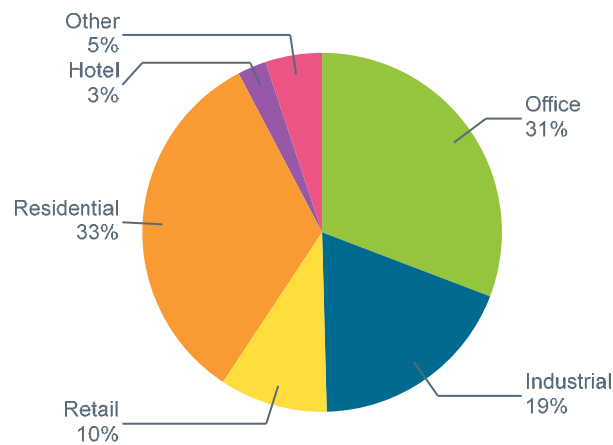
Portfolio Exposure by Geography



Portfolio Exposure by Sector



Portfolio Exposure by Property Type



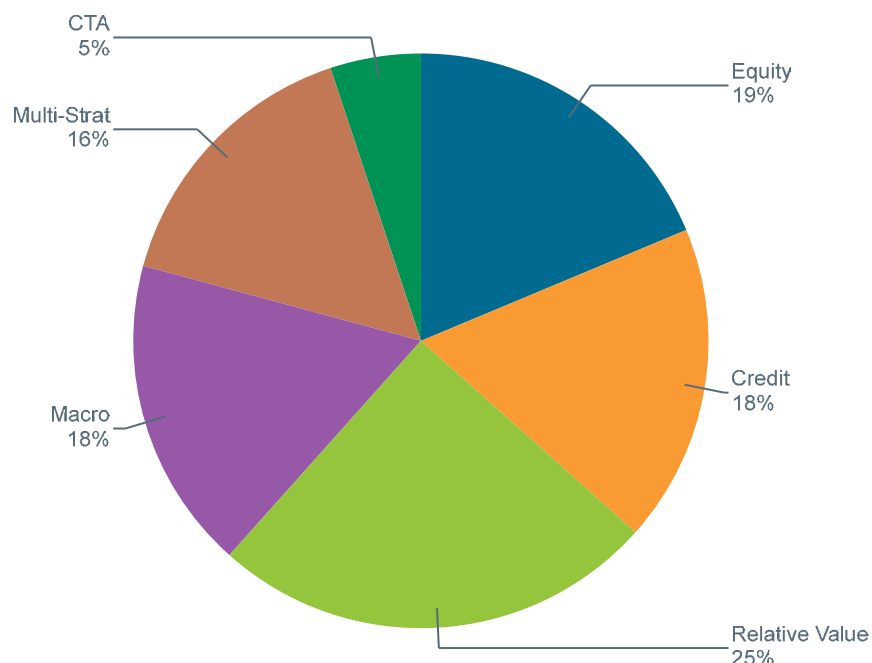
Allocations may not sum up to 100% exactly due to rounding. Allocation information shown for sector, property type, and geography is provided by TMRS and is as of 12/31/2019.

Absolute Return Performance and Allocation

As of September 30, 2020

Direct Portfolio Manager Exposures

3,076,898,938



Asset Class	Allocated/Committed	Drawn/Invested	Drawn/Invested (%)
Absolute Return	\$2,792,100,000	\$2,634,196,824	94%

Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Absolute Return	3.94	3.76	3.88	4.16	4.28	N/A	5.14	1.51	11.72	0.22	3.34	4.22	08/01/2014
Absolute Return Benchmark	5.70	4.35	4.94	3.31	2.63	3.17	4.90	-0.93	7.11	-1.34	0.79	2.55	
Difference	-1.76	-0.59	-1.06	0.85	1.65	N/A	0.24	2.44	4.61	1.56	2.55	1.67	
Absolute Return Direct Composite	3.96	3.81	3.96	3.99	N/A	N/A	5.16	1.07	12.51	0.35	N/A	4.73	01/01/2016
Absolute Return Benchmark	5.70	4.35	4.94	3.31	2.63	3.17	4.90	-0.93	7.11	-1.34	0.79	2.91	
Difference	-1.74	-0.54	-0.98	0.68	N/A	N/A	0.26	2.00	5.40	1.69	N/A	1.82	

Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Commitment and drawdown information shown is as of 09/30/2020 and is provided by TMRS staff. Drawn/Invested figures shown represent contributed capital and do not account for fees and distributions. Allocation information is provided by TMRS and is as of 09/30/2020. The BlackStone Treaty Oak Fund is in the process of winding down the portfolio.

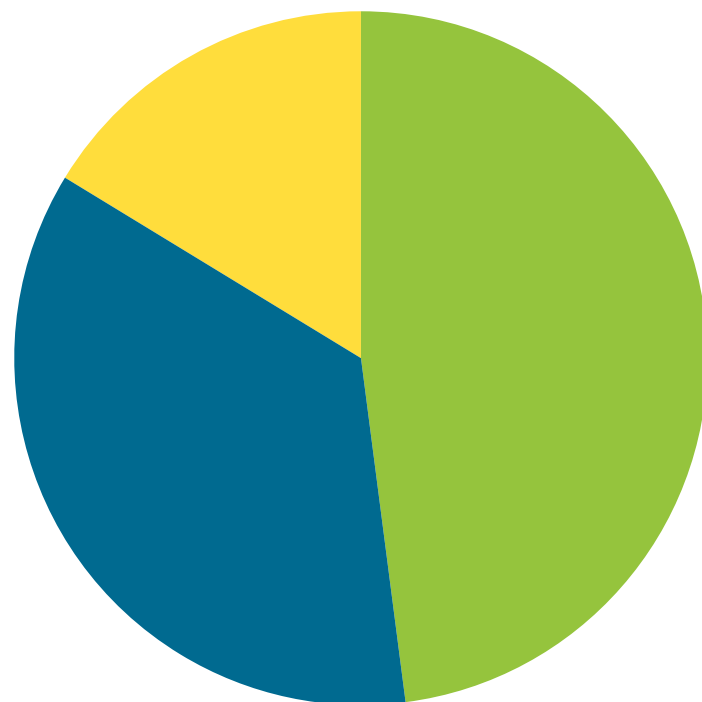


Private Equity Performance and Allocation

As of September 30, 2020

Asset Allocation by Sector

\$1,168,614,699



	Market Value (\$)	Allocation (%)
Private Equity - Buy Out	560,245,669	47.94
Private Equity - Venture/Growth	417,991,526	35.77
Private Equity - Special Situations	190,377,503	16.29

Asset Class	Allocated/Committed	Drawn/Invested	Drawn/Invested (%)
Private Equity	\$2,940,100,000	\$961,695,842	33%

Comparative Performance

	1 Quarter	CYTD	1 Year	3 Years	5 Years	10 Years	2019	2018	2017	2016	2015	Since Incep.	Inception Date
Private Equity	17.92	-5.15	1.04	16.92	N/A	N/A	12.39	39.18	19.69	1.68	N/A	13.25	01/01/2016
Private Equity - Buy Out	29.21	3.47	20.18	14.26	N/A	N/A	2.14	26.96	7.09	23.91	N/A	12.91	01/01/2016
Private Equity - Venture/Growth	10.31	-8.75	-4.96	25.78	N/A	N/A	26.51	58.25	34.71	N/A	N/A	19.04	07/01/2016
Private Equity - Special Situations	11.92	-6.39	-6.47	3.53	N/A	N/A	1.01	15.17	12.52	N/A	N/A	4.94	04/01/2016

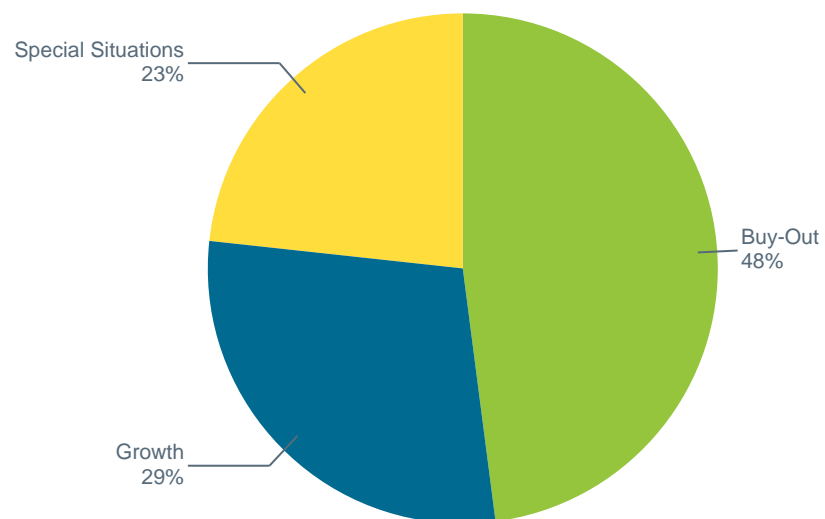
Performance shown is net of fees. Allocations shown may not sum up to 100% exactly due to rounding. Commitment and drawdown information shown is as of 09/30/2020 and is provided by TMRS staff. Drawn/Invested figures shown represent contributed capital and do not account for fees and distributions.



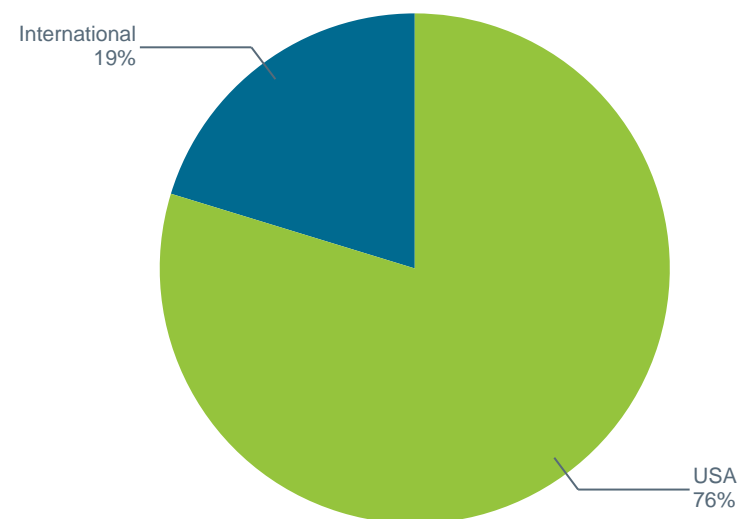
Private Equity Strategic Allocation

As of September 30, 2020

Private Equity Strategy Diversification by Commitment



Private Equity Geographic Diversification by Commitment



Policy Strategy Ranges

Control/Buy-out	40% to 75%
Venture/Growth/Minority	10% to 40%
Special Situations/Opportunistic	5% to 35%

Policy Geography Ranges

No less than 75% in USA
No more than 25% in International

Allocations may not sum up to 100% exactly due to rounding. Allocation information is provided by TMRS and is as of 09/30/2020.

Additional Information

For additional information on investment managers, please see the RVK quarterly performance report, or materials provided by a specialty consultant.

Composite Benchmark Comments

The **Actual Allocation Benchmark** is calculated monthly using beginning of month asset class weights applied to each corresponding benchmark return and currently consists of the following:

- Total Equity Benchmark
- Fixed Income Benchmark
- Non-Core Fixed Income Benchmark
- Real Return Benchmark
- Real Estate Benchmark
- Absolute Return Benchmark
- Private Equity Benchmark
- FTSE 30 Day T-Bill Index

The **Policy Index** represents asset allocation targets adopted historically and currently consists of the following:

- 30.0% Total Equity Benchmark
- 10.0% Fixed Income Benchmark
- 20.0% Non-Core Fixed Income Benchmark
- 10.0% Real Return Benchmark
- 10.0% Real Estate Benchmark
- 10.0% Absolute Return Benchmark
- 10.0% Private Equity Benchmark

Asset Class Composite Benchmarks:

The **Total Equity Benchmark** is calculated monthly and consists of 50% Russell 3000 Index and 50% MSCI EAFE Index (USD) (Net) through 07/31/2010; a blend of the Russell 3000 Index, MSCI ACW Ex US IM Index (USD) (Net) and MSCI EAFE Index (USD) (Net) at beginning of month investment weights through 11/30/2012; and a blend of the Russell 3000 Index and MSCI ACW Ex US IM Index (USD) (Net) at beginning of the month weights through 12/31/2018; and MSCI ACW IM Index (USD) (Net) thereafter.

The **Fixed Income Benchmark** is calculated monthly and consists of the Bloomberg US Gov't Crdt Lng Trm Bond Index through 06/30/2009; Bloomberg US Agg Bond Index thereafter.

The **Non-Core Fixed Income Benchmark** is calculated monthly using beginning of the month sub-asset class weights within the Non-Core Fixed Income Composite applied to each sub-asset class primary benchmark return.

The **Real Return Benchmark** is calculated monthly using beginning of the month sub-asset class weights within the Real Return Composite applied to each sub-asset class primary benchmark return.

The **Real Estate Benchmark** is calculated monthly using beginning of the month real estate manager weights applied to each corresponding primary benchmark return.

The **Absolute Return Benchmark** is calculated monthly and consists of the HFRI FOF: Dvf'd Index (1 Mo Lag).

The **Private Equity Benchmark** is set equal to the Composite return.

Real Estate Performance Comments

"Privately held real estate fund returns are one-quarter lagged and are provided by Private Edge. Quarterly returns are incorporated in the last month of that particular quarter. The returns for the first two months are zero.

Market values are previous quarter-end values as reported, rolled forward with current cash flows. Returns and market values provided by Private Edge are rolled into their respective Real Estate composite and the Total Plan composite.

Publicly traded real estate fund performance is non-lagged, reflecting monthly fluctuations. Detailed information regarding methodology can be found in the internal TMRS Performance Reporting Policy statement" (State Street Performance Team).

H/2 CP, LP is a publicly traded real estate fund, previously classified as non-public. Performance from 10/2015 - 12/2015 is revised to reflect the change in calculation methodology.

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&P</u>	<u>Moody's</u>	<u>Explanation</u>	<u>S&P</u>	<u>Moody's</u>	<u>Explanation</u>
Higher Credit Quality – Investment Grade			Lower Credit Quality – Below Investment Grade		
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., 1st quartile, 2nd quartile, 3rd quartile, and 4th quartile). The median observation is where the 2nd quartile and 3rd 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, and thus may differ from the classification of the investment manager and/or index provider.

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, and 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. Stocks are unclassified when there is not enough data to determine a size and style metric.

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.

Glossary

- 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.
- 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.
- Unemployment Rate** - The percentage of the total labor force that is unemployed but actively seeking employment.
- 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.
- 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 that focuses only on the negative movements of the return series. It is calculated by taking the standard deviation of the negative returns for the selected periodicity. 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

Glossary

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.

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.

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 4th 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 valuing a company's current share price relative to its trailing 12-month per-share earnings (EPS).

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.

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.

Return - Compounded rate of return for the period.

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

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.

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		

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

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 portfolio's 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

BOISE

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.

