

2016 Equity Asset Class Review

December 8-9, 2016

Kristin Qualls, Director of Equities

Carol Leung, Public Equity Senior Investment Analyst



Agenda

- I. Executive Summary
- II. Implementation & Performance Review
- III. IPS Monitoring & Portfolio Review
- IV. Public Equity Market Update
- V. 2016 Highlights & Initiatives
- VI. Appendix
 - Manager Scorecards
 - 2012-2015 Board Action & Implementation
 - Equity Strategy Descriptions

I. Executive Summary



Public Equities: Asset Class Objectives

US Equity:

- Intended to provide capital appreciation and is structured using a Core-Satellite Approach with the overall objective of exceeding its benchmark performance net of fees over rolling five year periods.
- Active and Rules-Based strategies with an active component are expected to add excess return within established tracking error limits and will meet quality, diversification, and liquidity guidelines as specified in the Managers' contracts.

International Equity:

- Intended to provide capital appreciation and diversification, and is structured using a Core-Satellite Approach with the overall objective of exceeding its benchmark performance net of fees over rolling five year periods.
- Active and Rules-Based strategies with an active component are expected to add excess return within established tracking error limits and will meet quality, diversification, and liquidity guidelines as specified in the Managers' contracts or otherwise agreed to in writing between TMRS and the Investment Manager.

Annual Comprehensive Review Process

- Per TMRS's IPS, annual comprehensive reviews are to be conducted and documented at least annually.
- The results of an annual or ad hoc comprehensive review will be reported to the Board along with recommended action, if appropriate.
- The annual review process includes:
 - A RFI Questionnaire is sent to all managers being reviewed for the most recent year. This questionnaire includes questions covering the firm, personnel, investment strategy or style, philosophy and process, compliance, operations, risk management, and performance.
 - Managers are reviewed on both quantitative and qualitative factors.
 - The review includes a due diligence visit by Staff to the Manager's office or a meeting that takes place at TMRS.
 - Results are reported to the Board along with any recommended actions, if appropriate.

II. Implementation & Performance Review



Implementation of the Public Equity Portfolio 2008 - 2015

Year	Pacing Plan Update
2008-2009	<ul style="list-style-type: none"> • In Jan. 2008, diversification began in a balanced approach investing monthly into passive commingled funds, Russell 3000 (US) lending fund & EAFE (Non-US) lending fund; target allocation was 12%; non-lending funds were implemented in Nov. 2008 following investment in lending funds ceased in 3rd qtr of 2008 due to sec lending market issues; • Further equity diversification stopped at the end of 2008 in anticipation of HB360 legislation; • In June 2009, TMRS started bi-monthly redemptions from the lending funds to the non-lending funds; • HB360 legislation passed in Jun. 2009; Jul. 2009, diversification continued into equities monthly; • 12% allocation to equities in 2008 & 23% allocation in 2009; target allocation of 40%.
2010-2011	<ul style="list-style-type: none"> • Market volatility causes completion of target allocation (40%) to be extended to Dec. 2011 from Dec. 2010; • NTGI's bi-monthly redemptions from the lending funds were completed in June 2010; • Diversification expands into Emerging Markets and Small Caps- conversion from EAFE to ACW ex. US IMI non-lending fund began in Aug. 2010; • In 2011, investment staff begins analyzing additional strategies to further diversify the equity portfolio; • Full conversion from EAFE to ACW ex. US IMI NL fund was completed in 2011; • 33% allocation to equities as of Dec. 2010; equity portfolio reached full target allocation of 40% in 2011.
2012-2013	<ul style="list-style-type: none"> • Mar. 2012, Trustees approve core/satellite structure with initial allocation to rules-based strategies; • Sept. 2012, Trustees approve selection of two managers for rules-based strategies, Fundamental Indexing and Minimum Volatility; Min Vol portfolios funded in Dec. 2012 & Fundamental Indexing funded in Jan. 2013; • Sept. 2013, the Board approved Phase I U.S. manager recommendations for the satellite (active) allocation of the equity portfolio; a 4% allocation was funded from the core portfolio in Dec. 2013. • 42.7% allocation to equities as of Dec. 2012; 40.7% core (passive), 2% satellite (active) rules-based strategies. • 48.6% allocation to equities as of Dec. 2013; 42.4% core (passive), 6.2% satellite (active) strategies.
2014-2015	<ul style="list-style-type: none"> • 2014 Phase I non-U.S. manager recommendations - March 2014 Board meeting; • 2014 Phase II U.S. Mid Cap manager recommendations - June 2014 Board meeting; • 2014 Phase II non-U.S. Emerging Markets manager recommendations - September 2014 Board meeting; • 2014 Equity Asset Class Review presented at December 2014 Board meeting; • 2015 Phase III U.S. Small Cap manager recommendations – June 2015 Board meeting; • 2015 Phase III non-U.S. Small Cap manager recommendations – Sept 2015 Board meeting; • 2015 Equity Asset Class Review presented at December 2015 Board meeting; • 45.1% allocation to equities as of Dec. 2014; 35.4% core (passive), 9.7% satellite (active) strategies. • 43.3% allocation to equities as of Dec. 2015; 29.3% core (passive), 14% satellite (active) strategies.

Public Equities: Portfolio Management Structure

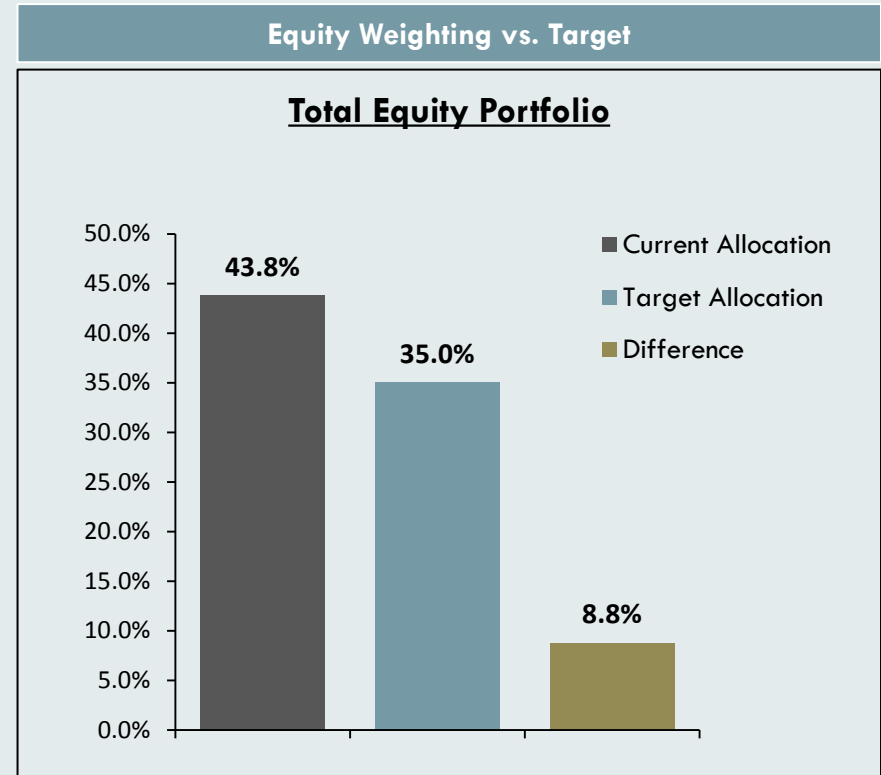
ASSET CLASS	STRATEGY TYPE	MANAGER	PORTFOLIO BENCHMARK
Domestic Equities US Core/Passive	Passive Broad Market Index	Northern Trust Asset Management	Russell 3000 Index
US Rules-Based	Passive Fundamental Index	State Street Global Advisors	Russell US Fundamental Index*
US Rules-Based	Passive Minimum Volatility	UBS Global Asset Management	MSCI US Min Vol Index
US Satellite/Active	US Traditional All Cap	Epoch Investment Partners, Inc.	Russell 3000 Index
US Satellite/Active	US Opportunistic All Cap	Sasco Capital, Inc.	Russell Mid Cap Value Index
US Satellite/Active	US Mid Cap Opportunistic	The Boston Company	Russell Mid Cap Index
US Satellite/Active	US Mid Cap Core	Champlain Investment Partners	Russell Mid Cap Index
US Satellite/Active	US Small Cap Opportunistic	The Boston Company	Russell 2000 Index
US Satellite/Active	US Small Cap Opportunities	Wellington Management	Russell 2000 Index
International Equities Non-US Core/Passive	Passive Broad Market Index	Northern Trust Asset Management	All Country World (ACW) ex US Investable Market Index (IMI)
Non-US Rules-Based	Passive Fundamental Index	State Street Global Advisors	Russell Fundamental Global ex US*
Non-US Rules-Based	Passive Minimum Volatility	UBS Global Asset Management	MSCI World ex US Min Vol Index
Non-US Satellite/Active	Non-US Opportunistic Rel Value	Wellington Management	MSCI ACWI ex US Index
Non-US Satellite/Active	Non-US Opportunistic Core	Lazard Asset Management	MSCI ACWI ex US Index
Non-US Satellite/Active	Non-US Emerging Markets	Acadian Asset Management	MSCI Emerging Markets (EM) IMI Index
Non-US Satellite/Active	Non-US Emerging Markets	William Blair & Company	MSCI Emerging Markets (EM) Index
Non-US Satellite/Active	Non-US Small Cap	Wasatch Advisors, Inc.	MSCI All Country World (ACW) ex. US Small Cap Index
Non-US Satellite/Active	Non-US Small Cap	Wellington Management	MSCI EAFE Small Cap Index

* Benchmark and portfolio name will change in December 2016

Current vs. Target Total Equity Allocation

As of 10/31/2016

Mandate	Market Value	% of Total Fund
PASSIVE EQUITY		
NTGI RUSSELL 3000	4,686,763,675	18.9%
NTGI ACW EX. US IMI	2,433,770,980	9.8%
TOTAL:	7,120,534,655	28.8%
ACTIVE EQUITY		
US RULES-BASED EQUITY	635,349,416	2.6%
US ACTIVE EQUITY	1,342,659,546	5.4%
NON-US RULES-BASED EQUITY	491,160,424	2.0%
NON-US ACTIVE EQUITY	1,245,845,128	5.0%
TOTAL:	3,715,014,514	15.0%

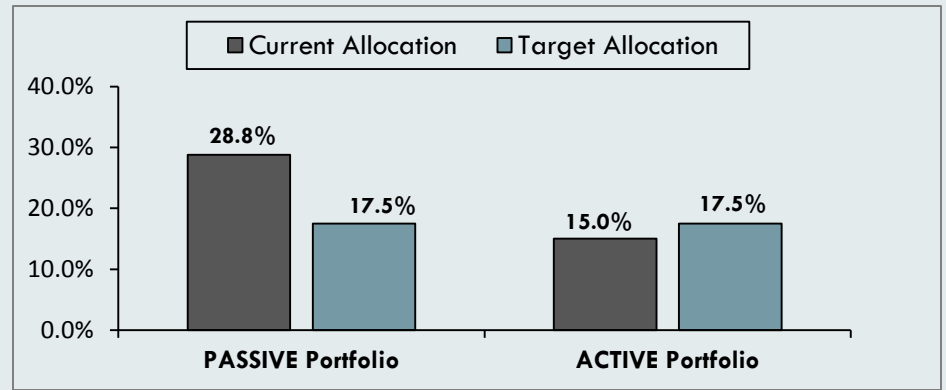


NOTE: Market values are preliminary; Percentages may not be exact due to rounding

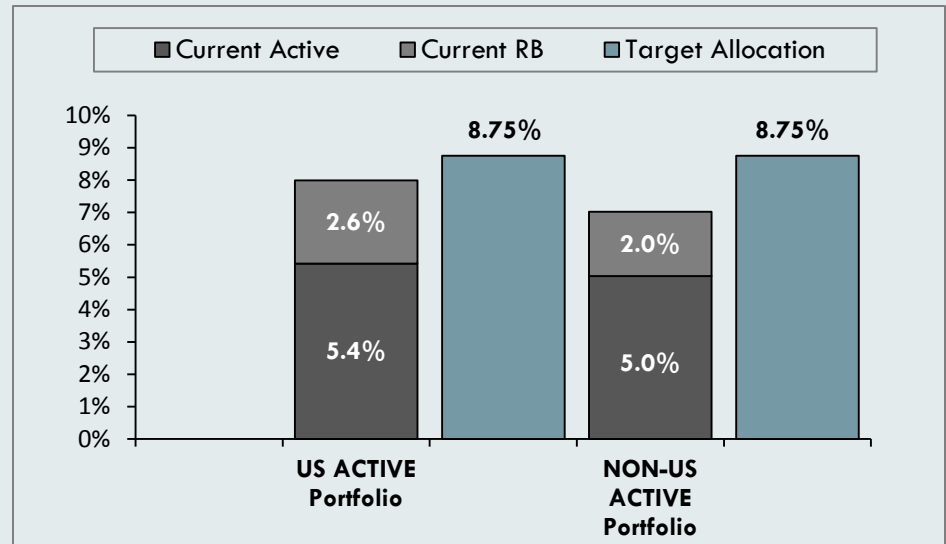
Passive/Active Structure Allocation

% of Total Fund as of 10/31/2016

PASSIVE Portfolio Managers	Market Value	% of Total Portfolio
US CORE EQUITY: NTGI Russell 3000	4,686,763,675	18.9%
NON-US CORE EQUITY: NTGI ACW ex. US IMI	2,433,770,980	9.8%
TOTAL:	7,120,534,655	28.8%



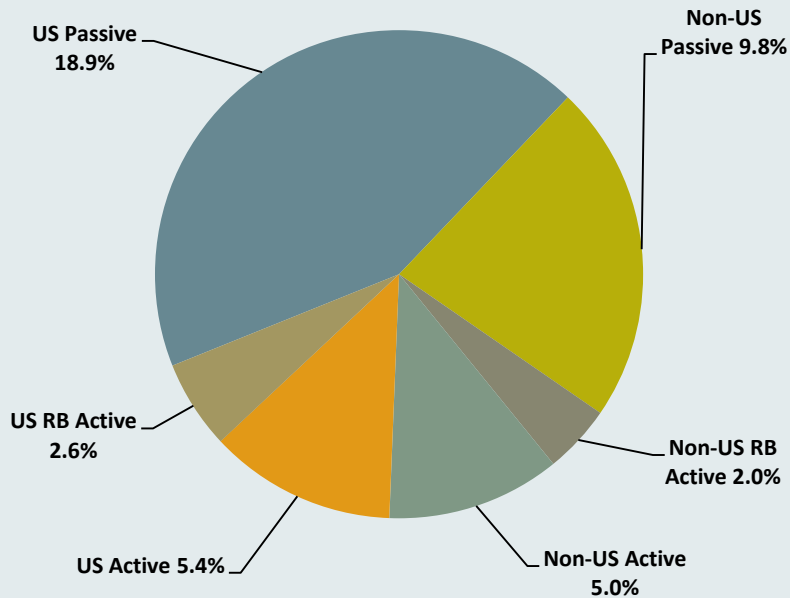
ACTIVE Portfolio Managers	Market Value	% of Total Portfolio
US RULES-BASED EQUITY:	635,349,416	2.6%
US ACTIVE EQUITY:	1,342,659,546	5.4%
NON-US RULES-BASED EQUITY:	491,160,424	2.0%
NON-US ACTIVE EQUITY:	1,245,845,128	5.0%
TOTAL:	3,715,014,514	15.0%



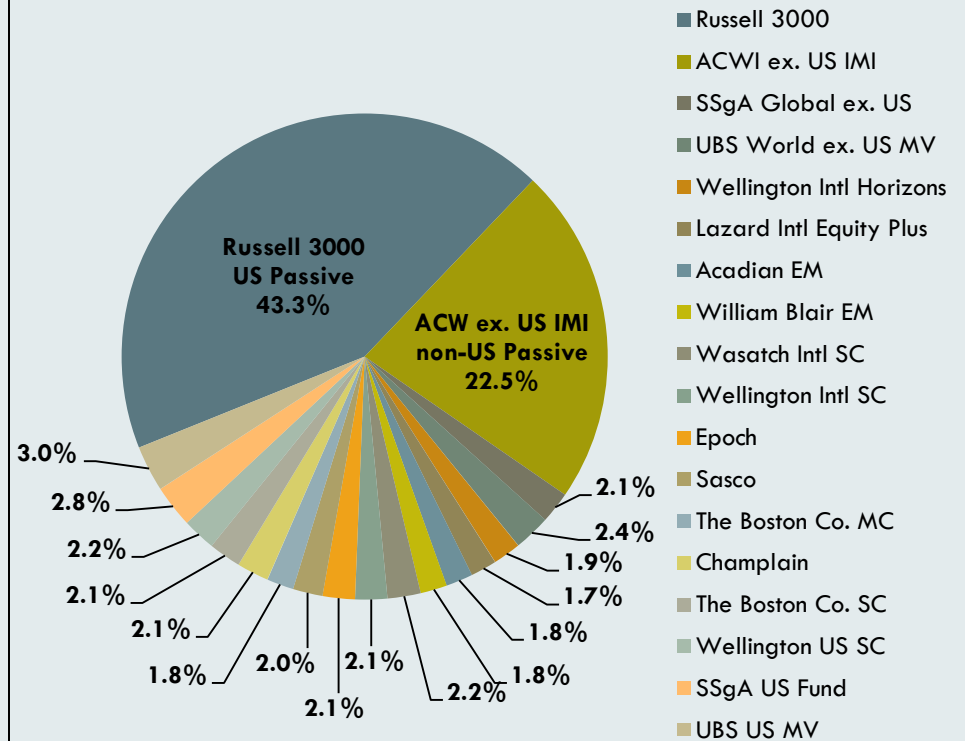
NOTE: Market values are preliminary; Percentages may not be exact due to rounding

Current Passive/Active Allocation

Current Allocation By Asset Category vs. Total Portfolio



Current Allocation by Manager vs. Total Equity Portfolio



Public Equity Performance – U.S.

Period ending October 31, 2016

Fund Name	Market Value	% of Total Plan	1 Day	WTD	MTD	QTD	YTD	1 Year	Since Inception	Incept Date
TMRS - TOTAL DOMESTIC EQUITY	6,664,786,844	26.9	0.07	0.07	-2.39	-2.39	5.93	4.31	7.03	01-01-08
TMRS - RUSSELL 3000 DAILY			0.06	0.06	-2.16	-2.16	5.84	4.24	7.18	
EXCESS			0.01	0.01	-0.23	-0.23	0.09	0.07	-0.15	
TMRS - RUSSELL 3000 INDEX FUND (NL)	4,686,763,675	18.9	0.06	0.06	-2.16	-2.16	5.84	4.25	14.25	12-01-08
RUSSELL 3000 (DAILY)			0.06	0.06	-2.16	-2.16	5.84	4.24	14.27	
EXCESS			0.00	0.00	0.00	0.00	0.00	0.01	-0.02	
SSGA RUSSELL FUNDAMENTAL US	306,436,404	1.2	0.03	0.03	-2.05	-2.05	7.91	5.70	11.32	02-01-13
Russell Fundamental US Index			0.03	0.03	-2.05	-2.05	8.07	5.91	11.48	
EXCESS			0.00	0.00	0.00	0.00	-0.16	-0.21	-0.16	
UBS US EQUITY MIN VOL FUND NL	328,913,012	1.3	0.56	0.56	-2.80	-2.80	7.26	7.51	13.94	01-01-13
MSCI USA Minimum Volatility Index-Net			0.57	0.57	-2.85	-2.85	6.75	6.90	13.28	
EXCESS			-0.01	-0.01	0.05	0.05	0.51	0.61	0.66	
EPOCH U.S. CHOICE	232,061,679	0.9	-0.08	-0.08	-2.33	-2.33	-1.43	-2.50	4.33	01-01-14
RUSSELL 3000 (DAILY)			0.06	0.06	-2.16	-2.16	5.84	4.24	6.56	
EXCESS			-0.14	-0.14	-0.17	-0.17	-7.27	-6.74	-2.23	
SASCO U.S. CONTRARIAN VALUE	214,366,817	0.9	0.20	0.20	-2.73	-2.73	12.43	5.81	1.33	01-01-14
Russell Midcap Value Total Return Index			0.39	0.39	-2.42	-2.42	10.96	7.84	7.04	
EXCESS			-0.19	-0.19	-0.31	-0.31	1.47	-2.03	-5.71	
THE BOSTON COMPANY OPP VALUE	194,379,964	0.8	-0.16	-0.16	-3.28	-3.28	4.22	1.85	-2.29	12-01-14
RUSSELL MIDCAP (DAILY)			0.34	0.34	-3.17	-3.17	6.76	4.17	2.26	
EXCESS			-0.50	-0.50	-0.11	-0.11	-2.54	-2.32	-4.55	
CHAMPLAIN MID-CAP CORE	230,351,479	0.9	-0.11	-0.11	-1.39	-1.39	12.95	11.50	7.00	12-01-14
RUSSELL MIDCAP (DAILY)			0.34	0.34	-3.17	-3.17	6.76	4.17	2.26	
EXCESS			-0.45	-0.45	1.78	1.78	6.19	7.33	4.74	
BOSTON CO US SM CAP OPPORTUNISTIC VALUE	231,867,362	0.9	-0.05	-0.05	-5.89	-5.89	0.63	0.38	-1.19	09-01-15
RUSSELL 2000 (DAILY)			0.32	0.32	-4.75	-4.75	6.16	4.11	3.92	
EXCESS			-0.37	-0.37	-1.14	-1.14	-5.53	-3.73	-5.11	
WELLINGTON US SMALL CAP OPP	239,632,245	1.0	0.18	0.18	-3.21	-3.21	6.06		1.35	12-01-15
RUSSELL 2000 (DAILY)			0.32	0.32	-4.75	-4.75	6.16		0.83	
EXCESS			-0.14	-0.14	1.54	1.54	-0.10		0.52	

Source: State Street Investment Analytics; unaudited

Public Equity Performance – non-U.S.

Period ending October 31, 2016

Fund Name	Market Value	% of Total Plan	1 Day	WTD	MTD	QTD	YTD	1 Year	Since Inception	Incept Date
TMRS - TOTAL INTERNATIONAL EQUITY	4,170,776,532	16.9	0.09	0.09	-1.94	-1.94	4.59	1.06	-0.49	01-01-08
INTL EQ ACTIVE WEIGHTED INDEX(DAILY)			0.03	0.03	-1.61	-1.61	4.37	0.75	-0.89	
EXCESS			0.06	0.06	-0.33	-0.33	0.22	0.31	0.40	
SSGA RUSSELL FUND GLOBAL EX-US	227,326,857	0.9	0.04	0.04	0.46	0.46	9.79	4.60	3.05	02-01-13
Russell Fundamental Glb Ex-US Index NET			0.02	0.02	0.53	0.53	10.20	5.01	3.17	
EXCESS			0.02	0.02	-0.07	-0.07	-0.41	-0.41	-0.12	
NTGI ACWI ex. US IMI (NL)	2,433,770,980	9.8	0.03	0.03	-1.61	-1.61	4.59	0.96	4.79	09-01-10
TMRS MSCI ACWI ex-US IMI NET (DAILY)			0.03	0.03	-1.61	-1.61	4.37	0.75	4.59	
EXCESS			0.00	0.00	0.00	0.00	0.22	0.21	0.20	
UBS WORLD EX US MIN VOL FD NL	263,833,567	1.1	0.19	0.19	-4.25	-4.25	3.15	1.29	7.38	01-01-13
MSCI world ex USA Minimum Volatility-Net			0.19	0.19	-4.27	-4.27	2.94	1.13	7.33	
EXCESS			0.00	0.00	0.02	0.02	0.21	0.16	0.05	
LAZARD INT'L EQUITY PLUS	189,483,861	0.8	0.10	0.10	-3.47	-3.47	0.94	-1.94	-3.26	09-01-14
MSCI AC WORLD ex US (NET)			0.03	0.03	-1.44	-1.44	4.30	0.22	-4.74	
EXCESS			0.07	0.07	-2.03	-2.03	-3.36	-2.16	1.48	
WELLINGTON INT'L HORIZONS	201,136,503	0.8	-0.28	-0.28	-3.78	-3.78	-2.09	-2.10	-0.55	09-01-14
MSCI AC WORLD ex US (NET)			0.03	0.03	-1.44	-1.44	4.30	0.22	-4.74	
EXCESS			-0.31	-0.31	-2.34	-2.34	-6.39	-2.32	4.19	
WILLIAM BLAIR EMERGING MARKETS	191,382,017	0.8	0.18	0.18	0.44	0.44	13.06	7.90	11.92	09-01-15
MSCI EMERGING MARKETS			0.18	0.18	0.24	0.24	16.30	9.27	11.50	
EXCESS			0.00	0.00	0.20	0.20	-3.24	-1.37	0.42	
ACADIAN EMERGING MARKETS	192,896,479	0.8	0.13	0.13	0.20	0.20	18.41	11.45	12.05	09-01-15
MSCI EMERGING MARKETS IMI INDEX (NET)			0.13	0.13	0.00	0.00	15.02	8.63	11.19	
EXCESS			0.00	0.00	0.20	0.20	3.39	2.82	0.86	
WASATCH INT'L SMALL CAP GROWTH	238,751,773	1.0	0.60	0.60	-3.65	-3.65	0.91		0.91	01-01-16
MSCI ACWI Ex US Small Cap (DAILY)			0.01	0.01	-2.63	-2.63	4.86		4.86	
EXCESS			0.59	0.59	-1.02	-1.02	-3.95		-3.95	
WELLINGTON INT'L SMALL CAP OPP	232,194,495	0.9	0.32	0.32	-4.01	-4.01	-1.49		-1.49	01-01-16
MSCI EAFE SMALL CAP NET			0.09	0.09	-2.83	-2.83	2.21		2.21	
EXCESS			0.23	0.23	-1.18	-1.18	-3.70		-3.70	

Source: State Street Investment Analytics; unaudited

III. IPS Monitoring & Portfolio Review



U.S. Equity Monitoring Summary Report

- IPS Guidelines for Individual Portfolio Accounts as it relates to active strategies:
 - Exceed an appropriate benchmark net of fees over rolling five-year periods;
 - Rank above median in an appropriate universe of Managers possessing a similar style over rolling five-year periods.
- No U.S. active strategy has reached a five-year performance period

Manager	Portfolio Name	Asset Class	Watch List?	Qualitative Evaluation	Quantitative Performance
Northern Trust Asset Management	Russell 3000 Index Fund (CORE)*	U.S. Equity	No	Within acceptance	(NTAM R3000 Fd tracks the benchmark over 5 years)
State Street Global Advisors	Russell Fundamental U.S. Index Fund	U.S. Equity	No	Within acceptance	N/A (inception date 2/1/2013)
UBS Global Asset Management	U.S. Equity Minimum Volatility Index Fund	U.S. Equity	No	Within acceptance	N/A (inception date 1/1/2013)
Epoch Investment Partners, Inc.	U.S. Choice	U.S. Equity	No	Within acceptance	N/A (inception date 1/1/2014)
Sasco Capital, Inc.	Contrarian Value	U.S. Equity	No	Within acceptance	N/A (inception date 1/1/2014)
Champlain Investment Partners	U.S. Mid Cap Core	U.S. Equity	No	Within acceptance	N/A (inception date 12/1/2014)
The Boston Company	U.S. Mid Cap Opportunistic Value	U.S. Equity	No	Within acceptance	N/A (inception date 12/1/2014)
The Boston Company	U.S. Small Cap Opportunistic Value	U.S. Equity	No	Within acceptance	N/A (inception date 9/1/2015)
Wellington Management Company, LLP	Small Cap Opportunities	U.S. Equity	No	Within acceptance	N/A (inception date 12/1/2015)

* The Core Portfolio (NTAM Russell 3000 Fund) is not included in the above referenced IPS Guidelines but is included for a comprehensive view of all strategies within the U.S. Public Equity portfolio.

Non-U.S. Equity Monitoring Summary Report

- IPS Guidelines for Individual Portfolio Accounts as it relates to active strategies:
 - Exceed an appropriate benchmark net of fees over rolling five-year periods;
 - Rank above median in an appropriate universe of Managers possessing a similar style over rolling five-year periods.
- No non-U.S. active strategy has reached a five-year performance period

Manager	Fund Name	Asset Class	Watch List?	Qualitative Evaluation	Quantitative Performance
Northern Trust Asset Management	ACW ex. U.S. IMI Fund (CORE)*	Non-U.S. Equity	No	Within acceptance	(NTAM ACW ex. US IMI Fd tracks the benchmark over 5 yrs)
State Street Global Advisors	Russell Fundamental Global ex-U.S. Index Fund	Non-U.S. Equity	No	Within acceptance	N/A (inception date 2/1/2013)
UBS Global Asset Management	World ex U.S. Equity Minimum Volatility Index Fund	Non-U.S. Equity	No	Within acceptance	N/A (inception date 1/1/2013)
Lazard Asset Management LLC	International Equity Plus	Non-U.S. Equity	No	Within acceptance	N/A (inception date 9/1/2014)
Wellington Management Company, LLP	International Horizons	Non-U.S. Equity	No	Within acceptance	N/A (inception date 9/1/2014)
Acadian Asset Management LLC	Emerging Markets Equity	Non-U.S. Equity	No	Within acceptance	N/A (inception date 9/1/2015)
William Blair & Company LLC	Emerging Markets Leaders	Non-U.S. Equity	No	Within acceptance	N/A (inception date 9/1/2015)
Wellington Management Company, LLP	International Small Cap Opportunities	Non-U.S. Equity	No	Within acceptance	N/A (inception date 1/1/2016)
Wasatch Advisors	International Small Cap Growth	Non-U.S. Equity	No	Within acceptance	N/A (inception date 1/1/2016)

* The Core Portfolio (NTAM ACW ex. US IMI Fund) is not included in the above referenced IPS Guidelines but included for a comprehensive view of all strategies within the non-U.S. Public Equity portfolio.

Equity Strategies Reviewed in 2016

US and non-US Passive Strategies:

- Northern Trust Asset Mgmt - Russell 3000 Fund – Non-Lending
- Northern Trust Asset Mgmt - All Country World (ACW) ex. U.S. Investable Market Index (IMI) Fund – Non-Lending

Rules-Based Strategies:

- UBS Global Asset Mgmt (UBS) - MSCI Min Volatility Indices – US & non-US Rules-Based
- State Street Global Advisors (SSgA) - Russell Fundamental Index Series® - US & non-US Rules-Based*

US Active Strategies:

- Epoch Investment Partners - U.S. Choice (US All Cap)
- Sasco Capital - Contrarian Value (US All Cap)
- Champlain Investment Partners – US Mid-Cap Core
- The Boston Company – US Mid-Cap Opportunistic Value
- The Boston Company – US Small Cap Opportunistic Value
- Wellington Management Co. - US Small Cap Opportunities

Non-US Active Strategies:

- Lazard Asset Management - International Equity Plus (non-US DM and EM)
- Wellington Management Co. - International Horizons (non-US DM and EM)
- Acadian Asset Management – non-US Emerging Markets
- William Blair & Co. – non-US Emerging Markets
- Wasatch Advisors – non-US Small Cap Growth
- Wellington Management Co. – non-US SC Opportunities

Active Strategies Return/Risk Objectives

MANAGER	STRATEGY	BENCHMARK	RETURN OBJECTIVES	RISK OBJECTIVES	INCEPTION DATE
Epoch Investment Partners	US Contrarian Value All Cap	Russell 3000 Index	3% (gross of fees); rolling 5 yr period	4-5%	1/1/2014
Sasco Capital, Inc.	US Choice All Cap	Russell Mid Cap Value Index	2% (gross of fees); rolling 5 yr period	4-8%	1/1/2014
The Boston Company	US Mid Cap Opportunistic Value	Russell Mid Cap Index	3-5% (gross of fees); mkt cycle 3-5 yrs	4-7%	12/1/2014
Champlain Investment Partners	US Mid Cap Core	Russell Mid Cap Index	2-4%; mkt cycle of 5 yrs	4-6%	12/1/2014
The Boston Company	US Small Cap Opportunistic Value	Russell 2000 Index	3% (gross of fees); mkt cycle 5 yrs	3-10% ex-ante	9/1/2015
Wellington Management	US Small Cap Opportunities	Russell 2000 Index	2-3% (gross of fees); 5 yrs mkt cycle	3-8% ex-post	12/1/2015
Wellington Management	Non-US Opportunistic Core	MSCI ACWI ex US Index	3% (gross of fees); full mkt cycle	3-9% ex-post	9/1/2014
Lazard Asset Management	Non-US Opportunistic Relative Value	MSCI ACWI ex US Index	2-3% (gross of fees); full mkt cycle	4-6% ex-ante	9/1/2014
Acadian Asset Management	Non-US Emerging Markets	MSCI Emerging Markets (EM) Index	2% (gross of fees); mkt cycle 3-5 yrs	4-6% ex-post	9/1/2015
William Blair & Company	Non-US Emerging Markets	MSCI Emerging Markets (EM) Index	2% (gross of fees); mkt cycle 3-5 yrs	4-6% ex-post	9/1/2015
Wellington Management	Non-US Small Cap Opportunities	MSCI EAFE Small Cap Index	2.5% (gross of fees); 3-5 yrs mkt cycle	3-8% ex-post	12/1/2015
Wasatch Advisors	Non-US Small Cap Growth	MSCI AC World ex. US Small Cap Index	2% (gross of fees); mkt cycle 5-7 yrs	4-6% ex-post	12/1/2015

Equity Funding to Other Asset Classes

As of 11/10/2016

- **Fixed Income:**
 - 2014 - 2015 Public Equity distributions equaled app \$805 million
- **Real Estate:**
 - 2014 – 2016 Public Equity distributions equaled app \$671.4 million
- **Private Equity:**
 - 2016 Public Equity distributions equaled app \$57.6 million
- **Total distributions from TMRS Core Portfolios is app \$1.5 Billion**

IV. Public Equity Market Update



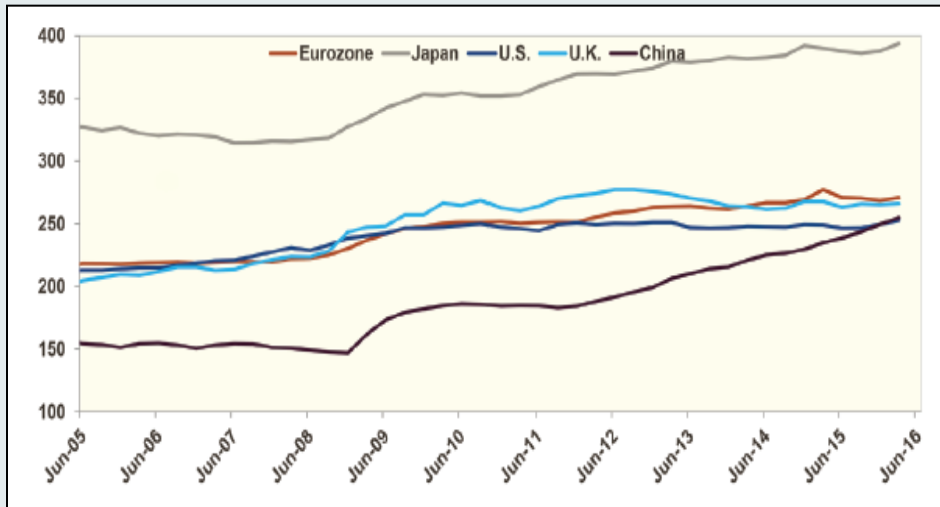
Equity Market Environment: 2016 World Market Returns

Total Returns of US, Europe and Japan

Week Ended	
October 31, 2016	
	YTD
World	4.1%
US	5.7%
Europe	-3.6%
UK	-7.8%
France	-1.2%
Germany	-2.3%
Italy	-20.2%
Spain	-2.2%
Nordics	-8.5%
Japan	-8.9%
Emerging Markets - BRIC	
Emergng markets	9.7%
Brazil	71.2%
Russia	19.4%
India	7.7%
China	7.1%

- Within developed markets, US is the only market that has returned positive this year.
- The big winners have all been Emerging Markets with Brazil being the best performer.
- The UK market did well until Brexit when GBP post Brexit fell 15%.
- The Italian market is the worst performer due to fears surrounding the health of the Italian banks.

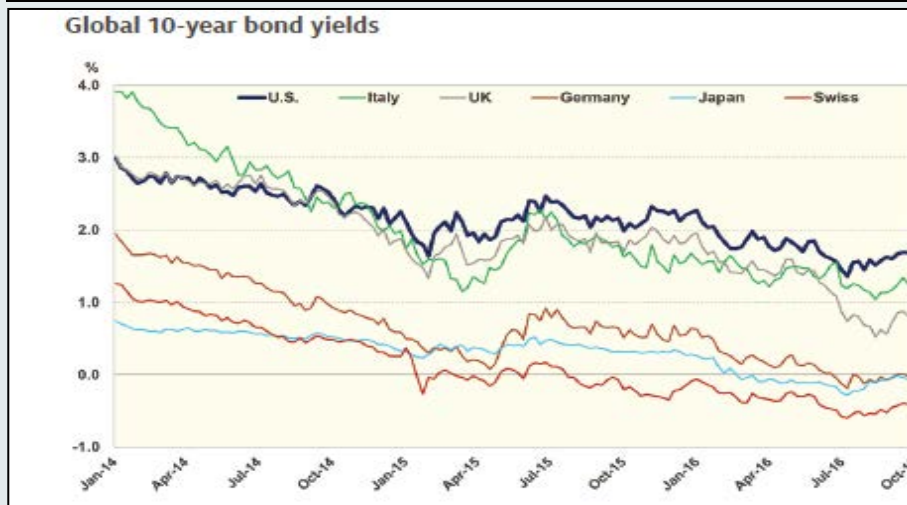
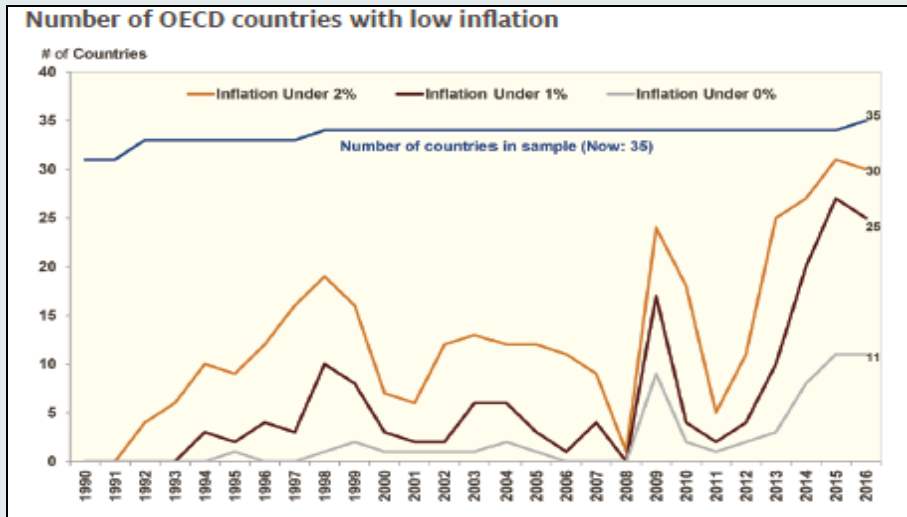
Major drivers of slow economic growth globally (1/2)



- Global debts continue to rise post the financial crisis in the US, UK, Eurozone and particularly in China (bottom black line) and Japan (top grey line).
- The high debt level acts as a drag on economic growth activities.
- 2016 Real GDP growth in major economic regions are well below 2%.
- US economic growth has been the strongest among developed regions.

GDP components		2015			2016		
		Growth In Workforce	Productivity	Real GDP	Growth In Workforce	Productivity	Real GDP
		1.6	0.7	2.3	1.7	0.0	1.7
		0.8	0.6	1.4	1.0	0.5	1.5
		0.3	0.3	0.6	0.1	0.4	0.5
Mature		1.1	+ 0.9	= 2.0	1.0	+ 0.6	= 1.7
		-0.2	6.7	6.5	0.2	3.6	3.8
Developing		1.2	+ 2.7	= 3.9	1.2	+ 2.2	= 3.3

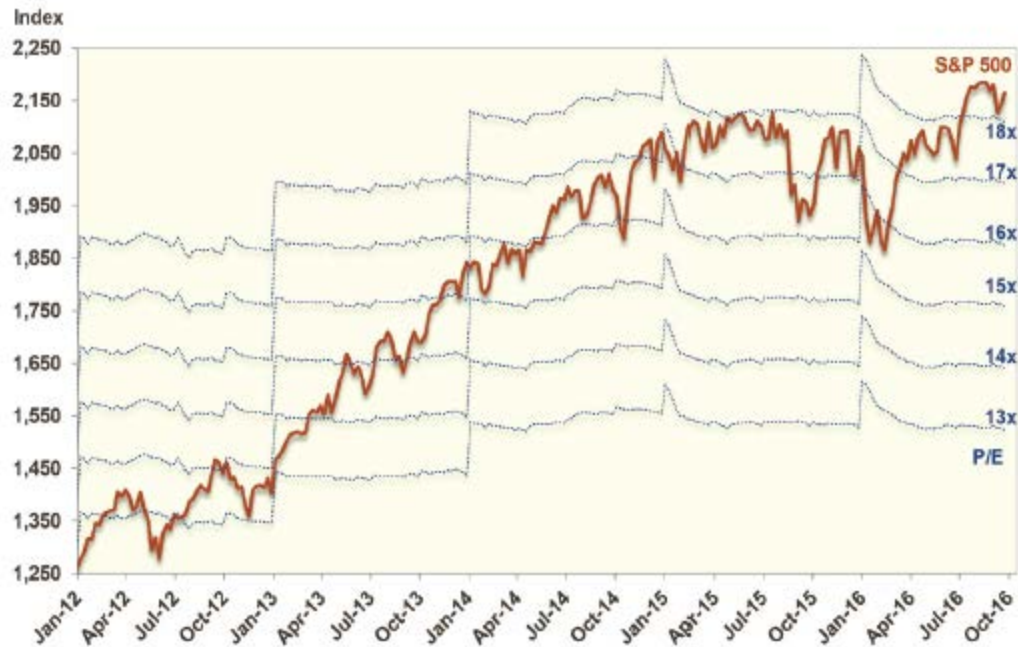
Major drivers of slow economic growth globally (2/2)



- The number of countries with inflation below 1% and under 0% have increased significantly from 2011.
- As a result, global central banks have embarked on multiple quantitative easing programs to drive down government bond yields to spur economic growth and inflation.
- The US and UK government 10- year bond yields are the only developed countries still yielding above 1%. J
- Japan and Switzerland have bond yields in negative rates.

Equity markets have re-rated due to expansion in earnings multiple

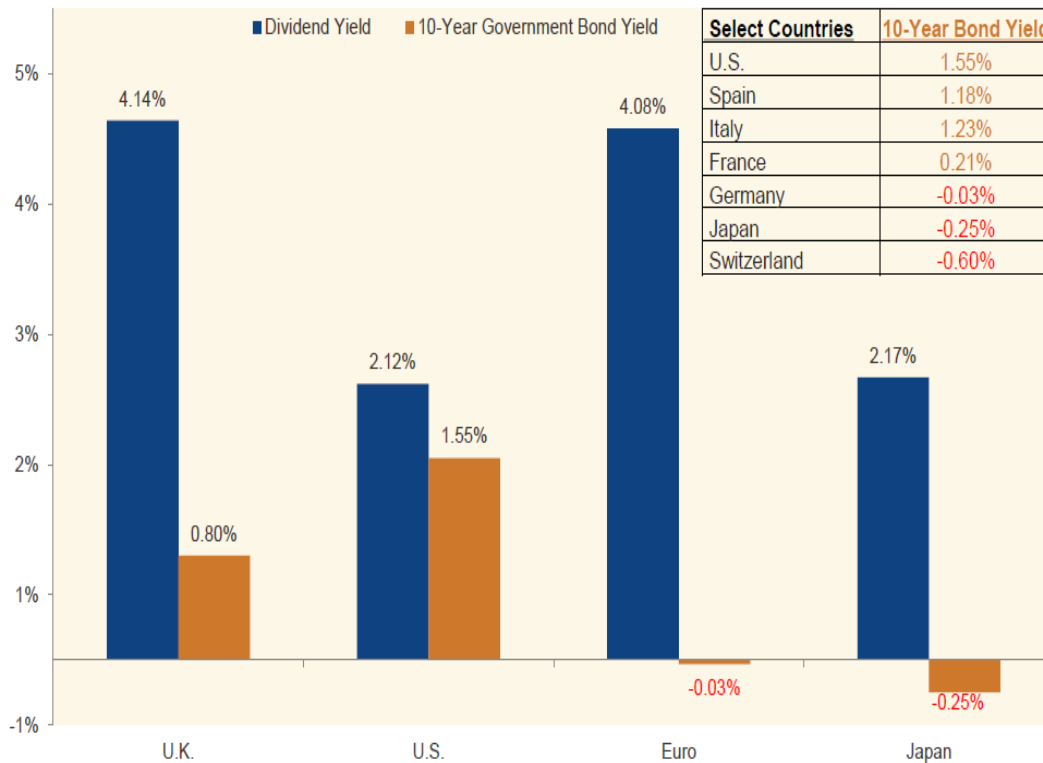
S&P 500 next twelve months earnings multiples



- S&P 500 Price-Earnings multiple has expanded from 12x forward earnings in 2012 to current 20x multiple.
- Most of this valuation increase has been driven by cheap money from global central banks' quantitative easing programs.

The chase for yields across the world

MSCI dividend yields vs. 10-year government bond yields



- Very low to negative bond yields have driven investors to buy stocks with bond-like features, low volatility with above 2% dividend yields.
- This search for yields has made active management a challenge in the last few years due to high demand for these bond-like low volatility stocks.

V. 2016 Highlights & Initiatives



Review of 2016 Highlights

- Since 2012, app \$3.7 billion has been invested in both US and non-US active strategies for the Passive/Active Re-structuring Project;
- Equity portfolio consists of 12 managers and 18 strategies;
- All Board approved active recommendations have been funded as of year-end 2015;
- Hired Tax Consultant (Ernst & Young) to assist with remaining emerging markets sub-custodian setup;
- Conducted app 133 meetings in 2016 (through 10/31/16) for manager due diligence, consultant, educational and prospective managers;
- Completed Initial Analysis for Phase IV Equity Core/Active Target Allocation;
- Completed Transition Management Review – October 2016 Board meeting;
- Completed 2016 Equity Asset Class Review – December 2016 Board meeting;
- 2017 Equity Pacing Plan – December 2016 Board meeting;
- The Core Equity portfolio will continue to fund Real Estate and Private Equity allocations;
- Carol Leung, CFA, was promoted to Senior Investment Analyst in July 2016.

Conclusion and 2017 Initiatives

- All TMRS equity portfolios are performing in accordance with expectations
- TMRS Investment Staff and RVK concur that no changes are immediately needed
- Continue to work with managers on highlighted issues
- Continue to evaluate potential changes to the equity passive/active structure in 2017
- Determine next steps for Transition Management Program

VI. Appendix – Manager Scorecards



U.S. & non-U.S. Equity Passive Portfolios: Northern Trust Asset Management (NTAM) Russell 3000 Fund & ACW ex. US IMI Fund

Assessment Area	Grade	Update & Comments
Organization		\$945.8 billion firm assets under management (as of 9/30/2016); \$448.7 billion in passive index equity strategies. App 40% of their total AUM is allocated to index strategies. Engineered equities (factor-based indexing) have seen the fastest growth in assets over the last few years. ESG factors (environmental, social, and governance) investments now account for \$55 billion of assets.
People		There were no significant changes to the portfolio management teams that oversee TMRS's portfolios. A new senior team leader has been added to the Portfolio Management Team who oversees all US and International Index portfolios. Will be adding 1 person to the London office for EMEA coverage. Have added team members to balance AUM growth.
Philosophy/Strategy/Process		There were no changes to the investment philosophy, strategy, or process.
Portfolio(s)		As of October 31, 2016 TMRS's allocation in the NT Russell 3000 Index Fund – NL and the NT ACWI ex US IMI – NL Fund represents app 29% of the TMRS total portfolio. Target allocation is 17.5% for the core/passive portfolio. TMRS ownership of the Russell 3000 fund is app 50% while the ownership of the ACW ex. US IMI fund is app 20%.
Performance		Performance is in line with expectations. As of 10/31/16, the YTD performance for the US portfolio was +5.8% while the international portfolio was +4.6%
Compliance		No compliance breaches.
Guideline Changes		None
Risk Management		There were no changes to the risk management process; collective funds continue to be managed in accordance with their respective fund declarations.
Operations		No change
Client Service		New relationship manager is Melissa Galla and our daily contact is Fred Porzelt. Fred was recently promoted to Team Lead of Investment Associates but will remain as a contact for the TMRS's accounts.
Other		None

Excellent

In Good Standing

Fair
(working with manager)

Unsatisfactory
(remedial action being taken)

Comprehensive Review

30

U.S. & non-U.S. Equity Rules-Based Portfolios: UBS Asset Management (UBS) U.S. Minimum Volatility & World ex. U.S. Minimum Volatility strategies

Assessment Area	Grade	Update & Comments
Organization		No change; \$650 billion firm assets under management (as of 9/30/2016). Equities represent 1/3 of the firm's AUM. The biggest growth in assets over the past year have been in equities, real estate and infrastructure.
People		Key management team remains intact.
Philosophy/Strategy/Process		No change
Portfolio(s)		As of 10/31/16, no changes; AUM for US Min Vol strategy is \$329 million, 100% TMRS ownership; AUM for World ex US Min Vol strategy is \$264 million, 100% TMRS ownership
Performance		Performance is in line with expectations. As of 10/31/16, the YTD performance for the US MV portfolio was +7.3% while the non-US MV portfolio was +3.2% The market has continued to bid up for stocks that exhibit low volatility characteristics and these strategies have provided downside protection to the TMRS portfolio.
Compliance		Global Compliance Team is based in various locations globally to monitor all activities in different time zones.
Guideline Changes		No change
Risk Management		No change
Operations		No change
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

U.S. & non-U.S. Equity Rules-Based Portfolios: State Street Global Advisors (SSgA) Russell Fundamental U.S. and Russell Fundamental Global ex-U.S.

Assessment Area	Grade	Update & Comments
Organization		The firm acquired GE Asset Management (AUM \$111 billion) in July, 2016. Firm has total AUM of approximately \$2.3 trillion as of 9/30/16; AUM of app \$8.9 billion in Fundamental Indexed assets.
People		No changes to the portfolio management team.
Philosophy/Strategy/Process		No change; firm continues to see interest in rules-based indexing strategies.
Portfolio(s)		No changes; As of 10/31/2016, AUM for US Fundamental strategy is \$306 million, 93% TMRS ownership; AUM for Global ex-US Fundamental strategy is \$227 million, 98% TMRS ownership. Portfolio names will change effective 12/15/16 to SSGA Russell RAFI Global ex-US and SSGA Russell RAFI US after an alliance between Frank Russell Co. and research Affiliates, Inc.
Performance		As of 10/31/2016, YTD performance for the US portfolio was +7.9% and the global ex. US portfolio was +9.8%. From inception to date, the US Fundamental portfolio has underperformed the index by 16 bps and the Global ex-US Fundamental portfolio has underperformed the index 12 bps.
Compliance		Global compliance team based on different global locations to monitor activities at all times in different time zones.
Guideline Changes		No change
Risk Management		No change
Operations		Head of Global Investment Ops retired recently; extensive coverage remains; no concerns.
Client Service		No change
Other		No change

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

U.S. Equity Active Portfolio: Epoch Investment Partners, Inc.

U.S. Choice strategy

Assessment Area	Grade	Update & Comments
Organization		No changes; as of 9/30/2016 \$43.2 billion firm assets under management.
People		6 investment staff joined the firm (4 are senior positions), 4 lead team members are dedicated to our strategy with the Lead PM as the final decision-maker. 8 other team members are dedicated to analysis for the strategy.
Philosophy/Strategy/Process		No changes.
Portfolio(s)		As of 10/31/16, U.S. Choice assets under management are \$437 million; assets of TMRS's portfolio are approximately \$232 million.
Performance		As of 10/31/16, YTD performance was -1.4% on an absolute basis and -7.3% relative to the benchmark. The underperformance has been due to the market bidding up excessively on stocks with high dividend yields and not rewarding companies with high cash flow such as the ones Epoch invests in. We have been in regular discussions with the manager on the performance. The manager is adhering to their investment philosophy and believes that market will not indefinitely be bidding up the extremely over-valued high dividend payers.
Compliance		No change
Guideline Changes		No change
Risk Management		There is a 6 member risk team that monitors the portfolio and provides input during the portfolio construction process.
Operations		No change
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

U.S. Equity Active Portfolio: Sasco Capital, Inc.

U.S. Contrarian Value

Assessment Area	Grade	Update & Comments
Organization		No change; \$4.2 billion firm assets under management (as of 9/30/16)
People		Management team has lost 1 research analyst in Nov. 2016; will be a long process to find a replacement and TMRS staff will get regular updates. TMRS staff doesn't have any real concern but this does change the dynamics of the team and the decision-making process of the team. There are now 3 senior portfolio managers and 2 research analysts; the research analysts are an integral part of the decision-making process and each retained 1 vote/analyst for decision-making. Prior to this, all 3 analysts shared one 1 vote among the three of them. This will be adjusted accordingly to account for the loss of Matt Hulquist 9was with the firm since 2007.
Philosophy/Strategy/Process		No change; only manage and offer one strategy with a maximum of 35 clients. Currently have 25 clients.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$214 million.
Performance		Year-to-date, the portfolio returned on an absolute basis of +12.4% and +1.5% relative to the benchmark. The strategy focuses on companies usually out of favor but are undergoing restructurings with 'jewel(s)' in their businesses. The portfolio has made a sizeable turnaround since the challenging performance of last year and the beginning of 2016.
Compliance		No change
Guideline Changes		No change
Risk Management		No change
Operations		No change
Client Service		No change
Other		None

Excellent

In Good Standing

Fair
(working with manager)

Unsatisfactory
(remedial action being taken)

Comprehensive Review

U.S. Equity Active Portfolio: The Boston Company (TBC)

U.S. Mid Cap Opportunistic Value

Assessment Area	Grade	Update & Comments
Organization		\$37.1 billion firm assets under management (as of 9/30/16) with 83 investment professionals and 153 employees.
People		No change; portfolio management team is solid; lead PM with 6 managing directors and analysts, 3 field research analysts, and a dedicated trader and portfolio strategist.
Philosophy/Strategy/Process		Investment process leans towards owning stocks trading at discounts to the underlying intrinsic value. The portfolio valuation is now below trading at a historical low multiple, offering significant outperformance when the market finally values the stocks for their full earnings potential.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$194 million.
Performance		The portfolio returned +4.2% on an absolute basis but underperformed the benchmark by 2.5%. The Portfolio Manager has high conviction that the stocks in the portfolio are extremely undervalued and will be re-rated by the market in the next two years.
Compliance		Additional resources have been added to monitor risks in cyber security and fund administration.
Guideline Changes		As of 9/1/16, a change in the classification system used by TMRS to determine sector diversification has had an impact on the MC portfolio and caused the portfolio to be O/W in Financials. TMRS provided a policy exception until further risk analysis can be done to determine if any permanent changes need to be made to the guidelines.
Risk Management		No change
Operations		The operations team is managed under the bank of BNY Mellon.
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

U.S. Equity Active Portfolio: The Boston Company (TBC)

U.S. Small Cap Opportunistic Value

Assessment Area	Grade	Update & Comments
Organization		\$37.1 billion firm assets under management (as of 9/30/16) with 83 investment professionals and 153 employees.
People		Same investment team that manages the mid cap portfolio.
Philosophy/Strategy/Process		Investment process leans towards owning stocks trading at discounts to the underlying intrinsic value. The portfolio valuation is now below trading at a historical low multiple, offering significant outperformance when the market finally values the stocks in their full earnings potential.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$232 million.
Performance		As of 10/31/16, the portfolio returned +0.6% on an absolute basis but underperformed the benchmark by 5.5%. The portfolio was inceptioned in September last year so it is too early to make any judgment on the success of the portfolio.
Compliance		Additional resources have been added to monitor risks in cyber security and fund administration.
Guideline Changes		No change
Risk Management		No change
Operations		The operations team is managed under the bank of BNY Mellon.
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

U.S. Equity Active Portfolio: Champlain Investment Partners

U.S. Mid Cap Core

Assessment Area	Grade	Update & Comments
Organization		As of 9/30/16, firm AUM was app \$7.0 billion firm.
People		Extended employee ownership to 7 new shareholders over the past couple of years. One partner will be retiring at the end of 2016 but will remain a shareholder; added a Sr. Associate Analyst and added 2 new employees to the Emerging Markets team based in CA.
Philosophy/Strategy/Process		No changes; the strategy buys good companies with credible managements at a discount to fair value.
Portfolio(s)		As of 10/31/16, asset of TMRS portfolio are approximately \$230 million.
Performance		The strategy is having another year of excellent performance returning YTD (as of 10/31/16) 13.0% on an absolute basis and positive 6.2% relative to the benchmark. The strategy's conservative approach in stocks selection tends to outperform the benchmark when the broad market is flat or declining.
Compliance		No change
Guideline Changes		Amendments were made in September to the minimum and maximum market capitalization of stocks that the strategy can buy. This was to clarify the interpretation of the guideline.
Risk Management		No change
Operations		No change
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

U.S. Equity Active Portfolio: Wellington Management

US Small Cap Opportunities

Assessment Area	Grade	Update & Comments
Organization		As of 9/30/2016, firm AUM was \$998 billion with 41% of assets invested in equity strategies; 2,000+ employees with 658 investment professionals; 13 offices globally.
People		New analyst Paul Elia has replaced Dan Posen who has been promoted to other responsibilities. Paul has 14 years of research experience in small caps. Lead PM has worked on this strategy for 29 years and the co-PM has been with the strategy for 18 years.
Philosophy/Strategy/Process		The team believes that markets, industries, and companies run in cycles and anticipating fundamental improvements, cyclical rebounds, or short-term mispricing can create opportunities. The market tends to underestimate superior management in small companies which also present investment opportunities.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$240 million. AUM of the strategy is \$2.1 billion.
Performance		As of 10/31/16, the portfolio returned +6.1% on an absolute basis but underperformed the benchmark by 0.10%. The portfolio was inceptioned in December last year so it is too early to make any judgment on the success of the portfolio.
Compliance		New team name is "Guideline Monitoring" from previously known as "Investment Compliance". The roles and responsibilities remain the same.
Guideline Changes		No change
Risk Management		No change
Operations		No change
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

Non-U.S. Equity Active Portfolio: Lazard Asset Management

International Equity Plus

Assessment Area	Grade	Update & Comments
Organization		No changes; As of 9/30/16, \$174 billion firm assets under management; total global/international equity assets are \$121.5 billion, representing 70% of total firm assets.
People		No changes to the investment team.
Philosophy/Strategy/Process		No changes to the investment philosophy, strategy or process. The strategy maintains relative value philosophy and adds value through stock selections. Approximately \$1.1 billion AUM for the strategy that TMRS is invested in.
Portfolio(s)		As of 10/31/2016, TMRS strategy is \$189 million for TMRS. The strategy is currently more positioned on the defensive due to high valuation of stocks and elevated macro risks. The total AUM for the strategy is \$11 billion. Emerging Markets represents 24% of the portfolio.
Performance		As of 10/31/16, YTD the strategy had mild over performance of 0.9% on an absolute basis but underperformed the benchmark by -3.4%. Since the portfolio was funded in September, 2014, it has outperformed the index by +1.5%.
Compliance		No change
Guideline Changes		No change
Risk Management		No change
Operations		Some mid office functions are outsourced to State Street Investors Service such as reconciliation, performance records, fees billing, etc.
Client Service		No change
Other		None

Excellent

In Good Standing

Fair
(working with manager)

Unsatisfactory
(remedial action being taken)

Comprehensive Review

Non-U.S. Equity Active Portfolio: Wellington Management International Horizons

Assessment Area	Grade	Update & Comments
Organization		As of 9/30/2016, firm AUM was \$998 billion with 41% of assets invested in equity strategies; 2,000+ employees with 658 investment professionals; 13 offices globally.
People		The Portfolio Manager is based in London but will be moving back to the Boston office in July, 2017. Her investment team is based in Boston.
Philosophy/Strategy/Process		No changes. The investment philosophy of investing with companies that have improving Return on Equity remains.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$201 million. AUM of the strategy is \$291 million.
Performance		A of 10/31/16, the strategy returned -2.1% on an absolute basis and -6.4% relative to the benchmark. However, the portfolio is +4.2% relative to the index since inception in September, 2014. The portfolio gave back some outperformance this year following a stellar year of outperformance in 2015.
Compliance		New team name is "Guideline Monitoring" from previously known as "Investment Compliance". The roles and responsibilities remain the same.
Guideline Changes		No change
Risk Management		No change
Operations		No change
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

non-U.S. Equity Active Portfolio: Wellington Management International Small Cap Opportunities

Assessment Area	Grade	Update & Comments
Organization		As of 9/30/2016, firm AUM was \$998 billion with 41% of assets invested in equity strategies; 2,000+ employees with 658 investment professionals; 13 offices globally.
People		The team is based in multiple locations – Boston, Tokyo and London. Team members meet online and regularly travel together to meet with companies.
Philosophy/Strategy/Process		Buy companies with quality businesses at reasonable valuation.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$232 million. AUM of the strategy is \$800 million.
Performance		As of 10/31/16, the portfolio returned -1.5% on an absolute basis but underperformed the benchmark by -3.7%. The portfolio was inceptioned in January 2016 so it is too early to make any judgment on the success of the portfolio.
Compliance		New team name is “Guideline Monitoring” from previously known as “Investment Compliance”. The roles and responsibilities remain the same.
Guideline Changes		No change
Risk Management		No change
Operations		No change
Client Service		No change
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

non-U.S. Equity Active Portfolio: Acadian Asset Management Emerging Markets Equity

Assessment Area	Grade	Update & Comments
Organization		As of 9/30/16, firm AUM was \$73.6 billion; no corporate structure changes. Looking to add value through different strategies for other asset classes, adding staff for these areas but with no impact to the equity team.
People		Director of Global Macro left the firm in 2016, no direct impact to the Emerging Markets equity strategy; replaced with an internal candidate. Added 1-2 junior analysts in 2016.
Philosophy/Strategy/Process		Emerging markets remains the main focus and began in 1994; annual review of capacity for all strategies; current capacity in the Emerging Markets Equity strategy that will be capped between \$19 - \$20 billion. Strategy remains a quant strategy where 80% of the investment decisions come from a bottom up analysis and 20% is derived from a macro viewpoint.
Portfolio(s)		As of 10/31/16, current TMRS portfolio has AUM of app \$193 million with \$17.7 billion invested in the Emerging Markets strategy.
Performance		As of 10/31/16, the strategy returned 18.4% on an absolute basis and +3.4% relative to the benchmark. Emerging Markets had an exceptional year of performance particularly in small caps. Emerging Markets benefitted from funds inflow into the region since early this year.
Compliance		No issues
Guideline Changes		None
Risk Management		Risk management is built into the portfolio construction process as well as the firm making sure they have controls in place for enterprise risk. Cyber security is a large focus of the risk team.
Operations		New Order Management System is being implemented by the end of the year; current proprietary system has been in place since the 1990s and Acadian needs more flexibility.
Client Service		Client service rep is leaving the firm; internal replacement taking over in Nov. 2016 with a strong backup associate who remains on the TMRS relationship.
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
------------------	-------------------------	--	---	-----------------------------

non-U.S. Equity Active Portfolio: William Blair Investment Management Emerging Markets Leaders

Assessment Area	Grade	Update & Comments
Organization		William Blair & Company, LLC underwent an internal corporate structure change and William Blair Investment Management, LLC was formed to separate William Blair's institutional investment management business from other business lines within William Blair & Company, L.L.C. William Blair Investment Management, LLC is a registered investment adviser with the SEC. This restructuring finalized in 2015. AUM at William Blair Investment Management, LLC is approximately \$67 billion (as of 9/30/16).
People		Jeff Urbina, one of the Portfolio Managers, is due to retire in the next 2-3 years. To transition this process, Jack Murphy has been added as a co-Portfolio Manager on the team in October this year. Jack was previously Director of Research within William Blair.
Philosophy/Strategy/Process		Quality and Growth biased.
Portfolio(s)		As of 10/31/16, assets of TMRS portfolio are approximately \$191 million. AUM of the strategy is \$4.7 billion.
Performance		As of 10/31/16, The strategy returned 13.1% on an absolute basis and -3.2% relative to the benchmark. The portfolio gave back some outperformance this year following a stellar Q4, 2015.
Compliance		No changes
Guideline Changes		No changes
Risk Management		No changes
Operations		No changes
Client Service		Bob Duwa, Product Specialist for the Emerging Markets Leader strategy has been promoted to other responsibilities. His responsibilities have been taken over by Amy McGarrity. Previously, Amy was the Deputy Chief Investment Officer for the Colorado PERA.
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

non-U.S. Equity Active Portfolio: Wasatch Advisors

non-US Small Cap Growth

Assessment Area	Grade	Update & Comments
Organization		As of 9/30/16, firm AUM is \$16.8 billion; organizational updates at the firm at the upper level for succession planning & career development.
People		There has been some turnover at the analyst and PM level; added two intl analysts in 2016 and one intl analyst departed the firm in June 2016; A PM left the firm and she managed the Frontier Emerging and Intl Micro Cap strategies; firm has promoted two individuals as PMs for these strategies. This had no impact on the team managing TMRS's strategy. Also, added a PM to the Research Team. PM team for TMRS's strategy remains in tact.
Philosophy/Strategy/Process		Ken Applegate is the newest member to the team and has been with the team for 2 ½ years and has integrated well; Ken brings extensive experience and risk management capabilities to the team; strategy focuses on the highest quality SC stocks in bot developed and emerging markets. 80% of the process comes from bottom up stock selection.
Portfolio(s)		As of 10/31/16, TMRS's AUM in the strategy is \$239 million; strategy AUM is \$3.1 billion and is currently closed.
Performance		As of 10/31/16, the portfolio returned +0.9% on an absolute basis but underperformed the benchmark by -3.9%. The portfolio was incepted in January 2016 so it is too early to make any judgment on the success of the portfolio.
Compliance		No issues; strong compliance policies at the firm and portfolio levels; conduct qtrly internal audits and do annual 3 rd party vendor vulnerability audits.
Guideline Changes		No change
Risk Management		Risk management is applied to the portfolio construction process and is a focus of the firm.
Operations		Avg tenure of team is 7 yrs; cross-train all team members; have added technology for more efficiency and automation of department functions.
Client Service		No issues; client service rep has been with the firm since 1992.
Other		None

Excellent	In Good Standing	Fair <i>(working with manager)</i>	Unsatisfactory <i>(remedial action being taken)</i>	Comprehensive Review
-----------	------------------	---------------------------------------	--	----------------------

VII. Appendix – 2012 – 2015 Board Action & Implementation



2012 Board Action & Implementation

- **March 2012** – Board authorized Core/Satellite structure with initial allocation to rules-based strategies
 - 50% Core (passive)/50% Satellite (active)
- **September 2012** – Board authorized \$800 million to rules-based strategies
 - \$200 million U.S. Fundamental Indexing – State Street Global Advisors (SSgA)
 - \$200 million Global ex. U.S. Fundamental Indexing – State Street Global Advisors (SSgA)
 - \$200 million U.S. Minimum Volatility – UBS Global Asset Management (UBS)
 - \$200 million World ex. U.S. Minimum Volatility – UBS Global Asset Management (UBS)
- **December 2012** – Minimum Volatility strategies were funded through UBS of \$400 million (U.S. and non-U.S.)
- **January 2013** – Fundamental Indexing strategies were funded through SSgA of \$400 million (U.S. and non-U.S.)

2013 Board Action & Implementation

- **June 2013** – Board authorized All Cap equity strategies for Phase I of “active” strategies for satellite structure
 - Authorized search process for U.S. and non-U.S. strategies, with initial focus on U.S. All Cap
- **September 2013** – Board approved managers for U.S. All Cap strategies
 - \$200 million U.S. Choice – Epoch Investment Partners, Inc.
 - \$200 million U.S. Contrarian Value – Sasco Capital, Inc.
- **November 2013** - Phase I Non-U.S. strategies search begins; authorized by the Board in June 2013
- **December 2013** – Epoch and Sasco for the U.S. All Cap strategies were funded and implemented
- Equity portfolio consisted of 5 managers across 8 strategies

2014 Board Action & Implementation

- **March 2014** – Board authorized manager recommendations for Phase I non-U.S. allocation
 - \$200 million non-U.S. International Equity Plus – Lazard Asset Management
 - \$200 million non-U.S. International Horizon – Wellington Management
- **June 2014** – Board approved manager recommendations for Phase II U.S. Mid Cap strategies
 - \$200 million U.S. Mid-Cap Opportunistic Value – The Boston Company
 - \$200 million U.S. Mid-Cap Core – Champlain Investment Partners
- **September 2014** – Board approved manager recommendations for Phase II non-U.S. Emerging Markets strategies
 - \$175 million non-U.S. Emerging Markets Equity – Acadian Asset Management
 - \$175 million non-U.S. Emerging Markets Leaders – William Blair & Co.
- \$1.15 billion approved for the satellite allocation in 2014
- Equity portfolio consists of 11 managers across 14 strategies

2015 Board Action & Implementation

- **June 2015** – Board approved manager recommendations for Phase III US Small Cap strategies
 - \$245 million US Small Cap Opportunistic Value – The Boston Company
 - \$245 million US Small Cap Opportunities – Wellington Management
- **August 2015** – Implemented the Emerging Market mandates, in addition to, one US Small Cap mandate; utilized BlackRock as the transition manager.
- **September 2015** – Board approved manager recommendations for Phase III non-US Small Cap strategies
 - App \$230 million non-US Intl Small Cap Growth – Wasatch Advisors
 - App \$230 million non-US Small Cap Opportunities – Wellington Management
- **December 2015** - Phase III non-US Small Cap mandates and remaining Phase III US Small Cap mandate were implemented
- Tax advisor/consultant to be hired for sub-custodian network within Emerging Markets is in process
 - Provides TMRS flexibility to choose the appropriate fund structure for current and/or future mandate(s)
 - Provides TMRS the opportunity to eliminate operating costs/expenses that are generally included in the administration of a commingled fund structure
 - TMRS Legal and Investment Staff have completed the majority of the Emerging Market country openings with seven countries remaining
- App \$950 million approved for the satellite allocation in 2015
- Equity portfolio consists of 12 managers across 18 strategies

Appendix – Equity Strategy Descriptions

October 31, 2016

(In order of implementation dates)



Northern Trust Asset Management

Russell 3000 Index Fund – Non-Lending

TMRS Inception Date: January 2008

MSCI All Country World ex. US Investable Market Index (IMI) – Non-Lending

TMRS Inception: September 2010

- The Russell 3000 Index Fund demonstrates the following characteristics:
 - The Russell 3000 Index seeks to represent the entire U.S. stock market.
 - It represents approximately 98% of the U.S. equity opportunity set.
 - The opportunity set includes large, mid, and small cap representation with growth and value characteristics.
- The MSCI All Country World ex. U.S. Investable Market Index (IMI) demonstrates the following characteristics:
 - Captures large, mid and small cap representation across 22 of 23 Developed Markets (DM) countries (excluding the United States) and 23 Emerging Markets (EM) countries.
 - The index covers approximately 99% of the global equity opportunity set outside the U.S.

MSCI Minimum Volatility Indices

MSCI US Min Vol Index strategy

MSCI World ex. US Min Vol Index strategy

TMRS Inception: December 2012

- The MSCI Minimum Volatility Indices historically demonstrate the following characteristics across markets:
 - Low Beta relative to the Parent Index
 - Lower Volatility than the Parent Index
 - Lower cap bias
 - Bias towards stocks with low idiosyncratic risk
- The MSCI Minimum Volatility Indices seek to have the lowest absolute volatility based on set of constraints.

Russell Fundamental Indices

Russell US Fundamental Index strategy

Russell Global ex. US Fundamental Index strategy

TMRS Inception: January 2013

- The Russell Fundamental Index Series® obtains alternative beta exposures vs. cap-weighted indexes while maintaining the diversification, transparency and liquidity of traditional indexing.
- Securities are selected and weighted according to fundamental measures of company size:
 - Adjusted Sales, Operating Cash Flow, and Dividends plus Buybacks.
- Fundamental Index strategies have a value tilt and a slight small-cap tilt; however, these tilts are dynamic:
 - When value stocks are out of favor and thus are cheap, Fundamental Index strategies tend to increase their allocation to deep value stocks.
 - When value is in favor, the value tilt is lower because these stocks tend to be priced higher.
- Rebalancing into out of favor stocks and out of the most popular stocks provides the majority of RAFI strategies' added value.

Epoch Investment Partners, Inc.

US Choice strategy

TMRS Inception: 1/1/2014

- **Strategy Characteristics:**

- Strategy Type: US Traditional All Cap
- Strategy Inception Date: April 2005
- Approximately 20 – 35 holdings that reflect the high conviction ideas of all Epoch's US strategies; long-term manager with average holding period of 3 years and low turnover.

- **Philosophy/Process:**

- Bottom-up fundamental research with a top-down/macro element that helps identify themes and evaluate a company's sensitivity to external risks.
- The strategy focuses on companies that are generating significant free cash flow and efficiently allocating the cash to maximize long-term shareholder value.
- Will tend to outperform when stock selection is rewarded and multiple expansion is not the key driver of returns.
- The strategy suffers during speculative, low quality, high-beta rallies where leverage and P/E expansion are the most evident.

Sasco Capital, Inc.

US Contrarian Value strategy

TMRS Inception: 1/1/2014

- **Strategy Characteristics:**

- Strategy Type: US Opportunistic All Cap
- Strategy Inception Date: April 1981
- Maximum 35 holdings that invest in companies going through restructurings/corporate transformations, undervalued companies with strong leadership; average holding period of 3 years and low turnover.

- **Philosophy/Process:**

- Bottom-up fundamental research process.
- Contrarian investment style which looks for companies with “hidden jewels” and management teams that are capable of unlocking the value of those jewels. Hidden jewels are aspects of the business that are undervalued by other market participants either because the company is too complex or it is underfollowed.
- The strategy will tend to do well in most “normal” market environments.
- The strategy suffers in narrowly lead markets (e.g., the tech bubble in the late 1990s), market rallies characterized as “low quality,” and in significant market extremes (i.e., straight up or straight down).

Lazard Asset Management

Non-US International Equity Plus strategy

TMRS Inception: 9/1/2014

- **Strategy Characteristics:**

- Strategy Type: Opportunistic relative value invested in developed and emerging markets
- Strategy Inception Date: June 1999
- Diversified portfolio with 60-80 holdings

- **Philosophy/Process:**

- Bottom-up, fundamental relative value investment approach that focuses on companies that are financially productive and inexpensively valued.
- Flexibility to look different than the index within a moderate risk-aware approach.
- Their goal is to preserve capital in falling markets and participate in the up markets producing competitive risk-adjusted returns.
- They will underperform in those strong thematic markets or markets with irrational exuberance where fundamentals are not driving returns.

Wellington Management

Non-US International Horizons strategy

TMRS Inception: 9/1/2014

- **Strategy Characteristics:**

- Strategy Type: Opportunistic core invested in developed and emerging markets
- Strategy Inception Date: September 2008
- Concentrated portfolio with 40-80 holdings

- **Philosophy/Process:**

- Purely bottom-up, fundamental stock selection approach investing in both developed and emerging markets across the style and market cap spectrum.
- Guiding philosophy is to focus on the market mispricing the return on invested capital of a particular stock.
- Looking for change and competitive advantages of companies that have improving returns or have sustainable returns.
- Due to the opportunistic nature of the investment approach, this strategy is meant to be an “all weather” portfolio performing well in both value and growth markets.
- Competitive risk-adjusted return profile and up/down market capture ratio.
- Tends to do poorly in markets where there is a sudden shift in momentum or regimes.

Champlain Investment Partners

US Mid-Cap Core strategy

TMRS Inception: 12/1/2014

- **Strategy Characteristics:**

- Strategy Type: Mid-cap core
- Strategy Inception Date: March 2004
- Concentrated portfolio with 50 - 75 holdings

- **Philosophy/Process:**

- Purely bottom-up, fundamental stock selection approach investing in mid-cap companies.
- Investment goals are to make money, manage risk, and be consistent; guiding philosophy is to focus on investing in good businesses at a good price.
- Believe in buying superior businesses with credible and sincere managements at a discount to fair or intrinsic value of that business.
- Tends to underperform during periods of speculation and where low quality and highly cyclical companies are favored.
- Expect to outperform the broad market during periods when companies with consistent growth are favored or the overall market is weak.

The Boston Company Asset Management

US Mid-Cap Opportunistic Value strategy

TMRS Inception: 12/1/2014

- **Strategy Characteristics:**

- Strategy Type: opportunistic value invested in mid-capitalization companies
- Strategy Inception Date: January 1994
- Diversified portfolio with 60-90 holdings
- Position weights are determined by the reward/risk ratio and contribution to total portfolio risk

- **Philosophy/Process:**

- Investment philosophy is bottom up, fundamental research approach which looks for companies that are trading at a discount to their intrinsic value.
- The lead portfolio manager also incorporates macro factors/themes into the research process.
- Their goal is to capitalize on the marketplace inefficiencies that are persistent and that provide opportunities to add excess return.
- They will underperform on a relative performance basis in environments that are characterized by extreme exuberance or pessimism.

The Boston Company Asset Management

US SC Opportunistic Value strategy

TMRS Inception: 9/1/2015

- **Strategy Characteristics:**

- Strategy Type: U.S. Small Cap Opportunistic Value Equity
- Strategy Inception Date: January 1994
- Diversified portfolio with 70-100 holdings
- Position weights are determined by the reward/risk ratio and contribution to total portfolio risk

- **Philosophy/Process:**

- Investment philosophy is bottom up, fundamental research approach which looks for companies that are trading at a discount to their intrinsic value.
- The lead portfolio manager also incorporates macro factors/themes into the research process.
- Very collaborative approach among portfolio manager and analysts; analysts follow a similar approach for analyzing potential portfolio holdings.
- They will underperform on a relative performance basis in environments that are characterized by extreme exuberance or pessimism; strategy will perform well when fundamentals drive stock performance.

Wellington Management

US SC Opportunities strategy

TMRS Inception: 12/1/2015

- **Strategy Characteristics:**

- Strategy Type: U.S. Small Cap Opportunities
- Strategy Inception Date: February 1994
- Diversified portfolio with 90-120 holdings

- **Philosophy/Process:**

- Bottom-up, opportunistic investment approach with focus on fundamental improvements, cyclical rebounds, and short-term mis-pricings of stocks.
- The team also seeks investment candidates that have superior management teams with quality earnings power and strong balance sheets.
- Collaboration among team members and the central research group and other portfolio management teams provides a free exchange of ideas from individuals with diverse backgrounds.
- Portfolio is expected to perform well on a relative basis in most economic and market conditions. Underperformance will be experienced during extended periods of speculation in momentum-driven markets where fundamentals are ignored.

Acadian Asset Management

Non-US Emerging Markets Equity strategy

TMRS Inception: 9/1/2015

- **Strategy Characteristics:**

- Strategy Type: Emerging markets
- Strategy Inception Date: January 1994
- Diversified portfolio with 300 - 450 holdings

- **Philosophy/Process:**

- Investment philosophy is bottom up and top down quantitative, fundamental research approach which looks for market inefficiencies caused by behavioral errors.
- Fundamental insights about mis-pricings can be best captured employing quantitative methods.
- Investment process starts with a broad universe of stocks and looks at both fundamental and behavioral factors to determine the best investment candidates.
- Both a bottom-up analysis and top-down analysis are done to form solid forecasts for each investment idea.
- They will underperform on a relative performance basis when markets depart from a focus on investment fundamentals.

William Blair & Company

Non-US Emerging Markets Leaders strategy

TMRS Inception: 9/1/2015

- **Strategy Characteristics:**

- Strategy Type: Emerging markets
- Strategy Inception Date: April 2008
- Diversified portfolio with 50 – 80 holdings

- **Philosophy/Process:**

- Bottom-up, fundamental stock selection approach investing in companies with high quality and sustainable growth characteristics. They also incorporate the macroeconomic and political environment and its potential impact on the portfolio.
- The team seeks investment candidates that provide value creation through peer group leadership, consistent earnings growth, high return on capital and assets, positive earnings trends, and low leverage.
- Believe that strong corporate performance is the foundation of superior long-term investment returns.
- Expects to perform well in up markets, protect in down markets, and produce attractive, risk-adjusted returns.

Wasatch Advisors

Non-US Small Cap Growth Strategy

TMRS Inception: 12/1/2015

- **Strategy Characteristics:**

- Strategy Type: International Small Cap Growth strategy
- Strategy AUM: Approximately \$2.4 billion; capacity is \$3.0 billion
- Benchmark: MSCI All Country World ex. US Small Cap Index
- Inception Date: April 2002
- 70 – 100 holdings

- **Philosophy/Process:**

- Investment philosophy is bottom up, fundamental approach which looks to own the highest quality small cap growth companies in developed and emerging markets.
- Systematic coverage of the developed and emerging markets small cap universe which is repeatedly screened using a standardized multi-factor methodology to identify companies with Wasatch's purchase criteria.
- 80% of the portfolio is developed using a bottom-up process and 20% from top-down/macro economic views.
- They will underperform on a relative performance basis when markets are rapidly growing but will keep pace; stable, quality growth focus provides downside protection for the portfolio.

Wellington Management

Non-US Small Cap Opportunities Strategy

TMRS Inception: 12/1/2015

- **Strategy Characteristics:**

- Strategy Type: International Small Cap Opportunities
- Strategy AUM: approximately \$400 million; capacity among 4 small cap strategies is \$3.5 billion
- Benchmark: MSCI EAFE Small Cap Index
- Inception Date: April 2001
- Diversified portfolio with 100 – 150 holdings

- **Philosophy/Process:**

- Bottom-up, opportunistic investment approach with focus on strong companies with sustainably high or growing return on invested capital and are attractively valued with 50% upside potential.
- The team also seeks investment candidates that have a quality orientation that can lead to better downside mitigation.
- Collaboration among team members and the central research group provides a free exchange of ideas from individuals with diverse backgrounds.
- Portfolio is expected to perform well on a relative basis in most economic and market conditions. Underperformance will be experienced during market environments dominated by lower quality companies.

Disclosures

TMRS periodically discloses public information that is not excepted from disclosure under Section 552.0225(b) of the Texas Public Information Act. Information provided by a manager, a general partner or other data provider to TMRS or a TMRS service provider, and contained in these materials, may have been independently produced or modified by TMRS or the TMRS service provider.