

Michigan Public Schools Pension - MPSERS

RATES OF RETURN - GROSS

Periods Ending December 31, 2015



PERFORMANCE SUMMARY REPORT

	MKT VAL \$	% of	10 Years	7 Years	5 Years	3 Years	1 Year	Qtr	1 Month	ITD	Incept Date
TOTAL PLAN											
TOTAL PUBLIC SCHOOL	42,576,509,651	100.0	6.60	10.07	9.16	10.02	2.79	2.02	-0.65	9.34	01-01-79
1 <i>MPSERS TOTAL PLAN POLICY</i>			6.41	10.77	8.86	9.26	2.24	1.74	-0.92		
DOMESTIC EQUITY											
TOTAL DOMESTIC EQUITY	11,853,289,003	27.8	7.38	15.04	12.11	15.04	-0.49	5.37	-1.85	9.12	09-01-91
<i>S&P COMPOSITE 1500</i>			7.41	14.97	12.39	14.90	1.01	6.59	-1.88		
TOTAL ACTIVE EQUITY	6,748,413,351	15.9	7.27	15.00	11.93	15.01	-1.77	4.39	-1.90	10.46	01-01-79
2 <i>SP1500</i>			7.41	14.97	12.39	14.90	1.01	6.59	-1.88		
TOTAL INTERNAL ACTIVE	4,035,653,434	9.5	6.87	14.34	11.48	14.32	-2.70	3.24	-2.31	4.64	02-01-00
<i>S&P 500</i>			7.31	14.81	12.57	15.13	1.38	7.04	-1.58	4.42	
LARGE CAP CORE	1,689,173,074	4.0		15.42	12.09	15.27	-7.31	-1.64	-3.08	6.49	08-01-07
<i>S&P 500</i>				14.81	12.57	15.13	1.38	7.04	-1.58	6.41	
LARGE CAP GROWTH	1,235,145,135	2.9	9.16	17.48	14.36	18.66	5.99	8.51	-1.13	2.64	01-01-00
3 <i>SP500 GROWTH BLEND</i>			8.78	16.56	14.06	17.19	5.52	7.86	-1.52	3.24	
4 ALL CAP GARP	735,823,088	1.7			8.66	15.26	-0.14	6.26	-2.16	16.50	04-01-09
<i>S&P COMPOSITE 1500</i>					12.39	14.90	1.01	6.59	-1.88	17.58	
CONCENTRATED EQUITY FUND	284,249,262	0.7					-10.37	4.39	-2.96	0.24	05-01-13
<i>S&P COMPOSITE 1500</i>							1.01	6.59	-1.88	11.73	
LARGE CAP VALUE	73,204,655	0.2	4.15	10.01	8.45	10.20	-7.57	3.71	-2.59	5.50	01-01-00
5 <i>SP500 VALUE BLEND</i>			5.69	12.96	10.96	12.83	-3.13	6.05	-1.68	4.72	
ABSOLUTE RETURN INCOME FUND	0	0.0									01-01-09
<i>60% S&P 500/40% BARCLAYS AGG</i>				10.70	8.95	9.62	1.28	4.01	-1.08	10.70	
CONCENTRATED GROWTH	18,058,219	0.0					-14.46	-1.21	-3.89	-6.34	05-01-13

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S&P SMALLCAP 600							-1.97	3.72	-4.79	10.75	
TOTAL EXTERNAL ACTIVE	2,621,611,794	6.2	8.07	15.41	11.47	14.41	0.82	5.87	-2.27	8.80	10-01-01
S&P COMPOSITE 1500			7.41	14.97	12.39	14.90	1.01	6.59	-1.88	7.34	
FISHER ALL CAP	619,242,808	1.5	9.98	16.66	10.58	16.24	4.80	8.78	-1.28	10.68	10-01-04
Fisher Blended benchmark			7.80	14.79	11.38	14.90	1.01	6.59	-1.88		
SEIZERT CAPITAL PARTNERS	466,476,207	1.1			11.48	12.41	-5.38	5.19	-3.02	14.37	11-01-09
Seizert Blended Benchmark					12.86	14.90	1.01	6.59	-1.88		
MID CAP CORE L.A. CAPITAL	291,788,854	0.7	10.55	18.85	14.61	19.86	7.50	6.34	-0.84	11.77	05-01-05
L.A. Capital Blended Benchmark			9.26	18.03	12.90	16.75	5.21	7.36	-1.74		
LA CAPITAL DEEP VALUE	272,883,179	0.6						5.24	-2.63	-3.73	04-01-15
S&P 1500/CITIGROUP VALUE								5.68	-2.06	-3.20	
CLARKSTON SMALL CAP CORE	183,751,511	0.4					6.23	4.58	-3.41	11.36	01-01-14
S&P SMALLCAP 600							-1.97	3.72	-4.79	1.82	
CLARKSTON CAPITAL LG CAP	181,548,339	0.4						6.50	0.14	2.94	04-01-15
S&P 1500/CITIGROUP VALUE								5.68	-2.06	-3.20	
GW CAPITAL ALL CAP	46,935,382	0.1					-8.83	2.23	-4.79	-3.80	01-01-14
S&P 1500/CITIGROUP VALUE							-3.53	5.68	-2.06	4.01	
MUNDER MID CAP CORE GROWTH	98,406,948	0.2			10.54	12.36	-6.25	1.24	-5.42	17.53	04-01-09
⁶ SP400 GROWTH BLEND					11.10	13.37	2.02	2.91	-3.36	19.26	
NORTHPOINTE CAPITAL	106,608,578	0.3	6.06	13.67	8.44	13.13	-0.60	5.33	-1.97	7.25	10-01-04
Northpointe Blended Benchmark			7.81	14.81	11.40	14.72	1.01	6.59	-1.88		
CHAMPLAIN INV PARTNERS MID CAP COR	0	0.0									02-01-09
CRAMER ROSENTHAL ALL CAP	0	0.0									05-01-05
ATTUCKS	182,636,090	0.4		14.11	10.81	13.36	-0.94	5.75	-1.94	5.75	11-01-07
BIVIUM	171,333,899	0.4		14.51	10.87	12.33	-3.17	2.77	-4.72	5.29	11-01-07

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SAD TACTICAL ALLOCATION FUND	91,148,124	0.2				89.83	-38.15	9.65	38.93	54.81	05-01-11
TOTAL PASSIVE EQUITY	5,104,875,652	12.0	7.75	15.37	12.79	15.16	1.20	6.69	-1.79	9.98	01-01-90
<i>7 S&P 900 BLEND</i>			<i>7.38</i>	<i>14.95</i>	<i>12.42</i>	<i>14.94</i>	<i>1.11</i>	<i>6.69</i>	<i>-1.78</i>		
EQUITY S&P 500 INDEX	4,670,112,335	11.0	7.60	15.17	12.91	15.34	1.47	7.07	-1.57	9.35	01-01-94
<i>S&P 500</i>			<i>7.31</i>	<i>14.81</i>	<i>12.57</i>	<i>15.13</i>	<i>1.38</i>	<i>7.04</i>	<i>-1.58</i>	<i>9.05</i>	
EQUITY S&P MIDCAP INDEX	434,763,317	1.0	8.99	17.15	11.55	13.35	-1.58	2.80	-4.03	12.25	01-01-94
<i>S&P MID CAP 400</i>			<i>8.18</i>	<i>16.36</i>	<i>10.68</i>	<i>12.76</i>	<i>-2.18</i>	<i>2.60</i>	<i>-4.17</i>	<i>11.33</i>	
TACTICAL ASSET ALLOCATION FUND	271,167	0.0									06-01-09
INTERNATIONAL EQUITY											
TOTAL INTERNATIONAL EQUITY	6,402,676,235	15.0	2.55	8.71	2.91	3.32	-2.33	4.26	-1.57	5.41	04-01-93
<i>8 INTERNATIONAL BLENDED BENCHMARK</i>			<i>1.48</i>	<i>6.41</i>	<i>1.39</i>	<i>1.75</i>	<i>-5.66</i>	<i>3.24</i>	<i>-1.88</i>		
TOTAL INTERNATIONAL PASSIVE	2,021,595,967	4.7			1.39	1.81	-2.10	3.66	-1.27	7.36	07-01-09
INTERNATIONAL DEVELOPED MARKETS P	1,639,048,823	3.8			4.50	6.17	1.64	4.63	-0.99	5.57	04-01-10
<i>S&P DEVELOPED BMI Ex US net</i>					<i>3.03</i>	<i>4.40</i>	<i>-1.64</i>	<i>4.21</i>	<i>4.21</i>	<i>4.25</i>	
EQUITY INTL- PASSIVE (PMI)	689,281,979	1.6			2.91	3.70	-2.62	4.07	-1.78	4.01	04-01-10
EQUITY INTL- PASSIVE (EMI)	557,127,207	1.3			6.90	10.59	8.96	5.84	0.61	8.58	04-01-10
EQUITY INTL- PASSIVE (VANGUARD DEV)	384,821,517	0.9			3.89	4.76	-0.21	3.94	-1.82	4.64	04-01-10
EQUITY INTL- PASSIVE (VANGUARD EUR)	7,818,120	0.0			3.48	4.50	-0.34	3.65	-2.15	4.23	04-01-10
INTERNATIONAL EM PASSIVE	382,547,144	0.9			-4.75	-6.74	-15.32	-0.33	-2.46	3.20	07-01-09

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<i>MSCI EMERGING MARKETS</i>					-4.81	-6.76	-14.92	0.66	-2.23	3.10	
VANGUARD EMERGING MARKETS INDEX	382,547,144	0.9			-4.75	-6.74	-15.32	-0.33	-2.46	3.20	07-01-09
TOTAL INTERNATIONAL STOCK PLUS	2,096,456,650	4.9		6.59	3.64	3.31	-5.04	4.27	-2.57	6.59	01-01-09
INTERNATIONAL DEV MARKETS STOCK PL	1,748,775,875	4.1		8.27	5.93	7.09	-1.47	5.08	-2.29	8.27	01-01-09
⁹ S&P DEVELOPED BMI-EPAC NET 75/25				9.05	4.95	7.29	1.85	4.97	4.97	9.05	
<i>S&P DEVELOPED BMI Ex US net</i>				8.47	3.03	4.40	-1.64	4.21	4.21	8.47	
INTERNAL INTERNATIONAL	1,082,850,510	2.5		8.95	6.83	9.56	0.23	4.76	-2.76	8.95	01-01-09
EQUITY INTL- PASSIVE SWAP	780,990,547	1.8			6.99	10.01	3.23	6.20	-2.70	7.22	04-01-10
INTERNAL OVERLAY COMPLEMENT	26,426,582	0.1			-1.12	0.81	-8.48	4.74	-3.73	-0.29	04-01-10
GLOBAL DIVIDEND FUND	275,433,382	0.6		12.18	10.25	9.74	-6.54	0.90	-2.83	12.18	01-01-09
PIMCO INTERNATIONAL STOCK PLUS	665,925,364	1.6			4.81	3.18	-4.13	5.61	-1.51	5.28	10-01-10
INTERNATIONAL EM STOCK PLUS	347,680,776	0.8			-4.65	-9.49	-19.74	0.38	-3.94	-3.77	10-01-10
<i>MSCI EMERGING MARKETS</i>					-4.81	-6.76	-14.92	0.66	-2.23	-3.29	
EQUITY INTL EMERGING MARKETS	83,174,041	0.2					-13.97	1.06	-2.17	-6.98	02-01-13
PIMCO EM FUND INDEX PLUS	0	0.0									10-01-10
PIMCO EM STOCKS PLUS FUND	264,506,735	0.6						0.16	-4.48	-20.31	04-01-15
TOTAL INTERNATIONAL ACTIVE	2,284,564,240	5.4	3.20	8.83	3.79	4.95	0.25	4.67	-0.96	4.70	05-01-05
INTERNATIONAL DM & ACWI LARGE/MID A	1,564,782,513	3.7	3.72	9.24	4.68	6.74	2.29	5.57	-0.95	5.20	05-01-05
<i>S&P DEVELOPED BMI Ex US net</i>			3.29	8.47	3.03	4.40	-1.64	4.21	4.21		
WELLINGTON TRUST - INTERNATIONAL R	403,617,425	0.9	4.37	10.19	4.67	6.73	0.97	4.56	-1.87	4.22	12-01-05
MARATHON-LONDON EAFE	247,198,082	0.6				10.04	7.15	5.87	-0.59	10.75	02-01-12

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BALLIE GIFFORD ACWI EX US ALPHA	0	0.0									03-01-12
T ROWE PRICE INT'L CORE EQUITY	147,722,851	0.3					-2.32	2.12	-1.96	-4.50	05-01-14
LAZARD WILMINGTON INT'L EQ	151,298,057	0.4					1.93	4.06	-1.56	-3.25	06-01-14
LA CAPITAL WORLD EX US	437,750,453	1.0							-0.69	-0.69	12-01-15
EFFISSIMO CAPITAL MANAGEMENT	177,195,644	0.4							0.22	0.22	12-01-15
INTERNATIONAL DM & ACWI SMALL ACTIV	401,234,162	0.9		12.41	6.79	8.78	5.55	4.93	-0.11	0.14	04-01-07
<i>MSCI ACWI EX US GROSS</i>				7.96	1.51	1.94	-5.25	3.30	-1.85	0.63	
SSGA-INTL SMALL CAP ALPHA	128,062,817	0.3		14.75	8.62	11.48	9.56	6.69	0.64	3.47	05-01-07
FRANKLIN TEMPLETON INTL SM CAP	141,937,812	0.3				7.94	3.78	3.52	-0.01	11.43	06-01-12
MFS INTERNATIONAL SMALL CAP	131,233,533	0.3				7.46	3.76	4.79	-0.95	8.48	05-01-12
INTERNATIONAL EMERGING ACTIVE	318,547,565	0.7			-1.18	-3.75	-12.28	0.78	-2.10	2.76	12-01-09
<i>MSCI EMERGING MARKETS</i>					-4.81	-6.76	-14.92	0.66	-2.23	-0.57	
LACM EMERGING MARKETS FUND	188,986,089	0.4			-2.84	-5.85	-15.05	-1.07	-2.62	1.34	12-08-09
WELLINGTON EMERGING LOCAL EQ	129,561,476	0.3				-0.39	-7.84	3.59	-1.33	4.68	12-01-11
ALTERNATIVE INVESTMENTS											
TOTAL ALTERNATIVE INVESTMENTS	6,846,668,803	16.1	12.65	12.97	15.12	15.10	10.56	-1.22	0.25	11.52	12-01-82
¹⁰ <i>ALTERNATIVE BLENDED BENCHMARK</i>			10.91	18.41	16.36	15.49	2.39	-5.66	-2.20		
¹¹ ALTERNATIVES EQUITY	6,784,588,357	15.9		12.97	15.29	15.23	10.67	-1.22	0.26	11.76	01-01-07
¹² <i>SP 500 PLUS 300 BPS PLUS 3 MONTH LA</i>			10.94	18.88	16.71	15.74	2.37	-5.73	-2.23		
ALTERNATIVES FIXED INCOME	62,080,446	0.1		10.75	8.72	8.01	1.96	-1.93	-0.24	7.65	01-01-07
<i>10 YEAR YIELD PLUS 300 BPS</i>				5.48	5.41	5.43	5.22	1.30	0.44	5.88	

REAL ESTATE

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REAL ESTATE INVESTMENTS	3,920,756,665	9.2	6.07	3.83	12.66	13.92	10.88	2.29	1.05	6.35	01-01-80
13 NCREIF PROPERTY BLENDED INDEX			6.38	6.23	10.75	10.61	11.89	2.59	2.81		
NCREIF OPEN FUND INDEX (NET)			5.55	5.47	12.60	12.77	13.95	3.11	3.11		
INFRASTRUCTURE INVESTMENTS											
14 INFRASTRUCTURE INVESTMENTS	442,587,139	1.0				9.50	-0.82	-0.94	0.62	9.51	11-01-11
CPI + 4% Lagged 3m						4.97	3.96	0.69	0.17		
DOMESTIC FIXED INCOME											
TOTAL FIXED INCOME	5,174,769,366	12.2	5.33	5.60	3.83	2.18	1.43	-0.19	-0.45	7.81	01-01-79
Barclays Aggregate Bond			4.52	4.09	3.25	1.44	0.55	-0.57	-0.32	7.77	
TOTAL FIXED INCOME INTERNAL	3,165,470,181	7.4	5.27	5.18	3.61	2.23	2.14	-0.04	-0.21	4.80	07-01-03
Barclays Aggregate Bond			4.52	4.09	3.25	1.44	0.55	-0.57	-0.32	4.16	
TOTAL FIXED INCOME EXTERNAL	2,009,299,186	4.7		6.38	4.30	1.88	0.24	-0.38	-0.84	5.32	04-01-06
Barclays Aggregate Bond				4.09	3.25	1.44	0.55	-0.57	-0.32	4.70	
LOOMIS SAYLES CORE PLUS	142,670,620	0.3					-2.90	-0.51	-1.43	2.31	08-01-13
Barclays Aggregate Bond							0.55	-0.57	-0.32	2.78	
TOTAL HIGH YIELD FIXED INCOME	575,029,765	1.4					-0.03	-0.02	-1.46	3.09	10-01-13
COLUMBIA MGMT INVT	326,056,273	0.8					0.56	0.70	-1.38	3.43	10-01-13
Barclays US HY BA/B 2% Issuer Cap							-2.72	-1.01	-2.15	1.76	
PRUDENTIAL HIGH YIELD FUND	248,973,491	0.6					-0.83	-1.04	-1.57	1.81	12-01-13
Barclays US HY BA/B 1% Issuer Cap							-2.81	-1.12	-2.28	0.45	

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TOTAL FIXED INCOME CORE	154,124,923	0.4		5.54	3.63	1.41	-0.04	0.04	-0.69	5.19	04-01-06
<i>Barclays Aggregate Bond</i>				4.09	3.25	1.44	0.55	-0.57	-0.32	4.70	
DODGE & COX CORE FIXED INCOME	154,124,923	0.4		5.87	3.89	2.18	-0.04	0.04	-0.69	5.43	04-01-06
TOTAL CORP FIXED INCOME MGRS	143,924,511	0.3		7.76	5.03	2.20	-0.15	-0.28	-0.79	5.68	09-01-06
<i>Barclays Credit</i>				6.55	4.38	1.49	-0.77	-0.52	-0.77	5.36	
PRUDENTIAL INVESTMENT CORP	143,924,511	0.3		7.85	5.17	2.31	-0.16	-0.28	-0.79	6.60	09-01-06
TOTAL TACTICAL FIXED INCOME	993,549,367	2.3		23.41	8.39	5.46	1.11	-0.43	-0.45	6.68	06-01-08
<i>Barclays Gov/Credit</i>				4.01	3.39	1.21	0.15	-0.74	-0.43	4.33	
MET WEST SECURITIZED OPS	468,202,350	1.1					1.36	0.29	0.04	2.96	11-01-13
<i>Barclays Aggregate Bond</i>							0.55	-0.57	-0.32	2.52	
CMBS INVESTMENT	271,638,254	0.6		24.07	9.21	6.79	1.81	-1.22	-0.88	7.21	06-01-08
75% BC 8.5+ AAA/25% BC 8.5+ AA				12.01	6.32	1.79	0.89	-1.62	-1.29	2.04	
PYRAMIS TACTICAL BOND FUND	181,799,405	0.4					-1.13	-1.70	-1.48	-0.13	06-01-14
NAPIER PARK ABS INCOME FUND	71,909,358	0.2						1.61	0.61	2.25	05-01-15
ABSOLUTE RETURN											
TOTAL ABSOLUTE RETURN	3,221,219,027	7.6		6.90	4.93	6.15	1.21	-0.96	0.06	-0.66	02-01-08
<i>HFRI FOF conservative 1 month lag</i>				3.34	2.71	4.20	1.27	-0.71	0.17	0.49	
ABSOLUTE RETURN STRATEGIES	3,221,219,027	7.6		6.44	4.93	6.15	1.21	-0.96	0.06	1.27	10-01-08
REAL RETURN AND OPPORTUNISTIC											
TOTAL REAL RETURN AND OPPORTUNISTI	3,317,269,867	7.8			9.81	13.12	6.23	1.78	0.35	9.98	04-01-10
¹⁵ <i>Real Return and Opportunistic Custom</i>					7.30	7.02	6.88	1.28	0.35	7.26	
REAL RETURN AND OPPORTUNISTIC	3,317,269,867	7.8			9.98	13.12	6.23	1.78	0.35	9.89	04-01-10

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CASH EQUIVALENTS											
TOTAL SHORT TERM	1,397,002,379	3.3	1.23	0.56	0.35	0.39	0.51	0.14	0.05	5.52	01-01-79
<i>CITIGROUP 1 MONTH T-BILL</i>			<i>1.09</i>	<i>0.06</i>	<i>0.04</i>	<i>0.03</i>	<i>0.02</i>	<i>0.01</i>	<i>0.01</i>	<i>4.50</i>	
SHORT TERM INVESTMENTS	111,237,659	0.3	0.87	0.13	0.05	0.06	0.13	0.03	0.01	5.41	01-01-79
SHORT TERM FIXED INCOME	1,285,764,720	3.0		0.53	0.37	0.42	0.53	0.14	0.05	0.63	12-01-08

Michigan Public Schools Pension - MPSERS

RATES OF RETURN - GROSS

Periods Ending December 31, 2015



STATE STREET

PERFORMANCE SUMMARY REPORT

Endnotes

1 Components as of 10/1/2007 - 9/30/2008 : 18.5% SP 500, 25.5% SP 1500, 12% SP Citigroup 50% USD - 50% Local, 8.5% NCREIF Less 130 BP, 12.5% SP 500 Plus 300 BP, 2% CPI, 17% BC Gov/Credit, BC U.S. Tips 3.5%, GSCI TR .5%

Components as of 10/1/2008 - 9/30/2010: 34% S&P 1500, 17% S&P Developed BMI-EPAC Net 50/50, 17% BC Gov/Credit, 11% NCREIF Property Blended Index, 16% S&P 500 plus 300 BPS, 3% Hedge Fund Research - Abs Return Index, 2% Consumer Price Index

Components as of 10/1/2010: 33% S&P 1500, 16% MSCI ACWI Ex US Gross (Daily), 16% BC Gov/Credit, 9% NCREIF Property Blended Index, 14% S&P 500 plus 300 BPS lagged 3 months, 6% HFRI FOF Conservative 1 Month Lag, 3% Real Return and Opportunistic Custom Benchmark, 1% Dow Jones-UBS Commodity Index, 2% Citigroup 1 Month T-Bill

Components as of 05/1/2012 - 02/28/2015: 31% S&P 1500, 16% MSCI ACWI Ex US Gross (Daily), 15% BC Gov/Credit, 6% NCREIF Property Blended Index, 16% S&P 500 plus 300 BPS lagged 3 mths, 4% Citigroup 1 Mth T-Bill, 5% U.S. CPI + 5%, 3% U.S. CPI + 4% lagged 3 months, 4% T-bills + 4%

Components as of 03/1/2015: 28% S&P 1500; 18% S&P 500 plus 300 BPS lagged 3 mths; 16% MSCI ACWI Ex US Gross; 10.5% Barclays U.S. Aggregate; 10% NCREIF Property Blended Index; 6% T-bills + 4%; 5% Michigan Actuarial Rate; 4.5% U.S. CPI + 5%; 2% U.S. 1 Month T-Bill

2 As of 1/1/2006, index is the S+P 1500. History prior to 1/1/2006 reflects the S+P 500.

3 As of 7/1/06, index is the S&P 500 Growth. History prior to 7/1/06 reflects the S&P 500 Barra Growth.

Michigan Public Schools Pension - MPSERS

RATES OF RETURN - GROSS

Periods Ending December 31, 2015



STATE STREET

PERFORMANCE SUMMARY REPORT

Endnotes - continued

- 4 History prior to 1/1/2012 does not reflect the All-Cap GARP Strategy.

- 5 As of 7/1/06, index is the S&P 500 Value. History prior to 7/1/06 reflects the S&P 500 Barra Value.

- 6 As of 7/1/06, index is the S&P 400 Growth. History prior to 7/1/06 reflects the S&P 400 Barra Growth.

- 7 As of 5/1/2007, index is S&P 900. History prior to 5/1/2007 reflects the S&P 1500.

- 8 Components as of 4/1/1993 - 12/31/2009 : 100% S&P Developed BMI EPAC Net 50/50.

Components as of 1/1/2010 to 9/31/2010: 100% S&P Developed BMI EPAC Net 75/25.

Components as of 10/1/2010 - 6/30/2014: 100% MSCI ACWI Ex US Gross

Components as of 07/1/2014 - current: 100% MSCI ACWI Ex US Net

Michigan Public Schools Pension - MPSERS

RATES OF RETURN - GROSS

Periods Ending December 31, 2015



STATE STREET

PERFORMANCE SUMMARY REPORT

Endnotes - continued

9 As of 1/1/2010, index is the S&P Developed BMI- EPAC net 75 USD/ 25 Local. History prior to 1/1/2010 reflects the S&P Developed BMI - EPAC Net 50/50.

10 Inception -12/31/06: SP 500 + 300 BP.

12/31/06 - 9/30/09 Blend of S&P500 + 300 BP and 10-Year Yield + 300 BP using ending weights of equity and fixed income holdings within Alternatives Investments Portfolio.

10/1/09-present: Blend of S&P500 + 300 BP +3 month lag and 10-Year Yield + 300 BP using ending weights of equity and fixed income holdings within Alternatives Investments Portfolio (Does not include T Rowe as part of calculations).

11 Alternatives Equity includes T. Rowe Price - Dist. Mgmt Svc Acct.

12 Inception - 9/30/2010: 100% S&P 500 +300BPS

As of 10/1/2010: 100% S&P 500 + 300BPS lagged 3 months

13 As of 10/1/2005, index is NCREIF Less 130 BP. History prior to 10/1/2005 reflects NCREIF Less 75 BP.

Michigan Public Schools Pension - MPSERS

RATES OF RETURN - GROSS

Periods Ending December 31, 2015



STATE STREET

PERFORMANCE SUMMARY REPORT

Endnotes - continued

- 14 Infrastructure Investment benchmark is composed of US CPI + 4%, 3 month lagged.

- 15 Total Real Return and Opportunistic Custom Benchmark is composed of: 50% (CPI +5%) and 50% (actuarial rate 8%).

INVESTMENT ADVISORY COMMITTEE MEETING

March 2, 2016

STATE OF MICHIGAN RETIREMENT SYSTEMS QUARTERLY INVESTMENT REVIEW



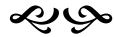
Nick A. Khouri, State Treasurer

**Prepared by Bureau of Investments
Michigan Department of Treasury**

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016

Agenda



- 9:30 a.m. Call to Order and Opening Remarks
- 9:40 a.m. Approval of the 9/3/15 & 12/1/15 IAC Meeting Minutes
- 9:45 a.m. Executive Summary & Performance for Periods Ending 12/31/15
- 10:00 a.m. Current Asset Allocation Review
- Markets Review and Outlook
- 10:15 a.m. Round Table Discussion ~ Key Take-away from each Asset Class
- Review of Investment Reports – *Receive and File*
- Absolute and Real Return/Opportunistic
 - Domestic Equity
 - Fixed Income
 - International Equity
 - Private Equity
 - Real Estate & Infrastructure
- Basket Clause – *Receive and File*
- 11:00 a.m. Closing Remarks ~ Adjournment



2016 Meeting Schedule

Thursday, June 16, 2016
Thursday, September 1, 2016
Thursday, December 15, 2016

All meetings start at 9:30 a.m.

www.michigan.gov/treasury

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

MINUTES

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments**

INVESTMENT ADVISORY COMMITTEE

The Investment Advisory Committee (IAC) held its quarterly meeting on Thursday, December 1, 2015, at the Bureau of Investments, Great Lakes Conference Room, 2501 Coolidge Road, Suite 400, East Lansing, Michigan.

Members Present:

James B. Nicholson, Chair
L. Erik Lundberg – Via phone
Reginald G. Sanders

In attendance from the Department of Treasury:

Treasurer Nick A. Khouri
Robert L. Brackenbury
Jack Behar
Dan Quigley
Marge McPhee
Janet Sudac

Jon M. Braeutigam
Jim Elkins
Brian Liikala
Karen Stout
Karl Borgquist

Gregory J. Parker
Peter Woodford
Richard Holcomb
Woody Tyler
Emma Khavari

Others in attendance:

Max Kotary
Phil Kivarkis
Molly Jason
Paul Lerg

Steve Cummings
Todd Sinclair
Mark Guastella
Jim Bauer

Tim McEnery
June Morse
Charles Abshagen

Call to Order

Mr. James B. Nicholson called the December 1, 2015, IAC meeting to order at 9:27 a.m.

Approval of Minutes of September 1, 2015

- The minutes of the September 1, 2015, will be approved at the March 2, 2016, meeting as there was not a quorum at the December 1, 2015, meeting.

Executive Summary Tab – Performance Review

- Mr. Braeutigam noted that a new asset liability study was due for the State Employees' Retirement System because of some of the changes in the Law.
- He noted that the one-year return for the plan was 2.6%, and in any one year there are variations in the stock and equity returns, which is to be expected.
- He discussed the length of the current bull run, which is 55 months, and noted that the longest bull run was 110 months.
- The annualized ten-year return was 6.7%, the timeframe, of which, was in the midst of the Great Recession. He felt this return was impressive, and it was due, in part, to the diversification of the portfolio.

- Mr. Braeutigam discussed the one-year return and how the selloff in late August affected the stock market.
- There was a discussion on how the Great Recession affected the stock market, and what was learned from the Great Recession.

Performance Tab

- Mr. Parker discussed the strong relative returns and the rates, noting the plan is in the top decile (2nd or 3rd for four of the five years) over the near and long terms.
- He noted that the ten-year return for the plan was 6.7% while the annualized median return over the past ten years was 5.7%.
- He felt it is impressive the value that has been added to the plan by the members of the BOI team.
- There was a discussion regarding the annualized rate-of-return for private equity and the benefits of investing in this asset class at the present time.
- It was noted that the plan is doing well due in part to the selectivity of top decile performing managers.
- Mr. Parker reviewed the AON study and explained that this information is beneficial to the BOI team. He noted that a section of the study compares the returns versus the policy benchmark. The policy benchmark is the strategic asset allocation times the benchmark weight.
- Mr. Parker discussed the three ways that value can be added to the plan – through asset allocation, selectivity, and effective rebalancing. He noted that selectivity was a key for added value at the present time.

Asset Allocation Tab

- Mr. Parker discussed the sources and uses of cash, noting that the largest use of cash was for benefit payments to the retirees.
- He noted that over the past year, money was added to the absolute return, and real return and opportunistic strategies.

Markets Review and Outlook Tab

- Mr. Parker discussed the 12% correction in the domestic equity market which occurred in August and the narrowing of the market itself. This indicates that the number of stocks that are doing well are fewer.
- He indicated that growth strategies have outperformed value strategies over the past several years. Typically, value strategies have outperformed growth strategies.
- He noted that international equity returns have been poor over the past year, especially in emerging markets.
- Mr. Parker discussed the meeting the Fed was scheduled to have mid-December where it was anticipated that they would begin a normalization policy and raise short-term interest rates.
- There was a discussion about the interest rates, the driver of the rates, where they are going, and how they will affect the long and short-term investments.

- Mr. Parker also discussed the U.S. economy – vehicle sales, new housing starts, and the labor markets. He noted that the number of vehicles sold over the past year was at a record high and that the labor market is strong.

Domestic Equity

- Mr. Jack Behar discussed the investment return on stocks. He commented on the multiple expansion component of stocks and why he feels it is so hard to predict; and the investment return on stocks and why he feels it is easier to predict.
- He noted that short-term returns are dominated by the speculative return while long-term returns are dominated by the investment return.
- Mr. Behar discussed the possibility of multiple expansion. He believes that either the long bond yield increases or multiples continue to expand.
- He noted that one risk is that multiples expand significantly and then long bond yields increase dramatically, which will set the stage for another recession.
- He also discussed the 30-year U.S. Treasury which is 3%, that is a 5.5% equity risk premium. He believes the equity risk premium will continue to compress over time.
- He noted that the historical equity risk premium over 50 years is 3.1% and over 90 years is 4.6%.
- He also noted that the expected return on the market is 8.5% versus 9.6% long term.
- Mr. Behar stated that the domestic equity portfolio trades at a lower multiple than the historical S&P 1500. He believes going forward the returns will be above 9%. In accomplishing this expected return and paying 10 basis points in fees will drop the long-term net return from 9.6% to 9.5%, versus the industry average of 8.2%.

Fixed Income

- Mr. Dan Quigley discussed the goals of the division, which are to seek a low to negative correlation with the equity market risk; the four objectives of the portfolio, which are principal preservation, diversification, liquidity, and income; and meet all four objectives in a low rate environment.
- He noted that the core portfolio outperformed the benchmark while the return seeking allocation underperformed. The risk in the portfolio was lowered by reducing the duration bet and the high-yield allocation.
- He discussed the short-term rates, which were driven by the FOMC tightening. The long-term rates were driven by lowered inflation expectations and real rates due to a slower global economy.
- The 10-year U.S. Treasury yielded 2.2% with a breakeven inflation level of 1.6%; the 2-year U.S. Treasury yielded 0.9%.
- He noted that the portfolio is setup with a barbell approach on credit quality and liquidity.
- Mr. Quigley discussed the market breakdown, noting that defaults are rising for both high yield energy and emerging market bonds. There is a possibility of a rate hike at the December FOMC meeting.

Asset Liability Study ~ AON Hewitt – Phil Kivarkis

- Mr. Phil Kivarkis discussed the analysis that was performed of the Michigan State Employees' Retirement System portfolio and plans. He discussed the risk/reward tradeoffs within the context of the plans.
- He anticipates the funded ratios in both plans will trend toward 100% over the next 20 years. He noted this will not be an easy task, but it is attainable if the plan's funding policy remains in place.
- He discussed why the contributions may be increasingly volatile.
- Mr. Kivarkis discussed the relationship between the plan assets and liabilities, the impact of the various asset allocation targets, the trend lines for the funded ratios and contributions; and the risk/reward tradeoffs.
- He noted that the goal is to achieve a balance between the assets and liabilities. He discussed how to balance the growth of assets relative to the growth of the liabilities.
- He discussed the growth of the liabilities which are primarily driven by the liabilities return, which is an actuarial assumption. He noted that assets can grow in one of two ways, by investment performance or cash contributions into the plan – or a combination of the two.
- Mr. Kivarkis talked about the number of participants, both active and inactive and how the Pension Reform affected the plan. The plan is becoming more mature as indicated by the drop in the number of participants.
- He discussed the projection of the pension plan and how the contribution policy will close the funding shortfall.
- He noted that the contribution rate is expected to decline over time.
- He believes that from the analysis performed, the current portfolio is constructed very well. It is nicely diversified across asset classes.

Absolute and Real Return/Opportunistic; International Equity; Private Equity; Real Estate and Infrastructure; and Basket Clause

In the spirit of time, these reports were received and filed.

Closing Remarks

Chairman Nicholson thanked everyone for attending.

Next Meeting Date and Adjournment

The next Investment Advisory Committee Meeting is scheduled for Wednesday, March 2, 2016. The meeting was adjourned by Chairman Nicholson at 11:17 a.m.

Approved:

James B. Nicholson, Chairman

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

EXECUTIVE SUMMARY

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Gregory J. Parker, CFA
Director of Investments – Public Markets
Director of Asset Allocation
Bureau of Investments**

EXECUTIVE SUMMARY

December 2015

Performance

An overview.

MPSERS Plan (12/31/15)	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	2.8%	10.0%	9.2%	10.1%	6.6%
Policy Return	2.2%	9.3%	8.9%	10.8%	6.4%
Peer Median Return	0.4%	7.8%	7.4%	9.4%	5.8%

- The peer group is the State Street Universe of U.S. public funds that are greater than \$10 billion in assets. There were an average of 30 observations across the time periods. Over the past one, three, and five years, the MPSERS plan returns were the highest of the peer group. Over the past ten years, the plan earned the second highest rate of return of the peer group.
- Compared to the median plan returns, the dollar value added to the combined plans over the past five years equates to approximately \$6 billion in additional assets.
- After posting double-digit gains each year for the three years prior, the one-year return for the period ending December 2015 was 2.8%.
- The returns exceeded the policy benchmark over the past year by 0.6%. Positive contributions to the excess returns were primarily from selectivity in private equity, international equity, and long-term fixed income.
- The outperformance to the peer median over the past year was helped by superior selectivity especially in private equity and long-term fixed income. The absolute return and real return / opportunistic asset classes added tremendous value over the time period. The overweight in real estate and private equity as well as the underweight to international equity also added relative value versus peers.

Asset Allocation

Building up commitments in private markets.

- The combined systems paid out approximately \$2.2 billion net of contributions over the past twelve months ending in December 2015; 3.6% of the December 2015 AUM.
- Over the past year, the plans put to work \$950 million in real return / opportunistic strategies, \$650 million in absolute return, \$300 million into international equities and \$100 million into real estate and long-term fixed income each. Over the same time period, the plans reduced the allocation to domestic equity by \$2.4 billion and private equity by \$1.2 billion. The allocation to short-term cash decreased by nearly \$700 million.
- According to the State Street peer universe data, the peer median allocation for the long-term fixed income asset class is 23.1% versus the plan's allocation of 12.2%. The strategic target allocation for fixed income is 10.5%.
- The plans have outstanding capital commitments to fund approximately \$8.2 billion in illiquid asset classes, primarily private equity. This figure is about 13.7% of the December 2015 market value and is an additional liquidity consideration. In the quarter ending December 2015, just over \$1 billion of new commitments were made.

Capital Markets

Risk assets in focus.

- Capital market assumptions used for determining strategic asset allocations are being reduced across the board. This is the general opinion for most consultants, investment banks, and other market participants. The reason for this is the low interest rate environment caused by the policies of the Federal Reserve and other central banks, as well as the run-up in prices for most risk assets over the past five years, after the depths of the Great Recession.
- Earnings growth for the S&P 500 over the past year, ending December 2015, is close to 0%. Valuation metrics are above average, and the absolute returns over the next cycle will not likely be as strong as the historical average.
- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending December 2015, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -6.7%, -13.4%, -11.3%, -7.5%, and -4.5% annualized respectively.
- Credit spreads are becoming more attractively priced. At the end of December 2015, investment grade spreads were about 70 bps higher than average. High-yield spreads were 270 bps higher than their long-term averages and have widened about 2.25% since a year ago.
- At the end of December 2015, the REIT Index was yielding almost 3.9% in income. Relative to the ten-year U.S. Treasury rate, this is about 90 bps above average. Other valuation metrics indicate that the index is very expensively priced. In other words, real estate is not expected to deliver high absolute returns over the longer term.

Economic Backdrop

U.S. economy continues to slowly grow.

- After months of anticipation, at its December 2015 meeting, the Federal Reserve Board voted to increase short-term interest rates by 25 basis points. This marks the first time in roughly seven years that the Fed Funds rate is higher than effectively zero percent.
- The most recent reading of the annualized U.S. GDP growth was 0.7%, slightly below the consensus estimate of 0.8%. Current estimates for 2016 GDP growth for the U.S. is 2.4%. Nearly all economists expect the U.S. economy to continue to grow in 2016, although at a low rate.
- There are a number of tailwinds to the U.S. economy. Over the last two years, the price of crude oil has dropped by approximately \$60 per barrel. A study by Union Bank of Switzerland concludes that for every \$10 drop in oil, the U.S. economy gets a boost of 0.1% growth the following year. Also, real government spending is up year-over-year by approximately 1%, which will likely add an additional few tenths of a percent to GDP.
- The jobs market is strong. The four-week moving average for initial jobless claims in October was the lowest since 1973. The national unemployment rate is at 4.9%, the lowest level since November 2007. The tightening labor market has not created wage inflation of any significance yet.
- In September 2015, U.S. auto sales eclipsed 18 million units on a seasonally adjusted basis. Except for a few one-time spikes in sales, this figure is among the best ever. Over the past five years, growth in sales of autos has averaged 8.8% year-over-year.

Investment Update*Highlighting the quarter.*

(\$ Millions)

NEW COMMITMENTS
October 1 – December 31, 2015

Asset Class	Fund Name	Commitment
Private Equity	Warburg Pincus XII	\$175
Private Equity	TSG7	125
Private Equity	Dover Street IX	100
Private Equity	Harvest Partners VII	75
Private Equity	FIMI Opportunity 6	50
Private Equity	Riverside IV	50
Private Equity	Shamrock Growth Capital IV	50
Private Equity	Axiom Asia IV	50
Real Estate & Infrastructure	Rialto Real Estate Fund III-Debt, LP	\$50
Real Estate & Infrastructure	TSP Value and Income Fund, LP	50
Real Estate & Infrastructure	Avanath II SMRS Co-Investment Fund, LLC	20
Real Estate & Infrastructure	M1 Westgate Colinvest, LLC	10
Absolute Return	Visium Balanced Fund, LP	\$100
Real Return & Opportunistic	RPEP SMRS Partners	65
Real Return & Opportunistic	Carlyle Energy Mezzanine Opportunity Fund	50
Real Return & Opportunistic	Orion Coinvest III, LP	20
Total		\$1,040

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

PERFORMANCE

**FOR PERIODS ENDING
DECEMBER 31, 2015**

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments**

Bureau of Investments

Mission Statement

The Bureau of Investments continually strives to provide quality investment management services, broad professional expertise, and independent advice to the State Treasurer as fiduciary of the State of Michigan Retirement Systems, and various Michigan trust funds and the State's common cash.

SMRS Goals

Maintain sufficient liquidity to pay benefits.

*Meet or exceed the actuarial assumption
over the long term.*

*Perform in the top half of the public plan
universe over the long term.*

Diversify assets to reduce risk.

*Exceed individual asset class benchmarks
over the long term.*

MPSERS PENSION

Time-Weighted Rates of Return

Periods Ending December 31, 2015

	% of Portfolio 12/31/15	Ten Years ¹		Seven Years ¹		Five Years ¹		Three Years ¹		One Year		Current Quarter	
		Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
TOTAL PLAN	100.0	6.6	7	10.1	17	9.2	5	10.0	4	2.8	4	2.0	68
Median - Greater than \$10 Billion ²		5.8		9.4		7.4		7.8		0.4		2.4	
MPSERS Total Plan Policy		6.4		10.8		8.9		9.3		2.2		1.7	
DOMESTIC EQUITIES	27.8	7.4	34	15.0	41	12.1	27	15.0	24	-0.5	60	5.4	41
Median ²		6.9		14.7		11.1		13.6		-0.2		5.2	
S&P 1500 Index		7.4		15.0		12.4		14.9		1.0		6.6	
PRIVATE EQUITIES	16.1	12.7	6	13.0	5	15.1	5	15.1	17	10.6	15	-1.2	78
Median ²		9.6		9.5		10.5		11.2		5.5		-0.5	
Alternative Blended Benchmark ³		10.9		18.4		16.4		15.5		2.4		-5.7	
INTERNATIONAL EQUITIES	15.0	2.6	80	8.7	46	2.9	53	3.3	57	-2.3	39	4.3	47
Median ²		3.7		8.7		3.2		3.8		-2.9		4.2	
International Blended Benchmark ⁴		1.5		6.4		1.4		1.8		-5.7		3.2	
BONDS	12.2	5.3	41	5.6	63	3.8	56	2.2	30	1.4	11	-0.2	14
Median ²		5.0		5.9		3.9		1.7		-0.3		-0.7	
Barclays Aggregate		4.5		4.1		3.3		1.4		0.6		-0.6	
REAL ESTATE & INFRASTRUCTURE	10.2	6.0	42	3.7	59	12.4	45	13.5	26	9.6	52	2.0	56
Median ²		5.3		4.6		12.0		12.1		9.9		2.4	
NCREIF - Property Blended Index ⁵		6.4		6.2		10.8		10.6		11.9		2.6	
NCREIF Open Fund Index Net		5.6		5.5		12.6		12.8		14.0		3.1	
REAL RETURN AND OPPORTUNISTIC	7.8					9.8		13.1		6.2		1.8	
50% (CPI +500 bps) + 50% (8% actuarial rate)						7.3		7.0		6.9		1.3	
ABSOLUTE RETURN	7.6			6.9		4.9		6.2		1.2		-1.0	
HFRI FOF Cons 1 month lagged				3.3		2.7		4.2		1.3		-0.7	
CASH EQUIVALENTS	3.3	1.2		0.6		0.4		0.4		0.5		0.1	
1 Month T-Bill		1.1		0.1		0.0		0.0		0.0		0.0	

¹ Annualized Returns and Percentile Rank.

² Comparison universe is the State Street Universe comprised of Public Funds greater than \$10 Billion on the total plan level and greater than \$1 Billion for asset classes.

³ SP 500 + 300 bps thru 12/31/06. Ending market value (EMV) weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 12/31/06 to 9/30/09. EMV weighted blend of 10 yr yield + 300 bps and SP 500 + 300 bps 3-month lagged 9/30/09 to present.

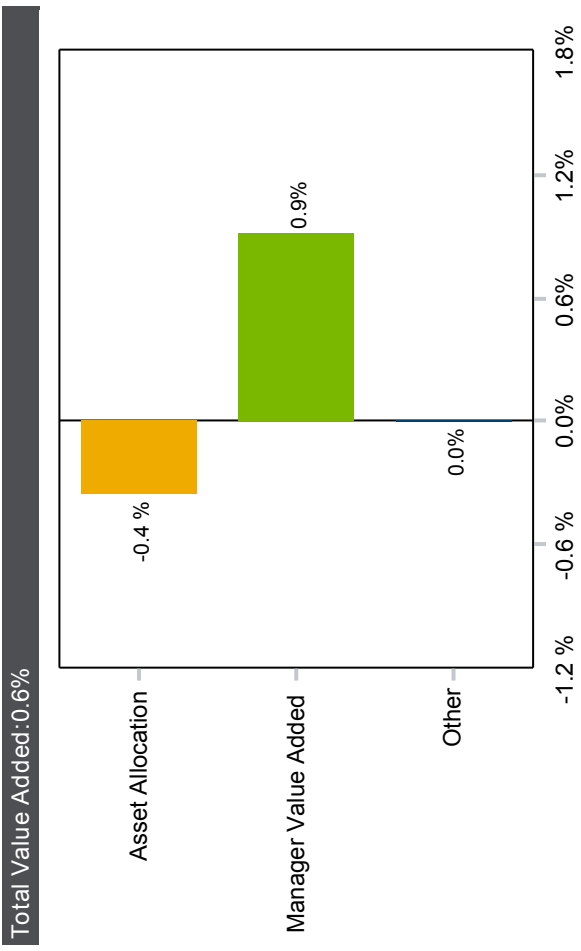
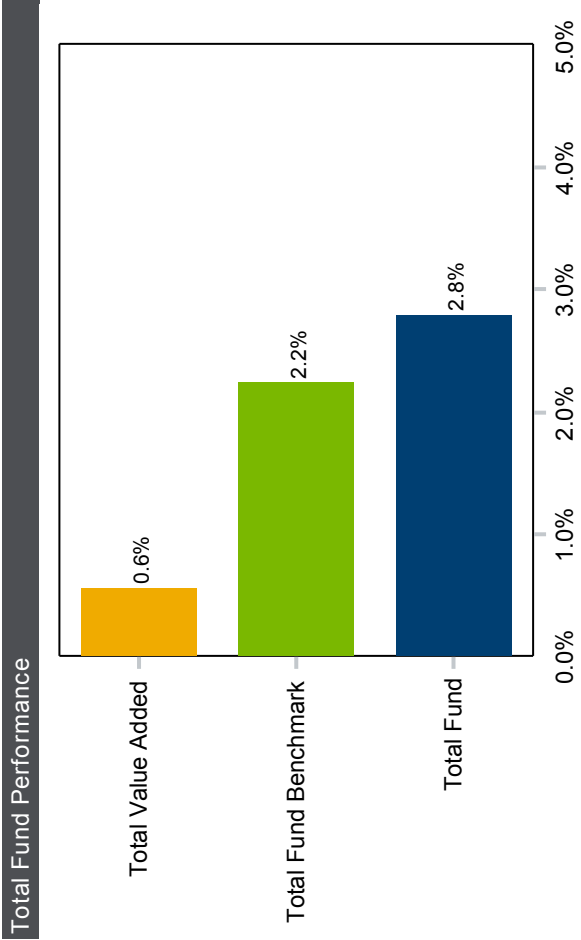
⁴ International blended benchmark is S&P Developed BMI-EPAC 50/50 prior to 1/1/2010. S&P Developed BMI-EPAC 75 USD / 25 Local, 1/1/2010 to 9/30/10. MSCI ACWI Ex USA Gross 10/1/2010 to present.

⁵ NCREIF - Property Blended Index is NPI minus 75 bps prior to October 2005, NPI minus 130 bps current.

Source: State Street Analytics; the NCREIF - NPI (Property Index) source is NCREIF; the S&P BMI-EPAC Index source is S&P.

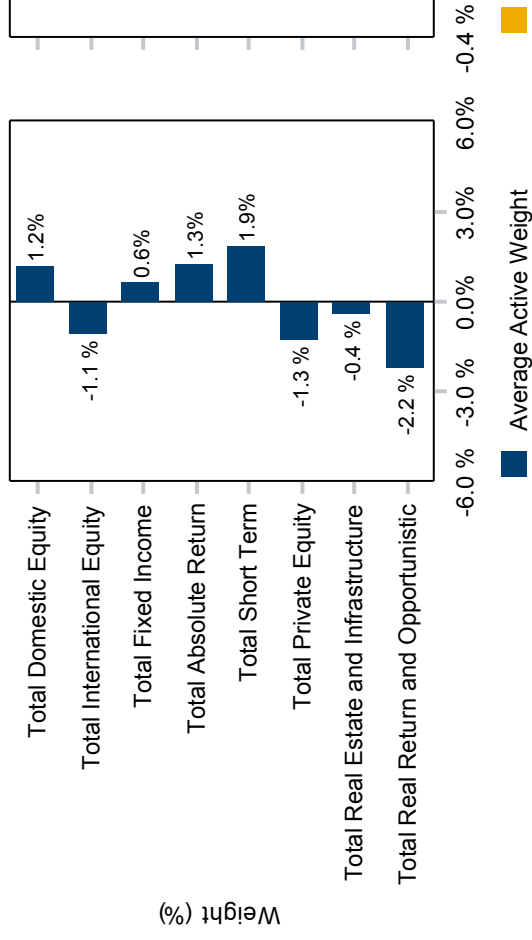
Total Fund Attribution

Total Michigan vs. Total Fund Benchmark

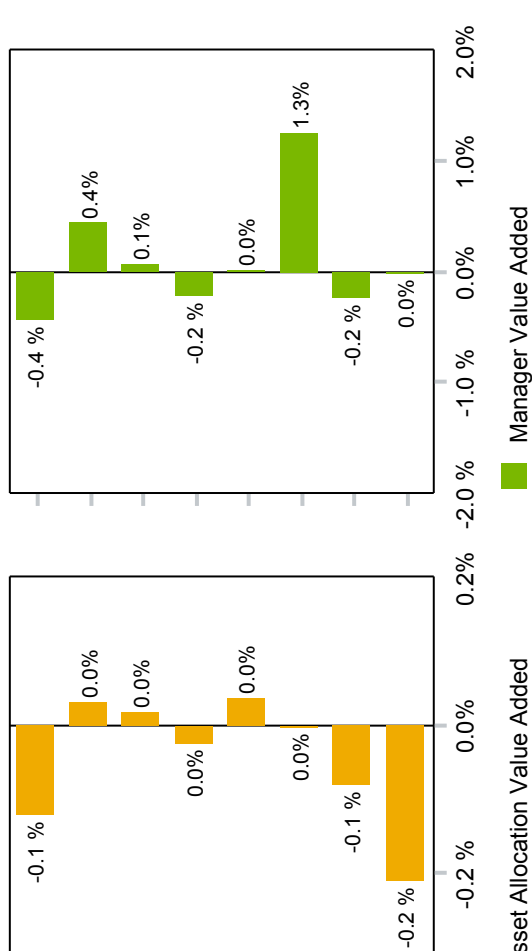


3

Total Asset Allocation: -0.4%



Total Manager Value Added: 0.9%



Weight (%)

■ Average Active Weight ■ Asset Allocation Value Added ■ Manager Value Added

Cumulative and Consecutive Total Fund Returns

MPSERS

Cumulative For Years Ending 12/31/15

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MPSERS	2.8	7.0	10.0	10.7	9.2	9.7	10.1	5.1	5.7	6.6
Public Plan - Median (> \$10 billion)*	0.4	3.8	7.8	9.1	7.4	8.3	9.4	4.3	4.9	5.8
Rank	4	5	4	11	5	8	17	18	12	7
bp Difference - Median	237	319	222	155	174	140	71	79	81	85
Consecutive For Years Ending										
	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07	12/06
MPSERS	2.8	11.3	16.4	12.6	3.3	12.7	12.1	-24.2	11.1	15.0
Public Plan - Median (> \$10 billion)*	0.4	7.1	15.4	13.4	1.6	12.7	17.5	-25.9	9.6	14.5
Rank	4	5	38	77	18	51	80	36	23	33
bp Difference - Median	237	429	94	-74	172	-1	-538	169	151	50

MSERS

Cumulative For Years Ending 12/31/15

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSERS	2.8	7.0	10.0	10.6	9.1	9.7	10.0	4.9	5.6	6.5
Public Plan - Median (> \$1 billion)*	0.3	3.5	7.8	9.1	7.4	8.2	9.5	4.5	4.9	5.8
Rank	2	3	3	8	3	7	34	26	17	12
bp Difference - Median	246	349	219	155	173	142	43	47	68	67
Consecutive For Years Ending										
	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07	12/06
MSERS	2.8	11.3	16.3	12.6	3.2	12.5	11.9	-24.4	11.0	15.0
Public Plan - Median (> \$1 billion)*	0.3	6.9	16.1	13.3	1.2	13.0	18.5	-26.2	9.7	14.7
Rank	2	3	48	72	17	63	85	31	16	35
bp Difference - Median	246	445	14	-67	201	-43	-663	176	135	31

*State Street Public Funds Universe

Cumulative and Consecutive Total Fund Returns

MSPRS

Cumulative For Years Ending 12/31/15

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MSPRS	2.8	6.9	9.9	10.6	9.1	9.7	9.9	4.9	5.6	6.5
Public Plan - Median (> \$1 billion)*	0.3	3.5	7.8	9.1	7.4	8.2	9.5	4.5	4.9	5.8
Rank	3	3	4	10	3	7	35	26	16	12
bp Difference - Median	245	347	215	151	173	143	39	47	70	70
Consecutive For Years Ending										
	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07	12/06
MSPRS	2.8	11.3	16.2	12.5	3.3	12.6	11.5	-24.2	11.2	15.1
Public Plan - Median (> \$1 billion)*	0.3	6.9	16.1	13.3	1.2	13.0	18.5	-26.2	9.7	14.7
Rank	3	3	49	74	15	63	88	28	14	34
bp Difference - Median	245	441	6	-74	216	-36	-701	198	156	39

MJRS

Cumulative For Years Ending 12/31/15

	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year	7 Year	8 Year	9 Year	10 Year
MJRS	2.8	6.8	9.7	10.4	8.9	9.4	9.5	4.7	5.4	6.3
Public Plan - Median (> \$1 billion)*	0.3	3.5	7.8	9.1	7.4	8.2	9.5	4.5	4.9	5.8
Rank	3	3	10	16	8	8	52	35	19	17
bp Difference - Median	245	336	189	130	151	118	-5	26	49	49
Consecutive For Years Ending										
	12/15	12/14	12/13	12/12	12/11	12/10	12/09	12/08	12/07	12/06
MJRS	2.8	11.0	15.6	12.5	3.1	12.2	9.9	-23.3	11.0	14.8
Public Plan - Median (> \$1 billion)*	0.3	6.9	16.1	13.3	1.2	13.0	18.5	-26.2	9.7	14.7
Rank	3	3	55	74	17	72	91	19	16	42
bp Difference - Median	245	418	-51	-78	190	-73	-862	293	136	9

*State Street Public Funds Universe

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

ASSET ALLOCATION REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016

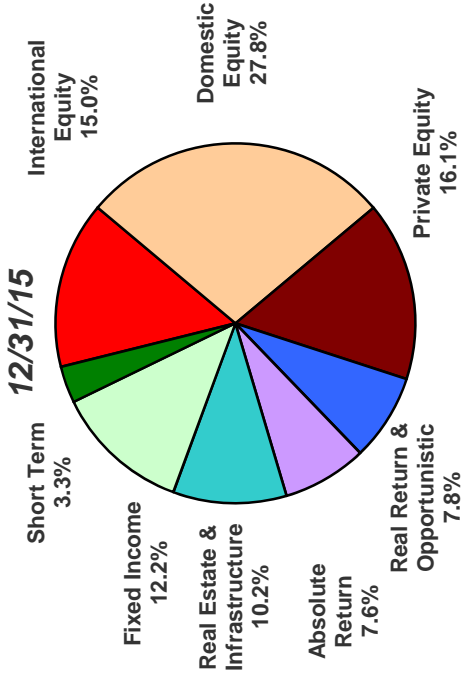


**Jon M. Braeutigam
Chief Investment Officer
Bureau of Investments**



STATE OF MICHIGAN RETIREMENT SYSTEMS PROFILE - DECEMBER 2015

Asset Allocation 12/31/15



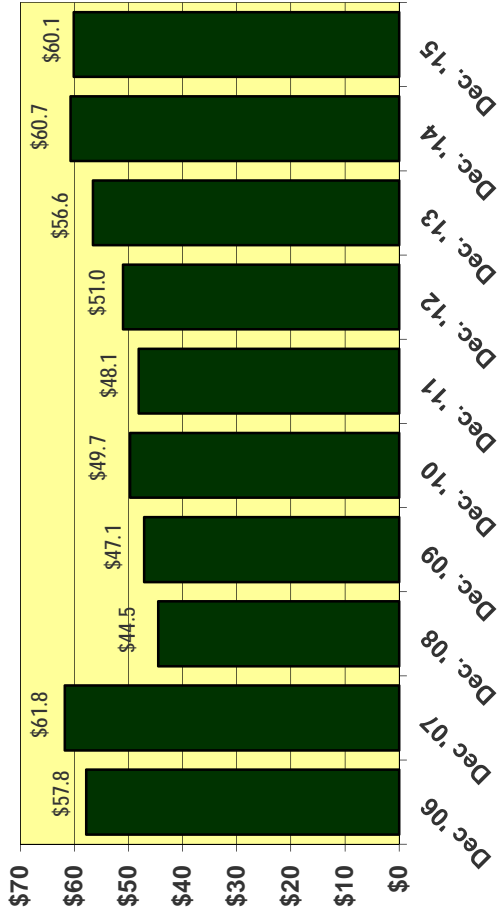
Asset Allocation By Market Value (In Millions)

Investment Strategies	12/31/15	9/30/15
Domestic Equity	\$16,724	\$16,605
Private Equity	9,659	10,124
International Equity	9,034	8,190
Fixed Income	7,301	7,216
Real Estate & Infra.	6,157	5,946
Real Return & Opport.	4,681	4,307
Absolute Return	4,544	4,442
Short Term**	1,971	2,577
TOTAL	\$60,071	\$59,407

Short Term Equivalents (in Billions)

Short Term Strategy***	\$2.0
Short Term in Other Inv. Strategies	0.8
TOTAL SHORT TERM	\$2.8
	4.7% of Total Funds

Market Value* (Billions of Dollars)



Market Value By Plan ~ 12/31/15 (in Millions)

	Pension Plan		OPEB**		Combined	
	Mkt. Value	%	Mkt. Value	%	Mkt. Value	%
MPERS	\$42,576		\$3,719		\$46,295	77.1%
MSERS - (closed)	10,802		1,368		12,170	20.3%
MSPRS	1,248		100		1,348	2.2%
MJRS - (closed)	257		1		258	0.4%
TOTAL	\$54,883		\$5,188		\$60,071	100.0%



18th Largest DB Public Pension Fund in the U.S.
19th Largest DB Pension Fund in the U.S.

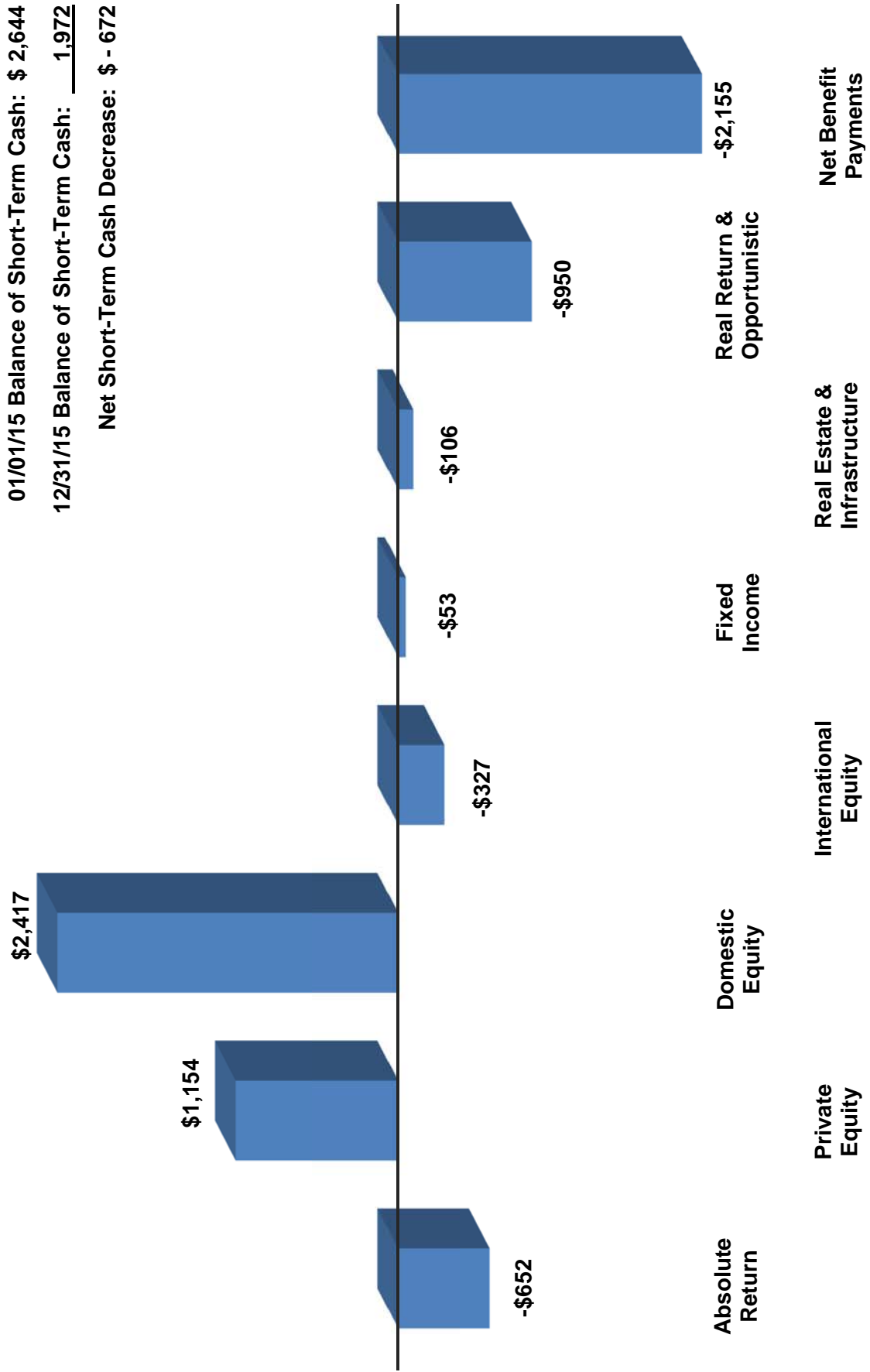
Pensions & Investments Survey - February 8, 2016 Issue



*The combined net payout for the plans for FY 2015 was \$2.2 billion with \$19.9 billion paid out since 2008 (SOMCAFR). This represents the amount paid to beneficiaries in excess of employer and employee contributions.
**OPEB - Other Post Employment Benefits

Sources and Uses of Cash

January 2015 ~ December 2015



A negative number in an asset category indicates a use of cash, a positive number indicates a source of cash.
 Dollars in millions

Asset Allocation Targets As of 12/31/15

Asset Class	MPSERS			MSERS			MSPRS			MJRS			SMRS
	Actual 12/31/15	Target 9/30/16	Target* 9/30/17	Actual 12/31/15	Target 9/30/16	Target* 9/30/17	Actual 12/31/15	Target 9/30/16	Target* 9/30/17	Actual 12/31/15	Target 9/30/16	Target* 9/30/17	Ranges
Broad U.S. Equity	27.8%	28.0%	28.0%	27.8%	28.0%	28.0%	27.8%	28.0%	28.0%	27.9%	28.0%	28.0%	20% - 50%
Private Equity	16.1%	17.0%	18.0%	16.1%	17.0%	18.0%	16.1%	17.0%	18.0%	16.1%	17.0%	18.0%	10% - 25%
Broad Int'l Equity	15.0%	15.5%	16.0%	15.0%	15.5%	16.0%	15.0%	15.5%	16.0%	15.0%	15.5%	16.0%	10% - 20%
U.S. Fixed Income Core	12.2%	11.5%	10.5%	12.2%	11.5%	10.5%	12.2%	11.5%	10.5%	12.1%	11.5%	10.5%	8% - 25%
Real Estate / Infrastructure	10.2%	10.0%	10.0%	10.2%	10.0%	10.0%	10.2%	10.0%	10.0%	10.2%	10.0%	10.0%	0% - 15%
Real Return / Opportunistic	7.8%	8.5%	9.5%	7.8%	8.5%	9.5%	7.8%	8.5%	9.5%	7.8%	8.5%	9.5%	0% - 15%
Absolute Return	7.6%	7.0%	6.0%	7.6%	7.0%	6.0%	7.6%	7.0%	6.0%	7.6%	7.0%	6.0%	0% - 12%
Cash	3.3%	2.5%	2.0%	3.3%	2.5%	2.0%	3.3%	2.5%	2.0%	3.3%	2.5%	2.0%	1% - 9%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

*Complies with basket clause and international restrictions.

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

MARKETS REVIEW AND OUTLOOK

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Gregory J. Parker, CFA
Director of Investments – Public Markets
Director of Asset Allocation
Bureau of Investments**

CAPITAL MARKETS

Return and Risk Assumptions, Benchmark and Outlook

A starting point.

MPSERS Plan	Assumed Return* (Arithmetic)	Standard Deviation*	Trailing 10-Year (Benchmark**)	Tactical (Short Term) Expectations***
Private Equity	11.4%	24.0%	10.9%	Hold
International Equity	9.4%	20.9%	2.9%	Add
Domestic Equity	8.0%	17.4%	7.4%	Hold
Real Estate (Core)	6.3%	11.5%	6.4%	Trim
Absolute Return	5.7%	9.0%	5.1%	Trim
Real Ret/Opportunistic	7.6%	12.1%	7.4%	Add
Long-Term Fixed	3.0%	3.5%	4.5%	Add
Short-Term	2.2%	1.0%	1.1%	Hold

* Aon Hewitt Investment Consultants Q1-2016 Long-Term Return/Risk Assumptions

** Investment Policy Statement; Annualized Returns

*** Actual investments may differ due to changing conditions and the availability of new information

Overview

Softening the outlook for risk assets.

- Capital market assumptions used for determining strategic asset allocations are being reduced across the board. This is the general opinion for most consultants, investment banks, and other market participants. The reason for this phenomenon is the low interest rate environment caused by the policies of the Federal Reserve and other central banks, as well as the run-up in prices for most risk assets over the past six years after the depths of the Great Recession.
- Over the past seven years ending December 2015, the broad domestic market index, S&P 1500, has returned a 15.0% annualized rate of return. In August 2015, the market hit a correction level of -12%. Technical price trends and market breadth are weak and valuations are above normal.
- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending December 2015, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -6.7%, -13.4%, -11.3%, -7.5%, and -4.5% annualized respectively. Technical price trends are poor for both developed and emerging markets. The strengthening U.S. dollar looks to be the swing-factor.
- The 10-year U.S. Treasury closed January 2016 at 1.9%, however nearly 30 basis points (bps) higher than one year prior. Perhaps in response to tightening of Federal Reserve Board policy in December 2015, the yields in 6-month U.S. Treasuries ended January at 0.5% or 40 bps higher than the year prior. The curve is somewhat steep, about 20 bps higher than average.
- Credit spreads are becoming more attractively priced. At the end of December 2015, investment grade spreads were about 70 bps higher than average. High-yield spreads were 270 bps higher than their long-term averages and have widened about 2.25% since a year ago.
- At the end of January 2016, the 2-year U.S. Treasury rate was 0.8%. This yield is very attractive when compared to Japan (-0.1%), Germany (-0.5%) and Switzerland (-1.0%). With the backdrop of good price strength, very competitive yields, and fundamentals in the favor of the U.S., it seems very logical that the dollar will continue to strengthen in 2016, placing additional pressure on commodities.

Domestic Equity

Market breadth continues to narrow.

- Over the past seven years ending December 2015, the broad domestic market index, S&P 1500, has returned a 15.0% annualized rate of return. However, there remains concern with market breadth and price level technicals.
- Since the bottom, six-and-a-half years ago now, the strength in appreciation of the U.S. stock market has been very powerful. However, at the end of October 2015, from a technical perspective, the large-cap market price appreciation has slowed.
- The breadth of the domestic market continues to narrow. By the end of January 2016, the S&P 500 had corrected 8.7% off its 52-week high. However, the average S&P 500 stock was underperforming the cap-weighted benchmark by approximately -12%. In addition, at the end of January 2016, nearly half of the S&P 500 companies were more than -20% below its 52-week high, and a quarter of companies have corrected by more than 30%.
- Earnings growth for the S&P 500 over the past year, ending December 2015, is close to 0%. Valuation metrics are above average, and the absolute returns over the next cycle will not likely be as strong as the historical average.
- For the period ending December 2015, large-cap stocks beat small caps by 5.8%, 3.5%, 3.4%, 0.8% and 0.5% over the past one, three, five, seven, and ten years respectively. Over the past year, growth continued its dominance over value style outperforming by 9.2%. Over the past three, five, seven, and ten years growth led value by roughly 2-4% annually.

International Equity

Relative value in international equity.

- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending December 2015, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -6.7%, -13.4%, -11.3%, -7.5%, and -4.5% annualized respectively.
- Within international equities, developed markets convincingly outperformed emerging markets over the past one, three, and five years ending December 2015 by 11.9%, 10.7%, and 7.6% annualized respectively. Emerging markets have outperformed developed markets by 0.7% annualized over the past ten years.
- The price trend (measured in local currency) of developed international was significantly weakened during the December 2015 quarter. Both developed and emerging markets have weak market technicals, both are priced below their respective 200-day moving averages.
- The plan is underweight international equity against a global benchmark – approximately 33% versus 50%; and it is also slightly underweight peers – approximately 15.0% versus 17.6%.
- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international equity markets trade at roughly a 10% discount to the U.S. counterparts, while emerging markets trade at over a 40% discount. However, it appears that much of this valuation gap is due to the sector weights of the non-U.S. indexes.
- Earnings in international markets have been below trend for some time, due in part to the pro-cyclicality of these markets. A catalyst for international equity markets to perform more competitively with U.S. markets would be a stabilization with modest economic growth prospects.

Interest Rates

Credit looks interesting.

- The 10-year U.S. Treasury closed January 2016 at 1.9%; however, nearly 30 bps higher than one year prior. Perhaps in response to tightening of Federal Reserve Board policy in December 2015, the yields in 6-month U.S. Treasuries ended January at 0.5% or 40 bps higher than the year prior. The curve is somewhat steep, about 20 bps higher than average.
- Credit spreads are becoming more attractively priced. At the end of December 2015, investment grade spreads were about 70 bps higher than average. High-yield spreads were 270 bps higher than their long-term averages and have widened about 2.25% since a year ago.
- Inflation expectations are being priced lower in the bond markets. The 10-year breakeven rates at the end of December 2015 were priced at 1.6%, 60 bps below the average of the past five years, and the lowest since the 2008 financial crisis.
- The Barclays Aggregate Index sensitivity to changes in interest rates has increased over time as measured by the modified adjusted duration. At the end of December 2015, the Barclays Aggregate Index had a duration of 6.0.

Real Estate

Rich valuations continue.

- The publicly traded FTSE NAREIT Index was up 2.8% over the past year for the period ending December 2015, beating the broad domestic equity market by 1.8%. Over the past three and five years, the index is up 10.6% and 11.9% respectively.
- There has been some pull back in the REIT Index. As of January 2016 the index is almost 12% off its January 2015 highs.
- At the end of December 2015, the REIT Index was yielding almost 3.9% in income. Relative to the 10-year U.S. Treasury rate, this is about 90 bps above average. Other valuation metrics indicate that the index is expensively priced.

Commodities

Getting weaker.

- At the end of January 2016, commodity prices, as measured by the Thomson Reuters CRB Index, collapsed by -46.7% since June 2014. Since its peak in 2008, prices are down by almost -65%, and prices are now less than at the March 2009 levels. The CRB Index is now at the low end of its trading range, and seemingly on an even lower trend.
- As measured by the DXY Index, the U.S. dollar has strengthened by around 40% since the winter months of 2008. At the end of January 2016, the U.S. dollar is 6% higher than the year prior as measured by the DXY Index
- At the end of January 2016, the 2-year U.S. Treasury rate was 0.8%. This yield is very attractive when compared to Japan (-0.1%), Germany (-0.5%) and Switzerland (-1.0%). With the backdrop of good price strength, very competitive yields, and fundamentals in the favor of the U.S., it seems logical that the dollar may continue to strengthen in 2016, which would place additional pressure on commodities.

ECONOMIC OUTLOOK

Select Historic Economic Growth with Forecasts

An eye to 2016.

Real GDP Growth Actual/Forecasts	2013	2014	2015	2016	2017
World	3.3	3.4	3.1	3.3	3.5
U.S.	1.5	2.4	2.4	2.4	2.3
Developed (G10)	1.2	1.8	2.0	2.1	2.1
Asia	4.9	4.8	4.6	4.9	4.9
EMEA	2.3	2.2	0.9	2.0	2.8
Europe	-0.3	0.9	1.5	1.6	1.7
Latin America	3.5	1.1	-1.0	-0.5	2.2
China	7.7	7.3	6.9	6.5	6.3

*Source: Bloomberg

Economic Overview

U. S. economy remains the bright spot.

- After months of anticipation, at its December 2015 meeting, the Federal Reserve Board voted to increase short-term interest rates by 25 basis points. This marks the first time in roughly seven years that the Fed Funds rate is higher than effectively zero percent. In the accompanying statements, the Fed has signaled that any additional rate increases will come at a gradual pace.
- The most recent reading of the annualized U.S. GDP growth was 0.7%, slightly below the consensus estimate of 0.8%. Current estimates for 2016 GDP growth for the U.S. is 2.4%. The Conference Board's Leading Economic Indicators index continues to signal economic expansion.
- The declines in energy costs are likely to continue to act as a tailwind to the U.S. economy. The costs of energy commodities such as crude oil, gasoline, and heating oil are down by half over the past two years. The mild winter of 2015-16 will also give consumers additional savings on energy use.
- Government spending increases should also begin to boost U.S. economic activity. For the most recent period, real government spending increased year-over-year by 1.3%.
- In September 2015, U.S. auto sales eclipsed 18 million units on a seasonally adjusted basis. Except for a few one-time spikes in sales, this figure is among the best ever. Over the past five years, growth in sales of autos have averaged 8.8% year-over-year. With the average vehicle age still higher than ten years old, the trend in growth could continue well through the next year.

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

ABSOLUTE AND REAL RETURN REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**James L. Elkins
Senior Investment Manager
Short-Term, Absolute and Real Return Division**

EXECUTIVE SUMMARY

Absolute Return

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Absolute Return	1.2%	6.2%	4.9%	6.9%	N/A
HFRI FOF Conservative*	1.3%	4.2%	2.7%	3.3%	N/A

*One month lag on the index

- The strategy of the Absolute Return portfolio is to further diversify the total plans' holdings targeting returns above investment grade fixed income with lower volatility than the equity portfolio. The portfolio utilizes a diverse mix of managers that invest both long and short to target specific exposures and hedge out unwanted risk.
- Multi-Strategy/Event – The strategy was flat for the quarter. Given the turbulence in energy markets, managers continued to suffer from midstream sector and credit exposure over the period. Most underperformance was due to long exposures to equity and credit names. Specific exposure to energy across the portfolio was the largest detractor over the quarter, with losses coming from both midstream and upstream positions.
- Credit – Performance for credit managers was negative for the quarter. Spreads across credit products widened further in the fourth quarter. For much of the period, the high-yield corporate space, in particular, suffered from poor technicals and a lack of liquidity, creating a difficult environment for credit managers. Long leaning corporate strategies tended to underperform as a result of high volatility and technical selling. Performance lagged primarily due to the underperformance of stressed and distressed credits. Energy credits, especially oil and gas names, drove underperformance in the lower rated high-yield space. Relative value / trading oriented credit strategies fared better than corporate fundamental and distressed strategies since higher liquidity of trading strategies helped limit losses during times of high volatility. Despite spread widening in structured credit markets, mortgage and structured product strategies generally outperformed corporate and trading oriented strategies. Continued robust collateral performance and positive carry provided stability for structured credit portfolios. In non-energy sectors, fundamentals remain favorable when compared to previous negative episodes within high yield and will likely present dislocations to take advantage of in 2016.
- Equity – Performance over the quarter was mixed. Against a backdrop of equity markets generating gains in the fourth quarter, equity hedge fund strategies were challenged over the period. The majority of equity market gains were attributable to a strong October which compensated for lack-luster performance in the subsequent months. While lower net managers and those strategies more relative value in nature generally benefitted, other managers underperformed. This underperformance was concentrated in managers that were overly exposed to the energy space. On the positive side, managers focusing on the technology, media and telecommunications and healthcare sectors fared well.
- Diversifying – Performance for diversifying strategies was positive overall for the quarter, primarily driven by quantitative strategies. In the first week of October, several managers experienced sharp losses on the back of factor reversals, most notably momentum. However, most managers were able to quickly rebound, generating positive returns in October and into the end of the quarter. Long momentum and long size biases benefitted many portfolios. This was especially true for strategies with longer holding periods, which typically have a higher likelihood of overweighting these factors, as well as managers with large short biotech and energy exposures. Commodity prices suffered another sharp leg down, registering the sector's worst

quarter since the global financial crisis, with many commodities reaching their lowest levels since 2003. Three key themes drove prices lower over the quarter: i) continuation of supply resilience, with much production being protected by weak emerging market currencies and cost deflation; ii) stronger U.S. dollar continuing to affirm the supply demand imbalance as it protects non-USD supply and dampens non-USD demand; and iii) Chinese growth concerns, that were spurred on by further devaluation of the Chinese currency. These themes combined to take most commodity prices significantly lower, especially in November and December. Commodity trading advisor strategies generated strong performance in the fourth quarter; positions in commodities, particularly short positions in energies, drove a large portion of the profits.

- In terms of strategy allocations, we remain cautious on taking material directional risks in the portfolio and continue to shift towards more diversifying, lower net exposures in fundamental strategies. We continue to favor managers who are able to generate returns on both the long and short sides and continue to observe the macro opportunity set while looking for attractive bottoms up opportunities.
- During the quarter, one new commitment was closed:
 - \$100 million Visium Balanced Fund LP ~ Healthcare Long/Short Equity

Real Return and Opportunistic

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Real Return and Opport.	6.2%	13.1%	9.8%	N/A	N/A
Custom Benchmark	6.9%	7.0%	7.3%	N/A	N/A

- The strategy of the Real Return & Opportunistic portfolio is to provide an inflation hedge or to gain exposure to attractive opportunities that may not fit in another plan portfolio.
- Senior Secured Credit – The spread on the LSTA Leveraged Loan Index widened from L+518 to L+623 since the beginning of 2015 as the default rate climbed up from 1.8% to 1.5%. The quarter saw an increase in volatility that was driven by several factors including the declining price of oil, concerns over global terrorism, and the ECB’s decision to maintain its quantitative easing pace. Furthermore, China’s pronounced deceleration of growth during 2015 drove market weakness globally. Periods of market volatility have become exacerbated as large retail flows dramatically shift prices due to liquidity fears, but the markets recovered some to round out the year as the Federal Reserve decided to raise its benchmark interest rate by 0.25%. The S&P/LSTA Leveraged Loan Index and Merrill Lynch U.S. High Yield Master II Index returned negative 2.10% and -2.17% respectively, for the quarter. The technical story for the loan market during the fourth quarter saw a slowing in demand with a net demand of \$7.1 billion versus a supply of \$36.5 billion in leveraged loans. Year-to-date total loan demand slowed toward the end of the year to reach \$76.1 billion, with \$97.3 billion in CLO issuance offsetting \$21.2 billion in redemptions from retail loan funds.
- Direct Lending – Fourth quarter volatility within the financial markets created uncertainty and forced firms who could typically access the public debt markets to seek out private solutions. As capital markets slowed towards a halt, it pushed private loan issuance even higher in the most robust quarter of the year. Direct lending funds have been able to target and lend to much larger companies and improve credit quality while maintaining their returns from the spreads on loans.
- Energy Funds – For the quarter, Spot WTI crude prices were down 18% and spot natural gas prices were down 7%, with long-dated futures contracts in those commodities decreasing by similar amounts. The current oil price downturn is now deeper and/or longer than any other

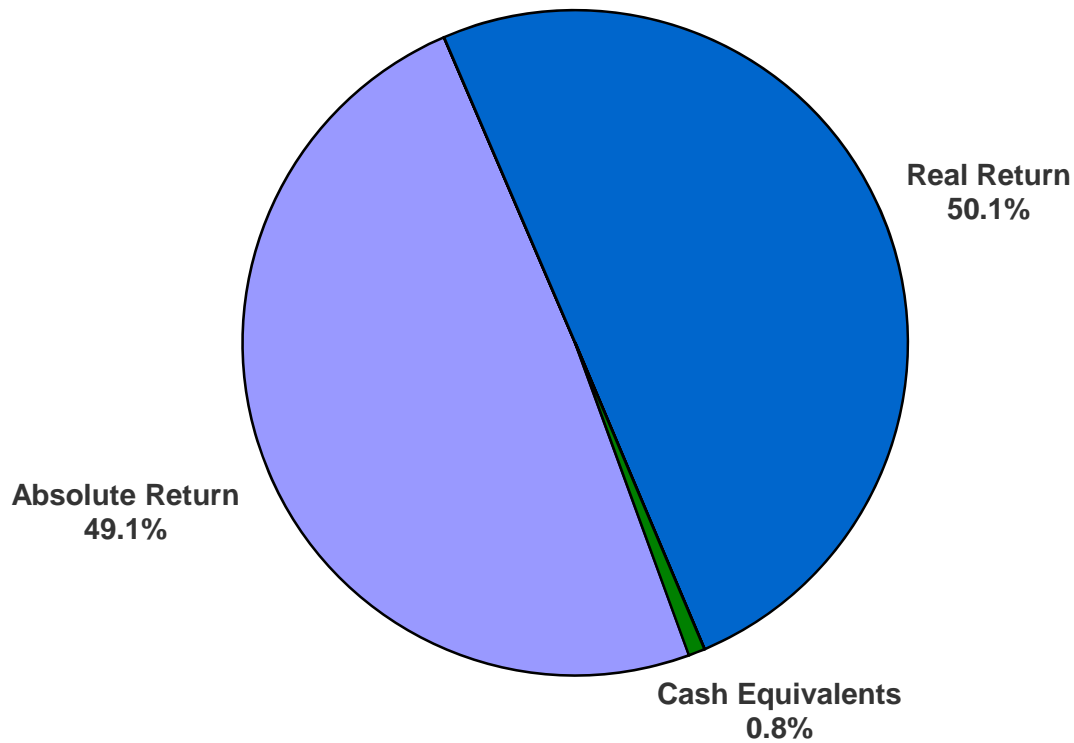
downturn since 1970. There have been five major oil price downturns in the last 45 years. During each of these, the oil price was trading 40-50% below their peak one year into the downturn. Oil is presently 70% below its peak – a historical outlier. With only approximately 30% of our energy commitments presently invested, a substantial amount of uncalled commitments remain ready to capitalize on the opportunities presented by lower energy prices should they persist.

- During the quarter, three new commitments were closed:
 - \$50 million Carlyle Energy Mezzanine Opportunity Fund ~ Energy Mezzanine Debt
 - \$20 million Orion Coinvest III LP ~ Zinc Mine Equity
 - \$65 million RPEP SMRS Partners ~ Power Transmission Line Equity



SMRS

Absolute, Real Return and Opportunistic 12/31/15



Market Value in Millions				
	<u>12/31/15</u>		<u>9/30/15</u>	
Absolute Return	\$4,533	49.1%	\$4,317	49.3%
Real Return	4,621	50.1%	4,143	47.4%
Cash Equivalents	71	0.8%	289	3.3%
Total Investments	<u>\$9,225</u>	<u>100.0%</u>	<u>\$8,749</u>	<u>100.0%</u>



SMRS
Absolute Return
12/31/15

Net Market Values by Entity

	<u>Net Market Value</u>	
Apollo Offshore Credit Strategies Fund Ltd.	\$	141,099,540
Brevan Howard Multi-Strategy Fund, L.P.		25,774,524
Drawbridge Opportunities Fund		188,493,830
* EnTrust White Pine Partners L.P.		358,244,159
JM IV, LP		21,187,967
MP Securitized Credit Master Fund, L.P.		73,374,542
* Sand Hill, LLC		468,103,742
Spartan Partners L.P.		7,489,254
* Tahquamenon Fund L.P.		3,153,263,231
** Visium Balanced Fund LP		96,312,063
Total Market Value	\$	4,533,342,852

* Fund of Funds

** **New Commitment**

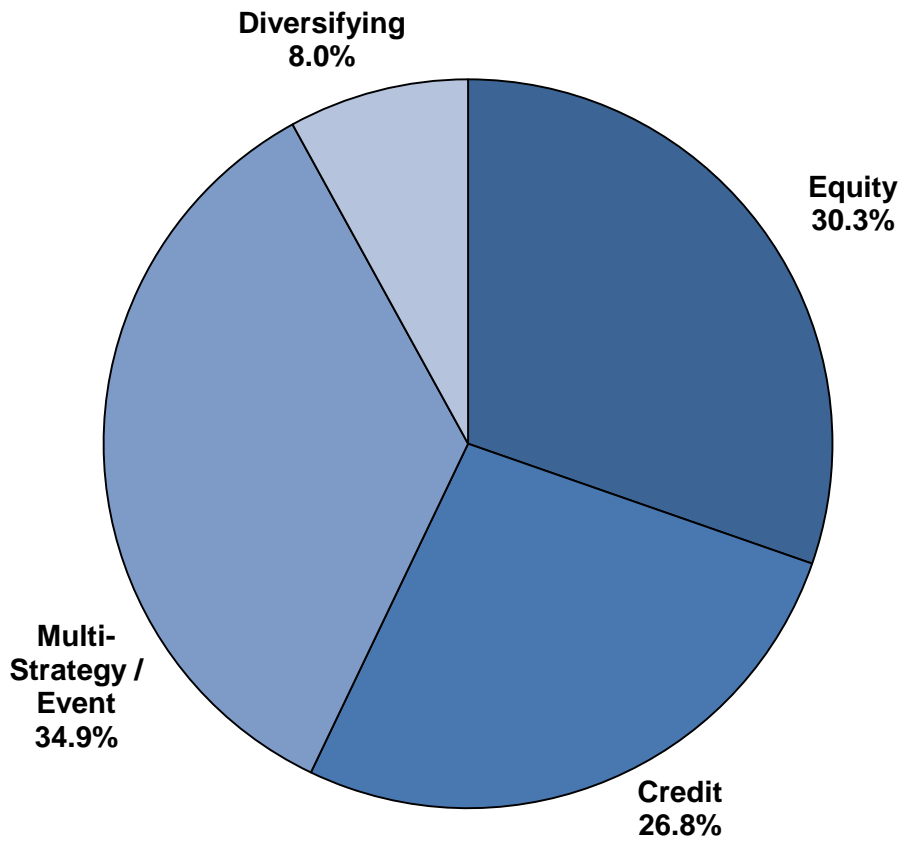


SMRS

Absolute Return

12/31/15

Investments By Strategy



Strategy Breakdown			
Underlying Funds:	103	Median Position Size:	0.4%
Strategies:	4	Average Position Size:	0.9%
Relationships:	9	Largest Position Size:	10.4%



SMRS

Real Return and Opportunistic 12/31/15

Net Market Value by Entity

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
* Abernathy Fund I, LLC	\$ 335,886,775	\$ 110,113,870
Apollo Credit Opportunities Fund III LP	66,763,332	35,733,791
Apollo European Principal Finance Fund II	46,868,082	12,984,293
Apollo Financial Credit Investments Fund II	313,575,834	145,406,390
Apollo HK TMS Investments Holdings LP	29,585,278	-
Apollo Offshore Credit Fund Ltd	252,798,390	-
Apollo Offshore Structured Credit Recovery Fund II	6,624,857	-
Apollo Offshore Structured Credit Recovery Fund III	117,563,131	96,701,504
Blackstone Strategic Capital Holdings LP	11,482,257	114,159,057
Blue Peninsula Fund LP	55,486,090	145,160,000
Carlyle Intl Energy Partners LP	11,359,605	38,920,030
** Carlyle Energy Mezzanine Opportunity Fund	301,540	46,221,394
* Content Holdings LLC	476,968,964	82,920,938
Elegantree Fund SPC	46,001,582	5,076,770
Energy Recapitalization and Restructuring Fund LP	40,812,067	18,700,269
ERR Michigan Holdings LP	7,346,512	2,335,070
* Fairfield Settlement Partners, LLC	60,544,431	58,718,523
FCO MA MI LP	29,841,811	66,891,765
Fortress MSR Opportunities Fund I A LP	113,733,861	-
** Fortress Transport	34,646,153	-
* Galaxie Ave. Partners, LLC	99,900,000	-
GSO Credit Alpha Fund LP	30,296,090	66,891,765
Highbridge Principal Strategies - Specialty Loan Fund III	132,794,107	18,076,412
Hopen Life Sciences Fund II	6,970,142	3,900,000
Innocor	30,000,000	-
JP Morgan Global Maritime Investment Fund LP	78,818,656	33,458,310
KANG Fund LP	15,296,149	-
KKR EI&G Fund	19,114,493	37,563,014
KKR Lending Partners I LP	66,607,487	-
KKR Lending Partners II LP	34,837,868	66,466,087
Lakewater LLC, Series 1	135,525,410	6,979,331
Lakewater LLC, Series 2	261,272,893	18,880,547
Lakewater LLC, Series 3	291,836,023	-
Lakewater LLC, Series 4	57,229,277	19,408,778
Lakewater LLC, Series 5	44,385,370	205,384,913
Merit Energy Partners LP	838,063	34,154,498
MidCap FinCo Holdings LTD	295,199,826	-
Napier Park Aircraft Leasing Vehicle I, LLC	32,340,339	65,356,807
** Orion Coinvest III LP	20,000,000	2,236,552
Orion Mine Finance Fund 1A LP	40,350,190	8,674,180
Orion Mine Finance Fund I LP	105,124,601	15,797,261
Renaissance Venture Cap Fund II LP	5,871,620	18,500,000

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
REOG Fund II Coinvest LP	11,895,976	15,579,217
Ridgewood Energy Oil & Gas II	66,480,959	55,840,665
Ridgewood Energy Oil & Gas III	1,135,722	223,864,278
** RPEP SMRS Holdings, LLC	65,000,000	-
SJC Direct Lending Fund I, LP	42,710,785	20,976,981
SJC Direct Lending Fund II, LP	296,920,989	55,071,319
* Social Network Holdings, LLC	221,834,820	-
Varo Coinvestment LP	11,959,287	940,992
Warwick Energy Partners III	39,335,687	9,673,667
Income Accruals	419,178	
	<hr/>	<hr/>
Total Market Value	\$ 4,620,492,560	\$ 1,983,719,239
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* Fund of Funds

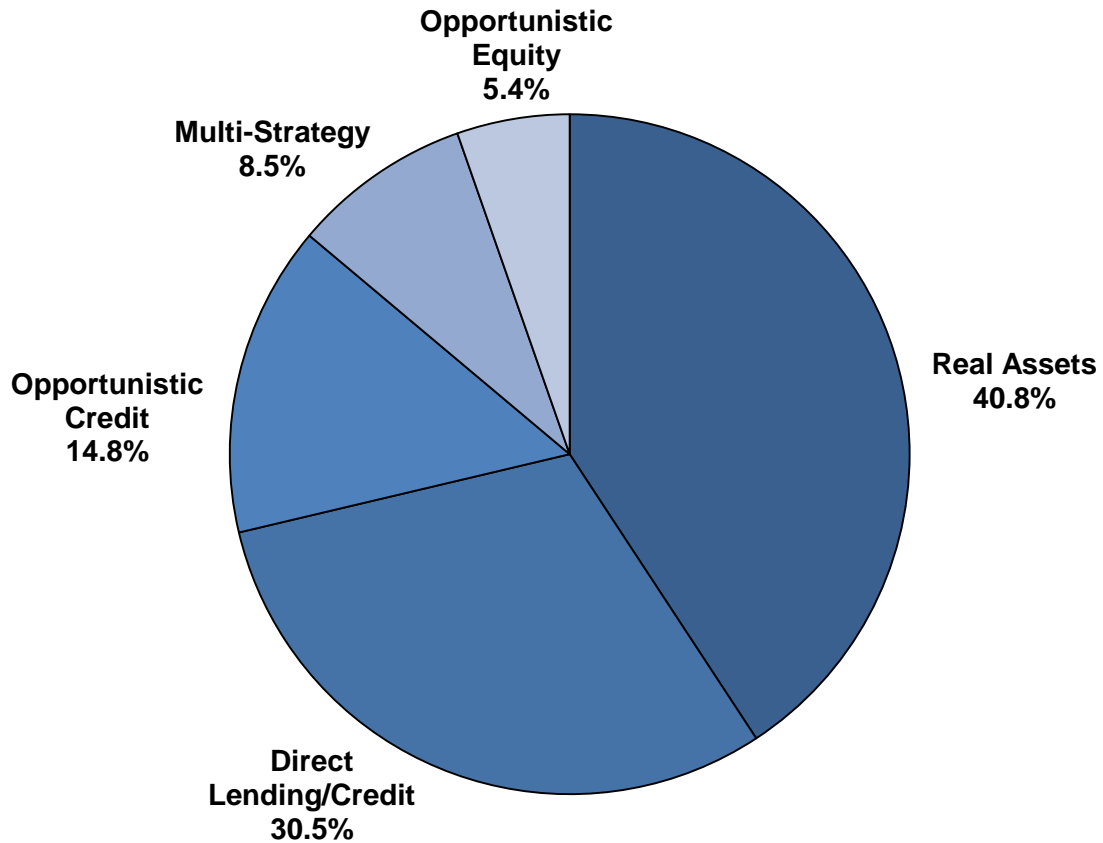
** **New Commitment**



SMRS

Real Return and Opportunistic 12/31/15

Investments By Strategy



Investment Strategy	
Real Assets	\$1,871,752,346
Direct Lending/Credit	\$1,402,958,674
Opportunistic Credit	\$680,623,790
Multi-Strategy	\$391,372,865
Opportunistic Equity	\$246,158,839

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

DOMESTIC EQUITY REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Jack A. Behar, CFA
Senior Investment Manager
Stock Analysis Division**

EXECUTIVE SUMMARY

Performance

Total Domestic Equity, Gross	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-0.5%	15.0%	12.1%	15.0%	7.4%
S&P 1500	1.0%	14.9%	12.4%	15.0%	7.4%
Peer Median Return	-0.2%	13.6%	11.1%	14.7%	6.9%
Rank vs. Peers	60	24	27	41	34

Total Domestic Equity, Net	1-Year	3-Years	5-Years	7-Years
Annualized Returns	-0.6%	14.9%	11.9%	14.9%
S&P 1500	1.0%	14.9%	12.4%	15.0%
Lipper Multi Core	-2.4%	12.7%	10.2%	13.9%

Total Active Equity, Net	1-Year	3-Years	5-Years	7-Years
Annualized Returns	-1.9%	14.8%	11.7%	14.8%
S&P 1500	1.0%	14.9%	12.4%	15.0%
Lipper Multi Core	-2.4%	12.7%	10.2%	13.9%
Rank vs. Lipper Multi Core	49	25	32	38

- Total domestic equity, gross of fees, lagged the S&P 1500 on a one year and a five year basis, while three, seven and ten year performance roughly matched the benchmark. This put domestic equity at or near the top third of its peer group over most long-term time periods.
 - Total domestic equity has a 25 basis points (bps) per year cost advantage over its peers, narrowing the one year 30 basis point gap in underperformance relative to peers to 5 basis points, net of fees.
- Total active equity had a difficult year, underperforming the benchmark by 290 bps net of fees. Such performance, while not satisfactory, was nevertheless at the median of its actively managed peer group. Three, five, and seven year performance remains at or near the top third of peers, albeit below the S&P 1500.
 - Growth stocks have outperformed value stocks by a cumulative 58% over the past seven years, which has been a headwind to performance. Historically, value stocks have outperformed growth stocks over extended periods of time.
 - Total active equity remains significantly over-weighted to value stocks, which should provide the portfolio with a substantial tailwind if and when this trend reverses.
- Both internal management and external management now rank solidly in the top half of their respective peer groups in terms of three, five, and seven year performance.
 - External management ranked in the top quartile of its peer group over the past year, which we see as a validation of SMRS' high quality/low cost manager strategy.

Strategy Update

- Total Active Equity's portfolio trades at an estimated 20% discount to the S&P 1500 on the basis of normalized earnings, with similar volatility and rates of growth going forward.
 - We expect Total Active Equity's PE ratio to at least partially converge with that of the S&P 1500 over the next five years, driving annualized outperformance.
 - If PE ratios do not converge, we nonetheless expect long term outperformance on the basis of a higher net dividend yield (dividends + buybacks) than the benchmark alongside similar or faster rates of earnings reinvestment.
 - Total active equity remains over-weighted to both the financial sector and to defensive stocks.

Market Environment and Outlook

- At ~17x normalized earnings, equity markets are reasonably priced relative to history, and attractively priced for an environment where bond yields stay abnormally low.
- Assuming a 2.0% normalized dividend yield, expected share count reductions of 2% via share buybacks and 4.6% long-term expected earnings growth, the S&P 1500 is poised to return approximately 8.6% over the long-term.
 - This compares to the 30-year U.S. Treasury at 3.0%, and a historical average return for the S&P 500 of 9.6% from 1928 - 2014.



SMRS

Domestic Equities

12/31/15

Markets	Amount	Total	% of Total
Internal (in millions)			
Indexed Portfolios	\$7,207		
Total Indexed		\$7,207	43.1%
Internal			
Active Portfolios	\$5,806		
Total Active		\$5,806	35.2%
Active			
Fisher Investments	\$861		
Los Angeles Capital	804		
Seizert Capital Partners	664		
Clarkston Capital Partners	516		
Attucks Asset Management	260		
Bivium Capital	244		
Northpointe Capital	154		
Munder Capital Management	142		
GW Capital	66		
Total Active		\$3,711	22.2%

TOTAL

\$16,724

100.0%

Combined Active Equity Portfolio, Return Expectations 12/31/15

Return Assumption Estimates

	<u>Expected Return ****</u>	<u>Normal Dividend Yield **</u>	<u>LT Growth Rate ***</u>
SAD Combined Active Equity	9.7%	5.2%	4.5%
S&P 1500 All-Cap	8.6%	4.0%	4.6%
S&P 500 Large-Cap	8.6%	4.1%	4.5%
S&P 500 Historical Average	9.6%		
S&P 400 Mid-Cap	8.5%	2.5%	6.0%
S&P 600 Small-Cap	8.3%	1.3%	7.0%
US 30-Year Treasury	3.0%	3.0%	0.0%

Normal Dividend Yield Decomposition

	<u>Normal Price/Earnings</u>	<u>Normal Earnings Yield*</u>	<u>Normal Payout Ratio</u>	<u>Normal Dividend Yield**</u>
SAD Combined Active Equity	13.5	7.4%	70%	5.2%
S&P 1500 All-Cap	17.0	5.9%	67%	4.0%
S&P 500 Large-Cap	16.9	5.9%	70%	4.1%
S&P 400 Mid-Cap	18.5	5.4%	45%	2.5%
S&P 600 Small-Cap	18.9	5.3%	24%	1.3%

Portfolio and Benchmark Risk Estimates

	<u>Expected Return ****</u>	<u>Standard Deviation</u>	<u>Expected Return/Volatility</u>
SAD Combined Active Equity	9.7%	17.3%	0.6
S&P 1500 All-Cap	8.6%	17.2%	0.5
S&P 500 Large-Cap	8.6%	17.4%	0.5
S&P 400 Mid-Cap	8.5%	17.0%	0.5
S&P 600 Small-Cap	8.3%	17.7%	0.5
US 30-Year Treasury	3.0%	22.0%	0.1

*Earnings Yield = Earnings/Price

**Includes Share Buybacks

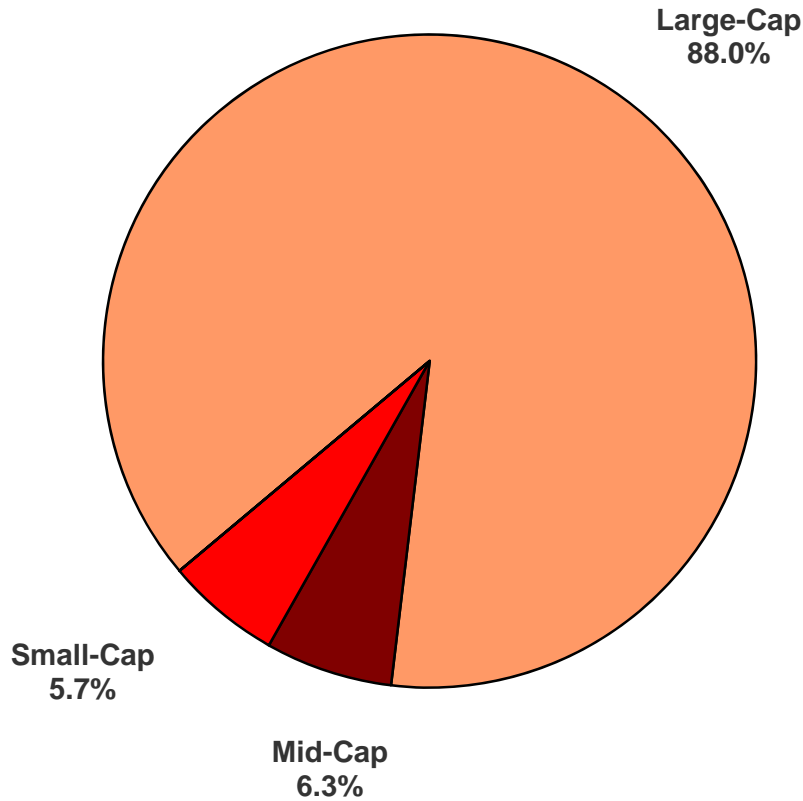
***LT Growth Rate Calculation: Return on Equity * (1-Dividend Payout Ratio)

****Expected Return Formula: Dividend Yield + LT Growth Rate



SMRS

Domestic Equity Exposure By Market Cap 12/31/15



Market Value in Millions

	12/31/15		
	<u>Assets</u>	<u>Percent</u>	<u>S&P 1500</u>
Large-Cap (>\$10B)	\$14,717	88.0%	84.8%
Mid-Cap (>\$4 <\$10B)	1,054	6.3%	8.6%
Small-Cap (<\$4B)	953	5.7%	6.6%
Total Domestic Equity	<u>\$16,724</u>	<u>100.0%</u>	<u>100.0%</u>



SMRS

All Domestic Equities Composite

12/31/15

Date:	<u>12/31/15</u>	<u>9/30/15</u>	<u>6/30/15</u>	<u>3/31/15</u>
Assets (\$million):	\$16,724	\$16,605	\$18,521	\$18,807
Number of Securities:	1,258	1,217	1,209	1,186
Active Share:	34%	34%	34%	32%

Benchmark: S&P 1500

Description: The Domestic Equities Composite combines both the SMRS' All Actively Managed Composite and its index funds.

Characteristics:	<u>SMRS</u>	<u>S&P 1500</u>
Weighted Average Capitalization (\$billion):	\$134.7	\$125.2
Trailing 12-month P/E:	16.4x	19.0x
Forecast P/E:	15.1x	17.2x
Price/Book:	2.3x	2.5x
Beta:	1.00	1.00
Dividend Yield:	2.3%	2.1%
3-5 Year EPS Growth Estimate:	10.5%	10.8%
Return on Equity:	14.0%	13.2%

TOP TEN HOLDINGS - All Domestic Equities 12/31/15

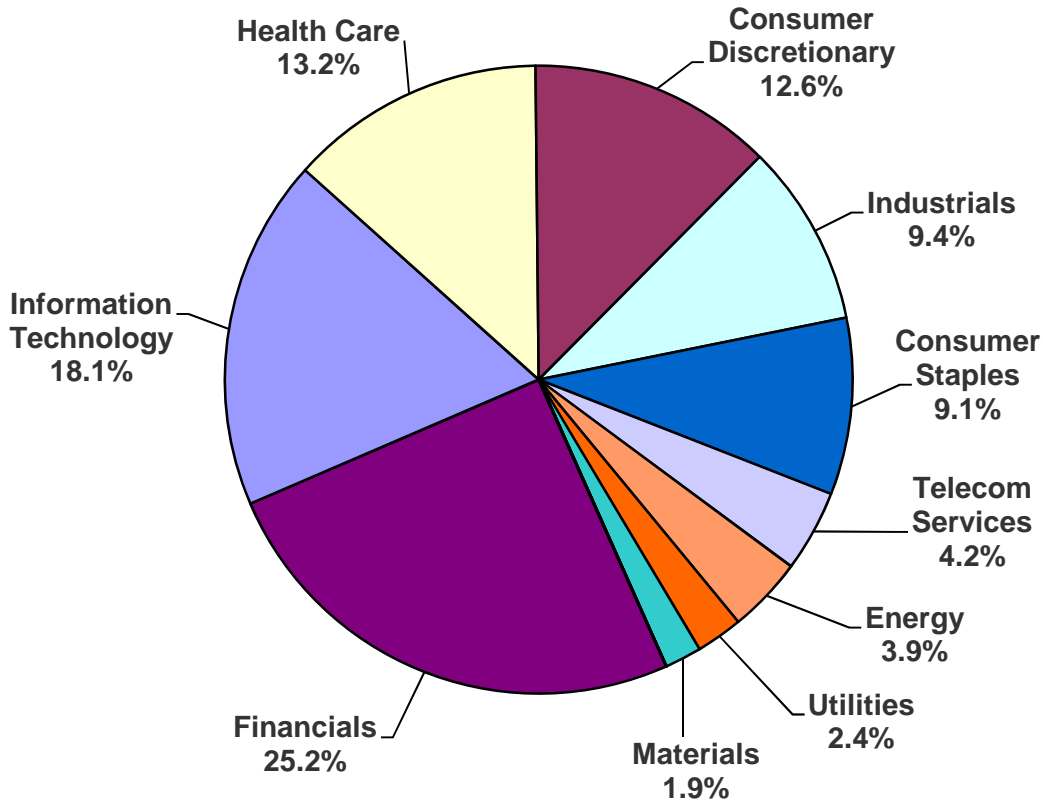
	<u>Portfolio Weight</u>	<u>Total Shares</u>	<u>12/31/15 Price</u>	<u>YTD15 Total Return</u>	<u>Market Value</u>
Verizon Communications Inc.	3.5%	12,679,024	\$46.22	3.6%	\$586,024,489
Apple Inc.	3.3%	5,193,441	\$105.26	-3.0%	546,661,600
U.S. Bancorp	3.2%	12,391,091	\$42.67	-2.8%	528,727,853
Wells Fargo & Company	2.8%	8,627,122	\$54.36	1.8%	468,970,352
SPDR S&P 500 ETF Trust	2.7%	2,189,950	\$203.87	1.3%	446,465,107
Gilead Sciences, Inc.	2.1%	3,469,271	\$101.19	8.6%	351,055,532
Wal-Mart Stores, Inc.	2.1%	5,608,666	\$61.30	-26.6%	343,811,226
Microsoft Corporation	1.9%	5,858,501	\$55.48	22.7%	325,029,635
Aflac Incorporated	1.9%	5,274,148	\$59.90	0.5%	315,921,465
Home Depot, Inc.	<u>1.6%</u>	2,063,679	\$132.25	28.5%	<u>272,921,548</u>
TOTAL	<u>25.0%</u>				<u>\$4,185,588,807</u>



SMRS

All Domestic Equity By Sector

12/31/15



Market Value in Millions				
12/31/15				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$4,220	25.2%	17.6%	7.6%
Information Technology	3,031	18.1%	20.3%	-2.2%
Health Care	2,201	13.2%	14.7%	-1.5%
Consumer Discretionary	2,113	12.6%	12.9%	-0.3%
Industrials	1,569	9.4%	10.5%	-1.1%
Consumer Staples	1,527	9.1%	9.4%	-0.3%
Telecom Services	709	4.2%	2.2%	2.0%
Energy	643	3.9%	6.1%	-2.2%
Utilities	404	2.4%	3.2%	-0.8%
Materials	307	1.9%	3.1%	-1.2%
Total	\$16,724	100.0%	100.0%	

Benchmark: S&P 1500



SMRS

All Actively Managed Composite

12/31/15

Date:	<u>12/31/15</u>	<u>9/30/15</u>	<u>6/30/15</u>	<u>3/31/15</u>
Assets (\$million):	\$9,517	\$9,118	\$10,222	\$10,502
Numbers of Securities:	922	888	872	836
Active Share:	59%	62%	61%	59%

Benchmark: S&P 1500

Description: The Actively Managed Composite is designed to add consistent alpha by investing in managers with value-added, but diverse strategies. While the expectation is that most will outperform over time, the composite is designed such that they do so during differing parts of the business cycle.

Characteristics:	<u>SMRS</u>	<u>S&P 1500</u>
Weighted Average Capitalization (\$billion):	\$137.7	\$125.2
Trailing 12-month P/E:	15.1x	19.0x
Forecast P/E:	13.9x	17.2x
Price/Book:	2.2x	2.5x
Beta:	0.99	1.00
Dividend Yield:	2.4%	2.1%
3-5 Year EPS Growth Estimate:	10.4%	10.8%
Return on Equity:	14.6%	13.2%

TOP TEN HOLDINGS - All Actively Managed 12/31/15

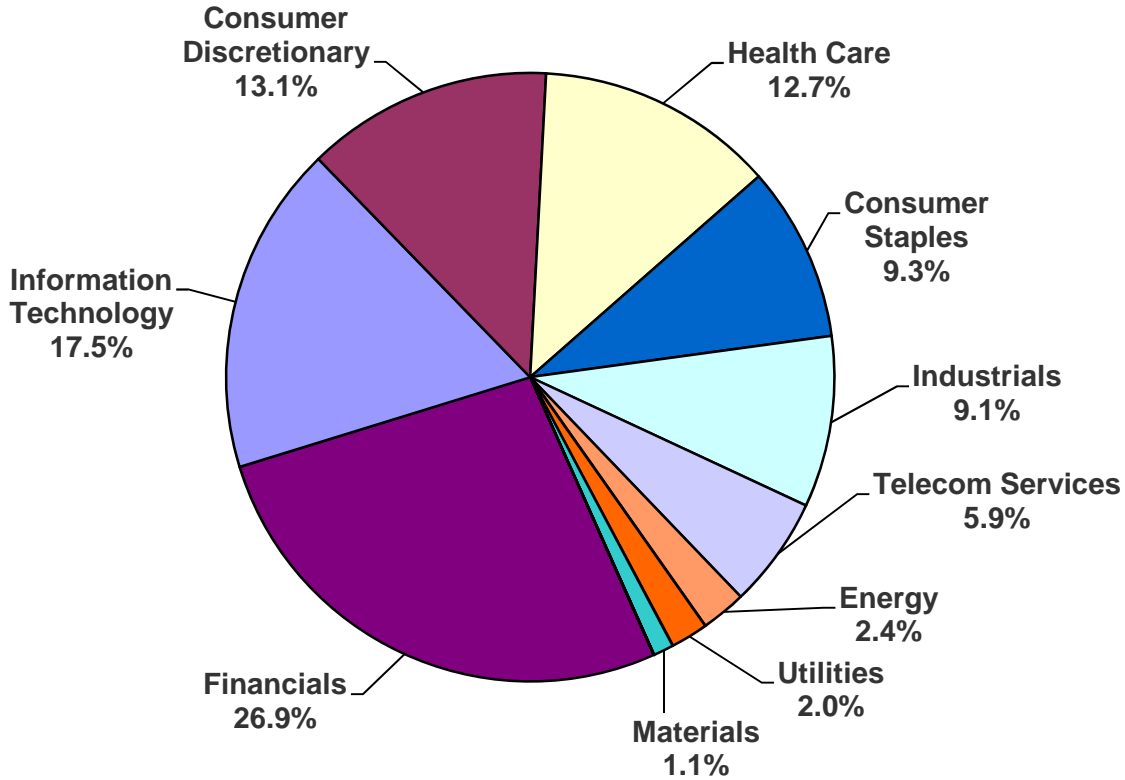
	<u>Portfolio Weight</u>	<u>Total Shares</u>	<u>12/31/15 Price</u>	<u>YTD15 Total Return</u>	<u>Market Value</u>
Verizon Communications Inc.	5.5%	11,287,353	\$46.22	3.6%	\$521,701,456
U.S. Bancorp	5.3%	11,828,753	\$42.67	-2.8%	504,732,891
Wells Fargo & Company	4.0%	7,037,288	\$54.36	1.8%	382,546,976
Apple Inc.	3.6%	3,286,510	\$105.26	-3.0%	345,938,043
Wal-Mart Stores, Inc.	3.3%	5,072,032	\$61.30	-26.6%	310,915,562
Aflac Incorporated	3.2%	5,128,239	\$59.90	0.5%	307,181,516
Gilead Sciences, Inc.	3.2%	2,976,359	\$101.19	8.6%	301,177,767
Home Depot, Inc.	2.3%	1,630,039	\$132.25	28.5%	215,572,658
American Express Company	2.2%	2,989,700	\$69.55	-24.2%	207,933,635
Alphabet Inc. Class A	<u>1.9%</u>	231,841	\$778.01	46.6%	<u>180,374,616</u>
TOTAL	<u>34.4%</u>				<u>\$3,278,075,119</u>



SMRS

All Active Domestic Equity By Sector

12/31/15



Market Value in Millions

12/31/15

	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$2,568	26.9%	17.6%	9.3%
Information Technology	1,662	17.5%	20.3%	-2.8%
Consumer Discretionary	1,246	13.1%	12.9%	0.2%
Health Care	1,212	12.7%	14.7%	-2.0%
Consumer Staples	888	9.3%	9.4%	-0.1%
Industrials	866	9.1%	10.5%	-1.4%
Telecom Services	559	5.9%	2.2%	3.7%
Energy	227	2.4%	6.1%	-3.7%
Utilities	190	2.0%	3.2%	-1.2%
Materials	99	1.1%	3.1%	-2.0%
Total	\$9,517	100.0%	100.0%	

Benchmark: S&P 1500

Manager Performance - Net of Fees

12/31/15

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>
Total Internal Active	\$5,680,677,952	-2.7%	14.3%	11.4%	14.3%
S&P 500		1.4%	15.1%	12.6%	14.8%
Style & Risk Adjusted Benchmark		-1.3%	12.6%	11.2%	14.0%
Lipper Large-Cap Core		-0.5%	13.5%	11.1%	13.7%
<i>Excess Return</i>		<i>-4.1%</i>	<i>-0.8%</i>	<i>-1.1%</i>	<i>-0.5%</i>
<i>Alpha</i>		<i>-1.4%</i>	<i>1.7%</i>	<i>0.3%</i>	<i>0.3%</i>
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		<i>78</i>	<i>36</i>	<i>44</i>	<i>35</i>
Total External Active	3,710,952,728	0.6%	14.0%	11.0%	14.8%
S&P 1500		1.0%	14.9%	12.4%	15.0%
Style & Risk Adjusted Benchmark		-0.6%	13.1%	11.1%	14.9%
Lipper Multi Core		-2.4%	12.7%	10.2%	13.9%
<i>Excess Return</i>		<i>-0.4%</i>	<i>-0.9%</i>	<i>-1.4%</i>	<i>-0.2%</i>
<i>Alpha</i>		<i>1.3%</i>	<i>0.9%</i>	<i>-0.1%</i>	<i>-0.1%</i>
<i>Pct. Rank vs. Lipper Multi Core</i>		<i>20</i>	<i>39</i>	<i>44</i>	<i>38</i>

Manager Performance - Net of Fees

12/31/15

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception</u>	<u>Inception Date</u>
SMRS Large-Cap Core	\$2,378,566,370	-7.3%	15.3%	12.0%	15.4%	6.4%	8/31/07
S&P 500		1.4%	15.1%	12.6%	14.8%	6.4%	
Style & Risk Adjusted Benchmark		-0.7%	10.5%	10.1%	13.3%	5.3%	
Lipper Large-Cap Core		-0.5%	13.5%	11.1%	13.7%	5.6%	
<i>Excess Return</i>		<i>-8.7%</i>	<i>0.1%</i>	<i>-0.5%</i>	<i>0.6%</i>	<i>0.0%</i>	
<i>Alpha</i>		<i>-6.6%</i>	<i>4.8%</i>	<i>1.9%</i>	<i>2.1%</i>	<i>1.1%</i>	
<i>Pct Rank vs Lipper Large-Cap Core</i>		<i>98</i>	<i>15</i>	<i>32</i>	<i>14</i>	<i>25</i>	
SMRS Large-Cap Growth	1,742,362,172	6.0%	18.7%	14.3%	17.4%	9.2%	5/31/05
S&P 500 Growth Index		5.5%	17.2%	14.1%	16.6%	8.9%	
Style & Risk Adjusted Benchmark		5.0%	16.5%	13.8%	16.4%	8.9%	
Lipper Large Growth		5.1%	16.5%	12.7%	16.4%	8.7%	
<i>Excess Return</i>		<i>0.5%</i>	<i>1.5%</i>	<i>0.3%</i>	<i>0.9%</i>	<i>0.3%</i>	
<i>Alpha</i>		<i>1.0%</i>	<i>2.2%</i>	<i>0.5%</i>	<i>1.1%</i>	<i>0.3%</i>	
<i>Pct Rank vs Lipper Large-Cap Growth</i>		<i>47</i>	<i>18</i>	<i>21</i>	<i>28</i>	<i>33</i>	
SMRS All-Cap Garp	1,031,075,454	-0.1%	15.3%	--	--	14.5%	4/30/11
S&P 1500 Super Composite		1.0%	14.9%	--	--	11.6%	
Style & Risk Adjusted Benchmark		-0.7%	13.8%	--	--	11.1%	
Lipper Multi Core		-2.4%	12.7%	--	--	9.3%	
<i>Excess Return</i>		<i>-1.1%</i>	<i>0.4%</i>	<i>--</i>	<i>--</i>	<i>2.9%</i>	
<i>Alpha</i>		<i>0.5%</i>	<i>1.5%</i>	<i>--</i>	<i>--</i>	<i>3.4%</i>	
<i>Pct. Rank vs. Lipper Multi Core</i>		<i>32</i>	<i>18</i>	<i>--</i>	<i>--</i>	<i>1</i>	
Fisher All-Cap	861,163,354	4.6%	15.9%	10.1%	16.1%	10.0%	10/31/04
S&P 1500/S&P 600 Value Blend		1.0%	14.9%	11.4%	14.8%	8.4%	
Style & Risk Adjusted Benchmark		3.4%	15.9%	13.4%	16.0%	8.8%	
Lipper Multi Core		-2.4%	12.7%	10.2%	13.9%	7.2%	
<i>Excess Return</i>		<i>3.6%</i>	<i>1.0%</i>	<i>-1.3%</i>	<i>1.3%</i>	<i>1.6%</i>	
<i>Alpha</i>		<i>1.2%</i>	<i>0.1%</i>	<i>-3.3%</i>	<i>0.1%</i>	<i>1.2%</i>	
<i>Pct. Rank vs. Lipper Multi Core</i>		<i>2</i>	<i>11</i>	<i>58</i>	<i>16</i>	<i>3</i>	

Manager Performance - Net of Fees
12/31/15

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception</u>	<u>Inception Date</u>
Seizert Capital Partners	\$663,835,883	-5.6%	12.1%	11.1%	--	14.0%	11/30/09
S&P 1500/S&P 400 Value Blend		1.0%	14.9%	12.9%	--	16.5%	
Style & Risk Adjusted Benchmark		-4.2%	12.6%	11.1%	--	13.1%	
Lipper Multi Core		-2.4%	12.7%	10.2%	--	12.4%	
<i>Excess Return</i>		-6.6%	-2.8%	-1.8%	--	-2.5%	
<i>Alpha</i>		-1.4%	-0.5%	0.0%	--	0.9%	
<i>Pct. Rank vs. Lipper Multi Core</i>		82	66	40	--	24	
LA Capital All-Cap Growth	418,986,055	7.2%	19.5%	14.1%	18.3%	11.3%	5/31/05
S&P 1500 Growth		5.2%	16.9%	13.8%	16.7%	9.0%	
Style & Risk Adjusted Benchmark		2.3%	13.5%	11.5%	15.4%	9.1%	
Lipper Multi-Cap Growth		2.2%	14.8%	11.1%	15.8%	8.5%	
<i>Excess Return</i>		2.0%	2.6%	0.3%	1.6%	2.3%	
<i>Alpha</i>		4.9%	6.0%	2.7%	2.9%	2.1%	
<i>Pct. Rank vs. Lipper Multi-Cap Growth</i>		11	6	8	14	6	
Concentrated Equity	401,968,136	-10.4%	--	--	--	0.2%	5/31/13
S&P 1500 Super Composite		1.0%	--	--	--	11.7%	
Style & Risk Adjusted Benchmark		-4.3%	--	--	--	12.6%	
Lipper Multi Core		-2.4%	--	--	--	9.5%	
<i>Excess Return</i>		-11.4%	--	--	--	-11.5%	
<i>Alpha</i>		-6.1%	--	--	--	-12.4%	
<i>Pct. Rank vs. Lipper Multi Core</i>		96	--	--	--	99	
LA Capital Deep Value	385,169,460	--	--	--	--	-3.8%	4/1/15
S&P 1500 Value		--	--	--	--	-3.2%	
Style & Risk Adjusted Benchmark		--	--	--	--	-3.3%	
Lipper Multi-Cap Value		--	--	--	--	-6.2%	
<i>Excess Return</i>		--	--	--	--	-0.6%	
<i>Alpha</i>		--	--	--	--	-0.5%	
<i>Pct. Rank vs. Lipper Multi-Cap Value</i>		--	--	--	--	33	
Attucks Asset Management	259,992,446	-1.3%	12.6%	10.2%	13.5%	5.2%	11/30/07
S&P 1500 Super Composite		1.0%	14.9%	12.4%	15.0%	5.9%	
Style & Risk Adjusted Benchmark		0.4%	13.6%	11.6%	14.9%	6.7%	
Lipper Small-Cap Core		-2.4%	12.7%	10.2%	13.9%	4.6%	
<i>Excess Return</i>		-2.3%	-2.3%	-2.2%	-1.5%	-0.7%	
<i>Alpha</i>		-1.7%	-1.0%	-1.4%	-1.5%	-1.5%	
<i>Pct. Rank vs. Lipper Multi Core</i>		44	57	56	64	42	
Clarkston Capital Small-Cap	259,547,478	6.0%	--	--	--	11.2%	1/1/14
S&P 600		-2.0%	--	--	--	1.8%	
Style & Risk Adjusted Benchmark		-0.9%	--	--	--	3.1%	
Lipper Small-Cap Core		-5.0%	--	--	--	-0.7%	
<i>Excess Return</i>		8.0%	--	--	--	9.4%	
<i>Alpha</i>		7.0%	--	--	--	8.1%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		1	--	--	--	1	
Clarkston Capital Large-Cap	256,252,031	--	--	--	--	2.9%	4/1/15
S&P 500		--	--	--	--	0.4%	
Style & Risk Adjusted Benchmark		--	--	--	--	-2.1%	
Lipper Large-Cap Core		--	--	--	--	-1.4%	
<i>Excess Return</i>		--	--	--	--	2.5%	
<i>Alpha</i>		--	--	--	--	5.0%	
<i>Pct. Rank vs. Lipper Large-Cap Core</i>		--	--	--	--	4	

Manager Performance - Net of Fees
12/31/15

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception</u>	<u>Inception Date</u>
Bivium Capital Partners	\$243,903,161	-3.6%	11.5%	10.1%	13.8%	4.7%	11/30/07
S&P 1500 Super Composite		-3.5%	12.7%	10.9%	13.2%	3.9%	
Style & Risk Adjusted Benchmark		-5.5%	12.8%	11.3%	15.3%	6.2%	
Lipper Multi Core		-5.7%	11.0%	9.0%	12.8%	3.9%	
<i>Excess Return</i>		0.0%	-1.2%	-0.8%	0.7%	0.8%	
<i>Alpha</i>		1.9%	-1.3%	-1.2%	-1.5%	-1.5%	
<i>Pct. Rank vs. Lipper Multi Core</i>		38	55	46	34	34	
NorthPointe All-Cap Core	153,804,077	-0.7%	12.7%	7.9%	13.1%	6.7%	10/31/04
NorthPointe Blended Benchmark		-2.0%	13.6%	10.7%	14.3%	8.2%	
Style & Risk Adjusted Benchmark		-0.8%	12.2%	11.3%	16.0%	8.8%	
Lipper Multi Core		-2.4%	12.7%	10.2%	13.9%	7.2%	
<i>Excess Return</i>		1.2%	-0.9%	-2.8%	-1.2%	-1.5%	
<i>Alpha</i>		0.1%	0.5%	-3.4%	-2.9%	-2.1%	
<i>Pct. Rank vs. Lipper Multi Core</i>		39	57	84	69	69	
Munder Mid-Cap Core Growth	141,992,020	-6.4%	11.9%	10.0%	--	16.9%	4/30/09
S&P 400 Mid-Cap Growth		2.0%	13.4%	11.1%	--	19.3%	
Style & Risk Adjusted Benchmark		2.4%	12.8%	10.7%	--	17.2%	
Lipper Mid-Cap Growth		-1.3%	12.9%	9.7%	--	17.1%	
<i>Excess Return</i>		-8.4%	-1.5%	-1.1%	--	-2.3%	
<i>Alpha</i>		-8.9%	-0.9%	-0.7%	--	-0.3%	
<i>Pct. Rank vs. Lipper Mid-Cap Growth</i>		86	61	49	--	57	
SMRS Large-Cap Value	101,160,647	-7.6%	10.2%	8.4%	10.0%	1.9%	7/31/07
S&P 500 Value Index		-3.1%	12.8%	11.0%	13.0%	3.6%	
Style & Risk Adjusted Benchmark		-3.1%	11.4%	10.1%	12.6%	4.0%	
Lipper Large Value		-3.7%	12.3%	10.1%	12.4%	3.7%	
<i>Excess Return</i>		-4.4%	-2.6%	-2.6%	-3.0%	-1.8%	
<i>Alpha</i>		-4.5%	-1.2%	-1.7%	-2.6%	-2.1%	
<i>Pct. Rank vs. Lipper Large-Cap Value</i>		93	84	86	95	92	
GW Capital	66,295,827	-9.1%	--	--	--	-4.0%	1/1/14
S&P 500 Value		-3.5%	--	--	--	4.0%	
Style & Risk Adjusted Benchmark		-6.3%	--	--	--	3.5%	
Lipper Multi-Cap Value		-5.7%	--	--	--	1.2%	
<i>Excess Return</i>		-5.6%	--	--	--	-8.0%	
<i>Alpha</i>		-2.8%	--	--	--	-7.5%	
<i>Pct. Rank vs. Lipper All-Cap Value</i>		76	--	--	--	91	
Concentrated All-Cap Growth	25,536,840	-14.5%	--	--	--	-6.4%	5/31/13
S&P 600		-2.0%	--	--	--	10.8%	
Style & Risk Adjusted Benchmark		-2.0%	--	--	--	7.2%	
Lipper Small-Cap Core		-5.0%	--	--	--	7.7%	
<i>Excess Return</i>		-12.5%	--	--	--	-17.1%	
<i>Alpha</i>		-12.5%	--	--	--	-13.5%	
<i>Pct. Rank vs. Lipper Small-Cap Core</i>		98	--	--	--	100	

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

FIXED INCOME REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Daniel J. Quigley
Senior Investment Manager
Long-Term Fixed Income Division**

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Long-Term Fixed Income	1.4%	2.2%	3.8%	5.6%	5.3%
Barclays Aggregate	0.6%	1.4%	3.3%	4.1%	4.5%
Peer Median Return	-0.3%	1.7%	3.9%	5.9%	5.0%
Rank vs. Peers	11	30	56	63	41

- Long-Term Fixed Income outperformed the Barclay's Aggregate benchmark and its peer group on a one-year basis. The fixed income portfolio has outperformed the benchmark across all time periods. This outperformance was aided by an overweight to corporate bonds and structured securities over longer time periods and by strong security selection on a one-year basis. The shorter duration of the portfolio was a small contributor to relative performance on a one-year basis as long-term interest rates increased slightly.

Strategy Update

- Allocation to Long-Term Fixed Income has remained stable for the last twelve months.
- Long-Term Fixed Income continues to look to increase the overall rate of return by allocating to securities with attractive risk-adjusted yields when the market allows. The portfolio currently maintains an out-of-benchmark exposure to high yield credit managers (11.1% of division assets) as well as securitized credit mandates (15.8% of division assets). This strategy increases the credit risk of the portfolio, however, this risk is offset by relatively lower interest rate risk due to the portfolio's lower duration.
- The portfolio addresses liquidity concerns by maintaining an allocation to U.S. Treasuries and U.S. TIPS (18.2% of portfolio assets). This government bond allocation also increases the portfolio's diversification.
- As opportunities present themselves, Long-Term Fixed Income will look to diversify from Barclay's Aggregate and Barclay's Investment Grade Credit focused investment strategies. This is due to the relatively lower yield levels and longer durations of these benchmarks when compared with historical levels. These changes will occur at the margin as the overall characteristics of the fund will continue to meet the diversification requirements of a core bond portfolio.

Market Environment and Outlook

- The U.S. Treasury yield curve has flattened on a year-over-year (YOY) basis as long-term interest rates have declined while short-term interest rates have increased. Lower inflation, reduced global growth expectations, and central bank intervention have contained long-term interest rates. The Federal Reserve increased short-term interest rates as they tightened monetary policy during their December FOMC meeting. The 2-year/10-year U.S. Treasury spread decreased by roughly 28 basis points (bps) YOY to 1.2% as of December 31, 2015.

- The U.S. investment grade credit spreads widened during the 2015 calendar year by 35 bps to 165 bps. This widening was driven both by volatile markets in the previous quarter as well as a record amount of corporate bond issuance.
- High-yield spreads widened by 177 bps during the past year to 660 bps. The energy, metals, and mining sectors were the main contributors to this widening as weakness in the commodity markets persist. High-yield energy spreads ended the year at 1,296 bps. These spreads widened by 568 bps during the calendar year and are the highest spreads that the energy sector has experienced since the credit crisis.
- Global weakness continued to suppress inflation expectations in developed markets. The breakeven inflation expectation implied by the yield of the 10-year U.S. TIPS ended the year at 1.56%, lower than the stated 2% inflation target of the Federal Reserve.
- U.S. interest rates continued to trade at higher levels than those in many developed markets. This has been driven by the relative strength of the U.S. economy as well as the expected tightening of monetary policy by the Federal Reserve. This tightening has been contrasted by monetary easing and lower interest rates by many of the major global central banks. This relative yield pickup is highlighted by ten-year yields of 0.26% in Japan and 0.63% in Germany.
- The portfolio remains defensively positioned for interest rate increases. The duration remains short of the benchmark as we focus on intermediate securities. We have offset this short position by holding a larger allocation to securitized and corporate debt securities in order to increase the interest income of the portfolio.

Conclusion

- Given the current level and shape of the yield curve, it seems appropriate to focus on intermediate duration securities. This area of the yield curve offers the best risk-adjusted return in this environment. We will continue to target investments that offer attractive yield pick-up for the portfolio as we believe that price appreciation opportunities are limited in a low yield environment. We will also look to maintain our overweight to securitized assets and high yield bonds within the portfolio.



SMRS

Long-Term Fixed Income

12/31/15

Markets	Amount	Total	% of Total
Core (in millions)			
LTFID Internal	\$4,452		
Dodge & Cox	220		
Total Core		\$4,672	64.0%
Credit			
Prudential	\$205		
Total Credit		\$205	2.8%
Securitized Debt			
Mid West Securitized Ops	\$668		
Principal Global	384		
Napier Park ABS Income	101		
Total Securitized Debt		\$1,153	15.8%
High Yield			
Columbia Management	\$459		
Prudential High Yield	355		
Total High Yield		\$814	11.1%
Tactical			
Pyramis	\$256		
Loomis Core Plus	201		
Total Tactical		\$457	6.3%

TOTAL

\$7,301

100.0%



SMRS

Fixed Income Holdings Portfolio Characteristics

Benchmark: Barclays Aggregate

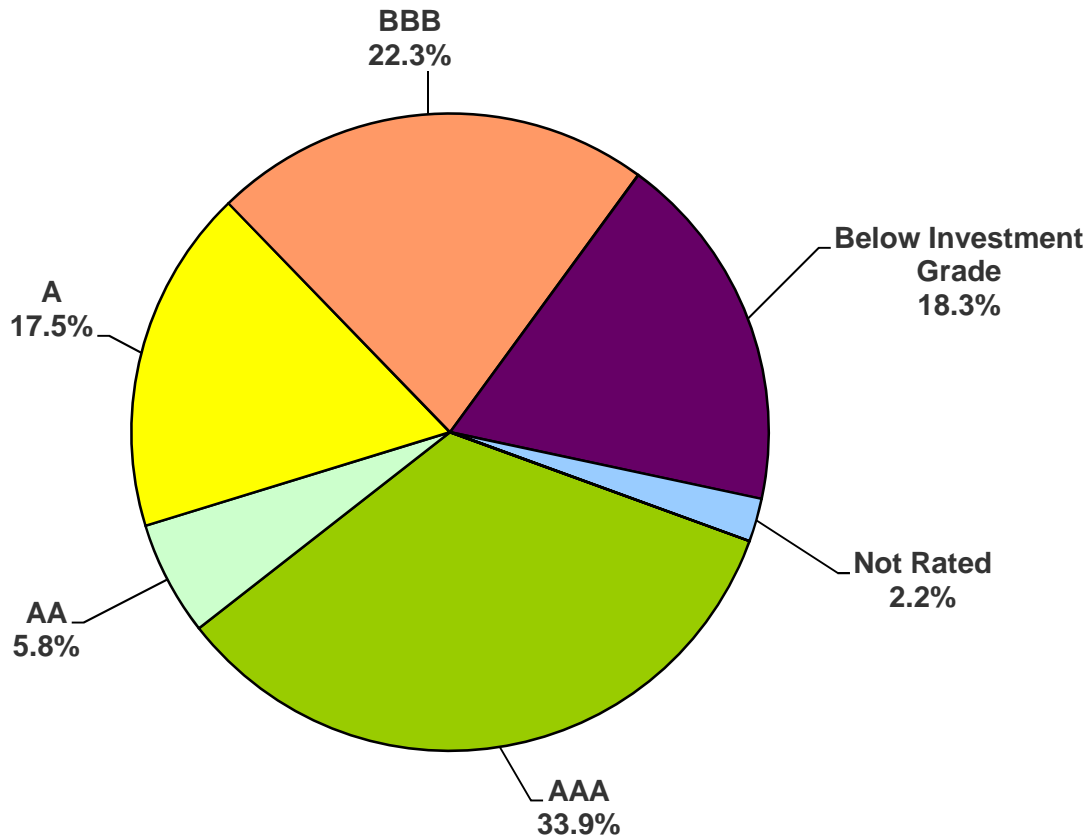
12/31/15

<u>Characteristic</u>	<u>Portfolio</u>	<u>Benchmark</u>	<u>Relative (%)</u>
Average Life	6.7	8.3	81
Average Life w/Cash Equiv.	6.5	8.3	78
Duration (Yrs)	5.3	6.0	88
Duration (Yrs) w/Cash Equiv.	5.2	6.0	87
Coupon (%)	3.6	3.3	109
Yield to Maturity (%)	3.9	2.6	150
Moody's Credit Rating	A3	Aa2	
S&P Credit Rating	BBB	AA-	



SMRS

Fixed Income By Rating Total U.S. Long-Term Fixed Income 12/31/15



Market Value in Millions				
12/31/15				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
AAA	\$2,474	33.9%	71.5%	-37.6%
AA	426	5.8%	5.2%	0.6%
A	1,275	17.5%	10.7%	6.8%
BBB	1,628	22.3%	11.5%	10.8%
Not Rated	161	2.2%	1.1%	1.1%
* Below Investment Grade	1,337	18.3%	0.0%	18.3%
Total Investments	\$7,301	100.0%	100.0%	

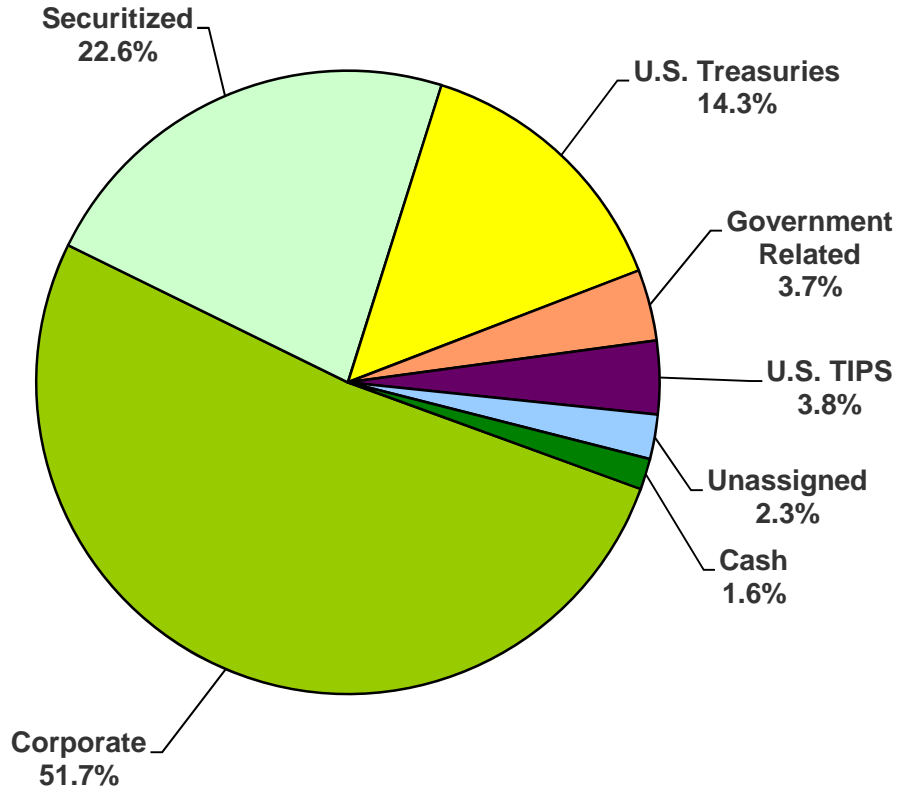
* Comprised of approximately 12.6% High Yield Credit and 5.7% High Yield RMBS/ABS

Benchmark: Barclays US Aggregate



SMRS

Fixed Income By Asset Type Total U.S. Long-Term Fixed Income 12/31/15



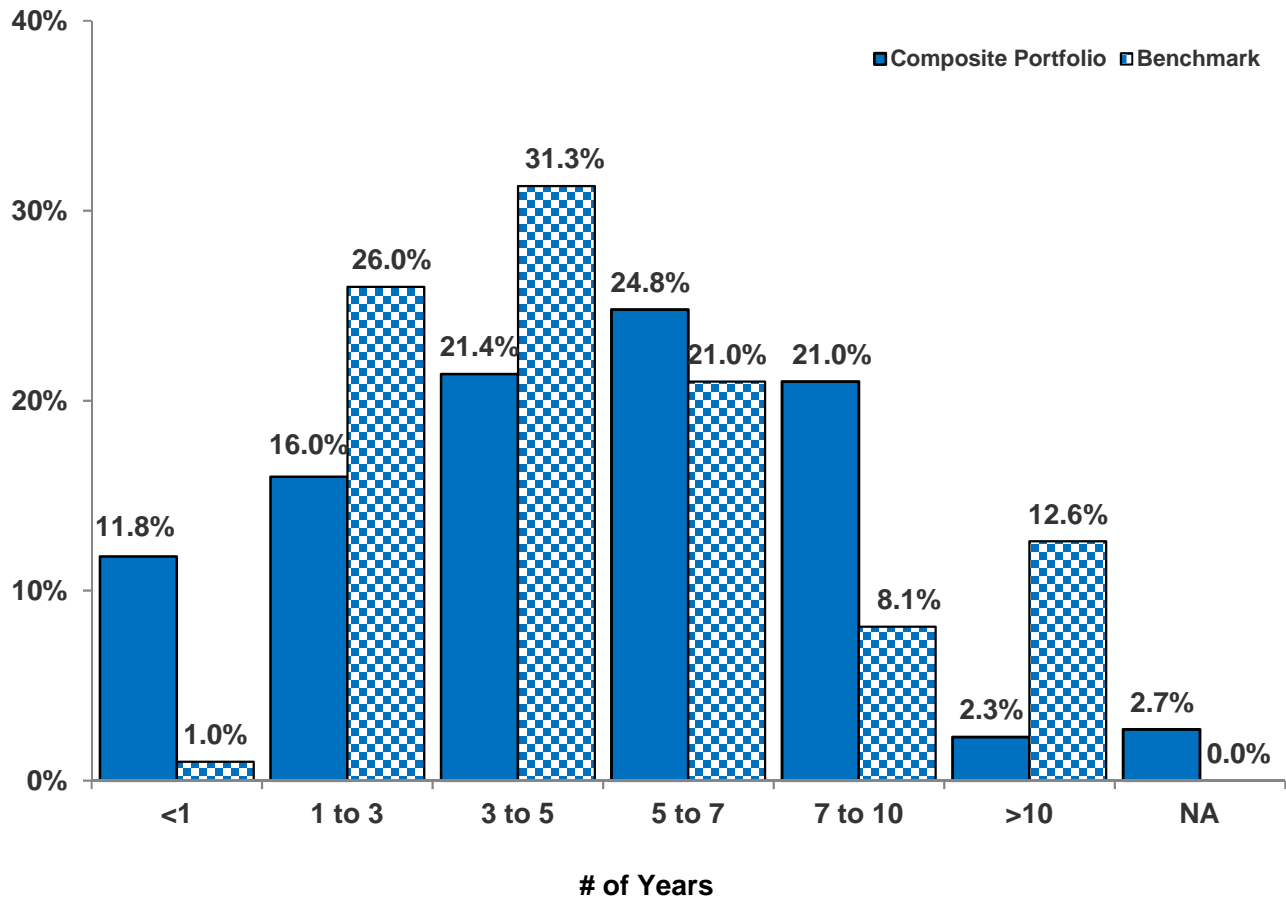
Market Value in Millions				
12/31/15				
	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Corporate	\$3,772	51.7%	24.2%	27.5%
Securitized	1,650	22.6%	31.1%	-8.5%
U.S. Treasuries	1,047	14.3%	36.3%	-22.0%
Government Related	273	3.7%	8.4%	-4.7%
U.S. TIPS	278	3.8%	0.0%	3.8%
Unassigned	165	2.3%	0.0%	2.3%
Cash	116	1.6%	0.0%	1.6%
Total Investments	<u>\$7,301</u>	<u>100.0%</u>	<u>100.0%</u>	

Benchmark: Barclays US Aggregate



SMRS

Duration Distribution Fixed Income Composite Versus Benchmark 12/31/15



Source: Factset

Market Value in Millions					
Duration	Assets	Portfolio Weight	Benchmark Weight	Portfolio Duration*	Benchmark Duration*
<1	\$866	11.8%	1.0%	1.0	1.2
1 to 3	1,165	16.0%	26.0%	2.3	1.9
3 to 5	1,564	21.4%	31.3%	4.2	4.0
5 to 7	1,808	24.8%	21.0%	6.1	6.0
7 to 10	1,533	21.0%	8.1%	7.9	8.1
>10	167	2.3%	12.6%	15.1	15.3
NA	198	2.7%	0.0%	0.0	0.0
Total	\$7,301	100.0%	100.0%	4.8	5.6

* Effective Duration

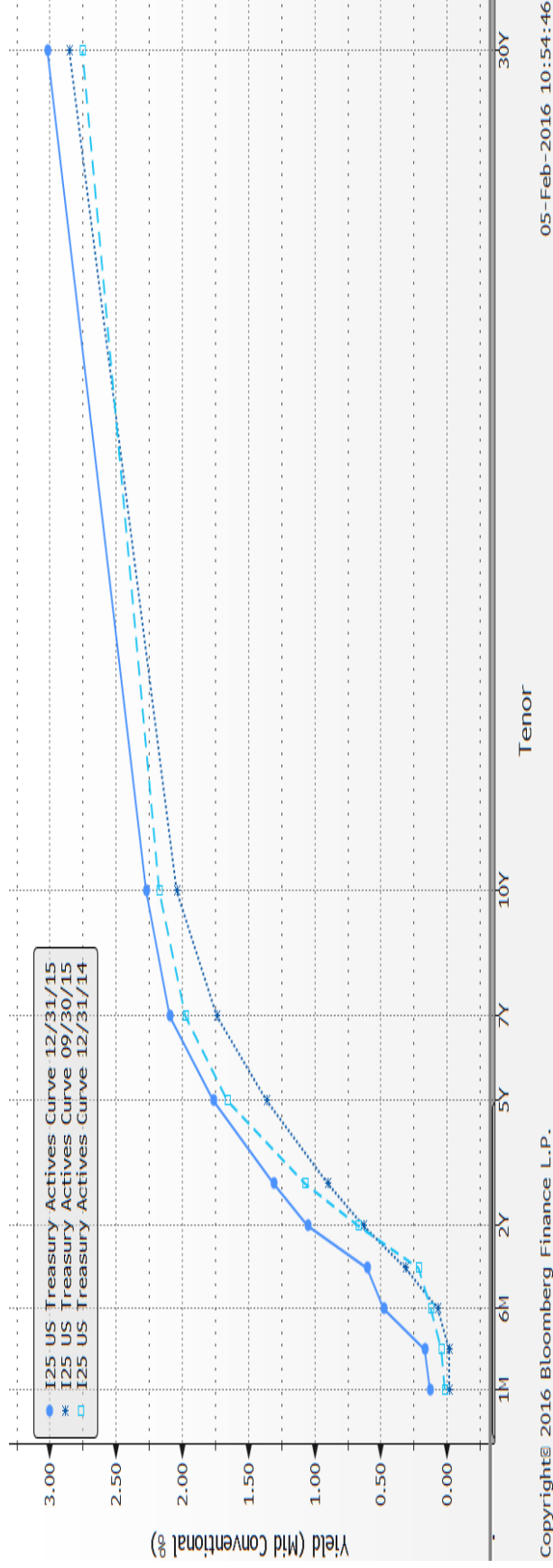
SMRS Internal/External Manager Performance – Net of Fees

12/31/15

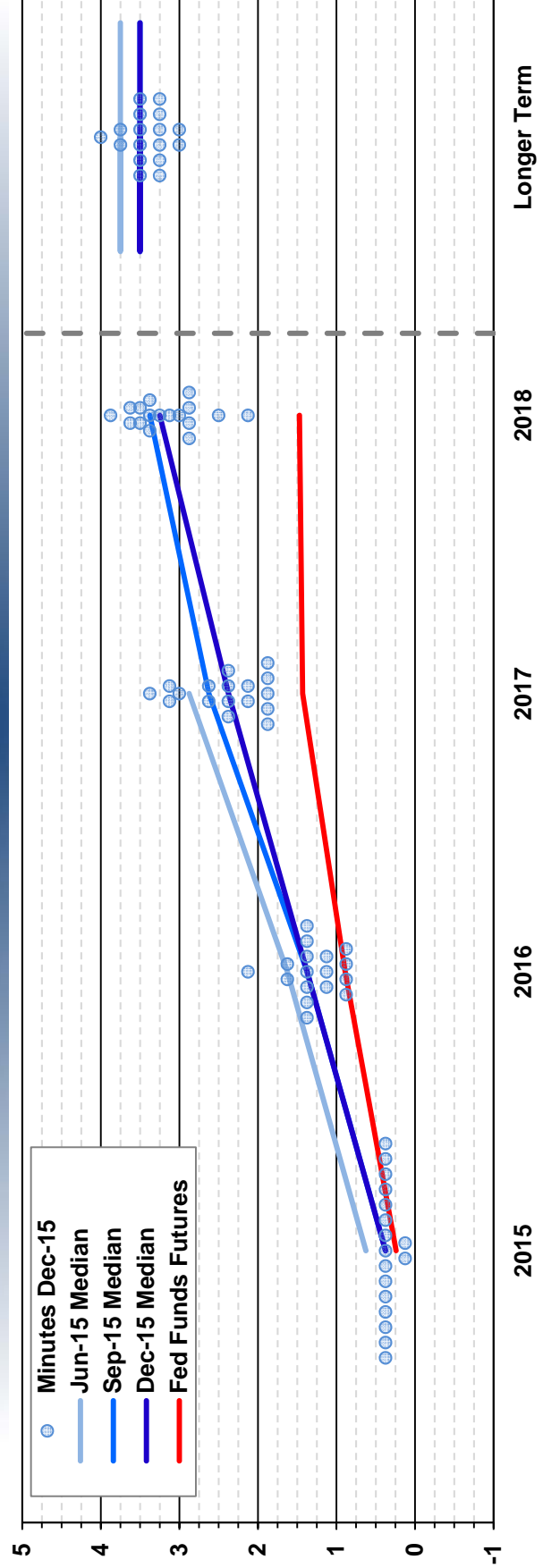
Total Fixed Income Performance, Net of Fees (MPSERS)

	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>10-Years</u>
Total Fixed Income	\$7,300,858,126	1.3%	2.1%	3.7%	5.5%	5.2%
<i>Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>0.6%</i>	<i>1.4%</i>	<i>3.1%</i>	<i>4.1%</i>	<i>4.5%</i>
Internal Fixed Income	\$4,451,941,059	2.0%	2.2%	3.6%	5.1%	5.2%
External Fixed Income	\$2,848,917,067	-0.1%	1.4%	4.1%	6.1%	--
MetWest Securitized Opportunities	667,783,030	0.9%	--	--	--	--
Principal CMBS	384,049,612	1.6%	6.5%	8.9%	23.7%	--
Pyramis Tactical Bond Fund	256,481,766	-1.4%	--	--	--	--
Prudential Investment Grade	205,178,900	-0.4%	2.0%	4.9%	7.6%	--
Dodge & Cox Core	219,813,467	-0.2%	2.1%	3.8%	5.7%	--
Loomis Sayles CorePlus	200,653,054	-3.2%	--	--	--	--
Napier Park ABS Income	101,452,288	N/A				
<i>Barclays Aggregate Bond Index</i>	<i>N/A</i>	<i>0.6%</i>	<i>1.4%</i>	<i>3.3%</i>	<i>4.1%</i>	<i>4.5%</i>
Columbia Management High Yield	458,568,122	0.2%	--	--	--	--
Prudential High Yield	354,936,828	-1.2%	--	--	--	--
<i>Barclays US HY BA/B 2% Cap</i>	<i>N/A</i>	<i>-2.7%</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>

U.S. Yield Movement



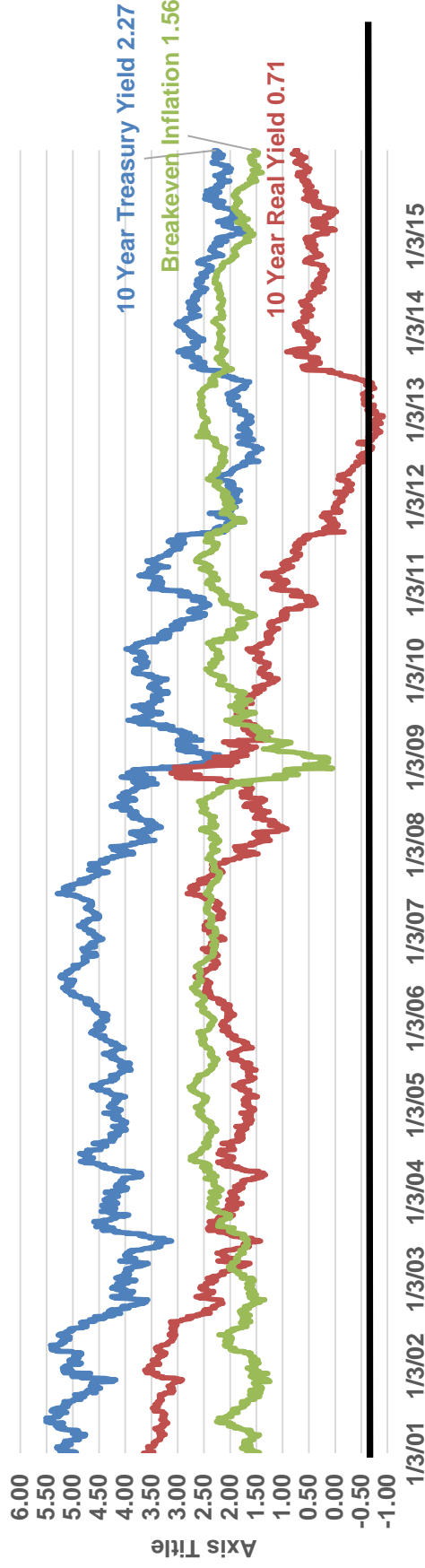
FOMC DOT PLOT



2-Year/10-Year U.S. Treasury Spread

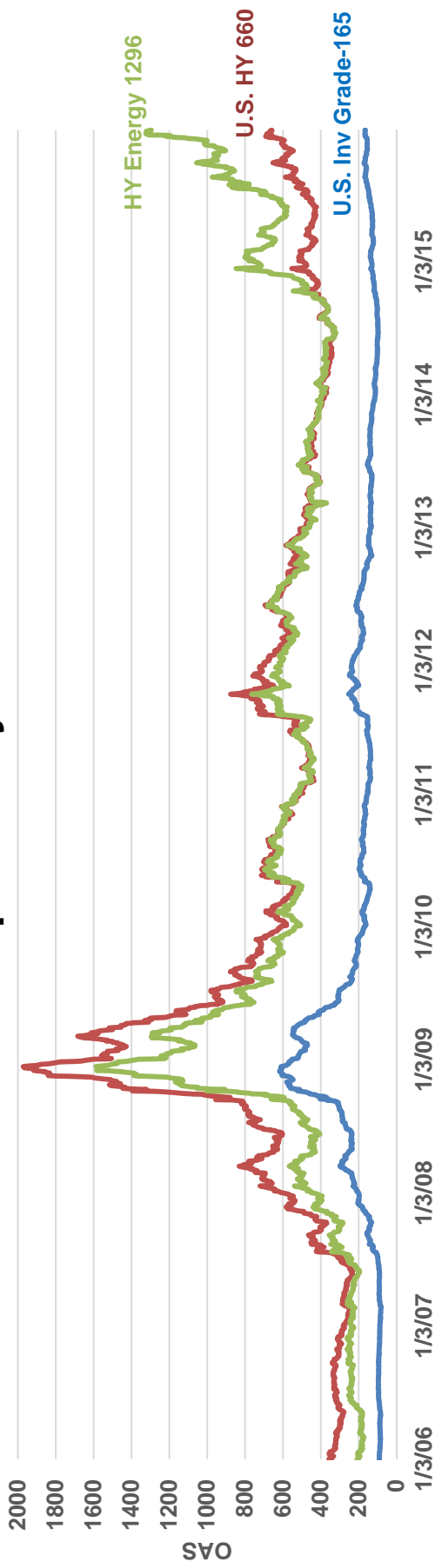


U.S. Real Yields and Inflation Expectations

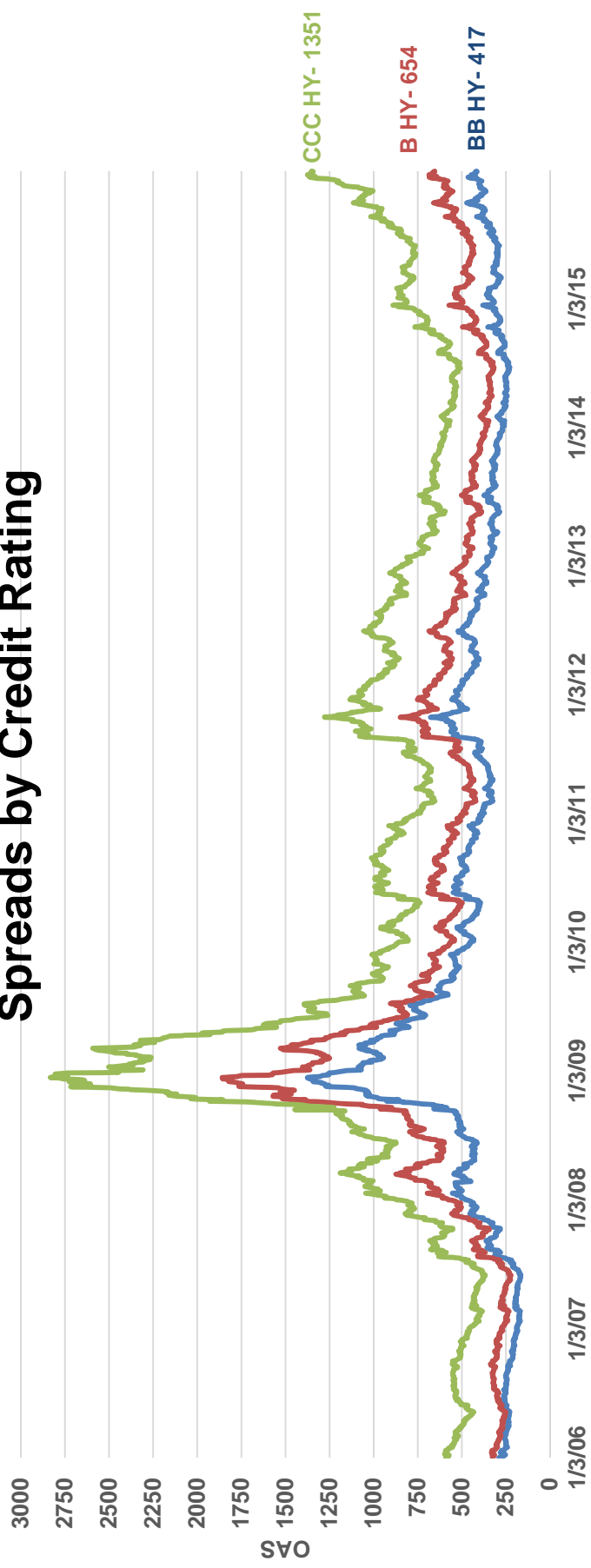


Source: Bloomberg

HY Spreads by Sector

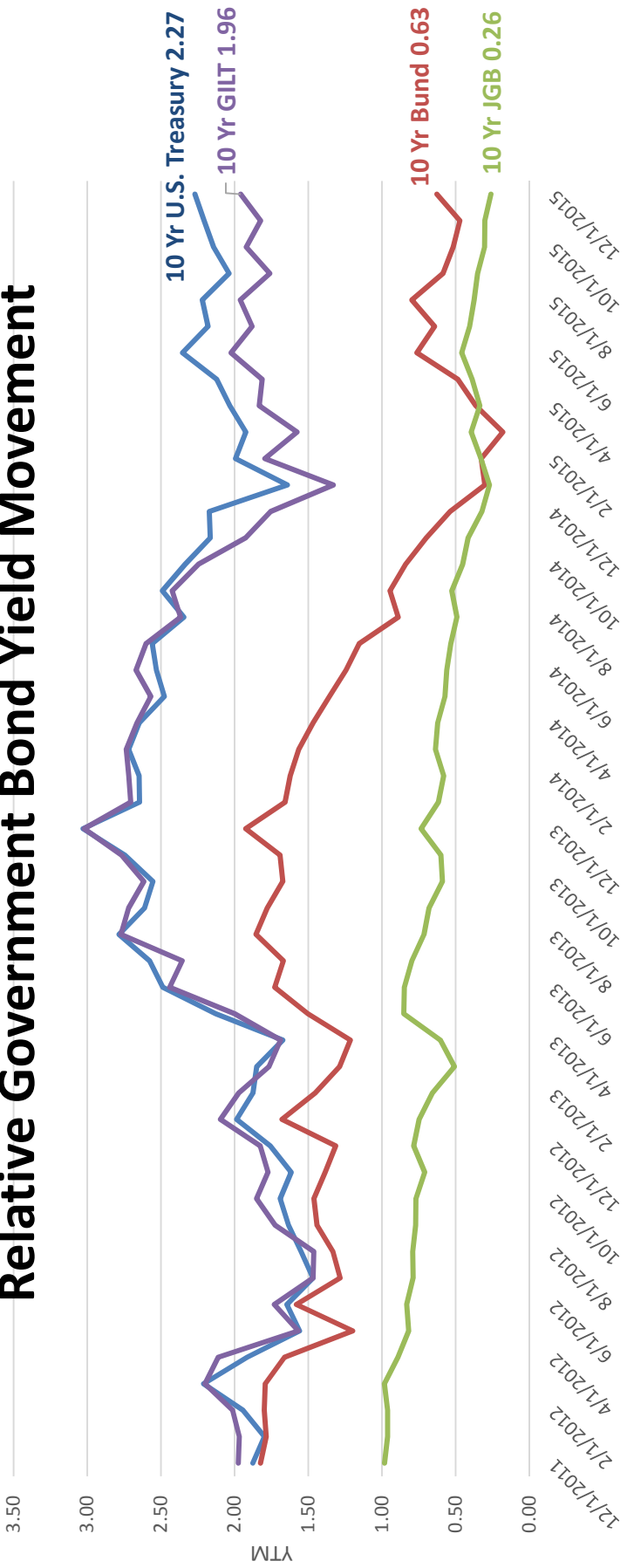


Spreads by Credit Rating



Source: Bloomberg

Relative Government Bond Yield Movement

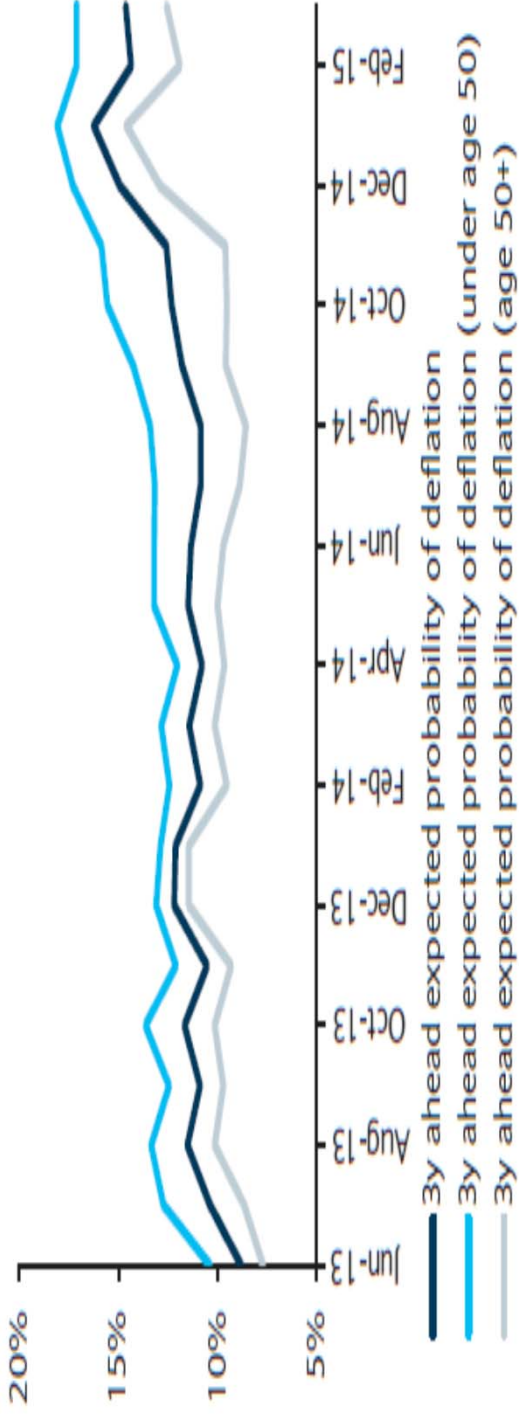


Large EGB market ownership of the ECB in various QE extension/expansion scenarios

	% of eligible QE universe owned by ECB (including SMP) - Dec 15	% of eligible QE universe owned by ECB in Mar 17 with €60bn QE	% of eligible QE universe owned by ECB in Sep 17 with €60bn QE	Scenario A: % of eligible QE universe owned by ECB in Mar 17 with QE increased from €60bn to €80bn from Jun 16 onwards	Scenario B: % of eligible QE universe owned by ECB in Mar 17 with QE increased from €60bn to €80bn from Jun 16 onwards
Germany	12.9%	29.2%	33.1%	33.0%	
France	7.5%	16.6%	18.5%	18.8%	
Italy	7.7%	14.0%	16.1%	15.8%	
Spain	11.7%	21.0%	22.5%	23.8%	

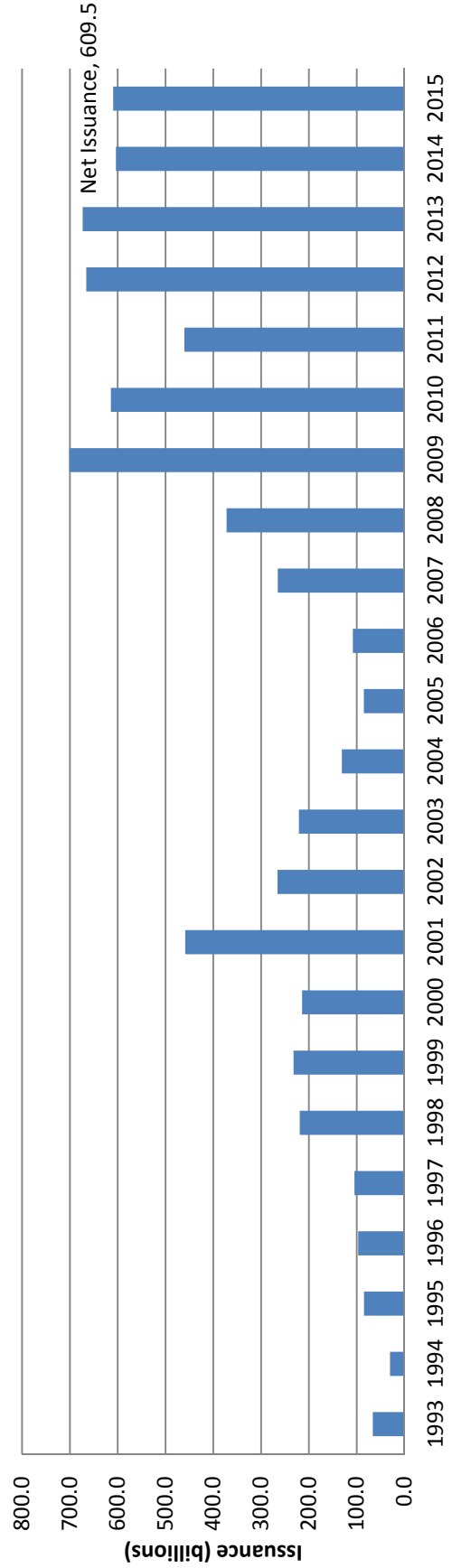
Source: Bloomberg, ECB, Barclays Research

Expected probability of deflation



Source: *Survey of Consumer Expectations*. © 2013-2015 Federal Reserve Bank of New York (FRBNY). The SCE data are available without charge at [/microeconomics/sce/index](http://microeconomics/sce/index) and may be used subject to license terms posted below. FRBNY disclaims any responsibility or legal liability for this analysis and interpretation of *Survey of Consumer Expectations* data

Net Corporate Bond Issuance



**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

INTERNATIONAL EQUITY REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Richard J. Holcomb, CFA
Senior Investment Manager
Quantitative Analysis Division**

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	-2.3%	3.3%	2.9%	8.7%	2.6%
Benchmark Return	-5.7%	1.8%	1.4%	6.4%	1.5%
Peer Return	-2.9%	3.8%	3.2%	8.7%	3.7%
Rank vs. Peers	39	57	53	46	80

- International equity returns trailed U.S. returns in the fourth quarter, as slowing economic growth in China, and energy and commodities pricing weakness strongly impacted emerging markets. The returns in the developed market countries continued to lead the emerging market countries, reflecting ongoing ECB stimulus and the net benefits from declining oil prices. Canada and Australia were notable exceptions. The U.S. dollar outperformed the Euro and Pound, and gained even more strongly against the currencies of commodity-related emerging market countries. Chinese stocks were quite strong at the end of December, before growth concerns and a weaker Yuan led to their correction in early 2016. Significant geopolitical risks remain unresolved throughout the world, and most political reforms appear on hold. Our international portfolio returns have exceeded their internal benchmark over all time periods.
- Performance comparisons with peer group returns have improved, reflecting contributions from all three strategic investment approaches. Indexed investments have benefited from an overweight to smaller capitalization stocks. Stock Plus strategies returns have benefited from the shift to the MSCI EM overlay by PIMCO, and are positioned to return to the longer term positive performance trend. Active managers have taken advantage of a more favorable investment environment for their individual disciplines.
- Indexed investments represent 31.4% of international equity exposure, and had a return of 3.7% in the fourth quarter, and -2.1% for the year. The positive relative performance can be attributed to an overweight of small capitalization stocks in the selection of index fund exposure components.
- Internally-managed stock plus funds have experienced a headwind in dividend stocks and Libor note spreads in the fourth quarter, but have outperformed their benchmarks over longer periods. Currency hedging in internal fund swap agreements has had a very significant positive impact. All counterparties used for swap agreements, and all fixed income securities held as collateral continue to be rated investment grade.

- Active developed market fund managers had a return of 4.7% for the quarter, and 0.3% for the year. Manager returns made a significant positive contribution to returns, and are well diversified with a combination of fundamental analysis driven and quantitative factor strategies. The Wellington Emerging Markets Local Equity fund continued to contribute to excess returns through its focus on India and EM local demand beneficiaries. The cumulative active exposure is designed to produce a positive ensemble alpha through multiple expert processes.

Outlook

- The outlook for international equities is positive based on expected slow improvement in the European economies, continued European Central Bank support and stimulus through QE actions, the competitive advantage of weaker currencies, and attractive valuation with the U.S. market. Emerging markets have been negatively affected by lower energy and commodity prices, and slower export growth. Political instability and currency devaluation stress are and will remain important issues.
- External managers, diversified by style, are benefiting from a better environment for active stock selection with wider universe return dispersion and more trading opportunities. Small and mid-cap international stocks are experiencing greater volatility, but will continue to have more attractive fundamentals than the larger State owned or influenced group. Stock Plus absolute return strategies have been impacted by interest rate and risk concerns, but can continue to achieve returns in excess of overlay costs.
- Emerging markets performance will continue to benefit from growing local consumer demand trends and access to technology. Positive governance, regulation, and financial system changes will gradually improve investment opportunities in many countries. Political instability, systemic corruption, rule of law, and unfavorable tax regimes will remain concerns. Infrastructure projects should stimulate emerging market economies, and China's plans for an Asian Infrastructure Investment Bank could be very supportive of regional and global trade. Commodity rates will improve as capacity is reduced.

Investment Plan

- Move toward longer-term asset allocation objectives as a slow global recovery develops and relative valuations of international markets remain positive.
- Take advantage of opportunities to enhance returns in internal stock plus strategies to achieve absolute returns in excess of equity overlay costs. Collaborate with internal fixed income and equities staff for an effective hybrid approach to security research and selection.
- Prepare for derivative market regulatory and structural changes, and focus on further development of counterparty relationships as a strategic advantage.



SMRS

International Equities

12/31/15

Markets	Amount	Total	% of Total
Indexed (in millions)			
SSgA	\$1,756		
Vanguard	1,084		
Total Indexed		\$2,840	31.4%
Stock Plus			
Internal Swaps	\$1,653		
PIMCO	1,315		
Total Stock Plus		\$2,968	32.9%
Active			
Los Angeles Capital	\$885		
Wellington	756		
Marathon London	348		
Effissimo	250		
Lazard	214		
T. Rowe Price	208		
Templeton	199		
MFS	185		
SSgA	181		
Total Active		\$3,226	35.7%

TOTAL

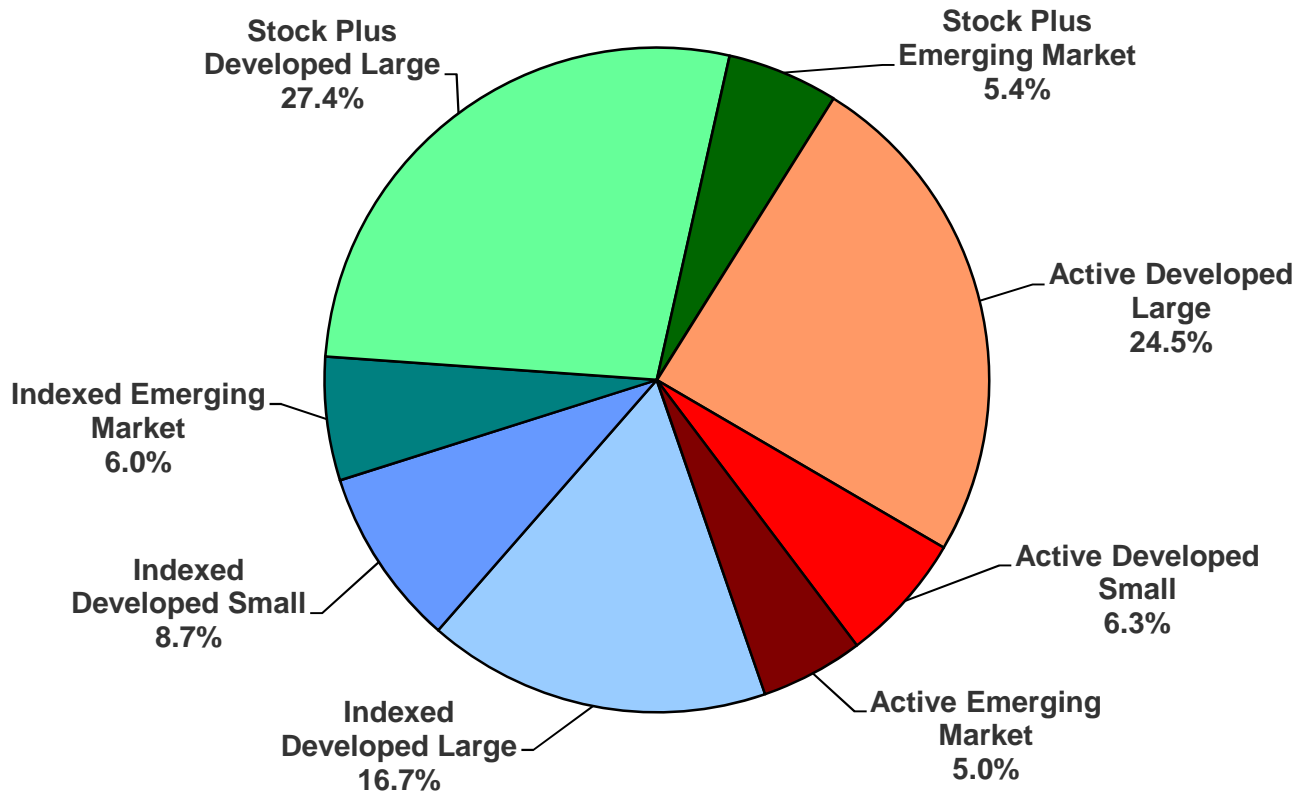
\$9,034

100.0%



SMRS

International Equity Exposure By Category 12/31/15



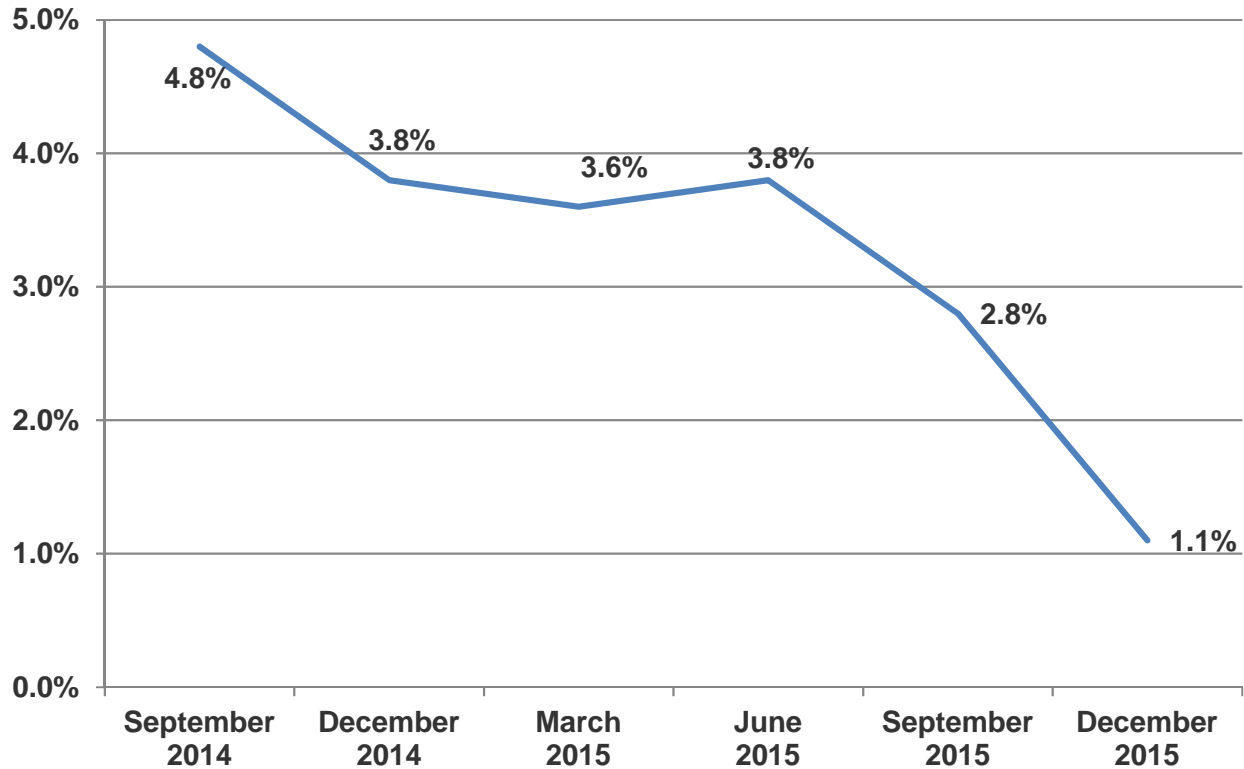
Market Value in Millions				
	12/31/15		9/30/15	
Indexed				
Developed Large	\$1,513	16.7%	\$1,455	17.8%
Developed Small	785	8.7%	742	9.1%
Emerging Market	542	6.0%	543	6.6%
Total Indexed Equity	\$2,840	31.4%	\$2,740	33.5%
Stock Plus				
Developed Large	\$2,478	27.4%	\$2,357	28.7%
Emerging Market	490	5.4%	489	6.0%
Total Stock Plus Equity	\$2,968	32.8%	\$2,846	34.7%
Active				
Developed Large	\$2,213	24.5%	\$1,619	19.8%
Developed Small	565	6.3%	539	6.6%
Emerging Market	448	5.0%	446	5.4%
Total Active Equity	\$3,226	35.8%	\$2,604	31.8%
Total International Equity	\$9,034	100.0%	\$8,190	100.0%

Michigan Department of Treasury, Bureau of Investments



SMRS

Emerging Market Allocation SMRS Versus Benchmark 12/31/15



Investments by Region

<u>Date</u>	<u>EM Allocation SMRS Relative to Benchmark*</u>
September 2014	4.8%
December 2014	3.8%
March 2015	3.6%
June 2015	3.8%
September 2015	2.8%
December 2015	1.1%

*As measured by Factset Equity Analytics



SMRS

Active International Equities Composite

12/31/15

Date:	<u>12/31/15</u>	<u>9/30/15</u>	<u>6/30/15</u>	<u>3/31/15</u>
Assets (\$million):	\$3,226	\$2,604	\$2,906	\$2,848
Numbers of Securities:	1,775	1,717	1,684	1,686
Active Share:	59%	63%	55%	59%

Benchmark: MSCI ACWI ex USA

Description: The Active International Equities Composite represents the profile of cumulative investments by active international managers with developed market large and small cap, and emerging market mandates. The manager returns are well diversified and reflect a combination of fundamental analysis driven and quantitative management approaches. The cumulative exposure, supported by multiple expert processes, is constructed to produce a positive, long-term ensemble alpha with control of assumed risk.

Characteristics:	<u>SMRS</u>	<u>ACWI ex USA</u>
Weighted Average Capitalization (\$billion):	\$3.9	\$12.9
Trailing 12-month P/E:	15.1x	16.9x
Forecast P/E:	15.5x	14.5x
Price/Book:	1.5x	1.5x
Beta:	0.83	1.00
Dividend Yield:	2.6%	3.1%
3-5 Year EPS Growth Estimate:	8.5%	10.1%
Return on Equity:	10.2%	9.2%

TOP TEN HOLDINGS – Active International Equities 12/31/15

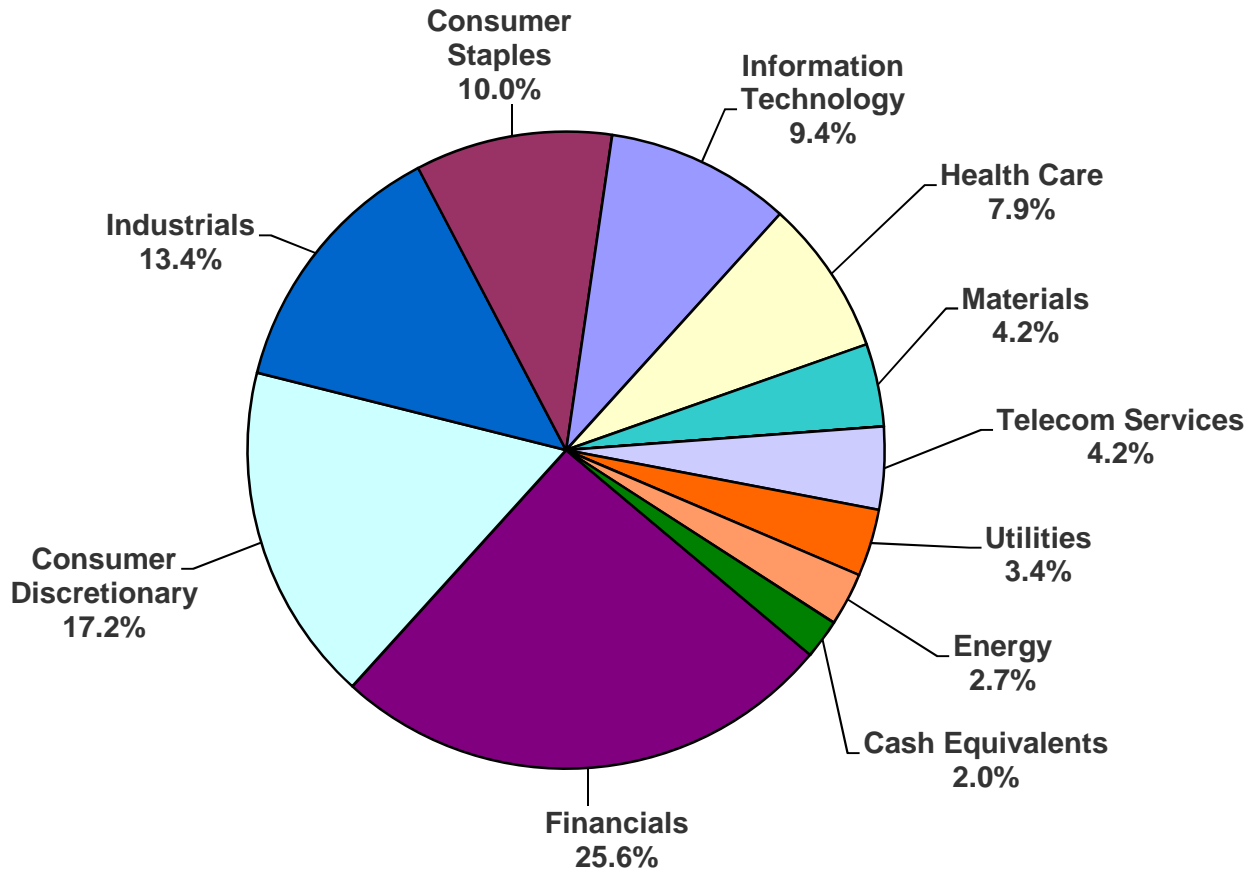
	Portfolio Weight	Market Value (Millions)
Ricoh Company, Ltd.	2.0%	\$63.3
Yamada Denki Co., Ltd.	1.5%	47.5
Novartis AG	0.9%	28.8
Nissan Shatai Co., Ltd.	0.8%	26.1
Kawasaki Kisen Kaisha, Ltd.	0.8%	24.7
Anheuser-Busch InBev Sa	0.5%	17.3
Adecco S.A.	0.5%	16.5
Lonza Group AG	0.5%	16.2
TOC Co., Ltd.	0.5%	16.0
Direct Line Insurance Group Plc	<u>0.5%</u>	<u>15.5</u>
TOTAL	<u>8.4%</u>	<u>\$271.9</u>



SMRS

Active International Equity By Sector

12/31/15



Market Value in Millions

12/31/15

	<u>Assets</u>	<u>Percent</u>	<u>Benchmark</u>	<u>Difference</u>
Financials	\$826	25.6%	27.1%	-1.5%
Consumer Discretionary	555	17.2%	12.1%	5.1%
Industrials	432	13.4%	11.2%	2.2%
Consumer Staples	323	10.0%	10.8%	-0.8%
Information Technology	303	9.4%	8.3%	1.1%
Health Care	255	7.9%	9.5%	-1.6%
Materials	135	4.2%	6.4%	-2.2%
Telecom Services	135	4.2%	5.2%	-1.0%
Utilities	110	3.4%	3.5%	-0.1%
Energy	87	2.7%	5.9%	-3.2%
Total Investments	\$3,161	98.0%	100.0%	
Cash Equivalents	65	2.0%	0.0%	2.0%
Total	\$3,226	100.0%	100.0%	

Benchmark: MSCI ACWI ex USA

International Active Manager Performance - Net of Fees
12/31/15

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception Date</u>
PIMCO Intl StocksPlus TR Strategy MSCI EAFE Net Div Index (unhedged)	\$941,616,246	-4.1% -0.8%	3.2% 5.0%	4.8% 3.6%	-- --	10/1/10
LA Capital World MSCI ACWI Ex-US	617,608,926	--	--	--	--	10/30/15
Wellington Intl Research Equity S&P BMI World Ex-US Index	575,207,397	0.5% -1.6%	6.2% 4.4%	4.2% 3.0%	9.7% 8.5%	12/1/05
Pimco EM Stock Plus MSCI Emerging Market Index	373,265,581	--	--	--	--	3/31/15
Marathon-London Intl Fund MSCI EAFE Index	348,273,321	6.5% -0.8%	9.4% 5.0%	-- --	-- --	2/1/12
LA Capital Emerging Market MSCI Emerging Market Index	267,409,951	-15.7% -14.9%	-6.4% -6.8%	-3.4% -4.8%	-- --	12/8/09
Effissimo Capital Management Japan MSCI EAFE Net Div Index (unhedged)	249,999,999	--	--	--	--	10/30/15
Lazard Wilmington Intl Equity Portfolio MSCI EAFE Net Div Index (unhedged)	213,525,000	1.9% -0.8%	-- --	-- --	-- --	5/1/14
T Rowe Price Intl Core MSCI EAFE Index	208,321,894	-2.3% -0.8%	-- --	-- --	-- --	4/1/14
Templeton Intl Smaller Companies Fund MSCI All Country World Index Ex-US Small Cap	198,646,440	3.0% 2.6%	7.2% 5.6%	-- --	-- --	6/1/12
MFS Intl Small Cap Equity Fund MSCI All Country World Index Ex-US Small Cap	185,068,100	3.0% 0.4%	6.7% 4.7%	-- --	-- --	5/1/12
Wellington Emerging Local Equity MSCI Emerging Market Index	181,467,630	-8.8% -14.9%	1.3% -6.8%	-- --	-- --	12/1/11
SSGA Small Cap Intl Alpha Strategy S&P Developed Ex-US Small Cap	181,174,615	9.10% 5.5%	10.9% 8.5%	8.0% 5.1%	14.1% 12.7%	5/1/07

International Indexed Manager Performance, Net of Fees
12/31/15

<u>Fund Name</u>	<u>Market Value</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>7-Years</u>	<u>Inception Date</u>
SSgA PMI Fund S&P Developed Ex-US Large/Midcap	\$971,222,012	-2.6% -3.1%	3.7% 3.6%	2.9% 2.6%	-- --	4/1/10
SSgA EMI Fund - Europe/Pacific S&P EPAC Small Cap	785,011,305	8.9% 8.6%	10.5% 10.3%	6.9% 6.5%	-- --	4/1/10
Vanguard Developed Mkts Fund Spliced Developed Ex-US Index *	542,226,752	-0.2% -0.3%	4.8% 5.2%	3.9% 3.7%	-- --	4/1/10
Vanguard Emerging Market Spliced Emerging Market Index **	541,625,640	-15.3% -15.4%	-6.7% -6.4%	-4.8% -4.6%	-- --	7/1/09

* Spliced Developed Ex-US Index: MSCI EAFE Index through May 29, 2013; FTSE Developed Ex North America Index through December 20, 2015; FTSE Developed All-Cap Ex-US Transition Index thereafter. Benchmark returns are adjusted for withholding taxes.

** Spliced Emerging Market Index: Select Emerging Markets Index through August 23, 2006; MSCI Emerging Markets Index through January 9, 2013; FTSE Emerging Transition Index through June 27, 2013; FTSE Emerging Index through November 1, 2015; and FTSE Emerging Markets All-Cap China A Transition Index thereafter. Benchmark returns are adjusted for withholding taxes.

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

PRIVATE EQUITY REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Peter A. Woodford
Senior Investment Manager
Private Equity Division**

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Returns	10.6%	15.1%	15.1%	13.0%	12.7%
Benchmark Return	2.4%	15.5%	16.4%	18.4%	10.9%
Peer Median Return	5.5%	11.2%	10.5%	9.5%	9.6%
Rank vs. Peers	15	17	5	5	6

- The Private Equity Division annualized returns have been strong in absolute terms for all time periods over the past ten years; returning 10.6% and 12.7% over the past one and ten years respectively.
- The Private Equity Division annualized returns have been strong relative to peer median returns for all time periods over the past ten years, ranking in the top 6% and 10% of peers over the past one and ten years respectively.
- It is not unusual for private equity returns to lag the public market benchmark return in a strong up market; the past several years have been no exception. However, over the past ten years, a full market cycle, the Private Equity Division has delivered 5.4% annualized excess returns over the S&P 500 (10-year S&P 500 return 7.3%).

Strategy Update

Over the past twelve months ending 12/31/15, the Private Equity Division returned approximately \$1.2 billion, net of contributions, to the pension fund. This trend has continued into the first quarter of 2016, albeit at a slower pace. A low interest rate environment favors higher prices, asset sellers rather than buyers, and excess distributions over capital calls. The target allocation remains 18%.

- The Private Equity Division has approximately \$4.9 billion in unfunded commitments. New commitments closed during the quarter include:
 - \$175 million to Warburg Pincus XII: diversified venture, growth and buyout fund
 - \$125 million to TSG7: middle market buyout fund
 - \$100 million to Dover Street IX: secondary investment fund
 - \$75 million to Harvest Partners VII: middle market buyout fund
 - \$50 million to FIMI Opportunity 6: leveraged buyout/distressed fund
 - \$50 million to Riverside IV: lower middle market buyout fund
 - \$50 million to Shamrock Growth Capital IV: Low-middle market buyout fund
 - \$50 million to Axiom Asia IV: Asia fund of funds manager targeting growth manager's
- The Private Equity Division strategy is focused on the asset classes of: leveraged buyouts, venture, distressed debt, mezzanine debt, and special situations. The division is overweight leveraged buyouts. This strategy has resulted in higher, more consistent long-term returns (10+ years) vs. other asset classes.

- The Private Equity Division continues to allocate to the other asset classes for portfolio diversification and to capitalize on cyclical market dislocations.
- Recently, the Private Equity Division began evaluating co-investments and secondary opportunities to enhance returns and to average down fees.

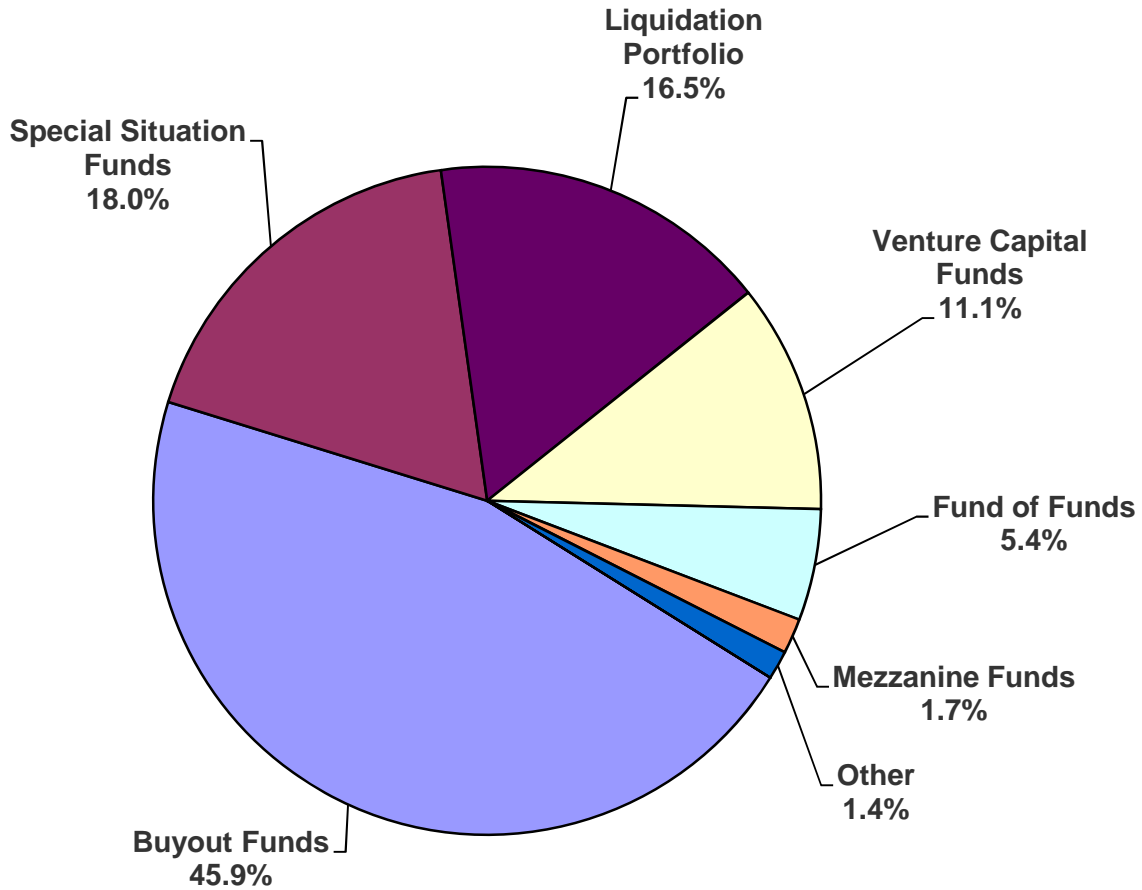
Market Environment

- The fourth quarter was characterized by significant market volatility, a Fed interest rate hike of 25 basis points, tightening in the leveraged finance markets and high acquisition multiples. Weakness in the equity markets and market volatility caused downward pressure on valuations and raise the following question: is this a temporary dip in the market or something more permanent? Some recent transactions by buyout firms indicate additional correction is expected, as targets are more defensive in nature and have higher downside protection. The biggest challenge continues to be finding good value relative to growth and paying reasonable entry multiples for these transactions.
- Secondary pricing remained strong throughout 2015, however, due in part to heightened volatility in global equity and commodity markets, secondary pricing moderated down slightly in the second half of the year. Buyout funds and venture funds priced at 91% and 74% of NAV respectively, during the second half of 2015.



SMRS Private Equity

12/31/15

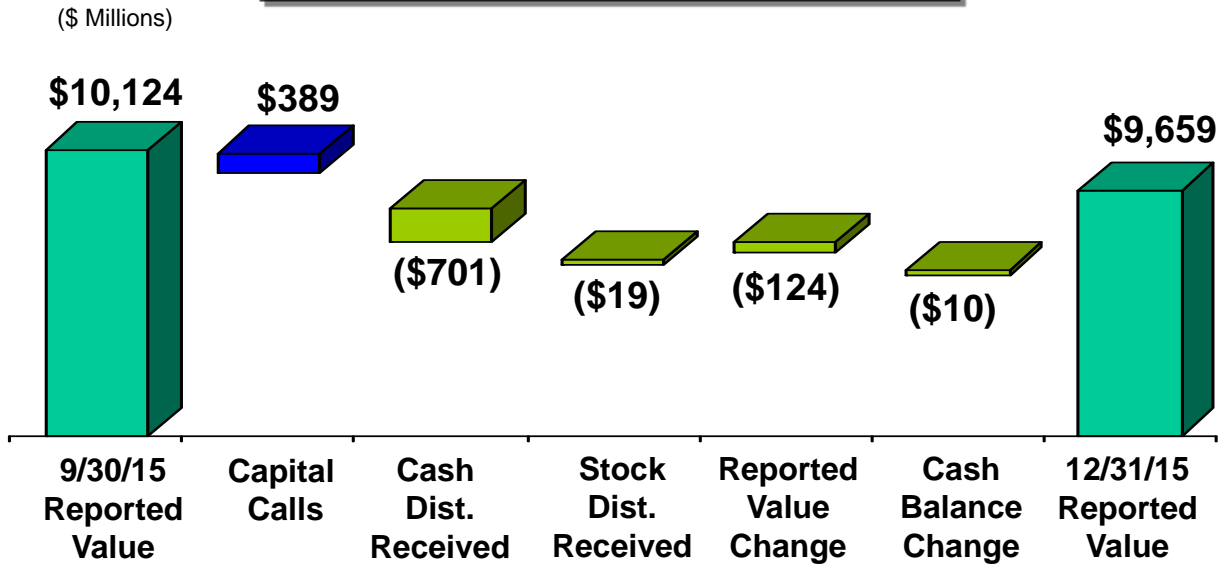


Market Value in Millions				
	12/31/15		9/30/15	
Buyout Funds	\$4,430	45.9%	\$5,541	54.7%
Special Situation Funds	1,743	18.0%	1,919	19.0%
Liquidation Portfolio	1,594	16.5%	270	2.6%
Venture Capital Funds	1,073	11.1%	1,562	15.4%
Fund of Funds	520	5.4%	526	5.2%
Mezzanine Funds	168	1.7%	164	1.6%
Other	131	1.4%	142	1.5%
Total	\$9,659	100.0%	\$10,124	100.0%

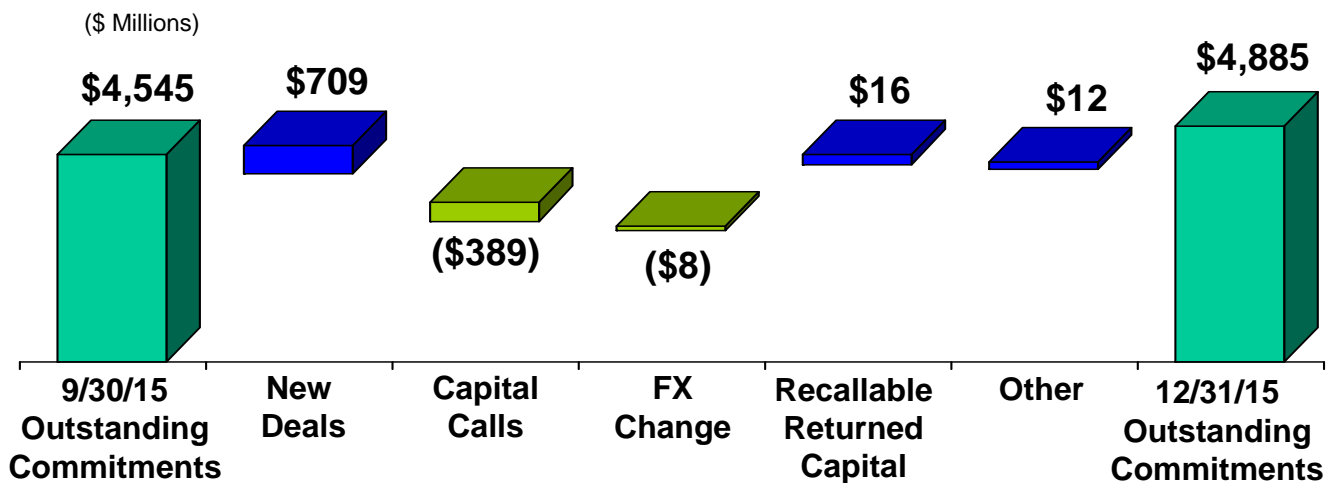


SMRS Private Equity 12/31/15

Invested Commitments



Outstanding Commitments



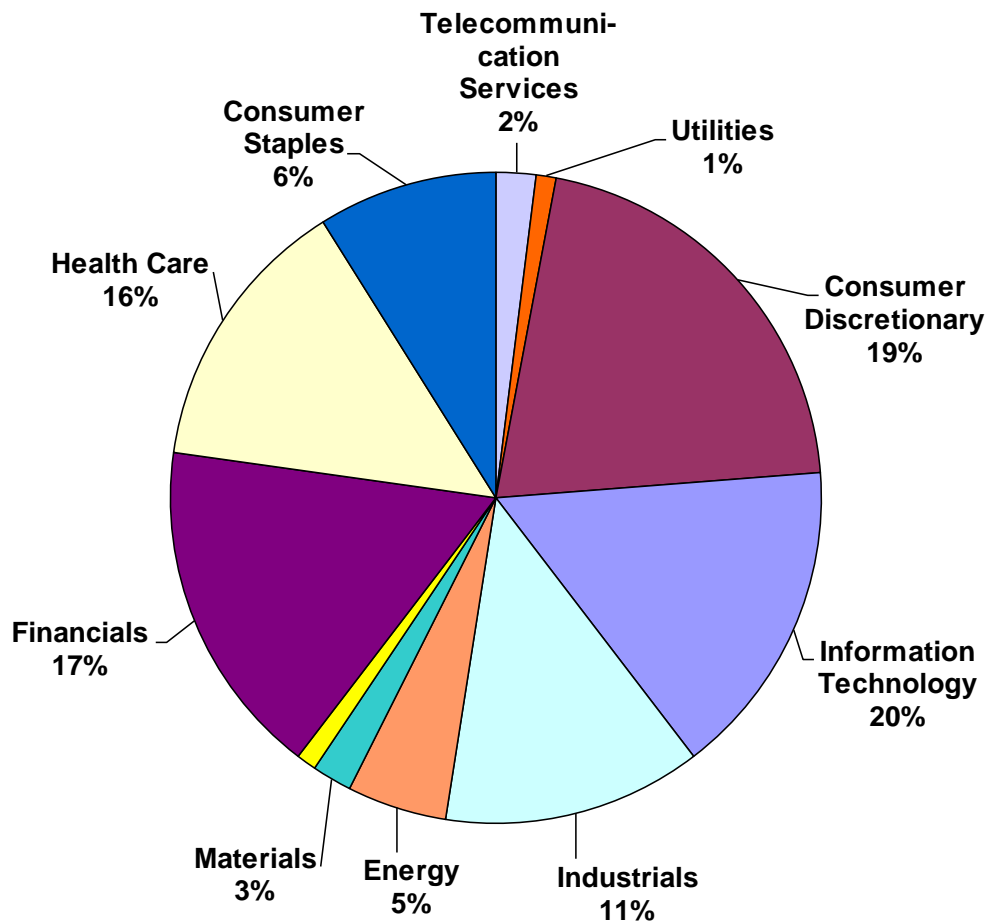


SMRS

Private Equity

12/31/2015

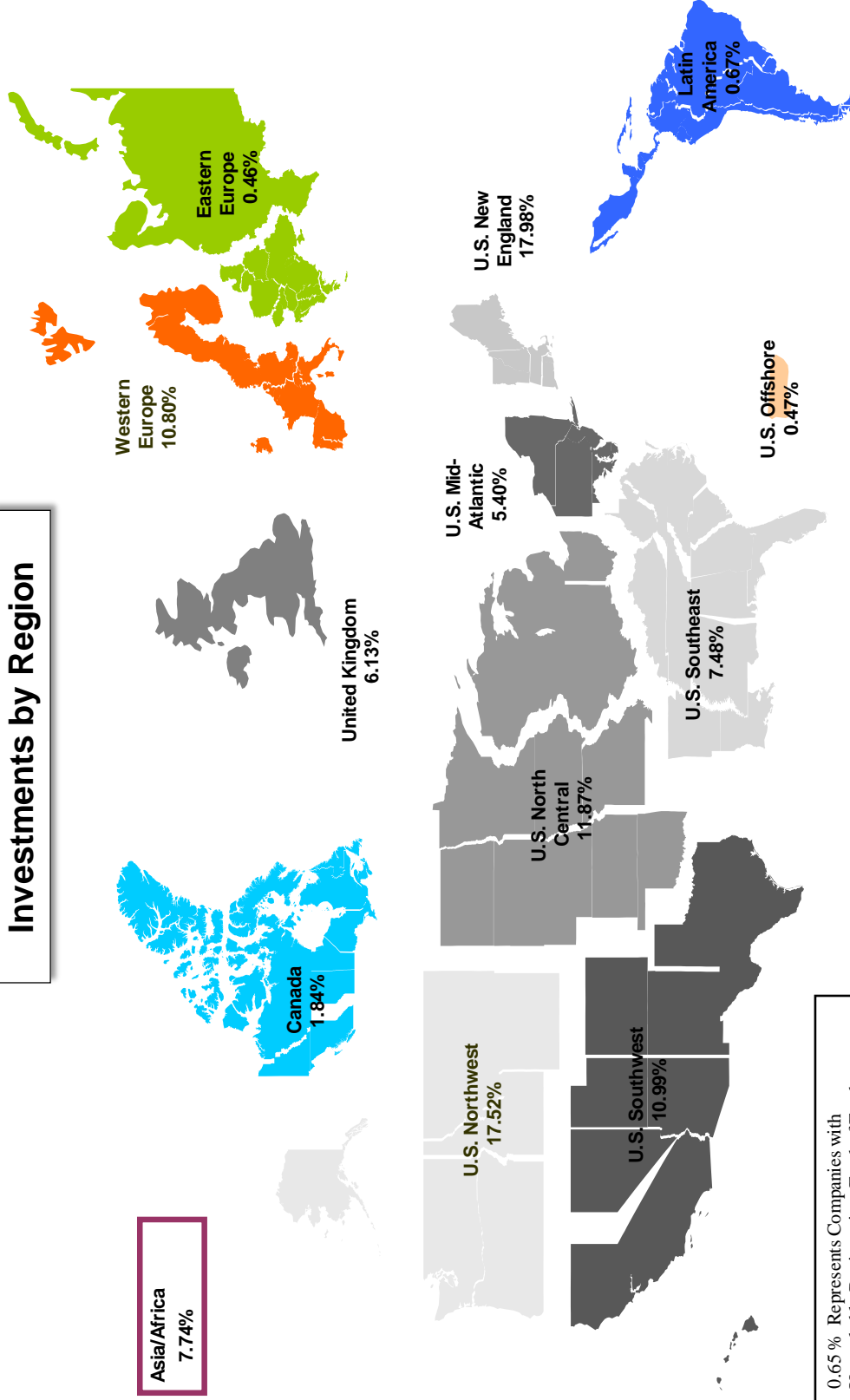
Investments by Industry



These numbers are based on the most recent available General Partner Data; primarily 9/30/15 and are subject to change.

SMRS
Private Equity
12/31/15

Investments by Region



0.65 % Represents Companies with Untrackable Regions, i.e.; Fund of Funds

Geographic Report: North America 73%, Europe 17%, Asia 8%, Other 2%



SMRS
Private Equity
12/31/15

Portfolio by Vintage Year

(\$ Millions)

Asset Vintage	Reported Value	Outstanding Commitment	Total Exposure
1986-98	\$ 21	\$ 16	\$ 37
1999	34	10	44
2000	74	28	102
2001	229	43	272
2002	107	9	116
2003	35	18	53
2004	207	46	253
2005	467	25	492
2006*	1,347	281	1,628
2007	1,132	167	1,299
2008	1,154	236	1,390
2009	87	2	89
2010	301	33	334
2011	712	247	959
2012	938	468	1,406
2013	391	341	732
2014	605	897	1,502
2015	1,688	2,018	3,706
Cash	128	-	128
Act. Small Cap - Stock Dist	2	-	2
Total	\$ 9,659	\$ 4,885	\$14,544

*Liquidation portfolio is 2006 vintage

FX Exposure

(\$ Millions)

	Reported Value	Outstanding Commitment	Total Exposure	Total (USD)
Euro (\$1.09/ €)	€ 441	€ 265	€ 706	\$767
Pound (\$1.47/ £)	£9	£1	£10	\$15



SMRS
Private Equity
12/31/15

Top 10 Sponsors

(\$ Millions)

<u>Asset Type</u>	<u>Reported Value</u>	<u>Outstanding Commitment</u>	<u>Total</u>
HarbourVest Partners	\$ 1,492	\$ 360	\$1,852
Blackstone Capital Partners	456	418	874
KKR	612	250	862
Grosvenor Capital Management	635	149	784
Warburg Pincus Capital	450	300	750
The Carlyle Group	382	268	650
TPG	393	202	595
Advent International	370	95	465
Coller Capital	152	255	407
Leonard Green & Partners	327	70	397
Top 10 Total Value	<u>\$5,269</u>	<u>\$2,367</u>	<u>\$7,636</u>

Cash Weighted Rates of Return*

<u>(Net IRR)</u>	<u>Current Qtr.</u>	<u>1-Year</u>	<u>3-Years</u>	<u>5-Years</u>	<u>10-Years</u>
Buyout	0.1%	8.0%	14.8%	13.5%	13.4%
Fund of Funds	-0.1%	5.4%	11.5%	10.1%	10.9%
Mezzanine	-0.2%	1.2%	10.0%	11.6%	9.7%
Special Situations	0.4%	4.1%	9.8%	10.2%	8.7%
Venture Capital	1.3%	9.4%	20.3%	17.6%	17.0%

*These numbers are based on most recent available General Partner reported data; primarily 12/31/15 and are subject to change.



SMRS Private Equity 12/31/15

Net Market Values by Ownership Entity

	Adjusted Reported Value	Unfunded Commitment
Accel Europe I, L.P.	\$ 17,527,973	\$ 1
Accel Europe II	14,742,801	3,300,000
Accel Growth Fund II, L.P.	12,715,057	1,260,000
Accel Growth Fund III, L.P.	9,237,236	4,760,000
Accel IX, L.P.	9,650,393	3,000,000
Accel VI, L.P.	1,388,840	-
Accel VII, L.P.	1,109,626	5,000,000
Accel VIII, L.P.	2,984,249	4,782,499
Accel VI-S	2,564,780	652,611
Accel X, L.P.	23,681,929	750,000
Accel XI, L.P.	7,167,988	1,680,000
Accel XII, L.P.	3,996,983	2,975,000
Advent Global Private Equity III	990,230	20
Advent Global Private Equity IV	1,853,370	-
Advent Global Private Equity V	26,166,001	8,700,000
Advent International GPE VI-A LP	185,317,716	7,299,980
Advent International GPE VII-B, L.P.	151,943,178	48,500,000
Advent Latin American Private Equity Fund VI, L.P.	3,703,419	30,362,500
Affinity Asia Pacific Fund II, L.P.	0	5,288,237
Affinity Asia Pacific Fund III, L.P.	71,058,776	14,200,795
Affinity Asia Pacific Fund IV L.P.	57,082,704	84,432,562
APA Excelsior V	114,494	545,625
Apax Europe Fund VI	52,747,726	2,297,305
Apax Europe V, L.P.	343,119	-
Apax Europe VII, L.P.	83,042,747	3,077,848
Apax Excelsior VI	339,852	1,614,434
Apax US VII	19,924,385	417,509
Apax VIII - B, L.P.	96,077,285	14,136,492
Apollo Investment Fund VIII L.P.	28,984,035	70,148,851
Arboretum Ventures II	2,445,389	-
Arboretum Ventures III, L.P.	13,350,015	1,485,000
Arboretum Ventures IV, L.P.	1,979,814	27,840,000
Ares Corporate Opportunities Fund II	20,944,487	11,423,773
Ares Corporate Opportunities Fund III, LP	93,864,972	11,415,987
Ares Corporate Opportunities Fund IV, L.P.	76,463,851	30,217,263
ASF Norman, LLC Receivable	90,956,104	-
AXA ASF Miller Co-Investment	58,520,840	23,071,187
Axiom Asia Private Capital Fund III, L.P.	20,804,924	16,676,764
** Axiom Asia IV, L.P.	0	50,000,000
BC European Capital IX	53,683,730	18,916,108
BC European Capital VII, L.P.	530,897	-

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
BC European Capital VIII, L.P.	27,890,658	8,494,866
Berkshire Fund IV, L.P.	0	1,898,016
Berkshire Fund V, L.P.	258,713	3,281,560
Berkshire Fund VI, L.P.	39,094,802	6,922,675
Berkshire Fund VII, L.P.	78,857,995	5,005,332
Berkshire Fund VIII, L.P.	91,690,292	33,326,760
Blackstone Capital Partners IV	42,542,725	5,085,117
Blackstone Capital Partners V	110,501,057	17,079,209
Blackstone Capital Partners VI, LP	262,481,375	76,547,874
Blackstone Capital Partners VII, L.P.	0	300,000,000
Blackstone Capital Partners V-S	17,469,706	711,131
Bridgepoint Europe IV	38,689,705	6,557,393
Carlyle Europe Partners II	7,952,799	4,025,038
Carlyle Europe Partners III	65,232,924	11,900,557
Carlyle Europe Partners IV, L.P.	27,889,581	81,095,644
Carlyle Partners IV, L.P.	22,416,689	16,009,296
Carlyle Partners V L.P.	182,021,065	58,421,628
Carlyle Partners VI, L.P.	76,507,242	96,424,469
Castle Harlan Partners IV	11,775,291	5,286,319
Castle Harlan Partners V	42,533,426	41,721,990
CCMP Capital Investors II	89,964,963	10,330,517
CCMP Capital Investors III, L.P.	25,090,407	25,510,101
Centerbridge Capital Partners III, LP	16,667,902	58,444,740
Cerberus SMRS Partners, L.P.	107,194,030	3,304,657
CM Liquidity Fund, L.P.	0	25,000,000
CMEA Ventures VI	0	-
Coller International Partners IV	4,850,057	1,000,000
Coller International Partners V, L.P.	70,422,556	43,600,000
Coller International Partners VI, L.P.	76,642,054	35,316,302
Coller International Partners VII, L.P.	0	150,000,000
Crescent Mezzanine Partners VI, L.P.	57,047,384	18,029,522
DLJ Investment Partners II	161,053	-
DLJ Investment Partners III	14,751,537	57,712,985
DLJ Merchant Banking Ptrs II, L.P.	432,679	1,856,746
** Dover Street IX, L.P.	0	100,000,000
EDF Ventures III	1,886,809	-
EnCap Energy Capital Fund X, L.P.	2,729,345	41,885,230
Entertainment IP Fund, L.P.	518,400	49,481,600
** FIMI Opportunity 6, L.P.	0	50,000,000
FirstMark Capital I, L.P.	104,815,590	196,596
FirstMark Capital OF I, L.P.	8,989,947	11,300,000
FirstMark Capital P2, L.P.	168,350,000	-
Flagship Ventures Fund 2004	11,493,121	-
Flagship Ventures Fund 2007, L.P.	45,203,258	-
Flagship Ventures Fund IV, L.P.	67,585,518	2,100,000
Flagship Ventures Fund V	7,500,872	26,950,000
Fox Paine Capital Fund II, LP	20,266,741	15,539,184
FS Equity Partners VII, L.P.	16,685,062	82,320,533
GCM Grosvenor Fund Investment Program I, L.P.	19,447,461	1,456,755
GCM Grosvenor Fund Investment Program II, L.P.	67,572,295	15,984,173
GCM Grosvenor Fund Investment Program III - 2004	79,645,385	4,976,736

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
GCM Grosvenor Fund Investment Program III - 2006	104,810,185	10,677,893
GCM Grosvenor Fund Investment Program V, L.P.	101,827,797	16,613,747
GCM Grosvenor Fund Investment Program VI, L.P.	13,906,729	20,246,671
GCM Grosvenor SeasPriFIP LP (PIS06-10)	90,221,056	27,753,029
GCM Grosvenor SeasPriFIP LP (PIS14)	83,077,442	37,547,659
GCM Grosvenor SeasPriFIP LP (Seed)	74,549,893	13,933,191
G-II Acquisition Holdings Note	6,932,579	-
Glencoe Capital Michigan Opportunities Fund, LP	34,948,091	10,449,534
Green Equity Investors IV	25,677,154	1,136,036
Green Equity Investors V	208,769,518	25,966,435
Green Equity Investors VI, L.P.	93,190,533	43,049,693
GSO Capital Opportunities Fund II, L.P.	23,104,013	18,777,931
HarbourVest Dover Street VIII, L.P.	40,307,380	24,975,000
HarbourVest Int'l III Direct	3,917,666	1,000,000
HarbourVest Int'l III Partnership	1,651,592	1,200,000
HarbourVest Partners Mezzanine Income Fund	2,625,000	47,375,000
HarbourVest V Partnership	254,134	300,000
HarbourVest VI - Direct Fund LP	4,152,963	750,000
HarbourVest VI Partnership	13,620,593	2,000,000
** Harvest Partners VII, L.P.	0	75,000,000
HVST - TOPE LLC	79,000,000	-
Insight Ventures Growth-Buyout Coinvestment Fund	11,572,924	37,875,000
Insight Venture Partners IX, L.P.	24,160,661	74,000,000
Kelso Investment Associates IX, L.P.	7,707,328	92,292,672
Kelso Investment Associates VII	4,017,756	4,970,176
Kelso Investment Associates VIII	132,907,163	26,658,476
Khosla Ventures III, L.P.	65,872,000	2,000,000
Khosla Ventures IV, L.P.	62,499,810	4,750,000
Khosla Ventures V, L.P.	16,570,452	33,500,000
KKR 2006 Fund, L.P.	199,141,118	8,059,689
KKR Asia	55,190,489	2,902,553
KKR Asian Fund II, L.P.	21,036,236	33,932,337
KKR China Growth Fund	32,367,747	14,477,088
KKR E2 Investors (Annex) Fund	2,711,327	587,747
KKR European Fund II	42,699,556	-
KKR European Fund III	95,386,265	23,204,025
KKR European Fund IV L.P.	9,670,742	116,413,425
KKR European Fund LP 1	1,345,549	-
KKR Millennium Fund	61,780,656	-
KKR North America Fund XI, L.P.	90,329,691	50,284,098
Lightspeed Venture Partners VI	2,013,840	-
Lightspeed Venture Partners VII, L.P.	48,525,208	510,436
Lion Capital Fund I (HME II)	89,210	11,017,644
Lion Capital Fund II	6,650,344	4,688,281
Lion Capital Fund III, L.P.	86,474,015	13,024,187
Matlin Patterson Global Opportunities Partners	37,306	-
MatlinPatterson Global Opportunities Partners II	3,027,047	-
MatlinPatterson Global Opportunities Partners III	66,470,569	5,688,461
Menlo Ventures IX, L.P.	7,036,049	-
Menlo Ventures X, L.P.	43,850,843	-

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
Menlo Ventures XI, L.P.	64,590,200	3,000,000
MeriTech Capital Partners II, L.P.	2,005,467	1,850,000
Meritech Capital Partners III, L.P.	18,218,075	600,000
Meritech Capital Partners IV, L.P.	16,874,691	425,000
Meritech Capital Partners V, L.P.	4,651,660	14,850,000
Michigan Growth Capital Partners II, L.P.	126,821,641	64,300,599
Michigan Growth Capital Partners, LP	120,714,421	17,551,945
Midtown Fund III, L.P.	1,403,547	-
Midtown II Liquidating Trust	2,344,625	-
New Leaf Growth Fund I, L.P.	120,879,008	-
New Leaf Ventures II, L.P.	22,619,746	-
New Leaf Ventures III, L.P.	12,356,154	25,312,500
Nordic Capital VI, L.P.	29,953,602	-
Nordic Capital VII	61,845,874	5,518,376
Nordic Capital VIII, L.P. (Alpha)	21,442,254	22,452,041
Oak Investment Partners X, L.P.	8,261,741	-
Oak Investments Partners IX, L.P.	1,379,686	-
Oaktree Opportunities Fund X, L.P.	4,377,774	25,500,000
Oaktree Opportunities Fund Xb, L.P.	0	70,000,000
OCM Opportunities Fund IX, L.P.	71,484,390	-
OCM Opportunities Fund VII (B), L.P.	4,669,635	-
OCM Opportunities Fund VII, L.P.	6,069,929	-
OCM Opportunities Fund VIII B, L.P.	33,115,354	-
OCM Opportunities Fund VIII, L.P.	18,650,131	-
OCM Principal Opportunities Fund IV	25,733,940	5,002,377
Ocqueoc Holdings, LLC	10,836,889	-
One Liberty Fund III	606,907	-
One Liberty Fund IV	1,803,415	-
One Liberty Ventures 2000	7,416,400	-
Parthenon Investors II	2,478,787	3,186,779
Parthenon Investors III	46,279,974	2,268,428
Parthenon Investors IV, L.P.	24,594,492	18,195,937
Peninsula Capital Fund IV	12,691,276	2,201,026
Peninsula Fund VI, L.P.	5,250,000	34,750,000
Phoenix Equity Partners IV	13,245,803	880,972
Public Pension Capital, LLC	3,371,331	47,160,985
Questor Partners Fund II	4,787,754	5,883,006
Rhone Partners V, L.P.	599,503	107,289,463
Riverside Capital Appreciation Fund VI, LP	42,959,596	34,816,404
Riverside Micro Cap Fund I, LP	27,208,409	6,535,026
Riverside Micro-Cap Fund II, L.P.	45,581,306	162,018
Riverside Micro-Cap Fund III, L.P.	40,169,207	6,194,999
** Riverside Micro-Cap Fund IV	0	50,000,000
** Shamrock Growth Capital Fund IV, L.P.	279,599	49,720,401
Silver Lake Partners II	9,279,884	3,531,586
Silver Lake Partners III	64,720,656	19,303,187
Silver Lake Partners IV, L.P.	19,890,812	35,303,205
SM/TCP L.P.	18,462,599	27,176,054
SMRS-NCRP LLC	1,346,254,329	182,483,832
Sprout Capital IX	80,309	-

	<u>Adjusted Reported Value</u>	<u>Unfunded Commitment</u>
TCW Shared Op Fund III	1,048,221	-
TCW Shared Op Fund IV	5,588	4,524,779
TCW/Crescent Mezzanine Partners III, L.P.	4,102,241	4,552,763
TCW/Crescent Mezzanine Partners IV, L.P.	7,179,249	6,030,737
TCW/Crescent Mezzanine Partners V, LLC	46,723,397	12,906,252
The Huron Fund III, L.P.	8,962,979	4,992,756
The Huron Fund IV, L.P.	9,573,955	23,646,846
The Shansby Group 4	2,497,364	520,829
The Shansby Group 5 (TSG5)	61,566,184	6,128,637
TPG IV (Texas Pacific Group IV)	13,990,699	211,725
TPG Partners III, LP	9,946,105	2,087,002
TPG Partners VI, L.P.	200,341,092	26,194,845
TPG Partners, VII, L.P.	2,276,824	146,711,151
TPG V (Texas Pacific Group V)	166,355,949	26,611,195
Trilantic Capital Partners V (North America) Fund A	21,026,082	25,879,408
TSG6, L.P.	111,446,724	55,954,457
** TSG7 A L.P.	0	125,000,000
Turnbridge Capital Partners I , LP	15,302,533	79,331,373
Veritas Capital Fund V, L.P.	37,610,503	36,969,209
Veritas V Co-Investors, L.P.	4,999,609	20,000,000
Vista Equity Partners Fund V, L.P.	35,662,769	16,303,560
Warburg Pincus Energy MCIP, L.P.	9,680,147	15,415,371
Warburg Pincus Energy, L.P.	16,715,218	81,300,000
Warburg Pincus Equity Partners, L.P.	4,139,731	-
Warburg Pincus International Partners	10,579,366	-
Warburg Pincus Private Equity IX	32,417,612	-
Warburg Pincus Private Equity VIII, L.P.	19,329,815	-
Warburg Pincus Private Equity X, L.P.	163,578,688	-
Warburg Pincus Private Equity XI, L.P.	190,727,472	31,500,000
** Warburg Pincus Private Equity XII, L.P.	2,712,500	172,287,500
WestAm COREplus Private Equity QP	5,179,744	2,086,719
WestAm Special Private Equity Partners	4,502,562	2,317,427
* Total Private Equity	\$ 9,528,902,309	\$ 4,884,778,403
Cash	103,051,877	-
Active Small Cap Cash	25,338,465	-
Active Small Cap	1,913,637	-
Income Accruals	103,704	-
Grand Total	\$ 9,659,309,992	\$ 4,884,778,403

* Total Private Equity amounts do not include Cash and Active Small Cap

** New Commitments made during quarter reported

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

**REAL ESTATE AND
INFRASTRUCTURE REVIEW**

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Brian C. Liikala
Senior Investment Manager
Real Estate and Infrastructure Division**

EXECUTIVE SUMMARY

Performance

MPSERS Plan	1-Year	3-Years	5-Years	7-Years	10-Years
Annualized Return	9.6%	13.5%	12.4%	3.7%	6.0%
NCREIF NPI	11.9%	10.6%	10.8%	6.2%	6.4%
Peer Median Return	9.9%	12.1%	12.0%	4.6%	5.3%
Rank vs. Peers	52	26	45	59	42

- Total Real Estate and Infrastructure Division (REID) value was \$6.2 billion with a total one-year return of 9.6%. Strong performance was the result of increased rental income and valuations in for-rent housing and hospitality assets. Credit strategies and unique opportunities sourced by staff have also contributed to overall performance. The return was negatively impacted by the decline in foreign currency in REID's infrastructure investments.

Strategy Update

- The REID strategy of obtaining the highest risk-adjusted returns focuses on developing apartments and industrial warehouse buildings in select urban markets, investing in under-managed office properties in markets that have strong economic fundamentals by adding value through leasing and management, and credit strategy investing through mezzanine debt opportunities on transitional properties. Also, REID has gained exposure in Europe where pricing and returns are favorable.
- The REID has been selling stabilized assets at attractive low capitalization rates where rental income increases are expected to be limited. The REID has disposed of suburban properties in favor of developing/redeveloping properties in dense urban areas where rent growth and appreciation are strong. The REID is also working with its advisors in executing the disposition of non-strategic properties in secondary markets at attractive values, returning over \$2 billion in gross distributions over the last two years.
- The REID has approximately \$1.4 billion in unfunded commitments. New commitments closed during the quarter include:
 - \$50 million in Rialto Real Estate Fund III-Debt, LP, a commingled fund investing in high-yield real estate debt, managed by Rialto Capital Management.
 - \$50 million in TSP Value and Income Fund LP, a commingled fund focused on value-add real estate properties, managed by Transwestern Investment Group.
 - \$20 million in Avanath II SMRS Co-Investment Fund LLC, a co-investment in affordable multi-family apartments in various locations, managed by Avanath Capital Management.
 - \$10 million in M1 Westgate CoInvest LLC, a co-investment in a multi-family development in Santa Monica, CA, managed by CIM Investment Advisors.

Market Environment

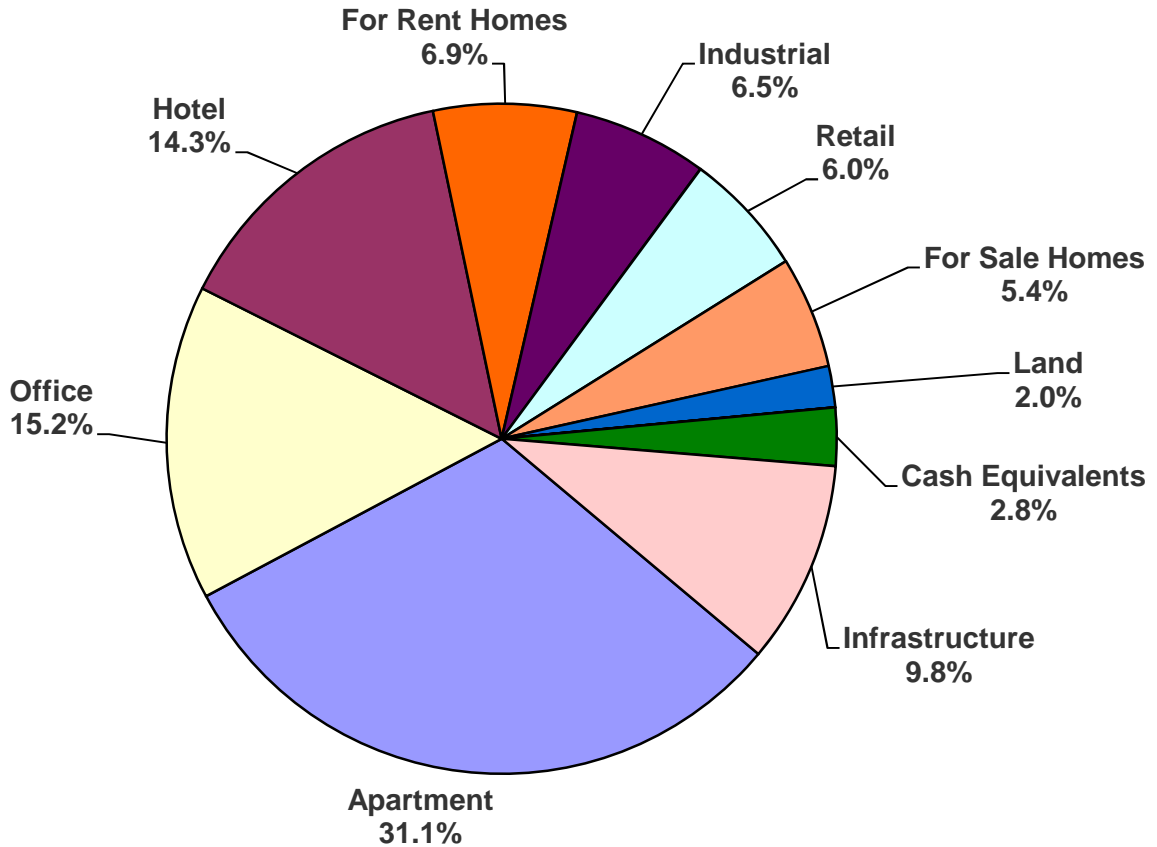
- High quality core assets continue to be in high demand as investors, both domestic and international, seek long-term protection from volatility at the expense of historically low yields. Investors are also valuing unleased space into their pricing. In major markets including New York, San Francisco, and Boston, properties are trading at near record low capitalization rates. However, early signs of pricing leveling off are appearing. Secondary markets are now being targeted by investors seeking higher yields. Development of apartments and condominiums in major urban markets continue. Office and industrial construction has started in the major markets, the highest starts since 2007. The U.S. has eased FIRPTA Rules to reduce federal taxes on foreign investors for real estate investments.
- Fund flows to the infrastructure sector continue to remain strong, as investor interest in the asset class continues to grow. Opportunities include North American energy where distressed pricing is appearing, power generation, European transportation, and emerging market fundamental infrastructure projects.
- In the commercial mortgage-backed securities (CMBS) market, spreads over the swap rate for 10-year AAA-rated securities increased 12 basis points (bps) from the prior quarter and now stand at 136 bps. Commercial Mortgage Alert reported that CMBS issuance is projected to be over \$110 billion for 2016 compared to \$106 billion in 2015. A wave of refinancing for 2007 ten-year vintage loans is on the horizon. New banking rules by the federal government could negatively impact traditional bank lenders in 2016. This could make it difficult for borrowers to refinance properties, with borrowing costs expected to rise due to the new rules. However, this provides opportunities for non-bank lenders, where REID's strategy has focused its attention.



SMRS

Real Estate and Infrastructure

12/31/15



Market Value in Millions				
	12/31/15		9/30/15	
Apartment	\$1,913	31.1%	\$1,840	30.9%
Office	937	15.2%	905	15.2%
Hotel	883	14.3%	902	15.2%
Infrastructure	603	9.8%	582	9.8%
For Rent Homes	423	6.9%	397	6.7%
Industrial	401	6.5%	326	5.5%
Retail	371	6.0%	384	6.5%
For Sale Homes	334	5.4%	338	5.7%
Land	123	2.0%	133	2.2%
	<u>\$5,988</u>	<u>97.2%</u>	<u>\$5,807</u>	<u>97.7%</u>
Cash Equivalents	<u>169</u>	<u>2.8%</u>	<u>139</u>	<u>2.3%</u>
Total Investments	<u>\$6,157</u>	<u>100.0%</u>	<u>\$5,946</u>	<u>100.0%</u>



SMRS
Real Estate and Infrastructure
12/31/15

**Top Ten
Advisors or Entity**

<u>Advisor or Entity</u>	<u>Net Market Value</u>
MWT Holdings, LLC (SHLP)	\$ 1,257,870,739
Clarion Partners	637,082,229
Blackstone Group	581,881,010
Kensington Realty Advisors, Inc.	302,084,803
CIM Investment Advisors LLC	247,752,834
Principal Real Estate Investors	238,087,506
Bentall Kennedy LP	232,312,095
Five Star Realty Partners, LLC	199,023,610
Domain Capital Advisors Inc	196,809,757
KBS Realty Advisors	184,150,629
	\$ 4,077,055,212

**Occupancy
by Property Type**

	Apartment	Office	Industrial	Retail	Hotel
SMRS Portfolio	94.3%	86.5%	90.8%	94.5%	76.8%
National Average	93.0%	86.0%	89.8%	94.2%	71.3%



SMRS
Net Market Values by Ownership Entity
12/31/15

REAL ESTATE

	<u>Net Market Value</u>	<u>Unfunded Commitment</u>
801 Grand Avenue Capital, LLC	\$ 85,429,986	\$ 0
AGL Annuity Contract GVA 0016	227,614,719	0
Avanath Affordable Housing I, LLC	25,650,148	2,492,748
Avanath Affordable Housing II, LLC	18,899,227	2,914,830
* Avanath II SMRS Co-Investment Fund LLC	20,000,000	0
Beacon Capital Strategic Partners IV, LP	6,851,418	0
Beacon Capital Strategic Partners V, LP	9,455,972	2,500,000
Blackstone R/E IH3 Co-Inv Partners	422,544,780	0
Blackstone Real Estate Partners V, LP	38,079,264	2,087,026
Blackstone Real Estate Partners VI, LP	49,865,682	4,080,193
Blackstone Real Estate Partners VIII, LP	14,514,743	70,235,000
Capri Select Income II	135,606	0
Capri Urban Investors, LLC	22,104,300	0
CIM Fund III, LP	85,532,219	0
CIM Fund VIII, LP	35,089,037	63,803,421
CIM Urban REIT, LLC	91,636,834	0
CIM VI (Urban REIT), LLC	28,352,857	0
City Lights Investments, LLC	5,843	0
Clarion Gables Multifamily Trust	27,345,642	0
CPI Capital Partners N.A., LP	424,559	0
CPI Capital Partners N.A. Secondary, LP	5,303,457	0
Crown Small Cap Real Estate	5,000,640	19,875,000
Devon Real Estate Conversion Fund, LP	5,622,441	0
Domain GVA-1, LLC	167,169,280	175,041,710
Domain Hotel Properties, LLC	436,234,680	0
Dynamic Retail Trust	68,195,917	0
Eastport Properties, LLC	20,114,418	0
Gateway Capital R/E Fund II, LP	58,459,880	1,275,000
Great Lakes Property Group Trust	286,859,186	0
Invesco Mortgage Recovery Feeder Fund	24,382,694	140,620
Invesco Mortgage Recovery Fund II, LP	46,630,972	27,764,976
IPF II Co-Invest LP	5,047,192	26,465,897
JBC North LaSalle, LLC	19,191,878	7,800,000
JBC Opportunity Fund III, LP	10,581,493	0
JP Morgan India Property Fund II, LLC	18,090,168	24,026,173
KBS/SM Fund III, LP	126,593,028	5,938,078
L-A Saturn Acquisition, LP	33,933,044	0
Landmark Real Estate Partners V, LP	17,535,145	3,900,000
LaSalle Asia Opportunity Fund II, LP	272,086	0
LaSalle Asia Opportunity Fund III, LP	17,443,597	1,250,000
Lion Industrial Trust	155,313,780	0
Lion Mexico Fund, LP	18,188,127	0
Lowes Hospitality Investment Partners	166,784	0
Lubert-Adler Real Estate Fund VII, LP	28,335,663	45,000,000
* M1 Westgate ColInvest LLC	7,141,887	2,563,592
MERS Acquisitions, Ltd.	126,279,270	0
MG Alliance, LLC	16,176,748	0
MIP Holdco, LLC	62,153,516	37,000,000
Morgan Stanley R/E Fund V - International	4,311,398	0
Morgan Stanley R/E Fund VI - International	23,963,379	0

	Net Market Value	Unfunded Commitment
Morgan Stanley R/E Fund V - U.S.	16,978,523	0
Morgan Stanley R/E Special Situations Fund III	46,620,420	0
MWT Holdings, LLC	1,257,870,739	0
Northpark-Land Associates, LLLP	29,640,477	64,500,000
Orange Investors LLC	34,227,942	0
Paladin Realty Brazil Investors III (USA), LP	26,802,250	0
Paladin Realty Latin America Investors IV-CI, LP	14,536,770	28,109,562
Principal Separate Account	152,657,520	0
Proprium RE Spec Situations Fund LP	19,351,440	16,660,593
Rialto Real Estate Fund, LP	32,803,170	0
Rialto Real Estate Fund II, LP	47,411,802	0
* Rialto Real Estate Fund III-Debt, LP	0	50,000,000
Rialto Mezzanine Partners Fund	71,867,957	0
SM Brell II, LP	57,557,601	0
Stockbridge Real Estate Fund II-C, LP	33,686,219	0
Strategic LP	232,310,999	43,600,000
TPG RE Finance Trust	94,528,224	5,659,260
TPG RE Fund II	5,969,316	41,587,286
* TSP Value and Income Fund LP	21,528,826	28,743,396
Trophy Property Development LP	61,542,979	7,408,100
True North High Yield Investment Fund II	27,229,203	5,000,000
True North Real Estate Fund III	11,634,381	38,131,387
Venture Center, LLC	40,132,549	0
Western National Realty Fund II, LP	24,038,642	0
	<u>\$ 5,385,152,533</u>	<u>\$ 855,553,848</u>
Short-Term Investments and Other	144,263,234	0
Total Real Estate Investments	<u>\$ 5,529,415,767</u>	<u>\$ 855,553,848</u>

INFRASTRUCTURE

ArcLight Energy Partners Fund VI, LP	\$ 13,769,395	\$ 35,076,963
ASF VI Infrastructure B LP	8,190,540	22,094,113
ASF Como Co-Investment LP	30,608,895	15,877,402
Balfour Beatty Infrastructure Partners, LP	26,091,665	24,979,809
Blackstone Energy Partners, LP	52,970,163	5,460,000
Blackstone Energy Partners II, LP	0	85,000,000
Brookfield Infrastructure Fund II-B, LP	35,872,908	13,993,142
Customized Infrastructure Strategies, LP	77,392,032	8,433,467
Dalmore Capital Fund	66,728,642	0
First Reserve Energy Infrastructure Fund II, LP	8,015,247	65,600,000
GCM Grosvenor Infrastructure Investment Program, LP	51,451,819	0
GCM Grosvenor Customized Infrastructure Strategies II, LP	15,792,480	45,867,578
GSO Energy Select Opportunities Fund LP	3,906,378	46,093,622
JP Morgan AIRRO India Sidecar Fund US, LLC	69,549,563	5,033,815
JP Morgan AIRRO Fund II US, LLC	12,259,160	83,384,246
KKR Eagle Co-Invest GP LTD	14,876,775	8,575,281
KKR Global Infrastructure Investors, LP	63,838,474	14,582,543
StonePeak Infrastructure Fund LP	51,112,983	16,573,057
	<u>\$ 602,427,121</u>	<u>\$ 496,625,038</u>
Short-Term Investments and Other	25,019,106	0
Total Infrastructure Investments	<u>\$ 627,446,226</u>	<u>\$ 496,625,038</u>
TOTAL INVESTMENTS	<u>\$ 6,156,861,993</u>	<u>\$ 1,352,178,886</u>

* New or additional commitment made during the quarter reported

**STATE OF MICHIGAN
RETIREMENT SYSTEMS**

BASKET CLAUSE REVIEW

INVESTMENT ADVISORY COMMITTEE MEETING

MARCH 2, 2016



**Karen M. Stout, CPA, CGFM, Administrator
Trust Accounting Division**



SMRS

Basket Clause Investments

12/31/15

<u>Asset Class</u>	<u>Value</u>
Total Absolute Return	\$4,533,342,852
Total Real Return and Opportunistic	864,840,505
Total International Equity	517,410,091
Total Long-Term Fixed Income	<u>33,158,160</u>
Total Basket Clause Investments	<u>\$5,948,751,608</u>

The basket clause investments at December 31, 2015, were \$6.0 billion or 9.9% of the total portfolio value of \$60.1 billion.

The Public Employee Retirement System Investment Act, 1965 PA 314, MCL 38.1132 *et seq*, authorizes the State Treasurer to invest up to 30% of the system's assets in investments "not otherwise qualified under the act." MCL 38.1140d(1). Commonly referred to as Section 20d (after the authorizing section of PA 314) or Basket Clause investments, this provision gives the State Treasurer the flexibility to take advantage of market opportunities not specifically authorized in PA 314 while conserving protections against imprudent investment.

Disclaimer



This presentation was given solely for the purpose of explaining the structure, investment process, and returns for the State of Michigan Retirement Systems. It should not be interpreted in any way as financial advice.

