

## MEETING MATERIALS

# HOWARD COUNTY RETIREMENT PLANS

December 5, 2019

**Margaret Belmondo, CIMA®**, Senior Consultant

**Will Forde, CFA, CAIA**, Senior Consultant

**Marisa Gorman**, Consulting Analyst



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# OCTOBER FLASH REPORT

NEPC, LLC

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# CALENDAR YEAR INDEX PERFORMANCE

	2010	2011	2012	2013	2014	2015	2016	2017	2018	Oct	YTD
<b>S&amp;P 500</b>	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	-4.4%	2.2%	23.2%
<b>Russell 1000</b>	16.1%	1.5%	16.4%	33.1%	13.2%	0.9%	12.1%	21.7%	-4.8%	2.1%	23.1%
<b>Russell 2000</b>	26.9%	-4.2%	16.3%	38.8%	4.9%	-4.4%	21.3%	14.6%	-11.0%	2.6%	17.2%
<b>Russell 2500</b>	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.9%	17.6%	16.8%	-10.0%	1.9%	20.0%
<b>MSCI EAFE</b>	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%	1.0%	25.0%	-13.8%	3.6%	16.9%
<b>MSCI EM</b>	18.9%	-18.4%	18.2%	-2.6%	-2.2%	-14.9%	11.2%	37.3%	-14.6%	4.2%	10.4%
<b>MSCI ACWI</b>	12.7%	-7.3%	16.1%	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	2.7%	19.4%
<b>Private Equity</b>	19.8%	9.5%	12.6%	22.3%	14.6%	10.4%	10.3%	21.0%	13.1%	-	4.9%
<b>BC TIPS</b>	6.3%	13.6%	7.0%	-8.6%	3.6%	-1.4%	4.7%	3.0%	-1.3%	0.3%	7.9%
<b>BC Municipal</b>	2.4%	10.7%	6.8%	-2.6%	9.1%	3.3%	0.2%	5.4%	1.3%	0.2%	6.9%
<b>BC Muni High Yield</b>	7.8%	9.2%	18.1%	-5.5%	13.8%	1.8%	3.0%	9.7%	4.8%	0.2%	9.9%
<b>BC US Corporate HY</b>	15.1%	5.0%	15.8%	7.4%	2.5%	-4.5%	17.1%	7.5%	-2.1%	0.3%	11.7%
<b>BC US Agg Bond</b>	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	0.3%	8.8%
<b>BC Global Agg</b>	5.5%	5.6%	4.3%	-2.6%	0.6%	-3.2%	2.1%	7.4%	-1.2%	0.7%	7.0%
<b>BC Long Treasuries</b>	9.4%	29.9%	3.6%	-12.7%	25.1%	-1.2%	1.3%	8.5%	-1.8%	-0.9%	18.7%
<b>BC US Long Credit</b>	10.7%	17.1%	12.7%	-6.6%	16.4%	-4.6%	10.2%	12.2%	-6.8%	0.5%	22.6%
<b>BC US STRIPS 20+ Yr</b>	10.9%	58.5%	3.0%	-21.0%	46.4%	-3.7%	1.4%	13.7%	-4.1%	-1.4%	26.6%
<b>JPM GBI-EM Global Div</b>	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-14.9%	9.9%	15.2%	-6.2%	2.9%	11.0%
<b>JPM EMBI Glob Div</b>	12.2%	7.3%	17.4%	-5.3%	7.4%	1.2%	10.2%	10.3%	-4.3%	0.3%	13.3%
<b>CS Hedge Fund</b>	10.9%	-2.5%	7.7%	9.7%	4.1%	-0.7%	1.2%	7.1%	-3.2%	-	6.7%
<b>BBG Commodity</b>	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-11.2%	2.0%	5.2%
<b>Alerian MLP</b>	35.9%	13.9%	4.8%	27.6%	4.8%	-32.6%	18.3%	-6.5%	-12.4%	-6.2%	4.2%
<b>FTSE NAREIT Equity REITs</b>	28.0%	8.3%	18.1%	2.5%	30.1%	3.2%	8.5%	5.2%	-4.6%	1.4%	28.7%

Source: FactSet, Barclays, Thomson One

\*Private Equity return represents calendar year pooled IRR and is subject to a one quarter lag



# TRAILING ANNUAL INDEX PERFORMANCE

Equity						
	Oct-19	YTD	1 YR	3 YR	5 YR	10 YR
<b>MSCI ACWI</b>	2.7%	19.4%	12.5%	11.3%	7.1%	8.8%
<b>S&amp;P 500</b>	2.2%	23.2%	14.3%	14.8%	10.7%	13.6%
<b>Russell 1000</b>	2.1%	23.1%	14.1%	14.7%	10.5%	13.7%
<b>Russell 2000</b>	2.6%	17.2%	4.9%	10.9%	7.3%	12.2%
<b>Russell 2500</b>	1.9%	20.0%	8.8%	11.7%	8.0%	13.1%
<b>MSCI EAFE</b>	3.6%	16.9%	11.0%	8.5%	4.3%	5.4%
<b>MSCI EM</b>	4.2%	10.4%	11.8%	7.3%	2.9%	3.8%
Credit						
	Oct-19	YTD	1 YR	3 YR	5 YR	10 YR
<b>BC Global Agg</b>	0.7%	7.0%	9.5%	2.8%	2.1%	2.4%
<b>BC US Agg</b>	0.3%	8.8%	11.5%	3.3%	3.2%	3.7%
<b>BC Credit</b>	0.6%	13.3%	14.8%	4.8%	4.4%	5.3%
<b>BC US HY</b>	0.3%	11.7%	8.3%	6.0%	5.2%	7.8%
<b>BC Muni</b>	0.2%	6.9%	9.4%	3.6%	3.5%	4.4%
<b>BC Muni HY</b>	0.2%	9.9%	11.6%	6.4%	6.1%	7.2%
<b>BC TIPS</b>	0.3%	7.9%	8.9%	2.4%	2.3%	3.4%
<b>BC 20+ STRIPS</b>	-1.4%	26.6%	39.6%	7.0%	8.2%	9.9%
<b>BC Long Treasuries</b>	-0.9%	18.7%	27.5%	5.2%	6.0%	6.9%
<b>BC Long Credit</b>	0.5%	22.6%	25.0%	7.4%	6.6%	7.8%
<b>BC Govt/Credit 1-3 Yr</b>	0.3%	3.8%	4.9%	1.9%	1.6%	1.5%
<b>JPM EMBI Glob Div</b>	0.3%	13.3%	14.3%	5.1%	5.4%	6.9%
<b>JPM GBI-EM Glob Div</b>	2.9%	11.0%	15.5%	4.3%	0.8%	2.7%
Real Assets						
	Oct-19	YTD	1 YR	3 YR	5 YR	10 YR
<b>BBG Commodity</b>	2.0%	5.2%	-2.6%	-0.7%	-6.6%	-4.4%
<b>Alerian MLP</b>	-6.2%	4.2%	-6.3%	-3.1%	-8.9%	5.3%
<b>FTSE NAREIT Equity REITs</b>	1.4%	28.7%	23.6%	9.9%	8.5%	13.7%

Source: S&P, MSCI, Russell, Barclays, JPM, Alerian, FTSE, FactSet



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE SUMMARY (GROSS)

	Ending October 31, 2019										
	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Fund Composite</b>	<b>1,115,178,728</b>	<b>100.0</b>	<b>100.0</b>	<b>1.6</b>	<b>13.0</b>	<b>11.4</b>	<b>9.5</b>	<b>7.2</b>	<b>8.5</b>	<b>7.3</b>	<b>Apr-97</b>
<i>Policy Index</i>				1.5	12.5	11.4	8.3	6.5	7.9	7.3	Apr-97
<i>Allocation Index</i>				1.5	--	--	--	--	--	--	Apr-97
<b>Total US Equity Composite</b>	<b>274,294,258</b>	<b>24.6</b>	<b>20.0</b>	<b>2.4</b>	<b>22.2</b>	<b>12.5</b>	<b>15.4</b>	<b>10.7</b>	<b>14.3</b>	<b>8.5</b>	<b>Jul-97</b>
<i>Russell 3000</i>				2.2	22.7	13.5	14.5	10.3	13.6	7.9	Jul-97
<i>US Equity Allocation Index</i>				2.3	22.2	12.6	14.2	10.0	13.8	--	Jul-97
<b>Total International Equity</b>	<b>200,186,216</b>	<b>18.0</b>	<b>20.0</b>	<b>4.1</b>	<b>16.6</b>	<b>14.0</b>	<b>9.0</b>	<b>4.7</b>	<b>5.6</b>	<b>4.7</b>	<b>Jul-97</b>
<i>MSCI ACWI ex USA</i>				3.5	15.5	11.3	8.1	3.8	4.9	4.6	Jul-97
<b>Total Fixed Income Composite</b>	<b>323,916,111</b>	<b>29.0</b>	<b>30.0</b>	<b>0.8</b>	<b>9.2</b>	<b>11.2</b>	<b>4.1</b>	<b>4.2</b>	<b>5.0</b>	<b>5.5</b>	<b>Jul-97</b>
<i>Fixed Income Policy Index</i>				0.3	8.8	11.5	3.3	3.2	3.7	5.3	Jul-97
<b>Total Real Assets Composite</b>	<b>40,103,299</b>	<b>3.6</b>	<b>7.5</b>	<b>0.0</b>	<b>0.6</b>	<b>3.5</b>	<b>9.4</b>	<b>9.0</b>	<b>5.0</b>	<b>7.3</b>	<b>Jul-03</b>
<i>NCREIF Property Index 1 Qtr. Lag</i>				0.0	4.8	6.5	6.9	8.8	9.2	8.8	Jul-03
<b>Cash Composite</b>	<b>7,660,668</b>	<b>0.7</b>		<b>0.1</b>	<b>1.6</b>	<b>1.9</b>	<b>1.3</b>	<b>0.8</b>	<b>0.4</b>	<b>1.4</b>	<b>Dec-03</b>
<i>91 Day T-Bills</i>				0.1	1.8	2.2	1.6	1.0	0.5	1.3	Dec-03
<b>Hedge Fund Composite</b>	<b>122,254,445</b>	<b>11.0</b>	<b>12.5</b>	<b>0.3</b>	<b>5.9</b>	<b>3.6</b>	<b>4.9</b>	<b>4.2</b>	<b>--</b>	<b>4.7</b>	<b>Jan-11</b>
<i>HFRI FOF: Conservative Index</i>				0.5	5.0	3.2	3.2	2.3	2.7	2.4	Jan-11
<b>Private Equity Composite</b>	<b>146,763,731</b>	<b>13.2</b>	<b>10.0</b>	<b>0.0</b>	<b>11.3</b>	<b>16.6</b>	<b>17.1</b>	<b>15.7</b>	<b>13.7</b>	<b>13.0</b>	<b>Jul-08</b>
<i>Cambridge Associates Global All PE (Qtr Lag)</i>				0.0	7.3	10.8	14.5	11.0	13.7	9.4	Jul-08

Fiscal year end 6/30.

All history prior to 3/1/2019 was provided by AndCo.



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	1 Mo (%)	YTD (%)	Ending October 31, 2019					
						1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Fund Composite</b>	<b>1,115,178,728</b>	<b>100.0</b>	<b>100.0</b>	<b>1.6</b>	<b>13.0</b>	<b>11.4</b>	<b>9.5</b>	<b>7.2</b>	<b>8.5</b>	<b>7.3</b>	<b>Apr-97</b>
Policy Index				1.5	12.5	11.4	8.3	6.5	7.9	7.3	Apr-97
Allocation Index				1.5	--	--	--	--	--	--	Apr-97
<b>Total US Equity Composite</b>	<b>274,294,258</b>	<b>24.6</b>	<b>20.0</b>	<b>2.4</b>	<b>22.2</b>	<b>12.5</b>	<b>15.4</b>	<b>10.7</b>	<b>14.3</b>	<b>8.5</b>	<b>Jul-97</b>
Russell 3000				2.2	22.7	13.5	14.5	10.3	13.6	7.9	Jul-97
US Equity Allocation Index				2.3	22.2	12.6	14.2	10.0	13.8	--	Jul-97
<b>Large Cap Composite</b>	<b>213,201,598</b>	<b>19.1</b>	<b>15.0</b>	<b>3.1</b>	<b>21.8</b>	<b>12.5</b>	<b>14.9</b>	<b>10.1</b>	<b>13.8</b>	<b>8.5</b>	<b>Apr-01</b>
Russell 1000				2.1	23.1	14.2	14.7	10.5	13.7	7.7	Apr-01
Invesco IQS – US Enhanced 1% Risk SMA	70,671,273	6.3		2.0	19.9	11.0	14.1	9.6	13.4	7.7	Apr-01
S&P 500				2.2	23.2	14.3	14.9	10.8	13.7	7.4	Apr-01
LSV Asset Management SMA	65,156,324	5.8		3.4	18.8	9.5	11.7	8.2	13.1	9.8	May-00
Russell 1000 Value				1.4	19.5	11.2	10.5	7.6	12.0	6.9	May-00
Westfield Capital Management SMA	77,374,001	6.9		3.8	26.4	16.7	18.8	12.4	--	15.7	Jul-10
Russell 1000 Growth				2.8	26.8	17.1	18.9	13.4	15.4	16.5	Jul-10
<b>Small/Mid Cap Composite</b>	<b>61,092,660</b>	<b>5.5</b>	<b>5.0</b>	<b>0.4</b>	<b>23.6</b>	<b>12.4</b>	<b>17.1</b>	<b>12.6</b>	<b>15.3</b>	<b>12.2</b>	<b>Apr-93</b>
Russell 2500				1.9	20.0	8.8	11.7	8.0	13.1	10.2	Apr-93
William Blair SMA	20,387,967	1.8		0.2	26.4	14.6	20.4	14.0	16.8	12.1	Jun-06
Russell 2500 Growth				2.6	23.1	11.8	15.3	9.8	14.4	9.4	Jun-06
ICM Small Company - ICSCX	23,400,848	2.1		1.9	21.3	9.6	12.6	9.7	13.1	11.8	Apr-93
Russell 2000 Value				2.4	15.5	3.2	8.6	6.2	11.1	9.7	Apr-93
Brown Capital Small Company Strategy SMA	17,303,845	1.6		-1.4	23.6	13.8	20.0	15.2	--	17.7	Aug-11
Russell 2000 Growth				2.8	18.6	6.4	13.2	8.4	13.4	10.8	Aug-11



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	Ending October 31, 2019							
				1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total International Equity</b>	<b>200,186,216</b>	<b>18.0</b>	<b>20.0</b>	<b>4.1</b>	<b>16.6</b>	<b>14.0</b>	<b>9.0</b>	<b>4.7</b>	<b>5.6</b>	<b>4.7</b>	<b>Jul-97</b>
<i>MSCI ACWI ex USA</i>				3.5	15.5	11.3	8.1	3.8	4.9	4.6	Jul-97
<b>International Developed Markets Composite</b>	<b>131,777,071</b>	<b>11.8</b>	<b>13.0</b>	<b>5.1</b>	<b>19.3</b>	<b>13.7</b>	<b>8.9</b>	<b>4.8</b>	<b>6.2</b>	<b>3.3</b>	<b>Mar-08</b>
<i>MSCI EAFE</i>				3.6	16.9	11.0	8.5	4.3	5.4	2.4	Mar-08
Mondrian International Equity Fund, L.P.	62,190,457	5.6		5.1	14.1	9.5	8.1	4.2	5.7	2.0	Dec-07
<i>MSCI EAFE</i>				3.6	16.9	11.0	8.5	4.3	5.4	1.5	Dec-07
Baillie Gifford EAFE Pure K - BGPKX	69,586,614	6.2		5.0	24.5	18.0	--	--	--	3.9	May-18
<i>MSCI EAFE</i>				3.6	16.9	11.0	8.5	4.3	5.4	0.0	May-18
<b>International Emerging Markets Composite</b>	<b>68,409,144</b>	<b>6.1</b>	<b>7.0</b>	<b>2.3</b>	<b>11.7</b>	<b>14.6</b>	<b>9.3</b>	<b>4.5</b>	<b>4.2</b>	<b>5.9</b>	<b>Feb-06</b>
<i>MSCI Emerging Markets</i>				4.2	10.4	11.9	7.4	2.9	3.8	4.6	Feb-06
DFA Emerging Markets Value Portfolio Institutional - DFEVX	26,831,454	2.4		3.5	3.9	4.2	5.9	2.5	3.3	5.3	Feb-06
<i>MSCI Emerging Markets</i>				4.2	10.4	11.9	7.4	2.9	3.8	4.6	Feb-06
GQG Partners Emerging Markets Equity Fund	41,577,690	3.7		1.6	17.4	--	--	--	--	17.2	Dec-18
<i>MSCI Emerging Markets</i>				4.2	10.4	11.9	7.4	2.9	3.8	7.4	Dec-18
<b>Total Fixed Income Composite</b>	<b>323,916,111</b>	<b>29.0</b>	<b>30.0</b>	<b>0.8</b>	<b>9.2</b>	<b>11.2</b>	<b>4.1</b>	<b>4.2</b>	<b>5.0</b>	<b>5.5</b>	<b>Jul-97</b>
<i>BBgBarc US Aggregate TR</i>				0.3	8.8	11.5	3.3	3.2	3.7	5.1	Jul-97
<b>Core Fixed Income Composite</b>	<b>277,554,717</b>	<b>24.9</b>	<b>25.0</b>	<b>0.4</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>7.2</b>	<b>Mar-19</b>
<i>BBgBarc US Aggregate TR</i>				0.3	8.8	11.5	3.3	3.2	3.7	7.8	Mar-19
Dodge & Cox SMA	134,771,940	12.1		0.5	9.4	10.8	4.3	4.1	--	4.7	May-10
<i>BBgBarc US Aggregate TR</i>				0.3	8.8	11.5	3.3	3.2	3.7	3.7	May-10
PIMCO Total Return	119,884,765	10.8		0.2	8.7	10.6	3.7	3.4	--	4.1	May-10
<i>BBgBarc US Aggregate TR</i>				0.3	8.8	11.5	3.3	3.2	3.7	3.7	May-10
State Street Global Advisors TIPS	22,898,012	2.1		0.3	7.8	8.9	2.4	2.3	3.3	3.3	Nov-09
<i>BBgBarc US TIPS TR</i>				0.3	7.9	9.0	2.4	2.3	3.4	3.4	Nov-09
<b>Emerging Markets Debt Composite</b>	<b>46,361,394</b>	<b>4.2</b>	<b>5.0</b>	<b>3.3</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>6.2</b>	<b>Mar-19</b>
<i>JP Morgan GBI EM Global Diversified TR USD</i>				2.9	11.0	15.6	4.3	0.8	2.6	6.4	Mar-19
Colchester Local Markets Debt Fund	46,361,394	4.2		3.3	10.8	16.0	5.7	--	--	9.0	Oct-15
<i>JP Morgan GBI EM Global Diversified TR USD</i>				2.9	11.0	15.6	4.3	0.8	2.6	7.0	Oct-15



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	Ending October 31, 2019							
				1 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Real Assets Composite</b>	<b>40,103,299</b>	<b>3.6</b>	<b>7.5</b>	<b>0.0</b>	<b>0.6</b>	<b>3.5</b>	<b>9.4</b>	<b>9.0</b>	<b>5.0</b>	<b>7.3</b>	<b>Jul-03</b>
<i>NCREIF Property Index 1 Qtr. Lag</i>				0.0	4.8	6.5	6.9	8.8	9.2	8.8	Jul-03
<b>Real Estate Composite</b>	<b>27,180,707</b>	<b>2.4</b>		<b>0.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>1.6</b>	<b>Mar-19</b>
<i>NCREIF Property Index 1 Qtr. Lag</i>				0.0	4.8	6.5	6.9	8.8	9.2	4.8	Mar-19
Realty Associates Fund VIII L.P.	6,414	0.0		0.0	-42.2	-42.2	-10.9	-2.0	-1.5	-2.0	Jul-07
Partners Group Global RE 2011	5,109,856	0.5		0.0	-9.8	-12.3	1.8	2.4	--	4.0	Mar-12
Partners Group Global RE 2014	18,068,761	1.6		0.0	5.5	7.5	11.6	--	--	9.5	Dec-14
Partners Group Global RE 2017	3,990,280	0.4		0.0	4.2	--	--	--	--	4.2	Dec-18
<i>NCREIF Property Index 1 Qtr. Lag</i>				0.0	4.8	6.5	6.9	8.8	9.2	6.5	Dec-18
<b>Real Assets Composite</b>	<b>12,922,592</b>	<b>1.2</b>		<b>0.0</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>-4.4</b>	<b>Mar-19</b>
<i>Cambridge Associates Global Natural Resources (1 Qtr Lag)</i>				0.0	-7.4	-5.4	5.9	-2.4	5.1	-7.4	Mar-19
Commonfund Natural Resources X	5,047,260	0.5		0.0	4.5	5.4	40.1	--	--	18.5	Apr-16
Commonfund Natural Resources XI	794,870	0.1		0.0	-41.7	-41.7	--	--	--	-39.2	Oct-18
Aether Real Assets IV	6,176,873	0.6		0.0	2.0	9.2	5.6	--	--	4.9	Jun-16
Aether Real Assets V	903,590	0.1		0.0	-69.8	-46.0	--	--	--	-38.9	Aug-18
<i>Cambridge Associates Global Natural Resources (1 Qtr Lag)</i>				0.0	-7.4	-5.4	5.9	-2.4	5.1	-1.6	Aug-18
<b>Cash Composite</b>	<b>7,660,668</b>	<b>0.7</b>	<b>0.0</b>	<b>0.1</b>	<b>1.6</b>	<b>1.9</b>	<b>1.3</b>	<b>0.8</b>	<b>0.4</b>	<b>1.4</b>	<b>Dec-03</b>
<i>91 Day T-Bills</i>				0.1	1.8	2.2	1.6	1.0	0.5	1.3	Dec-03
<b>Hedge Fund Composite</b>	<b>122,254,445</b>	<b>11.0</b>	<b>12.5</b>	<b>0.3</b>	<b>5.9</b>	<b>3.6</b>	<b>4.9</b>	<b>4.2</b>	<b>--</b>	<b>4.7</b>	<b>Jan-11</b>
<i>HFRI FOF: Conservative Index</i>				0.5	5.0	3.2	3.2	2.3	2.7	2.4	Jan-11
Magnitude International Class A Eligible	60,325,973	5.4		0.3	5.7	2.3	4.2	4.0	--	4.6	Jan-11
<i>HFRI FOF: Conservative Index</i>				0.5	5.0	3.2	3.2	2.3	2.7	2.4	Jan-11
Blackstone Partners Offshore Fund LTD	61,928,472	5.6		0.3	6.2	4.8	5.5	4.5	--	4.8	Mar-11
<i>HFRI FOF: Conservative Index</i>				0.5	5.0	3.2	3.2	2.3	2.7	2.3	Mar-11
<b>Private Equity Composite</b>	<b>146,763,731</b>	<b>13.2</b>	<b>10.0</b>	<b>0.0</b>	<b>11.3</b>	<b>16.6</b>	<b>17.1</b>	<b>15.7</b>	<b>13.7</b>	<b>13.0</b>	<b>Jul-08</b>
<i>Cambridge Associates Global All PE (Qtr Lag)</i>				0.0	7.3	10.8	14.5	11.0	13.7	9.4	Jul-08

Magnitude International Class A Eligible is preliminary as of 10/31/2019 and subject to change when finalized.



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL FOOTNOTES

Fiscal year ends 6/30.

Policy index consists of: 15% S&P 500 / 5% Russell 2500 / 13% MSCI EAFE / 7% MSCI Emerging Markets / 25% BBgBarc US Aggregate TR / 5% JP Morgan GBI EM Global Diversified TR USD / 7.5% NCREIF Property Index 1 Qtr. Lag / 12.5% HFRI FOF: Conservative Index / 10% Private Equity Composite.

Allocation index consists of: Weighted index of underlying managers to their respective benchmark.

Fixed Income Policy index consists of: 100% BBgBarc US Aggregate TR.

Core Fixed Income Composite, Emerging Markets Debt, Real Estate Composite, Real Assets Composite and Allocation Index performance is calculated by NEPC as of 6/30/2019.

Real Estate, Real Assets and Private Equity investments are reported on a quarter lag, valued as of 06/30/2019 and adjusted for capital calls and distributions through 10/31/2019.

All history prior to 3/1/2019 was provided by AndCo.















# Q3 2019 MARKET ENVIRONMENT

NEPC, LLC

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# PERFORMANCE OVERVIEW

## Q3 Market Summary

Macro			Equity			Credit			Real Assets		
US Dollar	VIX	US 10-Yr	S&P 500	MSCI EAFE	MSCI EM	US Agg.	High Yield	Dollar EMD	Oil	Gold	REITS
											
3.4%	1.4	-32 bps	1.7%	-1.1%	-4.2%	2.3%	1.3%	1.5%	-7.0%	4.4%	7.4%

**Global central banks shifted toward easier monetary policy, providing support for risk-assets, even as uncertainty around trade and slowing global growth continue to temper returns**

**The decline in global yields also reflected these concerns – leading to positive returns across safe-haven fixed income. Within credit, spreads were relatively flat, but broadly remain below medians**

**Oil experienced a volatile month as geopolitical concerns influenced spot prices following a bombing of Saudi Arabia’s oil infrastructure**

Market segment (index representation) as follows: US Dollar (DXY Index), VIX (CBOE Volatility Index), US 10-Year (US 10-Year Treasury Yield), S&P 500 (US Equity), MSCI EAFE Index (International Developed Equity), MSCI Emerging Markets (Emerging Markets Equity), US Agg (Barclays US Aggregate Bond Index), High Yield (Barclays US High Yield Index), Dollar EMD (JPM EMBI Global Diversified Index), Crude Oil (WTI Crude Oil Spot), Gold (Gold Price Spot), and REITs (NAREIT Composite Index). Source: FactSet



# MACRO PERFORMANCE OVERVIEW

## Q3 Macro Market Summary

The Fed and ECB enacted easier monetary policy programs in an attempt to counter growing downside risks

The market value of negative-yielding debt increased to over \$18T

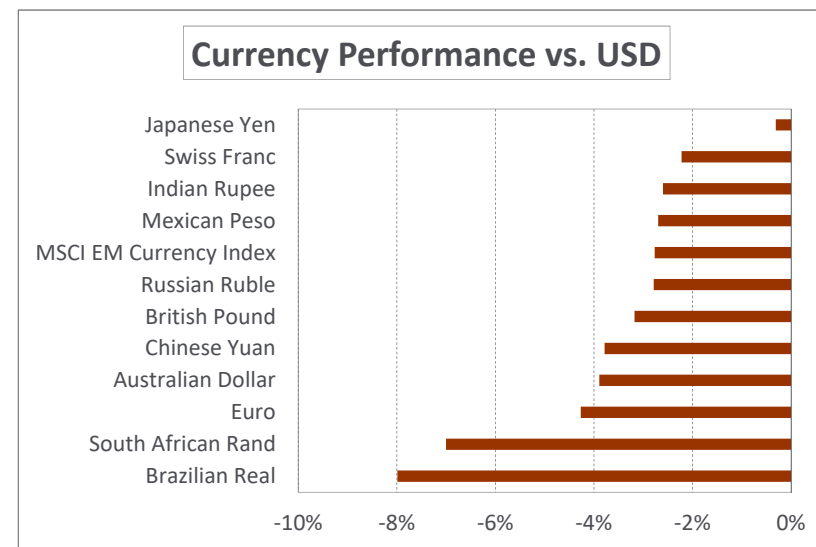
The dollar strengthened, reflecting a flight-to-quality amid ongoing growth concerns

	Yield 6/30/19	Yield 9/30/19	\Delta
US 10-Yr	2.00%	1.68%	-0.32%
US 30-Yr	2.53%	2.12%	-0.40%
US Real 10-Yr	0.31%	0.15%	-0.16%
German 10-Yr	-0.31%	-0.58%	-0.27%
Japan 10-Yr	-0.16%	-0.23%	-0.07%
China 10-Yr	3.30%	3.17%	-0.13%
EM Local Debt	5.69%	5.21%	-0.48%

Source: FactSet

Central Banks	Current Rate	CPI YOY	Notes from the Quarter
Federal Reserve	1.75% - 2.00%	1.8%	The Fed cut interest rates twice this quarter to a range of 1.75% - 2.00%
European Central Bank	0.00%	1.0%	The ECB cut its deposit rate to -0.50% from -0.40% and announced it would restart bond purchases in November.
Bank of Japan	-0.10%	0.3%	The BoJ will continue its ultra-easy QE program with inflation remaining well below target

Source: FactSet



Source: FactSet



# EQUITY PERFORMANCE OVERVIEW

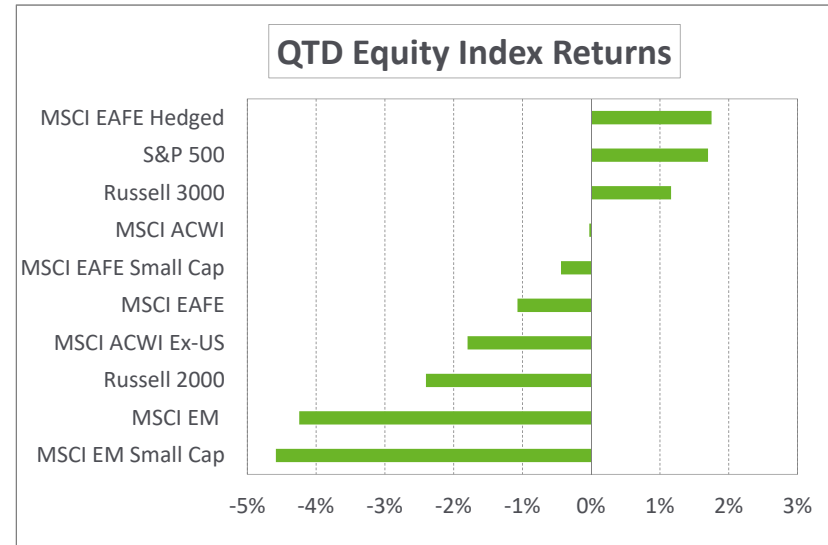
## Q3 Equity Market Summary

**US equities ended the quarter modestly higher on the back of more accommodative monetary policy**

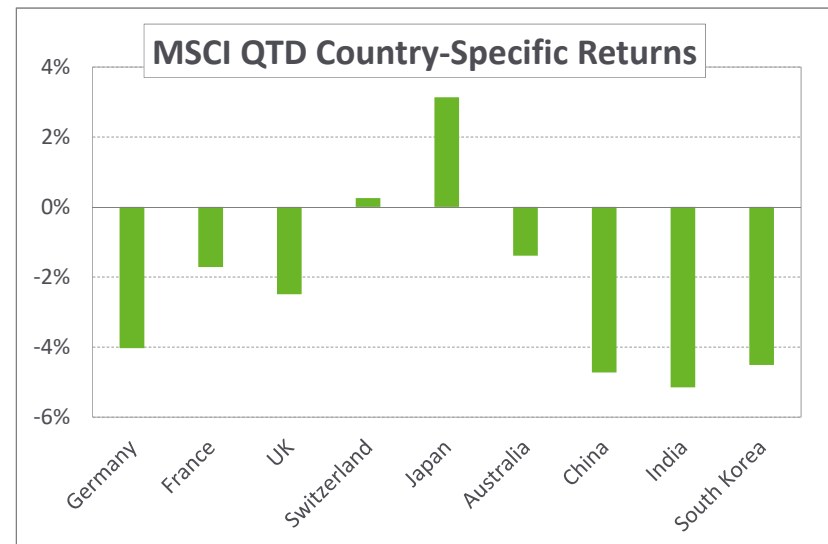
**Trade concerns and currency weakness versus the dollar broadly weighed on international and emerging market local equity returns**

Russell 3000 QTD Sector Returns	
Technology	3.4%
Health Care	-3.6%
Consumer Discretionary	-0.4%
Consumer Staples	5.7%
Energy	-7.6%
Materials & Processing	-0.3%
Producer Durables	0.5%
Financial Services	2.6%
Utilities	8.5%

Source: FactSet



Source: FactSet



Source: FactSet



# CREDIT PERFORMANCE OVERVIEW

## Q3 Credit Market Summary

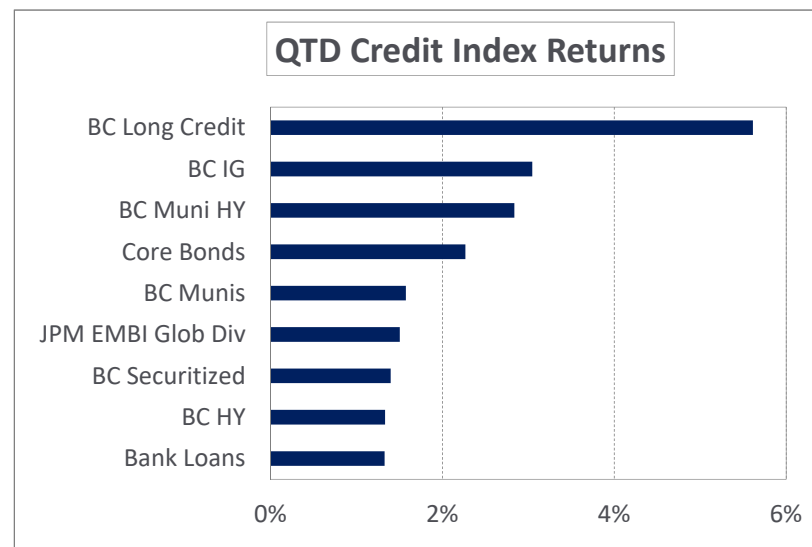
**Demand for safe-haven assets increased with ongoing trade and global growth uncertainties**

**Spreads across the credit complex remained relatively flat during the quarter, but remain below medians**

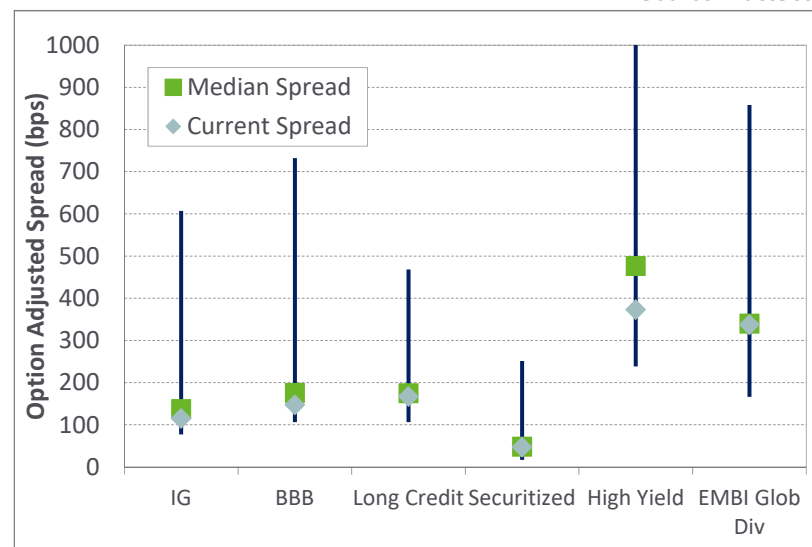
**Long duration assets benefitted from a significant decline in rates on the long-end of the yield curve**

Credit Spread (Basis Points)	6/30/2019	9/30/2019	Δ
BC IG Credit	113	115	+2
BC Long Credit	159	167	+8
BC Securitized	48	47	-1
BC High Yield	367	373	+6
Muni HY	255	246	-9
JPM EMBI	337	337	-
Bank Loans - Libor	391	398	+7

Source: FactSet



Source: FactSet



Source: FactSet; Ranges calculated since 11/30/2000



# REAL ASSETS PERFORMANCE OVERVIEW

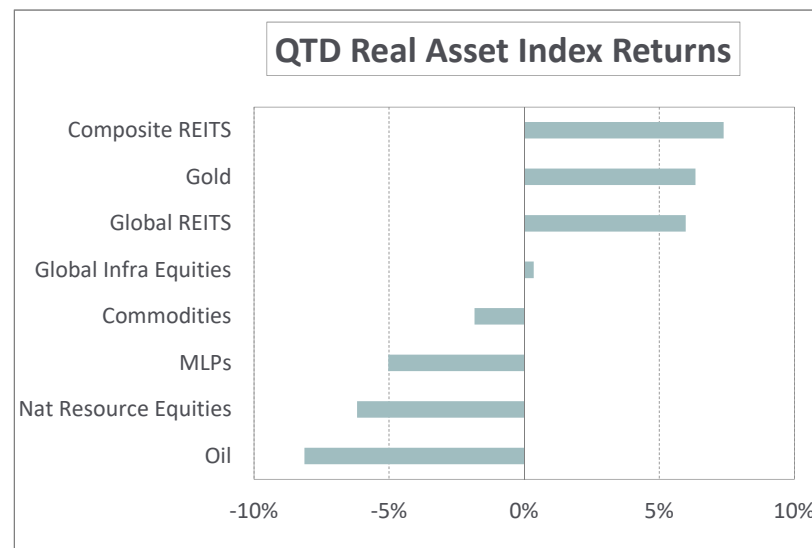
## Q3 Real Assets Market Summary

**Oil experienced a negative quarter with an attack on Saudi Arabia's oil facilities coupled with global growth concerns pushing volatility higher**

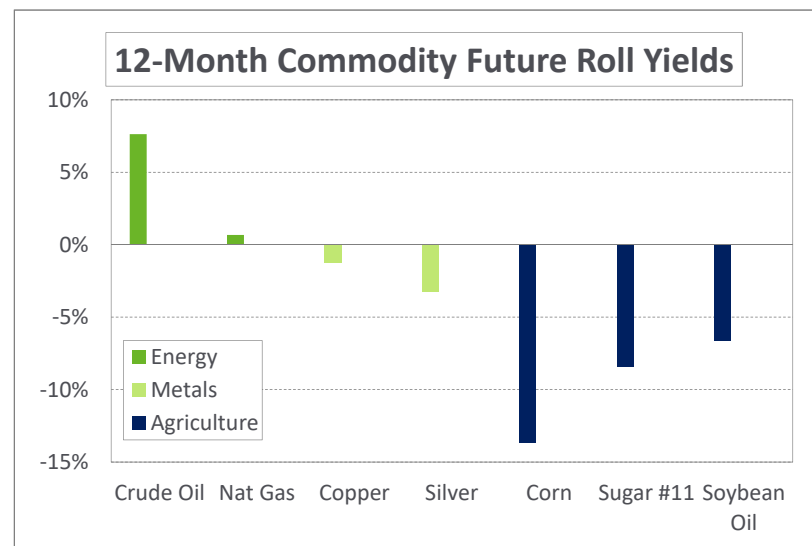
**Gold increased 4.4% during the quarter reflecting concerns around global growth and a lower-yield environment**

Real Asset Yields	6/30/19	9/30/19
MLPs	7.7%	7.8%
Core Real Estate	4.6%	4.5%
Composite REITs	4.2%	3.9%
Global REITs	4.2%	4.1%
Global Infrastructure Equities	4.3%	4.2%
Natural Resource Equities	4.2%	4.3%
US 10-Year Breakeven Inflation	1.73%	1.53%
Commodity Index Roll Yield	-2.0%	-3.0%
10-Year TIPS Real Yield	0.3%	0.2%

Source: FactSet



Source: FactSet



Source: FactSet



# CALENDAR YEAR INDEX PERFORMANCE

	2010	2011	2012	2013	2014	2015	2016	2017	2018	Sep	YTD
<b>S&amp;P 500</b>	15.1%	2.1%	16.0%	32.4%	13.7%	1.4%	12.0%	21.8%	-4.4%	1.9%	20.6%
<b>Russell 1000</b>	16.1%	1.5%	16.4%	33.1%	13.2%	0.9%	12.1%	21.7%	-4.8%	1.7%	20.5%
<b>Russell 2000</b>	26.9%	-4.2%	16.3%	38.8%	4.9%	-4.4%	21.3%	14.6%	-11.0%	2.1%	14.2%
<b>Russell 2500</b>	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.9%	17.6%	16.8%	-10.0%	1.8%	17.7%
<b>MSCI EAFE</b>	7.8%	-12.1%	17.3%	22.8%	-4.9%	-0.8%	1.0%	25.0%	-13.8%	2.9%	12.8%
<b>MSCI EM</b>	18.9%	-18.4%	18.2%	-2.6%	-2.2%	-14.9%	11.2%	37.3%	-14.6%	1.9%	5.9%
<b>MSCI ACWI</b>	12.7%	-7.3%	16.1%	22.8%	4.2%	-2.4%	7.9%	24.0%	-9.4%	2.1%	16.2%
<b>Private Equity</b>	19.8%	9.5%	12.6%	22.3%	14.6%	10.4%	10.3%	21.0%	13.1%	-	4.9%
<b>BC TIPS</b>	6.3%	13.6%	7.0%	-8.6%	3.6%	-1.4%	4.7%	3.0%	-1.3%	-1.4%	7.6%
<b>BC Municipal</b>	2.4%	10.7%	6.8%	-2.6%	9.1%	3.3%	0.2%	5.4%	1.3%	-0.8%	6.7%
<b>BC Muni High Yield</b>	7.8%	9.2%	18.1%	-5.5%	13.8%	1.8%	3.0%	9.7%	4.8%	-0.2%	9.7%
<b>BC US Corporate HY</b>	15.1%	5.0%	15.8%	7.4%	2.5%	-4.5%	17.1%	7.5%	-2.1%	0.4%	11.4%
<b>BC US Agg Bond</b>	6.5%	7.8%	4.2%	-2.0%	6.0%	0.5%	2.6%	3.5%	0.0%	-0.5%	8.5%
<b>BC Global Agg</b>	5.5%	5.6%	4.3%	-2.6%	0.6%	-3.2%	2.1%	7.4%	-1.2%	-1.0%	6.3%
<b>BC Long Treasuries</b>	9.4%	29.9%	3.6%	-12.7%	25.1%	-1.2%	1.3%	8.5%	-1.8%	-2.5%	19.8%
<b>BC US Long Credit</b>	10.7%	17.1%	12.7%	-6.6%	16.4%	-4.6%	10.2%	12.2%	-6.8%	-1.5%	21.9%
<b>BC US STRIPS 20+ Yr</b>	10.9%	58.5%	3.0%	-21.0%	46.4%	-3.7%	1.4%	13.7%	-4.1%	-3.6%	28.4%
<b>JPM GBI-EM Global Div</b>	15.7%	-1.8%	16.8%	-9.0%	-5.7%	-14.9%	9.9%	15.2%	-6.2%	1.0%	7.9%
<b>JPM EMBI Glob Div</b>	12.2%	7.3%	17.4%	-5.3%	7.4%	1.2%	10.2%	10.3%	-4.3%	-0.5%	13.0%
<b>CS Hedge Fund</b>	10.9%	-2.5%	7.7%	9.7%	4.1%	-0.7%	1.2%	7.1%	-3.2%	-	7.1%
<b>BBG Commodity</b>	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-24.7%	11.8%	1.7%	-11.2%	1.2%	3.1%
<b>Alerian MLP</b>	35.9%	13.9%	4.8%	27.6%	4.8%	-32.6%	18.3%	-6.5%	-12.4%	0.7%	11.1%
<b>FTSE NAREIT Equity REITs</b>	28.0%	8.3%	18.1%	2.5%	30.1%	3.2%	8.5%	5.2%	-4.6%	2.9%	27.0%

Source: FactSet, Barclays, Thomson One

\*Private Equity return represents calendar year pooled IRR and is subject to a one quarter lag



# RETURNS FOR KEY INDICES RANKED IN ORDER OF PERFORMANCE

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
MSCI EMERGING MARKETS 32.17	MSCI EMERGING MARKETS 39.39	BC AGGREGATE 5.24	MSCI EMERGING MARKETS 78.51	RUSSELL 2000 GROWTH 29.09	BC AGGREGATE 7.84	MSCI EMERGING MARKETS 18.22	RUSSELL 2000 GROWTH 43.30	S&P 500 13.69	RUSSELL 1000 GROWTH 5.67	RUSSELL 2000 VALUE 31.74	MSCI EMERGING MARKETS 37.28	BC AGGREGATE 0.01
MSCI EAFE 26.34	RUSSELL 1000 GROWTH 11.81	RUSSELL 2000 VALUE -28.92	RUSSELL 1000 GROWTH 37.21	RUSSELL 2000 26.85	RUSSELL 1000 GROWTH 2.64	RUSSELL 2000 VALUE 18.05	RUSSELL 2000 38.82	RUSSELL 1000 VALUE 13.45	S&P 500 1.38	RUSSELL 2000 21.31	RUSSELL 1000 GROWTH 30.21	RUSSELL 1000 GROWTH -1.51
RUSSELL 1000 VALUE 22.25	MSCI EAFE 11.17	RUSSELL 2000 -33.79	RUSSELL 2000 GROWTH 34.47	RUSSELL 2000 VALUE 24.5	S&P 500 2.11	RUSSELL 1000 VALUE 17.51	RUSSELL 2000 VALUE 34.52	RUSSELL 1000 13.24	RUSSELL 1000 0.92	RUSSELL 1000 VALUE 17.34	MSCI EAFE 25.03	S&P 500 -4.38
RUSSELL 2000 VALUE 23.48	RUSSELL 2000 GROWTH 7.06	RUSSELL 1000 VALUE -36.85	MSCI EAFE 31.78	MSCI EMERGING MARKETS 18.88	RUSSELL 1000 1.50	MSCI EAFE 17.32	RUSSELL 1000 GROWTH 33.48	RUSSELL 1000 GROWTH 13.05	BC AGGREGATE 0.55	RUSSELL 1000 12.05	RUSSELL 2000 GROWTH 22.17	RUSSELL 1000 -4.78
RUSSELL 2000 18.37	BC AGGREGATE 6.97	S&P 500 -37.0	RUSSELL 1000 28.43	RUSSELL 1000 GROWTH 16.71	RUSSELL 1000 VALUE 0.39	RUSSELL 1000 16.42	RUSSELL 1000 33.11	BC AGGREGATE 5.97	MSCI EAFE -0.81	S&P 500 11.96	S&P 500 21.83	RUSSELL 1000 VALUE -8.27
S&P 500 15.8	RUSSELL 1000 5.77	RUSSELL 1000 -37.6	RUSSELL 2000 27.16	RUSSELL 1000 16.10	RUSSELL 2000 GROWTH -2.91	RUSSELL 2000 16.35	RUSSELL 1000 VALUE 32.53	RUSSELL 2000 GROWTH 5.60	RUSSELL 2000 GROWTH -1.38	RUSSELL 2000 GROWTH 11.32	RUSSELL 1000 21.69	RUSSELL 2000 GROWTH -9.31
RUSSELL 1000 15.46	S&P 500 5.49	RUSSELL 1000 GROWTH -38.44	S&P 500 26.46	RUSSELL 1000 VALUE 15.51	RUSSELL 2000 -4.18	S&P 500 16.00	S&P 500 32.39	RUSSELL 2000 4.89	RUSSELL 1000 VALUE -3.83	MSCI EMERGING MARKETS 11.19	RUSSELL 2000 14.65	RUSSELL 2000 -11.01
RUSSELL 2000 GROWTH 13.35	RUSSELL 1000 VALUE -0.17	RUSSELL 2000 GROWTH -38.54	RUSSELL 2000 VALUE 20.58	S&P 500 15.06	RUSSELL 2000 VALUE -5.50	RUSSELL 1000 GROWTH 15.26	MSCI EAFE 22.78	RUSSELL 2000 VALUE 4.22	RUSSELL 2000 -4.41	RUSSELL 1000 GROWTH 7.08	RUSSELL 1000 VALUE 13.66	RUSSELL 2000 VALUE -12.86
RUSSELL 1000 GROWTH 9.07	RUSSELL 2000 -1.56	MSCI EAFE -43.38	RUSSELL 1000 VALUE 19.69	MSCI EAFE 7.75	MSCI EAFE -12.14	RUSSELL 2000 GROWTH 14.59	BC AGGREGATE -2.02	MSCI EMERGING MARKETS -2.19	RUSSELL 2000 VALUE -7.46	BC AGGREGATE 2.65	RUSSELL 2000 VALUE 7.84	MSCI EAFE -13.79
BC AGGREGATE 4.33	RUSSELL 2000 VALUE -9.78	MSCI EMERGING MARKETS -53.33	BC AGGREGATE 5.93	BC AGGREGATE 6.54	MSCI EMERGING MARKETS -18.42	BC AGGREGATE 4.21	MSCI EMERGING MARKETS -2.60	MSCI EAFE -4.90	MSCI EMERGING MARKETS -14.93	MSCI EAFE 1.00	BC AGGREGATE 3.54	MSCI EMERGING MARKETS -14.58

QTD	1 Year	3 year	5 Year	10 Year
BC AGGREGATE 2.27	BC AGGREGATE 10.30	RUSSELL 1000 GROWTH 16.89	RUSSELL 1000 GROWTH 13.39	RUSSELL 1000 GROWTH 14.94
S&P 500 1.70	S&P 500 4.25	S&P 500 13.39	S&P 500 10.84	S&P 500 13.24
RUSSELL 1000 GROWTH 1.49	RUSSELL 1000 VALUE 4.00	RUSSELL 1000 13.19	RUSSELL 1000 10.62	RUSSELL 1000 13.23
RUSSELL 1000 1.42	RUSSELL 1000 3.87	RUSSELL 2000 GROWTH 9.79	RUSSELL 2000 GROWTH 9.08	RUSSELL 2000 GROWTH 12.25
RUSSELL 1000 VALUE 1.36	RUSSELL 1000 GROWTH 3.71	RUSSELL 1000 VALUE 9.43	RUSSELL 2000 8.19	RUSSELL 1000 VALUE 11.46
RUSSELL 2000 VALUE -0.57	MSCI EAFE -1.34	RUSSELL 2000 8.23	RUSSELL 1000 VALUE 7.79	RUSSELL 2000 11.19
MSCI EAFE -1.07	MSCI EMERGING MARKETS -2.02	RUSSELL 2000 VALUE 6.54	RUSSELL 2000 VALUE 7.17	RUSSELL 2000 VALUE 10.06
RUSSELL 2000 -2.40	RUSSELL 2000 VALUE -8.24	MSCI EAFE 6.48	BC AGGREGATE 3.38	MSCI EAFE 4.90
RUSSELL 2000 GROWTH -4.17	RUSSELL 2000 -8.89	MSCI EMERGING MARKETS 5.97	MSCI EAFE 3.27	BC AGGREGATE 3.75
MSCI EMERGING MARKETS -4.25	RUSSELL 2000 GROWTH -9.63	BC AGGREGATE 2.92	MSCI EMERGING MARKETS 2.33	MSCI EMERGING MARKETS 3.37



# Q3 2019 TOTAL FUND PERFORMANCE

NEPC, LLC

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# EXECUTIVE SUMMARY

- **Asset Allocation**

- The assets of the Plan totaled \$1.1 billion as of September 30, 2019. The Plan had an investment gain of \$7.1 million during the quarter and \$1.1 million in net contributions.

- **Performance**

- The Plan gained 0.63% (gross) in Q3 as results were mixed in a volatile third quarter
  - The quarterly return ranked ahead of the median in the 48<sup>th</sup> percentile of the Public DB peer group
  - The Plan's return slightly outperformed the IF Public DB > \$1B Gross Median return of 0.60%
- For the trailing one year, the fund was up 5.2%, which placed it above the IF Public DB > \$1B Gross Median return of 3.9%
- In aggregate, the US Equity Composite was up 0.2% for the quarter, which underperformed both the Russell 3000 benchmark return of 1.2% and the eV All US Equity Gross Median return of 0.7%
  - Large Cap Equity contributed 0.4% for the quarter, underperforming the eV US Large Cap Equity Gross Median by 110 basis points
  - The Small/Mid Cap Equity composite lost -0.2% for the quarter, ranking in the 46<sup>th</sup> percentile and outperforming both the Russell 2500 benchmark and eV US Small-Mid Cap Equity Gross Median return by 110 and 40 basis points, respectively
- The International Equity Composite was down -2.9%, which underperformed the MSCI ACWI ex USA return of -1.8% and the eV ACWI ex-US All Cap Equity Gross universe median return of -1.7%
  - International Developed Equity was behind the median by 50 bps, returning -1.7%
  - International Emerging Equity underperformed the median by 120 bps, returning -5.0%
- The Fixed Income Composite gained 1.5% in the third quarter, underperforming the Barclays Aggregate by 80 basis points, and inline with the All US Fixed Income Gross Median return of 1.5%



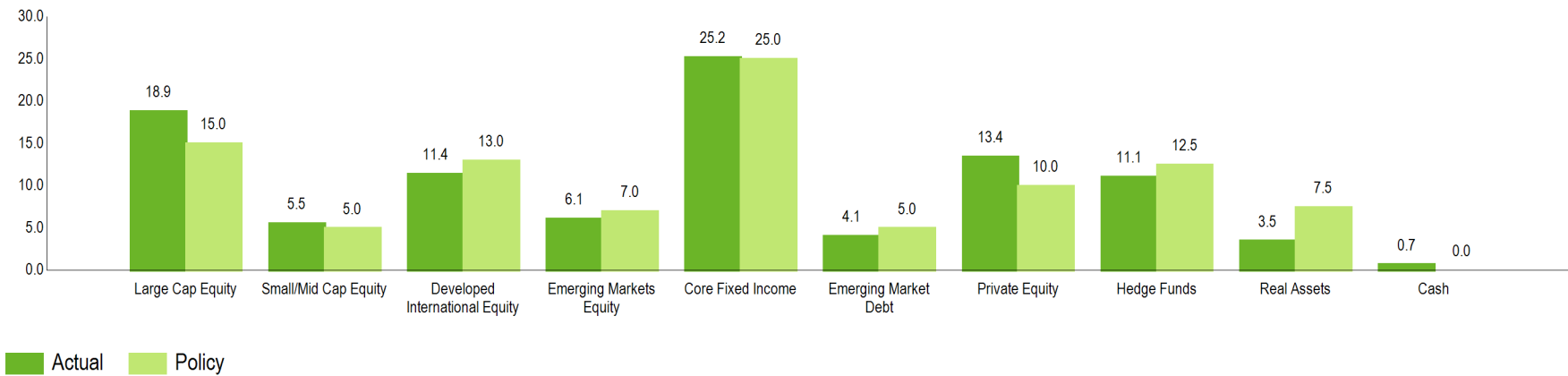
## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE SUMMARY (GROSS)

Ending September 30, 2019

	Market Value	3 Mo Rank	Fiscal YTD Rank	YTD Rank	1 Yr Rank	3 Yrs Rank	5 Yrs Rank	10 Yrs Rank	Inception	Inception Date							
<b>Total Fund Composite</b>	<b>\$1,097,688,078</b>	<b>0.6%</b>	<b>48</b>	<b>0.6%</b>	<b>48</b>	<b>11.3%</b>	<b>52</b>	<b>5.2%</b>	<b>15</b>	<b>8.7%</b>	<b>17</b>	<b>7.0%</b>	<b>27</b>	<b>8.2%</b>	<b>59</b>	<b>7.3%</b>	<b>Apr-97</b>
<i>Policy Index</i>		<i>0.8%</i>	<i>35</i>	<i>0.8%</i>	<i>35</i>	<i>10.8%</i>	<i>65</i>	<i>5.9%</i>	<i>10</i>	<i>7.5%</i>	<i>77</i>	<i>6.3%</i>	<i>59</i>	<i>7.6%</i>	<i>83</i>	<i>7.3%</i>	<i>Apr-97</i>
<i>Allocation Index</i>		<i>0.2%</i>	<i>82</i>	<i>0.2%</i>	<i>82</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>--</i>	<i>Apr-97</i>
<i>InvMetrics Public DB &gt; \$1B Gross Median</i>		<i>0.6%</i>		<i>0.6%</i>		<i>11.5%</i>		<i>3.9%</i>		<i>8.0%</i>		<i>6.5%</i>		<i>8.3%</i>		<i>7.2%</i>	<i>Apr-97</i>

Actual vs Target Allocation (%)

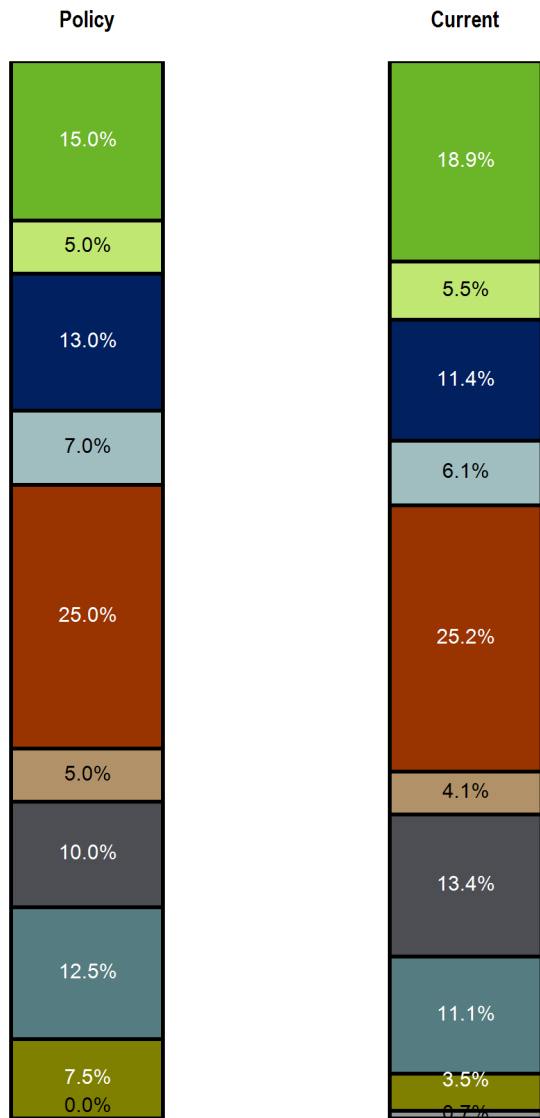


Fiscal year end 6/30.



## Howard County Retirement Plans

# ASSET ALLOCATION VS. POLICY TARGETS



Asset Allocation vs. Target				
	Current	Policy	Current	Difference*
Large Cap Equity	\$207,005,462	15.0%	18.9%	3.9%
Small/Mid Cap Equity	\$60,877,664	5.0%	5.5%	0.5%
Developed International Equity	\$125,503,083	13.0%	11.4%	-1.6%
Emerging Markets Equity	\$66,882,452	7.0%	6.1%	-0.9%
Core Fixed Income	\$276,681,360	25.0%	25.2%	0.2%
Emerging Market Debt	\$44,895,010	5.0%	4.1%	-0.9%
Private Equity	\$147,570,837	10.0%	13.4%	3.4%
Hedge Funds	\$121,958,633	12.5%	11.1%	-1.4%
Real Assets	\$38,469,464	7.5%	3.5%	-4.0%
Cash	\$7,844,113	0.0%	0.7%	0.7%
<b>Total</b>	<b>\$1,097,688,078</b>	<b>100.0%</b>	<b>100.0%</b>	

\*Difference between Policy and Current Allocation



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE SUMMARY (GROSS)

	Ending September 30, 2019											
	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Fiscal YTD (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
<b>Total Fund Composite</b>	<b>1,097,688,078</b>	<b>100.0</b>	<b>100.0</b>	<b>0.6</b>	<b>0.6</b>	<b>11.3</b>	<b>5.2</b>	<b>8.7</b>	<b>7.0</b>	<b>8.2</b>	<b>7.3</b>	<b>Apr-97</b>
<i>Policy Index</i>				0.8	0.8	10.8	5.9	7.5	6.3	7.6	7.3	Apr-97
<i>Allocation Index</i>				0.2	0.2	--	--	--	--	--	--	Apr-97
<b>Total US Equity Composite</b>	<b>267,883,126</b>	<b>24.4</b>	<b>20.0</b>	<b>0.2</b>	<b>0.2</b>	<b>19.3</b>	<b>0.2</b>	<b>13.7</b>	<b>10.9</b>	<b>13.7</b>	<b>8.5</b>	<b>Jul-97</b>
<i>Russell 3000</i>				1.2	1.2	20.1	2.9	12.8	10.4	13.1	7.8	Jul-97
<i>US Equity Allocation Index</i>				0.6	0.6	19.5	1.3	12.3	10.3	13.1	--	Jul-97
<b>Total International Equity</b>	<b>192,385,535</b>	<b>17.5</b>	<b>20.0</b>	<b>-2.9</b>	<b>-2.9</b>	<b>12.0</b>	<b>-0.1</b>	<b>7.3</b>	<b>3.6</b>	<b>4.9</b>	<b>4.6</b>	<b>Jul-97</b>
<i>MSCI ACWI ex USA</i>				-1.8	-1.8	11.6	-1.2	6.3	2.9	4.5	4.5	Jul-97
<b>Total Fixed Income Composite</b>	<b>321,576,370</b>	<b>29.3</b>	<b>30.0</b>	<b>1.5</b>	<b>1.5</b>	<b>8.3</b>	<b>9.5</b>	<b>3.7</b>	<b>4.2</b>	<b>5.1</b>	<b>5.5</b>	<b>Jul-97</b>
<i>Fixed Income Policy Index</i>				2.3	2.3	8.5	10.3	2.9	3.4	3.7	5.3	Jul-97
<b>Total Real Assets Composite</b>	<b>38,469,464</b>	<b>3.5</b>	<b>7.5</b>	<b>2.3</b>	<b>2.3</b>	<b>0.6</b>	<b>3.6</b>	<b>9.7</b>	<b>8.7</b>	<b>5.0</b>	<b>7.3</b>	<b>Jul-03</b>
<i>NCREIF Property Index 1 Qtr. Lag</i>				1.5	1.5	4.8	6.5	6.9	8.8	9.2	8.8	Jul-03
<b>Cash Composite</b>	<b>7,844,113</b>	<b>0.7</b>		<b>0.4</b>	<b>0.4</b>	<b>1.6</b>	<b>2.3</b>	<b>1.3</b>	<b>0.8</b>	<b>0.4</b>	<b>1.4</b>	<b>Dec-03</b>
<i>91 Day T-Bills</i>				0.5	0.5	1.7	2.3	1.5	1.0	0.5	1.3	Dec-03
<b>Hedge Fund Composite</b>	<b>121,958,633</b>	<b>11.1</b>	<b>12.5</b>	<b>0.1</b>	<b>0.1</b>	<b>5.6</b>	<b>3.0</b>	<b>4.8</b>	<b>4.2</b>	<b>--</b>	<b>4.7</b>	<b>Jan-11</b>
<i>HFRI FOF: Conservative Index</i>				-0.1	-0.1	4.6	1.2	3.1	2.0	2.7	2.4	Jan-11
<b>Private Equity Composite</b>	<b>147,570,837</b>	<b>13.4</b>	<b>10.0</b>	<b>4.3</b>	<b>4.3</b>	<b>11.3</b>	<b>16.8</b>	<b>17.6</b>	<b>15.4</b>	<b>13.7</b>	<b>13.1</b>	<b>Jul-08</b>
<i>Cambridge Associates Global All PE (Qtr Lag)</i>				3.8	3.8	7.3	10.8	14.5	11.0	13.7	9.5	Jul-08

Fiscal year end 6/30.

All history prior to 3/1/2019 was provided by AndCo.



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%) Rank	Fiscal YTD (%) Rank	YTD (%) Rank	1 Yr (%) Rank	3 Yrs (%) Rank	5 Yrs (%) Rank	10 Yrs (%) Rank	Inception (%)	Inception Date
<b>Total Fund Composite</b>	<b>1,097,688,078</b>	<b>100.0</b>	<b>100.0</b>	<b>0.6</b> 48	<b>0.6</b> 48	<b>11.3</b> 52	<b>5.2</b> 15	<b>8.7</b> 17	<b>7.0</b> 27	<b>8.2</b> 59	<b>7.3</b>	<b>Apr-97</b>
Policy Index				0.8 35	0.8 35	10.8 65	5.9 10	7.5 77	6.3 59	7.6 83	7.3	Apr-97
InvMetrics Public DB > \$1B Gross Median				0.6	0.6	11.5	3.9	8.0	6.5	8.3	7.2	Apr-97
<b>Total US Equity Composite</b>	<b>267,883,126</b>	<b>24.4</b>	<b>20.0</b>	<b>0.2</b> 57	<b>0.2</b> 57	<b>19.3</b> 49	<b>0.2</b> 53	<b>13.7</b> 28	<b>10.9</b> 31	<b>13.7</b> 33	<b>8.5</b>	<b>Jul-97</b>
Russell 3000				1.2 42	1.2 42	20.1 43	2.9 38	12.8 38	10.4 40	13.1 47	7.8	Jul-97
eV All US Equity Gross Median				0.7	0.7	19.0	0.7	11.5	9.7	12.9	9.5	Jul-97
<b>Large Cap Composite</b>	<b>207,005,462</b>	<b>18.9</b>	<b>15.0</b>	<b>0.4</b> 77	<b>0.4</b> 77	<b>18.2</b> 64	<b>0.9</b> 69	<b>13.2</b> 45	<b>10.0</b> 53	<b>13.2</b> 44	<b>8.4</b>	<b>Apr-01</b>
Russell 1000				1.4 52	1.4 52	20.5 41	3.9 46	13.2 45	10.6 42	13.2 43	7.6	Apr-01
eV US Large Cap Equity Gross Median				1.5	1.5	19.7	3.4	12.7	10.2	13.0	8.2	Apr-01
Invesco IQS – US Enhanced 1% Risk SMA	69,340,435	6.3		0.9 66	0.9 66	17.6 69	1.5 64	12.6 53	9.6 59	12.9 53	7.6	Apr-01
S&P 500				1.7 44	1.7 44	20.6 41	4.3 42	13.4 43	10.8 39	13.2 43	7.3	Apr-01
eV US Large Cap Equity Gross Median				1.5	1.5	19.7	3.4	12.7	10.2	13.0	8.2	Apr-01
LSV Asset Management SMA	63,101,304	5.7		1.0 69	1.0 69	14.9 82	-0.8 75	10.1 56	8.0 58	12.5 31	9.6	May-00
Russell 1000 Value				1.4 62	1.4 62	17.8 50	4.0 40	9.4 71	7.8 64	11.5 65	6.9	May-00
eV US Large Cap Value Equity Gross Median				1.8	1.8	17.7	2.6	10.5	8.2	11.9	8.3	May-00
Westfield Capital Management SMA	74,563,723	6.8		-0.7 76	-0.7 76	21.8 56	2.0 67	16.8 43	12.2 59	-- --	15.4	Jul-10
Russell 1000 Growth				1.5 29	1.5 29	23.3 40	3.7 53	16.9 40	13.4 35	14.9 35	16.3	Jul-10
eV US Large Cap Growth Equity Gross Median				0.6	0.6	22.4	3.9	16.2	12.7	14.5	15.8	Jul-10
<b>Small/Mid Cap Composite</b>	<b>60,877,664</b>	<b>5.5</b>	<b>5.0</b>	<b>-0.2</b> 42	<b>-0.2</b> 42	<b>23.1</b> 21	<b>-2.2</b> 44	<b>15.4</b> 15	<b>14.0</b> 7	<b>14.7</b> 15	<b>12.2</b>	<b>Apr-93</b>
Russell 2500				-1.3 59	-1.3 59	17.7 59	-4.0 57	9.5 58	8.6 55	12.2 61	10.2	Apr-93
eV US Small-Mid Cap Equity Gross Median				-0.6	-0.6	18.6	-3.0	10.4	8.9	12.7	11.6	Apr-93
William Blair SMA	20,349,538	1.9		1.1 2	1.1 2	26.1 17	3.0 16	18.8 4	15.3 6	16.3 10	12.2	Jun-06
Russell 2500 Growth				-3.2 54	-3.2 54	20.0 54	-4.1 58	12.3 70	10.2 59	13.5 60	9.2	Jun-06
eV US Small-Mid Cap Growth Equity Gross Median				-3.0	-3.0	20.8	-3.1	13.8	10.6	13.9	10.4	Jun-06
ICM Small Company - ICSCX	22,978,919	2.1		1.0 28	1.0 28	19.0 18	-5.4 44	10.8 13	10.8 7	12.3 27	11.8	Apr-93
Russell 2000 Value				-0.6 59	-0.6 59	12.8 73	-8.2 63	6.5 65	7.2 57	10.1 87	9.6	Apr-93
eV US Small Cap Value Equity Gross Median				-0.2	-0.2	15.3	-6.3	7.1	7.5	11.7	12.3	Apr-93
Brown Capital Small Company Strategy SMA	17,549,207	1.6		-3.2 33	-3.2 33	25.3 16	-3.6 33	18.0 15	17.1 5	-- --	18.1	Aug-11
Russell 2000 Growth				-4.2 46	-4.2 46	15.3 66	-9.6 72	9.8 83	9.1 79	12.2 87	10.5	Aug-11
eV US Small Cap Growth Equity Gross Median				-4.4	-4.4	18.0	-6.7	13.4	11.4	14.1	12.2	Aug-11



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD (%)	Rank	YTD (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date
<b>Total International Equity</b>	<b>192,385,535</b>	<b>17.5</b>	<b>20.0</b>	<b>-2.9</b>	<b>85</b>	<b>-2.9</b>	<b>85</b>	<b>12.0</b>	<b>66</b>	<b>-0.1</b>	<b>39</b>	<b>7.3</b>	<b>50</b>	<b>3.6</b>	<b>72</b>	<b>4.9</b>	<b>86</b>	<b>4.6</b>	<b>Jul-97</b>
MSCI ACWI ex USA				-1.8	53	-1.8	53	11.6	69	-1.2	46	6.3	65	2.9	84	4.5	88	4.5	Jul-97
eV ACWI ex-US All Cap Equity Gross Median				-1.7		-1.7		13.7		-1.8		7.2		4.8		7.2		6.7	Jul-97
<b>International Developed Markets Composite</b>	<b>125,503,083</b>	<b>11.4</b>	<b>13.0</b>	<b>-1.7</b>	<b>68</b>	<b>-1.7</b>	<b>68</b>	<b>13.6</b>	<b>40</b>	<b>-1.5</b>	<b>37</b>	<b>6.3</b>	<b>53</b>	<b>3.4</b>	<b>75</b>	<b>5.5</b>	<b>75</b>	<b>2.9</b>	<b>Mar-08</b>
MSCI EAFE				-1.1	46	-1.1	46	12.8	50	-1.3	36	6.5	50	3.3	77	4.9	88	2.2	Mar-08
eV All EAFE Equity Gross Median				-1.2		-1.2		12.7		-2.9		6.5		4.5		6.6		3.7	Mar-08
Mondrian International Equity Fund, L.P.	59,222,113	5.4		-1.9	73	-1.9	73	8.6	89	-2.0	42	5.5	70	2.6	88	5.0	87	1.6	Dec-07
MSCI EAFE				-1.1	46	-1.1	46	12.8	50	-1.3	36	6.5	50	3.3	77	4.9	88	1.2	Dec-07
eV All EAFE Equity Gross Median				-1.2		-1.2		12.7		-2.9		6.5		4.5		6.6		2.8	Dec-07
Baillie Gifford EAFE Pure K - BGPX	66,280,970	6.0		-1.5	62	-1.5	62	18.5	8	-0.8	27	--	--	--	--	--	--	0.6	May-18
MSCI EAFE				-1.1	46	-1.1	46	12.8	50	-1.3	36	6.5	50	3.3	77	4.9	88	-2.4	May-18
eV All EAFE Equity Gross Median				-1.2		-1.2		12.7		-2.9		6.5		4.5		6.6		-3.5	May-18
<b>International Emerging Markets Composite</b>	<b>66,882,452</b>	<b>6.1</b>	<b>7.0</b>	<b>-5.0</b>	<b>82</b>	<b>-5.0</b>	<b>82</b>	<b>9.2</b>	<b>41</b>	<b>2.5</b>	<b>31</b>	<b>9.3</b>	<b>12</b>	<b>4.0</b>	<b>38</b>	<b>3.7</b>	<b>83</b>	<b>5.8</b>	<b>Feb-06</b>
MSCI Emerging Markets				-4.2	62	-4.2	62	5.9	66	-2.0	69	6.0	56	2.3	71	3.4	92	4.3	Feb-06
eV Emg Mkts Equity Gross Median				-3.8		-3.8		7.9		0.0		6.3		3.4		4.9		5.7	Feb-06
DFA Emerging Markets Value Portfolio Institutional - DFEVX	25,928,567	2.4		-6.9	98	-6.9	98	0.4	99	-7.7	99	5.5	66	1.8	83	2.7	98	5.1	Feb-06
MSCI Emerging Markets				-4.2	62	-4.2	62	5.9	66	-2.0	69	6.0	56	2.3	71	3.4	92	4.3	Feb-06
eV Emg Mkts Equity Gross Median				-3.8		-3.8		7.9		0.0		6.3		3.4		4.9		5.7	Feb-06
GQG Partners Emerging Markets Equity Fund	40,953,885	3.7		-3.8	52	-3.8	52	15.6	8	--	--	--	--	--	--	--	--	15.3	Dec-18
MSCI Emerging Markets				-4.2	62	-4.2	62	5.9	66	-2.0	69	6.0	56	2.3	71	3.4	92	3.1	Dec-18
eV Emg Mkts Equity Gross Median				-3.8		-3.8		7.9		0.0		6.3		3.4		4.9		5.1	Dec-18



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%) Rank	Fiscal YTD (%) Rank	YTD (%) Rank	1 Yr (%) Rank	3 Yrs (%) Rank	5 Yrs (%) Rank	10 Yrs (%) Rank	Inception (%)	Inception Date
<b>Total Fixed Income Composite</b>	<b>321,576,370</b>	<b>29.3</b>	<b>30.0</b>	<b>1.5</b> 50	<b>1.5</b> 50	<b>8.3</b> 46	<b>9.5</b> 34	<b>3.7</b> 43	<b>4.2</b> 36	<b>5.1</b> 38	<b>5.5</b>	<b>Jul-97</b>
BBgBarc US Aggregate TR				2.3 30	2.3 30	8.5 44	10.3 27	2.9 62	3.4 58	3.7 62	5.1	Jul-97
eV All US Fixed Inc Gross Median				1.5	1.5	7.7	7.9	3.4	3.7	4.3	5.3	Jul-97
<b>Core Fixed Income Composite</b>	<b>276,681,360</b>	<b>25.2</b>	<b>25.0</b>	<b>2.0</b> --	<b>2.0</b> --	-- --	-- --	-- --	-- --	-- --	<b>6.8</b>	<b>Mar-19</b>
BBgBarc US Aggregate TR				2.3 --	2.3 --	8.5 --	10.3 --	2.9 --	3.4 --	3.7 --	7.4	Mar-19
Dodge & Cox SMA	134,129,860	12.2		2.1 35	2.1 35	8.8 41	9.4 35	4.1 37	4.1 38	-- --	4.7	May-10
BBgBarc US Aggregate TR				2.3 30	2.3 30	8.5 44	10.3 27	2.9 62	3.4 58	3.7 62	3.7	May-10
eV All US Fixed Inc Gross Median				1.5	1.5	7.7	7.9	3.4	3.7	4.3	4.1	May-10
PIMCO Total Return	119,712,669	10.9		2.1 35	2.1 35	8.4 45	9.9 32	3.4 49	3.6 52	-- --	4.1	May-10
BBgBarc US Aggregate TR				2.3 30	2.3 30	8.5 44	10.3 27	2.9 62	3.4 58	3.7 62	3.7	May-10
eV All US Fixed Inc Gross Median				1.5	1.5	7.7	7.9	3.4	3.7	4.3	4.1	May-10
State Street Global Advisors TIPS	22,838,831	2.1		1.3 39	1.3 39	7.5 62	7.1 38	2.2 78	2.4 66	-- --	3.3	Nov-09
BBgBarc US TIPS TR				1.3 39	1.3 39	7.6 60	7.1 34	2.2 76	2.4 65	3.5 69	3.4	Nov-09
eV US TIPS / Inflation Fixed Inc Gross Median				1.2	1.2	7.6	7.0	2.4	2.6	3.6	3.5	Nov-09
<b>Emerging Markets Debt Composite</b>	<b>44,895,010</b>	<b>4.1</b>	<b>5.0</b>	<b>-1.4</b> --	<b>-1.4</b> --	-- --	-- --	-- --	-- --	-- --	<b>2.8</b>	<b>Mar-19</b>
JP Morgan GBI EM Global Diversified TR USD				-0.8 --	-0.8 --	7.9 --	10.1 --	3.1 --	0.6 --	2.4 --	3.4	Mar-19
Colchester Local Markets Debt Fund	44,895,010	4.1		-1.4 81	-1.4 81	7.3 81	10.6 44	4.4 53	-- --	-- --	8.3	Oct-15
JP Morgan GBI EM Global Diversified TR USD				-0.8 66	-0.8 66	7.9 76	10.1 52	3.1 80	0.6 87	2.4 88	6.4	Oct-15
eV All Emg Mkts Fixed Inc Gross Median				0.0	0.0	10.3	10.2	4.5	4.2	6.4	7.2	Oct-15
<b>Total Real Assets Composite</b>	<b>38,469,464</b>	<b>3.5</b>	<b>7.5</b>	<b>2.3</b> 99	<b>2.3</b> 99	<b>0.6</b> 99	<b>3.6</b> 99	<b>9.7</b> 26	<b>8.7</b> 89	<b>5.0</b> 99	<b>7.3</b>	<b>Jul-03</b>
NCREIF Property Index 1 Qtr. Lag				1.5 99	1.5 99	4.8 99	6.5 97	6.9 83	8.8 88	9.2 99	8.8	Jul-03
eV US REIT Gross Median				7.9	7.9	28.8	19.7	8.6	11.0	13.7	11.3	Jul-03
<b>Real Estate Composite</b>	<b>25,803,841</b>	<b>2.4</b>		<b>3.4</b> --	<b>3.4</b> --	-- --	-- --	-- --	-- --	-- --	<b>1.6</b>	<b>Mar-19</b>
NCREIF Property Index 1 Qtr. Lag				1.5 --	1.5 --	4.8 --	6.5 --	6.9 --	8.8 --	9.2 --	4.8	Mar-19
Realty Associates Fund VIII L.P.	6,414	0.0		-31.8 --	-31.8 --	-42.2 --	-38.8 --	-10.1 --	-2.1 --	-1.5 --	-2.0	Jul-07
Partners Group Global RE 2011	5,109,856	0.5		4.8 --	4.8 --	-9.8 --	-12.3 --	1.8 --	2.4 --	-- --	4.0	Mar-12
Partners Group Global RE 2014	16,691,895	1.5		3.5 --	3.5 --	5.5 --	7.5 --	11.6 --	-- --	-- --	9.6	Dec-14
Partners Group Global RE 2017	3,990,280	0.4		1.0 --	1.0 --	4.2 --	-- --	-- --	-- --	-- --	4.2	Dec-18
NCREIF Property Index 1 Qtr. Lag				1.5 --	1.5 --	4.8 --	6.5 --	6.9 --	8.8 --	9.2 --	6.5	Dec-18



## Howard County Retirement Plans

# TOTAL FUND PERFORMANCE DETAIL (GROSS)

	Market Value (\$)	% of Portfolio	Policy %	3 Mo (%)	Rank	Fiscal YTD Rank (%)	YTD Rank	YTD Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Inception (%)	Inception Date	
<b>Real Assets Composite</b>	<b>12,665,623</b>	<b>1.2</b>		<b>-0.1</b>	--	<b>-0.1</b>	--	--	--	--	--	--	--	--	--	--	<b>-4.4</b>	<b>Mar-19</b>	
<i>Cambridge Associates Global Natural Resources (1 Qtr Lag)</i>				-2.4	--	-2.4	--	-7.4	--	-5.4	--	5.9	--	-2.4	--	5.1	--	-7.4	Mar-19
Commonfund Natural Resources X	5,047,260	0.5		-0.9	--	-0.9	--	4.5	--	5.4	--	40.1	--	--	--	--	--	18.9	Apr-16
Commonfund Natural Resources XI	794,870	0.1		-24.4	--	-24.4	--	-41.7	--	-41.7	--	--	--	--	--	--	--	-41.7	Oct-18
Aether Real Assets IV	5,937,285	0.5		2.1	--	2.1	--	2.0	--	9.2	--	5.6	--	--	--	--	--	5.0	Jun-16
Aether Real Assets V	886,208	0.1		-1.7	--	-1.7	--	-69.8	--	-46.0	--	--	--	--	--	--	--	-41.0	Aug-18
<i>Cambridge Associates Global Natural Resources (1 Qtr Lag)</i>				-2.4	--	-2.4	--	-7.4	--	-5.4	--	5.9	--	-2.4	--	5.1	--	-1.7	Aug-18
<b>Cash Composite</b>	<b>7,844,113</b>	<b>0.7</b>	<b>0.0</b>	<b>0.4</b>	--	<b>0.4</b>	--	<b>1.6</b>	--	<b>2.3</b>	--	<b>1.3</b>	--	<b>0.8</b>	--	<b>0.4</b>	--	<b>1.4</b>	<b>Dec-03</b>
<i>91 Day T-Bills</i>				0.5	--	0.5	--	1.7	--	2.3	--	1.5	--	1.0	--	0.5	--	1.3	Dec-03
<b>Hedge Fund Composite</b>	<b>121,958,633</b>	<b>11.1</b>	<b>12.5</b>	<b>0.1</b>	--	<b>0.1</b>	--	<b>5.6</b>	--	<b>3.0</b>	--	<b>4.8</b>	--	<b>4.2</b>	--	--	--	<b>4.7</b>	<b>Jan-11</b>
<i>HFRI FOF: Conservative Index</i>				-0.1	--	-0.1	--	4.6	--	1.2	--	3.1	--	2.0	--	2.7	--	2.4	Jan-11
Magnitude International Class A Eligible	60,163,532	5.5		-0.3	--	-0.3	--	5.4	--	2.1	--	4.2	--	4.1	--	--	--	4.6	Jan-11
<i>HFRI FOF: Conservative Index</i>				-0.1	--	-0.1	--	4.6	--	1.2	--	3.1	--	2.0	--	2.7	--	2.4	Jan-11
Blackstone Partners Offshore Fund LTD	61,795,101	5.6		0.5	--	0.5	--	5.9	--	3.9	--	5.4	--	4.3	--	--	--	4.8	Mar-11
<i>HFRI FOF: Conservative Index</i>				-0.1	--	-0.1	--	4.6	--	1.2	--	3.1	--	2.0	--	2.7	--	2.3	Mar-11
<b>Private Equity Composite</b>	<b>147,570,837</b>	<b>13.4</b>	<b>10.0</b>	<b>4.3</b>	--	<b>4.3</b>	--	<b>11.3</b>	--	<b>16.8</b>	--	<b>17.6</b>	--	<b>15.4</b>	--	<b>13.7</b>	--	<b>13.1</b>	<b>Jul-08</b>
<i>Cambridge Associates Global All PE (Qtr Lag)</i>				3.8	--	3.8	--	7.3	--	10.8	--	14.5	--	11.0	--	13.7	--	9.5	Jul-08

Fiscal year ends 6/30.

Core Fixed Income Composite, Emerging Markets Debt, Real Estate Composite, and Real Assets Composite performance is calculated by NEPC as of 3/31/2019.

All history prior to 3/1/2019 was provided by AndCo.

Allocation index consists of: Weighted index of underlying managers to their respective benchmark.

Policy index consists of: 15% S&P 500 / 5% Russell 2500 / 13% MSCI EAFE / 7% MSCI Emerging Markets / 25% BBgBarc US Aggregate TR / 5% JP Morgan GBI EM Global Diversified TR USD / 7.5% NCREIF Property Index 1 Qtr. Lag / 12.5% HFRI FOF: Conservative Index / 10% Private Equity Composite.



## Howard County Retirement Plans

# ASSET ALLOCATION VS. POLICY TARGETS

Allocation vs. Targets and Policy As Of June 30, 2019				
	Current Balance	Current Allocation	Target	Difference
Large Cap Equity	\$206,474,491	19.0%	15.0%	4.0%
Small/Mid Cap Equity	\$61,185,844	5.6%	5.0%	0.6%
Developed International Equity	\$127,922,995	11.7%	13.0%	-1.3%
Emerging Markets Equity	\$70,544,248	6.5%	7.0%	-0.5%
Core Fixed Income	\$265,634,167	24.4%	25.0%	-0.6%
Emerging Market Debt	\$45,609,054	4.2%	5.0%	-0.8%
Private Equity	\$143,287,078	13.2%	10.0%	3.2%
Hedge Funds	\$121,975,562	11.2%	12.5%	-1.3%
Real Assets	\$37,487,624	3.4%	7.5%	-4.1%
Cash	\$9,424,455	0.9%	0.0%	0.9%
<b>Total</b>	<b>\$1,089,545,519</b>	<b>100.0%</b>	<b>100.0%</b>	

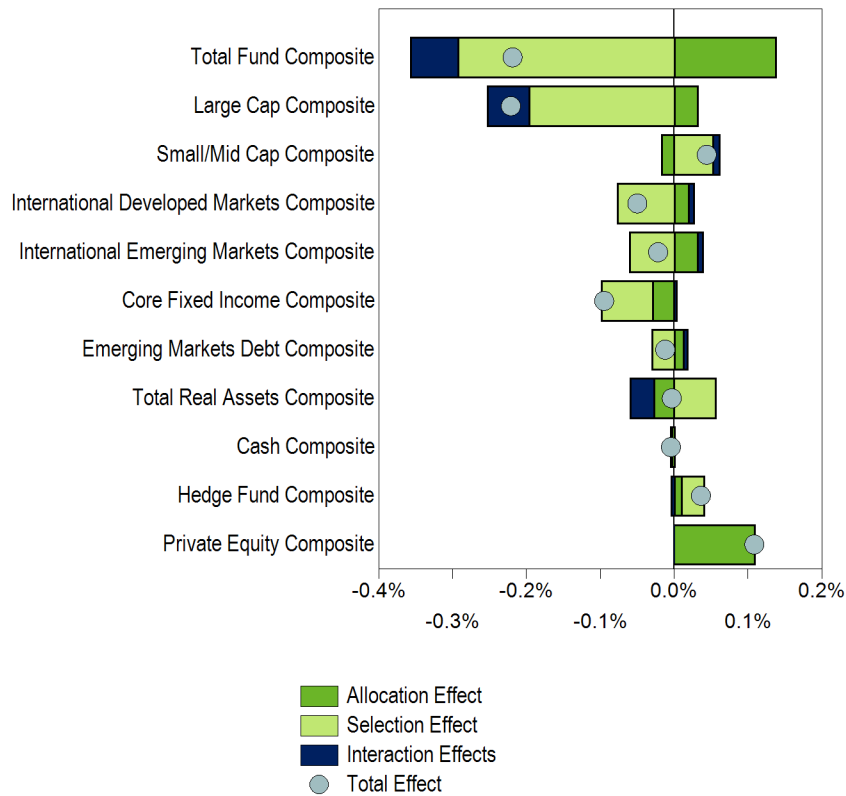
Allocation vs. Targets and Policy As Of September 30, 2019				
	Current Balance	Current Allocation	Target	Difference
Large Cap Equity	\$207,005,462	18.9%	15.0%	3.9%
Small/Mid Cap Equity	\$60,877,664	5.5%	5.0%	0.5%
Developed International Equity	\$125,503,083	11.4%	13.0%	-1.6%
Emerging Markets Equity	\$66,882,452	6.1%	7.0%	-0.9%
Core Fixed Income	\$276,681,360	25.2%	25.0%	0.2%
Emerging Market Debt	\$44,895,010	4.1%	5.0%	-0.9%
Private Equity	\$147,570,837	13.4%	10.0%	3.4%
Hedge Funds	\$121,958,633	11.1%	12.5%	-1.4%
Real Assets	\$38,469,464	3.5%	7.5%	-4.0%
Cash	\$7,844,113	0.7%	0.0%	0.7%
<b>Total</b>	<b>\$1,097,688,078</b>	<b>100.0%</b>	<b>100.0%</b>	



## Howard County Retirement Plans

# TOTAL FUND ATTRIBUTION ANALYSIS (GROSS)

**Attribution Effects**  
3 Months Ending September 30, 2019



**Attribution Summary**  
3 Months Ending September 30, 2019

	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
Large Cap Composite	0.4%	1.7%	-1.3%	-0.2%	0.0%	-0.1%	-0.2%
Small/Mid Cap Composite	-0.2%	-1.3%	1.1%	0.1%	0.0%	0.0%	0.0%
International Developed Markets Composite	-1.7%	-1.1%	-0.6%	-0.1%	0.0%	0.0%	0.0%
International Emerging Markets Composite	-5.0%	-4.2%	-0.8%	-0.1%	0.0%	0.0%	0.0%
Core Fixed Income Composite	2.0%	2.3%	-0.3%	-0.1%	0.0%	0.0%	-0.1%
Emerging Markets Debt Composite	-1.4%	-0.8%	-0.6%	0.0%	0.0%	0.0%	0.0%
Total Real Assets Composite	2.3%	1.5%	0.7%	0.1%	0.0%	0.0%	0.0%
Cash Composite	0.4%	0.5%	-0.1%	0.0%	0.0%	0.0%	0.0%
Hedge Fund Composite	0.1%	-0.1%	0.2%	0.0%	0.0%	0.0%	0.0%
Private Equity Composite	4.3%	4.3%	0.0%	0.0%	0.1%	0.0%	0.1%
<b>Total</b>	<b>0.6%</b>	<b>0.8%</b>	<b>-0.2%</b>	<b>-0.3%</b>	<b>0.1%</b>	<b>-0.1%</b>	<b>-0.2%</b>



# ANALYTICS DEFINITIONS

**Asset Allocation Effect** - Measures the ability to effectively allocate their portfolio's assets to various asset classes. The allocation effect determines whether the overweighting or underweighting of asset classes relative to a benchmark contributes positively or negatively to the overall portfolio return. Positive allocation occurs when the portfolio is overweighted in an asset class that outperforms the benchmark. Negative allocation occurs when the portfolio is overweighted in an asset class that underperforms the benchmark and underweighted in an asset class that outperforms the benchmark.

**Selection Effect** - Measures the ability to select managers within a given asset class relative to a benchmark. The over or underperformance of the portfolio is weighted by the benchmark weight, therefore, selection is not affected by plan's allocation to the asset class. The weight of the manager in the portfolio determines the size of the effect -- the larger the manager, the larger the effect is, positive or negative.

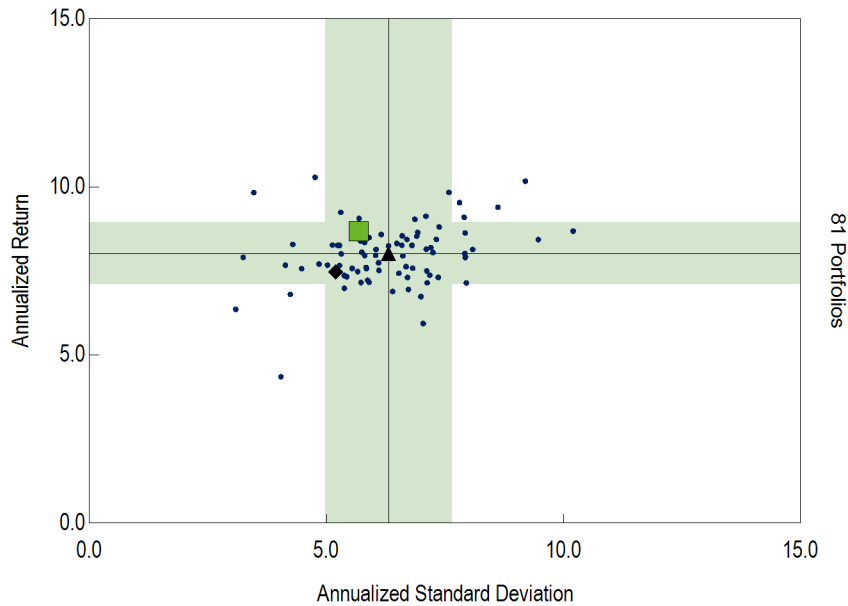
**Interaction Effect** - The interaction effect measures the combined impact of manager selection and manager allocation decisions within an asset class. For example, if client had superior manager selection and overweighted that particular asset class, the interaction effect is positive. If client had superior manager selection, but underweighted that asset class, the interaction effect is negative. In this case, client did not take advantage of the superior manager selection by allocating more assets to that asset class.



# Howard County Retirement Plans

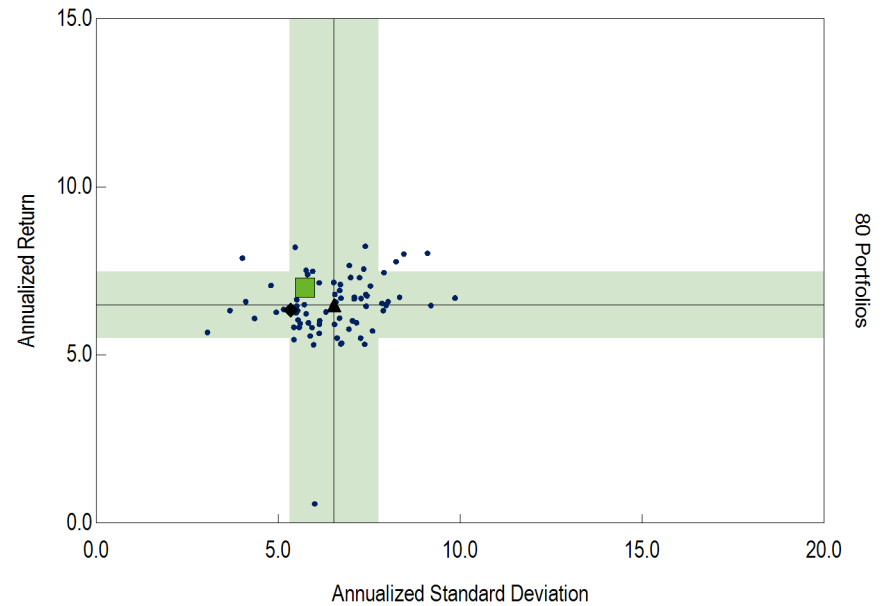
## TOTAL FUND RISK/RETURN (GROSS)

3 Years Ending September 30, 2019



- Total Fund Composite
- ◆ Policy Index
- Allocation Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB > \$1B Gross

5 Years Ending September 30, 2019



- Total Fund Composite
- ◆ Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvMetrics Public DB > \$1B Gross

3 Years Ending September 30, 2019

	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio	Sortino Ratio
Total Fund Composite	8.69%	5.69%	1.26	1.86
Policy Index	7.48%	5.19%	1.14	1.93

5 Years Ending September 30, 2019

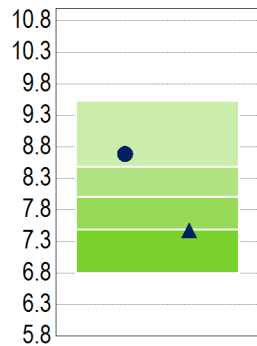
	Anlzd Ret	Anlzd Std Dev	Sharpe Ratio	Sortino Ratio
Total Fund Composite	7.00%	5.74%	1.05	1.69
Policy Index	6.33%	5.33%	1.01	1.71



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

## Total Fund Composite vs. InvMetrics Public DB > \$1B Gross 3 Years

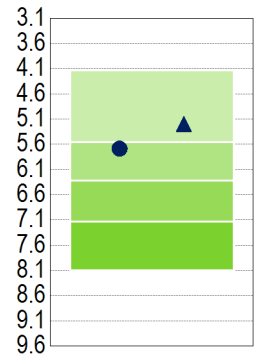
**Anlzd Return**



● Total Fund Composite	
Value	8.69
Rank	17
▲ Policy Index	
Value	7.48
Rank	77

Universe	
5th %tile	9.53
25th %tile	8.50
Median	8.02
75th %tile	7.50
95th %tile	6.80

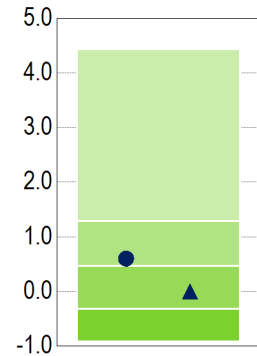
**Anlzd Standard Deviation**



● Total Fund Composite	
Value	5.69
Rank	29
▲ Policy Index	
Value	5.19
Rank	15

Universe	
5th %tile	4.13
25th %tile	5.54
Median	6.31
75th %tile	7.12
95th %tile	8.09

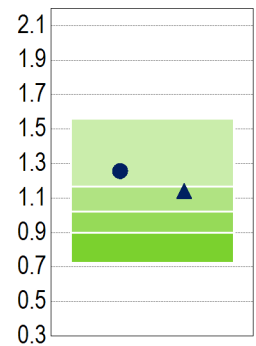
**Anlzd Alpha**



● Total Fund Composite	
Value	0.60
Rank	45
▲ Policy Index	
Value	0.00
Rank	66

Universe	
5th %tile	4.43
25th %tile	1.31
Median	0.48
75th %tile	-0.31
95th %tile	-0.91

**Sharpe Ratio**



● Total Fund Composite	
Value	1.26
Rank	18
▲ Policy Index	
Value	1.14
Rank	28

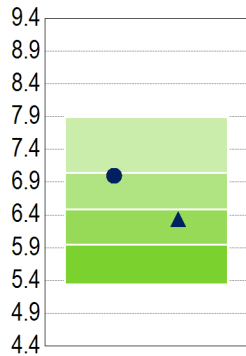
Universe	
5th %tile	1.56
25th %tile	1.17
Median	1.03
75th %tile	0.90
95th %tile	0.73



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

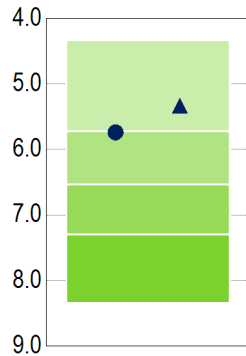
## Total Fund Composite vs. InvMetrics Public DB > \$1B Gross 5 Years

**Anlzd Return**



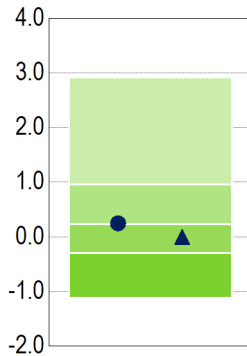
● Total Fund Composite	
Value	7.00
Rank	27
▲ Policy Index	
Value	6.33
Rank	59
Universe	
5th %tile	7.89
25th %tile	7.05
Median	6.49
75th %tile	5.96
95th %tile	5.35

**Anlzd Standard Deviation**



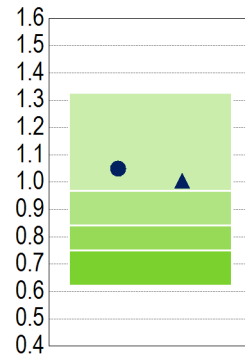
● Total Fund Composite	
Value	5.74
Rank	27
▲ Policy Index	
Value	5.33
Rank	10
Universe	
5th %tile	4.33
25th %tile	5.71
Median	6.53
75th %tile	7.29
95th %tile	8.33

**Anlzd Alpha**



● Total Fund Composite	
Value	0.25
Rank	50
▲ Policy Index	
Value	0.00
Rank	64
Universe	
5th %tile	2.92
25th %tile	0.97
Median	0.24
75th %tile	-0.28
95th %tile	-1.10

**Sharpe Ratio**



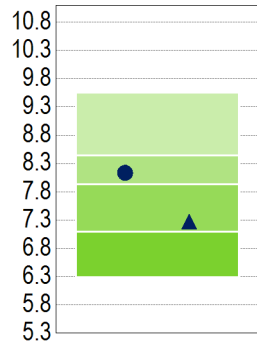
● Total Fund Composite	
Value	1.05
Rank	16
▲ Policy Index	
Value	1.01
Rank	22
Universe	
5th %tile	1.33
25th %tile	0.97
Median	0.84
75th %tile	0.75
95th %tile	0.62



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

## Total Fund Composite vs. InvMetrics Public DB > \$1B Gross 7 Years

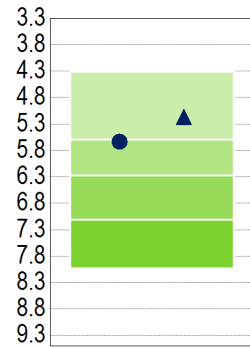
**Anlzd Return**



● Total Fund Composite	
Value	8.13
Rank	43
▲ Policy Index	
Value	7.27
Rank	70

Universe	
5th %tile	9.55
25th %tile	8.46
Median	7.94
75th %tile	7.11
95th %tile	6.29

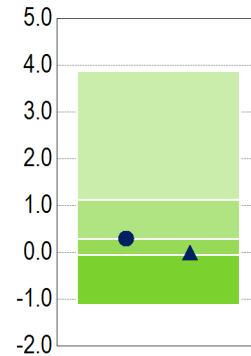
**Anlzd Standard Deviation**



● Total Fund Composite	
Value	5.64
Rank	30
▲ Policy Index	
Value	5.17
Rank	11

Universe	
5th %tile	4.31
25th %tile	5.58
Median	6.26
75th %tile	7.10
95th %tile	8.02

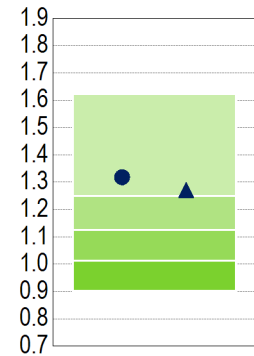
**Anlzd Alpha**



● Total Fund Composite	
Value	0.29
Rank	51
▲ Policy Index	
Value	0.00
Rank	73

Universe	
5th %tile	3.87
25th %tile	1.14
Median	0.30
75th %tile	-0.04
95th %tile	-1.11

**Sharpe Ratio**



● Total Fund Composite	
Value	1.32
Rank	22
▲ Policy Index	
Value	1.27
Rank	24

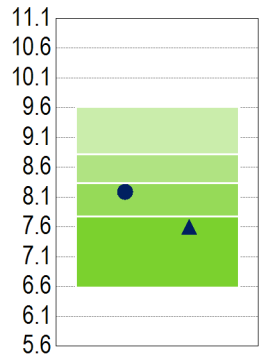
Universe	
5th %tile	1.62
25th %tile	1.25
Median	1.13
75th %tile	1.02
95th %tile	0.91



# TOTAL FUND RISK STATISTICS VS. PEER UNIVERSE

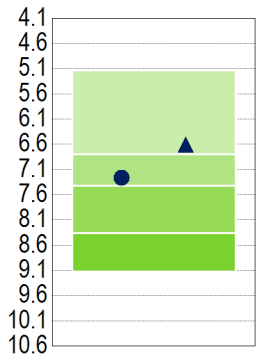
## Total Fund Composite vs. InvMetrics Public DB > \$1B Gross 10 Years

**Anlzd Return**



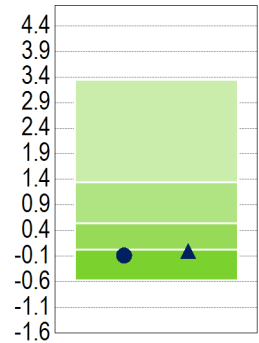
● Total Fund Composite	
Value	8.19
Rank	59
▲ Policy Index	
Value	7.60
Rank	83
Universe	
5th %tile	9.62
25th %tile	8.83
Median	8.34
75th %tile	7.78
95th %tile	6.60

**Anlzd Standard Deviation**



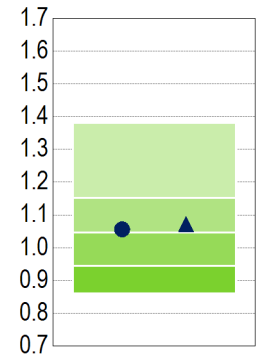
● Total Fund Composite	
Value	7.26
Rank	45
▲ Policy Index	
Value	6.60
Rank	22
Universe	
5th %tile	5.13
25th %tile	6.78
Median	7.41
75th %tile	8.35
95th %tile	9.11

**Anlzd Alpha**



● Total Fund Composite	
Value	-0.09
Rank	78
▲ Policy Index	
Value	0.00
Rank	76
Universe	
5th %tile	3.34
25th %tile	1.36
Median	0.55
75th %tile	0.04
95th %tile	-0.56

**Sharpe Ratio**



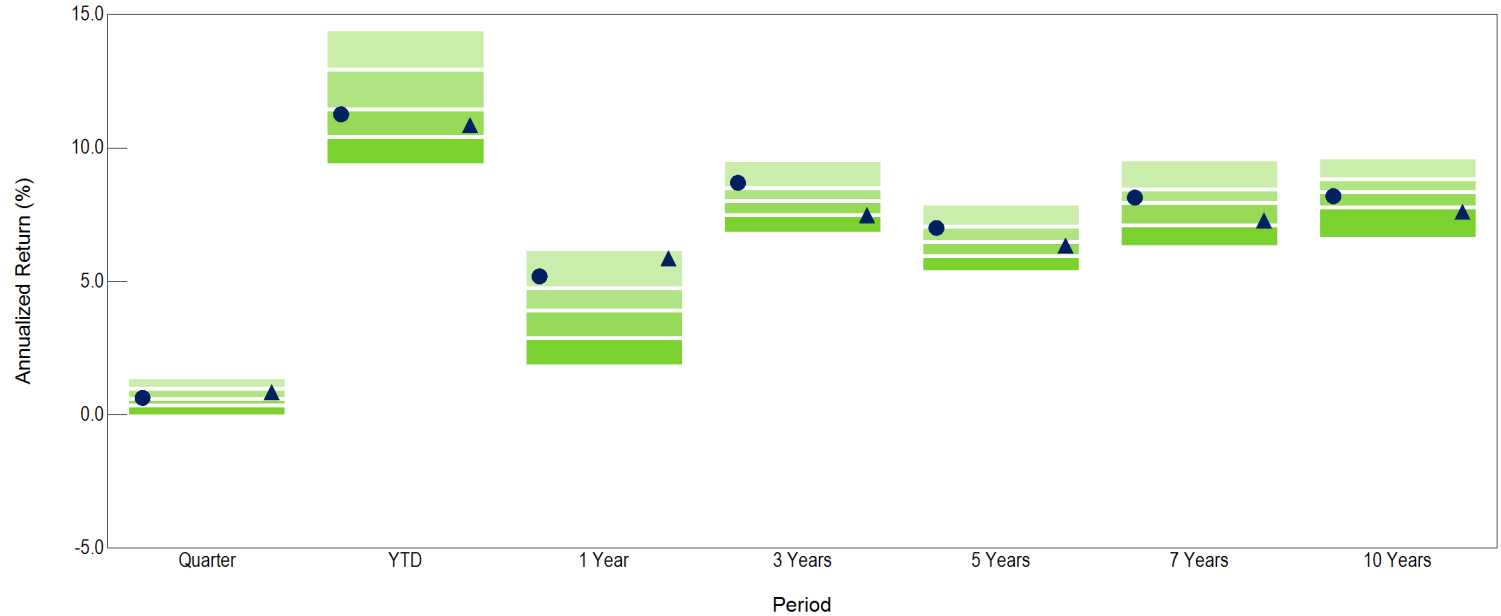
● Total Fund Composite	
Value	1.06
Rank	46
▲ Policy Index	
Value	1.07
Rank	40
Universe	
5th %tile	1.38
25th %tile	1.15
Median	1.05
75th %tile	0.95
95th %tile	0.86



## Howard County Retirement Plans

# TOTAL RETURN SUMMARY VS. PEER UNIVERSE (GROSS)

Total Fund Composite vs. InvMetrics Public DB > \$1B Gross



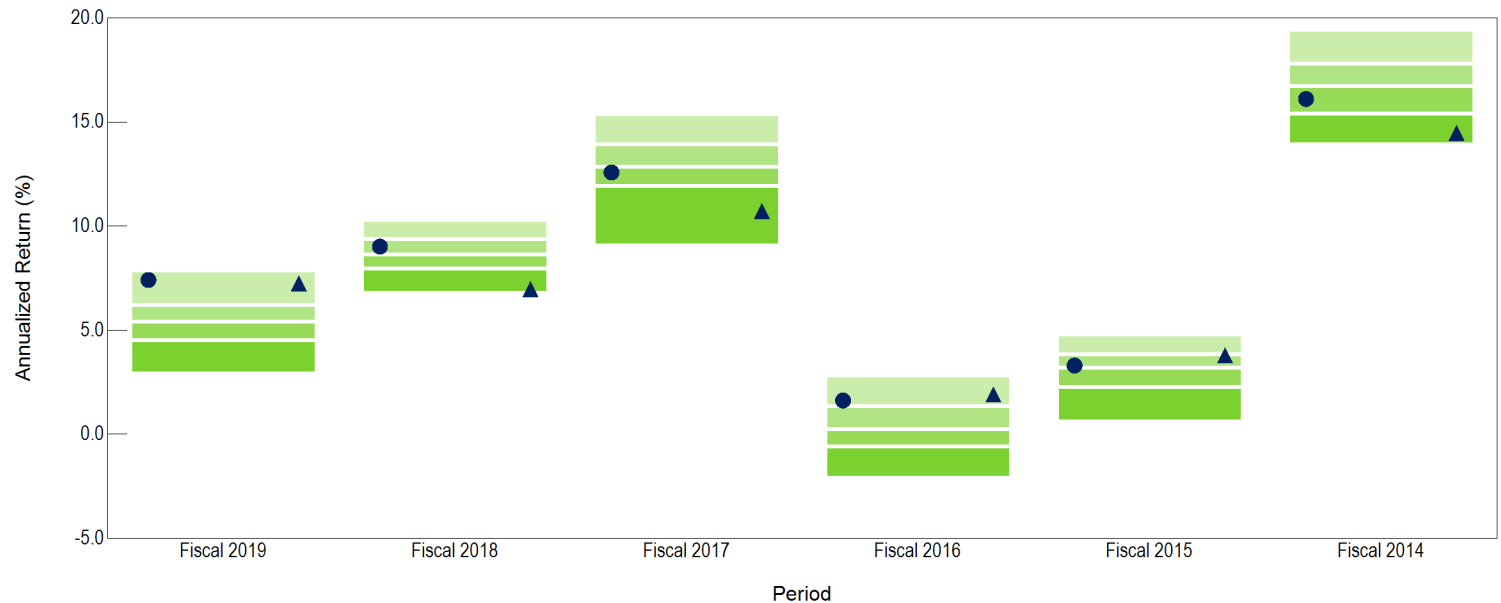
	Return (Rank)													
5th Percentile	1.4	14.4	6.2	9.5	7.9	9.6	9.6							
25th Percentile	1.0	12.9	4.8	8.5	7.1	8.5	8.8							
Median	0.6	11.5	3.9	8.0	6.5	7.9	8.3							
75th Percentile	0.4	10.4	2.9	7.5	6.0	7.1	7.8							
95th Percentile	-0.1	9.4	1.8	6.8	5.4	6.3	6.6							
# of Portfolios	81	81	81	81	80	79	74							
● Total Fund Composite	0.6	(48)	11.3	(52)	5.2	(15)	8.7	(17)	7.0	(27)	8.1	(43)	8.2	(59)
▲ Policy Index	0.8	(35)	10.8	(65)	5.9	(10)	7.5	(77)	6.3	(59)	7.3	(70)	7.6	(83)



## Howard County Retirement Plans

# FISCAL RETURN SUMMARY VS. PEER UNIVERSE (GROSS)

Total Fund Composite vs. InvMetrics Public DB > \$1B Gross



	Fiscal 2019		Fiscal 2018		Fiscal 2017		Fiscal 2016		Fiscal 2015		Fiscal 2014	
	Return	(Rank)	Return	(Rank)	Return	(Rank)	Return	(Rank)	Return	(Rank)	Return	(Rank)
5th Percentile	7.9		10.3		15.3		2.8		4.8		19.4	
25th Percentile	6.2		9.4		14.0		1.4		3.9		17.8	
Median	5.4		8.7		12.9		0.3		3.2		16.7	
75th Percentile	4.5		8.0		11.9		-0.6		2.3		15.4	
95th Percentile	2.9		6.8		9.1		-2.1		0.6		13.9	
# of Portfolios	88		62		108		91		92		65	
● Total Fund Composite	7.4	(9)	9.0	(35)	12.6	(61)	1.6	(22)	3.3	(48)	16.1	(62)
▲ Policy Index	7.2	(14)	7.0	(91)	10.7	(91)	1.9	(15)	3.8	(30)	14.5	(86)

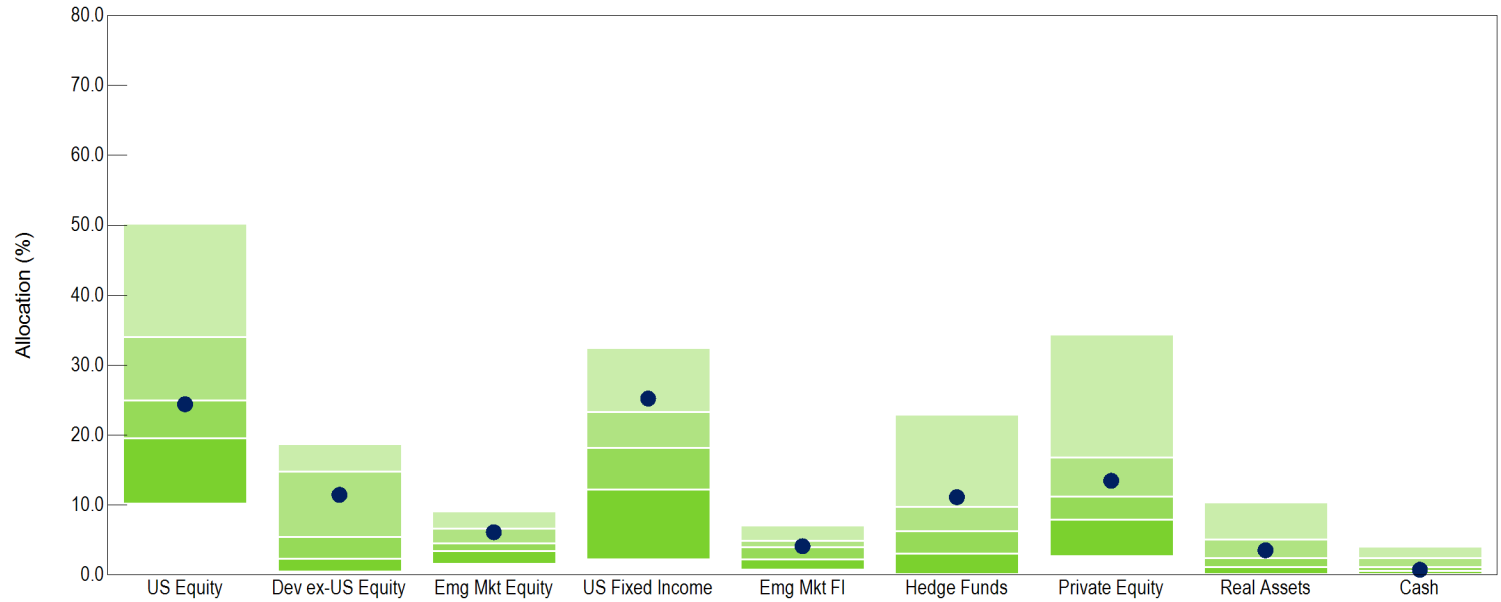
Fiscal year ends 6/30.



## Howard County Retirement Plans

# TOTAL FUND ALLOCATIONS VS. PEER UNIVERSE

Total Plan Allocation vs. InvMetrics Public DB > \$1B Gross



**Allocation (Rank)**

5th Percentile	50.2	18.7	9.1	32.4	7.0	22.9	34.4	10.4	4.0									
25th Percentile	34.1	14.9	6.7	23.4	5.0	9.8	16.8	5.1	2.5									
Median	25.0	5.5	4.6	18.2	4.1	6.3	11.3	2.5	1.2									
75th Percentile	19.6	2.4	3.5	12.3	2.3	3.1	8.0	1.2	0.6									
95th Percentile	10.2	0.6	1.7	2.3	0.8	0.2	2.8	0.2	0.2									
# of Portfolios	52	26	38	52	25	36	47	27	61									
● Total Fund Composite	24.4	(56)	11.4	(34)	6.1	(30)	25.2	(21)	4.1	(42)	11.1	(18)	13.4	(40)	3.5	(41)	0.7	(72)



## Howard County Retirement Plans

# ANALYSIS BY FUND - PRIVATE EQUITY

Investments		Commitments		Contributions & Distributions			Valuations			Performance		
Investment Name	Vintage Year	Commitment	Unfunded Commitment	Paid In Capital	Additional Fees	Cumulative Distributions	Valuation	Total Value	Net Benefit	DPI	TVPI	IRR
<b>Private Equity</b>												
57 Stars Global Opportunity Fund 4 (US), L.P.	2015	\$7,000,000	\$1,534,537	\$5,465,463	-\$15,283	\$0	\$6,540,670	\$6,540,670	\$1,090,490	0.00	1.20	10.18%
Aberdeen U.S. Private Equity V, L.P.	2013	\$15,000,000	\$600,000	\$14,400,000	\$0	\$9,058,841	\$14,343,962	\$23,402,803	\$9,002,803	0.63	1.63	18.79%
Aberdeen U.S. Private Equity VI, L.P.	2014	\$15,000,000	\$2,700,000	\$12,300,000	\$0	\$3,028,859	\$14,697,179	\$17,726,038	\$5,426,038	0.25	1.44	21.06%
Aberdeen U.S. Private Equity VII, L.P.	2017	\$5,000,000	\$2,800,000	\$2,200,000	\$0	\$383,858	\$2,449,622	\$2,833,480	\$633,480	0.17	1.29	31.39%
Crown Asia-Pacific Private Equity II PLC	2011	\$14,000,000	\$1,246,000	\$12,754,000	\$0	\$6,286,000	\$14,793,791	\$21,079,791	\$8,325,791	0.49	1.65	12.50%
Crown Asia-Pacific Private Equity III PLC	2014	\$5,000,000	\$1,315,000	\$3,685,000	\$0	\$340,000	\$5,702,703	\$6,042,703	\$2,357,703	0.09	1.64	24.73%
Crown Global Secondaries III PLC, L.P.	2012	\$10,000,000	\$2,980,000	\$7,020,000	\$0	\$5,460,000	\$4,704,891	\$10,164,891	\$3,144,891	0.78	1.45	13.61%
Greenspring Global Partners IV, L.P.	2008	\$4,000,000	\$160,000	\$3,840,000	\$36,255	\$5,020,032	\$4,855,497	\$9,875,529	\$5,999,274	1.30	2.55	17.82%
Greenspring Global Partners IX-B, L.P.	2019	\$7,250,000	\$5,945,000	\$1,305,000	\$0	\$0	\$1,342,590	\$1,342,590	\$37,590	0.00	1.03	4.31%
Greenspring Global Partners V-B, L.P.	2011	\$7,000,000	\$630,000	\$6,370,000	-\$16,154	\$6,447,000	\$8,889,520	\$15,336,520	\$8,982,674	1.01	2.41	21.39%
Greenspring Global Partners VI, L.P.	2014	\$7,500,000	\$900,000	\$6,600,000	\$1,152	\$1,950,000	\$11,376,978	\$13,326,978	\$6,725,826	0.30	2.02	22.94%
Greenspring Global Partners VIII-B, L.P.	2017	\$5,000,000	\$2,500,000	\$2,500,000	\$0	\$0	\$2,849,749	\$2,849,749	\$349,749	0.00	1.14	15.64%
Greenspring Secondaries Fund I, L.P.	2014	\$2,500,000	\$100,000	\$2,400,000	-\$903	\$1,217,914	\$4,460,905	\$5,678,819	\$3,279,722	0.51	2.37	28.15%
HarbourVest 2013 Direct Fund, L.P.	2013	\$15,000,000	\$484,349	\$14,515,651	\$108,146	\$13,349,430	\$14,393,498	\$27,742,928	\$13,119,131	0.91	1.90	21.09%
HarbourVest Partners Co-Investment Fund IV AIV, L.P.	2018	\$574,142	\$312,689	\$261,453	\$0	\$0	\$220,298	\$220,298	-\$41,155	0.00	0.84	-14.08%
HarbourVest Partners Co-Investment Fund IV, L.P.	2017	\$9,425,858	\$1,598,095	\$7,827,763	\$0	\$880,450	\$9,510,545	\$10,390,995	\$2,563,232	0.11	1.33	17.43%
NB Crossroads Fund XXI, L.P.	2015	\$15,000,000	\$6,150,000	\$8,850,000	\$0	\$0	\$12,006,626	\$12,006,626	\$3,156,626	0.00	1.36	16.25%
NB Crossroads Fund XXII, L.P.	2019	\$5,000,000	\$3,600,000	\$1,400,000	\$0	\$0	\$1,510,592	\$1,510,592	\$110,592	0.00	1.08	8.27%
Pantheon Global Secondary Fund IV, L.P.	2010	\$3,000,000	\$1,008,000	\$1,992,000	\$0	\$2,535,590	\$601,518	\$3,137,108	\$1,145,108	1.27	1.57	13.60%
Schroder Adveq Europe Direct II S.C.S.	2018	\$1,021,882	\$502,211	\$519,671	\$0	\$0	\$502,747	\$502,747	-\$16,924	0.00	0.97	-5.86%
Schroder Adveq Europe V, L.P.	2012	\$9,099,721	\$908,762	\$8,190,959	\$0	\$4,722,663	\$6,655,525	\$11,378,188	\$3,187,230	0.58	1.39	10.57%
Schroder Adveq Europe VI, L.P.	2015	\$6,827,114	\$2,562,300	\$4,264,814	\$0	\$700,988	\$4,564,922	\$5,265,910	\$1,001,096	0.16	1.23	12.95%
Schroder Adveq Europe VII S.C.S.	2018	\$3,978,027	\$3,148,782	\$829,245	\$0	\$0	\$920,929	\$920,929	\$91,685	0.00	1.11	14.42%
Siguler Guff Distressed Opportunities Fund III, L.P.	2007	\$10,000,000	\$300,000	\$9,700,000	\$0	\$13,937,533	\$1,565,579	\$15,503,112	\$5,803,112	1.44	1.60	10.39%
<b>Total Private Equity</b>		<b>\$183,176,743</b>	<b>\$43,985,725</b>	<b>\$139,191,018</b>	<b>\$113,213</b>	<b>\$75,319,158</b>	<b>\$149,460,837</b>	<b>\$224,779,995</b>	<b>\$85,475,764</b>	<b>0.54</b>	<b>1.61</b>	<b>16.23%</b>
<b>Total</b>		<b>\$183,176,743</b>	<b>\$43,985,725</b>	<b>\$139,191,018</b>	<b>\$113,213</b>	<b>\$75,319,158</b>	<b>\$149,460,837</b>	<b>\$224,779,995</b>	<b>\$85,475,764</b>	<b>0.54</b>	<b>1.61</b>	<b>16.23%</b>

Note for European Funds:

-Paid In Capital and Distributions are based on the exchange rate of the date of the cash flows.

-The commitment amount is calculated by taking the unfunded commitment amount in EUR, applying the exchange rate and then adding it to the USD commitment amount.



## Howard County Retirement Plans

# ANALYSIS BY FUND - REAL ESTATE

Investments		Commitments		Contributions & Distributions			Valuations			Performance		
Investment Name	Vintage Year	Commitment	Unfunded Commitment	Paid In Capital	Additional Fees	Cumulative Distributions	Valuation	Total Value	Net Benefit	DPI	TVPI	IRR
<b>Real Estate</b>												
Partners Group Global Real Estate 2011, L.P.	2011	\$14,692,350	\$1,611,064	\$13,081,287	\$65,873	\$11,650,312	\$5,109,856	\$16,760,168	\$3,613,008	0.89	1.27	5.72%
Partners Group Global Real Estate 2014 (USD) A, L.P. Inc.	2014	\$25,000,000	\$11,202,286	\$13,797,714	\$35,548	\$2,955,223	\$17,867,268	\$20,822,491	\$6,989,229	0.21	1.51	12.38%
Partners Group Real Estate Secondary 2017 (USD) A, L.P.	2018	\$10,000,000	\$6,995,955	\$3,004,045	\$50,032	\$0	\$3,287,063	\$3,287,063	\$232,986	0.00	1.08	8.68%
TA Associates Realty Fund IX, L.P.	2008	\$10,000,000	\$0	\$10,000,000	\$0	\$16,015,604	\$0	\$16,015,604	\$6,015,604	1.60	1.60	10.42%
TA Associates Realty Fund VI, L.P.	2002	\$10,000,000	\$0	\$10,000,000	\$0	\$15,172,037	\$0	\$15,172,037	\$5,172,037	1.52	1.52	8.55%
TA Associates Realty Fund VII, L.P.	2005	\$5,000,000	\$0	\$5,000,000	\$0	\$5,119,609	\$0	\$5,119,609	\$119,609	1.02	1.02	0.34%
TA Associates Realty Fund VIII, L.P.	2006	\$10,000,000	\$0	\$10,000,000	\$0	\$9,854,909	\$22,702	\$9,877,611	-\$122,389	0.99	0.99	-0.14%
<b>Total Real Estate</b>		<b>\$84,692,350</b>	<b>\$19,809,305</b>	<b>\$64,883,046</b>	<b>\$151,453</b>	<b>\$60,767,694</b>	<b>\$26,286,889</b>	<b>\$87,054,583</b>	<b>\$22,020,084</b>	<b>0.93</b>	<b>1.34</b>	<b>5.84%</b>
<b>Total</b>		<b>\$84,692,350</b>	<b>\$19,809,305</b>	<b>\$64,883,046</b>	<b>\$151,453</b>	<b>\$60,767,694</b>	<b>\$26,286,889</b>	<b>\$87,054,583</b>	<b>\$22,020,084</b>	<b>0.93</b>	<b>1.34</b>	<b>5.84%</b>



## Howard County Retirement Plans

# ANALYSIS BY FUND - REAL ASSETS

Investments		Commitments		Contributions & Distributions			Valuations			Performance		
Investment Name	Vintage Year	Commitment	Unfunded Commitment	Paid In Capital	Additional Fees	Cumulative Distributions	Valuation	Total Value	Net Benefit	DPI	TVPI	IRR
<b>Real Assets</b>												
Aether Real Assets IV, L.P.	2015	\$7,500,000	\$3,036,121	\$4,463,879	-\$906	\$0	\$5,417,952	\$5,417,952	\$954,979	0.00	1.21	12.36%
Aether Real Assets V, L.P.	2018	\$7,500,000	\$6,285,140	\$1,214,860	-\$4,941	\$0	\$1,114,209	\$1,114,209	-\$95,710	0.00	0.92	-12.71%
Commonfund Capital Natural Resources Partners XI, L.P.	2018	\$7,500,000	\$7,350,000	\$150,000	\$0	\$0	\$44,870	\$44,870	-\$105,130	0.00	0.30	-70.09%
Commonfund Capital Natural Resources Partners X, L.P.	2015	\$7,500,000	\$2,943,750	\$4,556,250	\$0	\$1,088,767	\$5,047,260	\$6,136,027	\$1,579,777	0.24	1.35	25.09%
<b>Total Real Assets</b>		<b>\$30,000,000</b>	<b>\$19,615,011</b>	<b>\$10,384,989</b>	<b>-\$5,847</b>	<b>\$1,088,767</b>	<b>\$11,624,291</b>	<b>\$12,713,058</b>	<b>\$2,333,916</b>	<b>0.10</b>	<b>1.22</b>	<b>15.93%</b>
<b>Total</b>		<b>\$30,000,000</b>	<b>\$19,615,011</b>	<b>\$10,384,989</b>	<b>-\$5,847</b>	<b>\$1,088,767</b>	<b>\$11,624,291</b>	<b>\$12,713,058</b>	<b>\$2,333,916</b>	<b>0.10</b>	<b>1.22</b>	<b>15.93%</b>



# TOTAL EQUITY COMPOSITE

3 Year Risk Return



3 Year Style Analysis



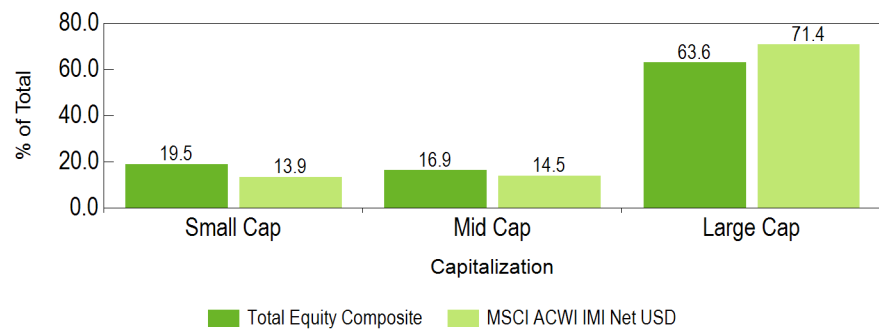
## Howard County Retirement Plans

# TOTAL EQUITY COMPOSITE

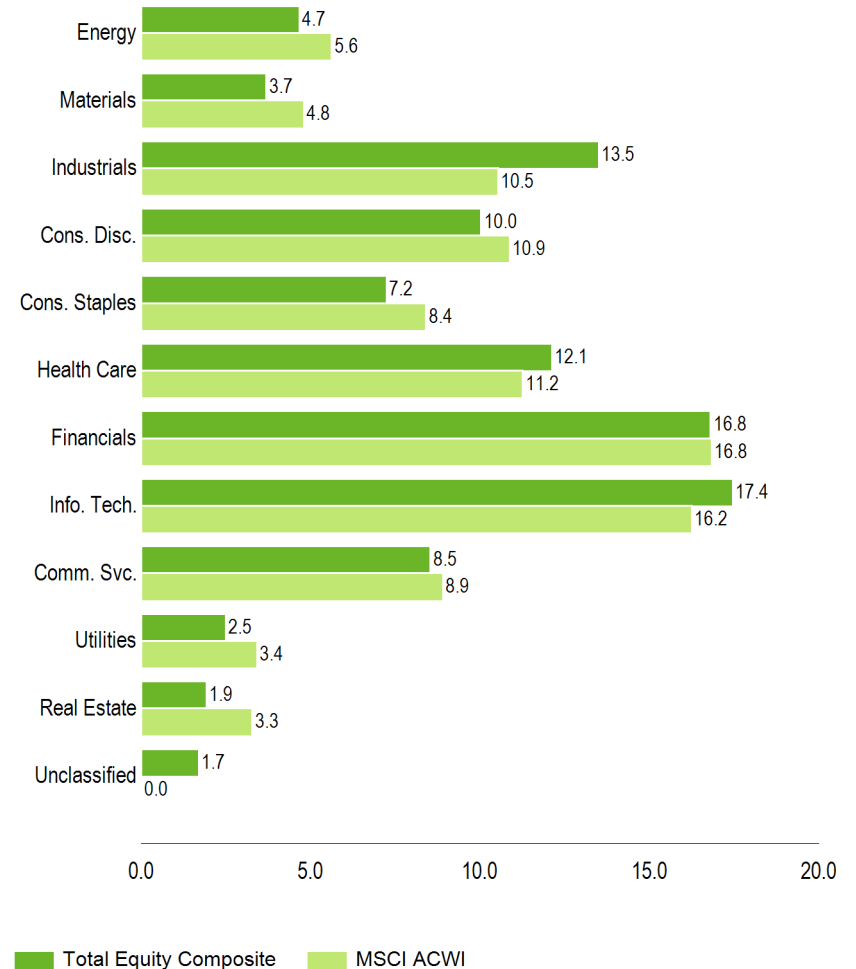
Characteristics		
	Portfolio	MSCI ACWI IMI Net USD
Number of Holdings	3,198	8,810
Weighted Avg. Market Cap. (\$B)	107.5	132.3
Median Market Cap. (\$B)	0.7	1.7
Price To Earnings	17.7	17.5
Price To Book	2.9	2.9
Price To Sales	1.3	1.5
Return on Equity (%)	17.5	17.8
Yield (%)	2.2	2.5
Beta	1.1	1.0
R-Squared	1.0	1.0

	Portfolio Q3-19	Index Q3-19
<b>Region Weighting</b>		
Americas	60.91	60.01
Europe	16.99	18.95
Asia/Pacific	21.52	19.54
Other	0.58	1.50

### Market Capitalization As of September 30, 2019



### Equity Sector Allocation



## Howard County Retirement Plans

# TOTAL EQUITY COMPOSITE

Top Ten Holdings	
MICROSOFT	1.6%
CASH - USD	1.5%
APPLE	1.4%
AMAZON.COM	1.3%
ALPHABET A	1.3%
FACEBOOK CLASS A	0.9%
VISA 'A'	0.8%
AIA GROUP	0.8%
METTLER TOLEDO INTL.	0.8%
JP MORGAN CHASE & CO.	0.7%

Top Positive Contributors		
	Relative Contribution %	Return %
KAKAKU.COM	0.1%	28.4%
OLYMPUS	0.1%	21.4%
SSE	0.0%	14.3%
SMC	0.0%	14.4%
INSULET	0.0%	38.2%
TREASURY WINE ESTATES	0.0%	20.9%
LAM RESEARCH	0.0%	23.6%
APPLIED MATS.	0.0%	11.6%
TYLER TECHNOLOGIES	0.0%	21.5%
ENERGY	0.0%	15.0%

Top Negative Contributors		
	Relative Contribution %	Return %
METTLER TOLEDO INTL.	-0.1%	-16.1%
AIA GROUP	-0.1%	-12.0%
HDFC BANK ADR 1:3	-0.1%	-12.1%
HOUSING DEVELOPMENT FINANCE CORPORATION	-0.1%	-11.5%
ABIOMED	-0.1%	-31.7%
APPLE	-0.1%	13.6%
SPOTIFY TECHNOLOGY	0.0%	-22.0%
WOOD GROUP (JOHN)	0.0%	-16.5%
FUJIFILM HOLDINGS	0.0%	-12.6%
ISS	0.0%	-18.1%

	Equity Sector Attribution										
	Total Effects	Selection Effect	Attribution Effects				Returns		Sector Weights		
			Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark			
Energy	-0.2%	0.2%	-0.5%	0.2%	-6.2%	-13.5%	5.3%	1.8%			
Materials	-0.2%	-0.1%	0.0%	-0.1%	-4.3%	3.1%	3.5%	2.3%			
Industrials	-0.7%	-0.3%	0.1%	-0.4%	-2.1%	3.3%	13.6%	8.1%			
Consumer Discretionary	0.0%	0.0%	0.1%	-0.1%	-0.8%	0.4%	10.3%	16.6%			
Consumer Staples	0.0%	0.0%	0.1%	-0.1%	4.2%	5.3%	6.4%	3.4%			
Health Care	-0.3%	-0.1%	-0.1%	-0.1%	-3.5%	-1.6%	11.6%	10.0%			
Financials	-0.7%	-0.1%	0.1%	-0.6%	-1.6%	2.6%	17.8%	3.6%			
Information Technology	-0.6%	-0.5%	-0.3%	0.2%	1.8%	3.6%	17.0%	34.7%			
Communication Services	-0.1%	-0.2%	0.0%	0.0%	-0.8%	1.4%	8.5%	14.7%			
Utilities	0.1%	0.0%	0.3%	-0.3%	4.2%	12.9%	3.0%	0.0%			
Real Estate	-0.3%	-0.3%	-0.2%	0.2%	0.8%	7.6%	1.7%	4.8%			
Cash	0.0%	0.0%	0.0%	0.0%	0.5%	--	1.3%	0.0%			
<b>Portfolio</b>	<b>-3.0%</b>	<b>=</b>	<b>-1.6%</b>	<b>+</b>	<b>-0.3%</b>	<b>+</b>	<b>-1.1%</b>	<b>-0.9%</b>	<b>2.1%</b>	<b>100.0%</b>	<b>100.0%</b>

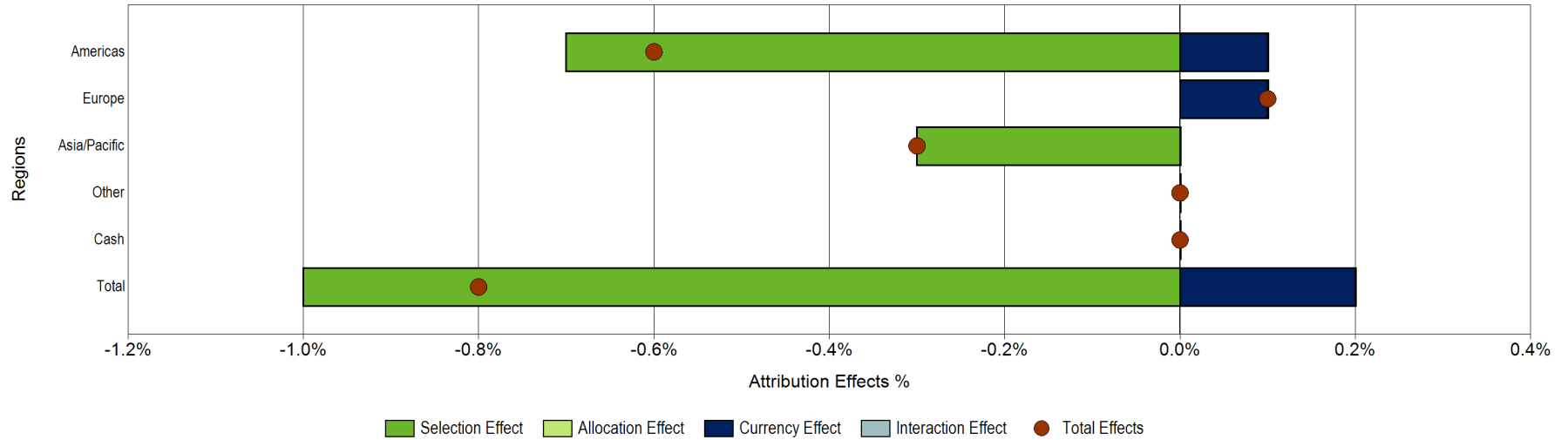
Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.



# Howard County Retirement Plans

## TOTAL EQUITY COMPOSITE

Total Equity Composite Performance Attribution vs. MSCI ACWI IMI Net USD



	Returns and Weights				Attribution Effects				
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect	Total Effects
<b>Totals</b>									
Americas	0.1%	1.1%	59.4%	59.3%	-0.7%	0.0%	0.1%	0.0%	-0.6%
Europe	-1.9%	-1.9%	17.1%	19.4%	0.0%	0.0%	0.1%	0.0%	0.1%
Asia/Pacific	-2.5%	-1.1%	21.7%	19.9%	-0.3%	0.0%	0.0%	0.0%	-0.3%
Other	-8.6%	-6.1%	0.6%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Cash	0.5%	--	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>-0.9%</b>	<b>0.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>-1.0%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>-0.8%</b>
<b>Totals</b>									
Developed	-0.5%	0.5%	87.5%	88.3%	-1.0%	0.0%	0.1%	0.0%	-0.8%
Emerging*	-4.2%	-4.1%	11.2%	11.7%	0.0%	0.0%	0.0%	0.0%	0.0%
Cash	0.5%	--	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



## Howard County Retirement Plans

# TOTAL EQUITY COMPOSITE

Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>Americas</b>				
Brazil*	0.8%	0.9%	-6.4%	-4.0%
Canada	0.5%	3.1%	7.1%	0.8%
Chile*	0.1%	0.1%	-7.4%	-7.8%
Colombia*	0.0%	0.0%	-9.0%	-5.8%
Mexico*	0.4%	0.3%	-2.6%	-1.5%
United States	57.6%	54.8%	0.1%	1.3%
<b>Total-Americas</b>	<b>59.4%</b>	<b>59.3%</b>	<b>0.1%</b>	<b>1.1%</b>
<b>Europe</b>				
Czech Republic*	0.0%	0.0%	-4.5%	-8.8%
Denmark	0.6%	0.5%	-13.3%	-1.8%
Finland	0.2%	0.3%	-3.6%	-2.5%
France	1.2%	3.1%	2.7%	-1.7%
Germany	2.7%	2.5%	-5.2%	-4.0%
Greece*	0.0%	0.0%	-1.1%	-2.4%
Hungary*	0.0%	0.0%	-13.5%	-4.1%
Ireland	0.3%	0.2%	-9.9%	-1.4%
Italy	0.8%	0.8%	2.4%	-0.1%
Netherlands	0.6%	0.9%	10.8%	2.8%
Poland*	0.1%	0.1%	-12.3%	-12.4%
Portugal	0.3%	0.1%	4.6%	-2.9%
Russia*	0.6%	0.4%	3.3%	-1.3%
Spain	0.9%	0.9%	-2.5%	-4.1%
Sweden	1.5%	1.0%	-0.5%	-4.6%
Switzerland	1.6%	2.6%	-2.7%	0.1%
United Kingdom	5.9%	5.2%	-2.4%	-2.3%
<b>Total-Europe</b>	<b>17.1%</b>	<b>19.4%</b>	<b>-1.9%</b>	<b>-1.9%</b>

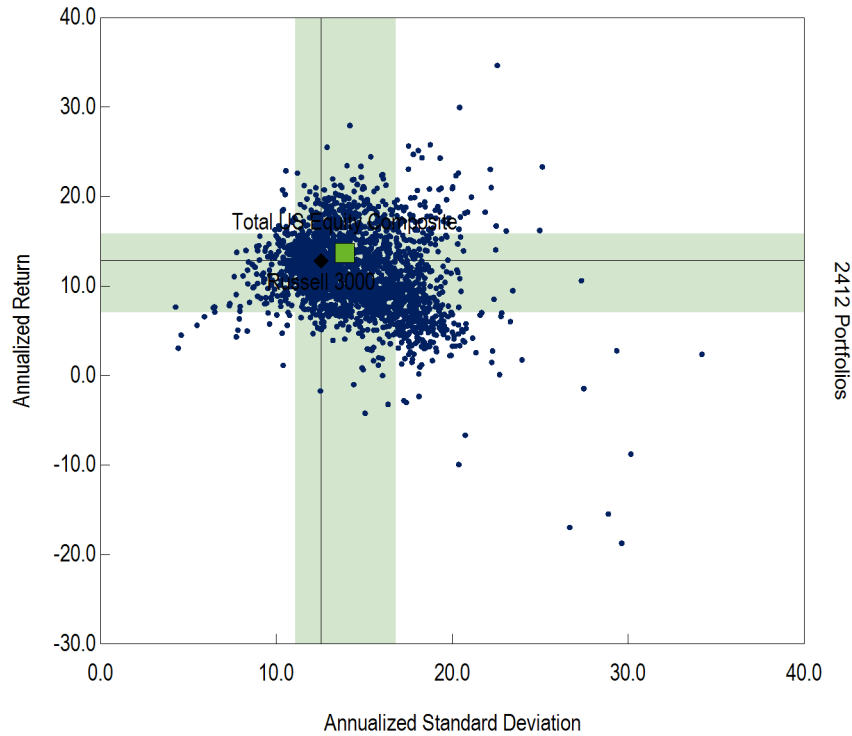
Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>AsiaPacific</b>				
Australia	1.0%	2.2%	3.7%	-1.2%
China*	1.1%	3.4%	-3.4%	-4.8%
Hong Kong	3.6%	1.1%	-9.6%	-11.6%
India*	3.3%	1.1%	-5.3%	-6.0%
Indonesia*	0.8%	0.3%	-3.6%	-5.4%
Japan	6.4%	7.6%	3.4%	3.3%
Korea*	1.2%	1.5%	-10.7%	-5.4%
Malaysia*	0.2%	0.3%	-5.5%	-5.7%
Philippines*	0.1%	0.1%	-5.7%	-4.9%
Singapore	1.8%	0.4%	-5.4%	-5.0%
Taiwan*	1.3%	1.4%	5.2%	5.6%
Thailand*	0.7%	0.4%	-4.2%	-6.2%
<b>Total-AsiaPacific</b>	<b>21.7%</b>	<b>19.9%</b>	<b>-2.5%</b>	<b>-1.1%</b>
<b>Other</b>				
Israel	0.1%	0.2%	5.0%	0.0%
South Africa*	0.4%	0.7%	-14.0%	-11.3%
Turkey*	0.1%	0.1%	14.1%	11.1%
<b>Total-Other</b>	<b>0.6%</b>	<b>1.3%</b>	<b>-8.6%</b>	<b>-6.1%</b>
<b>Totals</b>				
Developed	87.5%	88.3%	-0.5%	0.5%
Emerging*	11.2%	11.7%	-4.2%	-4.1%
Cash	1.3%		0.5%	

Country\* = Emerging Markets



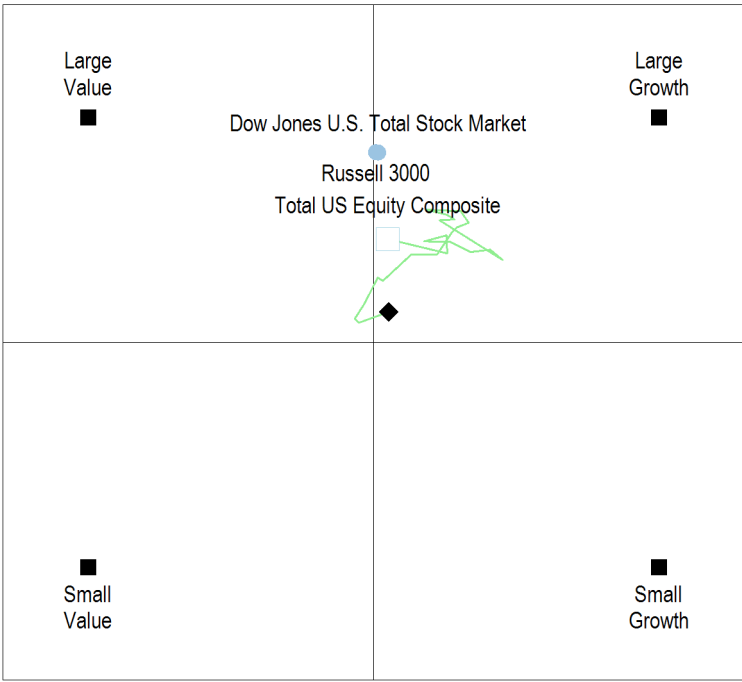
# TOTAL US EQUITY COMPOSITE

3 Year Risk Return



- Total US Equity Composite
- ◆ Russell 3000
- 68% Confidence Interval
- eV All US Equity Gross

3 Year Style Analysis



- First Rolling Period
- ◆ Last Rolling Period

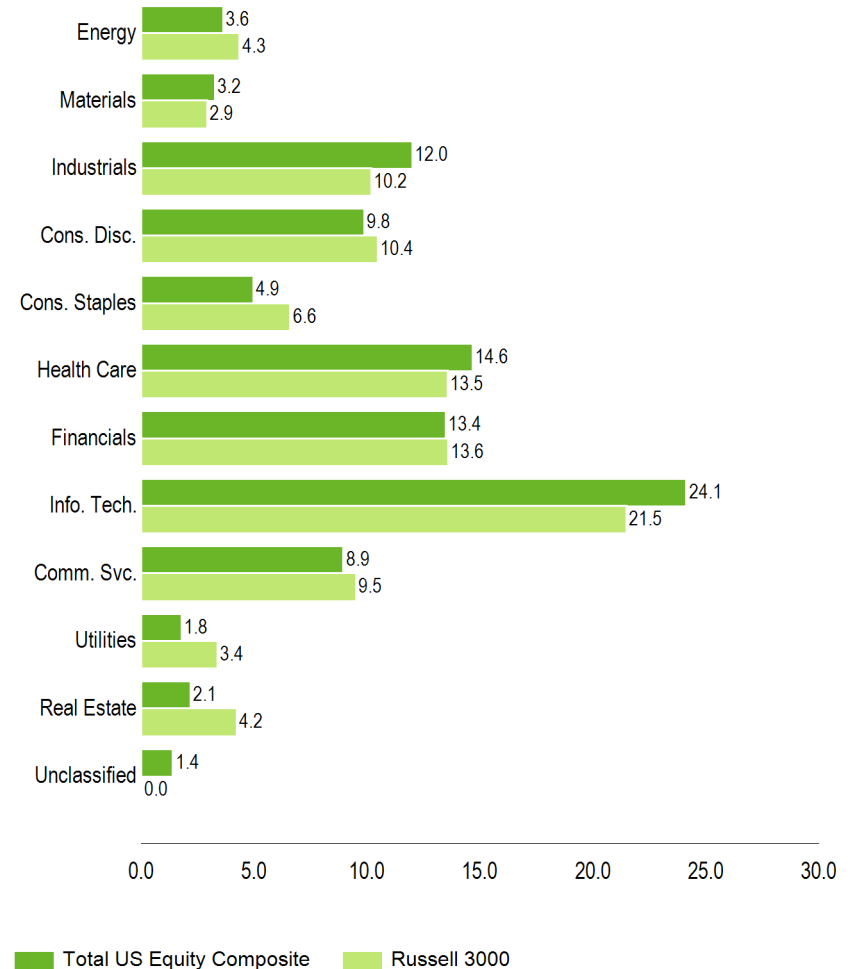


## Howard County Retirement Plans

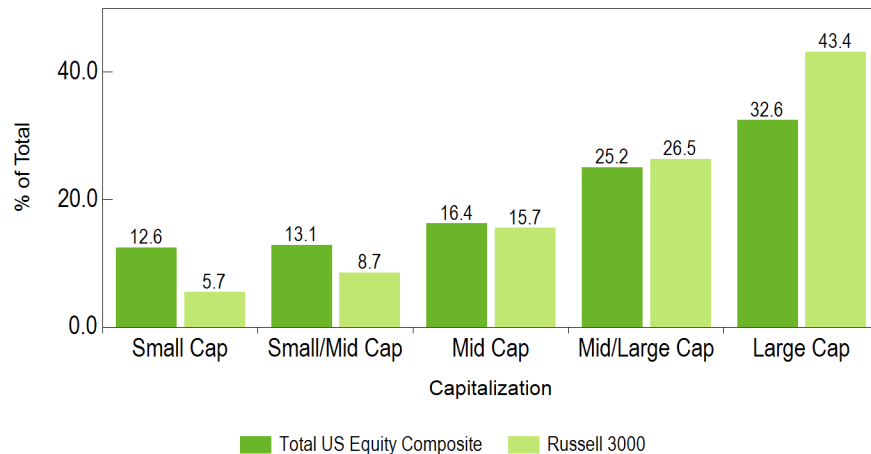
# TOTAL US EQUITY COMPOSITE

Characteristics		
	Portfolio	Russell 3000
Number of Holdings	567	2,988
Weighted Avg. Market Cap. (\$B)	153.7	195.3
Median Market Cap. (\$B)	13.2	1.6
Price To Earnings	19.1	20.5
Price To Book	3.3	3.5
Price To Sales	1.6	1.9
Return on Equity (%)	22.4	21.4
Yield (%)	1.8	1.9
Beta	1.1	1.0
R-Squared	1.0	1.0

## Equity Sector Allocation



## Market Capitalization As of September 30, 2019



## Howard County Retirement Plans

# TOTAL US EQUITY COMPOSITE

Top Ten Holdings	
MICROSOFT	2.7%
APPLE	2.4%
AMAZON.COM	2.3%
ALPHABET A	2.3%
FACEBOOK CLASS A	1.6%
VISA 'A'	1.5%
JP MORGAN CHASE & CO.	1.3%
CASH - USD	1.2%
CISCO SYSTEMS	1.1%
HOME DEPOT	1.1%

Top Positive Contributors		
	Relative Contribution %	Return %
INSULET	0.1%	38.2%
LAM RESEARCH	0.1%	23.6%
APPLIED MATS.	0.1%	11.6%
TYLER TECHNOLOGIES	0.1%	21.5%
ENTERGY	0.1%	15.0%
MARATHON PETROLEUM	0.1%	9.9%
BROOKFIELD ASSET MAN.'A' (NYS)	0.1%	11.5%
MANHATTAN ASSOCS.	0.0%	16.4%
TREX	0.0%	26.8%
CONAGRA BRANDS	0.0%	16.5%

Top Negative Contributors		
	Relative Contribution %	Return %
APPLE	-0.1%	13.6%
ABIOMED	-0.1%	-31.7%
METTLER TOLEDO INTL.	-0.1%	-16.1%
PROCTER & GAMBLE	-0.1%	14.2%
COOPER COS.	-0.1%	-11.8%
MCDERMOTT INTL.	-0.1%	-79.1%
EOG RES.	-0.1%	-20.1%
MARRIOTT INTL.'A'	-0.1%	-11.0%
NEXTGEN HEALTHCARE	0.0%	-21.3%
NEXTERA ENERGY	0.0%	14.4%

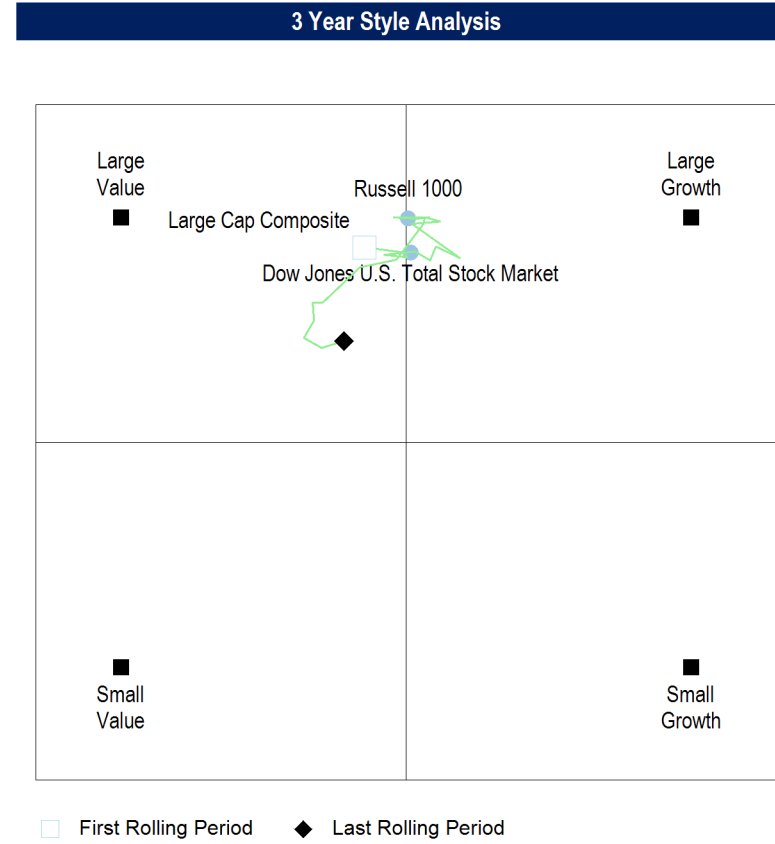
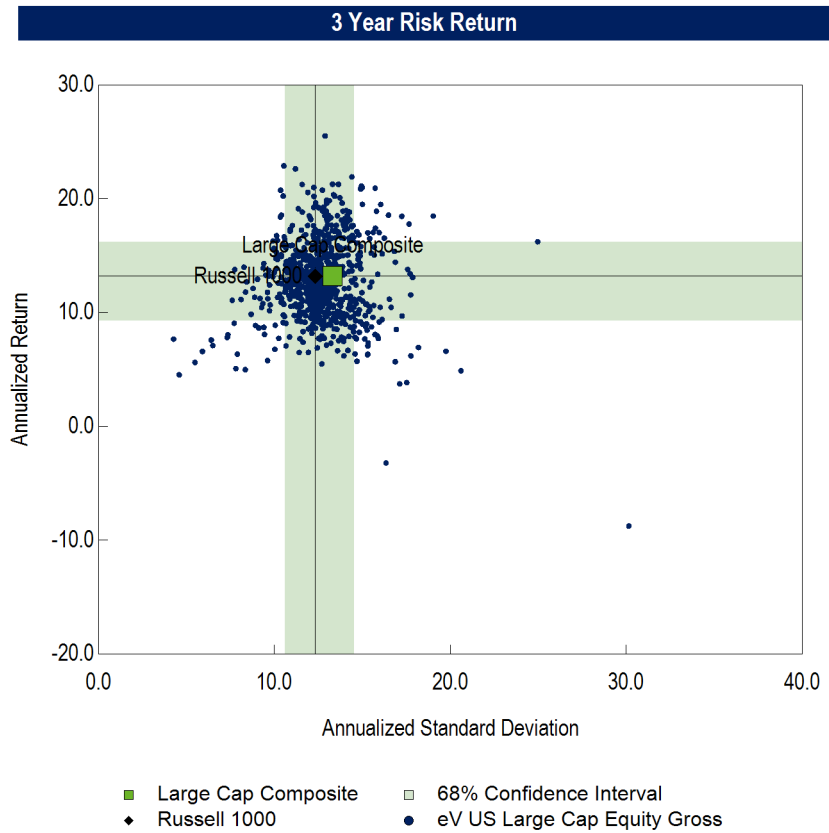
	Equity Sector Attribution										
	Attribution Effects				Returns		Sector Weights				
	Total Effects	Selection Effect	Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark			
Energy	0.0%	0.0%	0.0%	0.0%	-7.3%	-7.7%	4.4%	4.6%			
Materials	0.1%	0.1%	0.0%	0.0%	1.3%	-0.6%	2.8%	3.0%			
Industrials	-0.1%	0.0%	0.0%	0.0%	0.4%	0.7%	12.1%	10.2%			
Consumer Discretionary	0.0%	0.0%	0.0%	0.0%	0.2%	0.6%	10.4%	10.5%			
Consumer Staples	0.0%	0.1%	-0.1%	0.0%	7.7%	5.9%	4.6%	6.5%			
Health Care	-0.2%	-0.2%	0.0%	0.0%	-4.7%	-3.2%	14.4%	14.1%			
Financials	-0.1%	-0.1%	0.0%	0.0%	1.4%	1.8%	14.3%	13.7%			
Information Technology	-0.2%	-0.2%	0.0%	0.0%	1.6%	2.7%	23.7%	21.2%			
Communication Services	-0.1%	-0.1%	0.0%	0.0%	1.3%	2.0%	9.0%	9.2%			
Utilities	-0.1%	0.0%	-0.1%	0.0%	8.5%	8.1%	1.6%	3.2%			
Real Estate	-0.1%	0.0%	-0.1%	0.0%	7.3%	7.4%	1.6%	3.9%			
Cash	0.0%	0.0%	0.0%	0.0%	0.5%	--	1.0%	0.0%			
<b>Portfolio</b>	<b>-0.9%</b>	<b>=</b>	<b>-0.4%</b>	<b>+</b>	<b>-0.3%</b>	<b>+</b>	<b>-0.1%</b>	<b>0.4%</b>	<b>1.3%</b>	<b>100.0%</b>	<b>100.0%</b>

Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.



# Howard County Retirement Plans

## LARGE CAP COMPOSITE

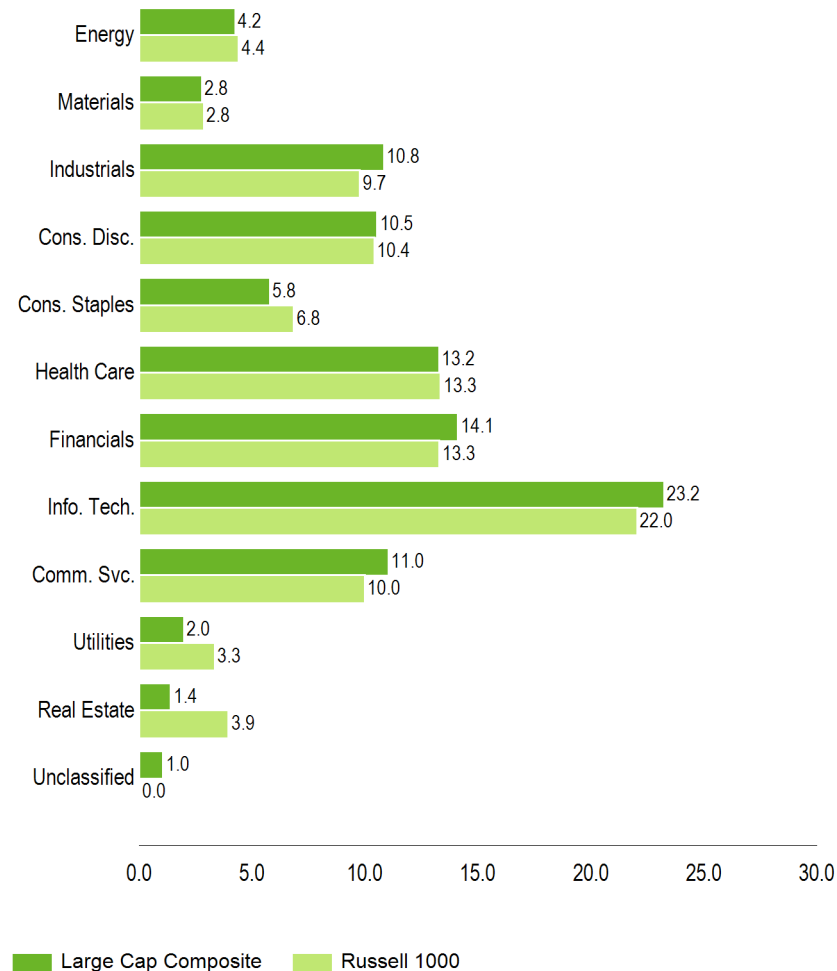


# Howard County Retirement Plans

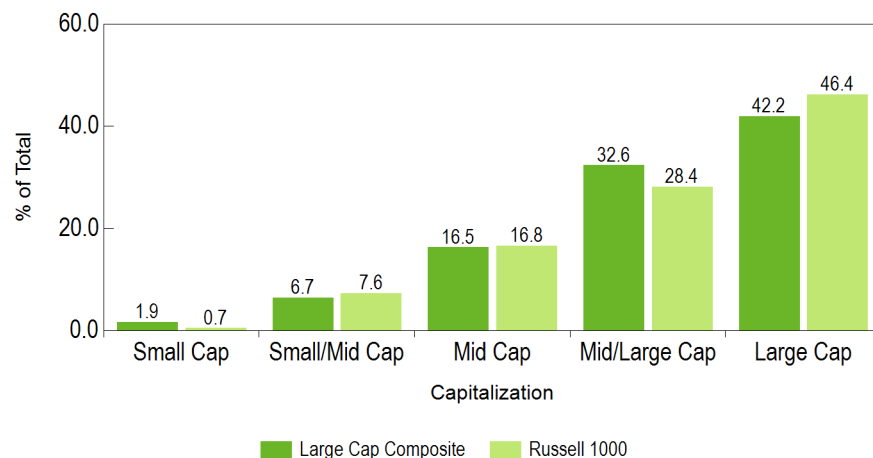
## LARGE CAP COMPOSITE

Characteristics		
	Portfolio	Russell 1000
Number of Holdings	365	997
Weighted Avg. Market Cap. (\$B)	197.2	208.9
Median Market Cap. (\$B)	29.6	9.8
Price To Earnings	17.8	20.7
Price To Book	3.3	3.6
Price To Sales	1.5	2.1
Return on Equity (%)	24.8	24.6
Yield (%)	2.0	1.9
Beta	1.1	1.0
R-Squared	1.0	1.0

### Equity Sector Allocation



### Market Capitalization As of September 30, 2019



## Howard County Retirement Plans

# LARGE CAP COMPOSITE

Top Ten Holdings	
MICROSOFT	3.5%
APPLE	3.1%
AMAZON.COM	3.0%
ALPHABET A	2.9%
FACEBOOK CLASS A	2.1%
VISA 'A'	1.9%
JP MORGAN CHASE & CO.	1.7%
CISCO SYSTEMS	1.4%
HOME DEPOT	1.4%
SALESFORCE.COM	1.2%

Top Positive Contributors		
	Relative Contribution %	Return %
LAM RESEARCH	0.1%	23.6%
APPLIED MATS.	0.1%	11.6%
ENTERGY	0.1%	15.0%
MARATHON PETROLEUM	0.1%	9.9%
BROOKFIELD ASSET MAN.'A' (NYS)	0.1%	11.5%
HOME DEPOT	0.1%	12.2%
CONAGRA BRANDS	0.1%	16.5%
PILGRIMS PRIDE	0.1%	26.2%
KROGER	0.1%	19.6%
BRISTOL MYERS SQUIBB	0.0%	12.8%

Top Negative Contributors		
	Relative Contribution %	Return %
METTLER TOLEDO INTL.	-0.1%	-16.1%
COOPER COS.	-0.1%	-11.8%
NETFLIX	-0.1%	-27.1%
EOG RES.	-0.1%	-20.1%
MARRIOTT INTL.'A'	-0.1%	-11.0%
VERTEX PHARMS.	-0.1%	-7.6%
SERVICENOW	-0.1%	-7.5%
PROCTER & GAMBLE	-0.1%	14.2%
NEXTERA ENERGY	-0.1%	14.4%
PAYPAL HOLDINGS	0.0%	-9.5%

Equity Sector Attribution									
	Total Effects	Selection Effect	Attribution Effects		Returns		Sector Weights		
			Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark	
Energy	0.1%	0.1%	0.0%	0.0%	-4.7%	-7.2%	5.2%	4.7%	
Materials	0.0%	0.0%	0.0%	0.0%	-0.4%	-0.2%	2.5%	2.9%	
Industrials	-0.2%	-0.2%	0.0%	0.0%	-1.3%	0.8%	10.7%	9.8%	
Consumer Discretionary	-0.1%	-0.1%	0.0%	0.0%	-0.2%	0.7%	11.2%	10.4%	
Consumer Staples	0.0%	0.1%	-0.1%	0.0%	7.6%	6.0%	5.4%	6.8%	
Health Care	-0.1%	-0.2%	0.1%	0.0%	-4.3%	-2.7%	12.6%	13.9%	
Financials	0.0%	0.0%	0.0%	0.0%	1.9%	2.1%	15.1%	13.4%	
Information Technology	-0.2%	-0.2%	0.0%	0.0%	2.0%	2.9%	23.0%	21.7%	
Communication Services	-0.1%	-0.1%	0.0%	0.0%	1.3%	2.2%	11.3%	9.6%	
Utilities	-0.1%	0.0%	-0.1%	0.0%	9.0%	8.2%	1.7%	3.2%	
Real Estate	-0.2%	0.1%	-0.2%	-0.1%	10.0%	7.7%	0.8%	3.7%	
Cash	0.0%	0.0%	0.0%	0.0%	0.5%	--	0.4%	0.0%	
<b>Portfolio</b>	<b>-0.9%</b>	<b>=</b>	<b>-0.5%</b>	<b>+</b>	<b>-0.3%</b>	<b>+</b>	<b>-0.1%</b>	<b>0.6%</b>	<b>1.5%</b>
								<b>100.0%</b>	<b>100.0%</b>

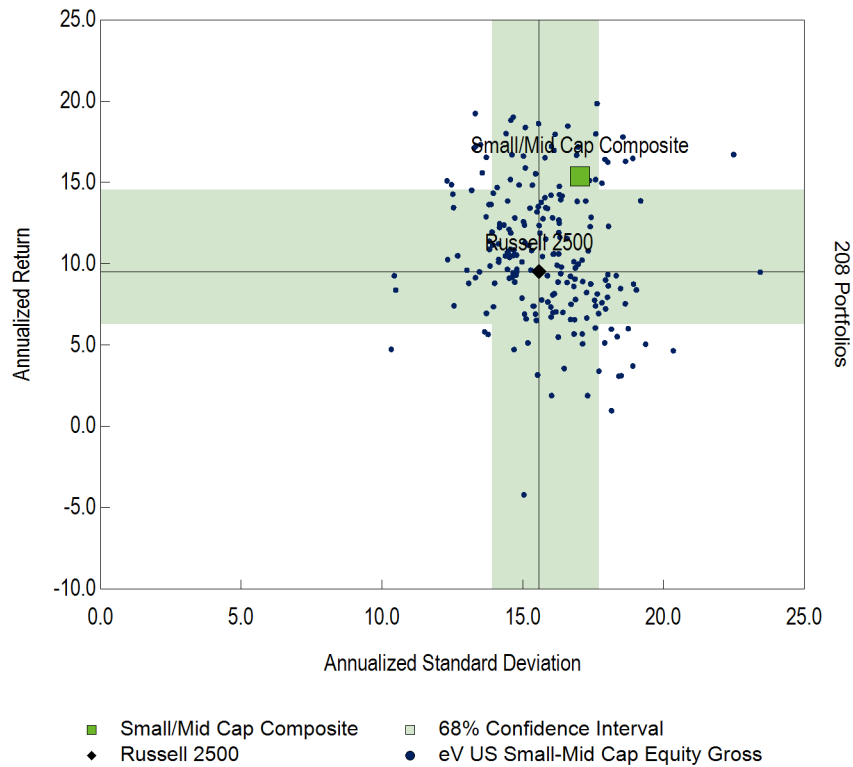
Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.



# Howard County Retirement Plans

## SMALL/MID CAP COMPOSITE

3 Year Risk Return



3 Year Style Analysis

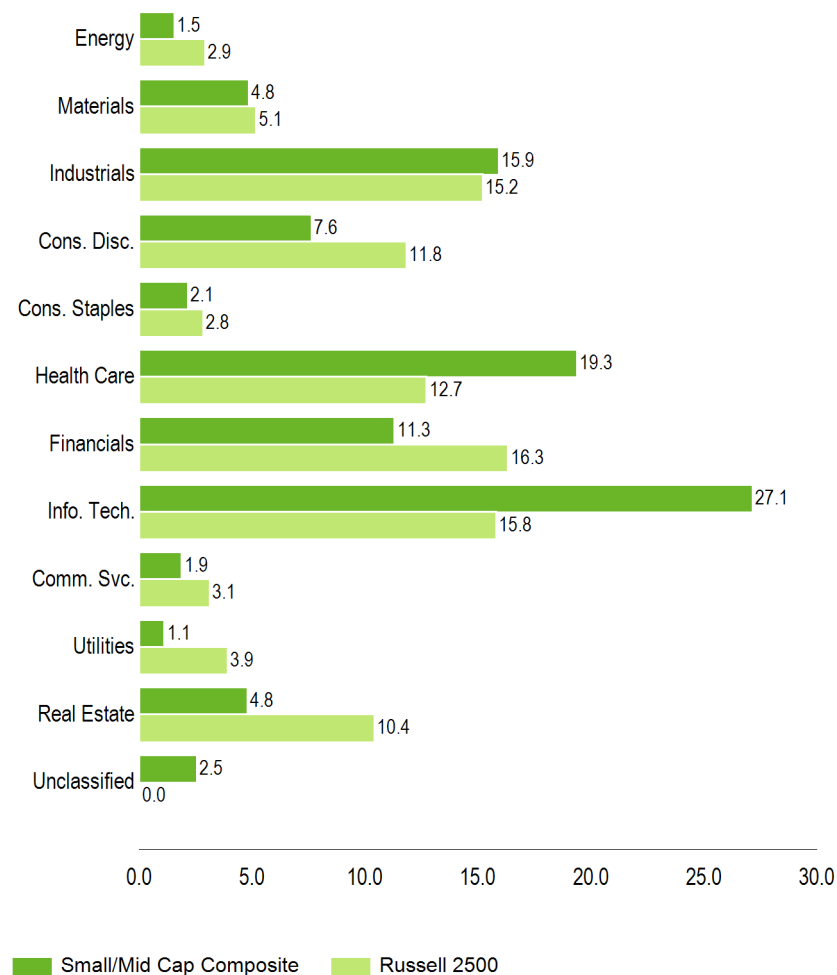


## Howard County Retirement Plans

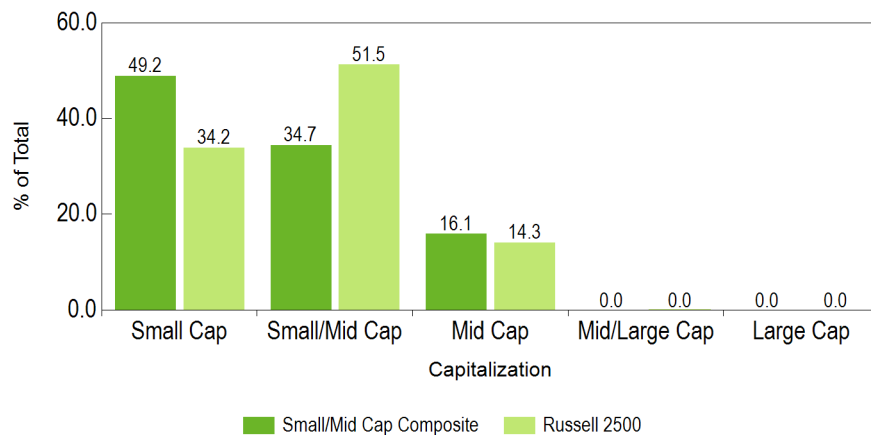
# SMALL/MID CAP COMPOSITE

Characteristics		
	Portfolio	Russell 2500
Number of Holdings	208	2,491
Weighted Avg. Market Cap. (\$B)	5.1	5.1
Median Market Cap. (\$B)	2.4	1.1
Price To Earnings	26.3	19.4
Price To Book	3.2	2.7
Price To Sales	1.7	1.3
Return on Equity (%)	12.6	7.0
Yield (%)	0.9	1.7
Beta	1.1	1.0
R-Squared	1.0	1.0

## Equity Sector Allocation



## Market Capitalization As of September 30, 2019



# Howard County Retirement Plans

## SMALL/MID CAP COMPOSITE

Top Ten Holdings	
CASH - USD	2.5%
TYLER TECHNOLOGIES	1.6%
VEEVA SYSTEMS CL.A	1.5%
MANHATTAN ASSOCS.	1.4%
ANSYS	1.4%
GUIDEWIRE SOFTWARE	1.4%
PAYCOM SOFTWARE	1.4%
NEOGEN	1.3%
COGNEX	1.2%
PROS HOLDINGS	1.2%

Top Positive Contributors		
	Relative Contribution %	Return %
INSULET	0.3%	38.2%
TYLER TECHNOLOGIES	0.2%	21.5%
MANHATTAN ASSOCS.	0.2%	16.4%
TREX	0.2%	26.8%
SAIA	0.1%	44.9%
MARTIN MRTA.MATS.	0.1%	19.4%
MDC HOLDINGS	0.1%	32.6%
NEOGEN	0.1%	9.7%
ANSYS	0.1%	8.1%
BURLINGTON STORES	0.1%	17.4%

Top Negative Contributors		
	Relative Contribution %	Return %
ABIOMED	-0.4%	-31.7%
NEXTGEN HEALTHCARE	-0.2%	-21.3%
INOGEN	-0.2%	-28.2%
GLAUKOS	-0.2%	-17.1%
CONDUENT	-0.2%	-35.1%
DMC GLOBAL	-0.2%	-30.4%
MCDERMOTT INTL.	-0.1%	-79.1%
VOCERA COMMUNICATIONS	-0.1%	-22.8%
PROTO LABS	-0.1%	-12.0%
GRANITE CON.	-0.1%	-33.0%

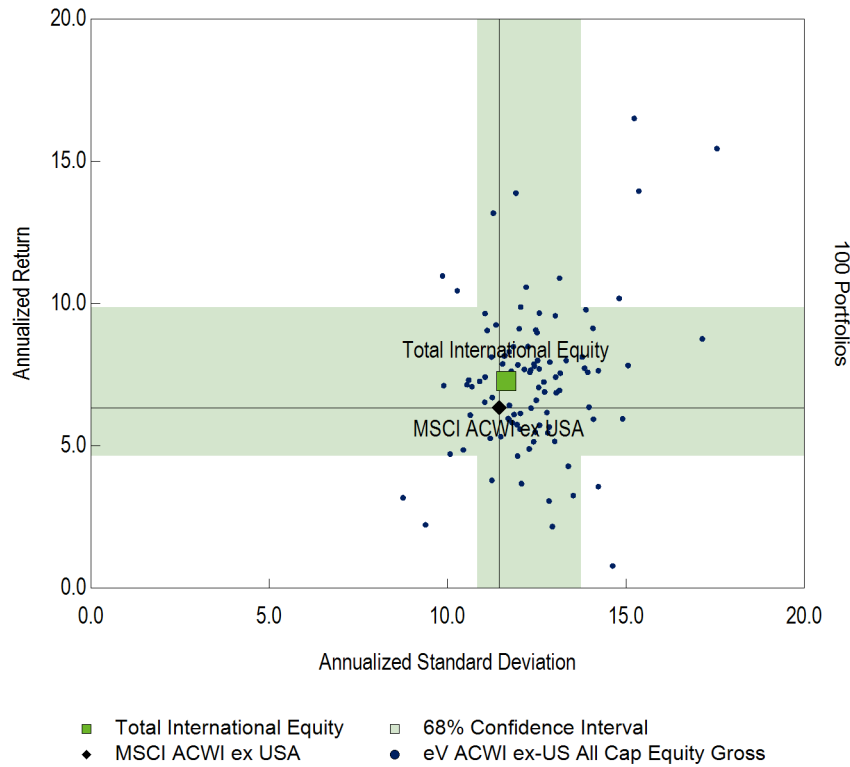
	Equity Sector Attribution								Portfolio	Benchmark	Portfolio	Benchmark
	Total Effects	Selection Effect	Attribution Effects		Returns		Sector Weights					
			Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark				
Energy	-0.2%	-0.4%	0.1%	0.1%	-28.9%	-15.7%	2.1%	2.8%				
Materials	0.3%	0.4%	0.0%	-0.1%	4.9%	-2.5%	3.8%	5.1%				
Industrials	0.8%	0.7%	0.0%	0.1%	4.0%	-0.8%	16.8%	15.6%				
Consumer Discretionary	0.1%	0.2%	0.0%	-0.1%	2.3%	0.4%	7.5%	11.1%				
Consumer Staples	0.0%	0.1%	0.0%	0.0%	8.7%	4.6%	1.7%	2.5%				
Health Care	0.0%	0.3%	-0.5%	0.2%	-5.5%	-8.1%	20.6%	13.3%				
Financials	-0.2%	-0.2%	-0.1%	0.1%	-0.5%	0.8%	11.6%	15.6%				
Information Technology	0.5%	0.3%	0.0%	0.2%	0.7%	-1.2%	26.1%	17.4%				
Communication Services	0.2%	0.2%	0.1%	-0.1%	1.2%	-5.8%	1.4%	3.2%				
Utilities	-0.2%	0.0%	-0.2%	0.0%	6.1%	6.7%	1.0%	3.7%				
Real Estate	-0.5%	-0.1%	-0.4%	0.0%	5.7%	6.9%	4.2%	9.8%				
Cash	0.0%	0.0%	0.0%	0.0%	0.5%	--	3.1%	0.0%				
<b>Portfolio</b>	<b>0.8%</b>	<b>=</b>	<b>1.6%</b>	<b>+</b>	<b>-1.1%</b>	<b>+</b>	<b>0.3%</b>	<b>-0.1%</b>	<b>-0.9%</b>	<b>100.0%</b>	<b>100.0%</b>	

Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.

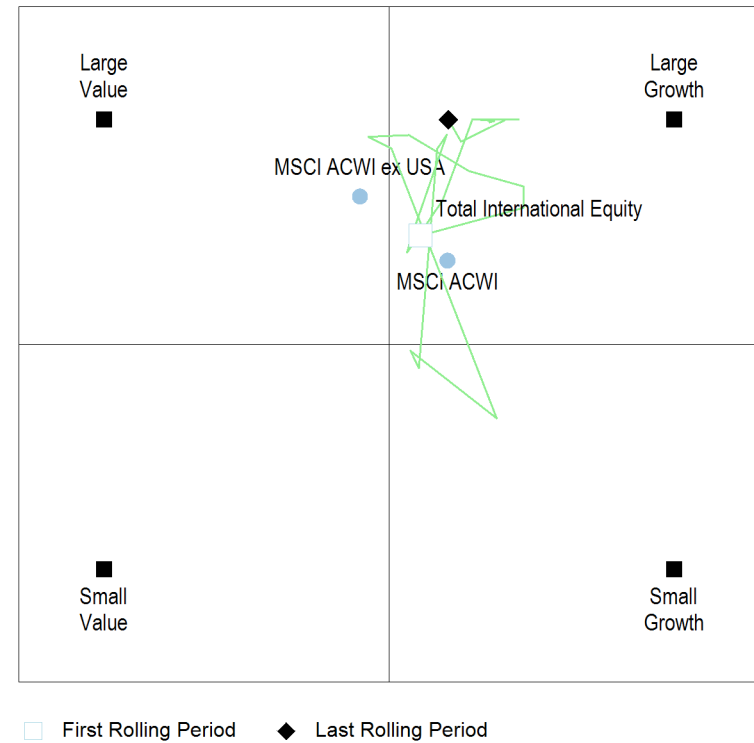


# TOTAL INTERNATIONAL EQUITY

3 Year Risk Return



3 Year Style Analysis



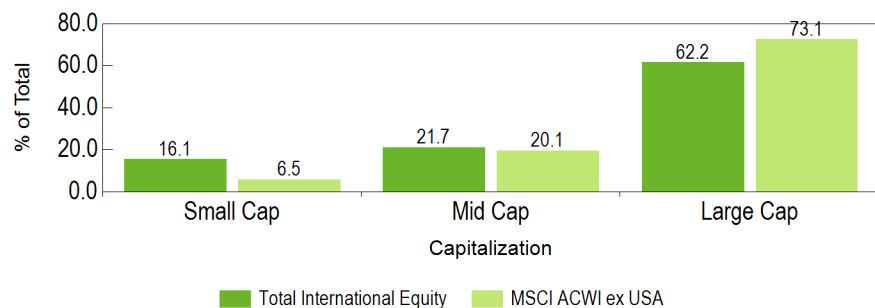
## Howard County Retirement Plans

# TOTAL INTERNATIONAL EQUITY

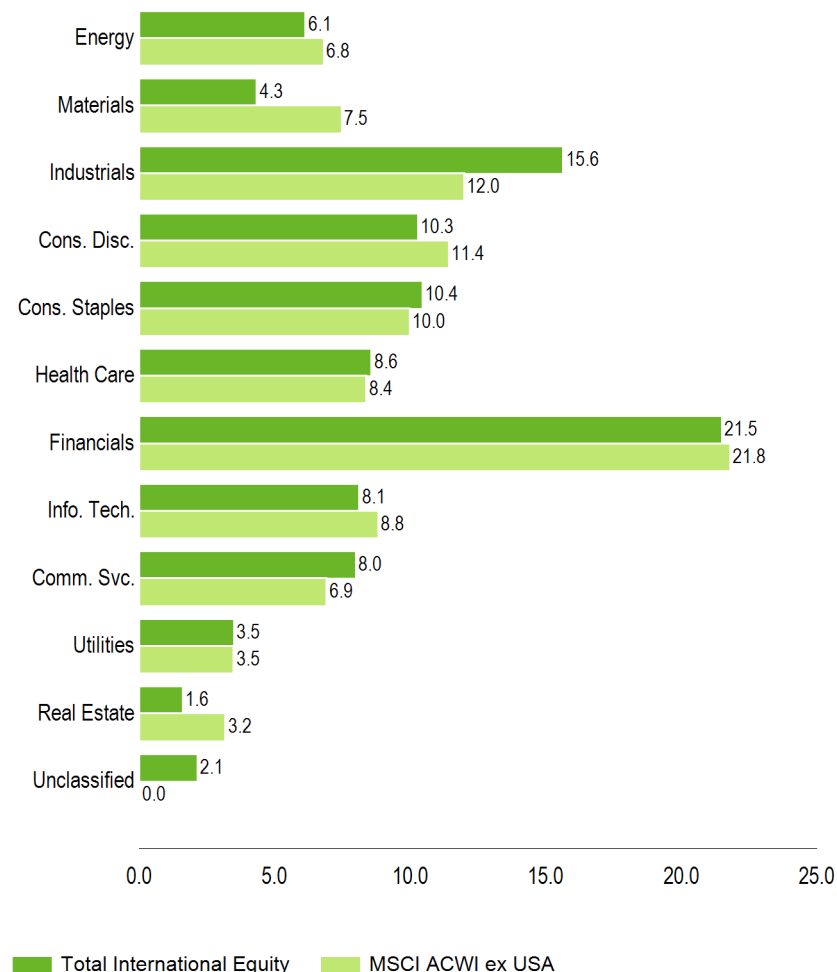
Characteristics		
	Portfolio	MSCI ACWI ex USA
Number of Holdings	2,634	2,206
Weighted Avg. Market Cap. (\$B)	42.4	64.0
Median Market Cap. (\$B)	0.4	7.3
Price To Earnings	16.5	15.0
Price To Book	2.4	2.3
Price To Sales	1.1	1.2
Return on Equity (%)	13.9	15.0
Yield (%)	2.9	3.3
Beta	1.0	1.0
R-Squared	1.0	1.0

Region Weighting	Portfolio Q3-19	Index Q3-19
Americas	6.58	10.64
Europe	40.55	42.74
Asia/Pacific	51.66	43.41
Other	1.20	3.20

**Market Capitalization**  
As of September 30, 2019



**Equity Sector Allocation**



## Howard County Retirement Plans

# TOTAL INTERNATIONAL EQUITY

Top Ten Holdings	
AIA GROUP	2.0%
CASH - USD	1.9%
UNITED OVERSEAS BANK	1.7%
HARGREAVES LANSDOWN	1.2%
HOUSING DEVELOPMENT FINANCE CORPORATION	1.1%
SHISEIDO	1.0%
RELIANCE INDUSTRIES	1.0%
METTLER TOLEDO INTL.	1.0%
BANK CENTRAL ASIA	1.0%
ASML HOLDING	1.0%

Top Positive Contributors		
	Relative Contribution %	Return %
KAKAKU.COM	0.1%	28.4%
OLYMPUS	0.1%	21.4%
SSE	0.1%	14.3%
SMC	0.1%	14.4%
TREASURY WINE ESTATES	0.1%	20.9%
TENCENT HOLDINGS	0.1%	-6.7%
ASML HOLDING	0.1%	18.4%
HARGREAVES LANSDOWN	0.1%	6.5%
ENEL	0.1%	9.2%
FUJITSU	0.1%	15.9%

Top Negative Contributors		
	Relative Contribution %	Return %
METTLER TOLEDO INTL.	-0.2%	-16.1%
AIA GROUP	-0.2%	-12.0%
HDFC BANK ADR 1:3	-0.1%	-12.1%
HOUSING DEVELOPMENT FINANCE CORPORATION	-0.1%	-11.5%
SPOTIFY TECHNOLOGY	-0.1%	-22.0%
WOOD GROUP (JOHN)	-0.1%	-16.5%
FUJIFILM HOLDINGS	-0.1%	-12.6%
ISS	-0.1%	-18.1%
JARDINE MATHESON HDG.	-0.1%	-14.4%
DAIMLER	-0.1%	-11.1%

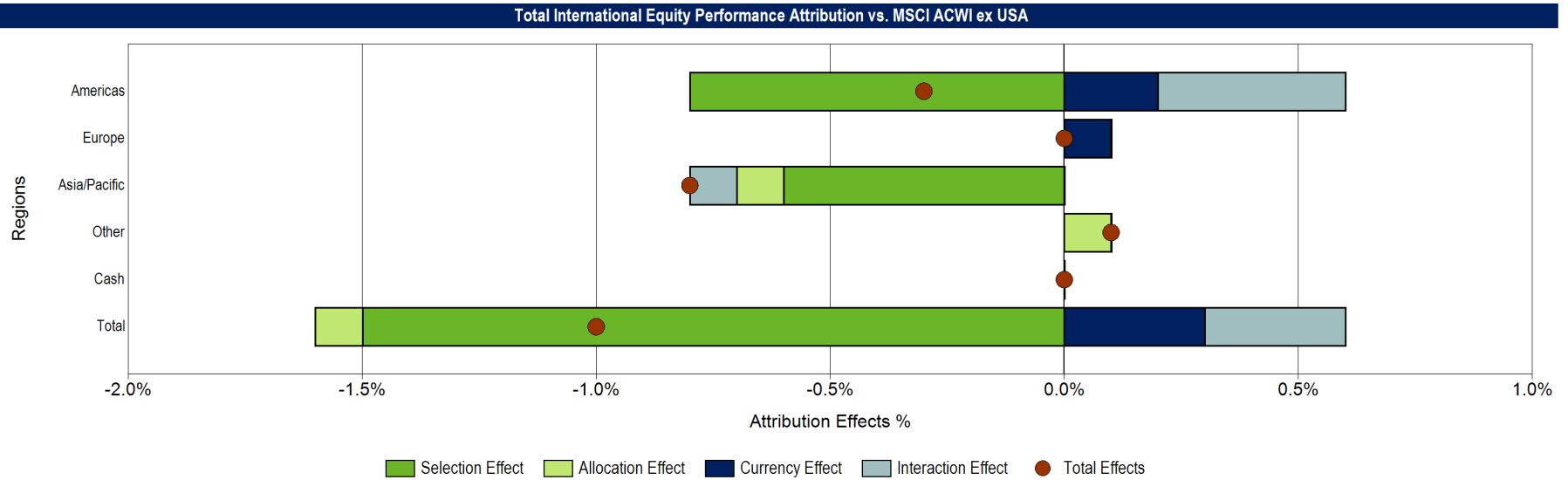
	Equity Sector Attribution										
	Attribution Effects					Returns		Sector Weights			
	Total Effects	Selection Effect	Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark			
Energy	0.0%	-0.1%	0.0%	0.0%	-5.2%	-4.4%	6.4%	7.1%			
Materials	0.1%	-0.2%	0.1%	0.2%	-9.1%	-6.3%	4.5%	7.7%			
Industrials	-0.5%	-0.3%	0.0%	-0.2%	-4.8%	-2.5%	15.7%	12.1%			
Consumer Discretionary	-0.1%	-0.1%	0.0%	0.0%	-2.2%	-0.7%	10.1%	11.3%			
Consumer Staples	0.0%	-0.1%	0.0%	0.1%	1.8%	1.7%	9.0%	9.4%			
Health Care	-0.1%	-0.2%	0.0%	0.1%	-0.5%	1.1%	7.9%	8.3%			
Financials	-0.2%	-0.3%	0.0%	0.1%	-4.2%	-3.4%	22.6%	22.0%			
Information Technology	0.0%	0.0%	0.0%	0.0%	2.4%	2.4%	7.6%	8.5%			
Communication Services	-0.1%	-0.1%	0.0%	-0.1%	-4.2%	-2.7%	7.9%	6.9%			
Utilities	0.1%	0.0%	0.1%	0.0%	2.3%	1.4%	5.0%	3.4%			
Real Estate	0.0%	-0.2%	0.0%	0.1%	-7.0%	-3.0%	1.8%	3.2%			
Cash	0.0%	0.0%	0.0%	0.0%	0.5%	--	1.7%	0.0%			
<b>Portfolio</b>	<b>-1.0%</b>	<b>=</b>	<b>-1.5%</b>	<b>+</b>	<b>0.1%</b>	<b>+</b>	<b>0.4%</b>	<b>-2.7%</b>	<b>-1.7%</b>	<b>100.0%</b>	<b>100.0%</b>

Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.



## Howard County Retirement Plans

# TOTAL INTERNATIONAL EQUITY



	Returns and Weights				Attribution Effects				
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect	Total Effects
<b>Totals</b>									
Americas	-9.1%	-1.3%	5.2%	10.1%	-0.8%	0.0%	0.2%	0.4%	-0.3%
Europe	-1.9%	-1.8%	40.5%	43.3%	0.0%	0.0%	0.1%	0.0%	0.0%
Asia/Pacific	-2.5%	-1.3%	51.5%	43.7%	-0.6%	-0.1%	0.0%	-0.1%	-0.8%
Other	-10.5%	-7.6%	1.2%	2.9%	0.0%	0.1%	0.0%	0.0%	0.1%
Cash	0.5%	--	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>-2.7%</b>	<b>-1.7%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>-1.5%</b>	<b>-0.1%</b>	<b>0.3%</b>	<b>0.3%</b>	<b>-1.0%</b>
<b>Totals</b>									
Developed	-2.2%	-0.9%	71.7%	73.5%	-1.1%	0.0%	0.2%	0.0%	-0.9%
Emerging*	-4.2%	-4.1%	26.6%	26.5%	-0.1%	0.0%	0.1%	0.0%	0.0%
Cash	0.5%	--	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



## Howard County Retirement Plans

# TOTAL INTERNATIONAL EQUITY

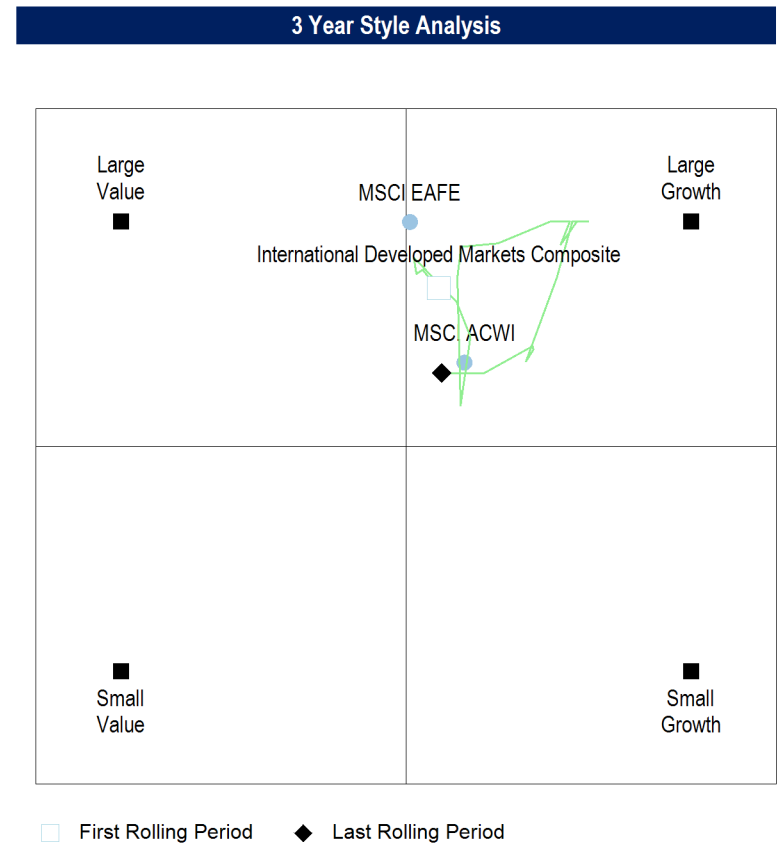
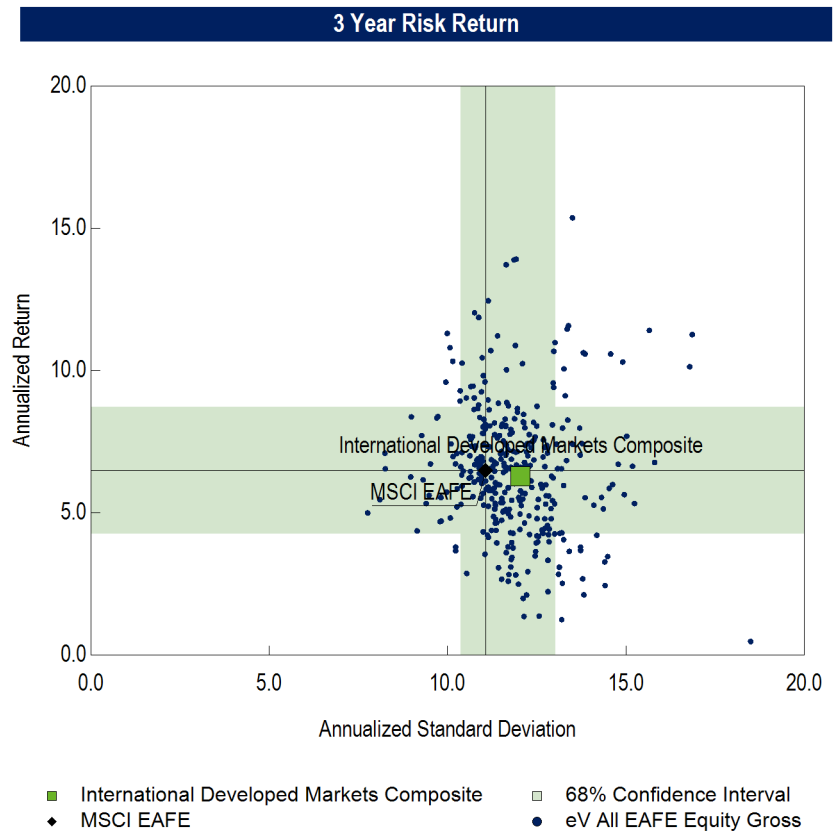
Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>Americas</b>				
Brazil*	1.8%	2.0%	-6.4%	-4.7%
Chile*	0.2%	0.2%	-7.4%	-7.5%
Colombia*	0.0%	0.1%	-9.0%	-6.1%
Mexico*	0.9%	0.7%	-2.6%	-1.6%
United States	2.2%	0.0%	-14.1%	1.6%
<b>Total-Americas</b>	<b>5.2%</b>	<b>10.1%</b>	<b>-9.1%</b>	<b>-1.3%</b>
<b>Europe</b>				
Czech Republic*	0.0%	0.0%	-4.5%	-9.4%
Denmark	1.3%	1.1%	-13.3%	-0.9%
Finland	0.6%	0.7%	-3.6%	-1.8%
France	2.9%	7.6%	2.7%	-1.6%
Germany	6.3%	5.8%	-5.6%	-4.0%
Greece*	0.0%	0.1%	-1.1%	-2.9%
Hungary*	0.0%	0.1%	-13.5%	-3.9%
Ireland	0.6%	0.4%	-9.9%	-0.5%
Italy	1.8%	1.5%	2.4%	0.2%
Netherlands	1.5%	2.0%	10.8%	3.6%
Poland*	0.2%	0.3%	-12.3%	-11.7%
Portugal	0.6%	0.1%	4.6%	1.9%
Russia*	1.3%	1.1%	3.3%	-1.1%
Spain	2.0%	2.0%	-2.5%	-3.8%
Sweden	3.6%	1.8%	-0.5%	-4.8%
Switzerland	3.7%	6.2%	-2.7%	0.3%
United Kingdom	13.9%	11.2%	-2.4%	-2.5%
<b>Total-Europe</b>	<b>40.5%</b>	<b>43.3%</b>	<b>-1.9%</b>	<b>-1.8%</b>

Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>AsiaPacific</b>				
Australia	2.4%	4.8%	3.7%	-1.3%
China*	2.6%	8.4%	-3.4%	-4.7%
Hong Kong	8.6%	2.7%	-9.6%	-11.9%
India*	7.8%	2.4%	-5.3%	-5.2%
Indonesia*	2.0%	0.6%	-3.6%	-5.3%
Japan	15.3%	16.0%	3.4%	3.2%
Korea*	2.9%	3.3%	-10.7%	-4.7%
Malaysia*	0.6%	0.6%	-5.5%	-6.4%
Philippines*	0.3%	0.3%	-5.7%	-4.5%
Singapore	4.4%	0.9%	-5.4%	-5.8%
Taiwan*	3.0%	2.9%	5.2%	5.8%
Thailand*	1.7%	0.8%	-4.2%	-5.9%
<b>Total-AsiaPacific</b>	<b>51.5%</b>	<b>43.7%</b>	<b>-2.5%</b>	<b>-1.3%</b>
<b>Other</b>				
South Africa*	1.0%	1.6%	-14.0%	-12.2%
Turkey*	0.1%	0.1%	14.1%	11.6%
<b>Total-Other</b>	<b>1.2%</b>	<b>2.9%</b>	<b>-10.5%</b>	<b>-7.6%</b>
<b>Totals</b>				
Developed	71.7%	73.5%	-2.2%	-0.9%
Emerging*	26.6%	26.5%	-4.2%	-4.1%
Cash	1.7%		0.5%	

Country\* = Emerging Markets



# INTERNATIONAL DEVELOPED MARKETS COMPOSITE

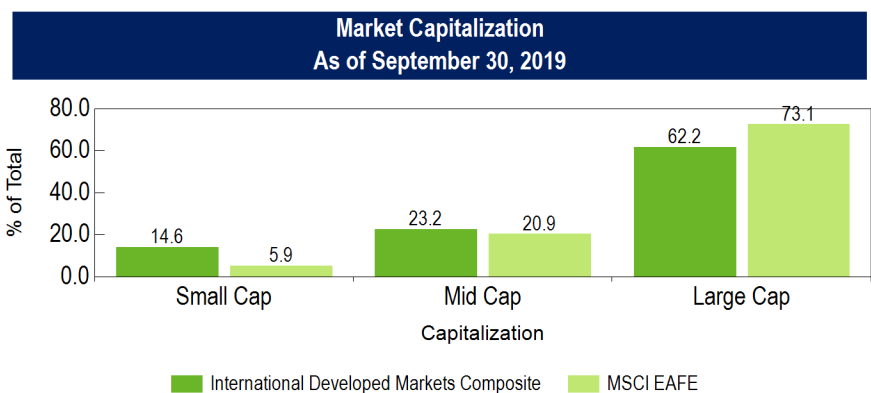


## Howard County Retirement Plans

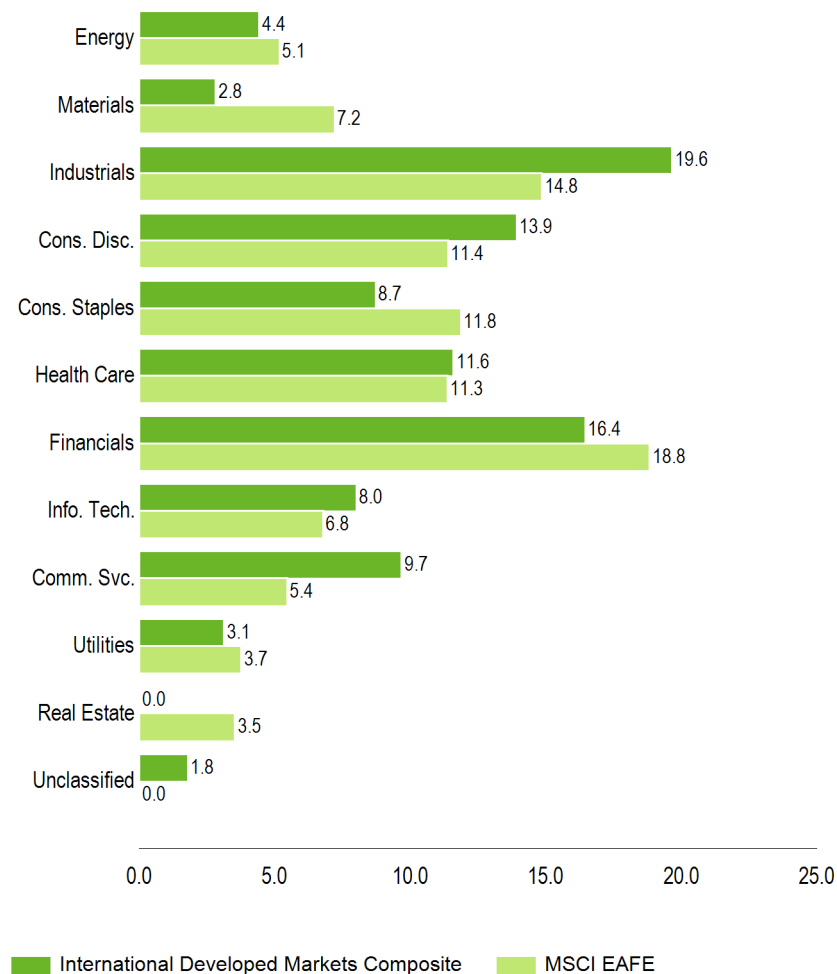
# INTERNATIONAL DEVELOPED MARKETS COMPOSITE

Characteristics		
	Portfolio	MSCI EAFE
Number of Holdings	119	922
Weighted Avg. Market Cap. (\$B)	38.3	59.7
Median Market Cap. (\$B)	20.7	9.9
Price To Earnings	18.1	15.8
Price To Book	2.5	2.3
Price To Sales	1.1	1.1
Return on Equity (%)	17.1	14.3
Yield (%)	3.0	3.3
Beta	1.1	1.0
R-Squared	1.0	1.0

	Portfolio Q3-19	Index Q3-19
<b>Region Weighting</b>		
Americas	3.78	0.55
Europe	56.30	61.73
Asia/Pacific	39.93	37.00
Other	--	0.71



## Equity Sector Allocation



## Howard County Retirement Plans

# INTERNATIONAL DEVELOPED MARKETS COMPOSITE

Top Ten Holdings	
UNITED OVERSEAS BANK	2.6%
HARGREAVES LANSDOWN	1.8%
AIA GROUP	1.7%
CASH - USD	1.6%
SHISEIDO	1.6%
METTLER TOLEDO INTL.	1.5%
ASML HOLDING	1.5%
COCHLEAR	1.5%
SAINT GOBAIN	1.4%
SMC	1.3%

Top Positive Contributors		
	Relative Contribution %	Return %
KAKAKU.COM	0.2%	28.4%
OLYMPUS	0.2%	21.4%
SSE	0.2%	14.3%
SMC	0.1%	14.4%
TREASURY WINE ESTATES	0.1%	20.9%
ASML HOLDING	0.1%	18.4%
HARGREAVES LANSDOWN	0.1%	6.5%
ENEL	0.1%	9.2%
TAIWAN SEMICON.MNFG.	0.1%	14.8%
FUJITSU	0.1%	15.9%

Top Negative Contributors		
	Relative Contribution %	Return %
METTLER TOLEDO INTL.	-0.3%	-16.1%
SPOTIFY TECHNOLOGY	-0.2%	-22.0%
WOOD GROUP (JOHN)	-0.2%	-16.5%
FUJIFILM HOLDINGS	-0.1%	-12.6%
ISS	-0.1%	-18.1%
JARDINE MATHESON HDG.	-0.1%	-14.4%
DAIMLER	-0.1%	-11.1%
AIA GROUP	-0.1%	-12.0%
NOVOZYMES B	-0.1%	-10.0%
EVONIK INDUSTRIES	-0.1%	-15.0%

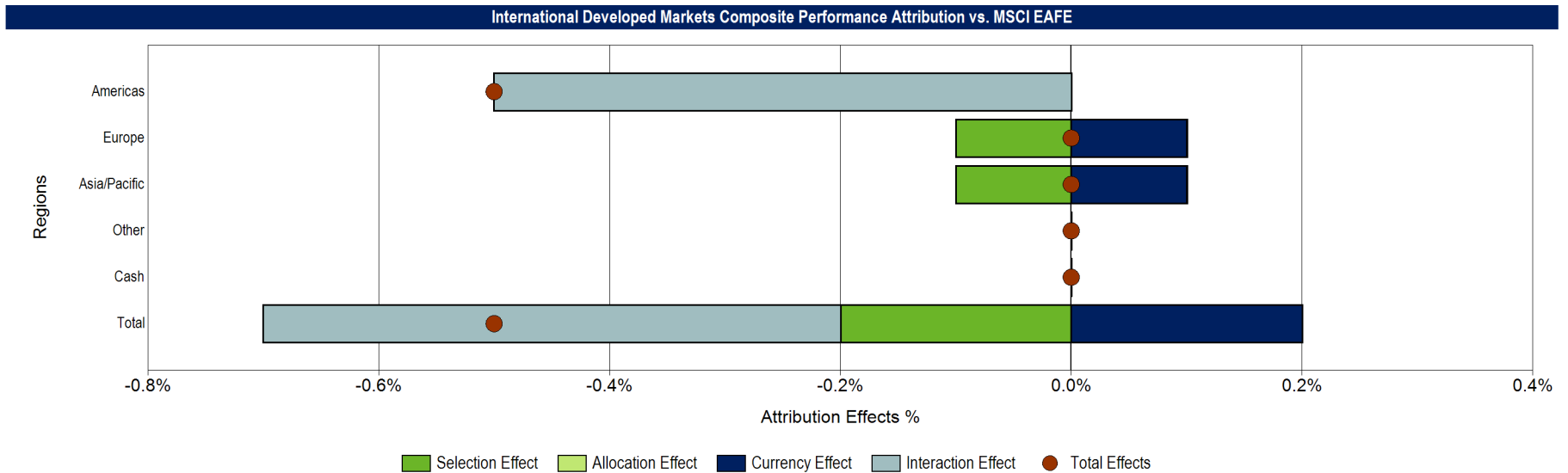
	Equity Sector Attribution										
	Attribution Effects				Returns		Sector Weights				
	Total Effects	Selection Effect	Allocation Effect	Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark			
Energy	-0.1%	-0.2%	0.0%	0.1%	-9.2%	-6.3%	4.9%	5.6%			
Materials	0.1%	-0.4%	0.2%	0.4%	-11.6%	-5.4%	3.0%	7.4%			
Industrials	-0.5%	-0.2%	-0.1%	-0.2%	-3.7%	-2.0%	19.9%	14.9%			
Consumer Discretionary	-0.3%	-0.2%	0.0%	-0.1%	-1.6%	0.3%	13.8%	11.2%			
Consumer Staples	0.0%	0.0%	-0.1%	0.2%	2.7%	2.1%	7.9%	11.1%			
Health Care	-0.3%	-0.4%	0.0%	0.1%	-0.1%	2.4%	10.9%	11.2%			
Financials	0.4%	0.3%	0.0%	0.1%	-0.9%	-2.5%	16.7%	19.0%			
Information Technology	0.2%	0.2%	0.0%	0.0%	2.4%	-0.5%	7.3%	6.7%			
Communication Services	-0.4%	-0.2%	0.0%	-0.2%	-3.5%	-0.8%	10.0%	5.4%			
Utilities	0.3%	0.3%	0.0%	0.0%	9.6%	2.5%	3.7%	3.8%			
Real Estate	0.1%	0.0%	0.0%	0.1%	-2.2%	-1.1%	0.3%	3.6%			
Cash	0.0%	0.0%	0.0%	0.0%	0.5%	--	1.6%	0.0%			
<b>Portfolio</b>	<b>-0.5%</b>	<b>=</b>	<b>-0.9%</b>	<b>+</b>	<b>0.1%</b>	<b>+</b>	<b>0.3%</b>	<b>-1.5%</b>	<b>-1.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.



## Howard County Retirement Plans

# INTERNATIONAL DEVELOPED MARKETS COMPOSITE



	Returns and Weights				Attribution Effects				
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect	Total Effects
<b>Totals</b>									
Americas	-18.0%	--	2.6%	0.0%	0.0%	0.0%	0.0%	-0.5%	-0.5%
Europe	-2.0%	-1.7%	57.8%	62.6%	-0.1%	0.0%	0.1%	0.0%	0.0%
Asia/Pacific	0.3%	0.3%	38.0%	36.8%	-0.1%	0.0%	0.1%	0.0%	0.0%
Other	--	-3.6%	0.0%	0.6%	--	0.0%	0.0%	--	0.0%
Cash	0.5%	--	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>-1.5%</b>	<b>-1.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>-0.2%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>-0.5%</b>	<b>-0.5%</b>
<b>Totals</b>									
Developed	-1.6%	-1.0%	97.7%	100.0%	-0.8%	0.0%	0.2%	0.0%	-0.5%
Emerging*	14.8%	--	0.6%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Cash	0.5%	--	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



## Howard County Retirement Plans

# INTERNATIONAL DEVELOPED MARKETS COMPOSITE

Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>Americas</b>				
United States	2.6%	0.0%	-18.0%	1.6%
<b>Total-Americas</b>	<b>2.6%</b>	<b>0.0%</b>	<b>-18.0%</b>	<b>--</b>
<b>Europe</b>				
Denmark	2.0%	1.7%	-13.3%	-0.9%
Finland	0.9%	1.0%	-3.6%	-1.8%
France	4.4%	11.4%	2.7%	-1.6%
Germany	9.6%	8.7%	-5.6%	-4.0%
Ireland	0.9%	0.5%	-9.9%	-0.5%
Italy	2.8%	2.3%	2.4%	0.2%
Netherlands	1.5%	3.0%	17.3%	3.6%
Portugal	1.0%	0.2%	4.6%	1.9%
Spain	3.1%	3.0%	-2.5%	-3.8%
Sweden	5.4%	2.7%	-0.5%	-4.8%
Switzerland	5.6%	9.3%	-2.7%	0.3%
United Kingdom	20.4%	16.8%	-2.2%	-2.5%
<b>Total-Europe</b>	<b>57.8%</b>	<b>62.6%</b>	<b>-2.0%</b>	<b>-1.7%</b>

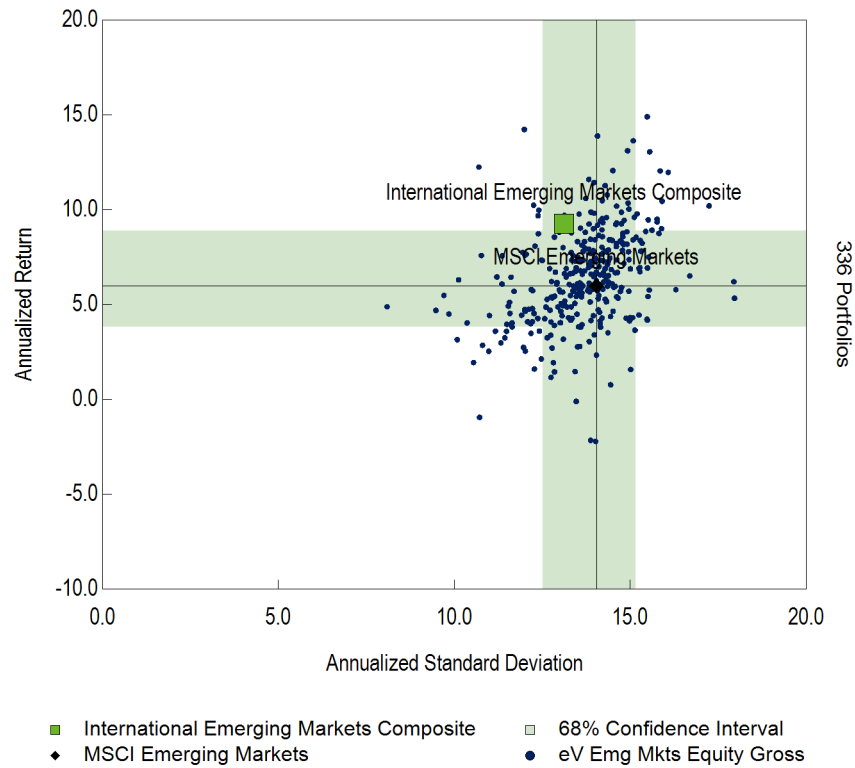
Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>AsiaPacific</b>				
Australia	3.6%	7.2%	3.7%	-1.3%
Hong Kong	5.4%	4.1%	-10.0%	-11.9%
Japan	23.3%	24.0%	3.4%	3.2%
Singapore	5.1%	1.4%	-7.0%	-5.8%
Taiwan*	0.6%	0.0%	14.8%	5.8%
<b>Total-AsiaPacific</b>	<b>38.0%</b>	<b>36.8%</b>	<b>0.3%</b>	<b>0.3%</b>
<b>Totals</b>				
Developed	97.7%	100.0%	-1.6%	-1.0%
Emerging*	0.6%	0.0%	14.8%	--
Cash	1.6%		0.5%	

Country\* = Emerging Markets

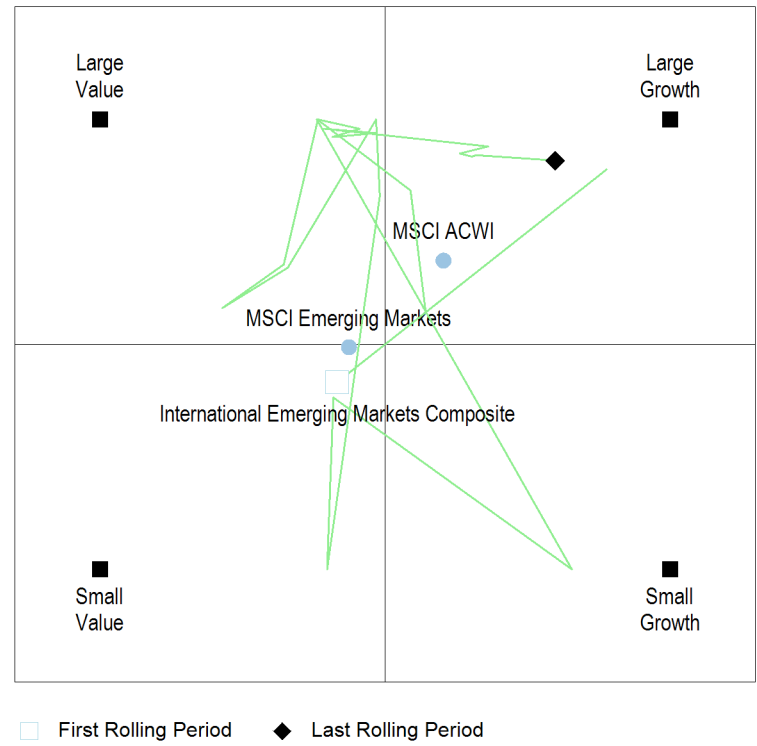


# INTERNATIONAL EMERGING MARKETS COMPOSITE

**3 Year Risk Return**



**3 Year Style Analysis**

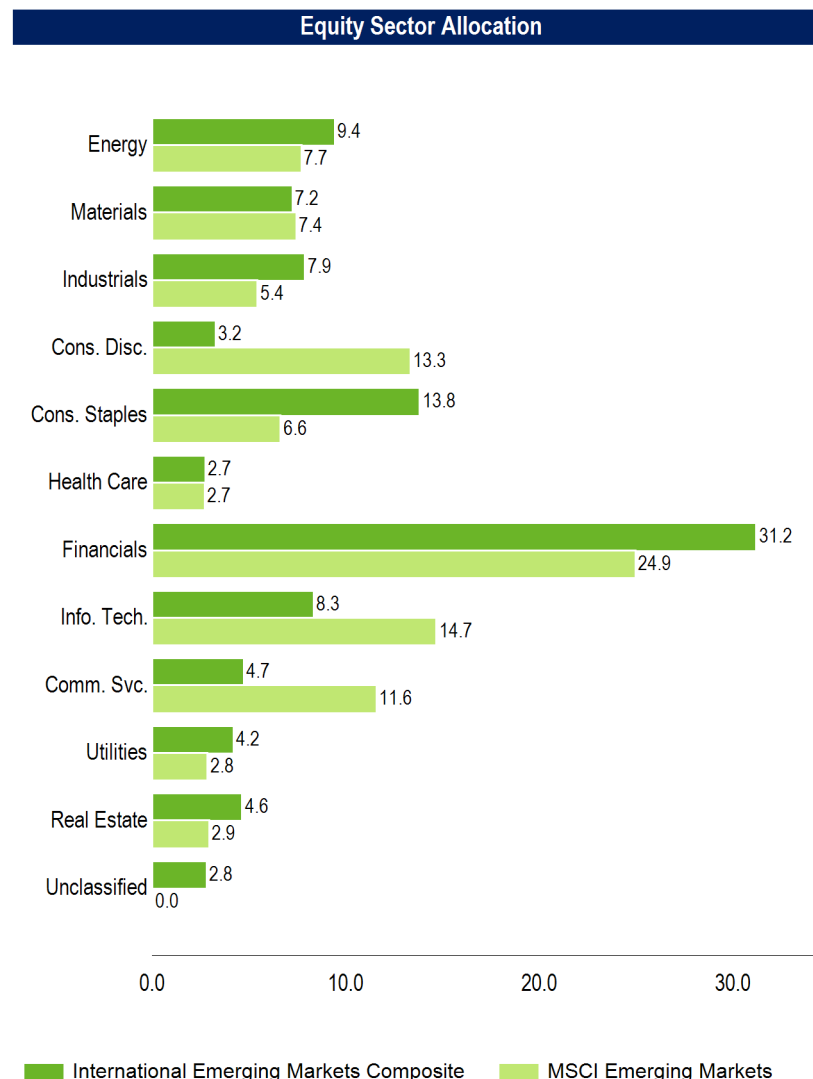
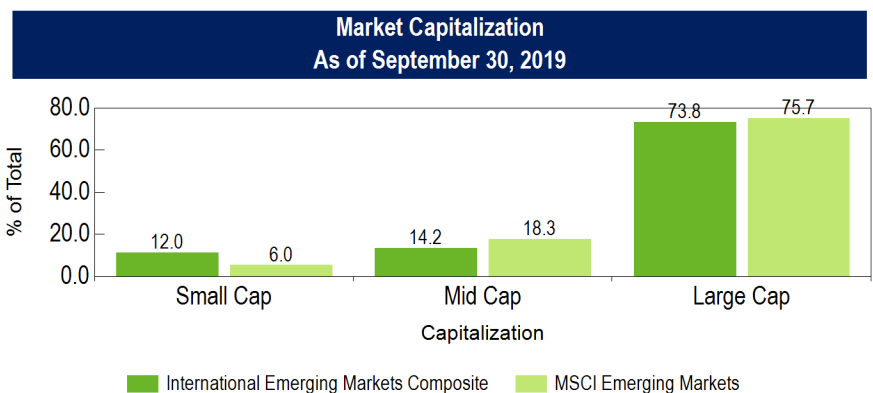


## Howard County Retirement Plans

# INTERNATIONAL EMERGING MARKETS COMPOSITE

Characteristics		
	Portfolio	MSCI Emerging Markets
Number of Holdings	2,519	1,194
Weighted Avg. Market Cap. (\$B)	50.5	80.2
Median Market Cap. (\$B)	0.4	5.3
Price To Earnings	14.2	13.6
Price To Book	2.3	2.4
Price To Sales	1.1	1.3
Return on Equity (%)	14.2	16.8
Yield (%)	2.8	3.1
Beta	0.9	1.0
R-Squared	0.9	1.0

	Portfolio Q3-19	Index Q3-19
<b>Region Weighting</b>		
Americas	11.99	12.69
Europe	10.20	5.95
Asia/Pacific	74.30	71.02
Other	3.52	10.34



## Howard County Retirement Plans

# INTERNATIONAL EMERGING MARKETS COMPOSITE

Characteristics	MSCI Emerging Markets	
	Portfolio	MSCI Emerging Markets
Number of Holdings	2,519	1,194
Weighted Avg. Market Cap. (\$B)	50.5	80.2
Median Market Cap. (\$B)	0.4	5.3
Price To Earnings	14.2	13.6
Price To Book	2.3	2.4
Price To Sales	1.1	1.3
Return on Equity (%)	14.2	16.8
Yield (%)	2.8	3.1
Beta	0.9	1.0
R-Squared	0.9	1.0

Top Positive Contributors	Relative	
	Contribution %	Return %
TENCENT HOLDINGS	0.3%	-6.7%
PUBLIC JOINT STOCK POLYUS GDR	0.1%	24.9%
BANCO BRADESCO PN	0.1%	-16.7%
KWEICHOW MOUTAI 'A'	0.1%	12.4%
KOTAK MAHINDRA BANK	0.1%	8.5%
INFOSYS ADR 1:1	0.1%	6.3%
RELIANCE INDUSTRIES	0.1%	4.1%
WULIANGYE ORD A	0.1%	5.9%
ALIBABA GROUP HOLDING ADR 1:8	0.1%	-1.3%
TRIP COM GROUP ADR 8:1	0.1%	-20.6%

Top Negative Contributors	Relative	
	Contribution %	Return %
TAIWAN SEMICON.MNFG.	-0.4%	14.8%
HDFC BANK ADR 1:3	-0.4%	-12.1%
HOUSING DEVELOPMENT FINANCE CORPORATION	-0.4%	-11.5%
AIA GROUP	-0.3%	-12.0%
CKI HOLDINGS	-0.2%	-16.4%
MTR	-0.2%	-16.2%
LINK RL.EST.INV.TST.	-0.2%	-10.3%
SAMSUNG FIRE & MAR.IN.	-0.2%	-19.7%
CHINA TOWER 'H'	-0.2%	-13.5%
COCA-COLA HBC	-0.1%	-6.5%

	Equity Sector Attribution								Returns		Sector Weights	
	Total Effects	Selection Effect	Attribution Effects			Interaction Effects	Portfolio	Benchmark	Portfolio	Benchmark		
			Allocation Effect									
Energy	0.2%	0.1%	0.0%		0.1%	-1.1%	-3.6%	9.3%	7.9%			
Materials	0.2%	0.2%	0.0%		0.0%	-7.2%	-10.2%	7.4%	7.6%			
Industrials	-0.4%	-0.3%	0.0%		-0.1%	-10.3%	-5.5%	7.5%	5.6%			
Consumer Discretionary	0.0%	-0.5%	-0.1%		0.6%	-7.9%	-3.2%	2.9%	13.5%			
Consumer Staples	0.2%	0.0%	0.2%		-0.1%	0.5%	-0.6%	11.1%	6.4%			
Health Care	0.1%	0.0%	0.0%		0.0%	-4.6%	-6.7%	2.0%	2.6%			
Financials	-0.4%	-0.1%	-0.3%		0.1%	-7.3%	-7.7%	33.9%	25.2%			
Information Technology	-0.7%	-0.6%	-0.5%		0.4%	2.5%	5.9%	8.2%	13.8%			
Communication Services	0.1%	-0.3%	0.2%		0.3%	-7.8%	-4.9%	3.8%	11.5%			
Utilities	-0.2%	-0.1%	0.1%		-0.2%	-4.7%	-3.5%	7.4%	2.7%			
Real Estate	-0.1%	0.0%	-0.1%		0.0%	-7.6%	-8.7%	4.6%	3.0%			
Cash	0.0%	0.0%	0.0%		0.0%	0.5%	--	1.7%	0.0%			
<b>Portfolio</b>	<b>-0.9%</b>	<b>=</b>	<b>-1.5%</b>	<b>+</b>	<b>-0.5%</b>	<b>+</b>	<b>1.2%</b>	<b>-4.9%</b>	<b>-4.1%</b>	<b>100.0%</b>	<b>100.0%</b>	

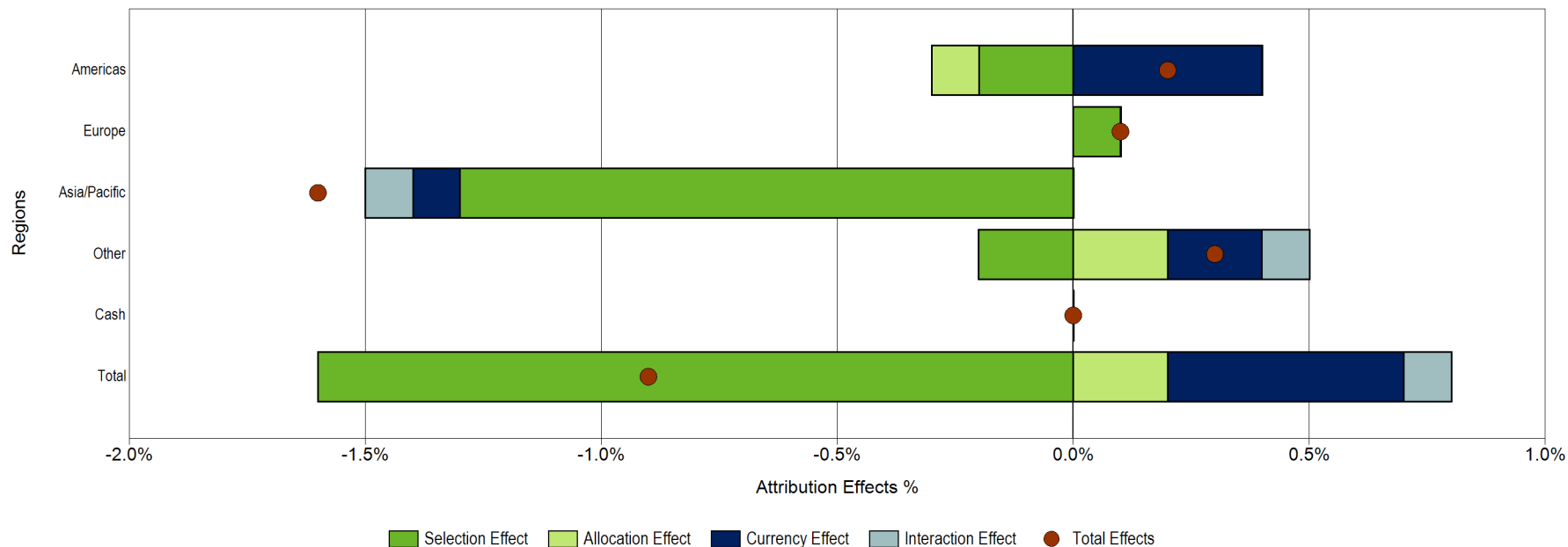
Attribution on manager pages is holdings based, using buy-and-hold assumptions from the beginning of the period portfolio. Results may differ from the flash report.



## Howard County Retirement Plans

# INTERNATIONAL EMERGING MARKETS COMPOSITE

International Emerging Markets Composite Performance Attribution vs. MSCI Emerging Markets



	Returns and Weights				Attribution Effects				
	Manager Return	Index Return	Manager Weight	Index Weight	Selection Effect	Allocation Effect	Currency Effect	Interaction Effect	Total Effects
<b>Totals</b>									
Americas	-4.8%	-5.6%	10.2%	12.3%	-0.2%	-0.1%	0.4%	0.0%	0.2%
Europe	-1.2%	-3.6%	7.4%	5.9%	0.1%	0.0%	0.0%	0.0%	0.1%
Asia/Pacific	-5.2%	-3.3%	77.3%	72.3%	-1.3%	0.0%	-0.1%	-0.1%	-1.6%
Other	-10.5%	-8.2%	3.4%	9.6%	-0.2%	0.2%	0.2%	0.1%	0.3%
Cash	0.5%	--	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Total</b>	<b>-4.9%</b>	<b>-4.1%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>-1.6%</b>	<b>0.2%</b>	<b>0.5%</b>	<b>0.1%</b>	<b>-0.9%</b>
<b>Totals</b>									
Developed	-6.9%	--	22.0%	0.0%	0.0%	0.0%	-0.2%	-0.9%	-1.1%
Emerging*	-4.5%	-4.1%	76.3%	100.0%	-0.7%	0.0%	0.7%	0.2%	0.2%
Cash	0.5%	--	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



## Howard County Retirement Plans

# INTERNATIONAL EMERGING MARKETS COMPOSITE

Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>Americas</b>				
Brazil*	5.4%	7.6%	-6.4%	-4.7%
Chile*	0.5%	0.9%	-7.4%	-7.5%
Colombia*	0.1%	0.4%	-9.0%	-6.1%
Mexico*	2.7%	2.6%	-2.6%	-1.6%
United States	1.5%	0.0%	-1.4%	1.6%
<b>Total-Americas</b>	<b>10.2%</b>	<b>12.3%</b>	<b>-4.8%</b>	<b>-5.6%</b>
<b>Europe</b>				
Czech Republic*	0.1%	0.2%	-4.5%	-9.4%
Greece*	0.0%	0.3%	-1.1%	-2.9%
Hungary*	0.1%	0.3%	-13.5%	-3.9%
Netherlands	1.4%	0.0%	-2.8%	3.6%
Poland*	0.5%	1.1%	-12.3%	-11.7%
Russia*	3.8%	4.0%	3.3%	-1.1%
United Kingdom	1.4%	0.0%	-6.7%	-2.5%
<b>Total-Europe</b>	<b>7.4%</b>	<b>5.9%</b>	<b>-1.2%</b>	<b>-3.6%</b>

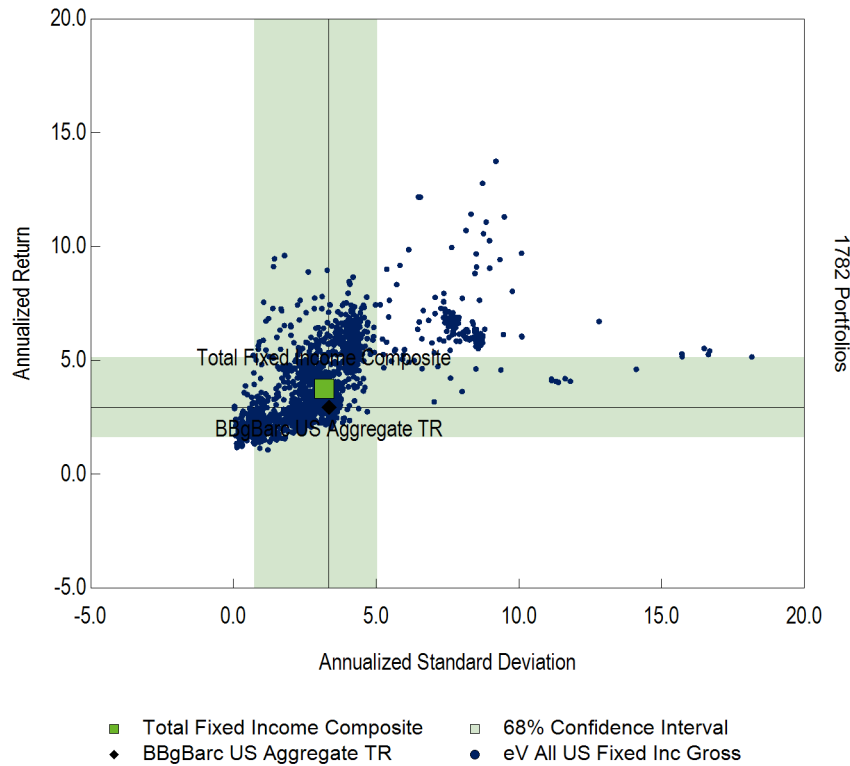
Country Allocation				
	Manager	Index	Manager	Index
	Allocation (USD)	Allocation (USD)	Return (USD)	Return (USD)
<b>AsiaPacific</b>				
China*	7.6%	31.6%	-3.4%	-4.7%
Hong Kong	14.7%	0.0%	-9.2%	-11.9%
India*	22.6%	9.0%	-5.3%	-5.2%
Indonesia*	5.9%	2.1%	-3.6%	-5.3%
Korea*	8.6%	12.4%	-10.7%	-4.7%
Malaysia*	1.7%	2.1%	-5.5%	-6.4%
Philippines*	0.7%	1.1%	-5.7%	-4.5%
Singapore	3.0%	0.0%	-0.3%	-5.8%
Taiwan*	7.5%	10.9%	3.7%	5.8%
Thailand*	5.1%	3.0%	-4.2%	-5.9%
<b>Total-AsiaPacific</b>	<b>77.3%</b>	<b>72.3%</b>	<b>-5.2%</b>	<b>-3.3%</b>
<b>Other</b>				
South Africa*	3.0%	5.9%	-14.0%	-12.2%
Turkey*	0.4%	0.5%	14.1%	11.6%
<b>Total-Other</b>	<b>3.4%</b>	<b>9.6%</b>	<b>-10.5%</b>	<b>-8.2%</b>
<b>Totals</b>				
Developed	22.0%	0.0%	-6.9%	--
Emerging*	76.3%	100.0%	-4.5%	-4.1%
Cash	1.7%		0.5%	

Country\* = Emerging Markets



# TOTAL FIXED INCOME COMPOSITE

3 Year Risk Return

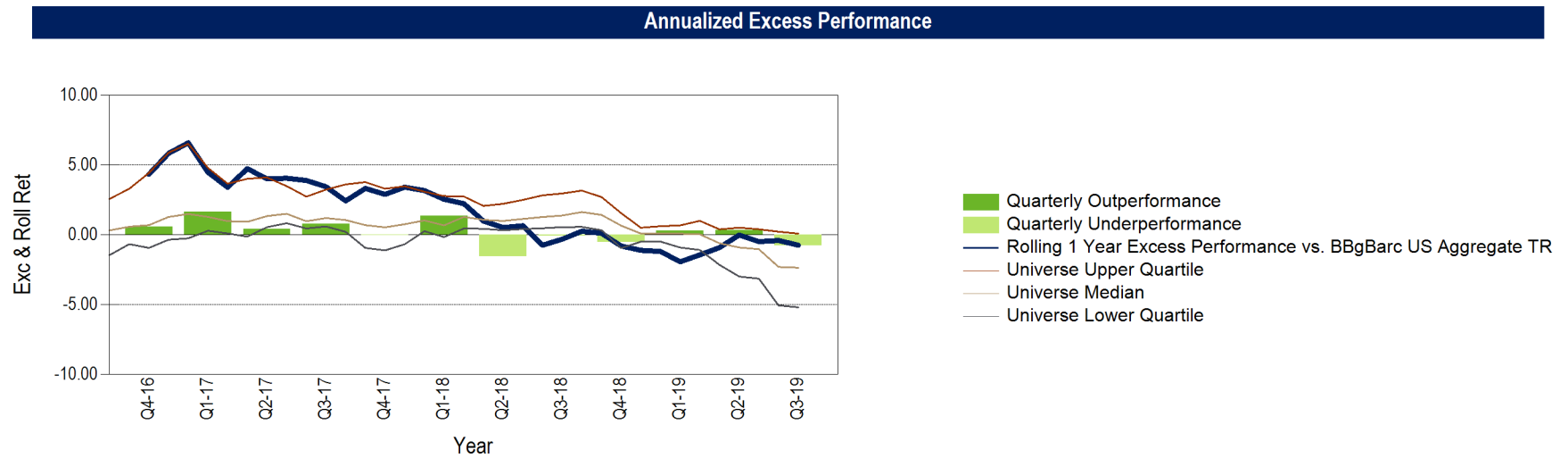


3 Year Style Analysis



## Howard County Retirement Plans

# TOTAL FIXED INCOME COMPOSITE



# NEPC'S DUE DILIGENCE MONITOR

Investment Options	Manager Changes/ Announcements (Recent Quarter)	NEPC Due Diligence Committee Recommendations
Colchester Local Markets Debt	Loss of Personnel: Colchester Staffing Announcement 10/21/19	1. No Action
DFA Emerging Markets All Cap Value Strategy	Other: Removal of Country Cap Weights 11/04/19	1. No Action
PIMCO Core Plus - Total Return Full Authority	Litigation: PIMCO Discrimination Lawsuit 10/21/19	1. No Action



# NEPC'S QUARTERLY DUE DILIGENCE DETAIL

Investment Options	Commentary	NEPC Rating
Colchester Local Markets Debt	<p>Colchester informed NEPC of a few changes, most of which are internal promotions (please see details below). On the investment team side, Paul Grice has given his notice and will be leaving in March 2020 after a long successful career to go manage his own money. This is a very amicable departure with decent lead time. Jean Lee has been added to the team in July this year after 7 years at WAMCO in London, and prior to that another 7 years at UBS and LGIM.</p> <ul style="list-style-type: none"> <li>- Promotion of Michele Connell, Head of Legal &amp; Compliance, to the Colchester Board</li> <li>- Addition of Jean Lee as Investment Officer to the Investment Team</li> <li>- Promotion of Cian O'Brien to Senior Investment Officer</li> <li>- Departure of Paul Grice Senior Investment Officer</li> <li>- Promotion of Janhavi Kumar to Head of Distribution for North America</li> <li>- Promotion of Trevor Denton to Chief Operating Officer</li> </ul>	1
DFA Emerging Markets All Cap Value Strategy	<p>Dimensional announced the removal of their country cap which has practically limited China weight across their EM portfolios. The original cap of 12.5% started in the 90s, and has been upped a couple of times in 2010 and 2016 to 15% and 17.5% respectively. They have been redistributing the extra weight pro rata across the entire universe (and not implicitly trying to match beta or minimize tracking error or standard deviation).</p> <p>The result of their simulated study on the historical impact of the cap shows the largest divergence on tracking error, and much smaller impact on standard deviation and performance. DFA only shared the 10 year number in their original public announcement; NEPC asked them to share shorter term effects from the same study given the larger country weight (China) in recent years. No surprises here, but tracking error is higher for portfolios with country cap especially in the last 1-3 years, while standard deviation is lower. This is the motivation for them to remove the cap, as China will continue to grow in weight in the index, driving tracking error higher, and as DFA has gotten more comfortable with China market risks (from trading/market mechanisms to accounting/fundamentals). With the removal of the cap, clients should expect the tracking error to come down, and standard deviation to go up going forward. Weighted average market cap would also go up in closer alignment with the MSCI benchmark.</p>	3
PIMCO Core Plus - Total Return Full Authority	<p>The Unfavorable News Committee met to discuss PIMCO's recent headline event.</p> <p>Andrea Martin Inokon, senior counsel at PIMCO, is suing for sex-, race-, and disability status-based discrimination. She named PIMCO, the firm's deputy counsel Rick LeBrun, and global general counsel David Flattum. PIMCO denies the allegations. Ms. Inokon is still employed at PIMCO.</p> <p>NEPC has spoken with PIMCO, and while they are limited in what they can say we have requested further information:</p> <ol style="list-style-type: none"> <li>1) We would like to hear the results of internal investigations around the specific "fraternity culture" allegations in this complaint</li> <li>2) We would like to hear more specific information about PIMCO's roadmap toward diverse representation at the firm's most senior management levels</li> </ol> <p>PIMCO has an executive level office dedicated to diversity and inclusion, which we have covered in prior due diligence events. At this time we believe this filing is a specific employment dispute and are recommending NO ACTION. We will continue speaking with PIMCO and update information and/or due diligence status accordingly.</p>	1



# APPENDIX

NEPC, LLC

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# HIGHLIGHTS OF 2019 THIRD QUARTER HAPPENINGS AT NEPC

## NEPC INSIGHTS

- 2019 Second Quarter Market Thoughts
- White Paper: "Determining Spending Levels for an Individual Portfolio"
- White Paper: "Are you Getting Independent and Objective Investment Advice?"
- "What a Long, Strange Trip It's Been – The Journey of the First 401(k) Participants"
- "Dollars and Cents: Transitioning Decisions into Dollars for Defined Contribution Participants"
- Taking Stock: "What is the Yield Curve Signaling? Part 2"
- Taking Stock: "What Happened to the Data-Dependent Fed?"
- Taking Stock: "A Multi-Asset Strategy That's the Right Fit For You"
- Taking Stock: "Healthcare Organizations Maintain Economic Optimism Despite Geopolitical Concerns"
- Taking Stock: "Getting Those Dollars and Cents to Add Up in Retirement Planning"
- Taking Stock: "Dear Millennials, What Do You Want from Your Investment Portfolio?"
- Taking Stock: "Is Help on the Way for Struggling Multiemployer Pensions?"
- Taking Stock: "Pension Liabilities Rise in Q2"

## WEBINAR REPLAYS

- NEPC's 2019 Q2 Quarterly Market Thoughts Call

To download NEPC's recent insights and webinar replays, visit: [www.NEPC.com/insights](http://www.NEPC.com/insights)



# HIGHLIGHTS OF 2019 THIRD QUARTER HAPPENINGS AT NEPC

## NEPC GIVES BACK

- NEPC sponsored a volunteer day with the Greater Boston chapter of Habitat for Humanity. Our volunteers spent their day helping to build homes for low-income families in need of decent and affordable housing.
- NEPC employees volunteered at the Greater Boston Food Bank (GBFB) on October 3<sup>rd</sup>. GBFB is the largest hunger-relief organization in New England and among the largest food banks in the country. The food banks are committed to increasing food distribution to provide at least one meal a day to every person in need, while supporting healthy lives and healthy communities. We had a group of about 20 volunteers who sorted and packed a total of 6,961 pounds of food and drink, which came to a total of 5,801 meals.



# INVESTMENT MANAGER - DUE DILIGENCE KEY

NEPC Due Diligence Status Key	
<b>No Action</b>	Informational items have surfaced; no action is recommended.
<b>Watch</b>	Issues have surfaced to be concerned over; manager can participate in future searches, but current and prospective clients must be made aware of the issues.
<b>Hold</b>	Serious issues have surfaced to be concerned over; manager cannot be in future searches unless a client specifically requests, but current and prospective clients must be made aware of the issues.
<b>Client Review</b>	Very serious issues have surfaced with a manager; manager cannot be in future searches unless a client specifically requests. Current clients must be advised to review the manager.
<b>Terminate</b>	We have lost all confidence in the product; manager would not be recommended for searches and clients would be discouraged from using. The manager cannot be in future searches unless a client specifically requests. Current clients must be advised to replace the manager.

NEPC Due Diligence Rating Key	
<b>1</b>	A high conviction investment product. Product has a clear and economically-grounded investment thesis, and is managed by an investment team that is sufficiently resourced and incented to execute on the thesis.
<b>2</b>	NEPC has a positive view of the strategy. Strategy has a compelling and sound investment thesis. The manager is sufficiently resourced and incented to execute on the thesis. Strengths outweigh the weaknesses, but the strategy does not meet all requirements for a 1 rating.
<b>3</b>	A satisfactory investment product. The strategy lacks a compelling investment thesis, however there are no significant concerns around the manager's viability.
<b>4</b>	The strategy may have an unclear or ambiguous investment thesis or the manager may lack the ability to execute on the stated thesis. The strategy likely has strengths and weaknesses and the weaknesses may outweigh the strengths.
<b>5</b>	A strategy that lacks an investment thesis or NEPC has no confidence in the manager's ability to execute on the thesis, and/or the investment firm may not be viable. Serious issues have been identified with an investment manager or product. This rating aligns with a Terminate Due Diligence status for client-owned products.
<b>NR</b>	Due diligence has not been sufficiently completed on the product or manager.



# GLOSSARY OF INVESTMENT TERMINOLOGY

**# Of Portfolios/Observations<sup>1</sup>** - The total number of data points that make up a specified universe

**Allocation Index<sup>3</sup>** - The allocation index measures the value added (or subtracted) to each portfolio by active management. It is calculated monthly: The portfolio asset allocation to each category from the prior month-end is multiplied by a specified market index.

**Asset Allocation Effect<sup>2</sup>** - Measures an investment manager's ability to effectively allocate their portfolio's assets to various sectors. The allocation effect determines whether the overweighting or underweighting of sectors relative to benchmark contributes positively or negatively to the overall portfolio return. Positive allocation occurs when the portfolio is over weighted in a sector that outperforms the benchmark and underweighted in a sector that underperforms the benchmark. Negative allocation occurs when the portfolio is over weighted in a sector that underperforms the benchmark and under weighted in a sector that outperforms the benchmark.

**Agency Bonds (Agencies)<sup>3</sup>** - The full faith and credit of the United States government is normally not pledged to payment of principal and interest on the majority of government agencies issuing these bonds, with maturities of up to ten years. Their yields, therefore, are normally higher than government and their marketability is good, thereby qualifying them as a low risk-high liquidity type of investment. They are eligible as security for advances to the member banks by the Federal Reserve, which attests to their standing.

**Asset Backed Securities (ABS)<sup>3</sup>** - Bonds which are similar to mortgage-backed securities but are collateralized by assets other than mortgages; commonly backed by credit card receivables, auto loans, or other types of consumer financing.

**Attribution<sup>3</sup>** - Attribution is an analytical technique that allows us to evaluate the performance of the portfolio relative to the benchmark. A proper attribution tells us where value was added or subtracted as a result of the manager's decisions.

**Average Effective Maturity<sup>4</sup>** - For a single bond, it is a measure of maturity that takes into account the possibility that a bond might be called back to the issuer.

For a portfolio of bonds, average effective maturity is the weighted average of the maturities of the underlying bonds. The measure is computed by weighing each bond's maturity by its market value with respect to the portfolio and the likelihood of any of the bonds being called. In a pool of mortgages, this would also account for the likelihood of prepayments on the mortgages.

**Batting Average<sup>1</sup>** - A measurement representing an investment manager's ability to meet or beat an index.

*Formula: Divide the number of days (or months, quarters, etc.) in which the manager beats or matches the index by the total number of days (or months, quarters, etc.) in the period of question and multiply that factor by 100.*

**Brinson Fachler (BF) Attribution<sup>1</sup>** - The BF methodology is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance. The main advantage of the BF methodology is that rather than using the overall return of the benchmark, it goes a level deeper than BHB and measures whether the benchmark sector, country, etc. outperformed/or underperformed the overall benchmark.

**Brinson Hood Beebower (BHB) Attribution<sup>1</sup>** - The BHB methodology shows that excess return must be equal to the sum of all other factors (i.e., allocation effect, selection effect, interaction effect, etc.). The advantage to using the BHB methodology is that it is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance.

**Corporate Bond (Corp)<sup>4</sup>** - A debt security issued by a corporation and sold to investors. The backing for the bond is usually the payment ability of the company, which is typically money to be earned from future operations. In some cases, the company's physical assets may be used as collateral for bonds.

**Correlation<sup>1</sup>** - A range of statistical relationships between two or more random variables or observed data values. A correlation is a single number that describes the degree of relationship between variables.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Coupon<sup>4</sup>** – The interest rate stated on a bond when it is issued. The coupon is typically paid semiannually. This is also referred to as the "coupon rate" or "coupon percent rate."

**Currency Effect<sup>1</sup>** – Is the effect that changes in currency exchange rates over time affect excess performance.

**Derivative Instrument<sup>2</sup>** – A financial obligation that derives its precise value from the value of one or more other instruments (or assets) at the same point of time. For example, the relationship between the value of an S&P 500 futures contract (the derivative instrument in this case) is determined by the value of the S&P 500 Index and the value of a U.S. Treasury bill that matures at the expiration of the futures contract.

**Downside Deviation<sup>1</sup>** – Equals the standard deviation of negative return or the measure of downside risk focusing on the standard deviation of negative returns.

*Formula:*

*Annualized Standard Deviation (Fund Return - Average Fund Return) where average fund return is greater than individual fund returns, monthly or quarterly.*

**Duration<sup>3</sup>** – Duration is a measure of interest rate risk. The greater the duration of a bond, or a portfolio of bonds, the greater its price volatility will be in response to a change in interest rates. A bond's duration is inversely related to interest rates and directly related to time to maturity.

**Equity/Debt/Cash Ratio<sup>1</sup>** – The percentage of an investment or portfolio that is in Equity, Debt, and/or Cash (i.e. A 7/89/4 ratio represents an investment that is made up of 7% Equity, 89% Debt, and 4% Cash).

**Foreign Bond<sup>3</sup>** – A bond that is issued in a domestic market by a foreign entity, in the domestic market's currency. A foreign bond is most often issued by a foreign firm to raise capital in a domestic market that would be most interested in purchasing the firm's debt. For foreign firms doing a large amount of business in the domestic market, issuing foreign bonds is a common practice.

**Hard Hurdle<sup>5</sup>** – is a hurdle rate that once beaten allows a fund manager to charge a performance fee on only the funds above the specified hurdle rate.

**High-Water Mark<sup>4</sup>** – The highest peak in value that an investment fund/account has reached. This term is often used in the context of fund manager compensation, which is performance based. Some performance-based fees only get paid when fund performance exceeds the high-water mark. The high-water mark ensures that the manager does not get paid large sums for poor performance.

**Hurdle Rate<sup>4</sup>** – The minimum rate of return on an investment required, in order for a manager to collect incentive fees from the investor, which is usually tied to a benchmark.

**Interaction Effects<sup>2</sup>** – The interaction effect measures the combined impact of an investment manager's selection and allocation decisions within a sector. For example, if an investment manager had superior selection and over weighted that particular sector, the interaction effect is positive. If an investment manager had superior selection, but underweighted that sector, the interaction effect is negative. In this case, the investment manager did not take advantage of the superior selection by allocating more assets to that sector. Since many investment managers consider the interaction effect to be part of the selection or the allocation, it is often combined with the either effect.

**Median<sup>3</sup>** – The value (rate of return, market sensitivity, etc.) that exceeds one-half of the values in the population and that is exceeded by one-half of the values. The median has a percentile rank of 50.

**Modified Duration<sup>3</sup>** – The percentage change in the price of a fixed income security that results from a change in yield.

**Mortgage Backed Securities (MBS)<sup>3</sup>** – Bonds which are a general obligation of the issuing institution but are also collateralized by a pool of mortgages.

**Municipal Bond (Muni)<sup>4</sup>** – A debt security issued by a state, municipality or county to finance its capital expenditures.

**Net Investment Change<sup>1</sup>** – Is the change in an investment after accounting for all Net Cash Flows.

**Performance Fee<sup>4</sup>** – A payment made to a fund manager for generating positive returns. The performance fee is generally calculated as a percentage of investment profits, often both realized and unrealized.

*Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net*



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Policy Index<sup>3</sup>** - A custom benchmark designed to indicate the returns that a passive investor would earn by consistently following the asset allocation targets set forth in this investment policy statement.

**Price to Book (P/B)<sup>4</sup>** - A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share, also known as the "price-equity ratio".

**Price to Earnings (P/E)<sup>3</sup>** - The weighted equity P/E is based on current price and trailing 12 months earnings per share (EPS).

**Price to Sales (P/S)<sup>4</sup>** - A ratio for valuing a stock relative to its own past performance, other companies, or the market itself. Price to sales is calculated by dividing a stock's current price by its revenue per share for the trailing 12 months.

**Return on Equity (ROE)<sup>4</sup>** - The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

**Selection (or Manager) Effect<sup>2</sup>** - Measures the investment manager's ability to select securities within a given sector relative to a benchmark. The over or underperformance of the portfolio is weighted by the benchmark weight, therefore, selection is not affected by the manager's allocation to the sector. The weight of the sector in the portfolio determines the size of the effect—the larger the sector, the larger the effect is, positive or negative.

**Soft Hurdle rate<sup>5</sup>** - is a hurdle rate that once beaten allows a fund manager to charge a performance fee based on the entire annualized return.

**Tiered Fee<sup>1</sup>** - A fee structure that is paid to fund managers based on the size of the investment (i.e. 1.00% fee on the first \$10M invested, 0.90% on the next \$10M, and 0.80% on the remaining balance).

**Total Effects<sup>2</sup>** - The active management (total) effect is the sum of the selection, allocation, and interaction effects. It is also the difference between the total portfolio return and the total benchmark return. You can use the active management effect to determine the amount the investment manager has added to a portfolio's return.

**Total Return<sup>1</sup>** - The actual rate of return of an investment over a specified time period. Total return includes interest, capital gains, dividends, and distributions realized over a defined time period.

**Universe<sup>3</sup>** - The list of all assets eligible for inclusion in a portfolio.

**Upside Deviation<sup>1</sup>** - Standard Deviation of Positive Returns

**Weighted Avg. Market Cap.<sup>4</sup>** - A stock market index weighted by the market capitalization of each stock in the index. In such a weighting scheme, larger companies account for a greater portion of the index. Most indexes are constructed in this manner, with the best example being the S&P 500.

**Yield (%)<sup>3</sup>** - The current yield of a security is the current indicated annual dividend rate divided by current price.

**Yield to Maturity<sup>3</sup>** - The discount rate that equates the present value of cash flows, both principal and interest, to market price.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



# GLOSSARY OF INVESTMENT TERMINOLOGY

**Alpha** - Measures the relationship between the fund performance and the performance of another fund or benchmark index and equals the excess return while the other fund or benchmark index is zero.

**Alpha Jensen** - The average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return. Also known as the abnormal return or the risk adjusted excess return.

**Annualized Excess Return over Benchmark** - Annualized fund return minus the annualized benchmark return for the calculated return.

**Annualized Return** - A statistical technique whereby returns covering periods greater than one year are converted to cover a 12 month time span.

**Beta** - Measures the volatility or systematic risk and is equal to the change in the fund's performance in relation to the change in the assigned index's performance.

**Information Ratio** - A measure of the risk adjusted return of a financial security, asset, or portfolio.

*Formula:*  
 $(\text{Annualized Return of Portfolio} - \text{Annualized Return of Benchmark}) / \text{Annualized Standard Deviation}(\text{Period Portfolio Return} - \text{Period Benchmark Return})$ . To annualize standard deviation, multiply the deviation by the square root of the number of periods per year where monthly returns per year equals 12 and quarterly returns is four periods per year.

**R-Squared** - Represents the percentage of a fund's movements that can be explained by movements in an index. R-Squared values range from 0 to 100. An R-Squared of 100 denotes that all movements of a fund are completely explained by movements in the index.

**Sharpe Ratio** - A measure of the excess return or risk premium per unit of risk in an investment asset or trading strategy.

**Sortino Ratio** - A method to differentiate between good and bad volatility in the Sharpe Ratio. The differentiation of up and down volatility allows the calculation to provide a risk adjusted measure of a security or fund's performance without upward price change penalties.

*Formula:*  
 $\text{Calculation Average } (X-Y) / \text{Downside Deviation } (X-Y) * 2$   
Where X=Return Series X Y = Return Series Y which is the risk free return (91 day T-bills)

**Standard Deviation** - The standard deviation is a statistical term that describes the distribution of results. It is a commonly used measure of volatility of returns of a portfolio, asset class, or security. The higher the standard deviation the more volatile the returns are.

*Formula:*  
 $(\text{Annualized Return of Portfolio} - \text{Annualized Return of Risk Free}) / \text{Annualized Standard Deviation (Portfolio Returns)}$

**Tracking Error** - Tracking error, also known as residual risk, is a measure of the degree to which a portfolio tracks its benchmark. It is also a measure of consistency of excess returns. Tracking error is computed as the annualized standard deviation of the difference between a portfolio's return and that of its benchmark.

*Formula:*  
 $\text{Tracking Error} = \text{Standard Deviation } (X-Y) * \sqrt{\text{\# of periods per year}}$   
Where X = periods portfolio return and Y = the period's benchmark return  
For monthly returns, the periods per year = 12  
For quarterly returns, the periods per year = 4

**Treynor Ratio** - A risk-adjusted measure of return based on systematic risk. Similar to the Sharpe ratio with the difference being the Treynor ratio uses beta as the measurement of volatility.

*Formula:*  
 $(\text{Portfolio Average Return} - \text{Average Return of Risk-Free Rate}) / \text{Portfolio Beta}$

**Up/Down Capture Ratio** - A measure of what percentage of a market's returns is "captured" by a portfolio. For example, if the market declines 10% over some period, and the manager declines only 9%, then his or her capture ratio is 90%. In down markets, it is advantageous for a manager to have as low a capture ratio as possible. For up markets, the higher the capture ratio the better. Looking at capture ratios can provide insight into how a manager achieves excess returns. A value manager might typically have a lower capture ratio in both up and down markets, achieving excess returns by protecting on the downside, whereas a growth manager might fall more than the overall market in down markets, but achieve above-market returns in a rising market.

$\text{Upside Capture} = \text{Total Return}(\text{Fund Returns}) / \text{Total Returns}(\text{BM Return})$  when Period Benchmark Return is  $> = 0$

$\text{Downside Capture} = \text{Total Return}(\text{Fund Returns}) / \text{Total Returns}(\text{BM Return})$  when Benchmark  $< 0$

Data Source: InvestorForce



# GLOSSARY OF INVESTMENT TERMINOLOGY

**# Of Portfolios/Observations<sup>1</sup>** – The total number of data points that make up a specified universe

**Allocation Index<sup>3</sup>** - The allocation index measures the value added (or subtracted) to each portfolio by active management. It is calculated monthly: The portfolio asset allocation to each category from the prior month-end is multiplied by a specified market index.

**Asset Allocation Effect<sup>2</sup>** - Measures an investment manager's ability to effectively allocate their portfolio's assets to various sectors. The allocation effect determines whether the overweighting or underweighting of sectors relative to a benchmark contributes positively or negatively to the overall portfolio return. Positive allocation occurs when the portfolio is over weighted in a sector that outperforms the benchmark and underweighted in a sector that underperforms the benchmark. Negative allocation occurs when the portfolio is over weighted in a sector that underperforms the benchmark and under weighted in a sector that outperforms the benchmark.

**Agency Bonds (Agencies)<sup>3</sup>** - The full faith and credit of the United States government is normally not pledged to payment of principal and interest on the majority of government agencies issuing these bonds, with maturities of up to ten years. Their yields, therefore, are normally higher than government and their marketability is good, thereby qualifying them as a low risk-high liquidity type of investment. They are eligible as security for advances to the member banks by the Federal Reserve, which attests to their standing.

**Asset Backed Securities (ABS)<sup>3</sup>** - Bonds which are similar to mortgage-backed securities but are collateralized by assets other than mortgages; commonly backed by credit card receivables, auto loans, or other types of consumer financing.

**Attribution<sup>3</sup>** - Attribution is an analytical technique that allows us to evaluate the performance of the portfolio relative to the benchmark. A proper attribution tells us where value was added or subtracted as a result of the manager's decisions.

**Average Effective Maturity<sup>4</sup>** - For a single bond, it is a measure of maturity that takes into account the possibility that a bond might be called back to the issuer.

For a portfolio of bonds, average effective maturity is the weighted average of the maturities of the underlying bonds. The measure is computed by weighing each bond's maturity by its market value with respect to the portfolio and the likelihood of any of the bonds being called. In a pool of mortgages, this would also account for the likelihood of prepayments on the mortgages.

**Batting Average<sup>1</sup>** - A measurement representing an investment manager's ability to meet or beat an index.

*Formula: Divide the number of days (or months, quarters, etc.) in which the manager beats or matches the index by the total number of days (or months, quarters, etc.) in the period of question and multiply that factor by 100.*

**Brinson Fachler (BF) Attribution<sup>1</sup>** - The BF methodology is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance. The main advantage of the BF methodology is that rather than using the overall return of the benchmark, it goes a level deeper than BHB and measures whether the benchmark sector, country, etc. outperformed/or underperformed the overall benchmark.

**Brinson Hood Beebower (BHB) Attribution<sup>1</sup>** - The BHB methodology shows that excess return must be equal to the sum of all other factors (i.e., allocation effect, selection effect, interaction effect, etc.). The advantage to using the BHB methodology is that it is a highly accepted industry standard for calculating the allocation, selection, and interaction effects within a portfolio that collectively explains a portfolio's underlying performance.

**Corporate Bond (Corp)<sup>4</sup>** - A debt security issued by a corporation and sold to investors. The backing for the bond is usually the payment ability of the company, which is typically money to be earned from future operations. In some cases, the company's physical assets may be used as collateral for bonds.

**Correlation<sup>1</sup>** - A range of statistical relationships between two or more random variables or observed data values. A correlation is a single number that describes the degree of relationship between variables.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



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**Coupon<sup>4</sup>** – The interest rate stated on a bond when it is issued. The coupon is typically paid semiannually. This is also referred to as the "coupon rate" or "coupon percent rate."

**Currency Effect<sup>1</sup>** - Is the effect that changes in currency exchange rates over time affect excess performance.

**Derivative Instrument<sup>3</sup>** - A financial obligation that derives its precise value from the value of one or more other instruments (or assets) at the same point of time. For example, the relationship between the value of an S&P 500 futures contract (the derivative instrument in this case) is determined by the value of the S&P 500 Index and the value of a U.S. Treasury bill that matures at the expiration of the futures contract.

**Downside Deviation<sup>1</sup>** - Equals the standard deviation of negative return or the measure of downside risk focusing on the standard deviation of negative returns.

*Formula:*

*Annualized Standard Deviation (Fund Return - Average Fund Return) where average fund return is greater than individual fund returns, monthly or quarterly.*

**Duration<sup>3</sup>** - Duration is a measure of interest rate risk. The greater the duration of a bond, or a portfolio of bonds, the greater its price volatility will be in response to a change in interest rates. A bond's duration is inversely related to interest rates and directly related to time to maturity.

**Equity/Debt/Cash Ratio<sup>1</sup>** – The percentage of an investment or portfolio that is in Equity, Debt, and/or Cash (i.e. A 7/89/4 ratio represents an investment that is made up of 7% Equity, 89% Debt, and 4% Cash).

**Foreign Bond<sup>3</sup>** - A bond that is issued in a domestic market by a foreign entity, in the domestic market's currency. A foreign bond is most often issued by a foreign firm to raise capital in a domestic market that would be most interested in purchasing the firm's debt. For foreign firms doing a large amount of business in the domestic market, issuing foreign bonds is a common practice.

**Hard Hurdle<sup>5</sup>** – is a hurdle rate that once beaten allows a fund manager to charge a performance fee on only the funds above the specified hurdle rate.

**High-Water Mark<sup>4</sup>** - The highest peak in value that an investment fund/account has reached. This term is often used in the context of fund manager compensation, which is performance based. Some performance-based fees only get paid when fund performance exceeds the high-water mark. The high-water mark ensures that the manager does not get paid large sums for poor performance.

**Hurdle Rate<sup>4</sup>** - The minimum rate of return on an investment required, in order for a manager to collect incentive fees from the investor, which is usually tied to a benchmark.

**Interaction Effects<sup>2</sup>** - The interaction effect measures the combined impact of an investment manager's selection and allocation decisions within a sector. For example, if an investment manager had superior selection and over weighted that particular sector, the interaction effect is positive. If an investment manager had superior selection, but underweighted that sector, the interaction effect is negative. In this case, the investment manager did not take advantage of the superior selection by allocating more assets to that sector. Since many investment managers consider the interaction effect to be part of the selection or the allocation, it is often combined with the either effect.

**Median<sup>3</sup>** - The value (rate of return, market sensitivity, etc.) that exceeds one-half of the values in the population and that is exceeded by one-half of the values. The median has a percentile rank of 50.

**Modified Duration<sup>3</sup>** - The percentage change in the price of a fixed income security that results from a change in yield.

**Mortgage Backed Securities (MBS)<sup>3</sup>** - Bonds which are a general obligation of the issuing institution but are also collateralized by a pool of mortgages.

**Municipal Bond (Muni)<sup>4</sup>** - A debt security issued by a state, municipality or county to finance its capital expenditures.

**Net Investment Change<sup>1</sup>** – Is the change in an investment after accounting for all Net Cash Flows.

**Performance Fee<sup>4</sup>** - A payment made to a fund manager for generating positive returns. The performance fee is generally calculated as a percentage of investment profits, often both realized and unrealized.

*Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net*



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**Policy Index<sup>3</sup>** - A custom benchmark designed to indicate the returns that a passive investor would earn by consistently following the asset allocation targets set forth in this investment policy statement.

**Price to Book (P/B)<sup>4</sup>** - A ratio used to compare a stock's market value to its book value. It is calculated by dividing the current closing price of the stock by the latest quarter's book value per share, also known as the "price-equity ratio".

**Price to Earnings (P/E)<sup>3</sup>** - The weighted equity P/E is based on current price and trailing 12 months earnings per share (EPS).

**Price to Sales (P/S)<sup>4</sup>** - A ratio for valuing a stock relative to its own past performance, other companies, or the market itself. Price to sales is calculated by dividing a stock's current price by its revenue per share for the trailing 12 months.

**Return on Equity (ROE)<sup>4</sup>** - The amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

**Selection (or Manager) Effect<sup>2</sup>** - Measures the investment manager's ability to select securities within a given sector relative to a benchmark. The over or underperformance of the portfolio is weighted by the benchmark weight, therefore, selection is not affected by the manager's allocation to the sector. The weight of the sector in the portfolio determines the size of the effect—the larger the sector, the larger the effect is, positive or negative.

**Soft Hurdle rate<sup>5</sup>** - is a hurdle rate that once beaten allows a fund manager to charge a performance fee based on the entire annualized return.

**Tiered Fee<sup>1</sup>** - A fee structure that is paid to fund managers based on the size of the investment (i.e. 1.00% fee on the first \$10M invested, 0.90% on the next \$10M, and 0.80% on the remaining balance).

**Total Effects<sup>2</sup>** - The active management (total) effect is the sum of the selection, allocation, and interaction effects. It is also the difference between the total portfolio return and the total benchmark return. You can use the active management effect to determine the amount the investment manager has added to a portfolio's return.

**Total Return<sup>1</sup>** - The actual rate of return of an investment over a specified time period. Total return includes interest, capital gains, dividends, and distributions realized over a defined time period.

**Universe<sup>3</sup>** - The list of all assets eligible for inclusion in a portfolio.

**Upside Deviation<sup>1</sup>** - Standard Deviation of Positive Returns

**Weighted Avg. Market Cap.<sup>4</sup>** - A stock market index weighted by the market capitalization of each stock in the index. In such a weighting scheme, larger companies account for a greater portion of the index. Most indexes are constructed in this manner, with the best example being the S&P 500.

**Yield (%)<sup>3</sup>** - The current yield of a security is the current indicated annual dividend rate divided by current price.

**Yield to Maturity<sup>3</sup>** - The discount rate that equates the present value of cash flows, both principal and interest, to market price.

Data Source: <sup>1</sup>InvestorForce, <sup>2</sup>Interaction Effect Performance Attribution, <sup>3</sup>NEPC, LLC, <sup>4</sup>Investopedia, <sup>5</sup>Hedgeco.net



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