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**Howard County Retirement Plans**

Investment Performance Review

June 30, 2018

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## Economic Overview

## Economic & Capital Market Highlights

June 30, 2018

### Economy

Economic reports from the second quarter indicate the global expansion remains intact, with growth accelerating over the course of the quarter. Trade tensions continued to make headlines, with the US announcing tariffs on \$50B of Chinese goods and China retaliating in-kind. While the tariffs currently implemented make up a small percentage of US imports and GDP, financial markets have been focused on trade developments and appear to be pricing a continuation of tensions. The Federal Reserve mostly dismissed trade concerns while raising interest rates by 25 bps at the June meeting of the Federal Open Market Committee (FOMC). At the end of June the Federal Reserve was targeting a short-term interest rate of 1.75% to 2.00%, the highest level of short-term rates since 2008.

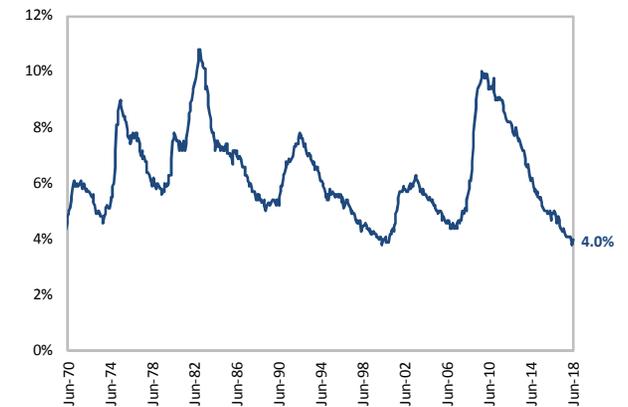
### Capital Markets

Trade news was the primary source of equity market fluctuations during the quarter. Following 2017, which saw global equities gain each month amid record low volatility, market swings have returned toward more normal levels in 2018. MSCI ACWI IMI gained modestly during the quarter, with the 0.7% quarterly return bringing the year-to-date gain for the Index to -0.2%. US large cap growth and small cap stocks were notable outperformers for the quarter, while international equities underperformed as the dollar strengthened against foreign currencies. Fixed income markets generally declined as yields rose across the curve; the 10-year Treasury yield ended the quarter at 2.86%, up 12 bps from March.

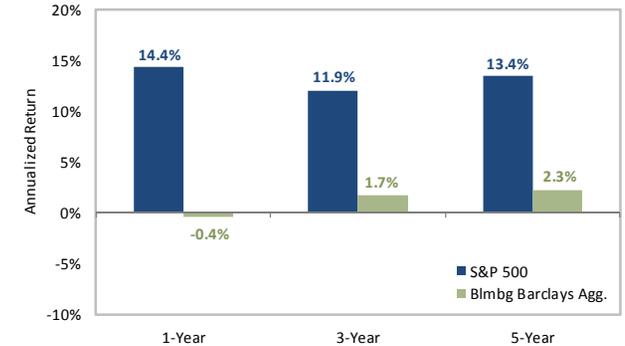
### Market Performance (Returns in USD)

		Quarter	1 Year	3 Year	5 Year
MSCI ACWI IMI	Global Equity	0.7%	11.1%	8.3%	9.6%
Russell 3000	US Equity	3.9%	14.8%	11.6%	13.3%
S&P 500	US Large Cap Equity	3.4%	14.4%	11.9%	13.4%
Russell 1000	US Large Cap Equity	3.6%	14.5%	11.6%	13.4%
Russell 1000 Value	US Large Cap Value Equity	1.2%	6.8%	8.3%	10.3%
Russell 1000 Growth	US Large Cap Growth Equity	5.8%	22.5%	15.0%	16.4%
Russell 2000	US Small Cap Core Equity	7.8%	17.6%	11.0%	12.5%
Russell 2000 Value	US Small Cap Value Equity	8.3%	13.1%	11.2%	11.2%
Russell 2000 Growth	US Small Cap Growth Equity	7.2%	21.9%	10.6%	13.7%
MSCI EAFE	Int'l Developed Large Cap Equity	-1.2%	6.8%	4.9%	6.4%
MSCI EAFE Small Cap	Int'l Developed Small Cap Equity	-1.6%	12.5%	10.1%	11.3%
MSCI Emerging Markets	Emerging Market Equity	-8.0%	8.2%	5.6%	5.0%
Alerian MLP	Master Limited Partnerships	11.8%	-4.6%	-5.9%	-4.1%
Blmbg Barc. US Aggregate	US Core Fixed Income	-0.2%	-0.4%	1.7%	2.3%
Blmbg Barc. US Treasury	US Treasuries	0.1%	-0.7%	1.0%	1.5%
Blmbg Barc. US Credit	US Corporate Bonds	-0.9%	-0.7%	2.9%	3.4%
Blmbg Barc. US MBS	US Mortgage Backed Securities	0.2%	0.2%	1.5%	2.3%
Blmbg Barc. High Yield	US High Yield Bonds	1.0%	2.6%	5.5%	5.5%

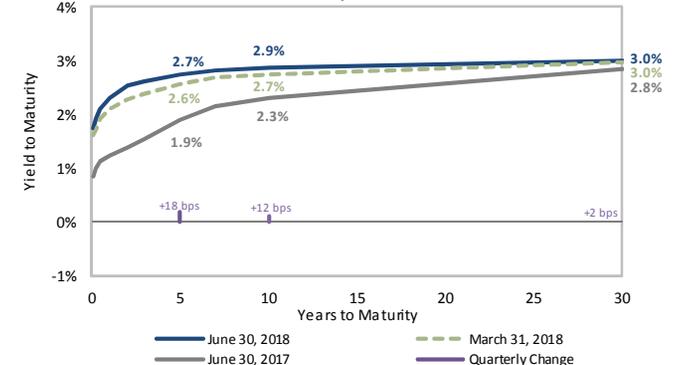
Unemployment Rate



Stocks vs. Bonds  
Recent Historical Performance



Treasury Yield Curve



**Public Equities**

- Trade news was the primary source of equity market fluctuations during the quarter. Following 2017, which saw global equities gain each month amid record low volatility, market swings have returned toward more normal levels in 2018. MSCI ACWI IMI gained modestly during the quarter, with the 0.7% quarterly return bringing the year-to-date gain for the Index to -0.2%. US large cap growth and small cap stocks were notable outperformers for the quarter, while international equities underperformed as the dollar strengthened.
- Master limited partnerships saw modest losses in June after gaining 8.1% in April and 5.0% in May. Distribution increases and improving fundamentals (including higher distribution coverage and demand for more pipeline infrastructure) contributed to the 11.8% gain for MLPs during the quarter.

**Public Debt**

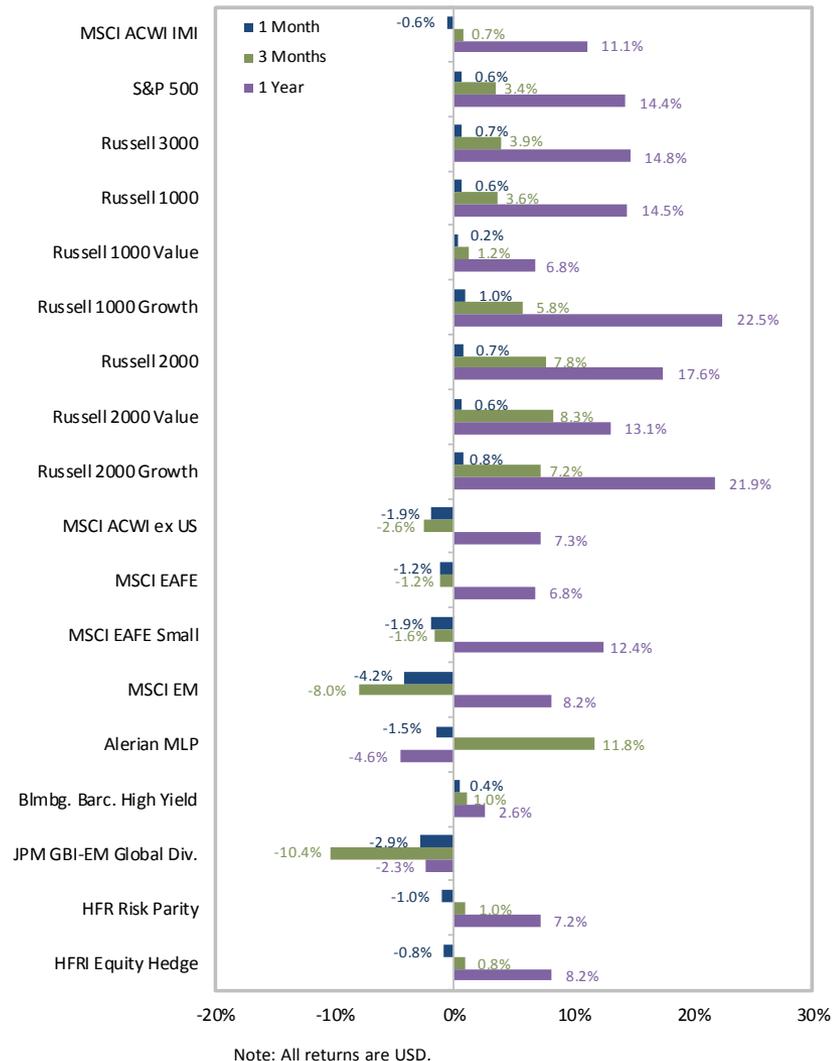
- High yield bonds gained 1.0% during the quarter, with the yield on the Bloomberg Barclays High Yield Index rising 30 bps to 6.5%. Rising interest rates and moderating demand for high yield bonds have lifted high yield bond yields to their highest levels since the end of November 2016.
- Local currency emerging market bonds suffered their worst quarterly performance since the third quarter of 2015, returning -10.4%. Outflows from emerging markets pushed local currency yields up 50 bps to 6.59%.

**Private Assets**

- The fundraising slowdown from the first quarter continued throughout the second quarter, with the 326 funds that closed during the quarter raising a total of \$159B (per Preqin). During every quarter in 2017 firms raised in excess of \$200B, bringing current fundraising activity more in line with 2015-2016. Dry powder levels have risen to a record \$1.8T in private markets, with private equity accounting for \$1.0T. Despite the increase in the number of private equity funds, which has generated more favorable terms and fees for investors, the largest and highest-profile funds generally remain oversubscribed.

**Hedge Funds**

- Risk parity strategies in aggregate saw modest gains during the quarter, consistent with performance across major asset classes.
- Growth hedge funds gained during the quarter alongside broad equity markets. Over the past year hedge funds have generated strong returns of over 8%.



**Public Debt**

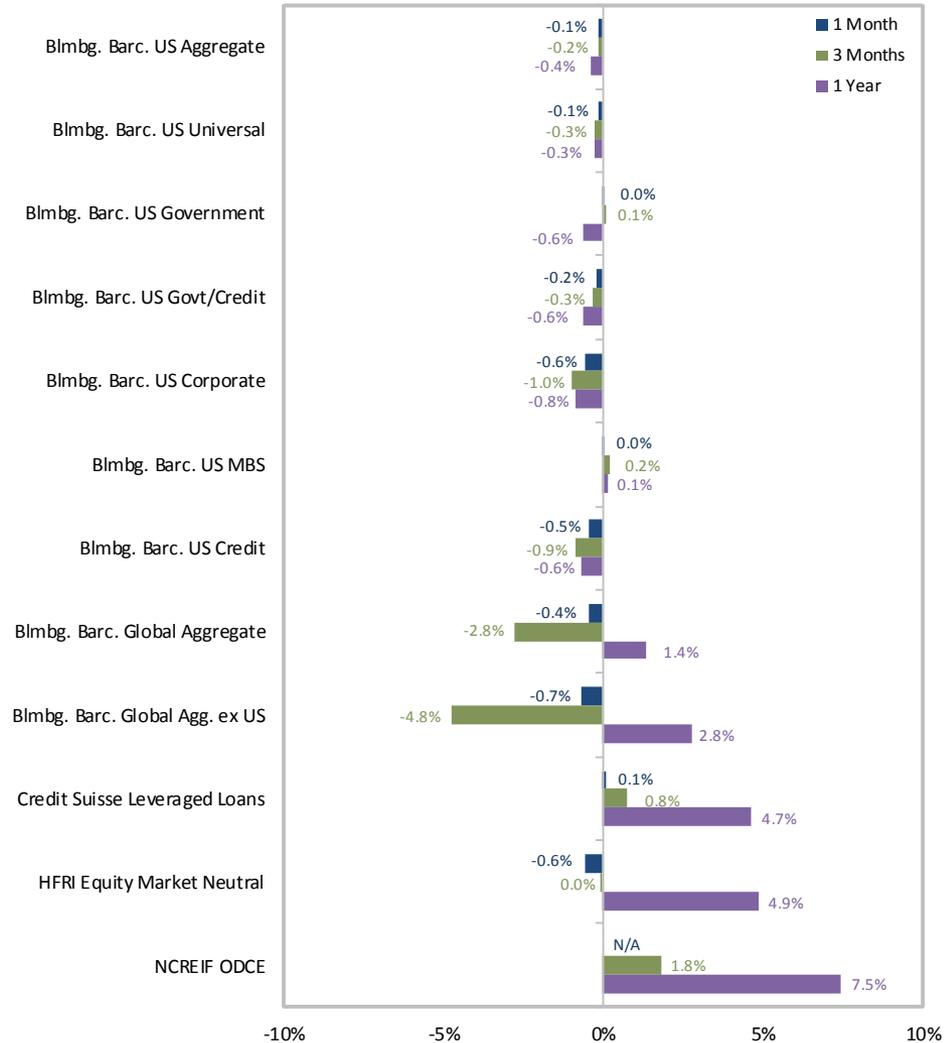
- 10-year Treasury yields rose 12 bps during the second quarter to end June at 2.9%. Over the first half of 2018 10-year yields rose 45 bps, with the rise in yields driven by increased expectations for Federal Reserve rate hikes and rising inflation expectations.
- Core fixed income strategies were generally negative for the quarter as yields rose and investment grade credit spreads widened. The yield on the Bloomberg Barclays US Aggregate ended June at 3.3%, which is its highest level since June 2010. Despite recent negative performance as yields have risen, fixed income expected returns have increased in recent quarters.
- International fixed income returned -4.8% for the quarter, with underperformance primarily driven by the strengthening dollar.
- Public bank loans, as measured by the Credit Suisse Leveraged Loan Index, continued to perform well during the quarter. Bank loans outperformed core fixed income by 100 bps, benefiting from their low duration during the period of rising rates.

**Relative Value Hedge Funds**

- Relative value hedge fund strategies generally saw flat performance for the quarter, outperforming core fixed income by 20 bps. As yields have risen over the past year, relative value strategies have outperformed core bonds by 530 bps.

**Core Real Estate**

- Core real estate returns for the second quarter were 2.0% gross and 1.8% net, bringing the one-year gain for core funds to 7.5% net. Core real estate gains have moderated from the 11%+ annualized returns of 2013-2015, but limited supply increases and continued strong demand have acted as tailwinds for the market.



**Inflation**

- TIPS gained 0.8% during the quarter and outperformed treasuries by 70 bps. Over the past year TIPS have been among the best-performing fixed income asset classes as inflation has increased; the Consumer Price Index rose 2.9% over the 12 months ending June, the highest inflation rate the US economy has experienced since 2012. At the end of the second quarter, market-implied 10-year breakeven inflation expectations were 2.1%, up 7 bps from the end of March.

**Deflation**

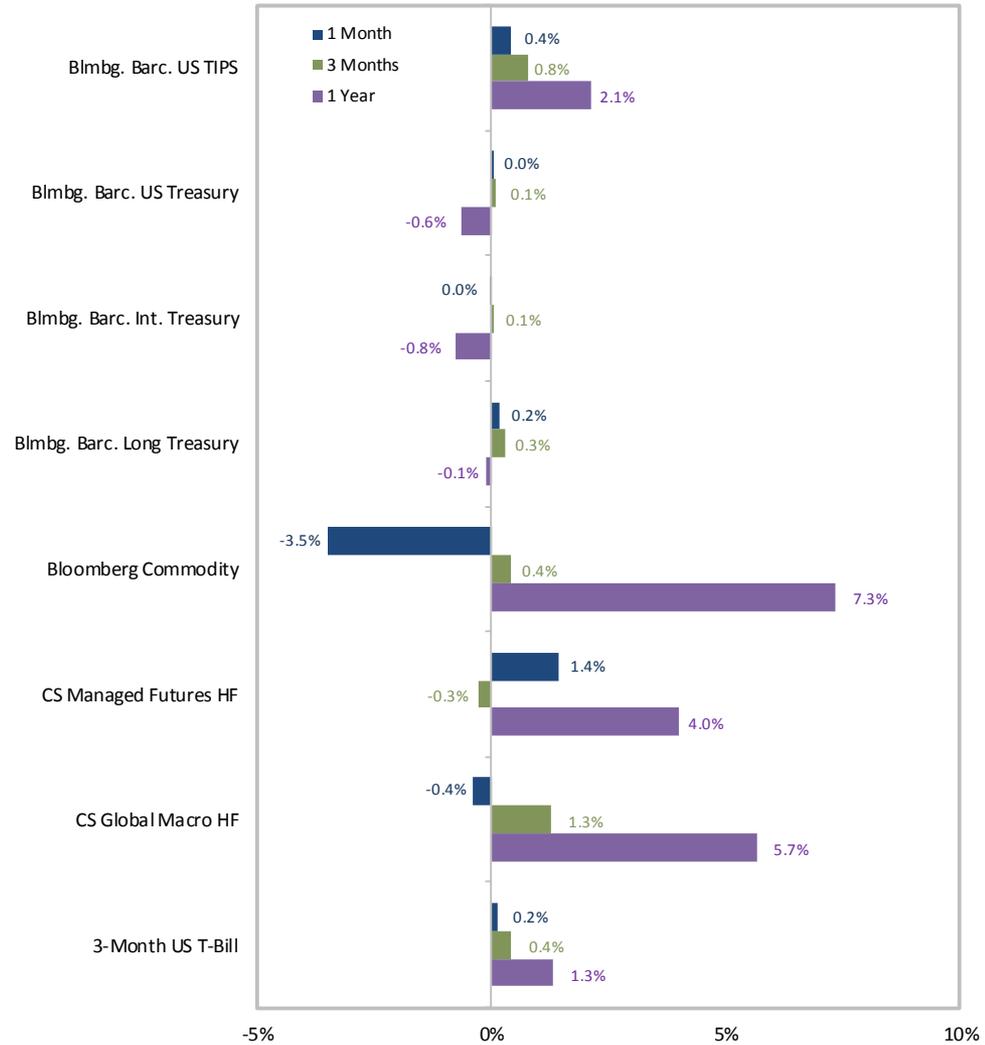
- Long treasuries saw modest gains for the quarter, outperforming shorter-duration treasuries as yields rose less at the long end of the curve than at the short end. Long treasury yields have remained anchored as demand from global investors for relatively high-yielding US bonds has been persistent. Developed market bond yields outside the US remain well below those offered by treasuries.
- Cash returns have increased but remain low, with 90-day T-Bills returning 0.4% for the quarter and 1.3% over the past year.

**Commodities**

- The Bloomberg Commodity Index returned 0.4% during the quarter, with notable underperformers including agriculture commodities due to trade concerns in addition to strong supply from good growing conditions to-date in 2018. Energy has been a meaningful contributor, led by gains from crude oil of 14% during the quarter and 23% over the first half of 2018.

**Tactical Trading**

- Tactical trading strategies saw mixed performance but were positive in aggregate, with global macro strategies gaining while managed futures declined. Over the past year global macro and managed futures strategies have both generated returns of 4% or greater.



## INVESTMENT THEMES: LOOKING FORWARD

### *What Has Happened*

#### **Growth**

- Late-cycle indicators for financial markets and economies have become increasingly prominent.
- Equity valuations are high, particularly in the US.
- Narrow market breadth as a small group of technology-focused growth stocks have outperformed.

#### **Income**

- Short-term yields have risen as the Federal Reserve has raised interest rates, while long-term yields have risen but more modestly.
- Credit spreads have compressed despite levels of corporate debt-to-GDP at cyclical highs.

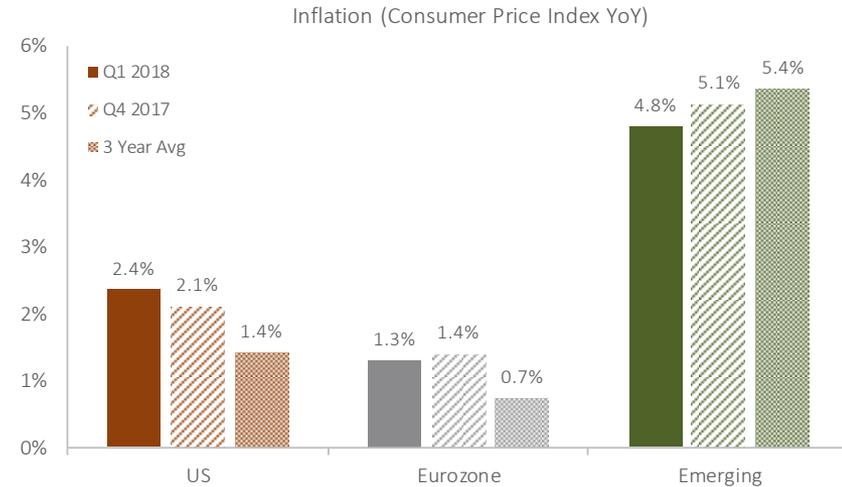
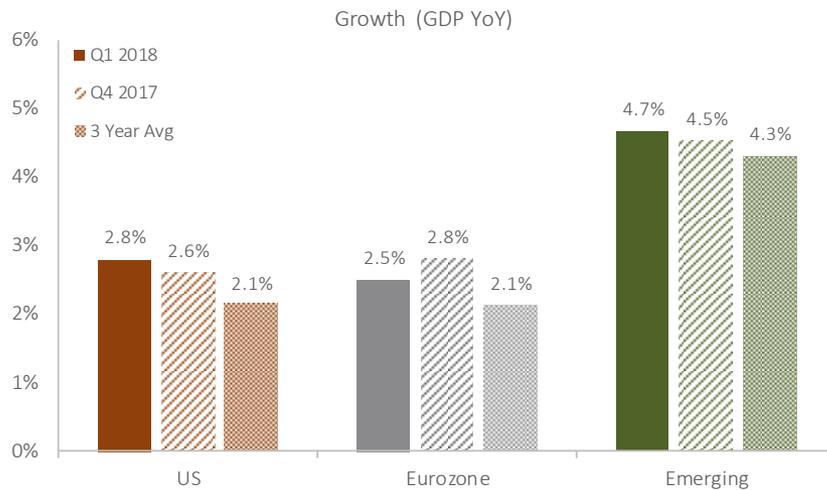
#### **Diversification**

- The 'cost' of holding diversifying assets has declined given high equity valuations and low bond yields.

### *What Investors Should Do*

- Favor relatively defensive positioning and maintain rebalancing discipline; increasing volatility can quickly shift portfolio allocations away from target.
- Tilt towards developed international and emerging markets within equity portfolios.
- Implement value tilt with a focus on tracking error; value/growth performance can vary dramatically over extended time periods.
- Favor return sources that diversify away from duration without significant credit risk (i.e., relative value hedge funds, unconstrained fixed income).
  - Size these allocations appropriately given significant tracking error vs. core fixed income.
- Inflation protection is particularly attractive; the market's pricing of future inflation remains low despite increasing inflationary pressures.

### ECONOMIC PERSPECTIVE

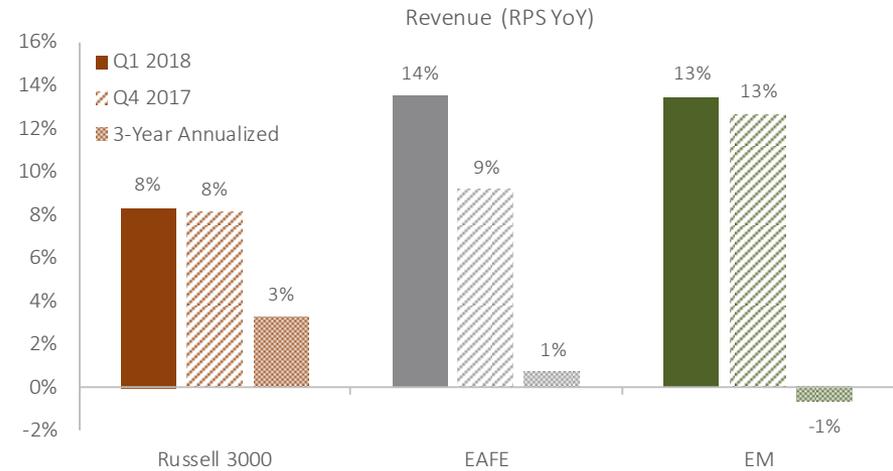
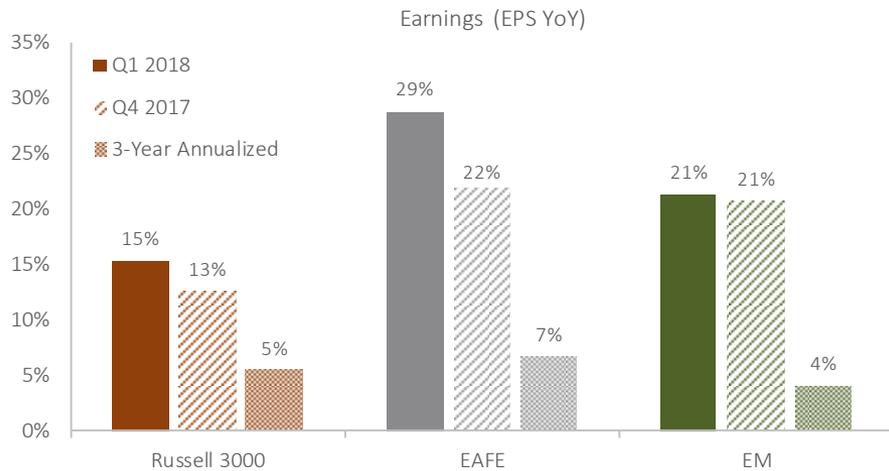


Economic Indicator	December 2010	June 2018
10-Year Market-Implied Inflation (US)	2.3%	2.1%
Unemployment Rate	9.3%	4.0%
Wage Growth YoY	1.8%	2.7%
Output Gap (GDP % of Potential GDP)	-3.7%	+0.6%

- The combination of increased growth rates across regions and subdued inflation has been a key driver of equity market gains. This ‘Goldilocks’ scenario for risk assets has contributed to the 16.8% annualized gain for ACWI since the coordinated increase in global growth began in March 2016.
- While the economy has made significant progress in recent years, the market’s expectation for inflation is lower today than it was at the end of 2010. Given the market’s current pricing, we continue to believe real assets present value in the current market environment.

Source: IMF International Financial Statistics for growth and inflation; Markit for PMIs; Bloomberg for economic indicators.

**EQUITY MARKETS**

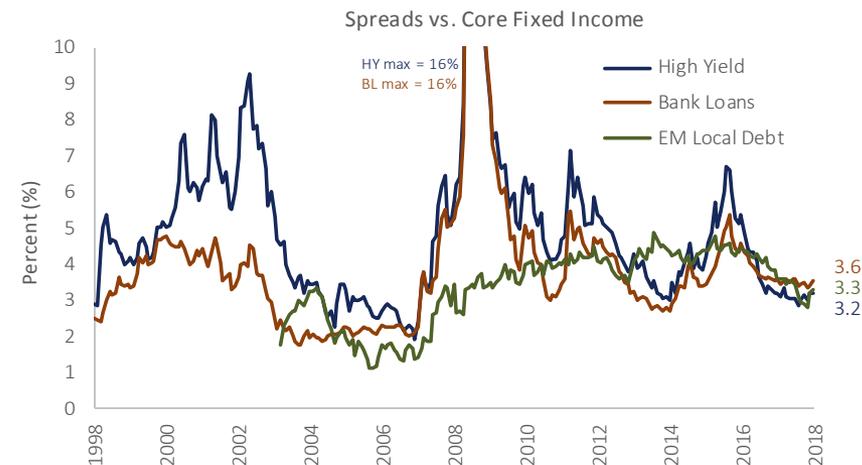
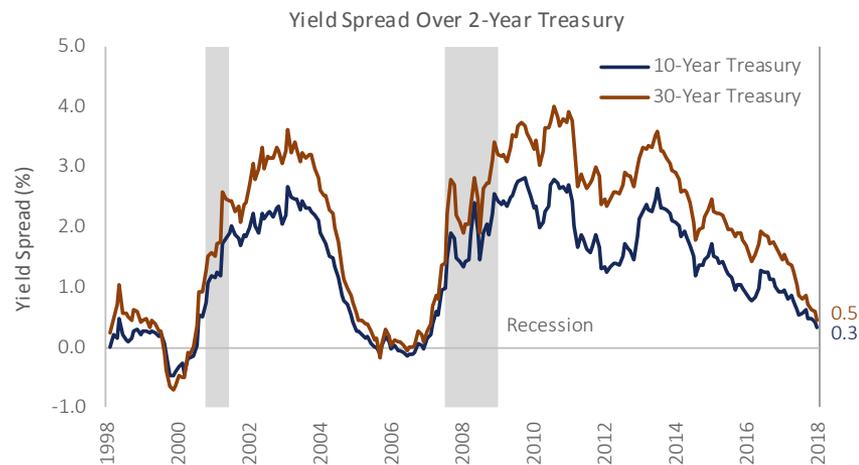
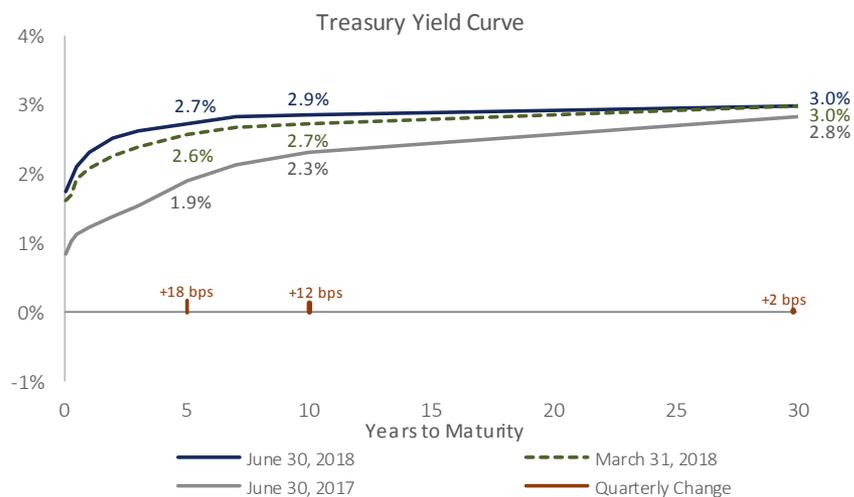


	ACWI	Percentile
Previous 20 years; 0% = most expensive 100% = most attractive	CAPE	33%
	Trailing P/E	49%
	Forward P/E	50%
	Price-to-Book	42%

- Earnings have grown at their fastest pace since 2010-2011, with earnings being supported by strong revenue growth. International markets have seen particularly strong earnings and revenue growth.
- From a valuation perspective the global equity market is modestly overvalued. Underlying regional valuations show the US remains expensive compared to international markets despite stronger recent earnings outside the US.

Source: Bloomberg, MSCI, Russell for earnings, AQR and Bloomberg for valuations.

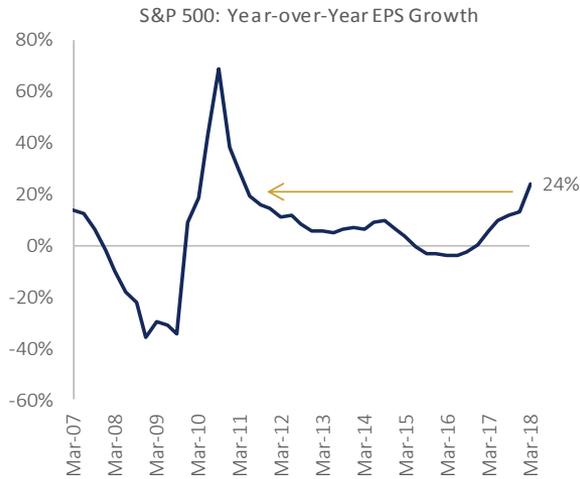
**FIXED INCOME MARKETS**



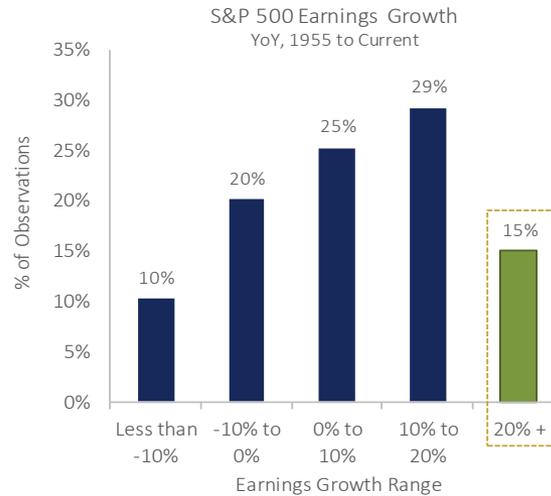
- Fixed income expected returns have increased year-to-date as yields have risen. As the slope of the yield curve has flattened, shorter-duration bonds have increased in attractiveness compared to longer-term bonds.
- The spreads of riskier fixed income markets compared to core fixed income remain relatively muted; high yield bond spreads remain near cycle-lows, while emerging market debt and bank loans offer a modestly higher spread currently.

Source: Bloomberg, JP Morgan, and Credit Suisse for spreads.

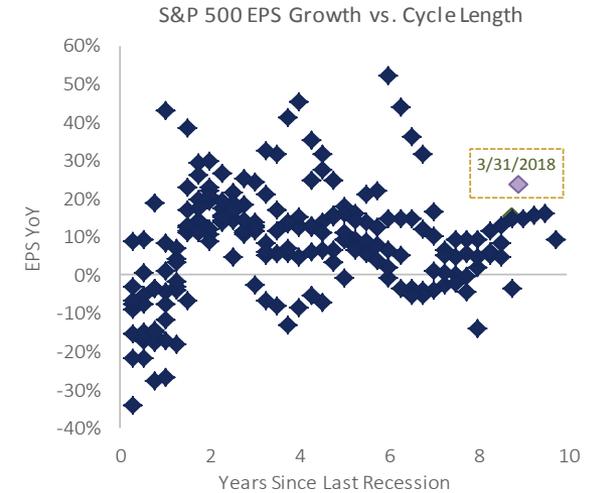
## EARNINGS STRENGTH IN PERSPECTIVE



Recent earnings growth rates have been at their highest levels since the post-crisis rebound.



Dating back to 1955, earnings have expanded this quickly just 15% of the time.



EPS growth of this magnitude has only occurred during extreme periods; 1980s inflation, tech bubble, post-GFC rebound.

- Valuations declined with recent earnings strength, implying that recent earnings growth had been largely expected.
- However, valuations remain elevated from a historical perspective.

S&P 500	Trailing 12-mo P/E
12/31/2017	22.4x
3/31/2018	20.8x

Current vs. Last 20 Years (Percentile)

31%

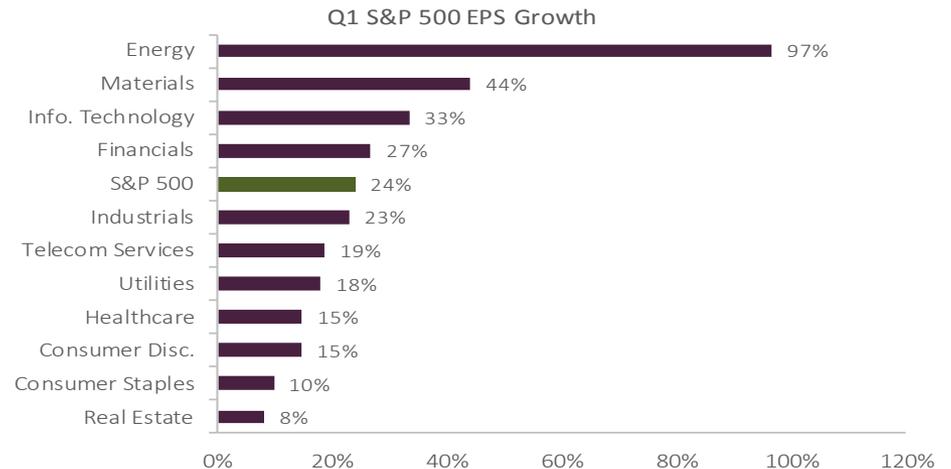
0% = most expensive  
100% = most attractive

Source: Bloomberg and FactSet. All observations are quarterly. EPS Growth vs. Cycle Length utilizes data from 1955 to current.

**DRIVERS OF EARNINGS GROWTH**

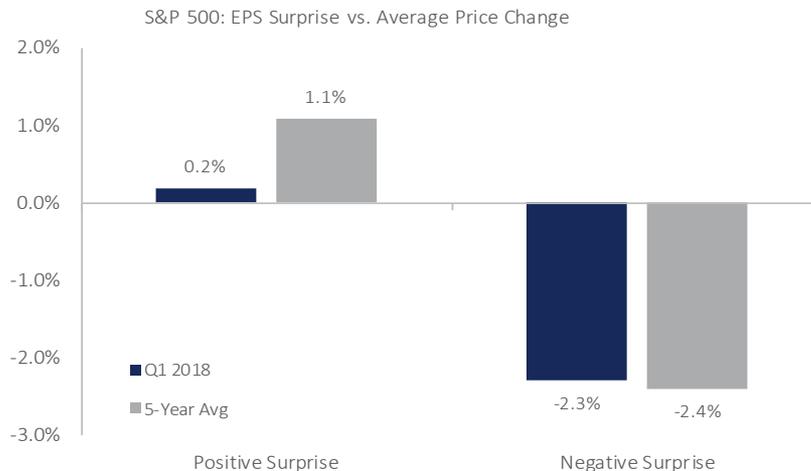
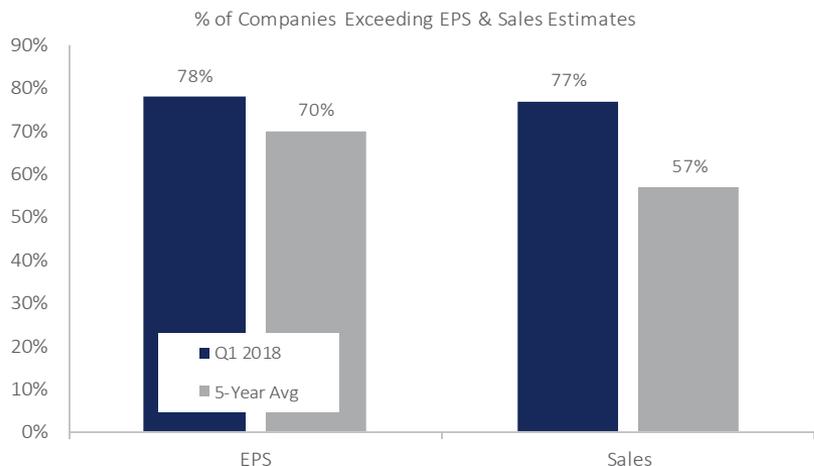
- As companies reported first quarter earnings, two major factors contributed to high levels of EPS growth:
  - The benefits of lower corporate tax rates were reaped by companies (approximately 5% benefit to EPS).
    - In dollar terms, Financials and Information Technology were the biggest beneficiaries.
  - The recovery in oil prices resulted in a rebound in Energy and Materials sector growth.

Sector	Median Change in Tax Rate
Consumer Disc.	-8.5%
Consumer Staples	-4.4%
Energy	-2.9%
Financials	-7.5%
Healthcare	-4.2%
Industrials	-7.5%
Info Technology	-6.3%
Materials	-3.6%
Telecom Services	-10.6%
Utilities	-13.4%
<b>Total S&amp;P 500</b>	<b>-6.5%</b>



Source: Bloomberg for sector tax rate data, FactSet for sector earnings per share.

## STRONG EARNINGS, WEAK MARKET REACTION



- Companies with strong earnings have not been rewarded with higher prices and companies with disappointing earnings have been punished by the market at a similar magnitude as the 5-year average.
- This highlights the impact of elevated valuations on equity markets.
  - As expectations increase, even very strong earnings are less rewarded.

Source: FactSet.

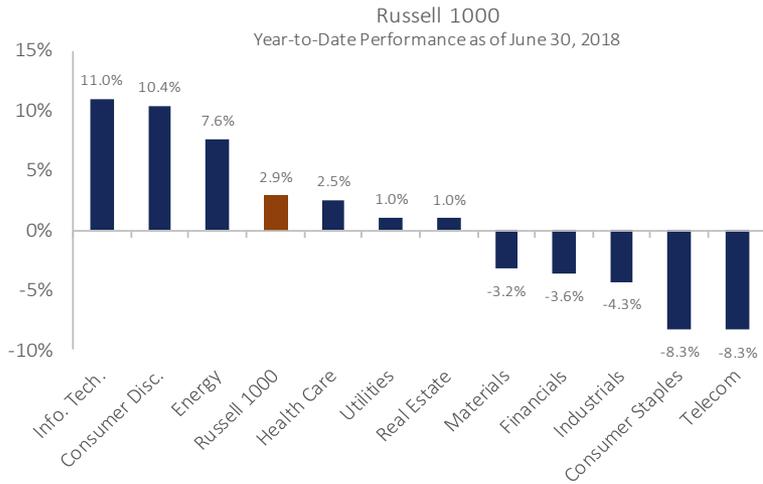
## EXPECTATIONS FOR EARNINGS GROWTH ARE HIGH



- Analysts are extrapolating recent earnings strength into the future.
- MSCI's aggregation of bottom-up earnings estimates is at its highest level since they started collecting this data in 2003.

Source: Bloomberg and MSCI.

**NARROW MARKET LEADERSHIP**



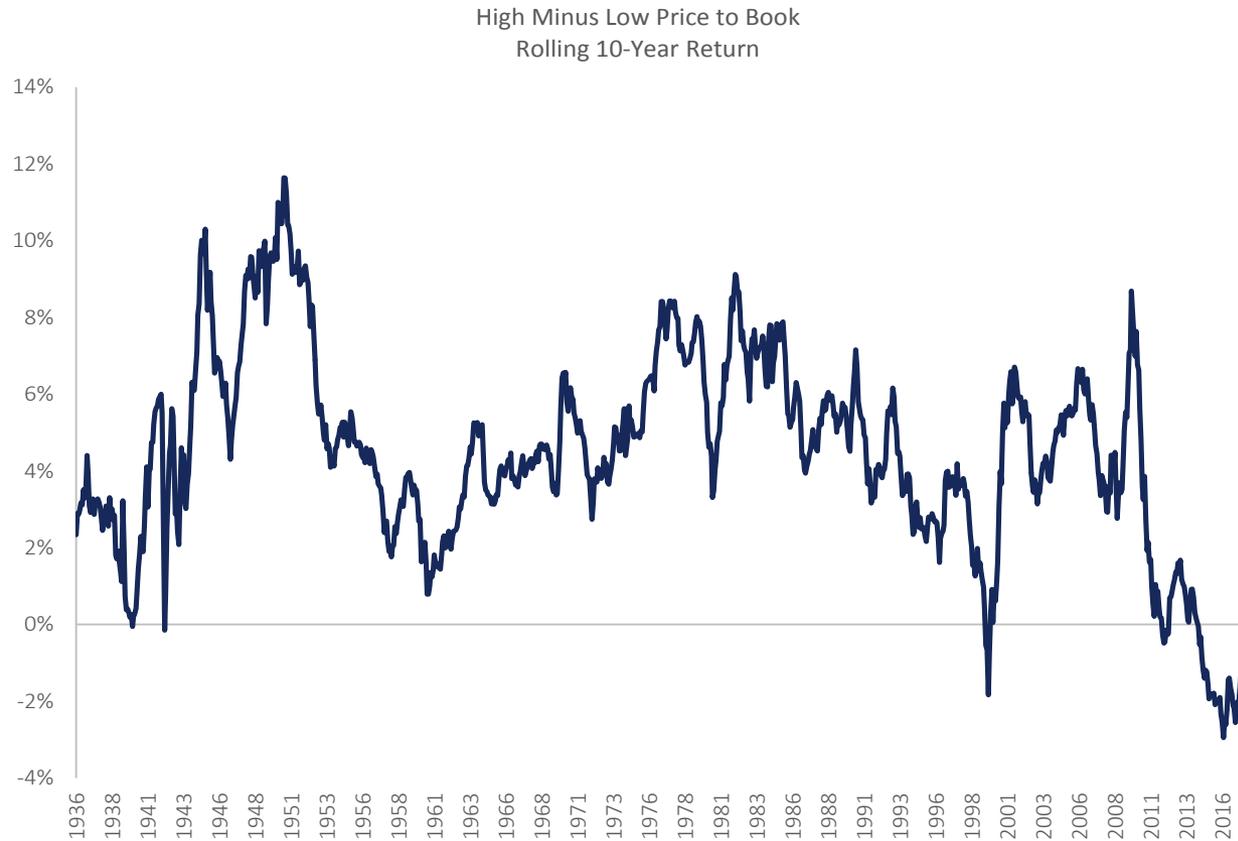
Sector	Name	Weight	Total Return YTD	Contribution to R1000 Return
Consumer Disc.	Amazon.com	2.7%	45.3%	1.2%
Consumer Disc.	Netflix	0.6%	103.9%	0.7%
Tech	Microsoft	2.9%	16.3%	0.5%
Tech	Apple	3.5%	10.2%	0.4%
Tech	MasterCard	0.7%	30.2%	0.2%
Tech	Adobe Systems	0.5%	39.1%	0.2%
Tech	Facebook	1.8%	10.1%	0.2%
Tech	Alphabet	2.6%	6.6%	0.2%
Tech	Visa	0.9%	16.6%	0.2%
Tech	Salesforce.com	0.4%	33.4%	0.1%
<i>Russell 1000</i>			2.9%	3.7%

- Only 3 of the 11 Russell 1000 sectors have outperformed the Index year-to-date.

- The Russell 1000 has not seen 8 companies in the same sector in its top 10 contributors since the tech bubble.
- The 10 companies listed above have generated more than 100% of the Russell 1000's gain in 2018.

Source: Bloomberg.

## VALUE GROWTH PERFORMANCE ENVIRONMENT



- We are currently in the most extreme period of growth outperformance ever measured by the Fama/French data.

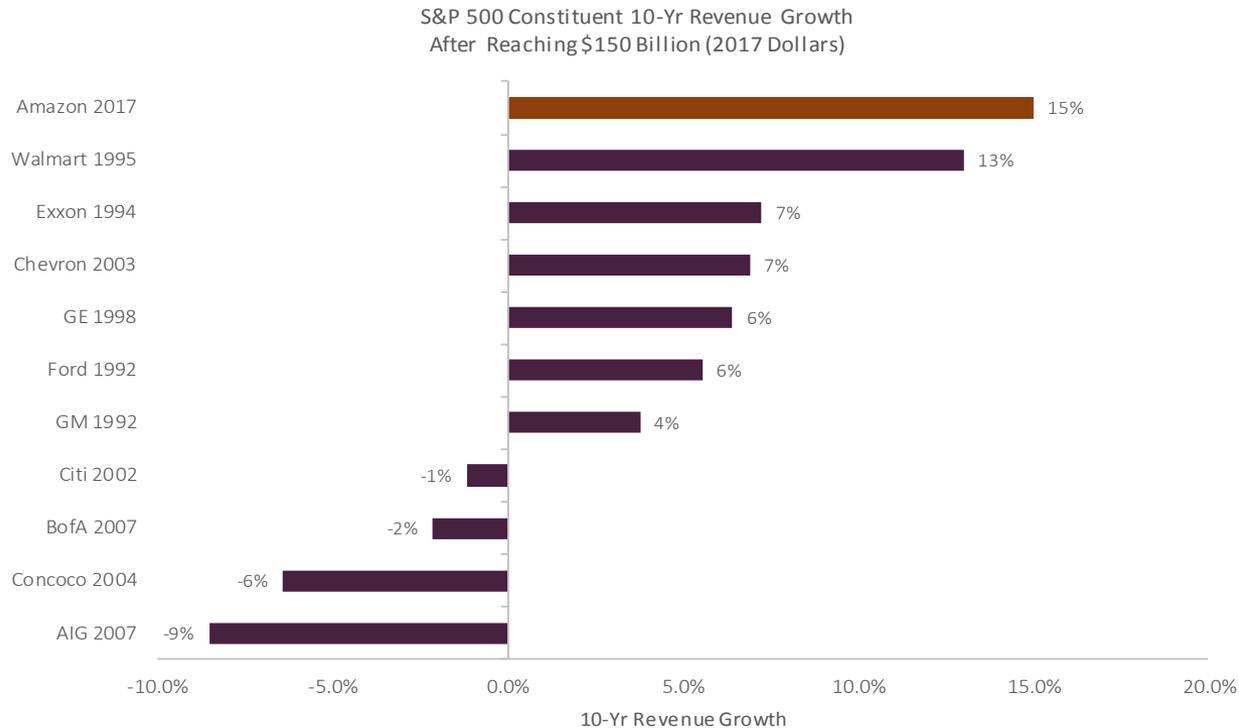
PRICES VS. FUNDAMENTALS

	18-Month Increase in:		
	Market Cap (\$ Billions)	Revenue (Trailing 12-Month \$ Billions)	Earnings (Trailing 12-Month \$ Billions)
Amazon	\$483	\$80	\$4
Google	\$313	\$34	\$(3)
Facebook	\$127	\$24	\$12
Netflix	\$97	\$5	\$1

- Over the last 18 months, F.A.N.G. stock performance has been primarily driven by investor anticipation of future prospects versus higher realized revenue and earnings increases.
- During this period, Amazon’s market cap increased 6x faster than its revenue growth and 116x faster than its earnings growth.
  - This compares to the average Russell 1000 company which saw its market cap increase 2x vs. revenue growth and 24x earnings growth.
- Prices are being driven more by potential than fundamentals.

## AMAZON'S LOFTY EXPECTATIONS

- The market expects Amazon to grow its current revenues of \$165 billion at 15% annually over the next 10 years.
- Historically, only one company in history has been able to grow 10-year annualized revenues at a double digit pace after reaching \$150 billion (2017 dollars) – Walmart (13%) in 1995-2005.
- While Amazon's business model is certainly disruptive, expectations are very high.



Source: Bloomberg.

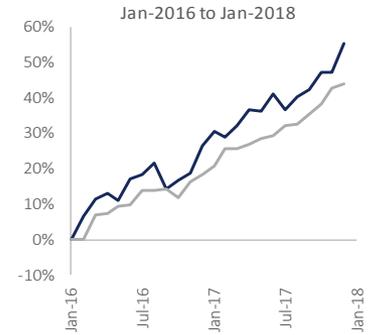
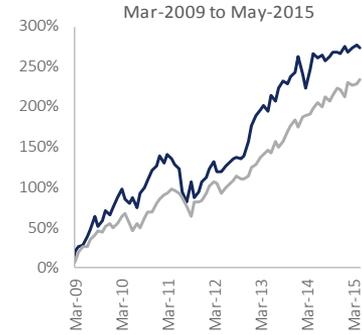
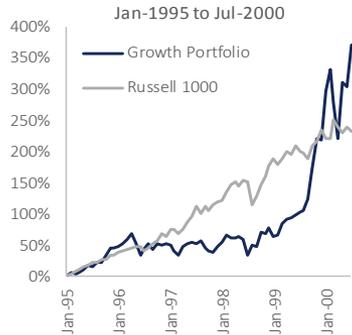
## SECOND QUARTER 2018 F.A.N.G. EARNINGS



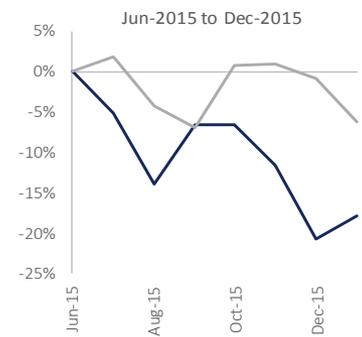
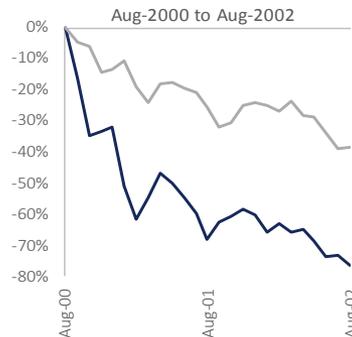
- Despite producing strong growth, investors have had negative reactions so far to F.A.N.G stock second quarter earnings announcements.
  - Amazon and Google beat EPS expectations by 48% and 24%, respectively, but their stocks were basically unchanged.
  - Netflix’s EPS was 8% higher than expected, but the stock sold off because the company only added 5 million subscribers vs. expectations of 6 million.
  - Facebook’s EPS was 4% higher than expected, but the stock sold off because user growth was only 150 million vs. expectations of 160 million (for perspective, there are 325 million people in the entire US).

## THE MARKET LOVES 100+ P/E RATIOS...UNTIL IT DOESN'T

- Market cycles consistently feature pockets of companies that become favored by investors. Despite P/E ratios over 100, expectations and narratives continue to build while multiples expand further.



- The issue, however, is these stocks are the most vulnerable to any bad news because expectations have become so high. This results in significant underperformance in turbulent market environments.

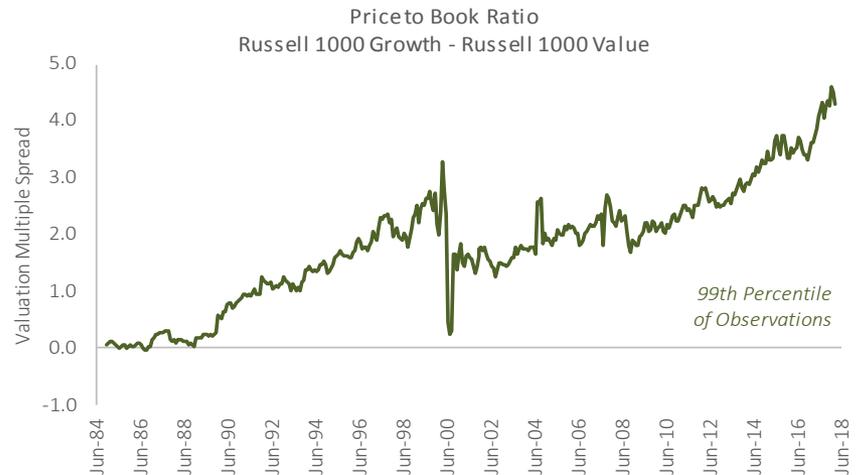
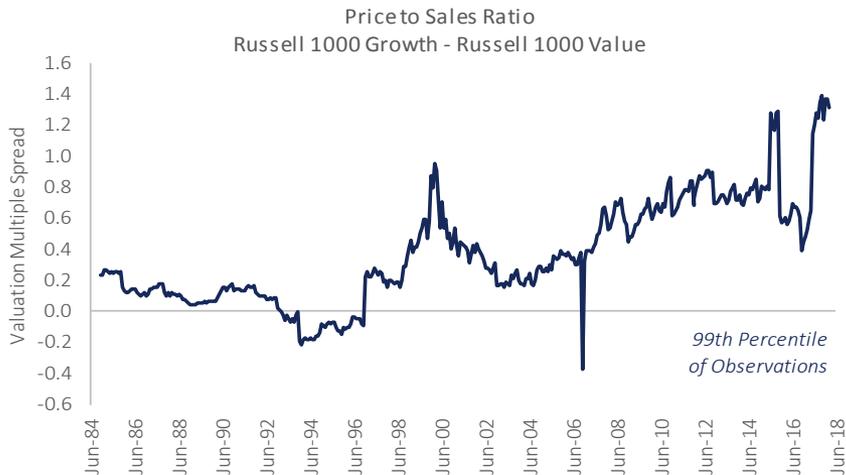
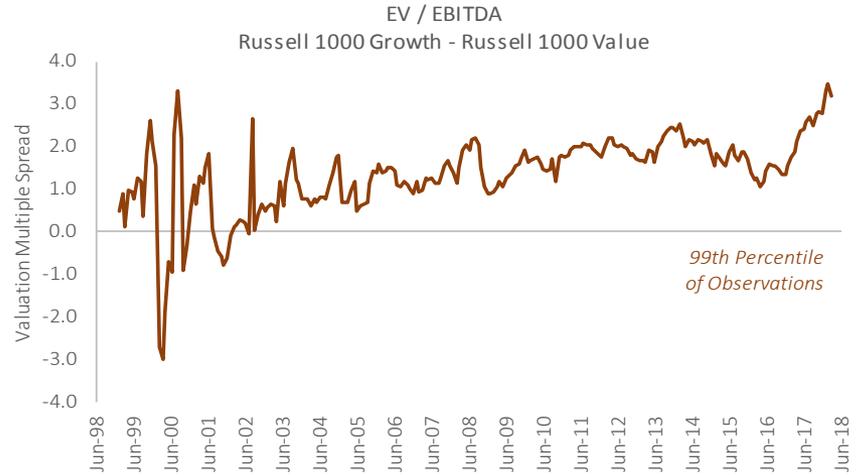
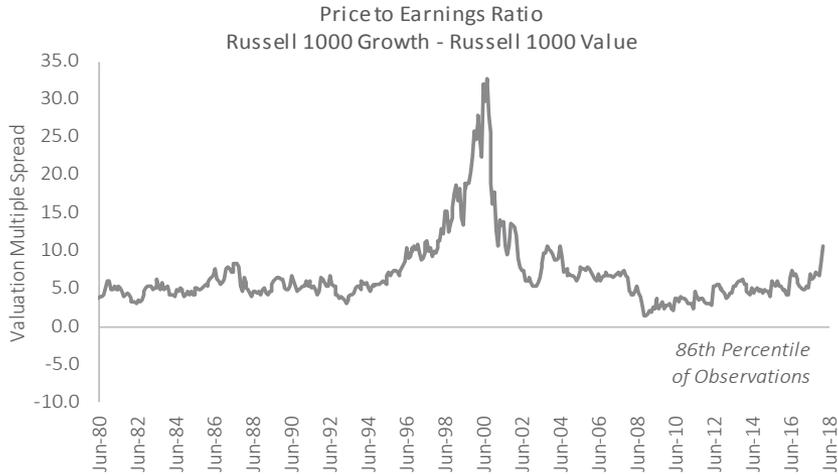


January 1995 – January 2018

	Growth Portfolio	Russell 1000
Annualized Return	8.7%	10.3%
Standard Deviation	29.8%	14.8%

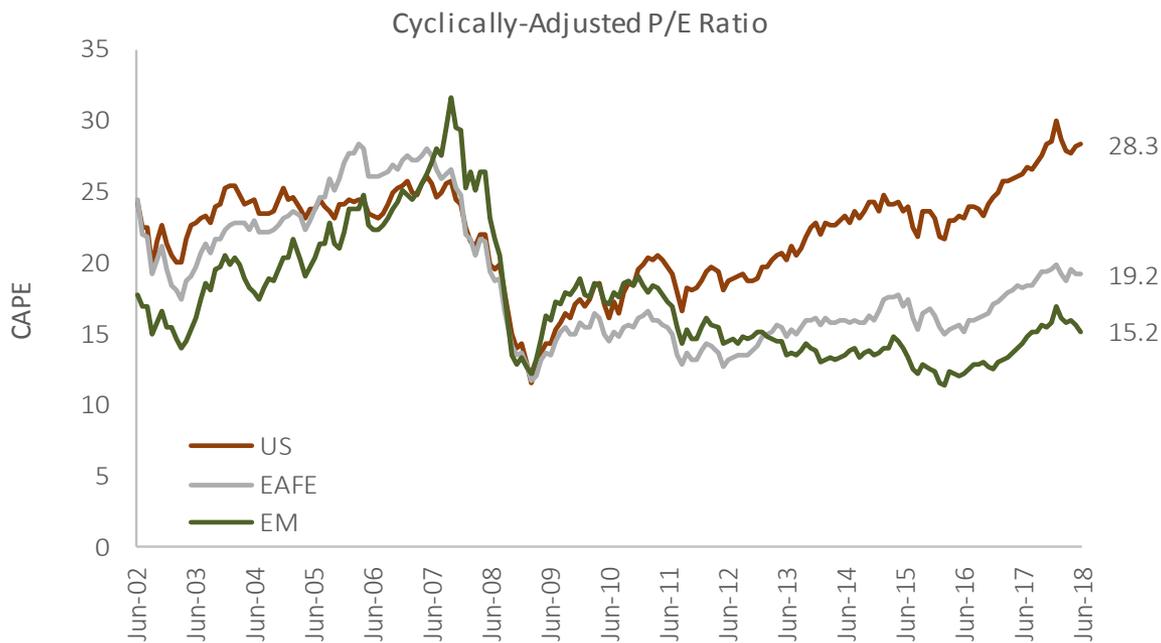
Source: Bloomberg. 'Growth Portfolio' is an equal-weighted portfolio of stocks in the Russell 1000 with P/E ratios over 100x, rebalanced monthly.

**GROWTH STOCK VALUATIONS ARE LOFTY**



Note: Data based on index underlying holdings metrics from FactSet, which was provided by AJO. Data history: P/E – Jan 1980, EV/EBITDA – Dec 1998, P/S and P/B – Nov 1984.

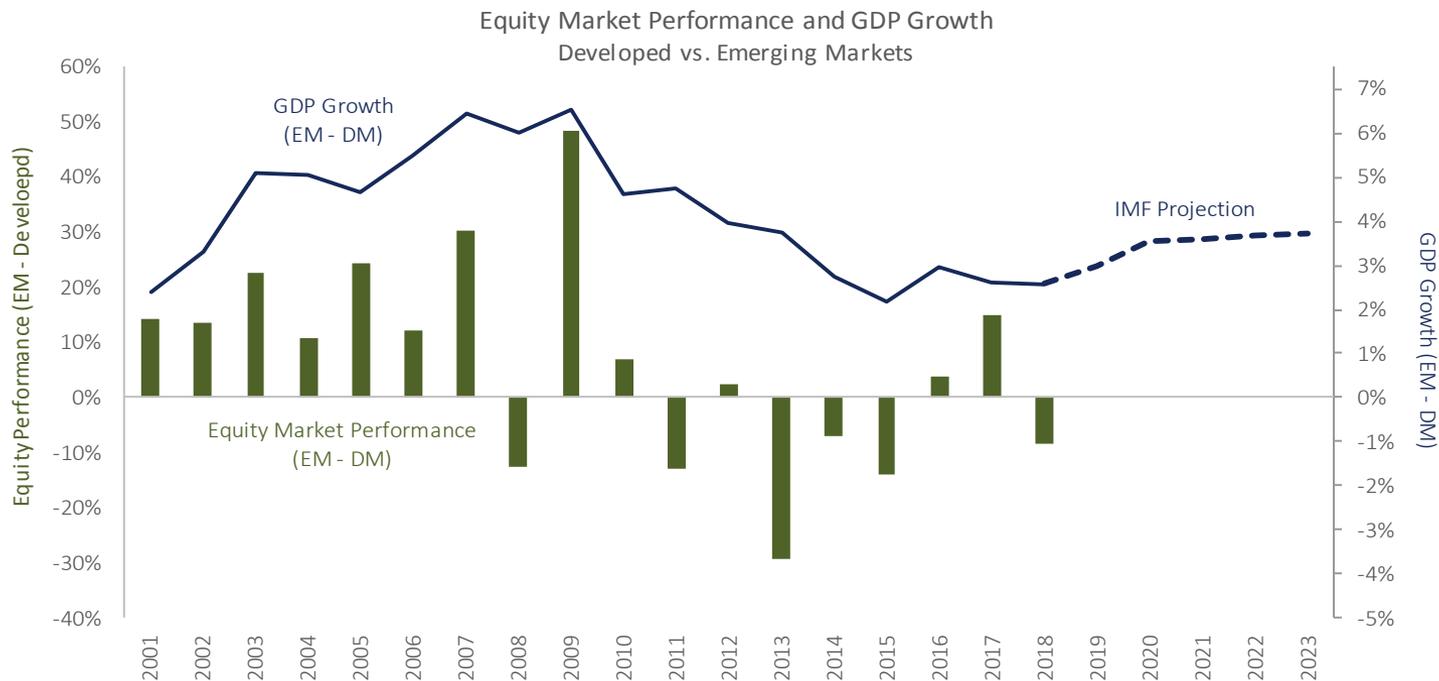
## EQUITY MARKET VALUATIONS



- Investors are paying nearly twice as much for a dollar of US earnings compared to emerging markets.
- The market is priced for continued good news in the US and bad news outside the US, specifically emerging markets.

Source: AQR.

## OUTLOOK FOR EMERGING MARKETS



- The growth differential between emerging and developed economies has stabilized and is forecasted to widen in coming years.
- We expect the widening growth gap to contribute to emerging market outperformance prospectively.

Source: IMF.

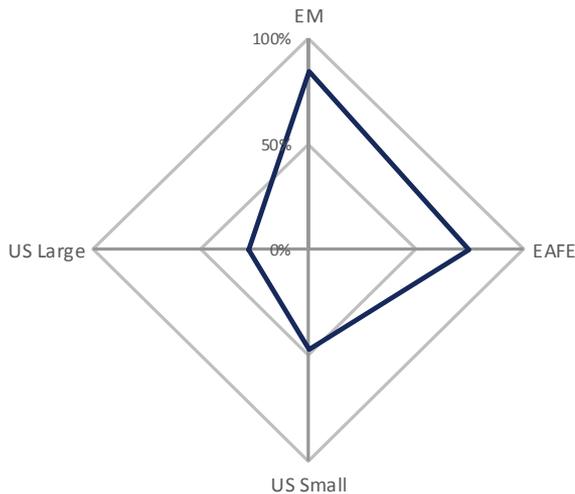
ASSET CLASS VALUATION OVERVIEW

Equity



ACWI

Relative Valuations



Region	Current %	Last Qtr %
US Large Cap	28%	25%
US Small Cap	47%	46%
International Developed	75%	78%
Emerging Markets	85%	72%

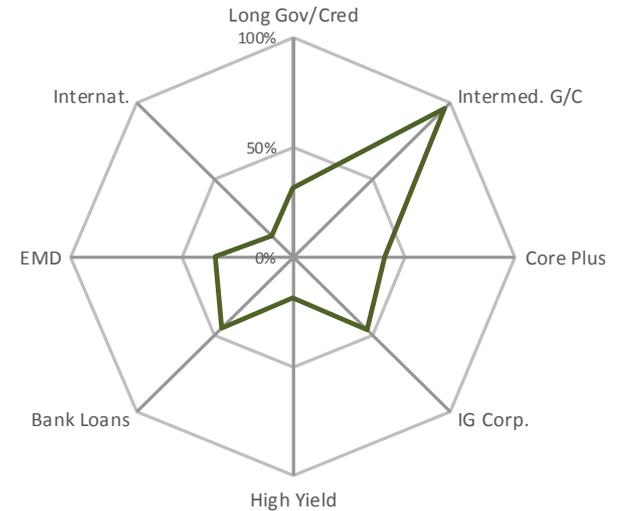
0% = Most Expensive 100% = Most Attractive vs. trailing 20 years of observations

Equity: Utilizes cyclically adjusted P/E ratio for ACWI, and CAPE ratios relative to ACWI for relative valuations.  
 Fixed income: Utilizes yield to worst for the Bloomberg Barclays Aggregate, and option-adjusted spreads relative to the Bloomberg Barclays Aggregate for relative valuations. Source: AQR and Bloomberg.

Fixed Income



Bloomberg Barclays US Aggregate



Sector	Current %	Last Qtr %
Core Plus	41%	26%
IG Corporates	47%	36%
High Yield	18%	18%
Bank Loans	46%	44%
EM Debt	35%	29%
Long Gov/Credit	31%	32%
International Developed	14%	15%
Intermediate Gov/Credit	96%	90%

# Relative Performance

June 30, 2018

## STYLE PERFORMANCE RANKING: ONE-YEAR TIME PERIODS

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Q2 2018	10 Yr ROR	20 Yr ROR
Best Performing	EM 74.8%	EAFE 8.1%	Large Value 38.4%	Large Growth 23.1%	Large Value 35.2%	Large Growth 38.7%	EM 66.4%	Small Value 22.8%	Small Value 14.0%	Core Bonds 10.3%	EM 55.8%	EM 25.6%	EM 34.1%	EM 32.2%	EM 39.4%	Int. Treas. 11.4%	EM 78.5%	Small Growth 29.1%	Core Bonds 7.8%	EM 18.2%	Small Growth 43.3%	S&P 500 13.7%	Large Growth 5.7%	Small Value 31.7%	EM 37.3%	Small Growth 9.7%	Small Value 8.3%	Large Growth 11.8%	Small Value 8.7%
	EAFE 32.9%	Large Growth 2.7%	S&P 500 37.6%	S&P 500 23.0%	S&P 500 33.4%	S&P 500 28.6%	Small Growth 43.1%	Core Bonds 11.6%	Core Bonds 8.4%	Int. Treas. 9.6%	Small Growth 48.5%	Small Value 22.3%	EAFE 14.0%	EAFE 26.9%	Large Growth 11.8%	Core Bonds 5.2%	HY Bonds 58.2%	Small Cap 26.9%	Int. Treas. 6.6%	Small Value 18.1%	Small Cap 38.8%	Large Value 13.5%	S&P 500 1.4%	Small Cap 21.3%	Large Growth 30.2%	Small Cap 7.7%	Small Cap 7.8%	Small Growth 11.2%	EM 8.5%
	Small Value 23.8%	S&P 500 1.3%	Large Growth 37.2%	Large Value 21.6%	Small Value 31.8%	EAFE 20.3%	Large Growth 33.2%	Int. Treas. 10.3%	Int. Treas. 8.2%	HY Bonds -1.4%	Small Cap 47.3%	EAFE 20.7%	Large Value 7.1%	Small Value 23.5%	EAFE 11.6%	HY Bonds -26.2%	Large Growth 37.2%	Small Value 24.5%	HY Bonds 5.0%	Large Value 17.5%	Small Value 34.5%	Large Growth 13.1%	Int. Treas. 1.2%	Large Value 17.3%	EAFE 25.0%	Large Growth 7.3%	Small Growth 7.2%	Small Cap 10.6%	Small Cap 8.0%
	Small Cap 18.9%	HY Bonds -1.0%	Small Growth 31.0%	Small Value 21.4%	Small Growth 30.5%	Large Growth 15.6%	EAFE 27.3%	Large Value 7.0%	HY Bonds 5.3%	EM -6.0%	Small Value 46.0%	Small Cap 18.3%	Large Growth 5.3%	Large Value 22.2%	Int. Treas. 8.8%	Small Value -28.9%	Small Growth 34.5%	EM 18.9%	Large Growth 2.6%	EAFE 17.3%	Large Growth 33.5%	Core Bonds 6.0%	Core Bonds 0.6%	HY Bonds 17.1%	Small Growth 22.2%	Small Value 5.4%	Large Growth 5.8%	S&P 500 10.2%	Small Growth 6.9%
	Large Value 18.1%	Small Value -1.5%	Small Cap 28.4%	Small Cap 16.5%	Small Cap 22.4%	Core Bonds 8.7%	Small Cap 21.3%	Small Cap -3.0%	Small Cap 2.5%	Small Value -11.4%	EAFE 39.2%	Large Value 16.5%	S&P 500 4.9%	Small Cap 18.4%	Small Growth 7.1%	Small Cap -33.8%	EAFE 31.9%	Large Growth 16.7%	S&P 500 2.1%	Small Cap 16.3%	Large Value 32.5%	Small Growth 5.6%	EAFE -0.8%	S&P 500 12.0%	S&P 500 21.8%	S&P 500 2.6%	S&P 500 3.4%	Small Value 9.9%	Large Value 6.7%
	HY Bonds 17.1%	Small Cap -1.8%	Small Value 25.8%	HY Bonds 11.4%	Small Growth 12.9%	Int. Treas. 8.6%	S&P 500 21.0%	HY Bonds -5.9%	EM -2.4%	Large Value -15.5%	Large Value 30.0%	Small Growth 14.3%	Small Value 4.7%	S&P 500 15.8%	Core Bonds 7.0%	Large Value -36.9%	Small Cap 27.2%	Large Value 15.5%	Large Value 0.4%	S&P 500 16.0%	S&P 500 32.4%	Small Cap 4.9%	Small Growth -1.4%	Small Growth 11.3%	Small Cap 14.6%	HY Bonds 0.2%	Large Value 1.2%	Large Value 8.5%	HY Bonds 6.5%
	Small Growth 13.4%	Int. Treas. -1.8%	HY Bonds 19.2%	Small Growth 11.3%	HY Bonds 12.7%	HY Bonds 1.9%	Large Value 7.4%	S&P 500 -9.1%	Large Value -5.6%	EAFE -15.7%	Large Growth 29.8%	HY Bonds 11.1%	Small Cap 4.6%	Small Growth 13.4%	S&P 500 5.5%	S&P 500 -37.0%	S&P 500 26.5%	HY Bonds 15.1%	Small Growth -2.9%	HY Bonds 15.8%	EAFE 22.8%	Small Value 4.2%	Large Value -3.8%	EM 11.2%	Large Value 13.7%	Int. Treas. -0.7%	HY Bonds 1.0%	HY Bonds 8.2%	S&P 500 6.5%
	S&P 500 10.1%	Large Value -2.0%	Core Bonds 18.5%	EAFE 6.4%	Core Bonds 9.7%	Small Growth 1.2%	HY Bonds 2.4%	EAFE -14.0%	Small Growth -9.2%	Small Cap -20.5%	HY Bonds 29.0%	S&P 500 10.9%	Small Growth 4.1%	HY Bonds 11.9%	HY Bonds 1.9%	Large Growth -38.4%	Small Value 20.6%	S&P 500 15.1%	Small Cap -4.2%	Large Growth 15.3%	HY Bonds 7.4%	Int. Treas. 2.6%	Small Cap -4.4%	Large Growth 7.1%	Small Value 7.8%	Core Bonds -1.6%	Int. Treas. 0.1%	Core Bonds 3.7%	Large Growth 6.3%
	Core Bonds 9.8%	Small Growth -2.4%	Int. Treas. 14.4%	EM 6.0%	Int. Treas. 7.7%	Small Cap -2.5%	Int. Treas. 0.4%	Large Growth -22.4%	S&P 500 -11.9%	S&P 500 -22.1%	S&P 500 28.7%	Large Growth 6.3%	HY Bonds 2.7%	Large Growth 9.1%	Large Value -0.2%	Small Growth -38.5%	Large Value 19.7%	EAFE 7.8%	Small Value -5.5%	Small Growth 14.6%	Int. Treas. -1.3%	HY Bonds 2.5%	HY Bonds -4.5%	Core Bonds 2.7%	HY Bonds 7.5%	Large Value -1.7%	Core Bonds -0.2%	EAFE 2.8%	Core Bonds 4.7%
	Int. Treas. 8.2%	Core Bonds -2.9%	EAFE 11.6%	Int. Treas. 4.0%	EAFE 2.1%	Small Value -6.5%	Core Bonds -0.8%	Small Growth -22.4%	Large Growth -20.4%	Large Growth -27.9%	Core Bonds 4.1%	Core Bonds 4.3%	Core Bonds 2.4%	Core Bonds 4.3%	Small Cap -1.6%	EAFE -43.4%	Core Bonds 5.9%	Core Bonds 6.5%	EAFE -12.1%	Core Bonds 4.2%	Core Bonds -2.0%	EM -2.2%	Small Value -7.5%	Int. Treas. 1.1%	Core Bonds 3.5%	EAFE -2.7%	EAFE -1.2%	Int. Treas. 2.4%	EAFE 4.3%
Large Growth 2.9%	EM -7.3%	EM -5.2%	Core Bonds 3.6%	EM -11.6%	EM -25.3%	Small Value -1.5%	EM -30.6%	EAFE -21.2%	Small Growth -30.3%	Int. Treas. 2.1%	Int. Treas. 2.0%	Int. Treas. 1.6%	Int. Treas. 3.5%	Small Value -9.8%	EM -53.3%	Int. Treas. -1.4%	Int. Treas. 5.3%	EM -18.4%	Int. Treas. 1.7%	EM -2.6%	EAFE -4.9%	EM -14.9%	EAFE 1.0%	Int. Treas. 1.1%	EM -6.7%	EM -8.0%	EM 2.3%	Int. Treas. 3.9%	

## **Winners for the Trailing 12 Months**

- Geopolitical headlines and trade tensions dominated the first half of 2018, bringing an end to the abnormally low-volatility market conditions of 2017. However, economic growth continued globally and inflation remained subdued, providing equities room to grow.
  - Russell 1000 Growth: 22.5%
  - Russell 2000 Growth: 21.9%
  - Russell 2000: 17.6%

## **Losers for the Trailing 12 Months**

- No major asset classes were significant losers over the trailing 12 months.

## **Areas of Positive Performance for the Trailing 12 Months**

- The Total Fund Composite outperformed its Implementation Index by 2.1% for the trailing 12 months; Total Fund returned 9.0% versus the benchmark at 6.9%. The Total Fund ranked in the 37th percentile versus other Public Fund peers.
- The US Non-Large Cap Composite returned 23.9%, outperformed the Russell 2500 Index by 767 bps, and ranked in the 13th percentile versus peers.
  - All US non-large cap managers posted strong absolute and relative returns. William Blair returned 24.7% and outperformed by 317 bps, Investment Counselors of Maryland returned 19.4% and outperformed by 627 bps, and Brown returned 30.2% and outperformed by 833 bps.
- The US Large Cap Composite returned 16.3%, outperformed the Russell 1000 index by 1.8%, and ranked in the 33rd percentile versus peers.
  - All US large cap managers had strong yearly returns. Invesco returned 15.8% and ranked in the 33rd percentile, LSV returned 11.1% and ranked in the 41st percentile, and Westfield returned 21.9% and ranked in the 48th percentile.

## **Areas of Negative Performance for the Trailing 12 Months**

- On an absolute basis, the International Developed and Emerging Markets Composites were positive. However, both ranked below median versus peers; the International Developed Composite ranked 60th and the Emerging Markets Composite ranked 57th.

## **Winners for the Recent Quarter:**

- Despite trade news returning the market to a more a normal state of volatility, domestic equities continued their upward march, driven largely by large cap growth and small cap stocks. Overall, global equity markets saw modest gains over the quarter.
  - Russell 2000: 7.8%
  - Russell 1000 Growth: 5.8% (outperformed Value by 4.6%)

## **Losers for the Recent Quarter:**

- Emerging and international developed market equities fell, as the dollar strengthened. Further declines in local currencies, due to outflows from emerging markets, led local currency emerging market bonds to their worst quarterly performance since the third quarter of 2015. Fixed income indices broadly declined over the quarter, as yields rose across the curve.
  - MSCI Emerging Markets: -8.0%
  - MSCI ACWI ex US: -2.6%
  - Blmbg. Barc. Global EMD – Local: -8.1%
  - Blmbg. Barc. Global Aggregate: -2.8%

## **Areas of Positive Performance for the Recent Quarter**

- The US Equity Composite returned 4.1% over the quarter, outperformed the Russell 3000 Index by 21 bps, and ranked in the 27th percentile versus peers. The Non-Large Cap Composite returned 8.3% and outperformed the Russell 2500 Index by 263 bps, ranking in the 8th percentile versus peers. The Large Cap Composite underperformed the index and ranked close to median.
- The Real Assets Composite returned 5.5% over the quarter, beating the NCREIF Property Index by 382 bps and ranking in the 6th percentile versus peers.

## **Areas of Negative Performance for the Recent Quarter**

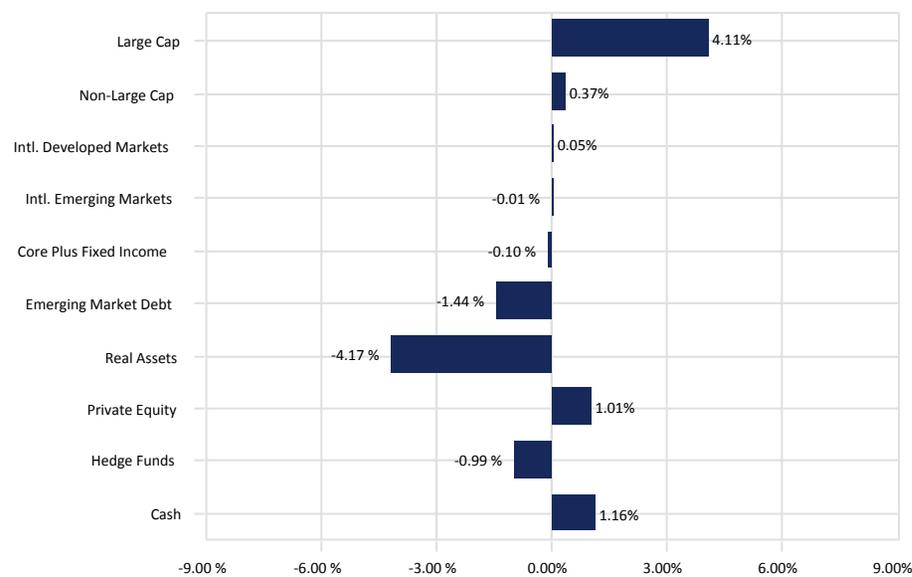
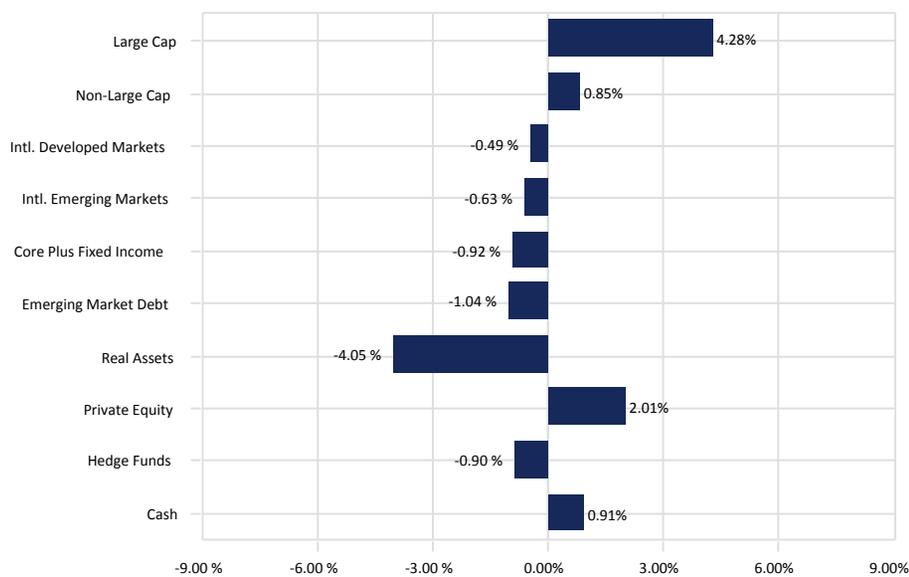
- The International Emerging Markets Composite returned -9.1% and underperformed the MSCI Emerging Markets Index (Net) by 121 bps and ranked below median in its peer universe.
- The International Developed Markets Composite returned -0.4%, but outperformed the MSCI EAFE Index (Net) by 0.6%, ranking in the top quartile.
- The Fixed Income Composite returned -1.7% and underperformed the Policy Index by 154 bps, ranking in the bottom quartile.

**Total Fund**

# Howard County Retirement Plans

## Asset Allocation vs. Target Allocation

June 30, 2018



June 30, 2018

	<u>Market Value</u> (\$)	<u>Allocation</u> (%)	<u>Target</u> (%)
Large Cap	194,967,293	19.28	15.00
Non-Large Cap	59,163,332	5.85	5.00
Intl. Developed Markets	126,518,917	12.51	13.00
Intl. Emerging Markets	64,372,299	6.37	7.00
Core Plus Fixed Income	243,483,407	24.08	25.00
Emerging Market Debt	40,005,233	3.96	5.00
Real Assets	34,866,184	3.45	7.50
Private Equity	121,423,194	12.01	10.00
Hedge Funds	117,297,518	11.60	12.50
Cash	9,179,862	0.91	0.00
<b>Total Fund</b>	<b>1,011,277,239</b>	<b>100.00</b>	<b>100.00</b>

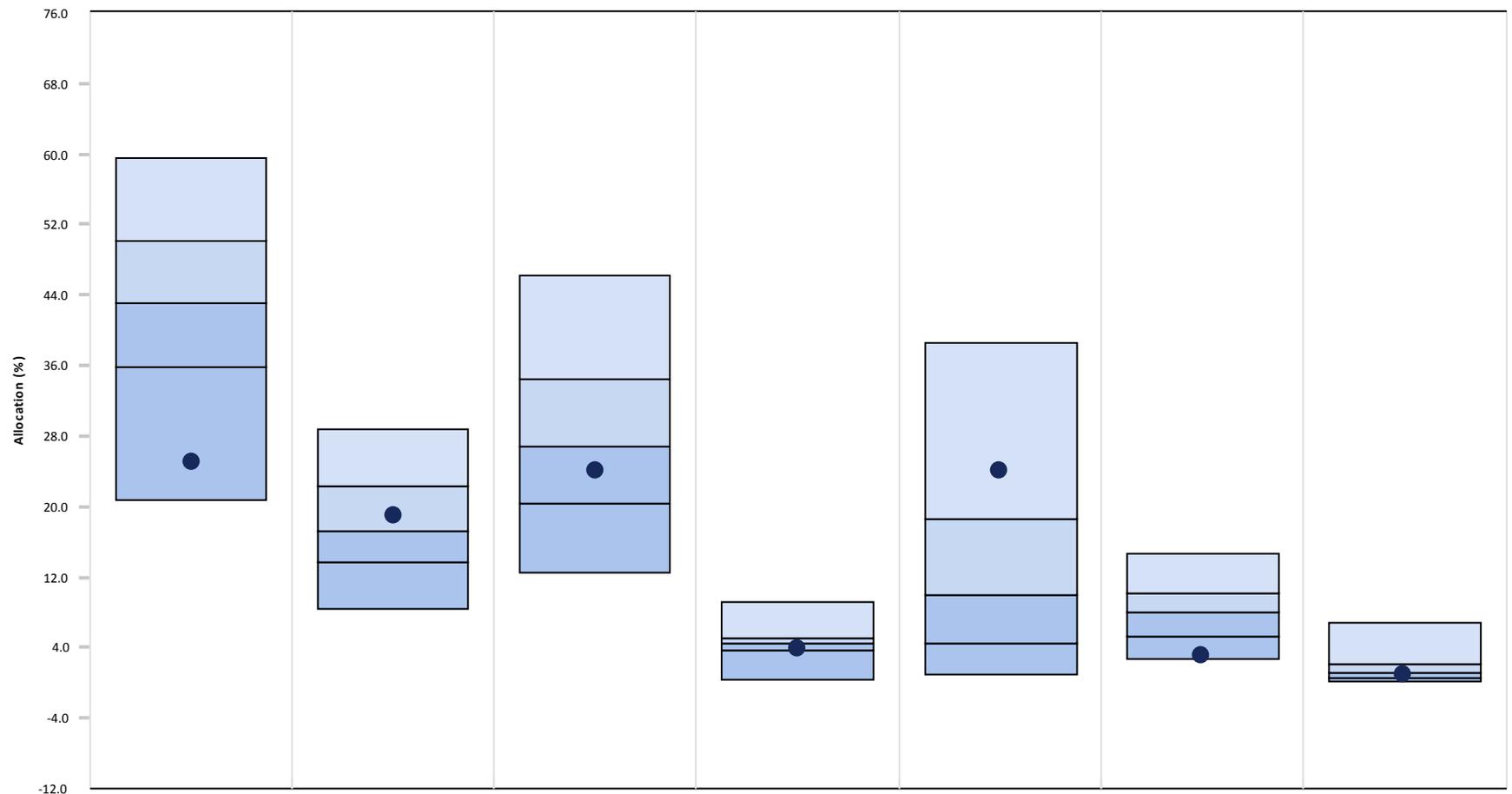
December 31, 2017

	<u>Market Value</u> (\$)	<u>Allocation</u> (%)	<u>Target</u> (%)
Large Cap	189,441,429	19.11	15.00
Non-Large Cap	53,279,749	5.37	5.00
Intl. Developed Markets	129,397,425	13.05	13.00
Intl. Emerging Markets	69,347,936	6.99	7.00
Core Plus Fixed Income	246,858,728	24.90	25.00
Emerging Market Debt	35,310,365	3.56	5.00
Real Assets	33,001,370	3.33	7.50
Private Equity	109,192,151	11.01	10.00
Hedge Funds	114,123,641	11.51	12.50
Cash	11,466,237	1.16	0.00
<b>Total Fund</b>	<b>991,419,031</b>	<b>100.00</b>	<b>100.00</b>

# Howard County Retirement Plans

Plan Sponsor TF Asset Allocation - All Public Plans

June 30, 2018



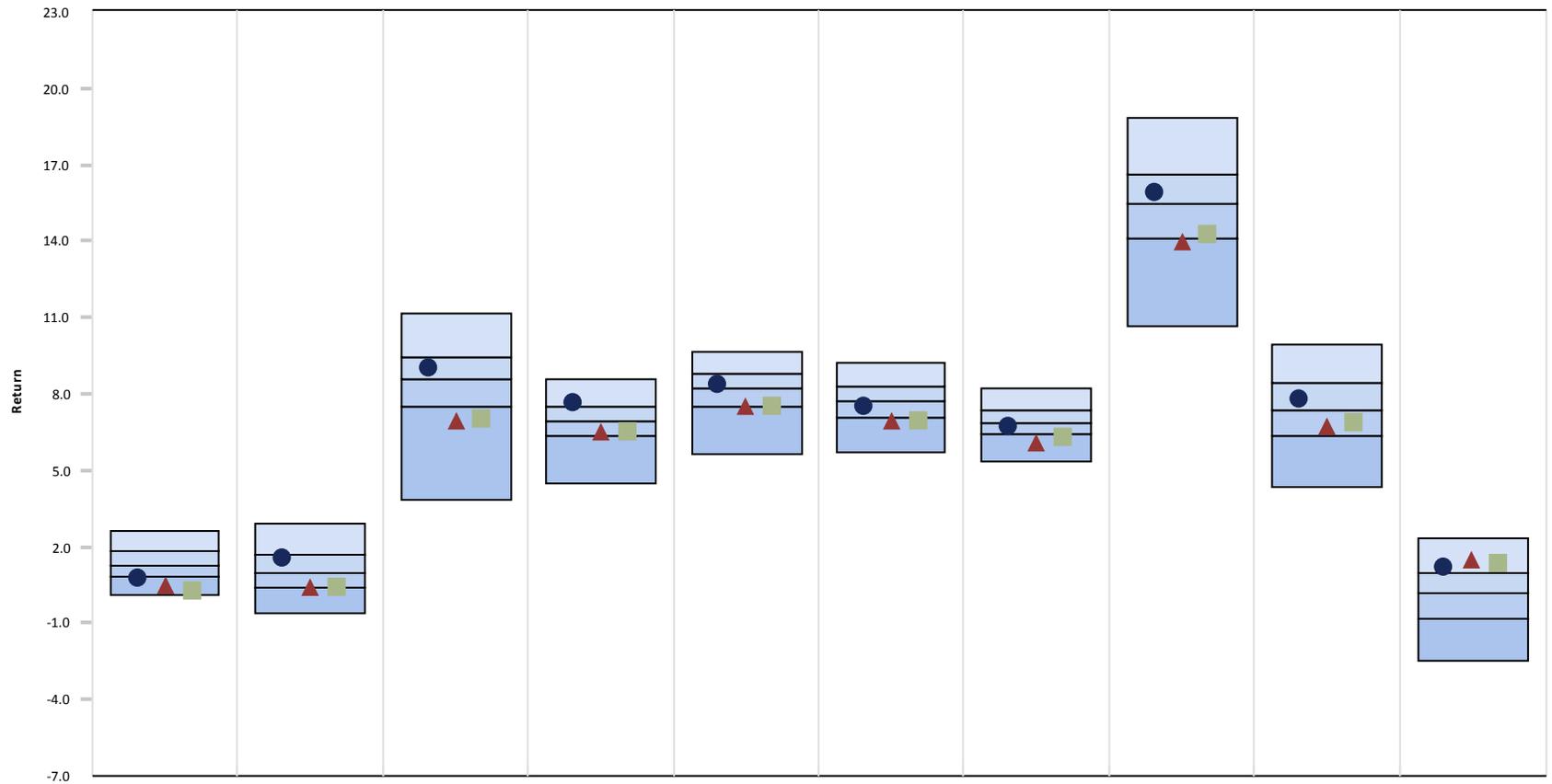
	<u>US Equity</u>	<u>Intl. Equity</u>	<u>US Fixed Income</u>	<u>Intl. Fixed Income</u>	<u>Alternative Inv.</u>	<u>Real Estate</u>	<u>Cash</u>
● Total Fund Composite	25.13 (92)	18.88 (45)	24.08 (61)	3.96 (69)	23.98 (15)	3.07 (94)	0.91 (58)
5th Percentile	59.50	28.69	46.22	9.23	38.63	14.69	6.87
1st Quartile	50.15	22.30	34.50	5.01	18.65	10.17	2.13
<b>Median</b>	<b>43.16</b>	<b>17.26</b>	<b>26.73</b>	<b>4.53</b>	<b>9.98</b>	<b>7.94</b>	<b>1.14</b>
3rd Quartile	35.80	13.73	20.33	3.63	4.40	5.18	0.52
95th Percentile	20.72	8.36	12.46	0.31	0.94	2.63	0.07
Population	480	461	483	164	178	295	411

Parentheses contain percentile rankings.

# Howard County Retirement Plans

All Public Plans - Total Fund Peer Group Return

June 30, 2018



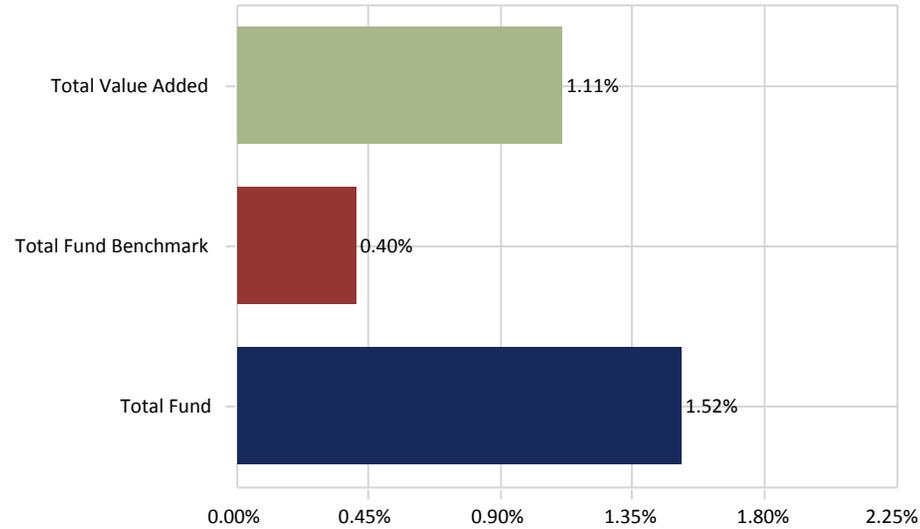
	<u>3 Month</u>	<u>CYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>7 Year</u>	<u>10 Year</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
● Total Fund Composite	0.76 (81)	1.52 (30)	9.01 (37)	7.64 (22)	8.38 (42)	7.47 (58)	6.72 (60)	15.87 (43)	7.80 (40)	1.15 (20)
▲ Total Implementation Index	0.45 (87)	0.40 (75)	6.92 (85)	6.46 (70)	7.47 (76)	6.90 (82)	6.05 (86)	13.97 (77)	6.71 (68)	1.44 (16)
■ Total Policy Index	0.27 (92)	0.37 (76)	6.97 (85)	6.47 (70)	7.47 (76)	6.90 (82)	6.26 (82)	14.23 (73)	6.87 (63)	1.31 (18)
5th Percentile	2.61	2.94	11.15	8.59	9.67	9.22	8.21	18.86	9.94	2.34
1st Quartile	1.84	1.68	9.44	7.53	8.79	8.31	7.38	16.64	8.41	0.96
<b>Median</b>	<b>1.25</b>	<b>0.99</b>	<b>8.56</b>	<b>6.94</b>	<b>8.18</b>	<b>7.70</b>	<b>6.87</b>	<b>15.49</b>	<b>7.34</b>	<b>0.15</b>
3rd Quartile	0.86	0.40	7.52	6.33	7.51	7.10	6.45	14.11	6.38	-0.79
95th Percentile	0.10	-0.62	3.85	4.46	5.63	5.74	5.32	10.64	4.36	-2.50
Population	460	460	457	406	387	370	336	641	643	584

# Howard County Retirement Plans

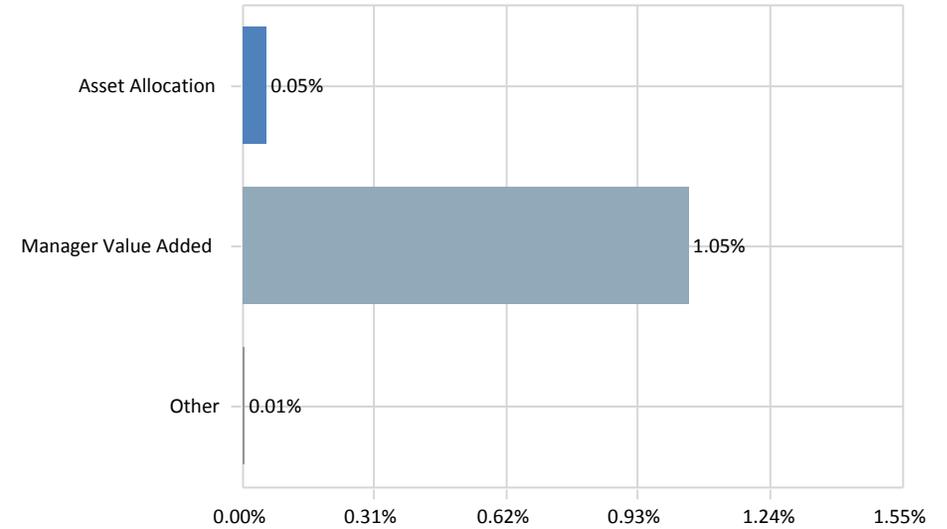
Total Fund Attribution

Year To Date Ending June 30, 2018

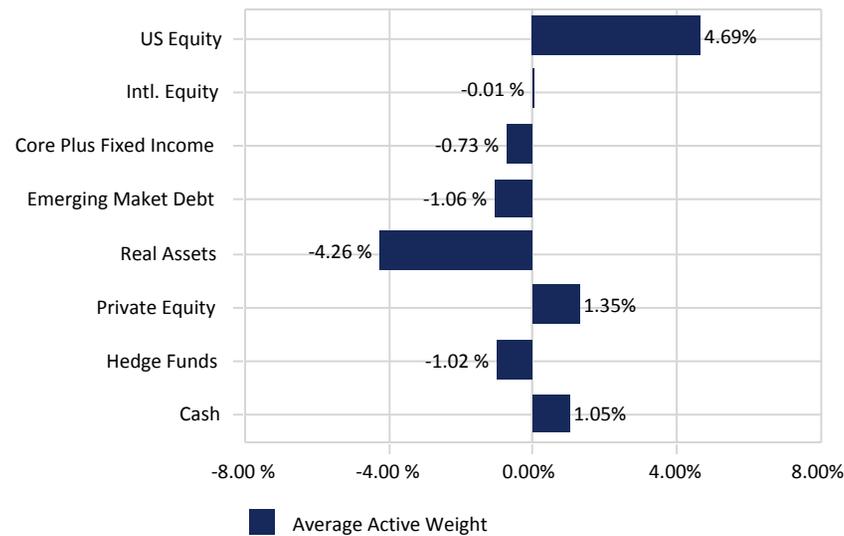
## Total Fund Performance



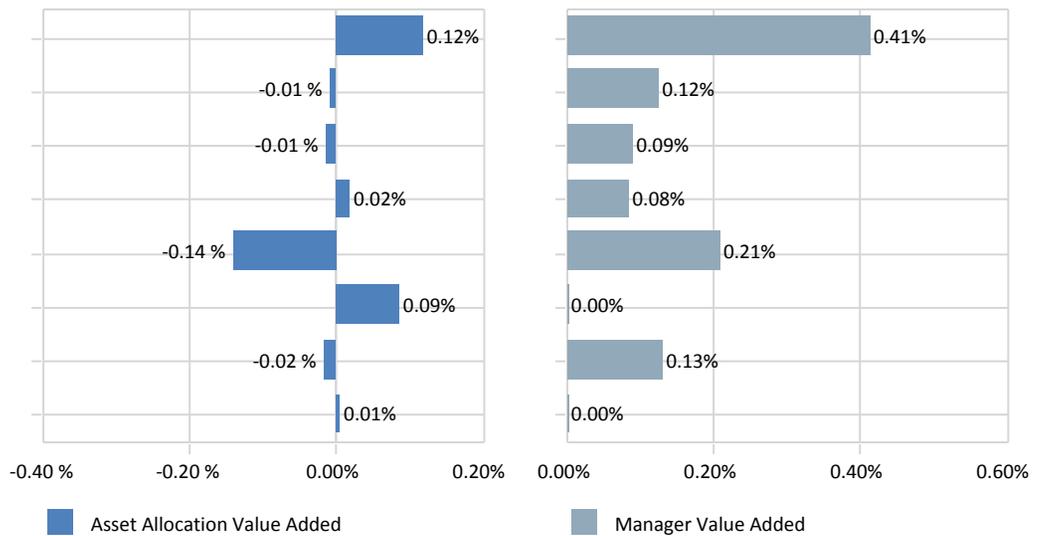
## Total Value Added:1.11%



## Total Asset Allocation:0.05%



## Total Manager Value Added:1.05%

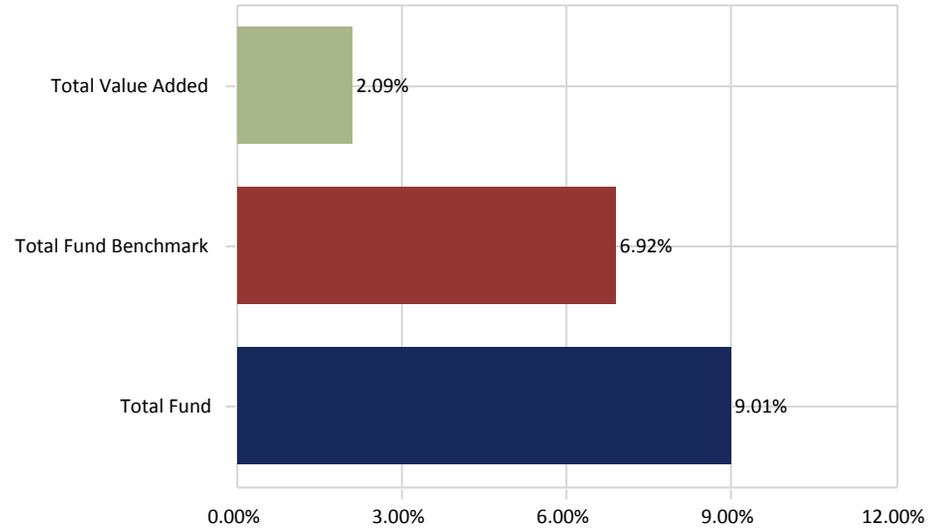


# Howard County Retirement Plans

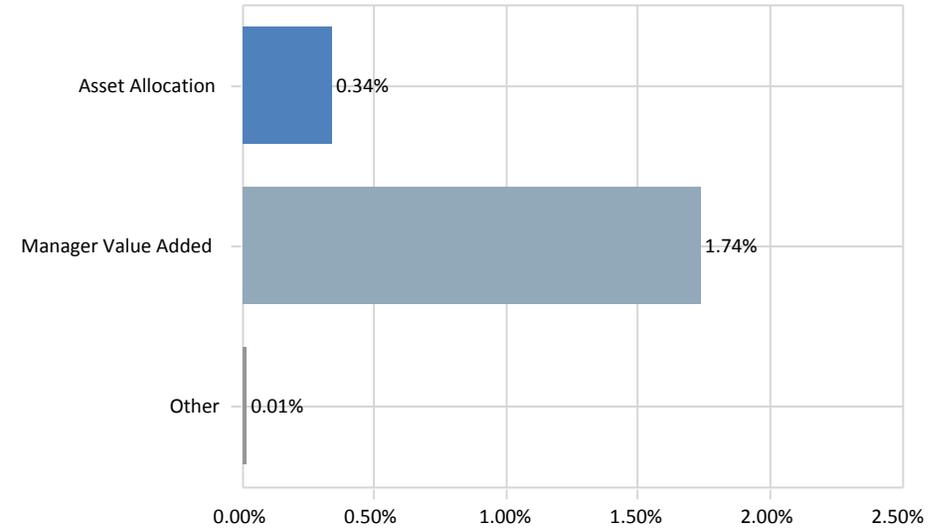
Total Fund Attribution

1 Year Ending June 30, 2018

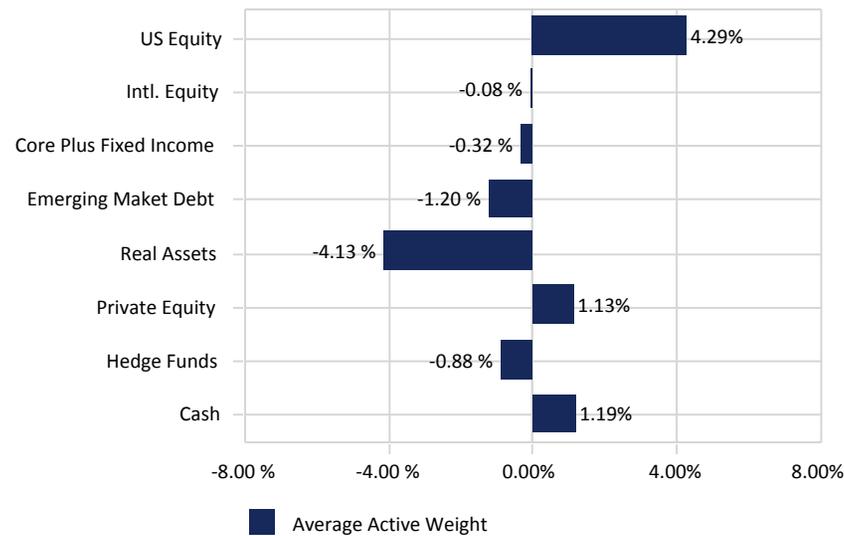
## Total Fund Performance



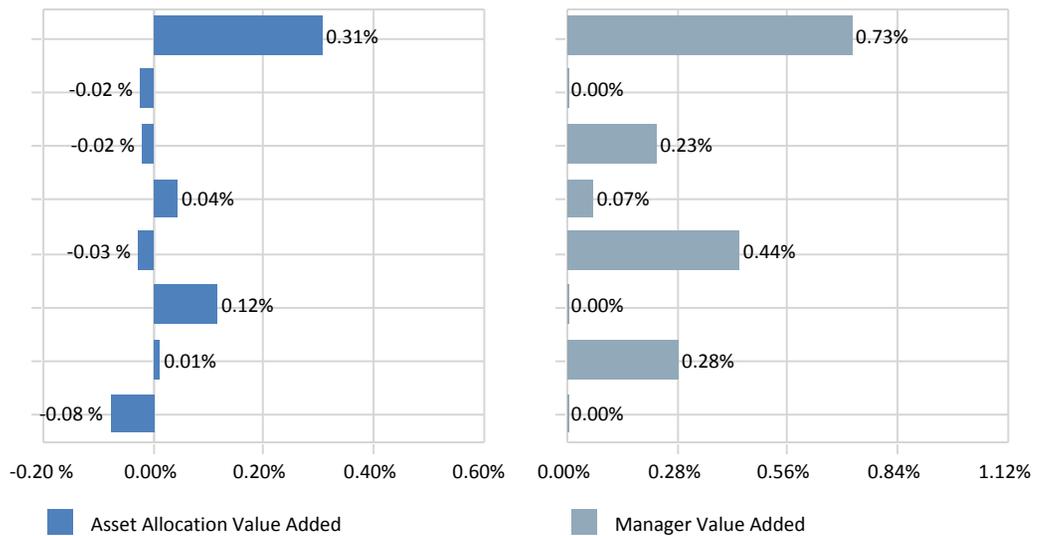
## Total Value Added: 2.09%



## Total Asset Allocation: 0.34%



## Total Manager Value Added: 1.74%

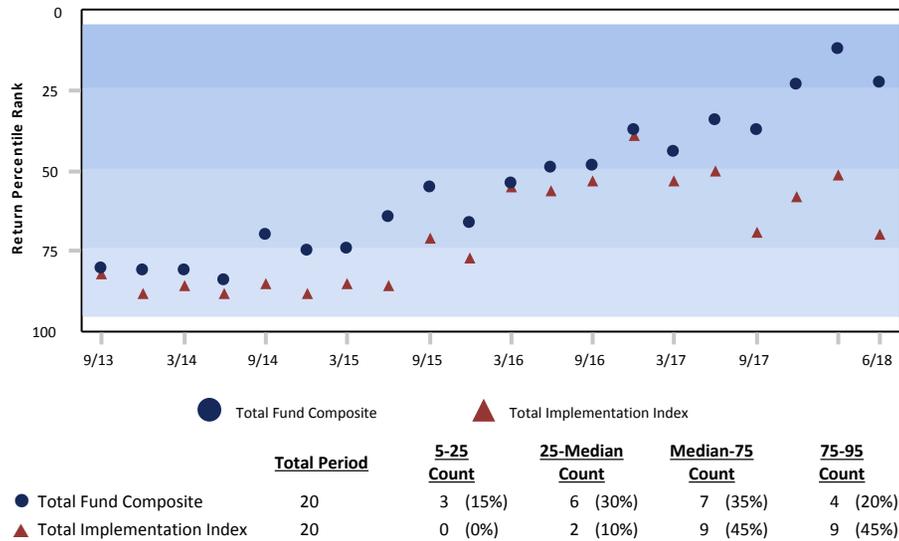


# Howard County Retirement Plans

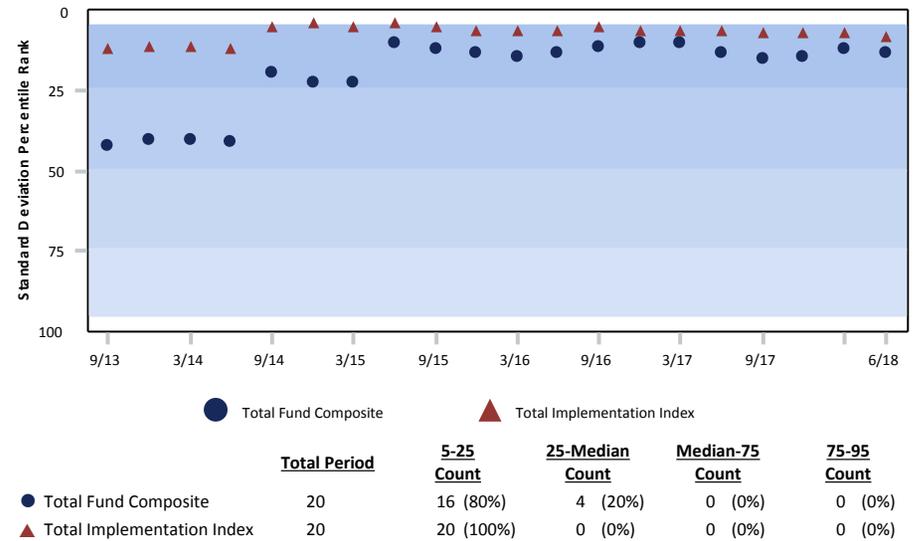
Total Fund Composite

June 30, 2018

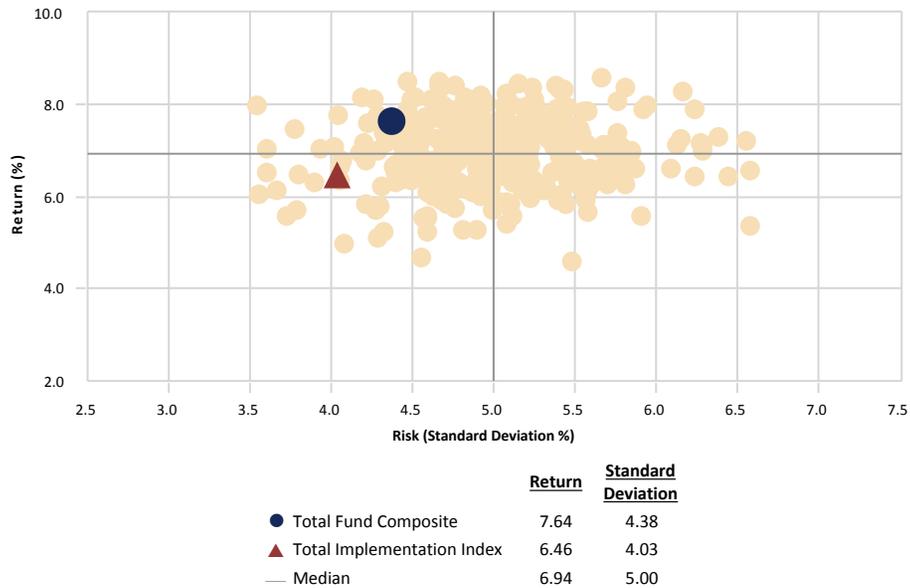
## 3 Year Rolling Return Rank



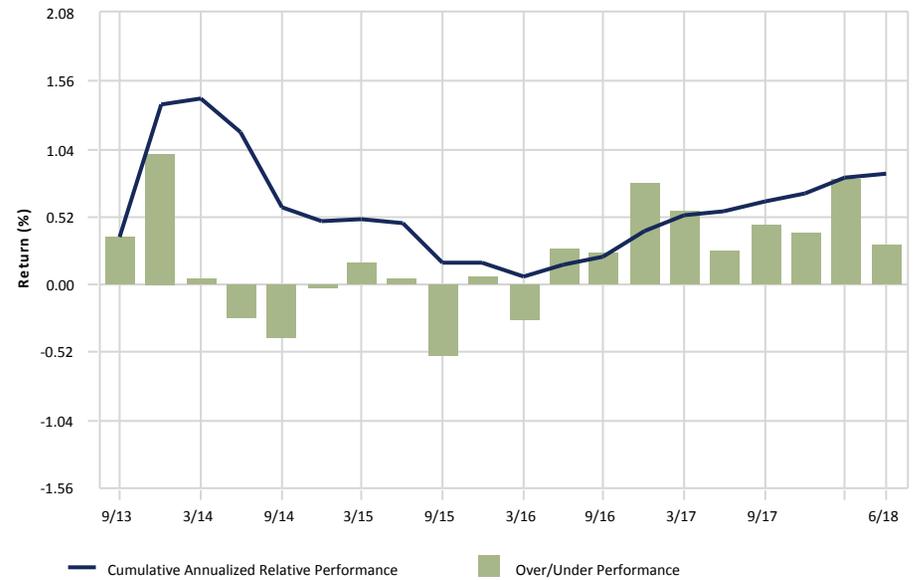
## 3 Year Rolling Standard Deviation Rank



## Risk vs. Return (07/01/15 - 06/30/18)



## Relative Performance vs. Total Implementation Index

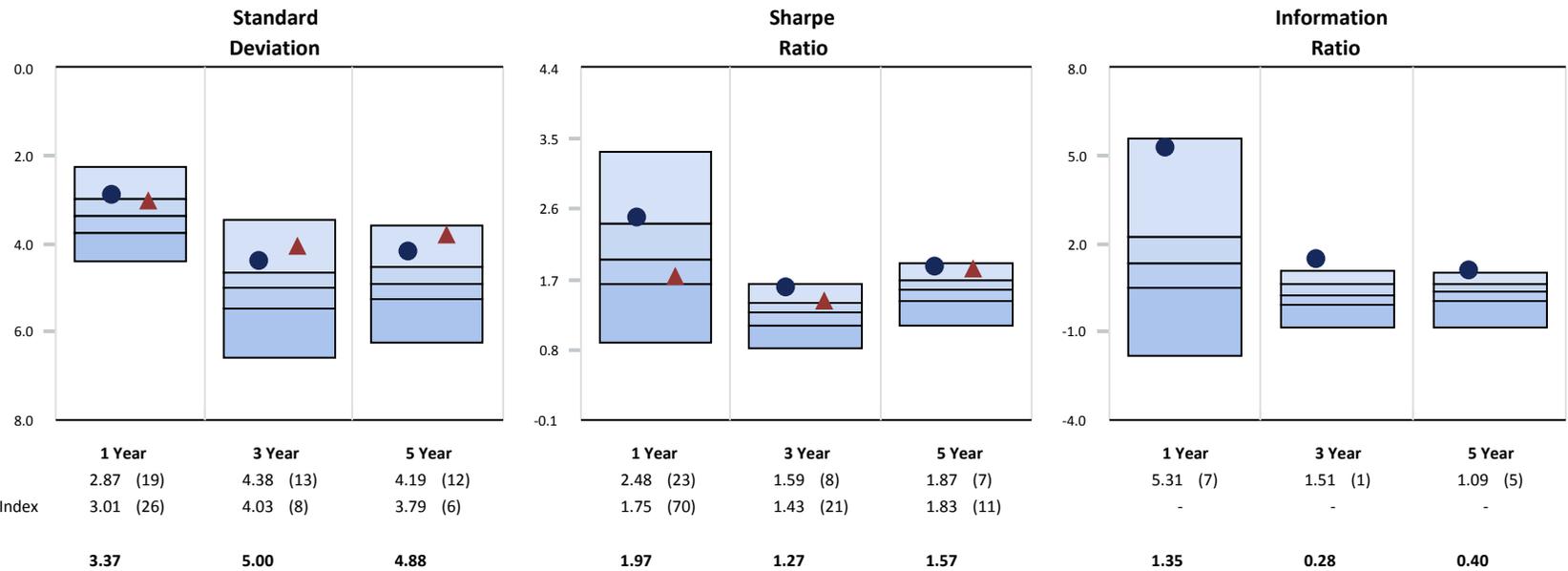


# Howard County Retirement Plans

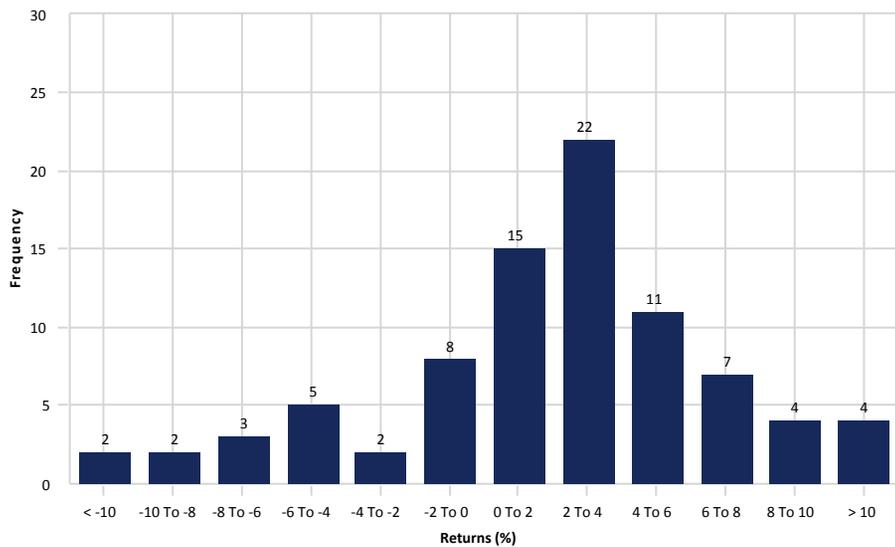
Total Fund Composite

June 30, 2018

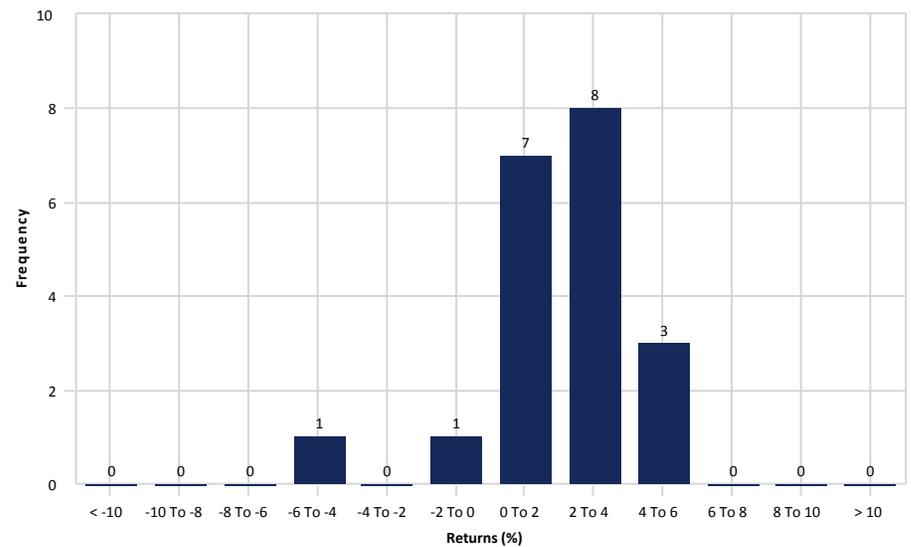
## Peer Group Analysis: All Public Plans-Total Fund



### Inception - Quarterly Distribution of Returns



### 5 Years - Quarterly Distribution of Returns

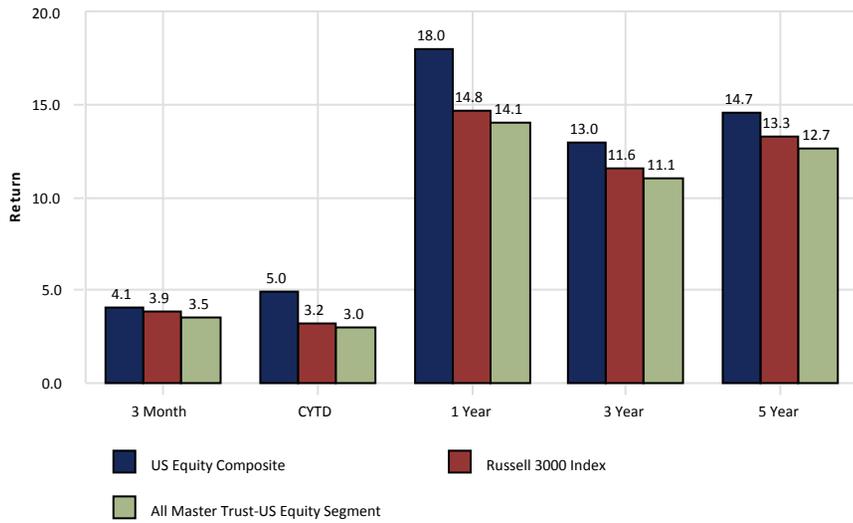


# Howard County Retirement Plans

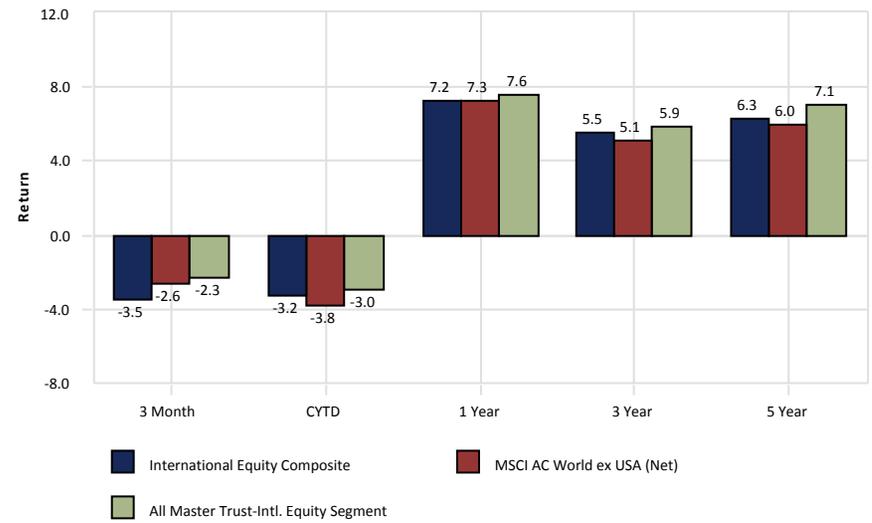
## Composite Summary

June 30, 2018

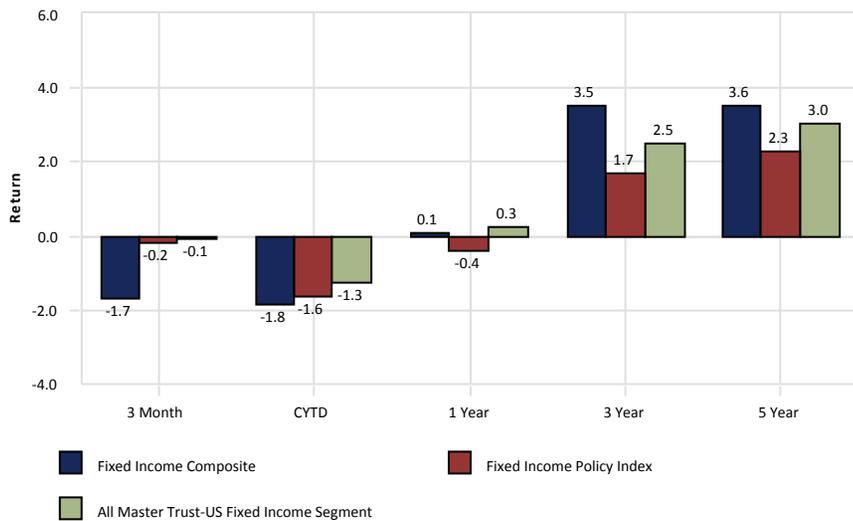
### US Equity Composite



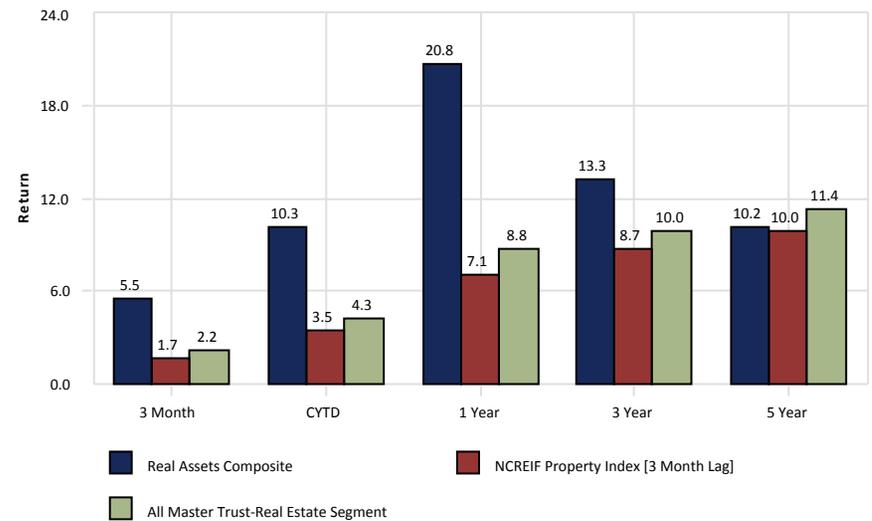
### International Equity Composite



### Fixed Income Composite



### Real Assets Composite



# Howard County Retirement Plans

Composite Asset Allocation & Performance % | gross of fees

June 30, 2018

	Asset \$	Asset %	1 Month	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
<b>Total Fund Composite</b>	<b>1,011,277,239</b>	<b>100.00</b>	<b>-0.51 (93)</b>	<b>0.76 (81)</b>	<b>1.52 (30)</b>	<b>9.01 (37)</b>	<b>9.01 (37)</b>	<b>7.64 (22)</b>	<b>8.38 (42)</b>	<b>7.35 (47)</b>	<b>Apr-1997</b>
<i>Total Implementation Index</i>			<i>-0.43</i>	<i>0.45</i>	<i>0.40</i>	<i>6.92</i>	<i>6.92</i>	<i>6.46</i>	<i>7.47</i>	<i>6.81</i>	
Excess Return			-0.08	0.31	1.12	2.09	2.09	1.18	0.91	0.54	
<i>Total Policy Index</i>			<i>-0.50</i>	<i>0.27</i>	<i>0.37</i>	<i>6.97</i>	<i>6.97</i>	<i>6.47</i>	<i>7.47</i>	<i>7.32</i>	<i>Apr-1997</i>
Total Fund EX Alternatives	774,510,613	76.59	-0.65	-0.02	0.46	8.21	8.21	7.34	8.04	6.56	Jul-2008
Total Fund EX Real Assets	976,411,055	96.55	-0.54	0.60	1.23	8.63	8.63	7.42	8.33	7.41	Dec-2003
Total Equity Composite	445,021,840	44.01	-0.94	0.68	1.28	13.12	13.12	9.69	11.00	7.19	Apr-2000
US Equity Composite	254,130,624	25.13	0.08 (79)	4.10 (27)	4.96 (12)	18.03 (8)	18.03 (8)	12.98 (10)	14.66 (7)	8.64 (26)	Jul-1997
<i>Russell 3000 Index</i>			<i>0.65</i>	<i>3.89</i>	<i>3.22</i>	<i>14.78</i>	<i>14.78</i>	<i>11.58</i>	<i>13.29</i>	<i>7.77</i>	
Excess Return			-0.57	0.21	1.74	3.25	3.25	1.40	1.37	0.87	
<i>US Equity Allocation Index</i>			<i>0.65</i>	<i>4.33</i>	<i>3.82</i>	<i>15.34</i>	<i>15.34</i>	<i>11.57</i>	<i>13.20</i>	<i>9.15</i>	<i>Jan-2004</i>
Large Cap Composite	194,967,293	19.28	-0.25 (78)	2.87 (53)	3.09 (38)	16.34 (33)	16.34 (33)	11.89 (37)	14.03 (32)	8.55 (32)	Apr-2001
<i>Russell 1000 Index</i>			<i>0.65</i>	<i>3.57</i>	<i>2.85</i>	<i>14.54</i>	<i>14.54</i>	<i>11.64</i>	<i>13.37</i>	<i>7.45</i>	
Excess Return			-0.90	-0.70	0.24	1.80	1.80	0.25	0.66	1.10	
Non-Large Cap Composite	59,163,332	5.85	1.19 (30)	8.34 (8)	11.64 (11)	23.91 (13)	23.91 (13)	16.59 (1)	16.94 (2)	12.64 (23)	Apr-1993
<i>Russell 2500 Index</i>			<i>0.72</i>	<i>5.71</i>	<i>5.46</i>	<i>16.24</i>	<i>16.24</i>	<i>10.30</i>	<i>12.29</i>	<i>10.68</i>	
Excess Return			0.47	2.63	6.18	7.67	7.67	6.29	4.65	1.96	
International Equity Composite	190,891,216	18.88	-2.26 (80)	-3.52 (80)	-3.22 (57)	7.22 (66)	7.22 (66)	5.52 (62)	6.26 (84)	4.76 (89)	Jul-1997
<i>MSCI AC World ex USA (Net)</i>			<i>-1.88</i>	<i>-2.61</i>	<i>-3.77</i>	<i>7.28</i>	<i>7.28</i>	<i>5.07</i>	<i>5.99</i>	<i>-</i>	
Excess Return			-0.38	-0.91	0.55	-0.06	-0.06	0.45	0.27	-	
International Developed Markets Composite	126,518,917	12.51	-0.59 (14)	-0.40 (21)	-1.21 (27)	7.70 (60)	7.70 (60)	4.96 (75)	6.70 (79)	3.27 (82)	Mar-2008
<i>MSCI EAFE Index (Net)</i>			<i>-1.19</i>	<i>-0.97</i>	<i>-2.37</i>	<i>7.37</i>	<i>7.37</i>	<i>5.41</i>	<i>6.93</i>	<i>2.92</i>	
Excess Return			0.60	0.57	1.16	0.33	0.33	-0.45	-0.23	0.35	
International Emerging Markets Composite	64,372,299	6.37	-5.40 (88)	-9.07 (66)	-6.89 (54)	6.38 (57)	6.38 (57)	6.63 (45)	5.20 (63)	5.95 (59)	Feb-2006
<i>MSCI Emerging Markets Index (Net)</i>			<i>-4.09</i>	<i>-7.86</i>	<i>-6.51</i>	<i>8.59</i>	<i>8.59</i>	<i>5.98</i>	<i>5.39</i>	<i>5.32</i>	
Excess Return			-1.31	-1.21	-0.38	-2.21	-2.21	0.65	-0.19	0.63	
Fixed Income Composite	283,488,640	28.03	-0.34 (75)	-1.70 (93)	-1.83 (70)	0.11 (55)	0.11 (55)	3.52 (29)	3.55 (38)	5.35 (64)	Jul-1997
<i>Fixed Income Policy Index</i>			<i>-0.12</i>	<i>-0.16</i>	<i>-1.62</i>	<i>-0.40</i>	<i>-0.40</i>	<i>1.72</i>	<i>2.27</i>	<i>5.12</i>	
Excess Return			-0.22	-1.54	-0.21	0.51	0.51	1.80	1.28	0.23	

## Howard County Retirement Plans

Composite Asset Allocation & Performance % | gross of fees

June 30, 2018

	Asset \$	Asset %	1 Month	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
Real Assets Composite	34,866,184	3.45	0.45 (48)	5.52 (6)	10.26 (5)	20.76 (3)	20.76 (3)	13.26 (5)	10.19 (82)	7.64 (88)	Jul-2003
<i>NCREIF Property Index [3 Month Lag]</i>			0.56	1.70	3.53	7.12	7.12	8.72	10.00	9.09	
Excess Return			-0.11	3.82	6.73	13.64	13.64	4.54	0.19	-1.45	
<i>NCREIF Fund Index-ODCE (VW) [M]</i>			2.05	2.05	4.30	8.44	8.44	9.37	11.04	8.29	Jul-2003
Alternatives Composite	238,720,713	23.61	-0.06	3.33	5.05	11.64	11.64	8.77	9.54	8.63	Jul-2008
Private Equity Composite	121,423,194	12.01	-0.57	5.19	7.38	17.18	17.18	15.10	16.11	12.54	Jul-2008
Hedge Fund Composite	117,297,518	11.60	0.48	1.50	2.78	6.54	6.54	3.79	4.98	4.92	Jan-2011
<i>HFRI FOF: Conservative Index</i>			0.05	1.09	1.65	4.19	4.19	1.93	3.02	2.56	
Excess Return			0.43	0.41	1.13	2.35	2.35	1.86	1.96	2.36	
Cash Composite	9,179,862	0.91	0.10	0.29	0.54	0.91	0.91	0.38	0.23	1.30	Dec-2003
<i>FTSE 3 Month T-Bill</i>			0.15	0.44	0.79	1.33	1.33	0.64	0.39	1.22	
Excess Return			-0.05	-0.15	-0.25	-0.42	-0.42	-0.26	-0.16	0.08	

# Howard County Retirement Plans

Manager Allocation & Performance % | gross of fees

June 30, 2018

	Asset \$	Asset %	1 Month	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
<b>US Equity</b>											
Invesco	63,870,577	6.32	0.05 (61)	3.31 (37)	2.55 (47)	15.79 (33)	15.79 (33)	11.47 (44)	13.23 (56)	7.69 (67)	Apr-2001
<i>S&amp;P 500</i>			0.62	3.43	2.65	14.37	14.37	11.93	13.42	7.17	
Excess Return			-0.57	-0.12	-0.10	1.42	1.42	-0.46	-0.19	0.52	
LSV Asset Management*	61,094,492	6.04	-1.13 (94)	-0.31 (92)	-2.00 (82)	11.12 (41)	11.12 (41)	9.93 (37)	12.64 (22)	10.08 (10)	May-2000
<i>Russell 1000 Value Index</i>			0.25	1.18	-1.69	6.77	6.77	8.26	10.34	6.83	
Excess Return			-1.38	-1.49	-0.31	4.35	4.35	1.67	2.30	3.25	
Westfield	70,002,224	6.92	0.24 (68)	5.41 (48)	8.53 (41)	21.89 (48)	21.89 (48)	14.16 (43)	16.19 (42)	16.58 (50)	Jul-2010
<i>Russell 1000 Growth Index</i>			0.96	5.76	7.25	22.51	22.51	14.98	16.36	17.22	
Excess Return			-0.72	-0.35	1.28	-0.62	-0.62	-0.82	-0.17	-0.64	
William Blair	18,329,172	1.81	1.66 (24)	5.68 (53)	11.63 (36)	24.70 (39)	24.70 (39)	15.03 (9)	17.30 (3)	12.49 (18)	Jun-2006
<i>Russell 2500 Growth Index</i>			0.84	5.53	8.04	21.53	21.53	10.86	13.87	9.99	
Excess Return			0.82	0.15	3.59	3.17	3.17	4.17	3.43	2.50	
Investment Counselors of Maryland	24,225,260	2.40	0.73 (40)	9.24 (9)	7.71 (10)	19.37 (13)	19.37 (13)	15.40 (4)	14.78 (7)	12.56 (59)	Apr-1993
<i>Russell 2000 Value Index</i>			0.61	8.30	5.44	13.10	13.10	11.22	11.18	10.45	
Excess Return			0.12	0.94	2.27	6.27	6.27	4.18	3.60	2.11	
Brown Capital Management	16,608,900	1.64	1.35 (46)	10.07 (36)	17.90 (18)	30.19 (24)	30.19 (24)	20.56 (4)	20.47 (3)	20.42 (2)	Aug-2011
<i>Russell 2000 Growth Index</i>			0.78	7.23	9.70	21.86	21.86	10.60	13.65	13.31	
Excess Return			0.57	2.84	8.20	8.33	8.33	9.96	6.82	7.11	
<b>International Equity</b>											
Mondrian International	59,795,548	5.91	-1.23 (26)	-1.98 (55)	-3.64 (75)	5.16 (86)	5.16 (86)	4.25 (84)	6.48 (83)	1.79 (86)	Dec-2007
<i>MSCI EAFE Index (Net)</i>			-1.22	-1.24	-2.75	6.84	6.84	4.90	6.44	1.35	
Excess Return			-0.01	-0.74	-0.89	-1.68	-1.68	-0.65	0.04	0.44	
Baillie Gifford	66,723,369	6.60	0.06 (4)	-	-	-	-	-	-	1.03 (2)	May-2018
<i>MSCI EAFE Index (Net)</i>			-1.22	-	-	-	-	-	-	-3.44	
Excess Return			1.28	-	-	-	-	-	-	4.47	
DFA Emerging Markets	64,372,299	6.37	-5.40 (88)	-9.07 (66)	-6.89 (54)	6.38 (57)	6.38 (57)	6.63 (45)	5.21 (63)	6.13 (49)	Feb-2006
<i>MSCI Emerging Markets (Net)</i>			-4.15	-7.96	-6.66	8.20	8.20	5.60	5.01	4.98	
Excess Return			-1.25	-1.11	-0.23	-1.82	-1.82	1.03	0.20	1.15	

All returns are time-weighted and calculated using custodian data.

\* Inception date differs from manager; Summit does not calculate partial month returns.

# Howard County Retirement Plans

Manager Allocation & Performance % | gross of fees

June 30, 2018

	Asset \$	Asset %	1 Month	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
<b>Fixed Income</b>											
Dodge & Cox	114,679,918	11.34	-0.15 (79)	-0.18 (81)	-1.11 (14)	0.65 (12)	0.65 (12)	3.10 (4)	3.59 (5)	4.18 (11)	May-2010
<i>Blmbg. Barc. U.S. Aggregate</i>			-0.12	-0.16	-1.62	-0.40	-0.40	1.72	2.27	2.98	
Excess Return			-0.03	-0.02	0.51	1.05	1.05	1.38	1.32	1.20	
PIMCO Total Return	107,292,999	10.61	0.04 (9)	-0.46 (96)	-1.64 (81)	-0.10 (55)	-0.10 (55)	2.31 (33)	2.64 (52)	3.58 (41)	May-2010
<i>Blmbg. Barc. U.S. Aggregate</i>			-0.12	-0.16	-1.62	-0.40	-0.40	1.72	2.27	2.98	
Excess Return			0.16	-0.30	-0.02	0.30	0.30	0.59	0.37	0.60	
State Street Global Advisors TIPS	21,510,491	2.13	0.40 (53)	0.78 (34)	-0.04 (79)	2.11 (54)	2.11 (54)	1.90 (67)	1.66 (60)	3.11 (61)	Nov-2009
<i>Blmbg. Barc. U.S. TIPS</i>			0.40	0.77	-0.02	2.11	2.11	1.93	1.68	3.13	
Excess Return			0.00	0.01	-0.02	0.00	0.00	-0.03	-0.02	-0.02	
Colchester LMD	40,005,233	3.96	-2.25 (14)	-9.86 (22)	-4.35 (19)	-0.74 (17)	-0.74 (17)	-	-	9.23 (1)	Oct-2015
<i>JPM GBI-EM Global Diversified</i>			-2.86	-10.42	-6.44	-2.33	-2.33	-	-	6.36	
Excess Return			0.61	0.56	2.09	1.59	1.59	-	-	2.87	
<b>Real Assets</b>											
TA Realty Associates VIII	1,678,862	0.17	0.00	3.41	6.74	11.46	11.46	9.34	9.37	1.82	Jul-2007
<i>NCREIF Property Index [3 Month Lag]</i>			0.56	1.70	3.53	7.12	7.12	8.72	10.00	6.86	
Excess Return			-0.56	1.71	3.21	4.34	4.34	0.62	-0.63	-5.04	
TA Realty Associates IX	61,092	0.01	0.00	-5.78	0.86	-0.48	-0.48	5.41	8.24	8.10	Apr-2010
<i>NCREIF Property Index [3 Month Lag]</i>			0.56	1.70	3.53	7.12	7.12	8.72	10.00	10.97	
Excess Return			-0.56	-7.48	-2.67	-7.60	-7.60	-3.31	-1.76	-2.87	
Partners Group Global RE 2011	8,403,677	0.83	0.00	3.21	7.22	24.76	24.76	12.81	9.31	7.71	Mar-2012
Partners Group Global RE 2014	17,253,997	1.71	0.00	5.18	11.66	19.88	19.88	15.44	-	10.58	Dec-2014
Commonfund Natural Resources X	3,794,505	0.38	4.61	17.50	17.50	24.91	24.91	-	-	23.86	Apr-2016
Aether Real Assets IV	3,674,052	0.36	0.00	3.15	4.96	17.07	17.07	-	-	1.90	Jun-2016
<b>Private Equity</b>											
Siguler Guff Distressed Opps III	1,822,039	0.18	2.00	4.18	6.14	10.40	10.40	7.60	8.46	9.03	Jul-2008
Greenspring IV	4,816,159	0.48	0.00	2.42	2.42	8.20	8.20	9.18	20.20	15.49	Jul-2009
Pantheon Global Secondaries IV	638,974	0.06	0.51	7.92	7.92	19.97	19.97	11.13	10.93	13.09	Sep-2010
LGT Crown Asia-Pacific II	14,125,605	1.40	-1.12	4.39	7.98	16.30	16.30	14.01	15.03	-11.47	Jul-2011

All returns are time-weighted and calculated using custodian data.

\* Inception date differs from manager; Summit does not calculate partial month returns.

## Howard County Retirement Plans

Manager Allocation & Performance % | gross of fees

June 30, 2018

	Asset \$	Asset %	1 Month	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
Greenspring V	7,401,105	0.73	2.41	7.24	7.24	16.68	16.68	19.07	21.45	17.87	Sep-2011
Adveq Europe V	7,505,422	0.74	0.00	6.49	13.76	38.72	38.72	16.26	7.47	8.43	Jan-2013
LGT Crown Global Secondaries III	5,352,408	0.53	-0.55	1.58	2.42	11.89	11.89	14.04	15.02	16.38	Feb-2013
Flag Private Equity V	12,836,258	1.27	0.00	6.97	6.97	23.20	23.20	17.05	-	15.41	Oct-2013
HarbourVest Partners 2013 Direct	16,325,930	1.61	-7.33	3.20	3.20	13.30	13.30	17.78	-	18.55	Jan-2014
Greenspring VI	7,901,666	0.78	5.38	12.68	12.68	18.48	18.48	18.73	-	15.95	Apr-2014
Greenspring Secondaries Fund I	3,086,336	0.31	0.00	4.66	14.16	13.06	13.06	18.91	-	20.49	May-2014
Greenspring VIII	858,507	0.08	-0.23	-2.77	-2.77	-	-	-	-	-18.48	Sep-2017
Adveq Europe VI	3,237,503	0.32	0.00	5.24	16.02	25.15	25.15	-6.37	-	6.04	Feb-2015
Flag Private Equity VI	10,412,317	1.03	3.74	7.42	14.31	19.05	19.05	-	-	16.56	Aug-2015
57 Stars	4,105,815	0.41	-6.69	-2.36	-2.36	11.50	11.50	-	-	-1.66	Oct-2015
NB Crossroads XXI	8,367,053	0.83	0.00	5.48	5.48	19.47	19.47	-	-	4.60	Oct-2015
LGT Crown Asia-Pacific III	3,941,585	0.39	1.97	11.84	18.47	31.32	31.32	-	-	22.86	Nov-2015
HarbourVest IV	7,592,933	0.75	0.00	0.96	0.96	1.72	1.72	-	-	10.11	Jan-2017
Aberdeen US PE VII	1,095,580	0.11	0.00	-0.66	-0.66	-	-	-	-	-0.66	Dec-2017
<b>Hedge Funds</b>											
Magnitude International	58,260,955	5.76	1.15	2.03	3.38	7.22	7.22	3.41	4.69	5.05	Jan-2011
<i>HFRI FOF: Conservative Index</i>			0.05	1.09	1.65	4.19	4.19	1.93	3.02	2.56	
Excess Return			1.10	0.94	1.73	3.03	3.03	1.48	1.67	2.49	
Blackstone Offshore F1	59,036,564	5.84	-0.18	0.98	2.20	5.88	5.88	4.18	5.26	4.86	Mar-2011
<i>HFRI FOF: Conservative Index</i>			0.05	1.09	1.65	4.19	4.19	1.93	3.02	2.42	
Excess Return			-0.23	-0.11	0.55	1.69	1.69	2.25	2.24	2.44	
<b>Cash</b>											
Cash - General Employees	3,574,918	0.35	0.12	0.34	0.61	1.02	1.02	0.43	0.27	1.30	Jan-2004
Cash - Police & Fire	4,584,682	0.45	0.11	0.33	0.56	0.90	0.90	0.36	0.22	1.26	Jan-2004

All returns are time-weighted and calculated using custodian data.

\* Inception date differs from manager; Summit does not calculate partial month returns.

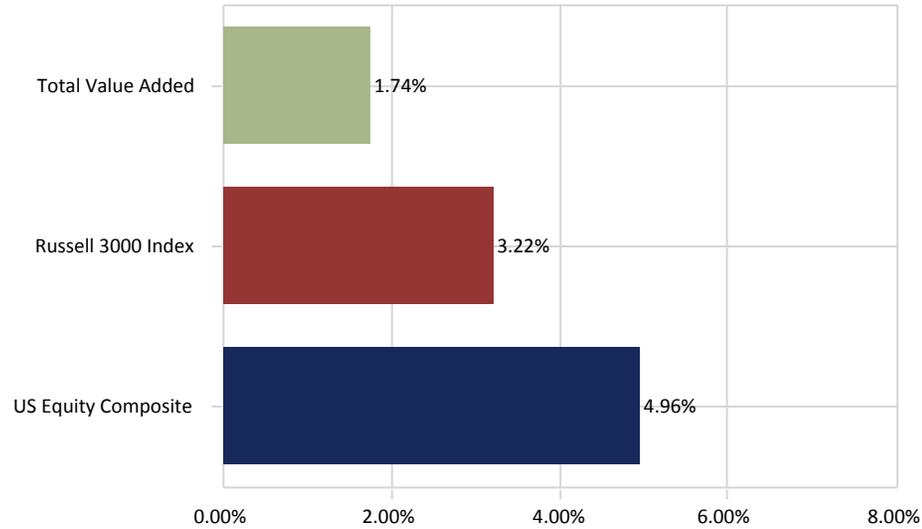
## US Equity

# Howard County Retirement Plans

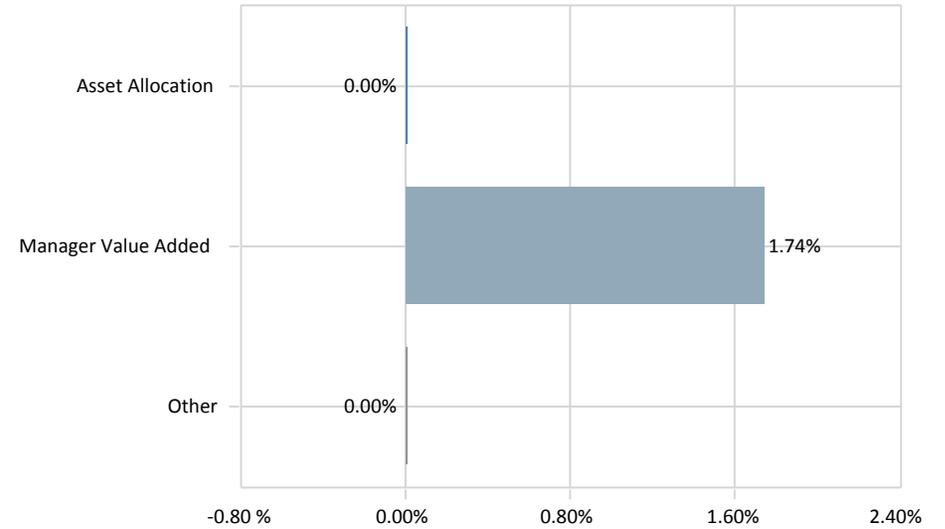
US Equity Composite Attribution

Year To Date Ending June 30, 2018

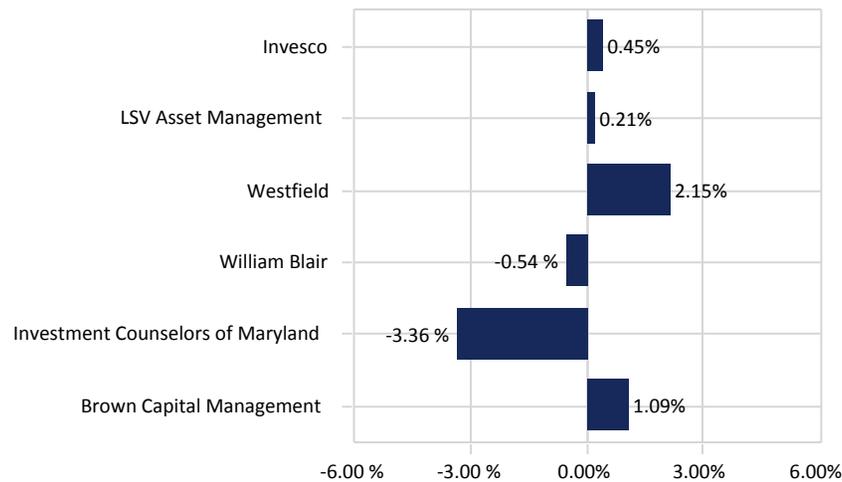
## Total Fund Performance



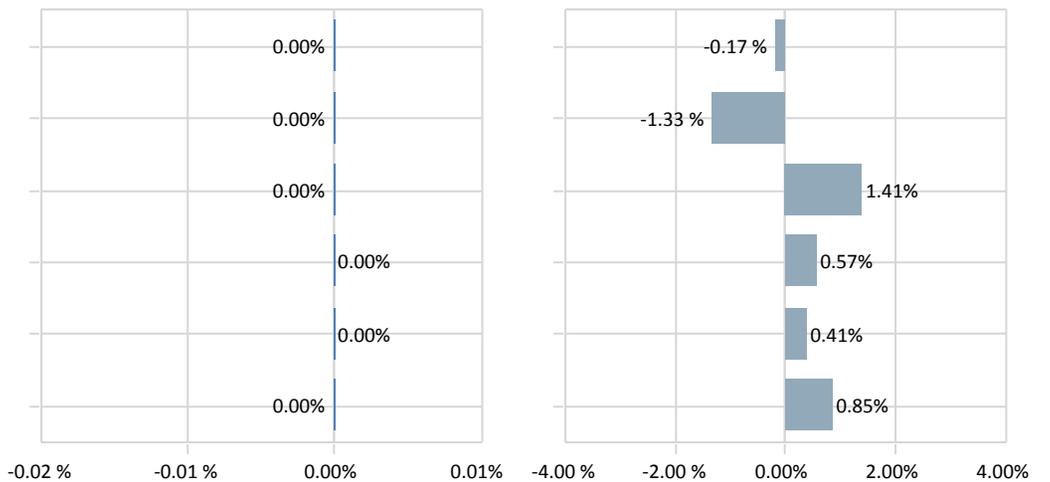
## Total Value Added:1.74%



## Total Asset Allocation:0.00%



## Total Manager Value Added:1.74%



■ Average Active Weight

■ Asset Allocation Value Added

■ Manager Value Added

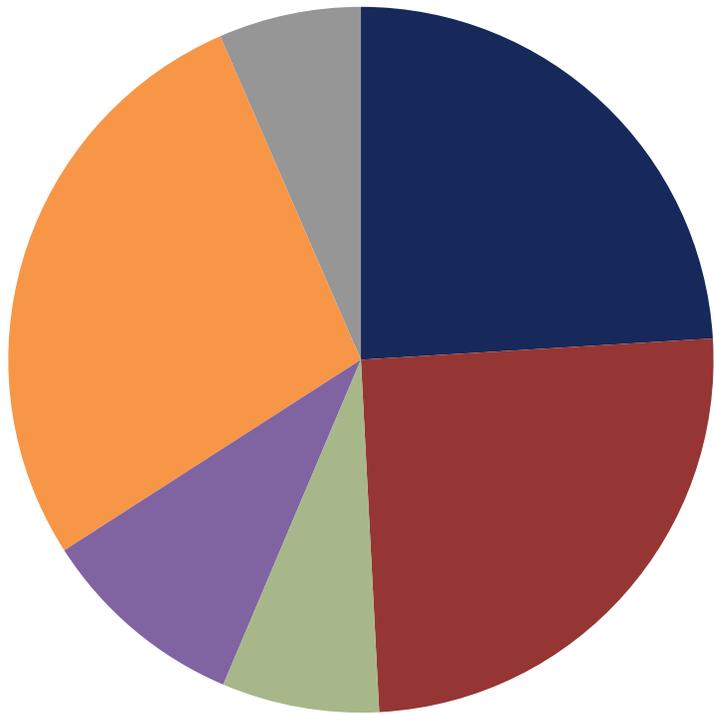
# Howard County Retirement Plans

US Equity Composite vs. Russell 3000 Index

June 30, 2018

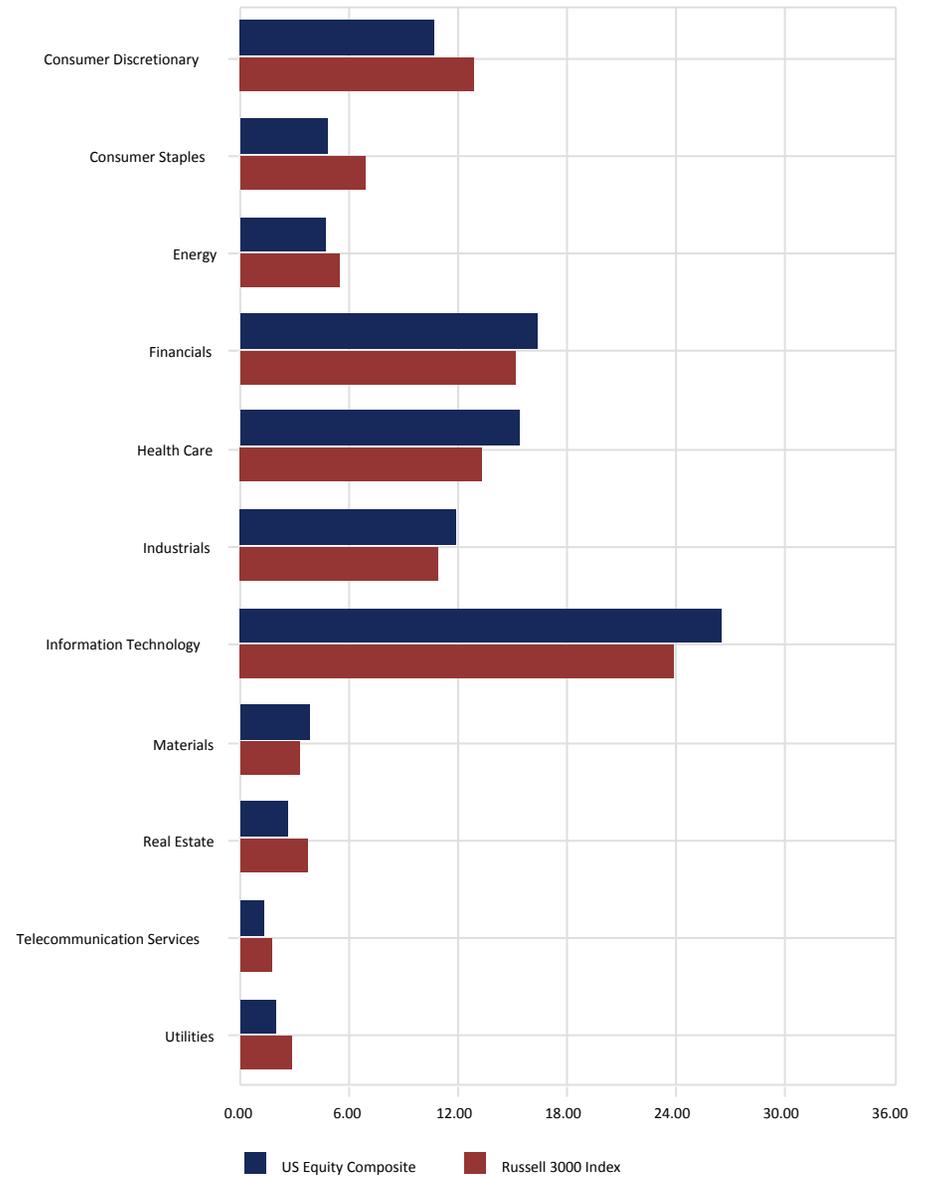
## Manager Allocation

June 30, 2018 : \$254,130,624



	Market Value (\$)	Allocation (%)
LSV Asset Management	61,094,492	24.04
Invesco	63,870,577	25.13
William Blair	18,329,172	7.21
Investment Counselors of Maryland	24,225,260	9.53
Westfield	70,002,224	27.55
Brown Capital Management	16,608,900	6.54

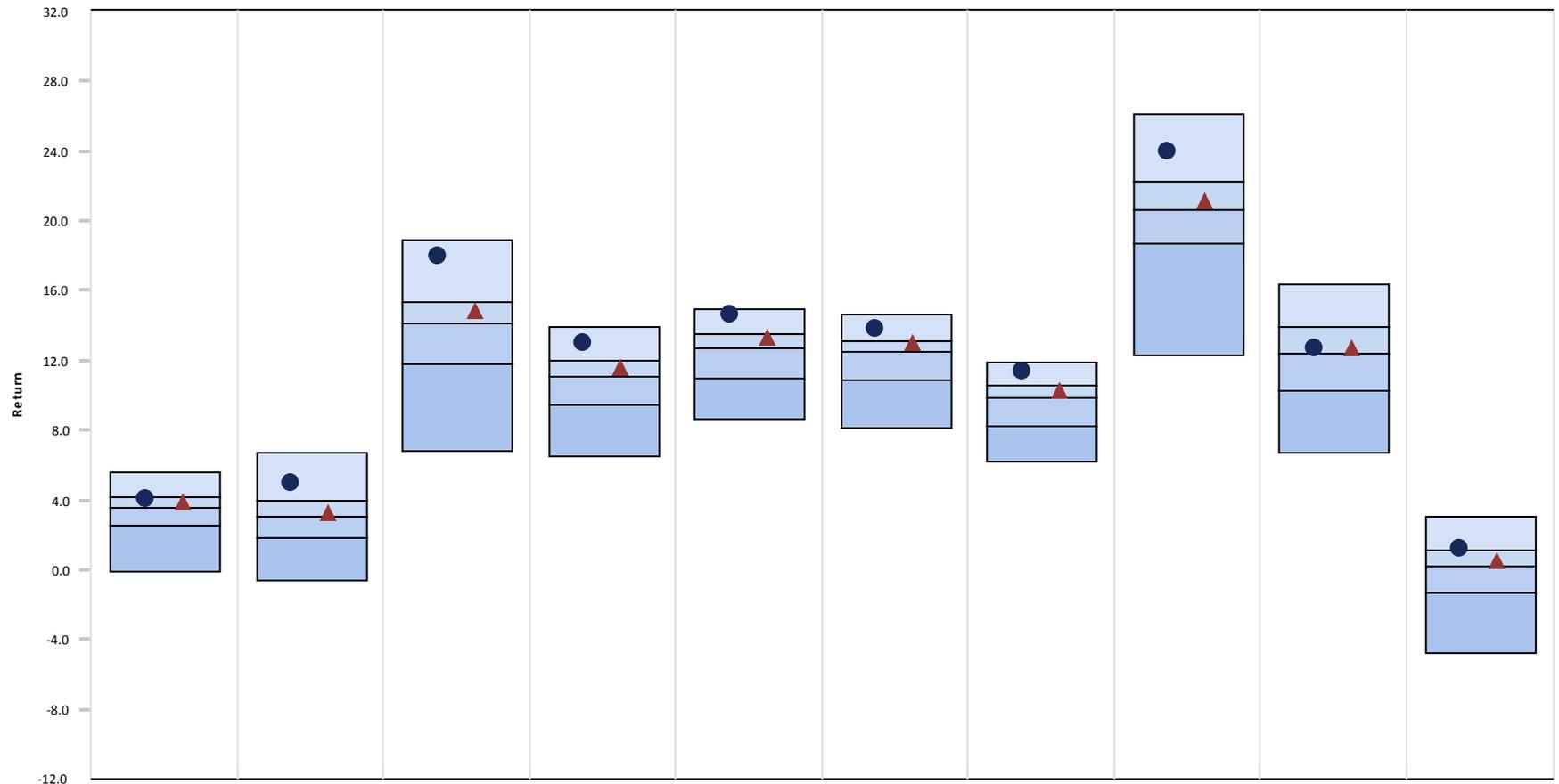
## Sector Allocation - Holdings Based



# Howard County Retirement Plans

All Master Trust - US Equity Peer Group Return

June 30, 2018



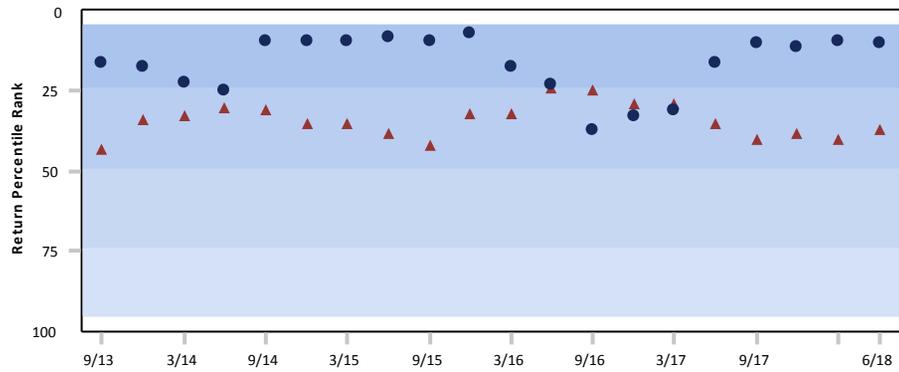
	<u>3 Month</u>	<u>CYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>7 Year</u>	<u>10 Year</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
● US Equity Composite	4.10 (27)	4.96 (12)	18.03 (8)	12.98 (10)	14.66 (7)	13.84 (10)	11.42 (10)	23.93 (14)	12.68 (45)	1.22 (23)
▲ Russell 3000 Index	3.89 (36)	3.22 (46)	14.78 (37)	11.58 (37)	13.29 (34)	13.01 (29)	10.23 (37)	21.13 (42)	12.74 (44)	0.48 (41)
5th Percentile	5.63	6.70	18.85	13.90	14.93	14.60	11.87	26.14	16.38	3.03
1st Quartile	4.12	3.91	15.35	11.96	13.48	13.14	10.51	22.25	13.93	1.07
<b>Median</b>	<b>3.51</b>	<b>3.01</b>	<b>14.10</b>	<b>11.10</b>	<b>12.71</b>	<b>12.48</b>	<b>9.89</b>	<b>20.63</b>	<b>12.43</b>	<b>0.23</b>
3rd Quartile	2.55	1.87	11.81	9.42	10.98	10.89	8.20	18.71	10.25	-1.31
95th Percentile	-0.14	-0.63	6.84	6.51	8.59	8.10	6.16	12.30	6.70	-4.77
Population	293	288	280	268	237	209	122	360	393	337

# Howard County Retirement Plans

US Equity Composite

June 30, 2018

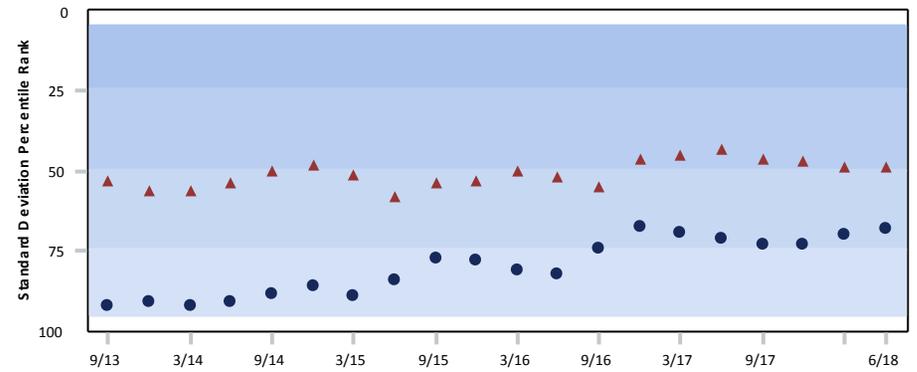
## 3 Year Rolling Return Rank



● US Equity Composite ▲ Russell 3000 Index

	<u>Total Period</u>	<u>5-25 Count</u>	<u>25-Median Count</u>	<u>Median-75 Count</u>	<u>75-95 Count</u>
● US Equity Composite	20	17 (85%)	3 (15%)	0 (0%)	0 (0%)
▲ Russell 3000 Index	20	2 (10%)	18 (90%)	0 (0%)	0 (0%)

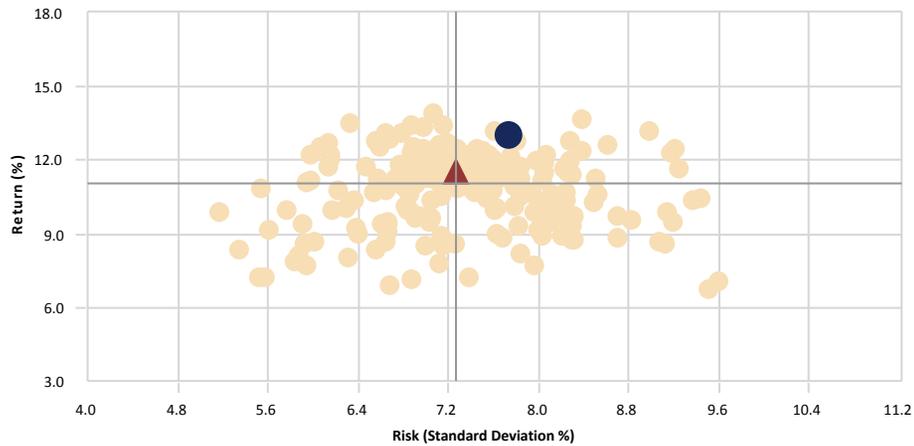
## 3 Year Rolling Standard Deviation Rank



● US Equity Composite ▲ Russell 3000 Index

	<u>Total Period</u>	<u>5-25 Count</u>	<u>25-Median Count</u>	<u>Median-75 Count</u>	<u>75-95 Count</u>
● US Equity Composite	20	0 (0%)	0 (0%)	8 (40%)	12 (60%)
▲ Russell 3000 Index	20	0 (0%)	10 (50%)	10 (50%)	0 (0%)

## Risk vs. Return (07/01/15 - 06/30/18)



	<u>Return</u>	<u>Standard Deviation</u>
● US Equity Composite	12.98	7.74
▲ Russell 3000 Index	11.58	7.26
— Median	11.10	7.27

## Relative Performance vs. Russell 3000 Index



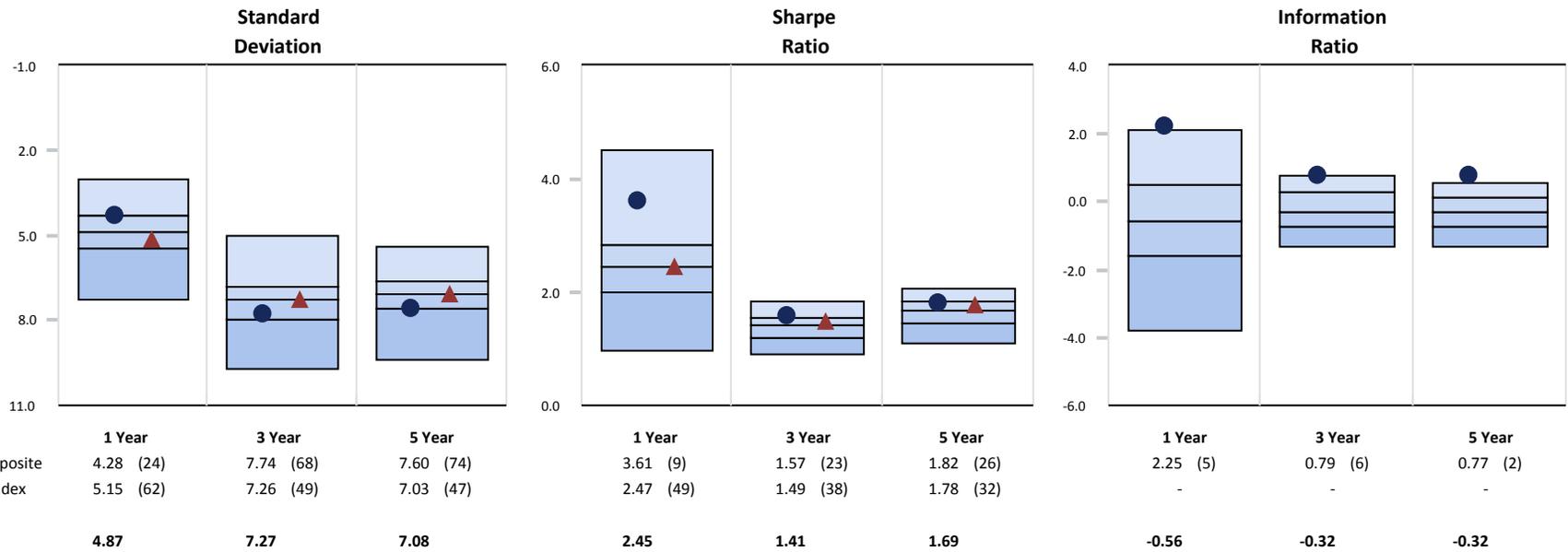
— Cumulative Annualized Relative Performance ■ Over/Under Performance

# Howard County Retirement Plans

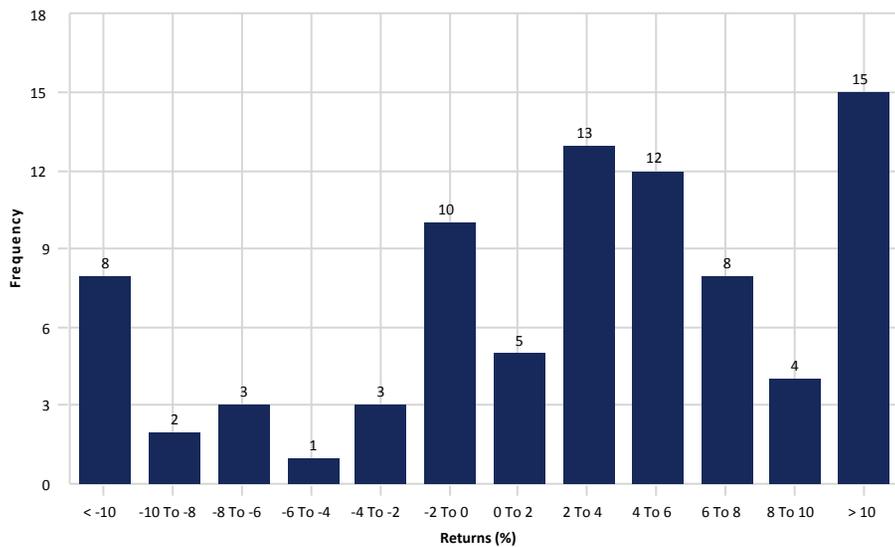
US Equity Composite

June 30, 2018

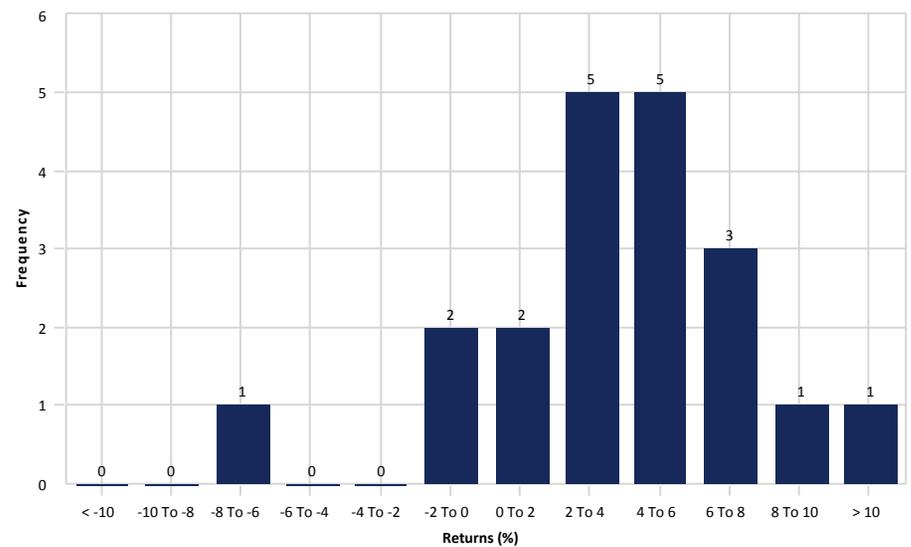
## Peer Group Analysis: All Master Trust-US Equity Segment



### Inception - Quarterly Distribution of Returns



### 5 Years - Quarterly Distribution of Returns



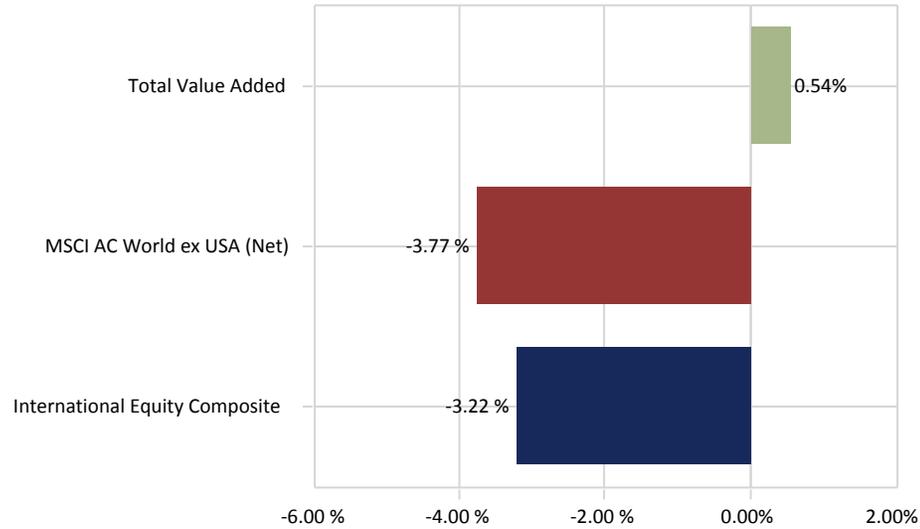
## International Equity

# Howard County Retirement Plans

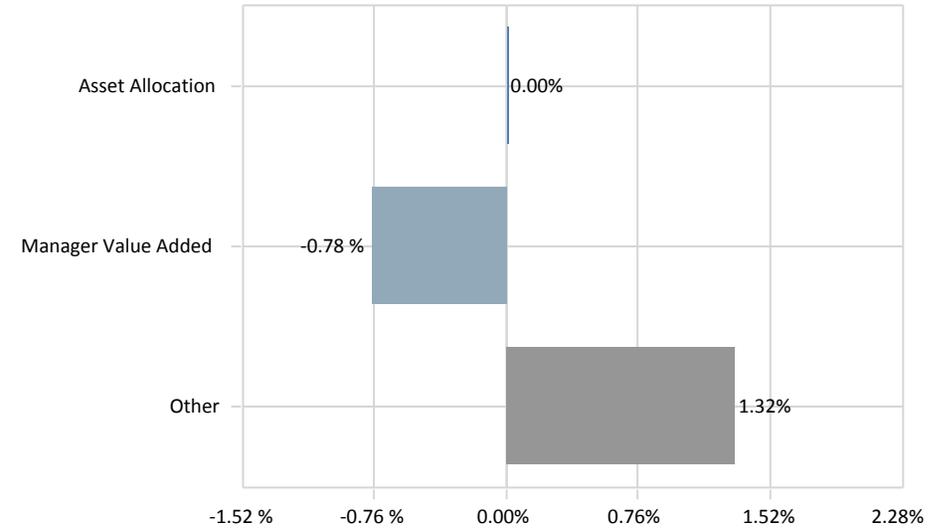
International Equity Composite Attribution

Year To Date Ending June 30, 2018

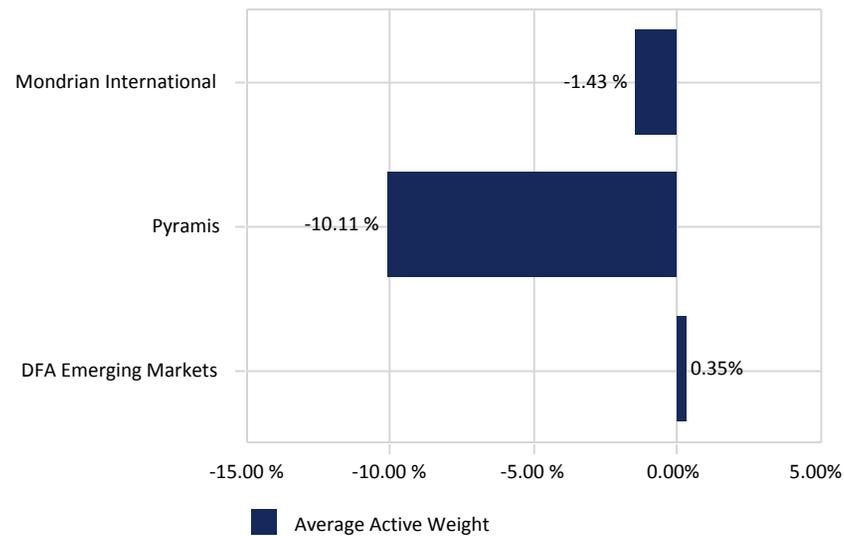
## Total Fund Performance



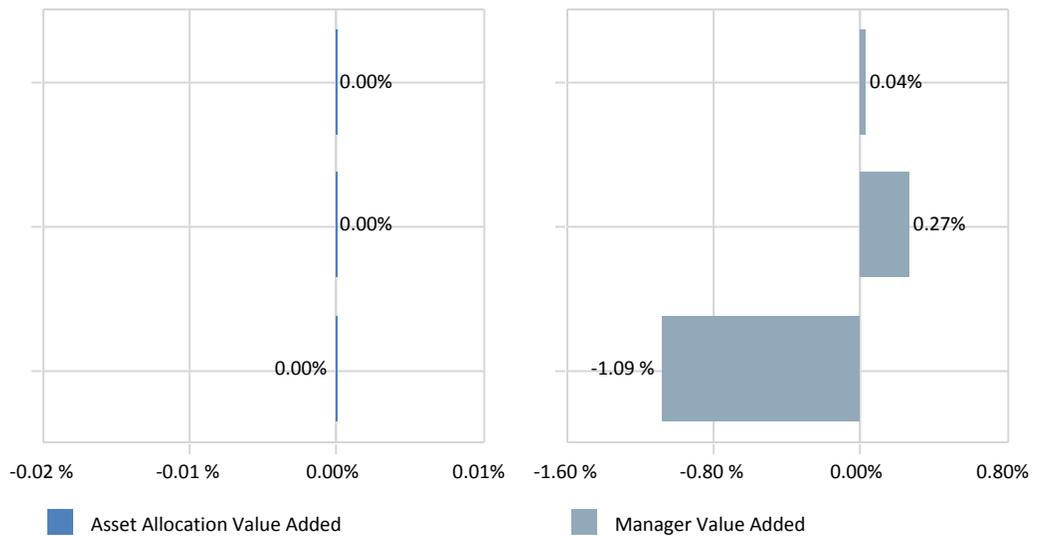
## Total Value Added:0.54%



## Total Asset Allocation:0.00%



## Total Manager Value Added:-0.78%



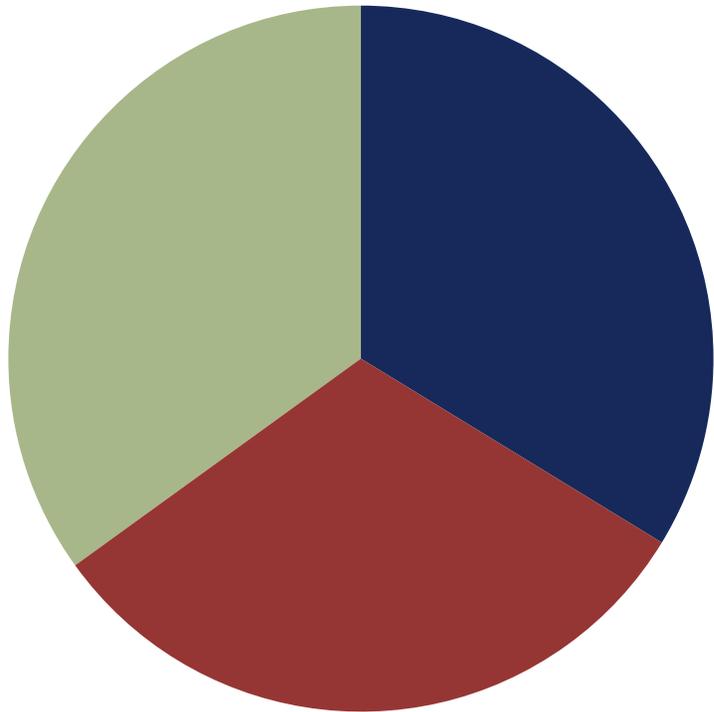
# Howard County Retirement Plans

International Equity Composite vs. MSCI AC World ex USA (Net)

June 30, 2018

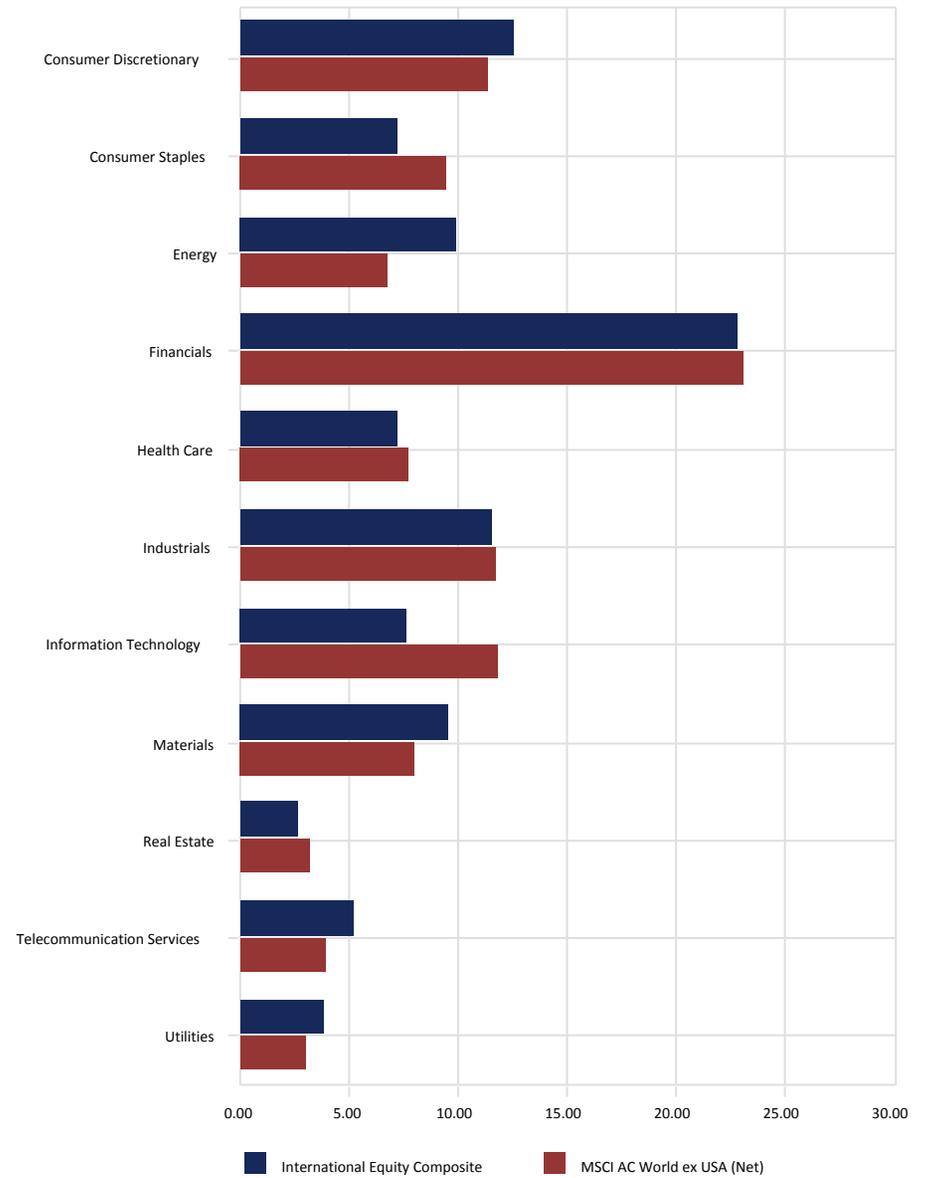
## Manager Allocation

June 30, 2018 : \$190,891,216



	Market Value (\$)	Allocation (%)
DFA Emerging Markets	64,372,299	33.72
Mondrian International	59,795,548	31.32
Baillie Gifford	66,723,369	34.95

## Sector Allocation - Holdings Based

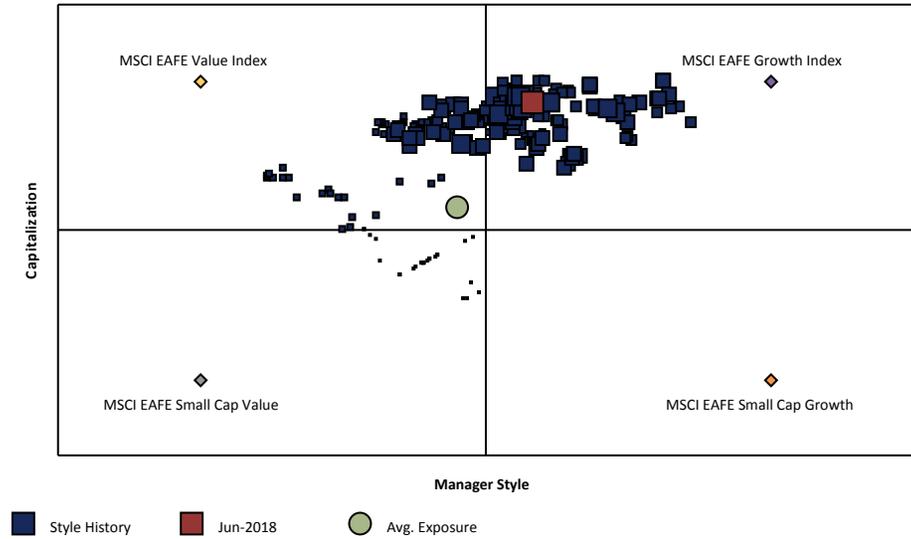


# Howard County Retirement Plans

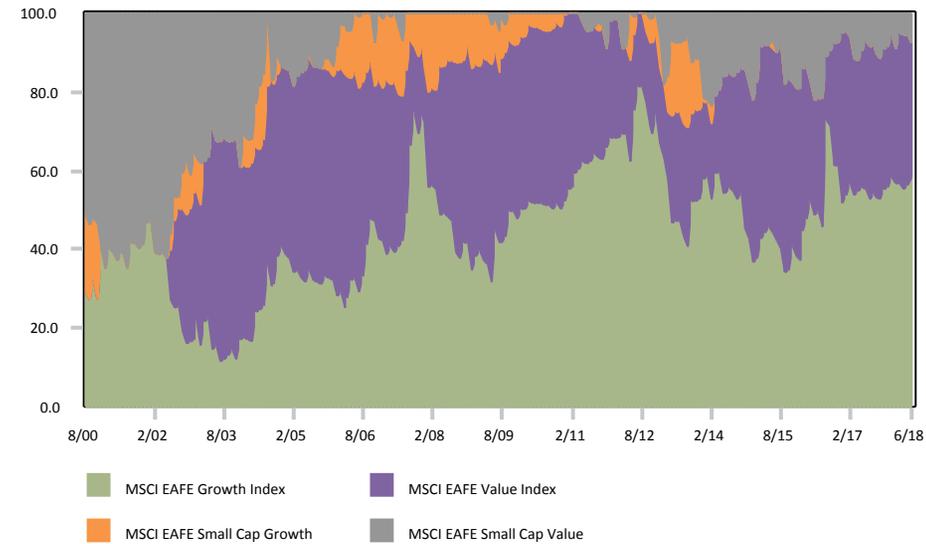
International Equity Composite vs. MSCI AC World ex USA (Net)

June 30, 2018

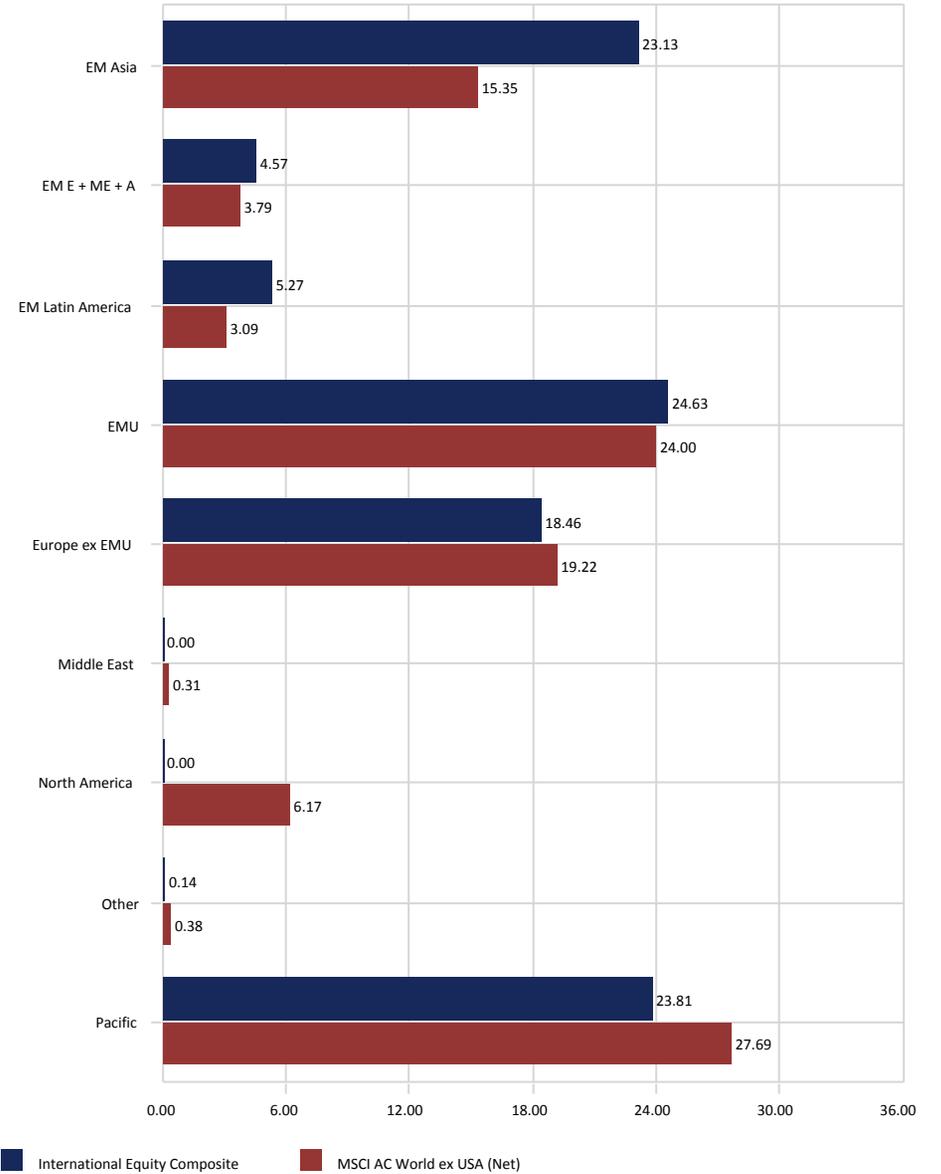
## Style Analysis - Returns Based



## 3 Year Style Analysis



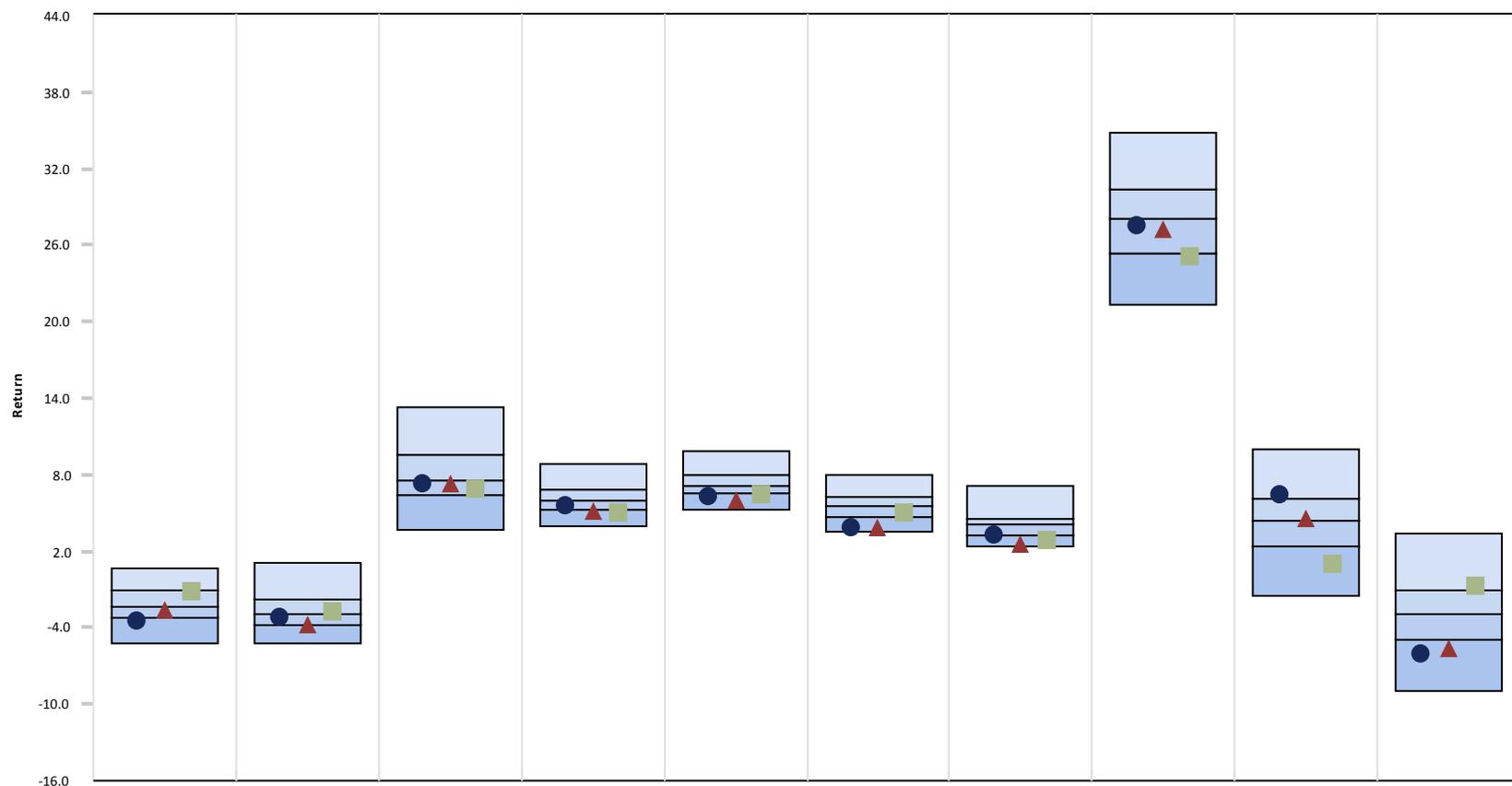
## Region Allocation - Holdings Based



# Howard County Retirement Plans

All Master Trust - International Equity Peer Group Return

June 30, 2018



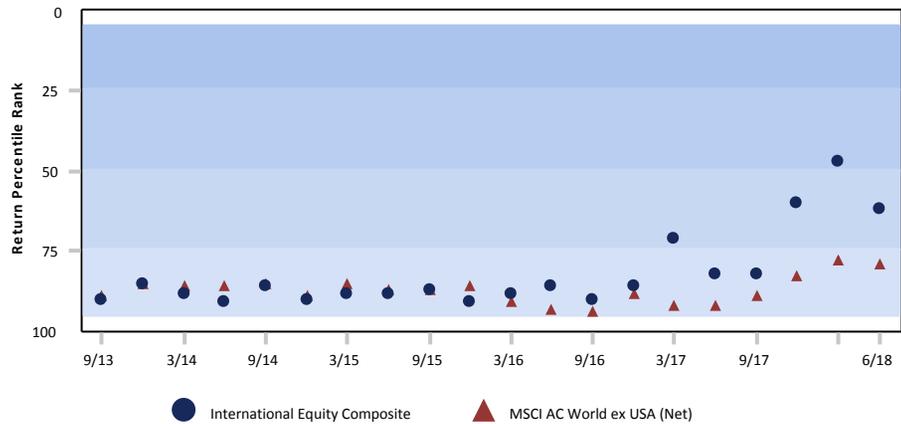
	<u>3 Month</u>	<u>CYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>7 Year</u>	<u>10 Year</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
● International Equity Composite	-3.52 (80)	-3.22 (57)	7.22 (66)	5.52 (62)	6.26 (84)	3.86 (91)	3.23 (76)	27.55 (57)	6.45 (23)	-6.13 (88)
▲ MSCI AC World ex USA (Net)	-2.61 (60)	-3.77 (74)	7.28 (64)	5.07 (79)	5.99 (89)	3.81 (92)	2.54 (93)	27.19 (62)	4.50 (47)	-5.66 (83)
■ MSCI EAFE Index (Net)	-1.24 (29)	-2.75 (47)	6.84 (71)	4.90 (84)	6.44 (79)	4.89 (70)	2.84 (84)	25.03 (80)	1.00 (86)	-0.81 (23)
5th Percentile	0.61	1.07	13.32	8.85	9.89	8.03	7.15	34.76	9.93	3.31
1st Quartile	-1.13	-1.83	9.50	6.86	7.91	6.30	4.58	30.37	6.08	-1.02
<b>Median</b>	<b>-2.31</b>	<b>-2.95</b>	<b>7.60</b>	<b>5.92</b>	<b>7.07</b>	<b>5.47</b>	<b>4.13</b>	<b>28.09</b>	<b>4.35</b>	<b>-2.94</b>
3rd Quartile	-3.16	-3.81	6.44	5.18	6.52	4.66	3.23	25.36	2.35	-5.02
95th Percentile	-5.18	-5.20	3.66	3.89	5.29	3.54	2.36	21.36	-1.51	-8.94
Population	279	275	262	245	209	171	104	323	343	291

# Howard County Retirement Plans

## International Equity Composite

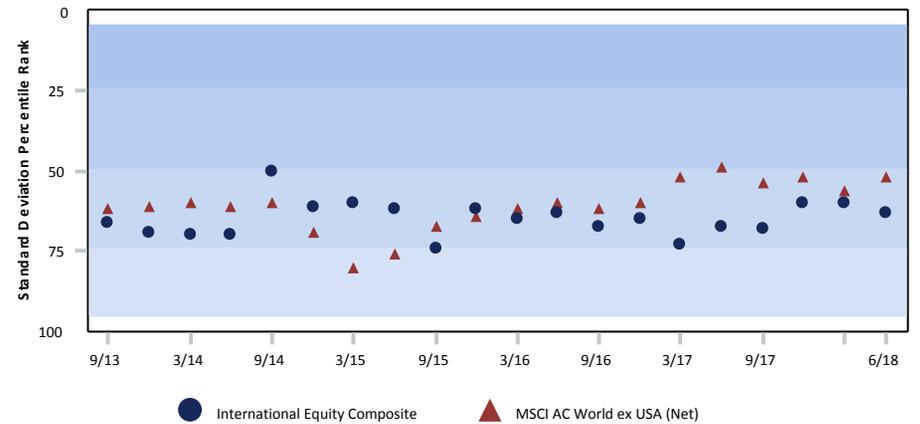
June 30, 2018

### 3 Year Rolling Return Rank



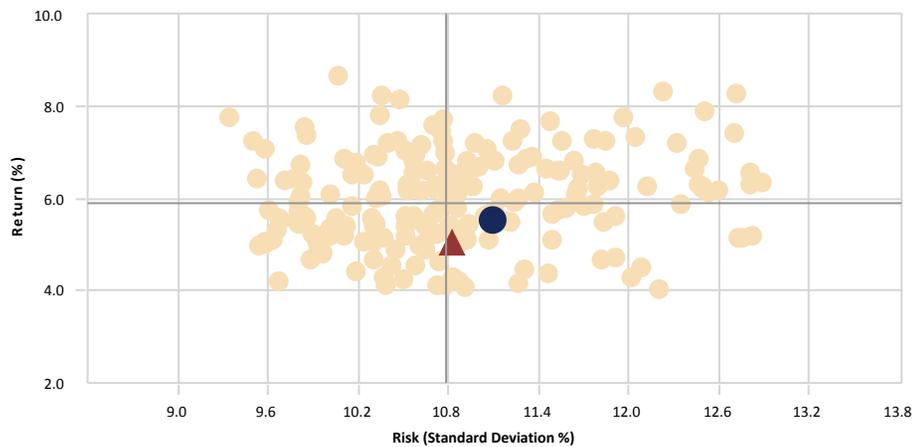
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
● International Equity Composite	20	0 (0%)	1 (5%)	3 (15%)	16 (80%)
▲ MSCI AC World ex USA (Net)	20	0 (0%)	0 (0%)	0 (0%)	20 (100%)

### 3 Year Rolling Standard Deviation Rank



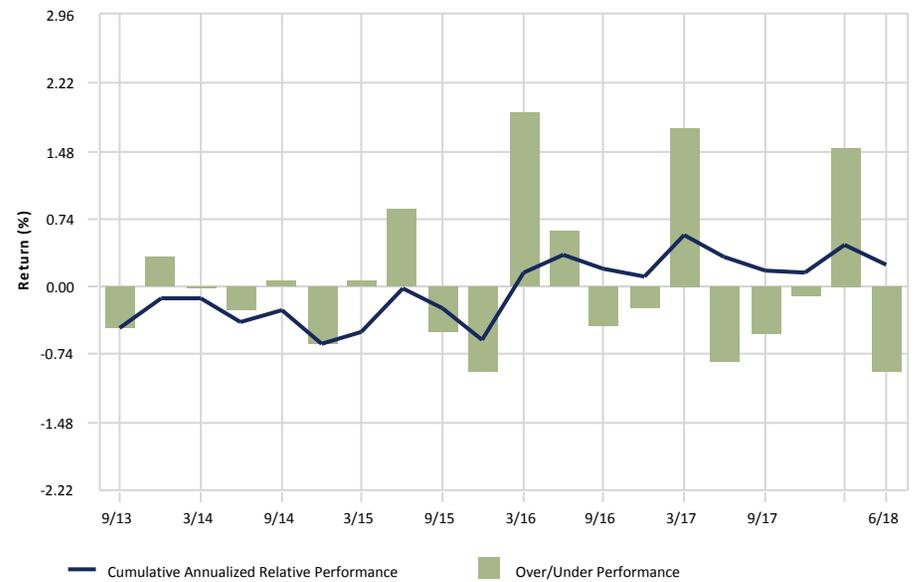
	Total Period	5-25 Count	25-Median Count	Median-75 Count	75-95 Count
● International Equity Composite	20	0 (0%)	1 (5%)	19 (95%)	0 (0%)
▲ MSCI AC World ex USA (Net)	20	0 (0%)	1 (5%)	17 (85%)	2 (10%)

### Risk vs. Return (07/01/15 - 06/30/18)



	Return	Standard Deviation
● International Equity Composite	5.52	11.10
▲ MSCI AC World ex USA (Net)	5.07	10.83
— Median	5.92	10.78

### Relative Performance vs. MSCI AC World ex USA (Net)



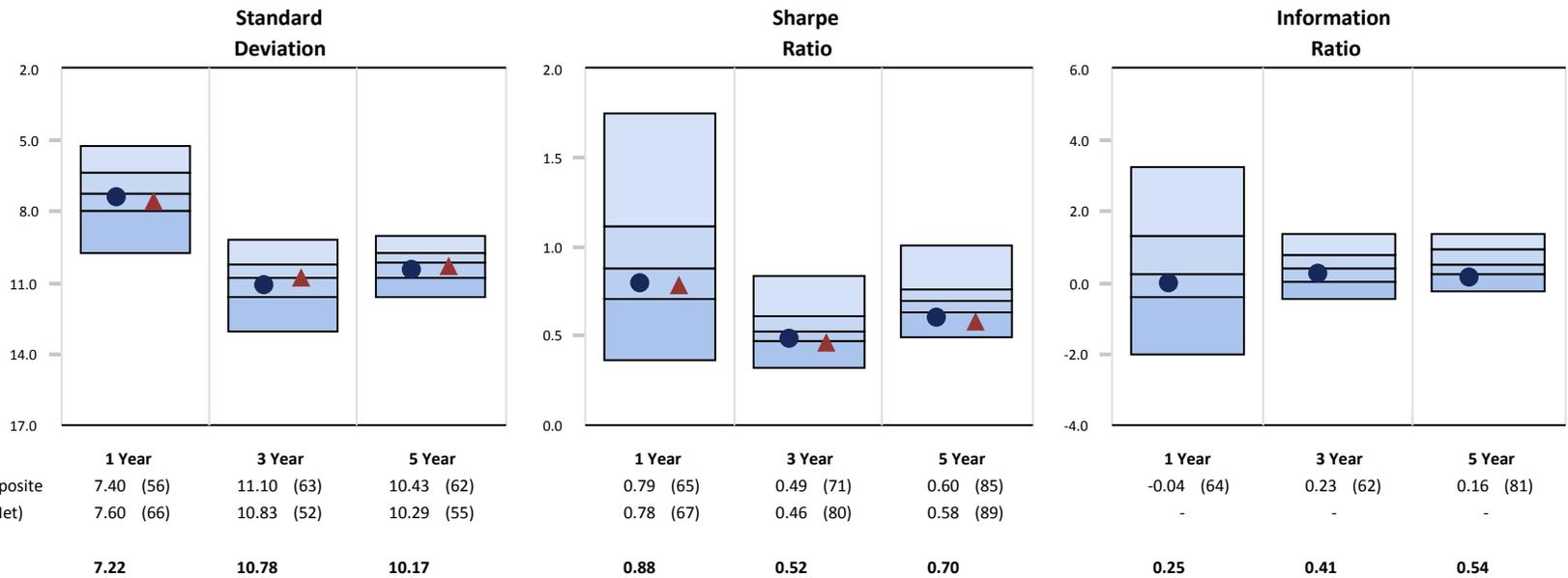
— Cumulative Annualized Relative Performance    ■ Over/Under Performance

# Howard County Retirement Plans

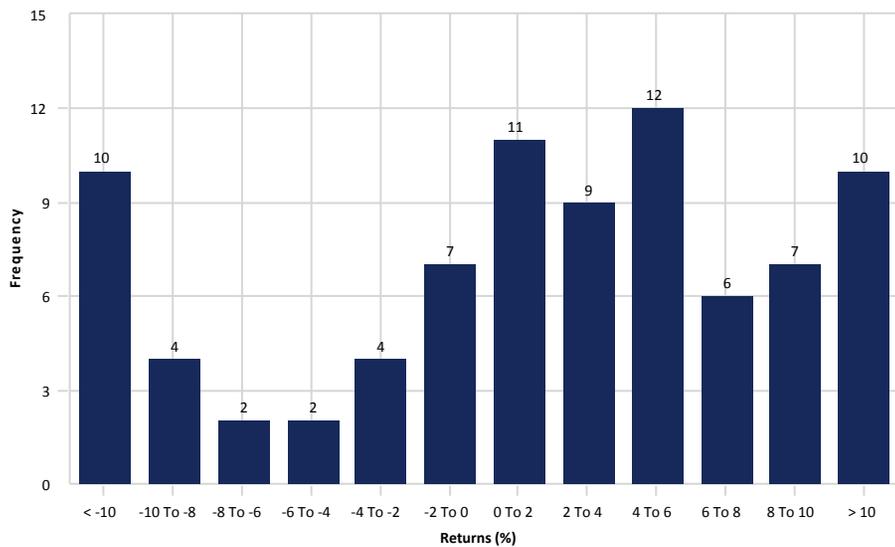
International Equity Composite

June 30, 2018

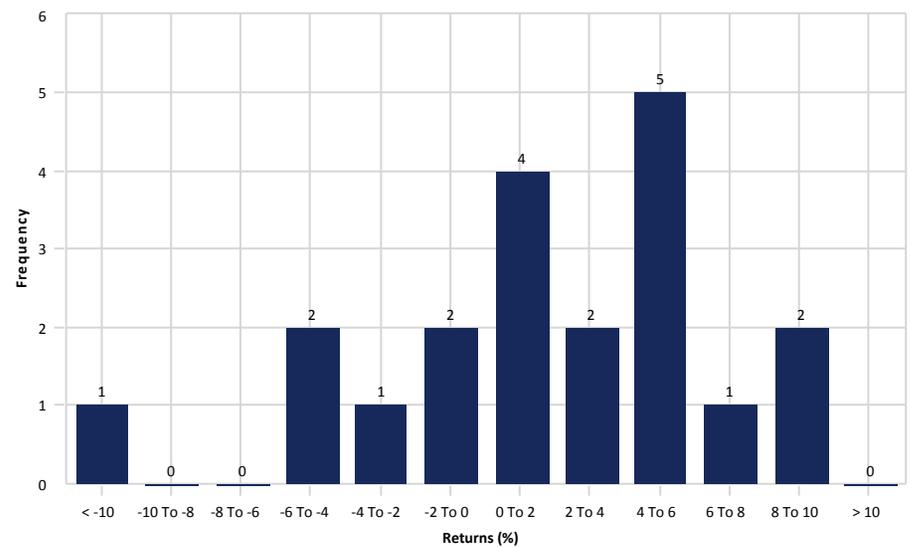
## Peer Group Analysis: All Master Trust-Intl. Equity Segment



### Inception - Quarterly Distribution of Returns



### 5 Years - Quarterly Distribution of Returns



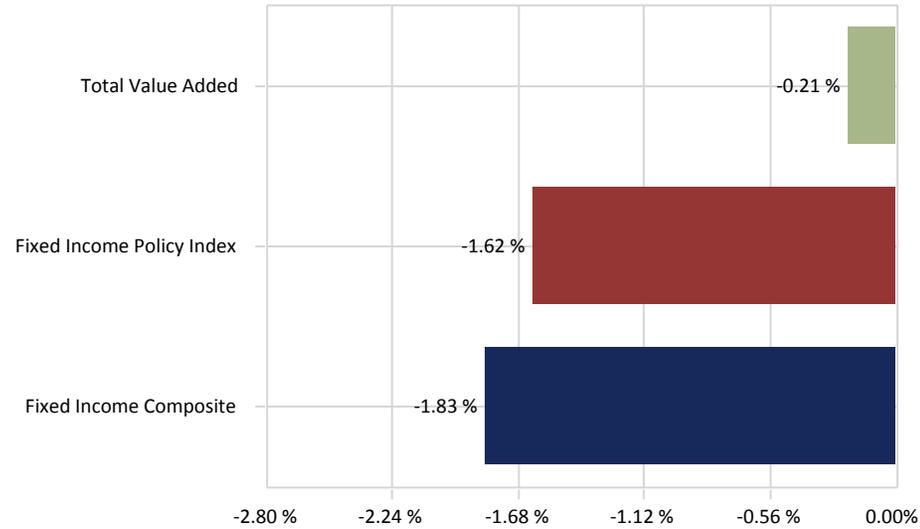
## Fixed Income

# Howard County Retirement Plans

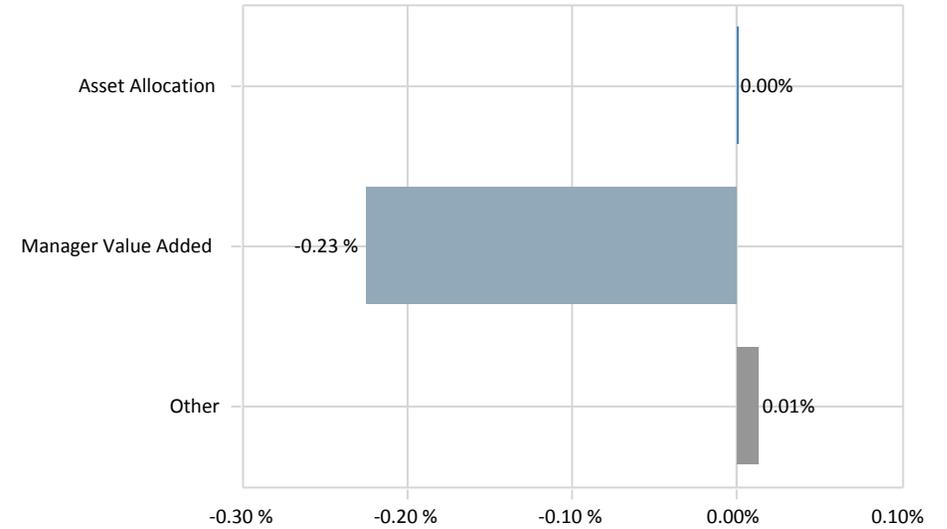
Fixed Income Composite Attribution

Year To Date Ending June 30, 2018

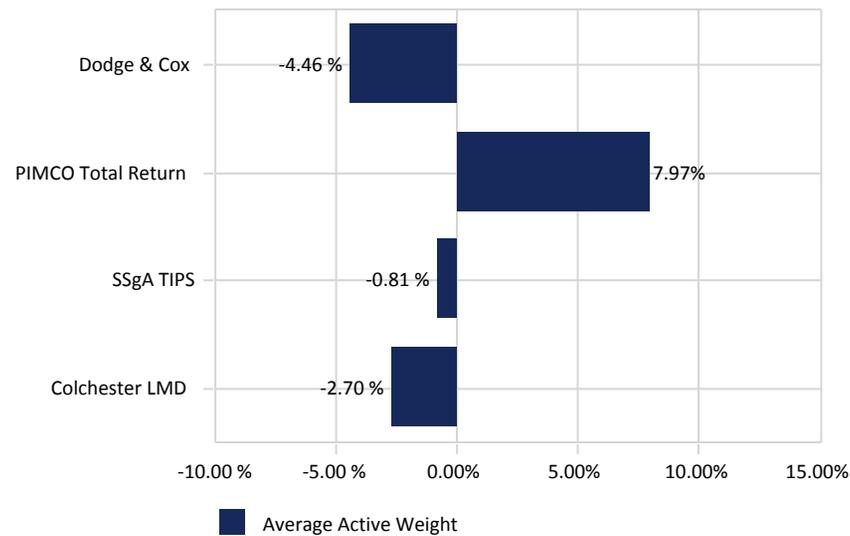
## Total Fund Performance



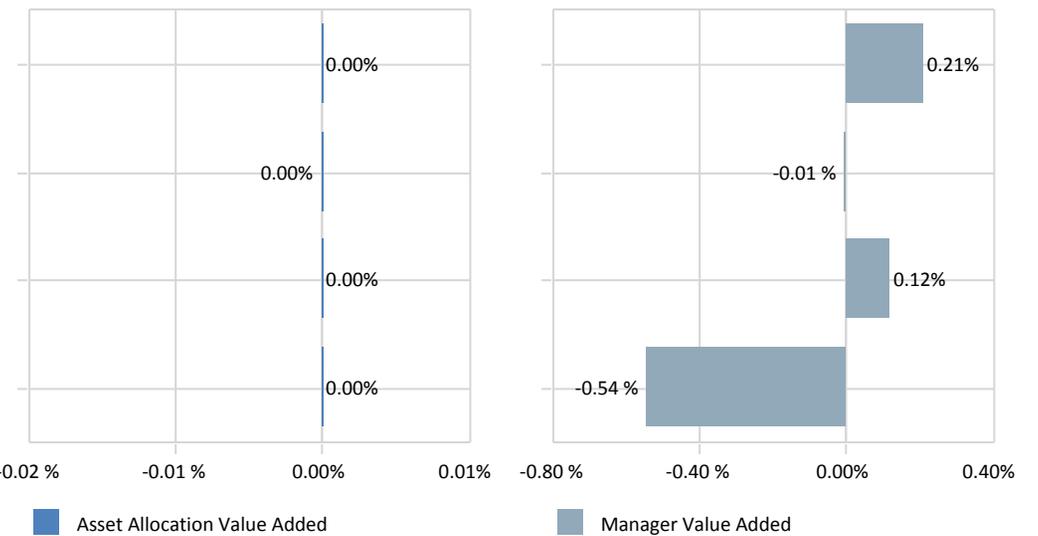
## Total Value Added:-0.21 %



## Total Asset Allocation:0.00%



## Total Manager Value Added:-0.23 %



■ Average Active Weight

■ Asset Allocation Value Added

■ Manager Value Added

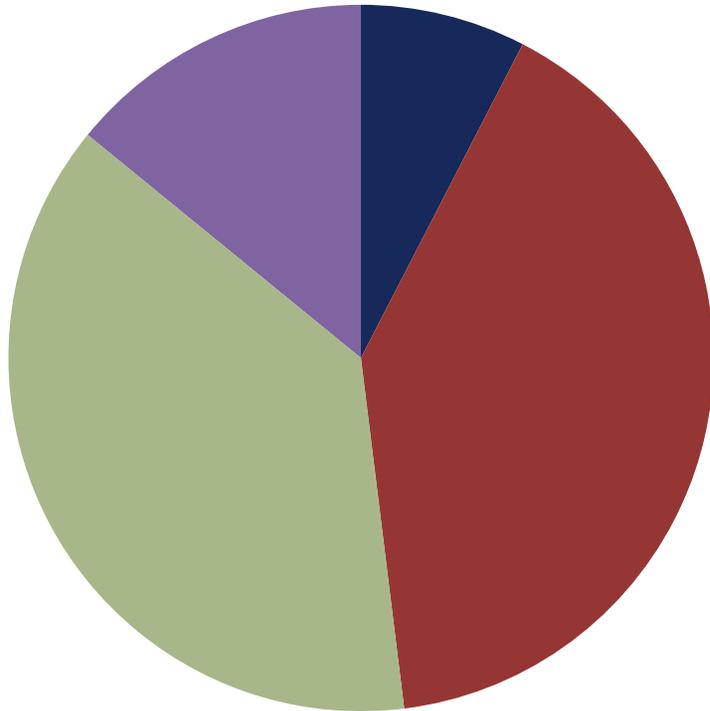
# Howard County Retirement Plans

Fixed Income Composite

June 30, 2018

## Manager Allocation

June 30, 2018 : \$283,488,640

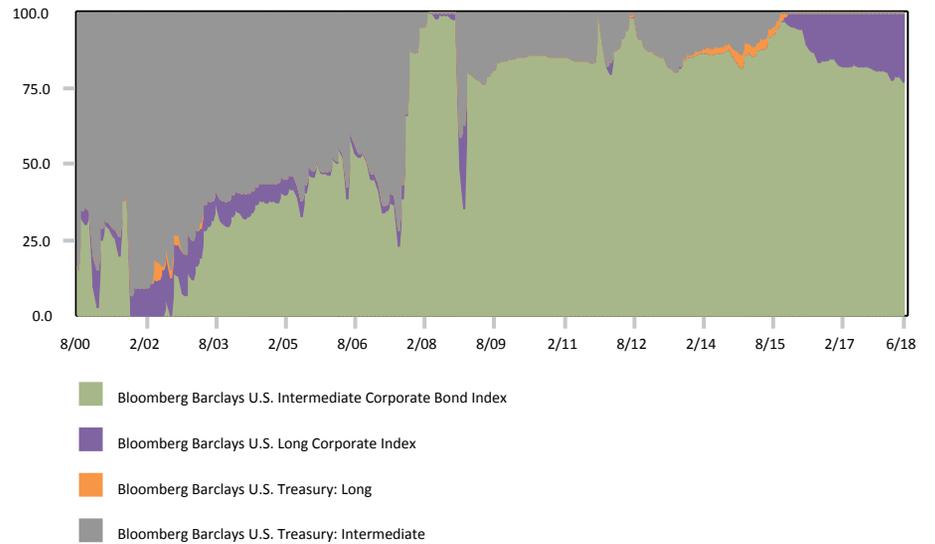


	Market Value (\$)	Allocation (%)
State Street Global Advisors TIPS	21,510,491	7.59
Dodge & Cox	114,679,918	40.45
PIMCO Total Return	107,292,999	37.85
Colchester LMD	40,005,233	14.11

## Style Analysis - Returns Based



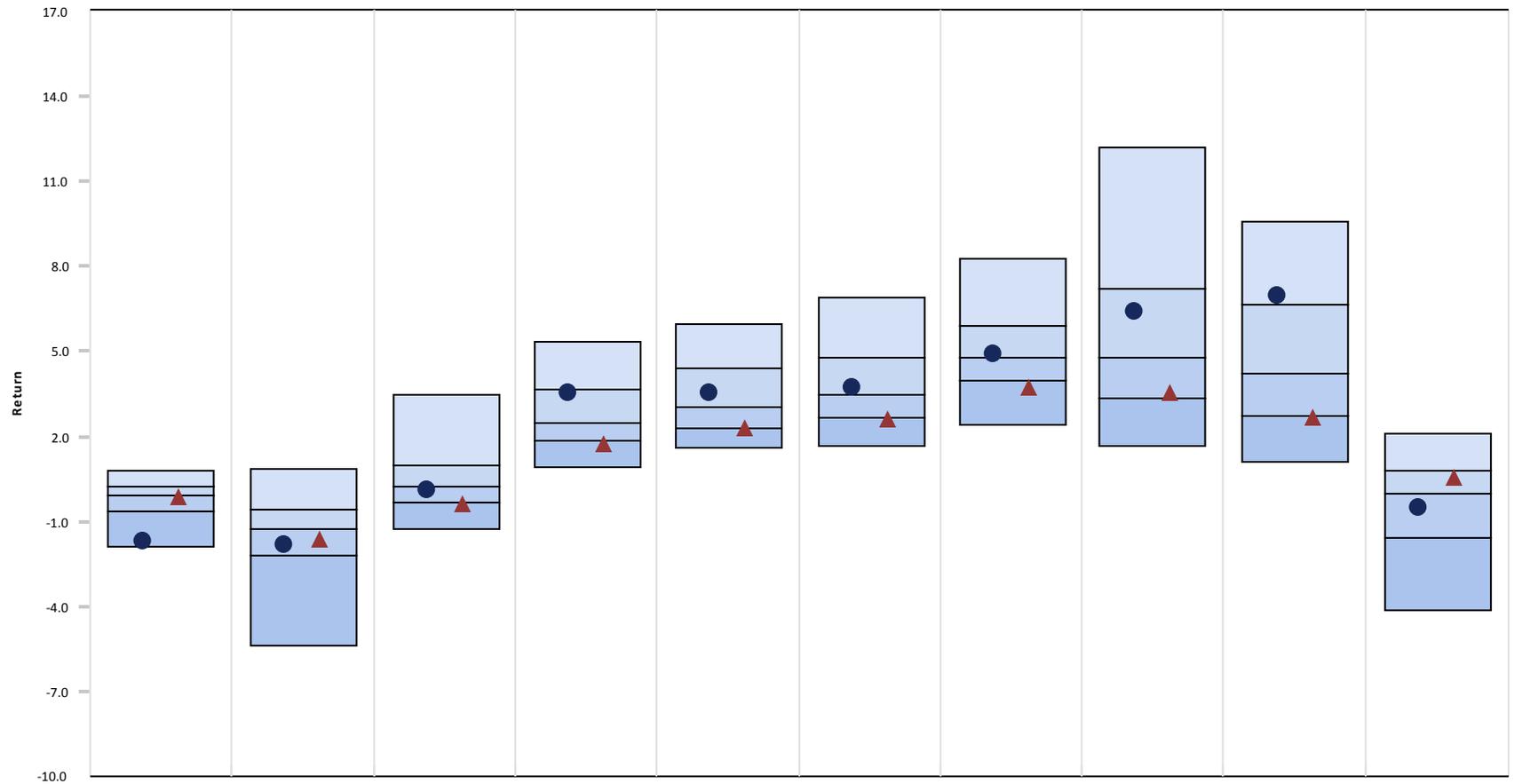
## 3 Year Style Analysis



# Howard County Retirement Plans

All Master Trust - US Fixed Income Peer Group Return

June 30, 2018



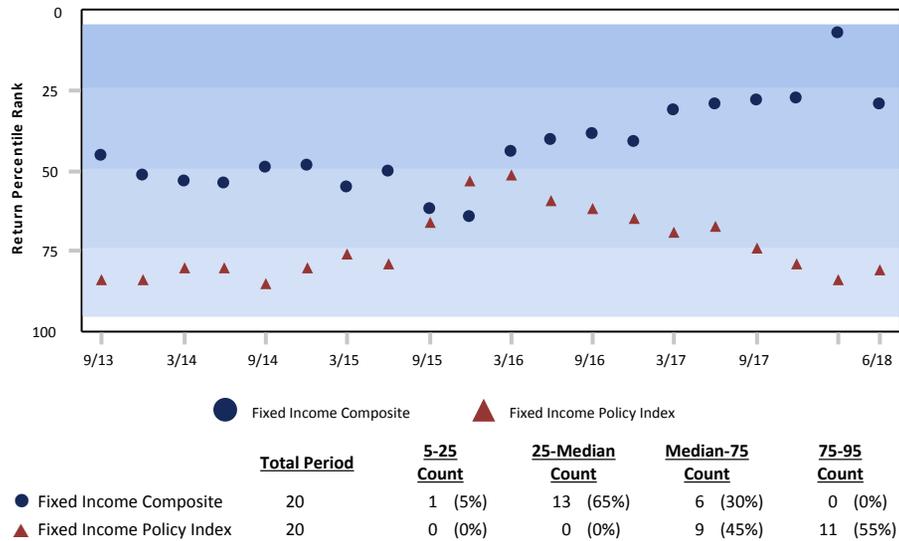
	<u>3 Month</u>	<u>CYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>7 Year</u>	<u>10 Year</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
● Fixed Income Composite	-1.70 (93)	-1.83 (70)	0.11 (55)	3.52 (29)	3.55 (38)	3.75 (42)	4.92 (46)	6.43 (31)	6.97 (23)	-0.53 (61)
▲ Fixed Income Policy Index	-0.16 (54)	-1.62 (63)	-0.40 (78)	1.72 (81)	2.27 (77)	2.57 (79)	3.72 (82)	3.54 (69)	2.65 (77)	0.55 (32)
5th Percentile	0.81	0.85	3.47	5.32	5.96	6.89	8.27	12.20	9.60	2.10
1st Quartile	0.21	-0.60	0.96	3.66	4.38	4.75	5.91	7.21	6.65	0.79
<b>Median</b>	<b>-0.10</b>	<b>-1.28</b>	<b>0.25</b>	<b>2.49</b>	<b>3.05</b>	<b>3.50</b>	<b>4.80</b>	<b>4.78</b>	<b>4.24</b>	<b>-0.01</b>
3rd Quartile	-0.65	-2.23	-0.31	1.84	2.30	2.67	3.96	3.32	2.70	-1.58
95th Percentile	-1.91	-5.37	-1.24	0.93	1.62	1.65	2.43	1.64	1.09	-4.15
Population	296	292	285	265	227	199	121	333	361	311

# Howard County Retirement Plans

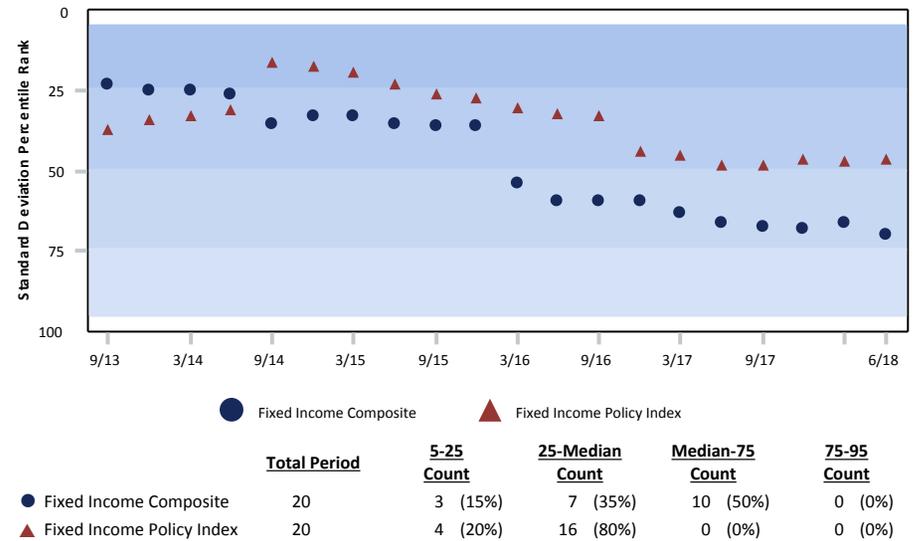
Fixed Income Composite

June 30, 2018

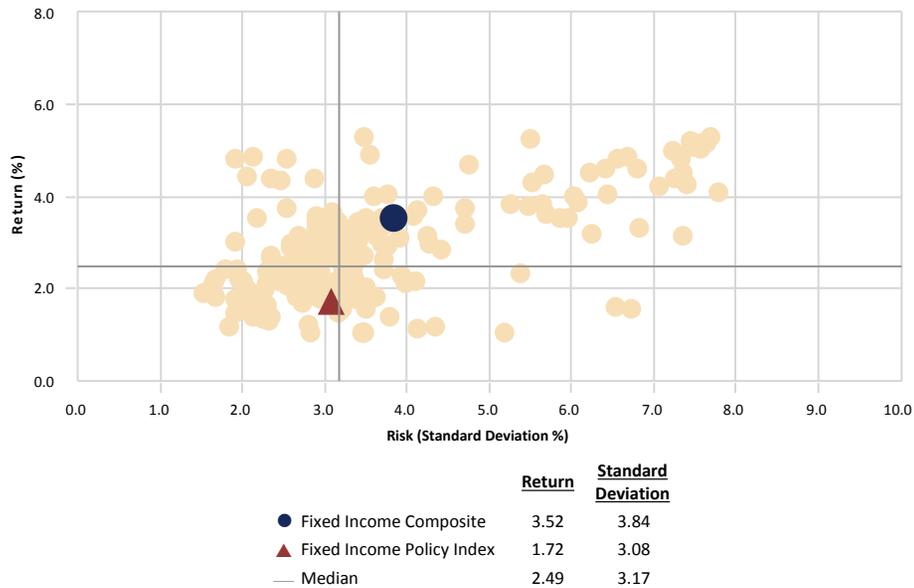
## 3 Year Rolling Return Rank



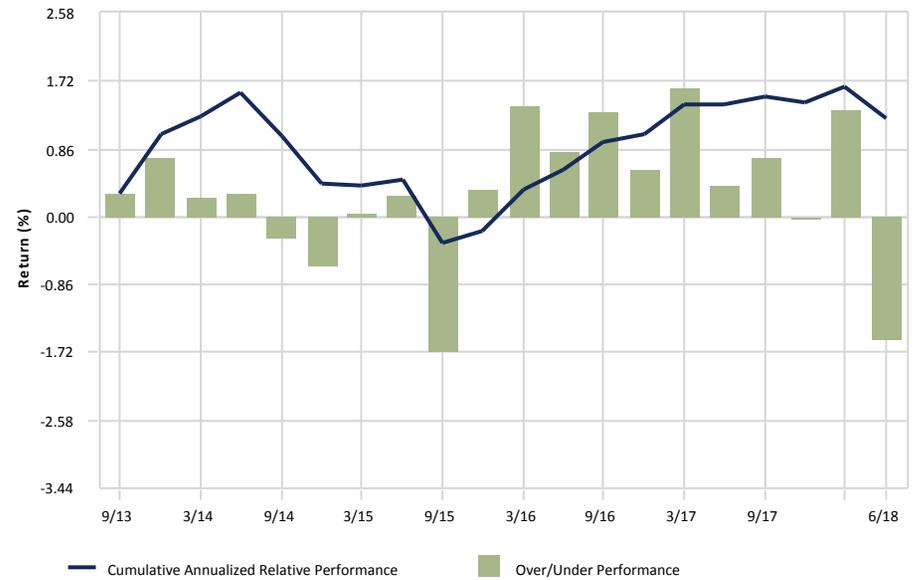
## 3 Year Rolling Standard Deviation Rank



## Risk vs. Return (07/01/15 - 06/30/18)



## Relative Performance vs. Fixed Income Policy Index

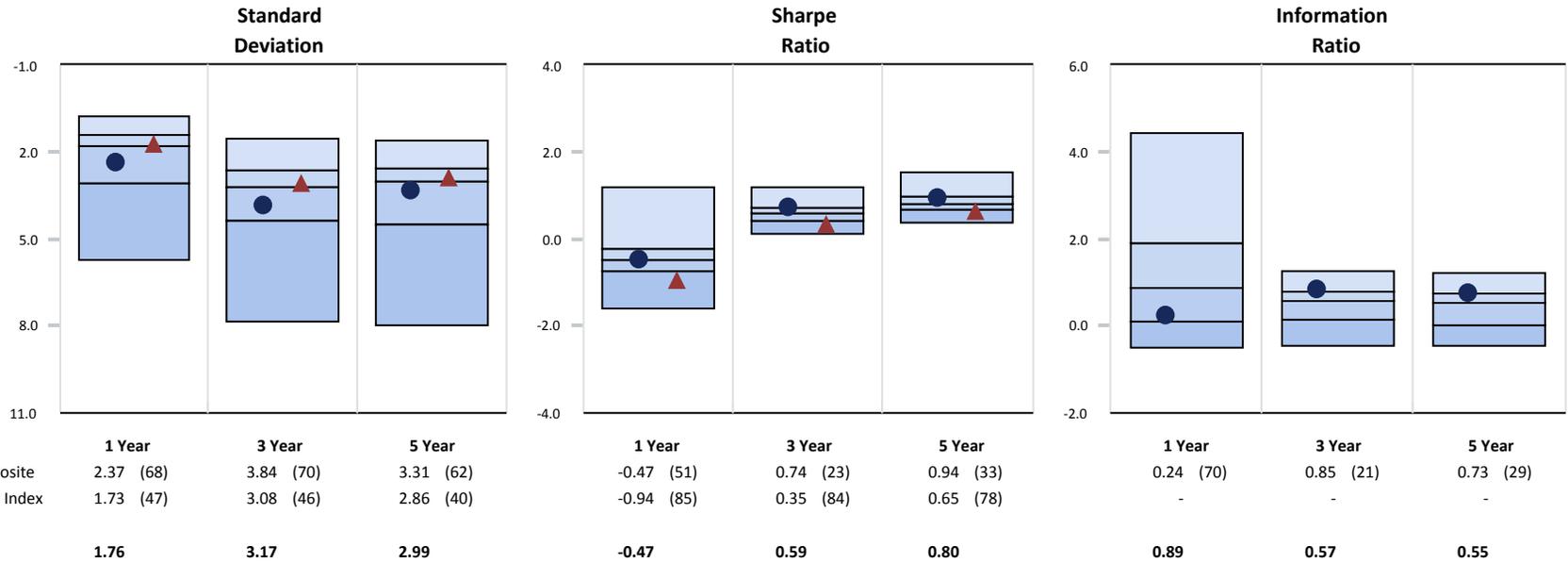


# Howard County Retirement Plans

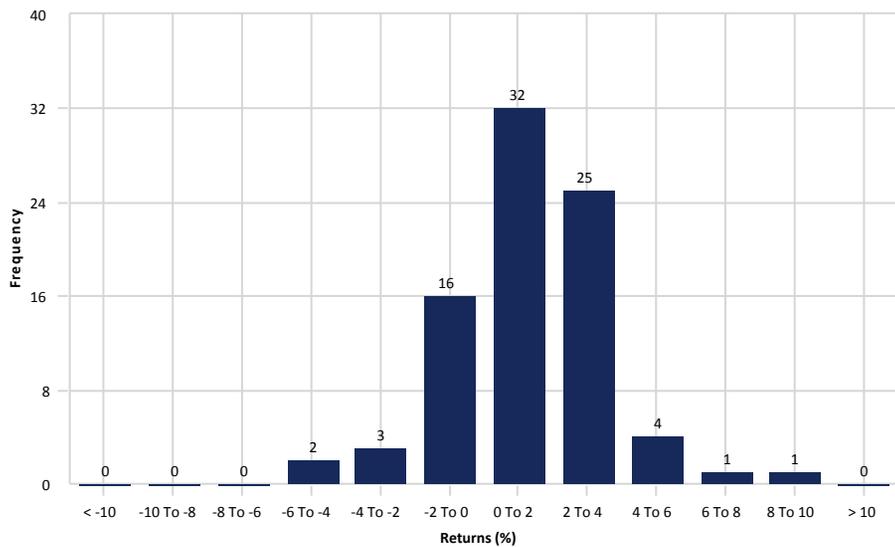
Fixed Income Composite

June 30, 2018

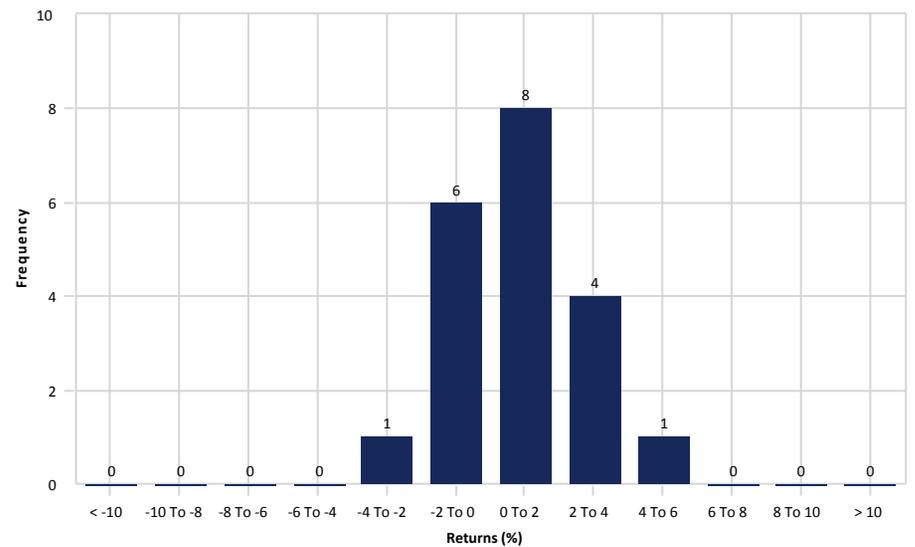
## Peer Group Analysis: All Master Trust-US Fixed Income Segment



### Inception - Quarterly Distribution of Returns



### 5 Years - Quarterly Distribution of Returns



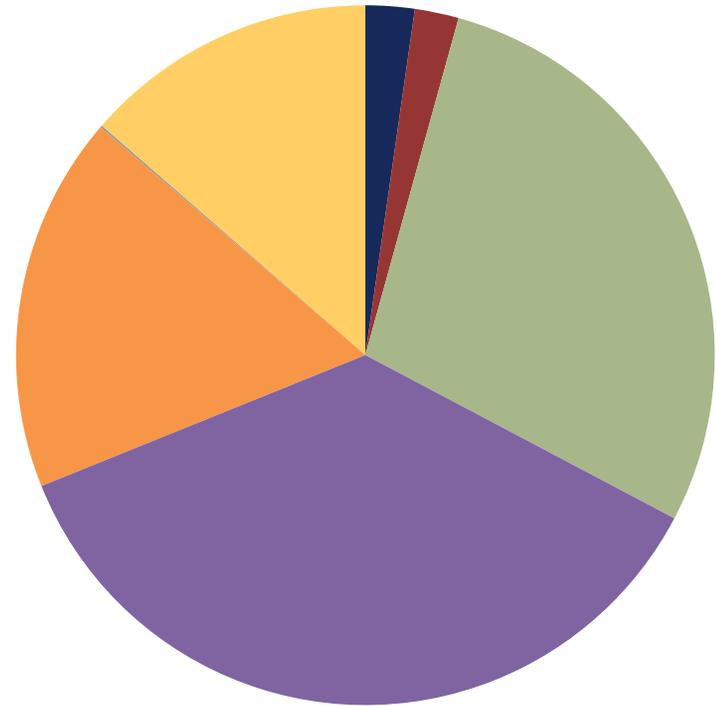
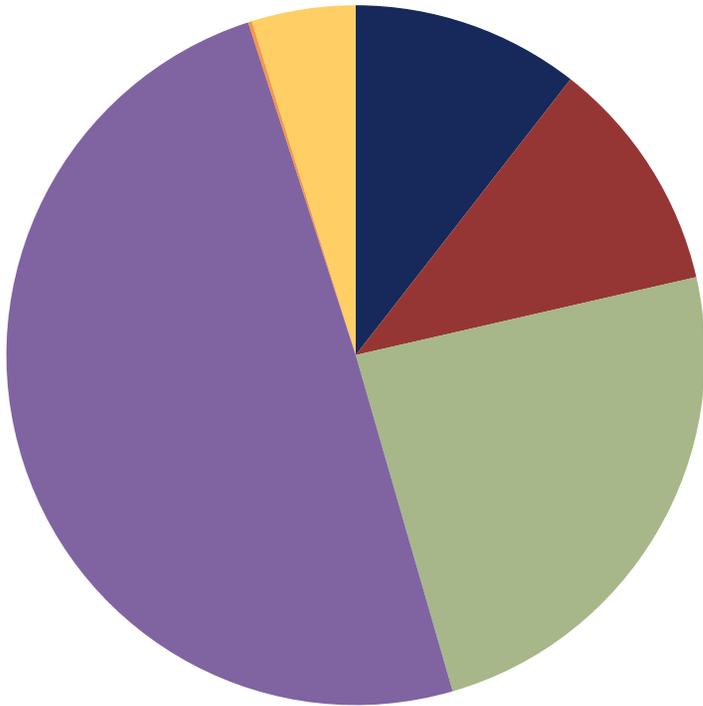
## Real Assets

# Real Assets Manager Allocation Chart

Asset Allocation By Manager

June 30, 2018

June 30, 2018 : \$34,866,184
December 31, 2016 : \$37,773,341



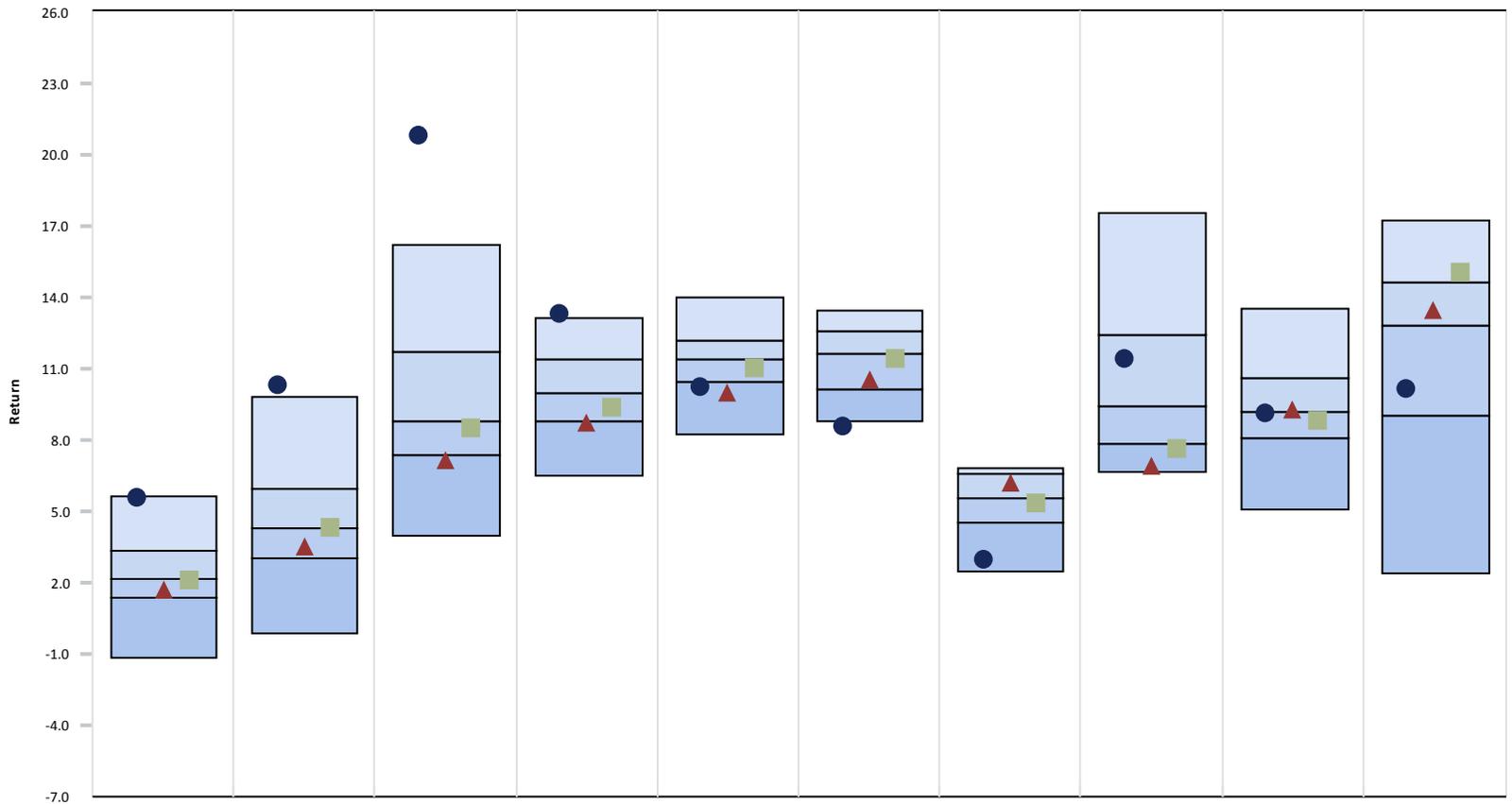
	Market Value (\$)	Allocation (%)
Aether Real Assets IV	3,674,052	10.54
Commonfund Natural Resources X	3,794,505	10.88
Partners Group Global RE 2011	8,403,677	24.10
Partners Group Global RE 2014	17,253,997	49.49
TA Realty Associates IX	61,092	0.18
TA Realty Associates VII	-	0.00
TA Realty Associates VIII	1,678,862	4.82

	Market Value (\$)	Allocation (%)
Aether Real Assets IV	856,098	2.27
Commonfund Natural Resources X	767,376	2.03
Partners Group Global RE 2011	10,736,621	28.42
Partners Group Global RE 2014	13,665,700	36.18
TA Realty Associates IX	6,572,390	17.40
TA Realty Associates VII	31,729	0.08
TA Realty Associates VIII	5,143,428	13.62

# Howard County Retirement Plans

All Master Trust - Real Estate Peer Group Return

June 30, 2018



	<u>3 Month</u>	<u>CYTD</u>	<u>1 Year</u>	<u>3 Year</u>	<u>5 Year</u>	<u>7 Year</u>	<u>10 Year</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>
● Real Assets Composite	5.52 (6)	10.26 (5)	20.76 (3)	13.26 (5)	10.19 (82)	8.55 (98)	2.96 (92)	11.40 (34)	9.13 (51)	10.12 (70)
▲ NCREIF Property Index [3 Month Lag]	1.70 (71)	3.53 (67)	7.12 (79)	8.72 (77)	10.00 (84)	10.55 (69)	6.21 (40)	6.89 (91)	9.22 (50)	13.48 (37)
■ NCREIF Fund Index-ODCE (VW) [M]	2.05 (56)	4.30 (49)	8.44 (55)	9.37 (58)	11.04 (56)	11.39 (66)	5.29 (53)	7.62 (78)	8.77 (55)	15.02 (24)
5th Percentile	5.63	9.81	16.17	13.12	14.02	13.44	6.84	17.52	13.50	17.21
1st Quartile	3.36	5.92	11.69	11.42	12.21	12.56	6.57	12.41	10.58	14.61
<b>Median</b>	<b>2.19</b>	<b>4.26</b>	<b>8.80</b>	<b>9.97</b>	<b>11.42</b>	<b>11.64</b>	<b>5.56</b>	<b>9.44</b>	<b>9.16</b>	<b>12.81</b>
3rd Quartile	1.39	3.02	7.34	8.76	10.48	10.16	4.54	7.84	8.07	9.00
95th Percentile	-1.16	-0.16	3.98	6.52	8.20	8.82	2.49	6.69	5.05	2.36
Population	143	124	107	66	46	33	20	104	92	74

## Howard County Retirement Plans

### Real Assets Summary of Partnerships\*

June 30, 2018

Partnerships	Vintage Year	Investment Strategy	Capital Commitment (\$)	Drawn Down (\$)	Distributed (\$)	Market Value (\$,1)	IRR (% <sup>1</sup> )	TVPI Multiple (1, 2)	Valuation Date (1)
<b>Real Asset Partnerships</b>									
TA Realty Associates VIII	2006	Real Estate - Value Added	10,000,000	10,000,000	8,179,095	1,678,862	-0.17	0.99	06/30/2018
TA Realty Associates IX	2008	Real Estate - Value Added	10,000,000	10,000,000	16,085,723	61,092	10.72	1.62	06/30/2018
Partners Group Global Real Estate 2011(3)	2011	Real Estate - Opportunistic (FOF)	15,000,000	13,351,599	9,481,163	8,403,677	7.44	1.34	06/30/2018
Partners Group Global Real Estate 2014	2013	Real Estate - Opportunistic (FOF)	25,000,000	13,833,263	1,679,104	17,253,997	12.83	1.37	06/30/2018
Commonfund Natural Resources X	2015	Natural Resources - Diversified (FOF)	7,500,000	3,098,073	342,838	3,794,505	40.08	1.34	06/30/2018
Aether Real Assets IV	2015	Natural Resources - Diversified (FOF)	7,500,000	4,310,212	988,742	3,674,052	10.05	1.08	06/30/2018
<b>Total Real Assets (4)</b>			<b>90,000,000</b>	<b>68,541,714</b>	<b>55,811,710</b>	<b>34,866,184</b>	<b>6.64</b>	<b>1.32</b>	<b>06/30/2018</b>

1) Valuations are typically reported on one quarter lag. If the valuation date is earlier than the statement's date, the market value and performance are estimated by rolling forward the latest reported balance to include relevant new cash flows.

2) Total Value to Paid In (TVPI) reflects total realized and unrealized performance.

3) Fund is not USD: Cash flows are in actual USD per the custodian. Market values and remaining commitment are translated using the spot on the valuation date.

4) Total Real Assets include fully realized partnerships.

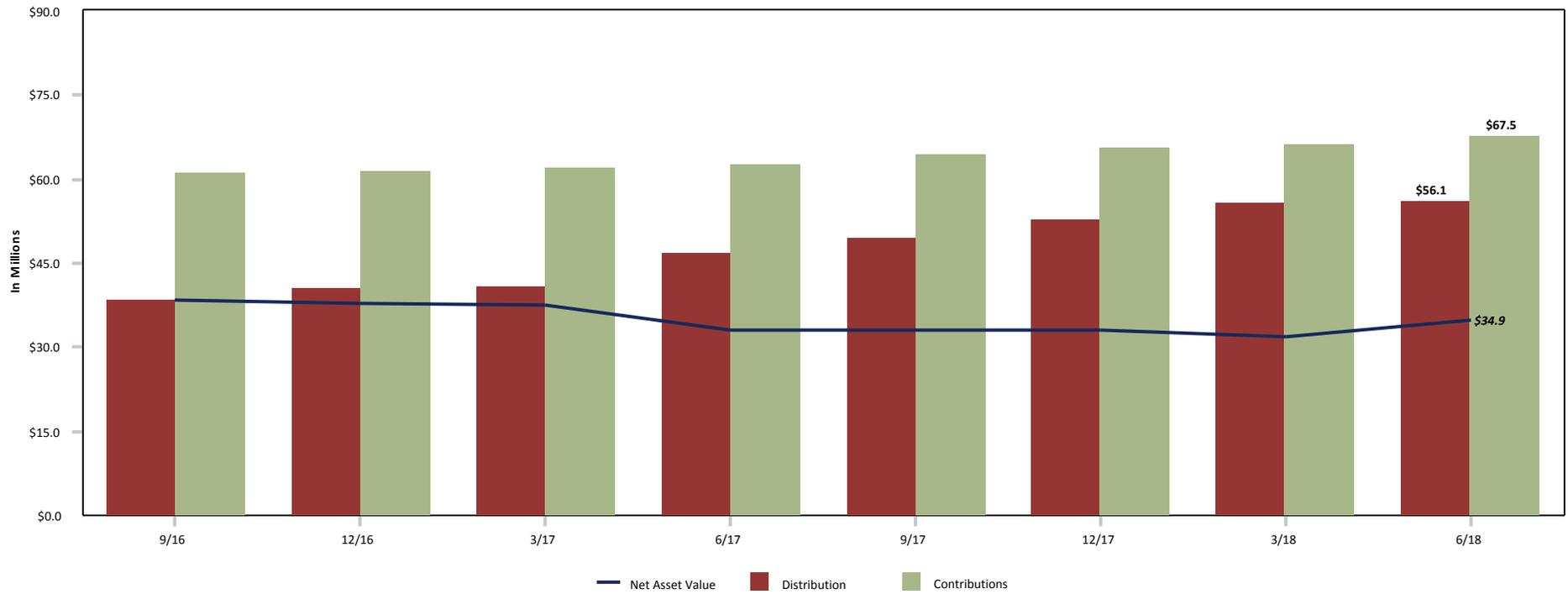
\*Source of performance data is from the Custodial Bank.

# Howard County Retirement Plans

## Real Assets Portfolio Summary\*

June 30, 2018

### Cumulative Cash Flow Analysis



\*The Custodial Bank is the source of performance data for liquid real assets.

## Alternatives

## Howard County Retirement Plans

### Private Equity Summary of Partnerships

June 30, 2018

Partnerships	Vintage Year	Investment Strategy	Capital Commitment (\$)	Drawn Down (\$,1)	Distributed (\$,1)	Market Value (\$,1,2)	IRR (%) (3)	TVPI Multiple (3)	Valuation Date
<b>Private Equity</b>									
Siguler Guff Distressed Opps III	2007	Distressed Debt (FOF)	10,000,000	10,220,383	14,136,629	1,822,039	10.53	1.56	06/30/2018
Greenspring IV	2008	Venture Capital (FOF)	4,000,000	3,892,217	4,112,032	4,816,159	18.22	2.29	06/30/2018
Pantheon Global Secondaries IV	2010	Secondaries (FOF)	3,000,000	2,186,420	2,684,421	638,974	14.16	1.52	06/30/2018
LGT Crown Asia-Pacific II	2011	International Private Equity (FOF)	14,000,000	11,705,006	4,662,000	14,125,605	13.15	1.61	06/30/2018
Greenspring V	2011	Venture Capital (FOF)	7,000,000	6,143,846	5,607,000	7,401,105	20.52	2.12	06/30/2018
Adveq Europe V	2012	Buyout - Small (FOF)	10,000,000	7,797,352	2,662,125	7,505,422	10.15	1.30	06/30/2018
LGT Crown Global Secondaries III	2012	Secondaries (FOF)	10,000,000	6,284,447	3,690,000	5,352,408	14.66	1.44	06/30/2018
Flag Private Equity V	2013	Diversified (FOF)	15,000,000	13,664,188	6,649,993	12,836,258	16.68	1.43	06/30/2018
HarbourVest Partners 2013 Direct	2013	Diversified (COI)	15,000,000	15,748,646	8,051,401	16,325,930	18.75	1.55	06/30/2018
Greenspring VI	2014	Venture Capital (FOF)	7,500,000	5,851,152	1,473,750	7,901,666	18.61	1.60	06/30/2018
Greenspring Secondaries Fund I	2014	Secondaries	2,500,000	2,399,097	661,665	3,086,336	18.84	1.56	06/30/2018
Adveq Europe VI	2015	Buyout - Small (FOF)	7,500,000	3,031,304	431,732	3,237,503	14.87	1.21	06/30/2018
Flag Private Equity VI	2014	Buyout - Small (FOF)	15,000,000	9,525,000	1,837,079	10,412,317	19.61	1.29	06/30/2018
57 Stars	2015	Diversified (FOF)	7,000,000	4,371,217	456,084	4,105,815	3.59	1.04	06/30/2018
NB Crossroads XXI	2015	Diversified (FOF)	15,000,000	8,250,000	750,000	8,367,053	9.14	1.11	06/30/2018
LGT Crown Asia-Pacific III	2014	International Private Equity (FOF)	5,000,000	2,743,161	-	3,941,585	23.69	1.44	06/30/2018
HarbourVest IV	2016	Buyout - Mid (COI)	10,000,000	7,867,200	875,000	7,592,933	9.71	1.08	06/30/2018
Aberdeen US Private Equity VII	2017	Buyout - Small (FOF)	5,000,000	1,100,223	-	1,095,580	-0.74	1.00	06/30/2018
Greenspring VIII B	2017	Venture Capital (FOF)	5,000,000	900,000	-	858,507	-10.42	0.95	06/30/2018
<b>Total Private Equity</b>			<b>167,500,000</b>	<b>123,680,859</b>	<b>58,740,911</b>	<b>121,423,194</b>	<b>14.82</b>	<b>1.46</b>	<b>06/30/2018</b>

1. Information contained in this report is being derived from custodial data. 2. Custodial valuations may be lagged in comparison to actual fund valuations. 3. In the beginning life of a fund, fees and expenses are disproportionately large compared to investments (aka "J-Curve"); therefore performance is considered not meaningful until a fund is about 50% drawn.

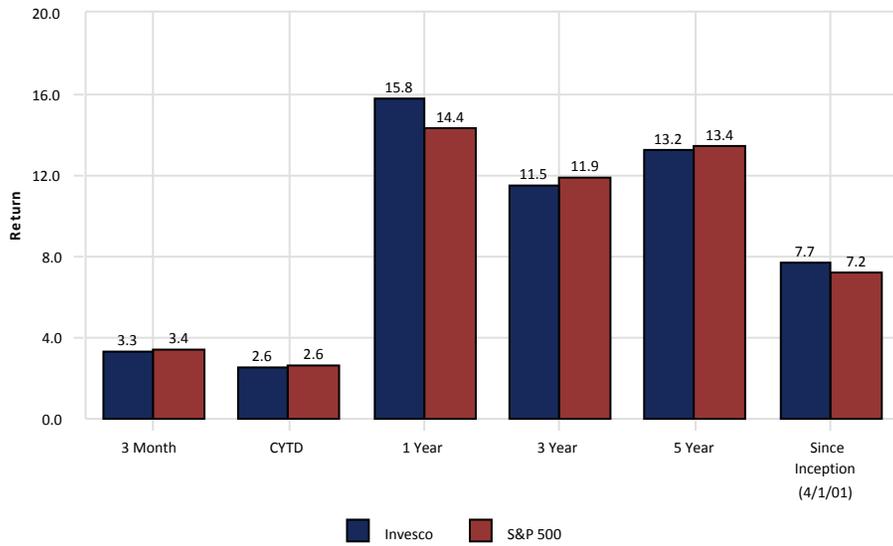
## Manager Detail

# Howard County Retirement Plans

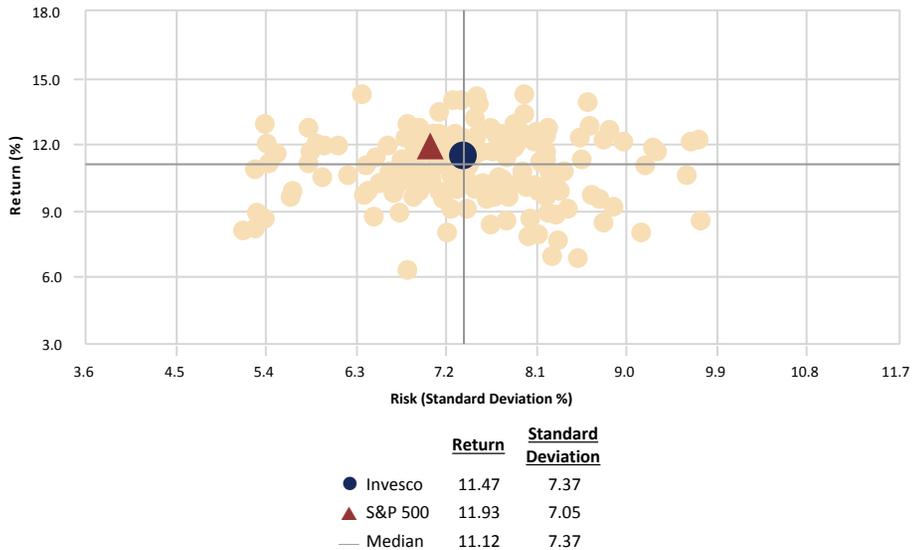
Invesco vs. IM U.S. Large Cap Core Equity (SA+CF)

June 30, 2018

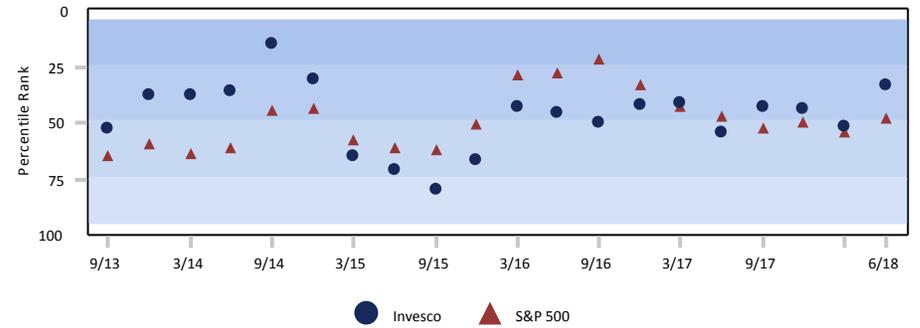
## Comparative Performance



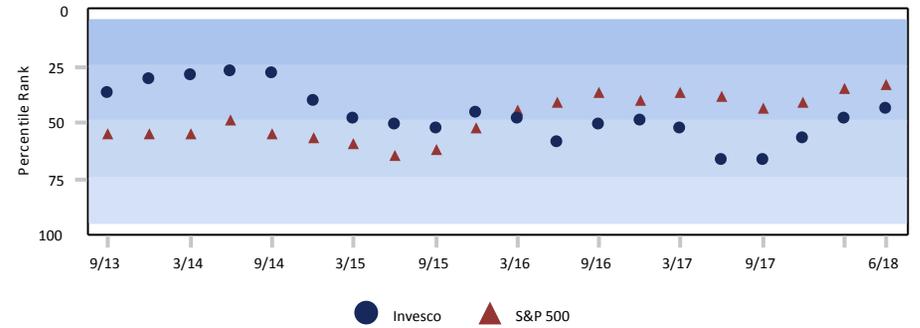
## Risk/Return (07/01/15 - 06/30/18)



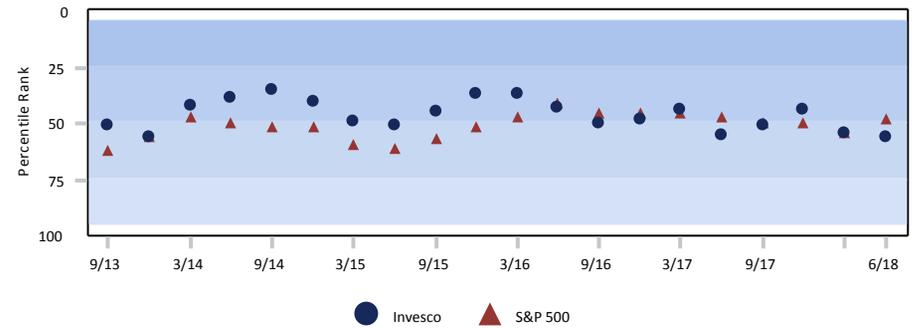
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

Invesco

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>Invesco</b>	<b>3.31</b>	<b>2.55</b>	<b>15.79</b>	<b>11.47</b>	<b>13.23</b>
S&P 500	3.43	2.65	14.37	11.93	13.42
IM U.S. Large Cap Core Equity (SA+CF) Median	2.89	2.38	14.24	11.12	13.35
Invesco Rank	37	47	33	44	56

## Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
Apple Inc	3.80	3.95	-0.15	10.76
Microsoft Corp	3.49	3.29	0.20	8.51
Amazon.com Inc	2.34	2.97	-0.63	17.44
Facebook Inc	2.12	2.02	0.10	21.61
Alphabet Inc Class A	1.72	1.46	0.26	8.87
Boeing Co	1.70	0.80	0.90	2.84
JPMorgan Chase & Co	1.65	1.54	0.11	-4.77
Berkshire Hathaway Inc	1.56	1.56	0.00	-6.43
Unitedhealth Group Inc	1.40	1.02	0.38	15.05
Mastercard Inc	1.30	0.78	0.52	12.36

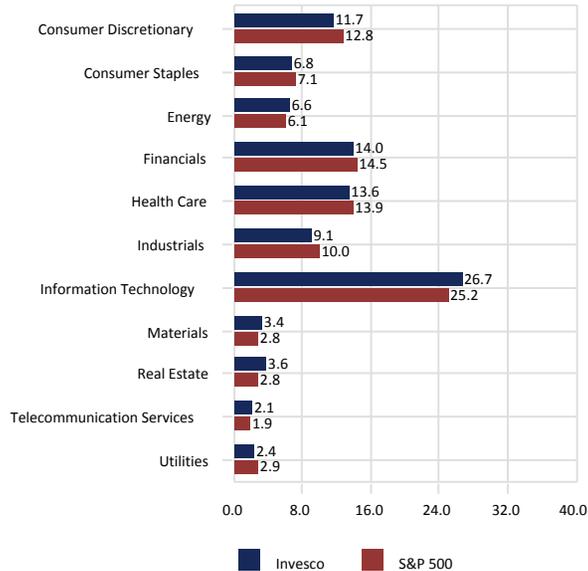
## Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
Invesco	-0.52	1.01	10.19	0.98	-0.32	98.52	101.44
S&P 500	0.00	1.00	10.02	1.00	-	100.00	100.00

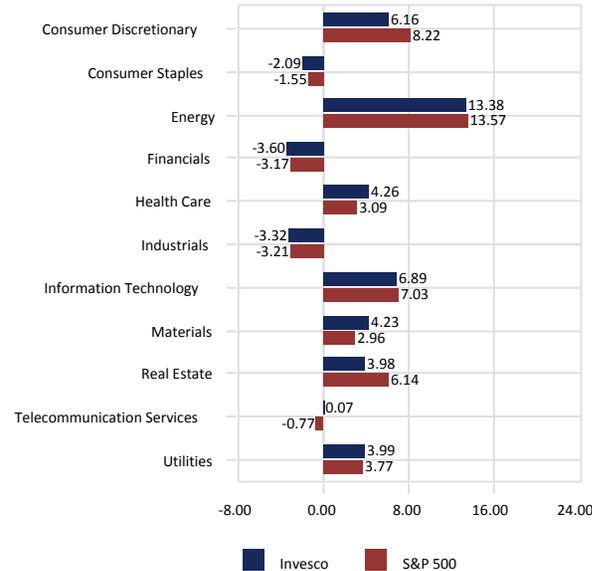
## Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	202,816,366	213,952,552
Median Mkt. Cap (\$000)	36,716,374	20,691,163
Price/Earnings ratio	18.42	20.90
Price/Book ratio	3.36	3.39
5 Yr. EPS Growth Rate (%)	14.87	14.76
Current Yield (%)	1.97	1.96
Beta (5 Years, Monthly)	1.01	1.00
Number of Stocks	226	505

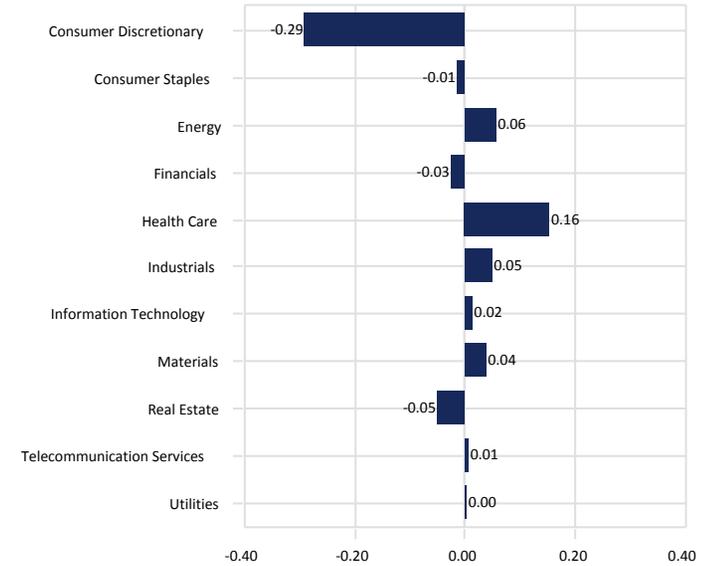
## Sector Allocation



## Sector Performance



## Total Sector Attribution



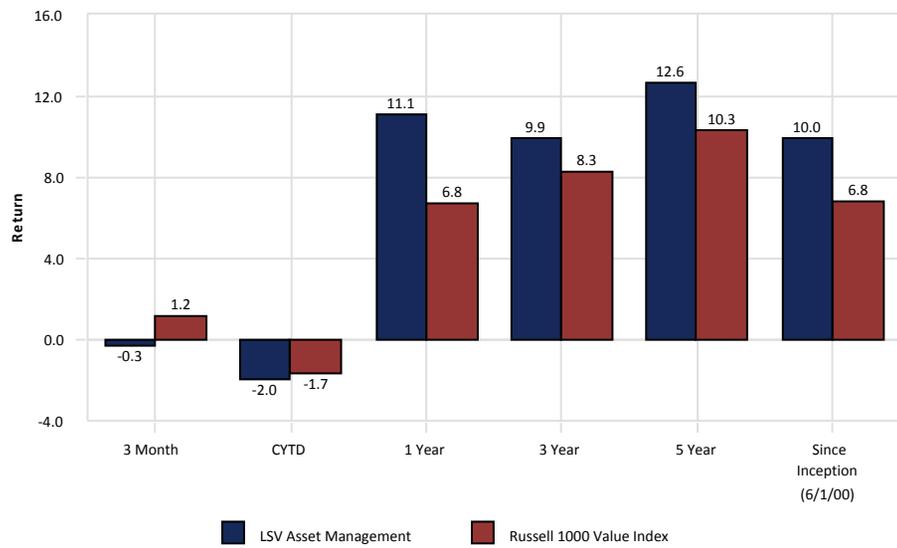
gross of fees

# Howard County Retirement Plans

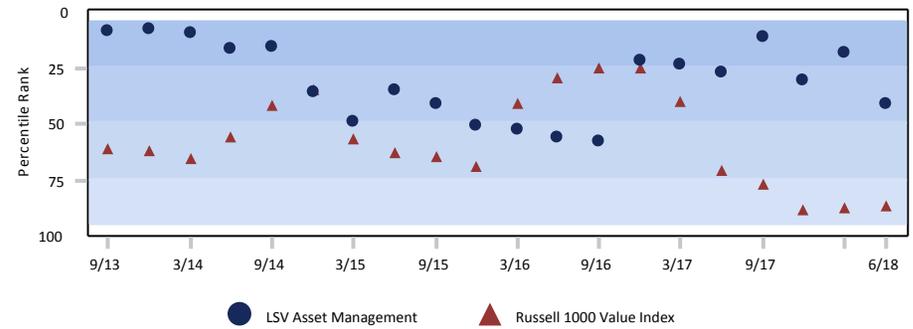
LSV Asset Management vs. IM U.S. Large Cap Value Equity (SA+CF)

June 30, 2018

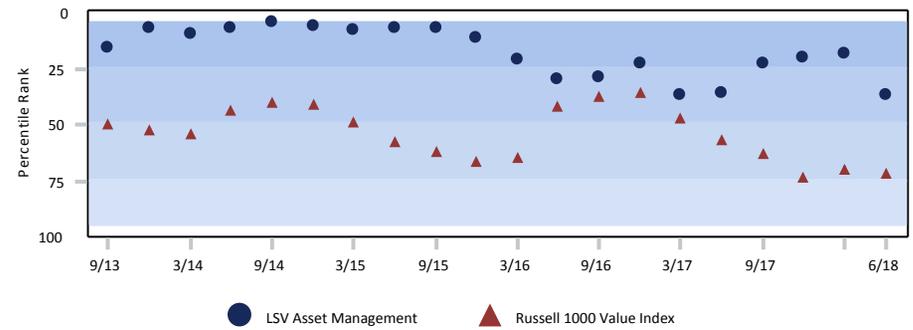
## Comparative Performance



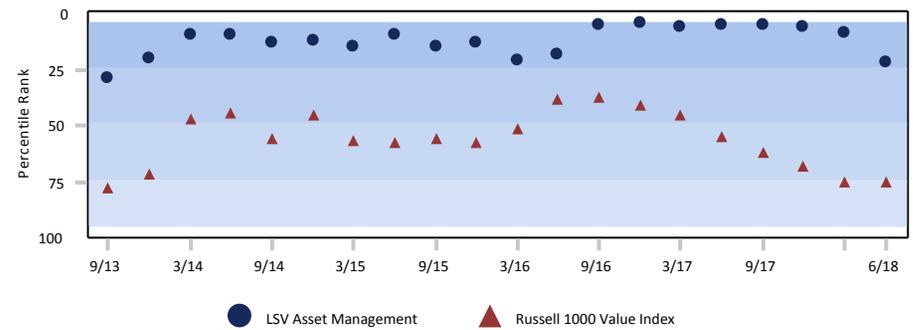
## 1 Year Rolling Percentile Ranking



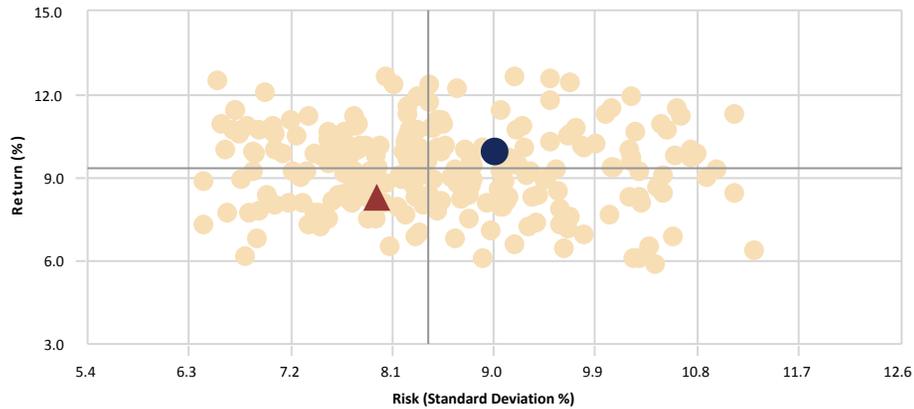
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Risk/Return (07/01/15 - 06/30/18)



	<u>Return</u>	<u>Standard Deviation</u>
● LSV Asset Management	9.93	9.02
▲ Russell 1000 Value Index	8.26	7.97
— Median	9.33	8.41

gross of fees

# Howard County Retirement Plans

LSV Asset Management

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>LSV Asset Management</b>	<b>-0.31</b>	<b>-2.00</b>	<b>11.12</b>	<b>9.93</b>	<b>12.64</b>
<i>Russell 1000 Value Index</i>	1.18	-1.69	6.77	8.26	10.34
<i>IM U.S. Large Cap Value Equity (SA+CF) Median</i>	1.69	-0.47	10.29	9.33	11.50
<b>LSV Asset Management Rank</b>	<b>92</b>	<b>82</b>	<b>41</b>	<b>37</b>	<b>22</b>

## Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
JPMorgan Chase & Co	3.31	2.71	0.60	-4.77
Cisco Systems Inc	2.77	1.59	1.18	1.13
Pfizer Inc	2.32	1.62	0.70	3.22
Bank of America Corp	2.31	2.05	0.26	-5.61
Intel Corp	2.30	1.78	0.52	-4.01
Johnson & Johnson	2.22	2.05	0.17	-4.61
Exxon Mobil Corp	2.03	2.69	-0.66	12.00
Citigroup Inc	2.03	1.31	0.72	-0.39
Valero Energy Corp	1.83	0.37	1.46	20.29
Chevron Corp	1.67	1.85	-0.18	11.82

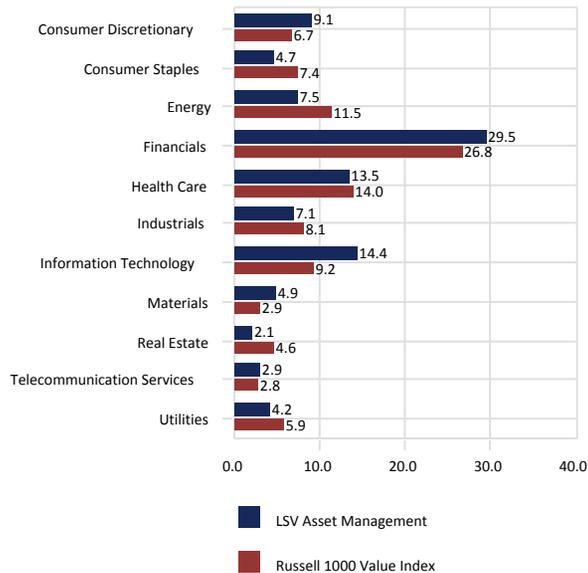
## Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
LSV Asset Management	0.99	1.08	11.27	0.94	0.59	111.72	104.24
<i>Russell 1000 Value Index</i>	0.00	1.00	10.12	1.00	-	100.00	100.00

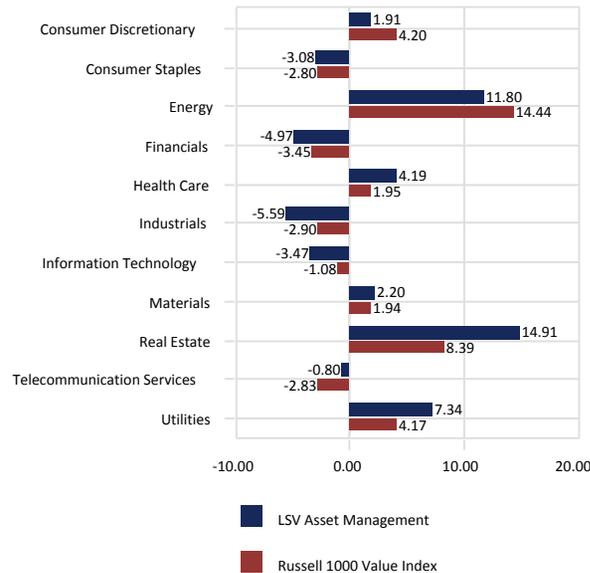
## Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	91,105,468	117,081,350
Median Mkt. Cap (\$000)	15,464,816	9,900,412
Price/Earnings ratio	12.98	16.10
Price/Book ratio	2.12	2.15
5 Yr. EPS Growth Rate (%)	12.48	8.54
Current Yield (%)	2.77	2.53
Beta (5 Years, Monthly)	1.09	1.00
Number of Stocks	150	729

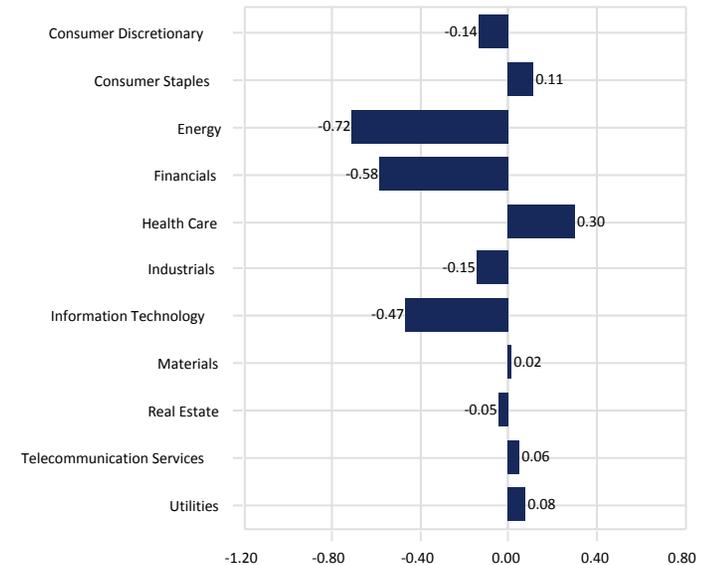
## Sector Allocation



## Sector Performance



## Total Sector Attribution



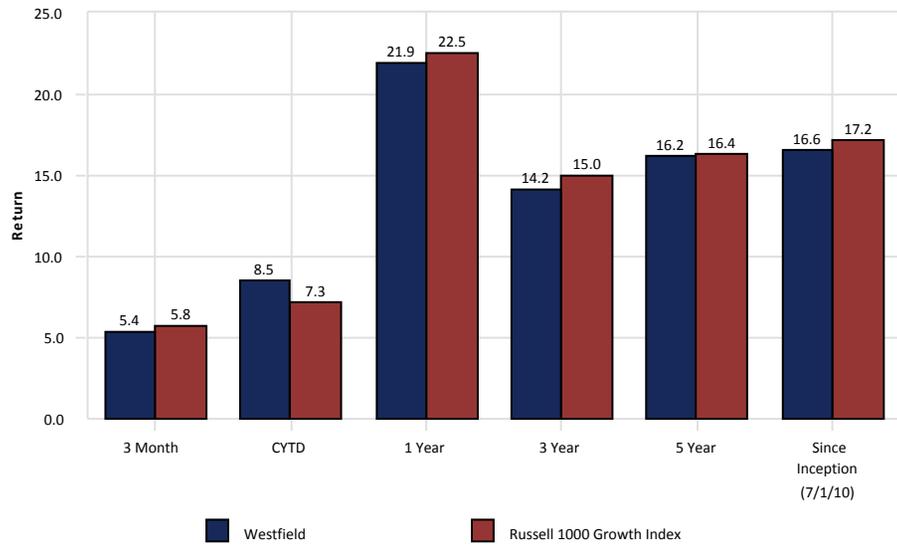
gross of fees

# Howard County Retirement Plans

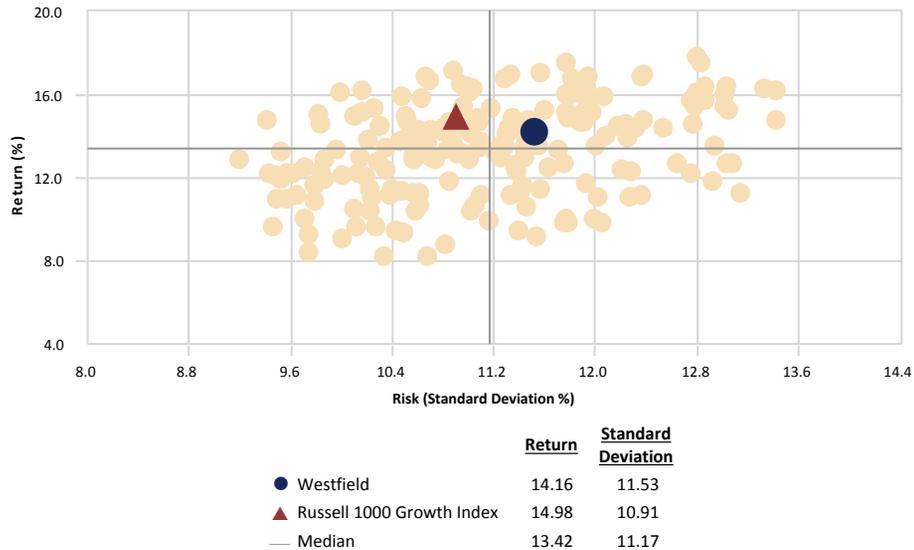
Westfield vs. IM U.S. Large Cap Growth Equity (SA+CF)

June 30, 2018

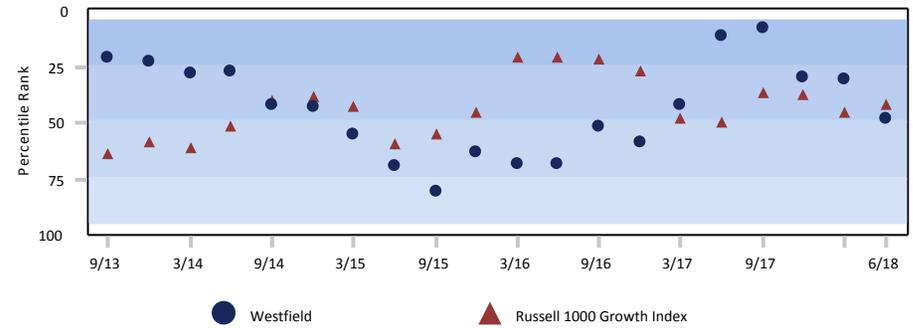
## Comparative Performance



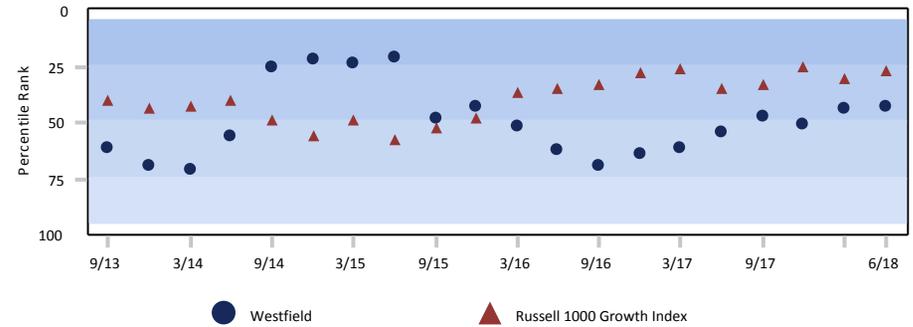
## Risk/Return (07/01/15 - 06/30/18)



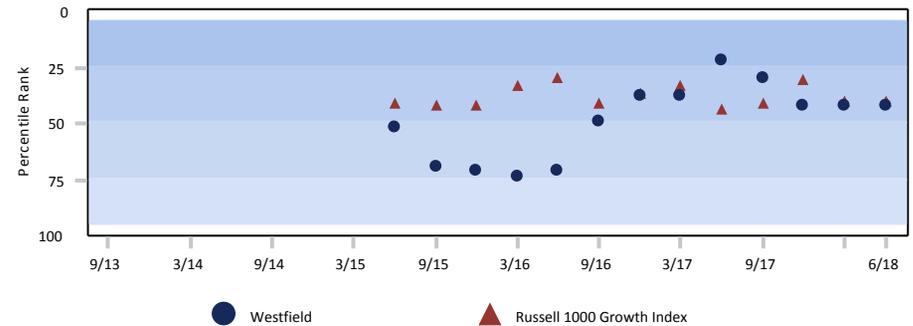
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

Westfield

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>Westfield</b>	<b>5.41</b>	<b>8.53</b>	<b>21.89</b>	<b>14.16</b>	<b>16.19</b>
<i>Russell 1000 Growth Index</i>	5.76	7.25	22.51	14.98	16.36
<i>IM U.S. Large Cap Growth Equity (SA+CF) Median</i>	5.22	7.36	21.27	13.42	15.61
<b>Westfield Rank</b>	<b>48</b>	<b>41</b>	<b>48</b>	<b>43</b>	<b>42</b>

## Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
Amazon.com Inc	5.83	5.40	0.43	17.44
Facebook Inc	4.76	3.61	1.15	21.61
Apple Inc	4.54	7.12	-2.58	10.76
Visa Inc	3.82	1.85	1.97	10.90
Alphabet Inc	3.57	2.65	0.92	8.13
Microsoft Corp	3.36	5.53	-2.17	8.51
Boeing Co	2.99	1.44	1.55	2.84
salesforce.com Inc	2.80	0.75	2.05	17.28
Home Depot Inc. (The)	2.76	1.76	1.00	10.06
Alphabet Inc Class A	2.70	2.64	0.06	8.87

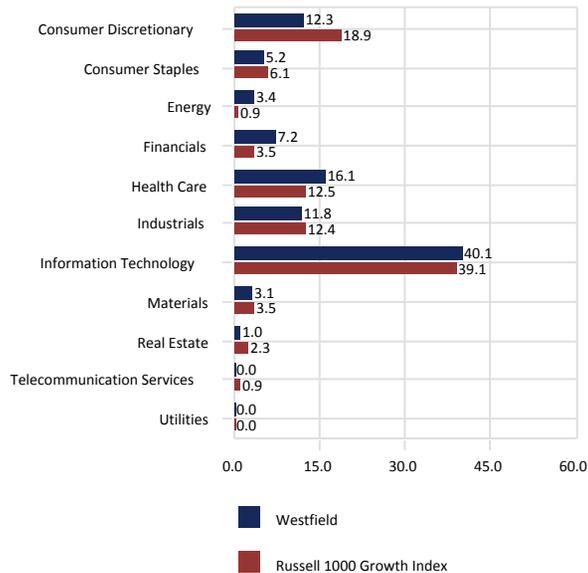
## Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
Westfield	-0.95	1.02	11.53	0.93	-0.21	100.59	109.21
<i>Russell 1000 Growth Index</i>	0.00	1.00	10.91	1.00	-	100.00	100.00

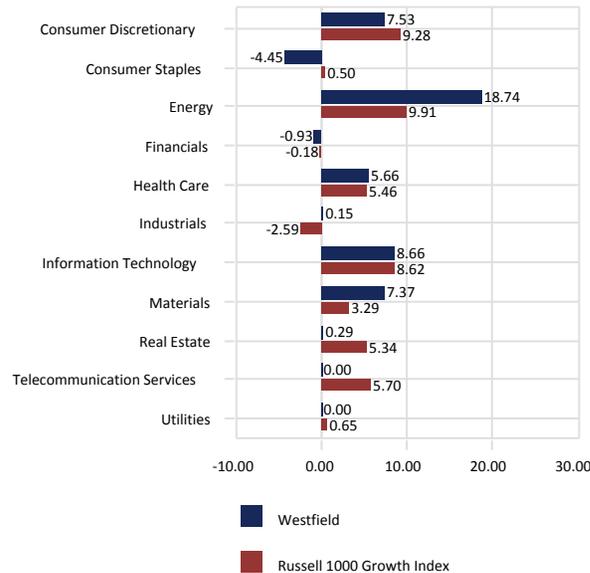
## Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	256,747,768	267,911,294
Median Mkt. Cap (\$000)	66,635,318	12,043,105
Price/Earnings ratio	25.34	28.75
Price/Book ratio	5.54	7.16
5 Yr. EPS Growth Rate (%)	27.39	21.26
Current Yield (%)	1.02	1.25
Beta (5 Years, Monthly)	1.03	1.00
Number of Stocks	48	542

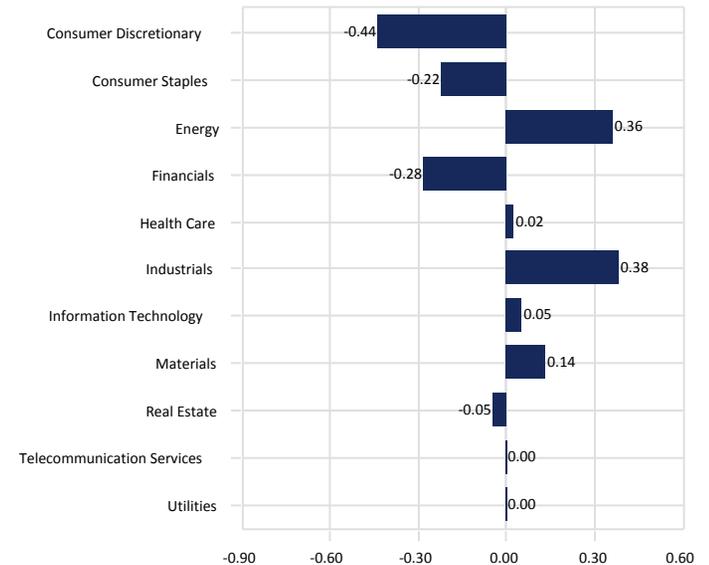
## Sector Allocation



## Sector Performance



## Total Sector Attribution



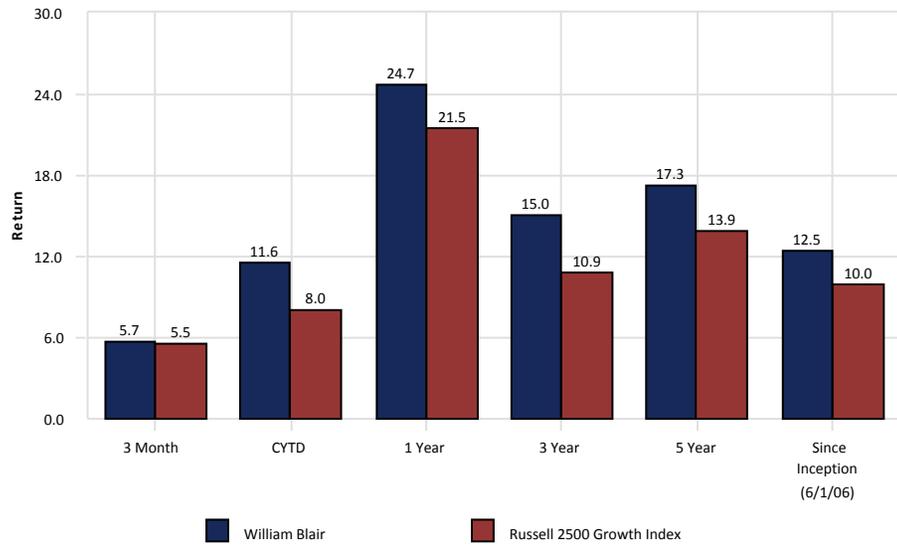
gross of fees

# Howard County Retirement Plans

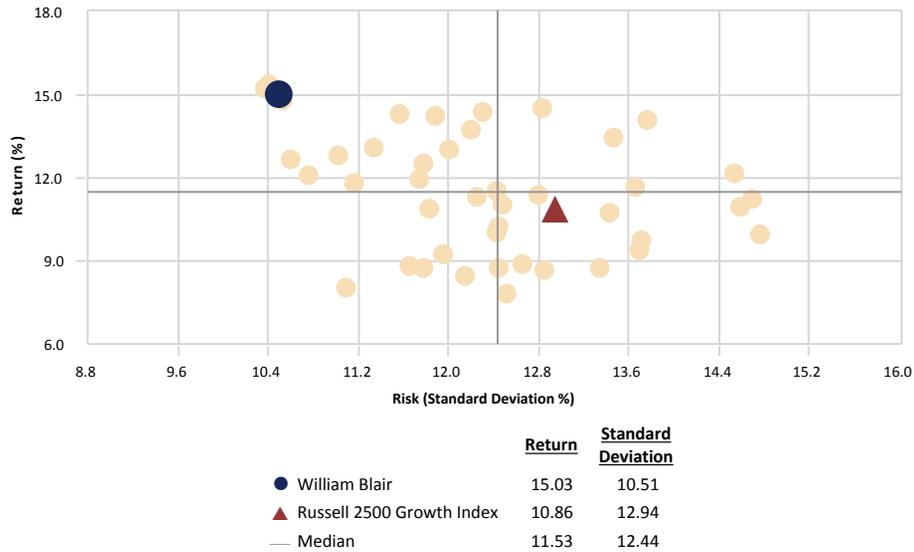
William Blair vs. IM U.S. SMID Cap Growth Equity (SA+CF)

June 30, 2018

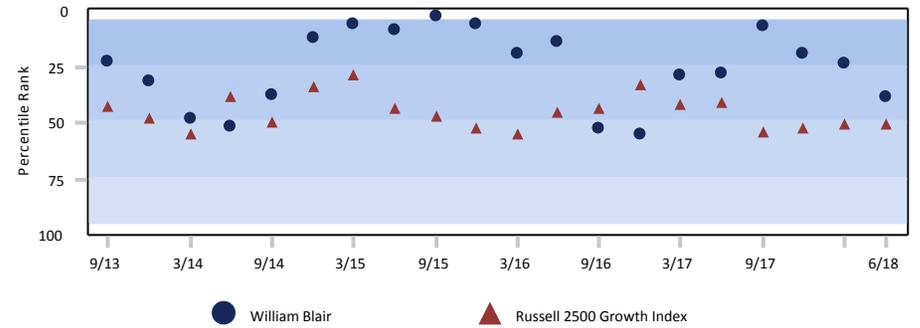
## Comparative Performance



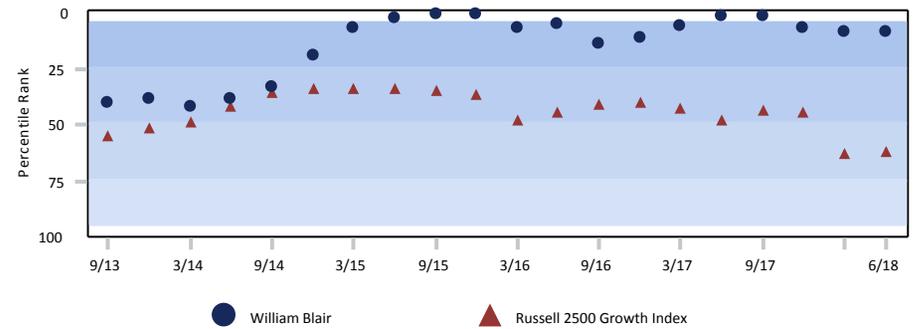
## Risk/Return (07/01/15 - 06/30/18)



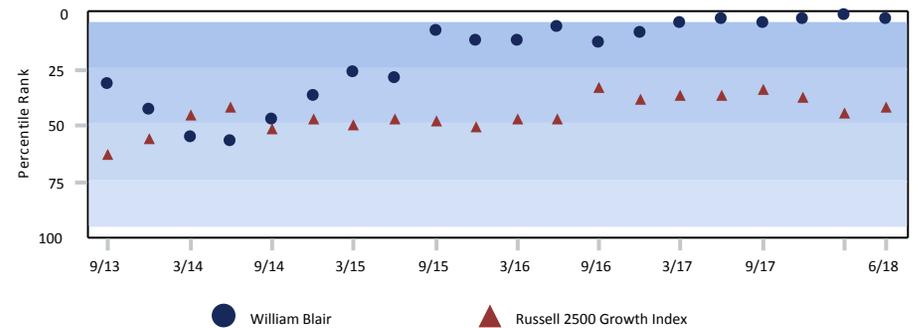
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

William Blair

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>William Blair</b>	<b>5.68</b>	<b>11.63</b>	<b>24.70</b>	<b>15.03</b>	<b>17.30</b>
<i>Russell 2500 Growth Index</i>	5.53	8.04	21.53	10.86	13.87
<i>IM U.S. SMID Cap Growth Equity (SA+CF) Median</i>	5.80	9.36	21.91	11.53	13.48
<b>William Blair Rank</b>	<b>53</b>	<b>36</b>	<b>39</b>	<b>9</b>	<b>3</b>

## Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
CoStar Group Inc	3.20	0.00	3.20	13.77
Copart Inc	3.08	0.00	3.08	11.05
BWX Technologies Inc	2.68	0.29	2.39	-1.68
TransUnion	2.37	0.00	2.37	26.31
Encompass Health Corp	2.36	0.31	2.05	18.89
Martin Marietta Materials Inc.	2.35	0.00	2.35	7.95
Ligand Pharmaceuticals Inc	2.31	0.20	2.11	25.44
Six Flags Entertainment Corp	2.25	0.23	2.02	13.86
Booz Allen Hamilton Holding Corp	2.14	0.27	1.87	13.41
Adtalem Global Education Inc	1.95	0.00	1.95	1.16

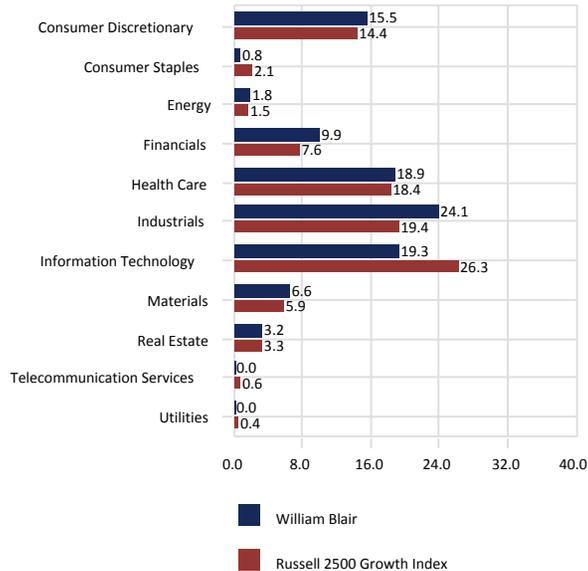
## Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
William Blair	6.09	0.78	10.51	0.92	0.83	97.28	65.87
<i>Russell 2500 Growth Index</i>	0.00	1.00	12.94	1.00	-	100.00	100.00

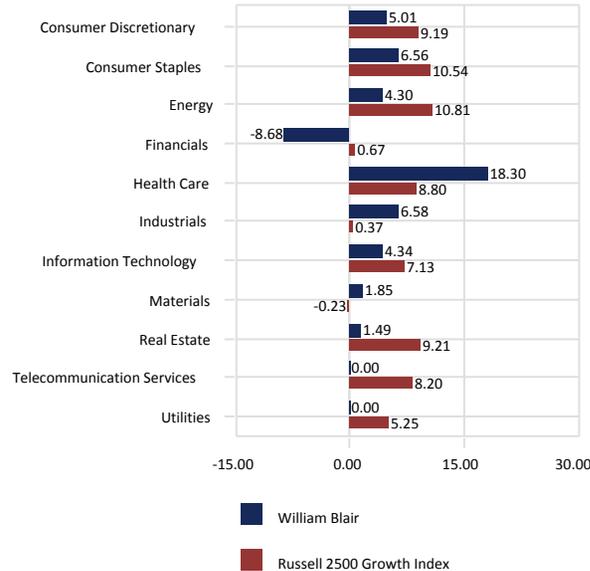
## Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	7,153,759	4,900,886
Median Mkt. Cap (\$000)	5,818,945	1,311,430
Price/Earnings ratio	30.25	26.43
Price/Book ratio	4.63	4.95
5 Yr. EPS Growth Rate (%)	19.67	17.70
Current Yield (%)	0.61	0.72
Beta (5 Years, Monthly)	0.79	1.00
Number of Stocks	74	1,473

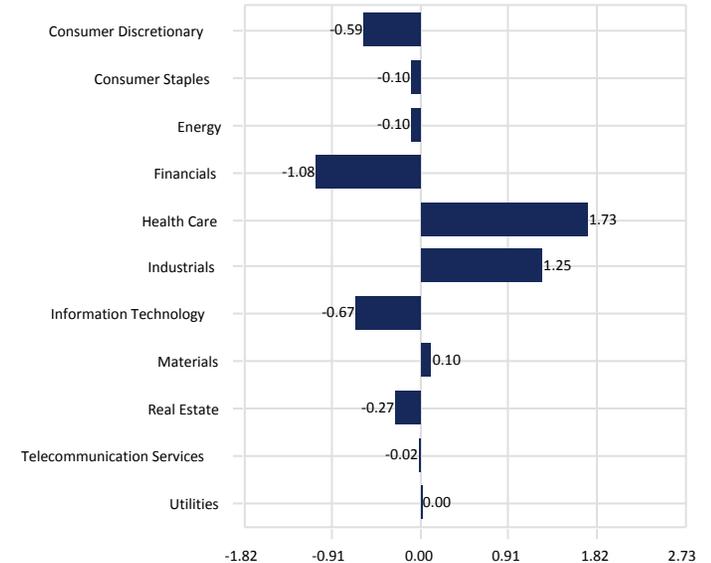
## Sector Allocation



## Sector Performance



## Total Sector Attribution



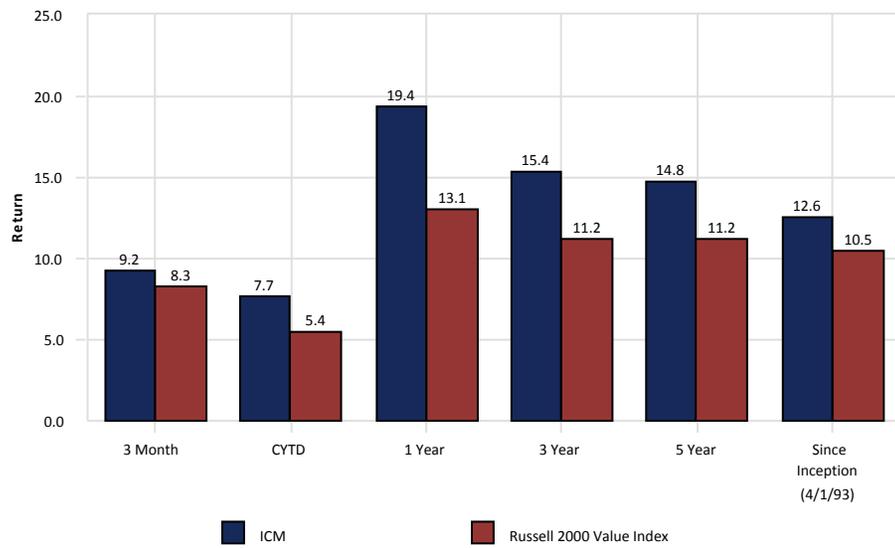
gross of fees

# Howard County Retirement Plans

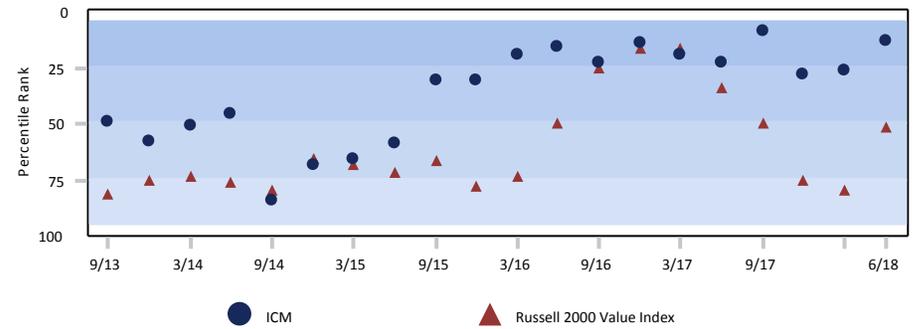
ICM vs. IM U.S. Small Cap Value Equity (SA+CF)

June 30, 2018

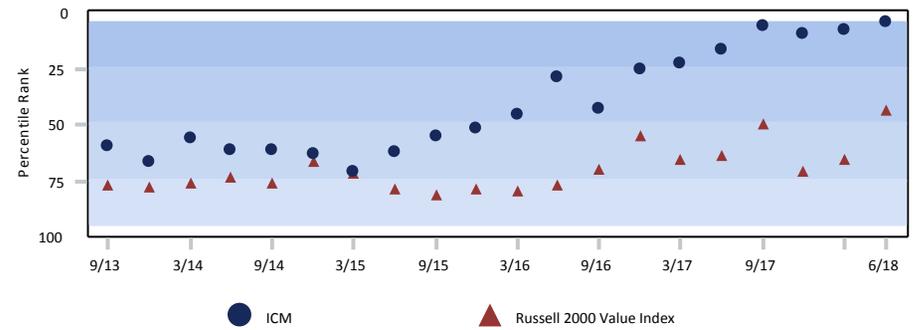
## Comparative Performance



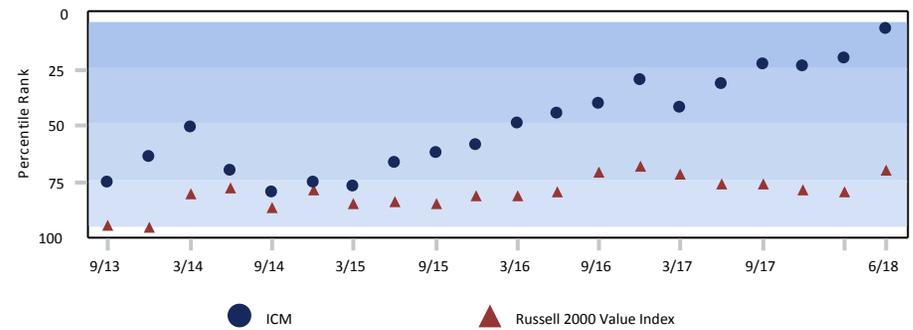
## 1 Year Rolling Percentile Ranking



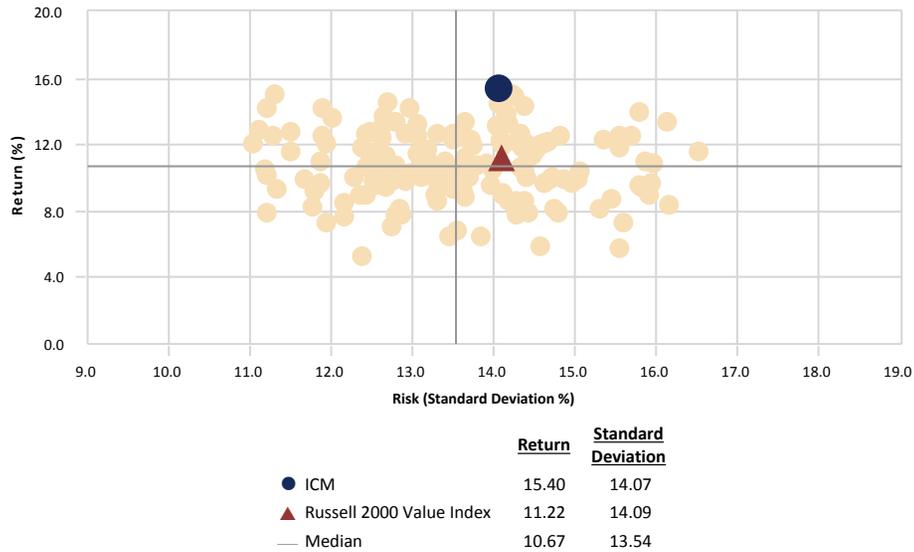
## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



## Risk/Return (07/01/15 - 06/30/18)



gross of fees

# Howard County Retirement Plans

ICM

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>ICM</b>	<b>9.24</b>	<b>7.71</b>	<b>19.37</b>	<b>15.40</b>	<b>14.78</b>
<i>Russell 2000 Value Index</i>	8.30	5.44	13.10	11.22	11.18
<i>IM U.S. Small Cap Value Equity (SA+CF) Median</i>	5.62	3.99	13.30	10.67	12.21
<b>ICM Rank</b>	<b>9</b>	<b>10</b>	<b>13</b>	<b>4</b>	<b>7</b>

## Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
Carrizo Oil & Gas Inc	1.51	0.00	1.51	74.06
Ensign Group Inc (The)	1.50	0.00	1.50	36.37
Armstrong World Industries Inc	1.47	0.00	1.47	12.25
Simmons First National Corp	1.39	0.25	1.14	5.59
CBIZ Inc	1.37	0.11	1.26	26.03
ICF International Inc	1.35	0.10	1.25	21.80
Mitel Networks Corp	1.34	0.00	1.34	18.17
Kite Realty Group Trust	1.34	0.13	1.21	14.46
Belden Inc	1.33	0.23	1.10	-11.27
Perficient Inc	1.32	0.05	1.27	15.05

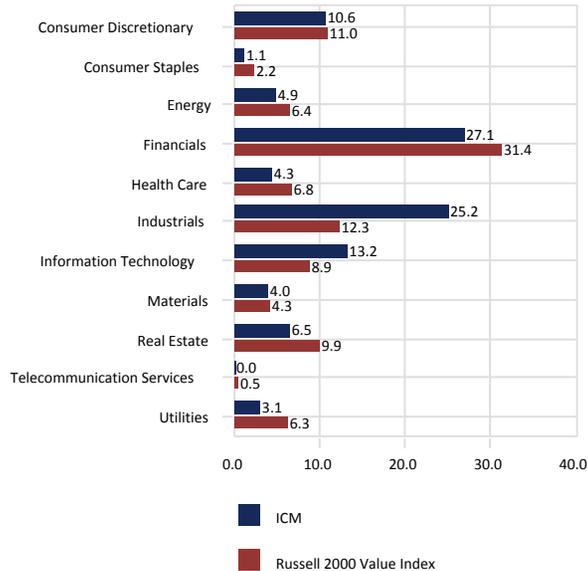
## Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
ICM	4.05	0.98	14.07	0.96	1.27	105.59	82.32
<i>Russell 2000 Value Index</i>	0.00	1.00	14.09	1.00	-	100.00	100.00

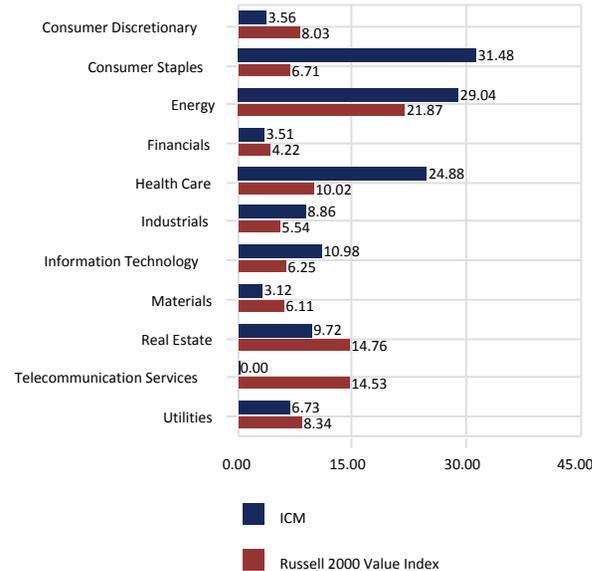
## Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	1,963,275	2,081,335
Median Mkt. Cap (\$000)	1,525,441	827,105
Price/Earnings ratio	20.48	15.70
Price/Book ratio	1.89	1.66
5 Yr. EPS Growth Rate (%)	6.19	7.41
Current Yield (%)	1.26	2.00
Beta (5 Years, Monthly)	1.00	1.00
Number of Stocks	104	1,364

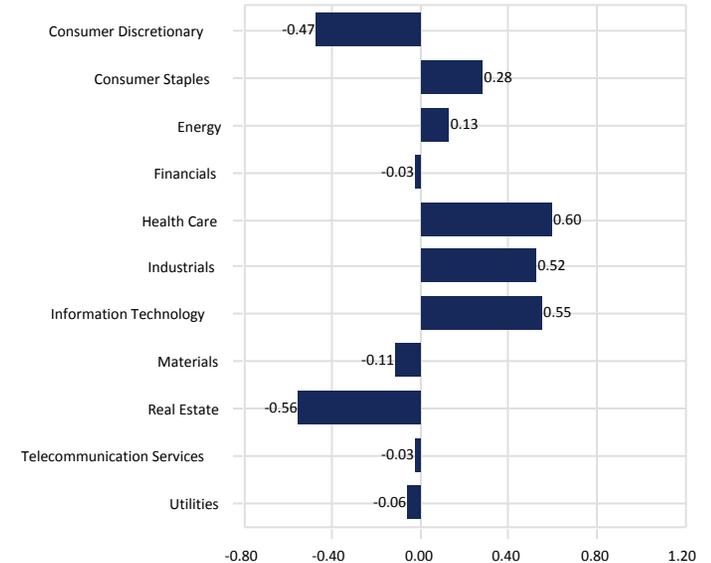
## Sector Allocation



## Sector Performance



## Total Sector Attribution



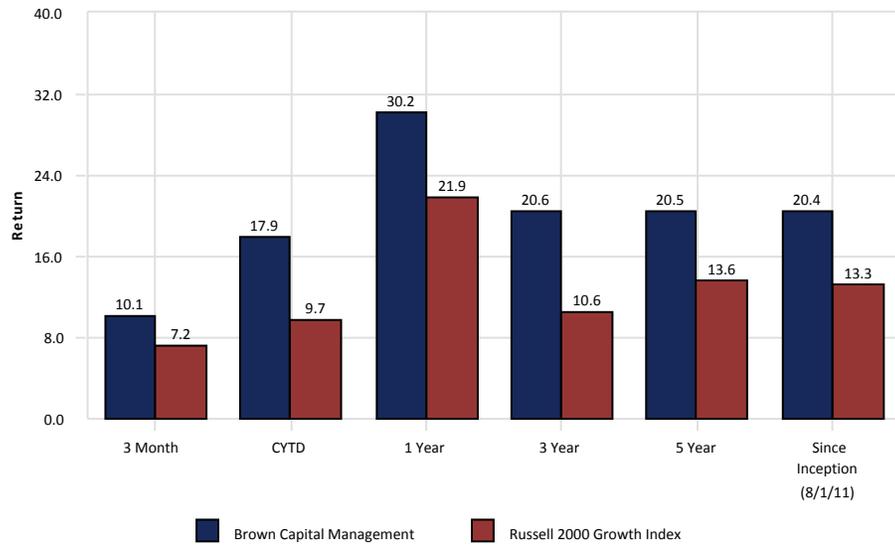
gross of fees

# Howard County Retirement Plans

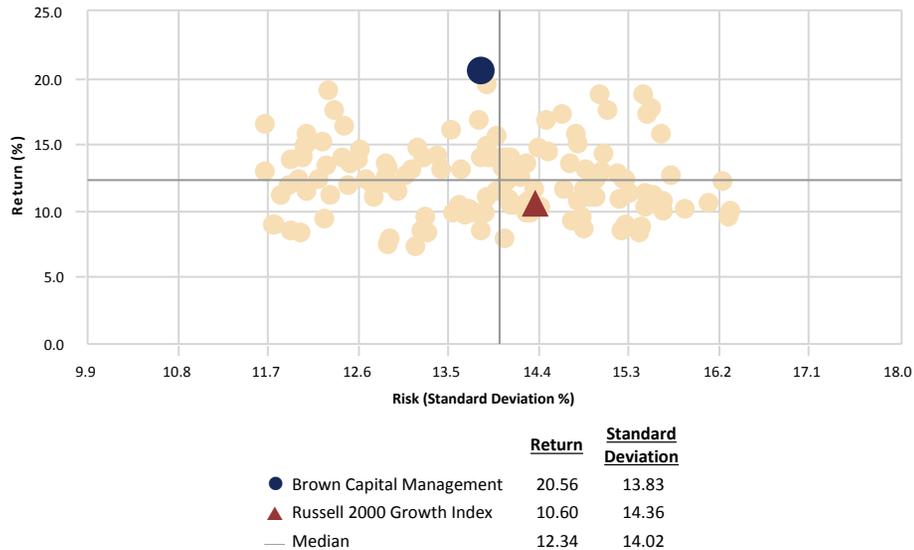
Brown Capital Management vs. IM U.S. Small Cap Growth Equity (SA+CF)

June 30, 2018

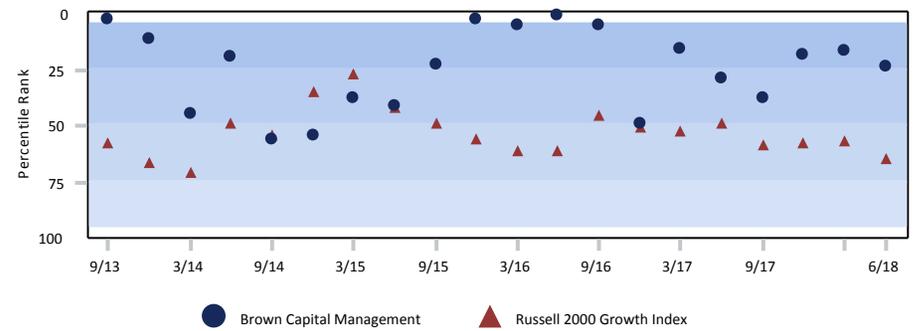
## Comparative Performance



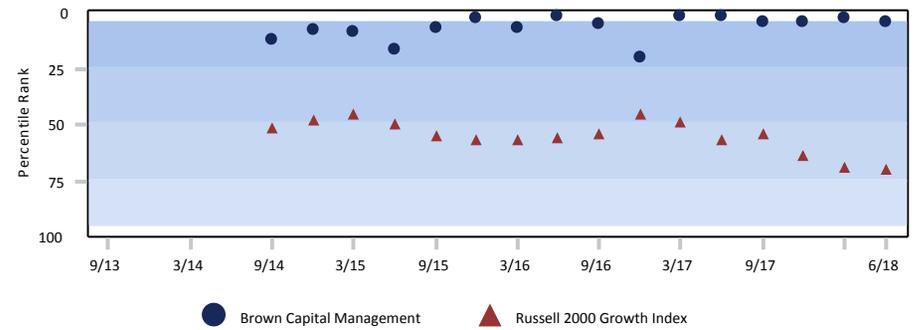
## Risk/Return (07/01/15 - 06/30/18)



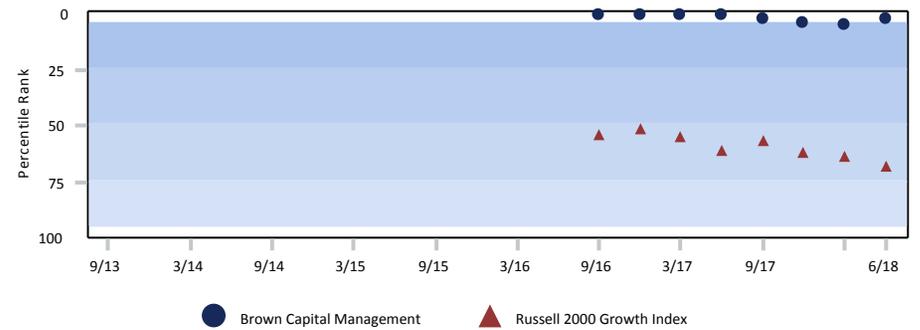
## 1 Year Rolling Percentile Ranking



## 3 Year Rolling Percentile Ranking



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

## Brown Capital Management

June 30, 2018

### Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>Brown Capital Management</b>	<b>10.07</b>	<b>17.90</b>	<b>30.19</b>	<b>20.56</b>	<b>20.47</b>
<i>Russell 2000 Growth Index</i>	7.23	9.70	21.86	10.60	13.65
<i>IM U.S. Small Cap Growth Equity (SA+CF) Median</i>	8.82	12.12	24.51	12.34	14.60
<b>Brown Capital Management Rank</b>	<b>36</b>	<b>18</b>	<b>24</b>	<b>4</b>	<b>3</b>

### Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
Neogen Corp	5.88	0.37	5.51	19.70
Tyler Technologies Inc.	5.24	0.00	5.24	5.28
Proto Labs Inc	5.23	0.29	4.94	1.19
ABIOMED Inc	5.10	0.00	5.10	40.57
Blackbaud Inc	4.89	0.45	4.44	0.75
Veeva Systems Inc	4.86	0.00	4.86	5.26
Paycom Software Inc	4.56	0.00	4.56	-7.97
Quidel Corp	4.31	0.20	4.11	28.35
Cognex Corp	4.23	0.00	4.23	-14.11
ANSYS Inc	4.20	0.00	4.20	11.16

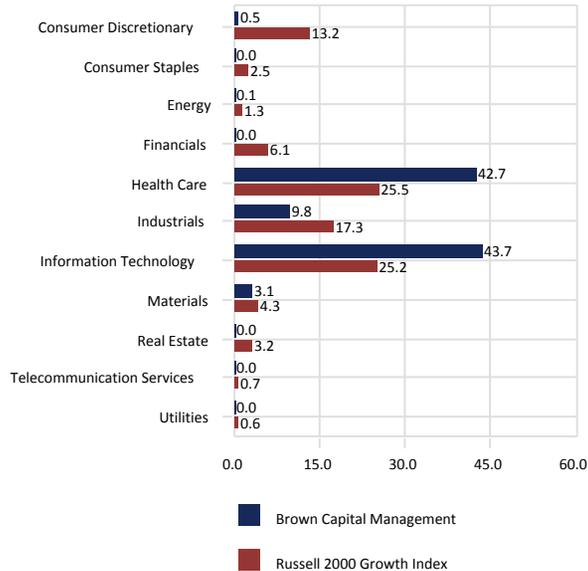
### Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
Brown Capital Management	10.84	0.85	13.83	0.78	1.26	110.09	54.72
<i>Russell 2000 Growth Index</i>	0.00	1.00	14.36	1.00	-	100.00	100.00

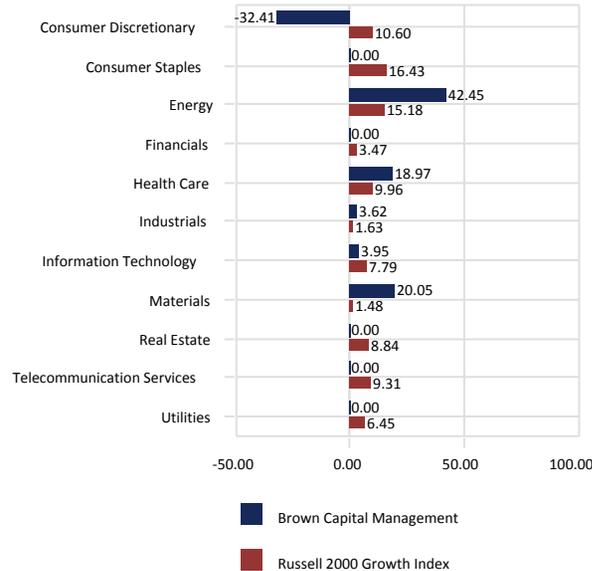
### Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	5,457,733	2,415,553
Median Mkt. Cap (\$000)	3,020,082	1,022,137
Price/Earnings ratio	60.20	25.65
Price/Book ratio	6.39	4.33
5 Yr. EPS Growth Rate (%)	21.15	14.47
Current Yield (%)	0.17	0.64
Beta (5 Years, Monthly)	0.86	1.00
Number of Stocks	36	1,225

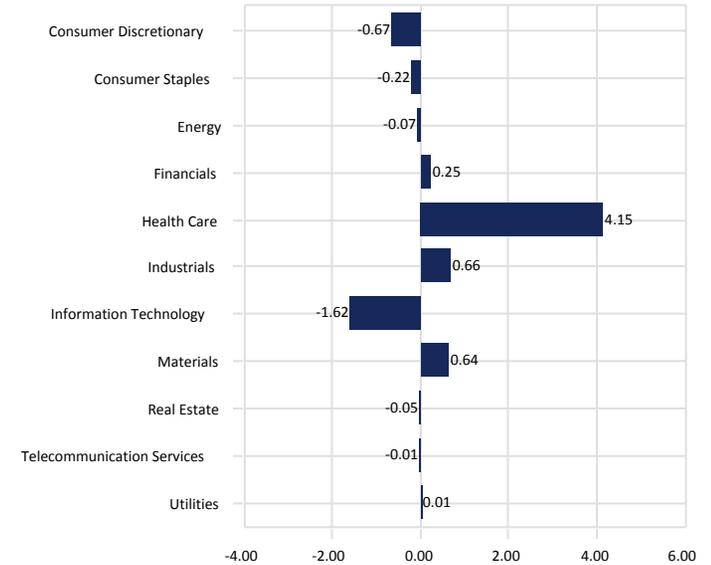
### Sector Allocation



### Sector Performance



### Total Sector Attribution



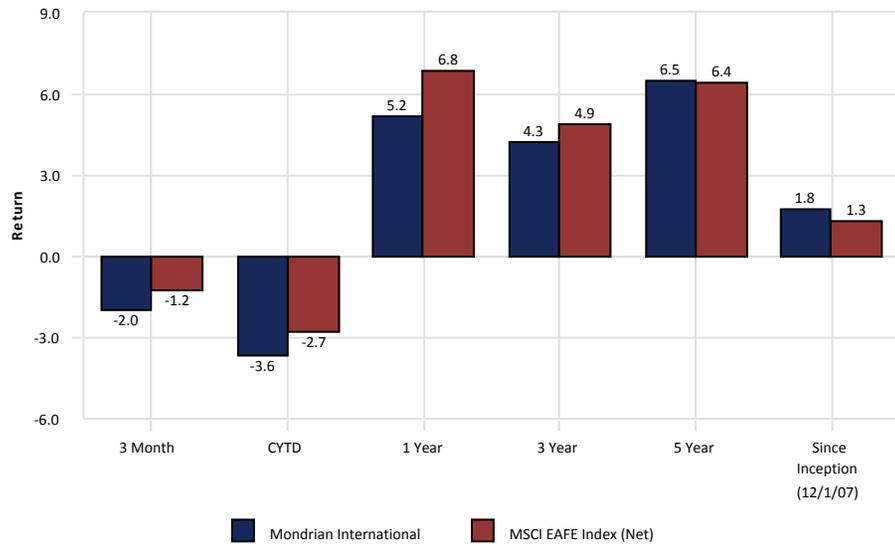
gross of fees

# Howard County Retirement Plans

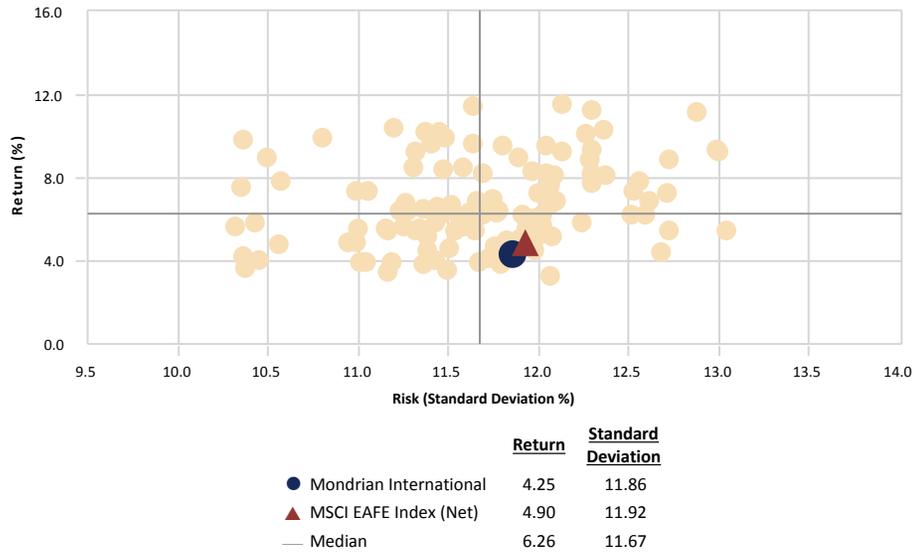
## Mondrian International vs. IM International Core Equity (SA+CF)

June 30, 2018

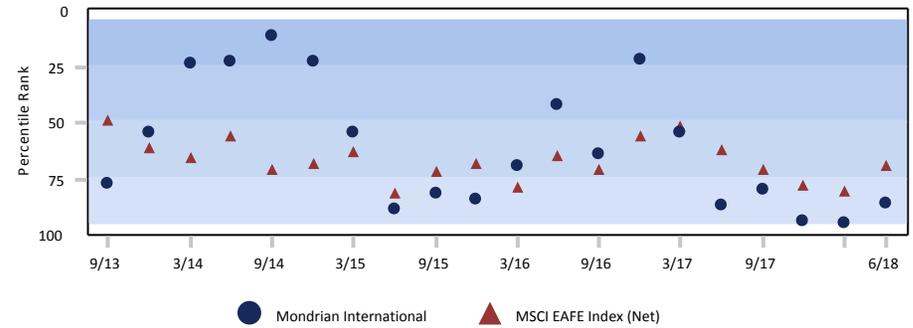
### Comparative Performance



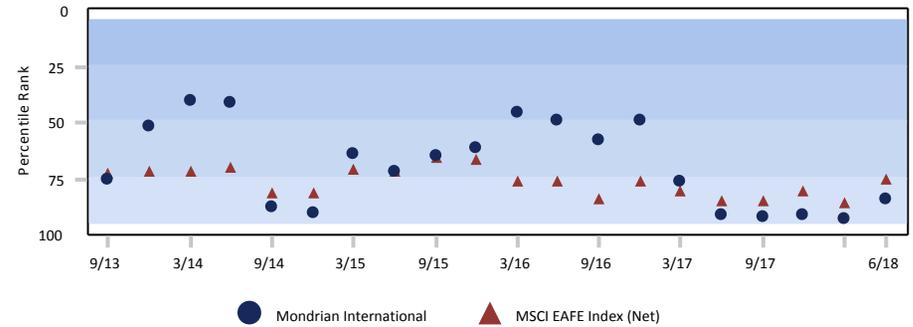
### Risk/Return (07/01/15 - 06/30/18)



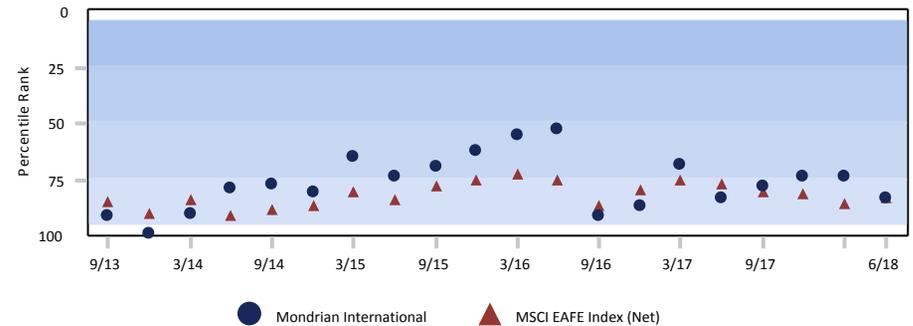
### 1 Year Rolling Percentile Ranking



### 3 Year Rolling Percentile Ranking



### 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

## Mondrian International

June 30, 2018

### Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>Mondrian International</b>	<b>-1.98</b>	<b>-3.64</b>	<b>5.16</b>	<b>4.25</b>	<b>6.48</b>
<i>MSCI EAFE Index (Net)</i>	-1.24	-2.75	6.84	4.90	6.44
<i>IM International Core Equity (SA+CF) Median</i>	-1.82	-2.63	8.50	6.26	7.89
<b>Mondrian International Rank</b>	<b>55</b>	<b>75</b>	<b>86</b>	<b>84</b>	<b>83</b>

### Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
Sanofi	3.39	0.63	2.76	4.23
Tesco PLC	3.36	0.23	3.13	18.14
Enel Ente Nazionale Per L'Energia Elettrica SPA, Roma	3.30	0.32	2.98	-9.37
Eni SpA	3.27	0.33	2.94	8.05
United Overseas Bank Ltd	3.14	0.18	2.96	-4.39
CK Hutchison Holdings Ltd	3.06	0.20	2.86	-9.33
Telia Company AB	2.92	0.09	2.83	0.18
BP PLC	2.87	1.06	1.81	14.92
Iberdrola SA, Bilbao	2.81	0.31	2.50	5.03
Honda Motor Co Ltd	2.80	0.33	2.47	-14.13

### Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
Mondrian International	-0.34	0.95	11.86	0.91	-0.17	100.35	104.95
<i>MSCI EAFE Index (Net)</i>	0.00	1.00	11.92	1.00	-	100.00	100.00

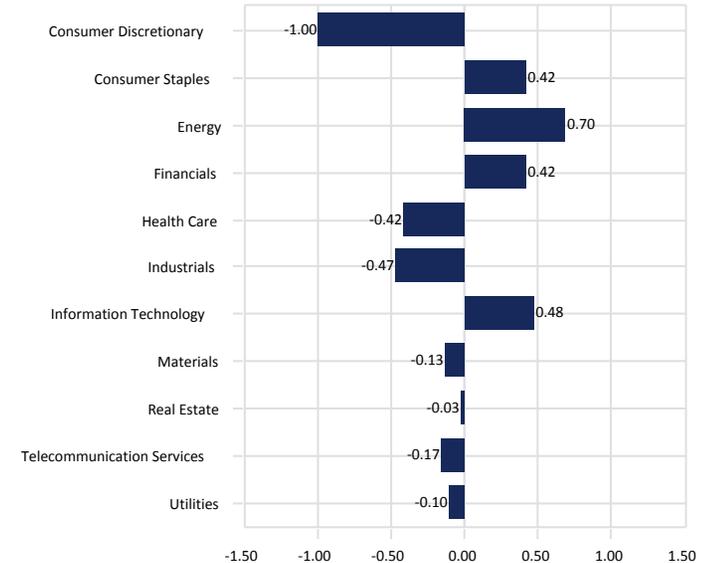
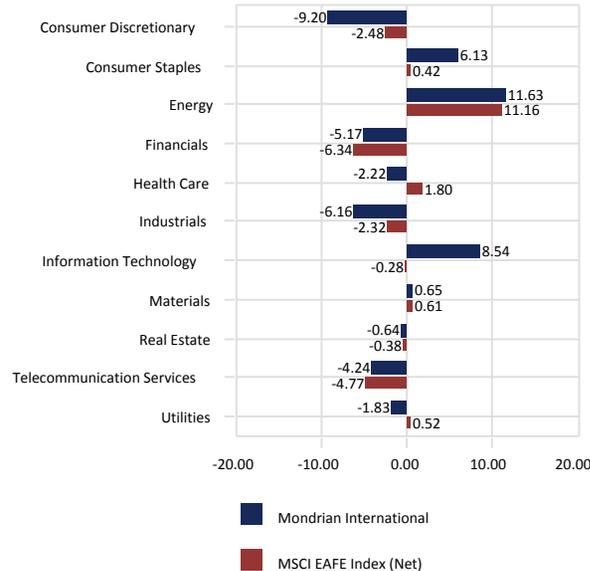
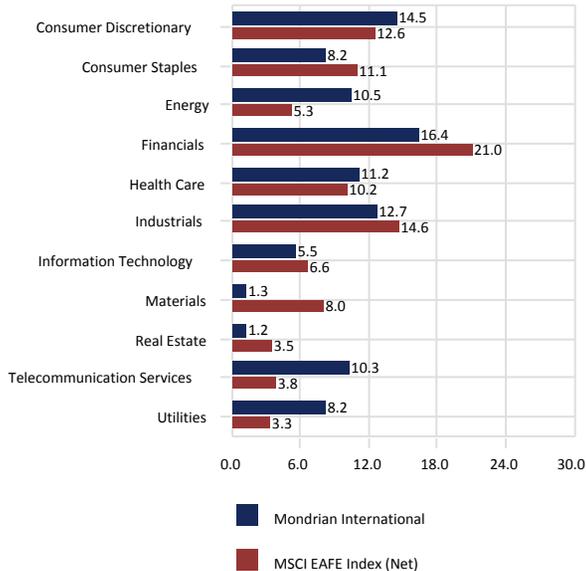
### Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	52,172,627	59,946,965
Median Mkt. Cap (\$000)	34,544,878	11,374,752
Price/Earnings ratio	13.34	14.10
Price/Book ratio	1.60	2.15
5 Yr. EPS Growth Rate (%)	9.89	10.98
Current Yield (%)	4.23	3.28
Beta (5 Years, Monthly)	0.95	1.00
Number of Stocks	60	926

### Sector Allocation

### Sector Performance

### Total Sector Attribution



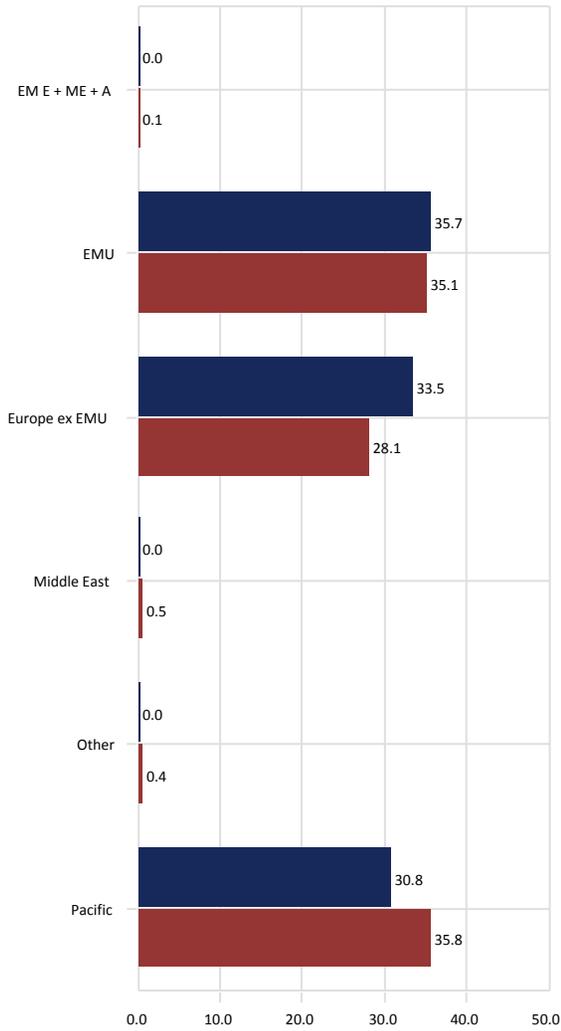
gross of fees

# Howard County Retirement Plans

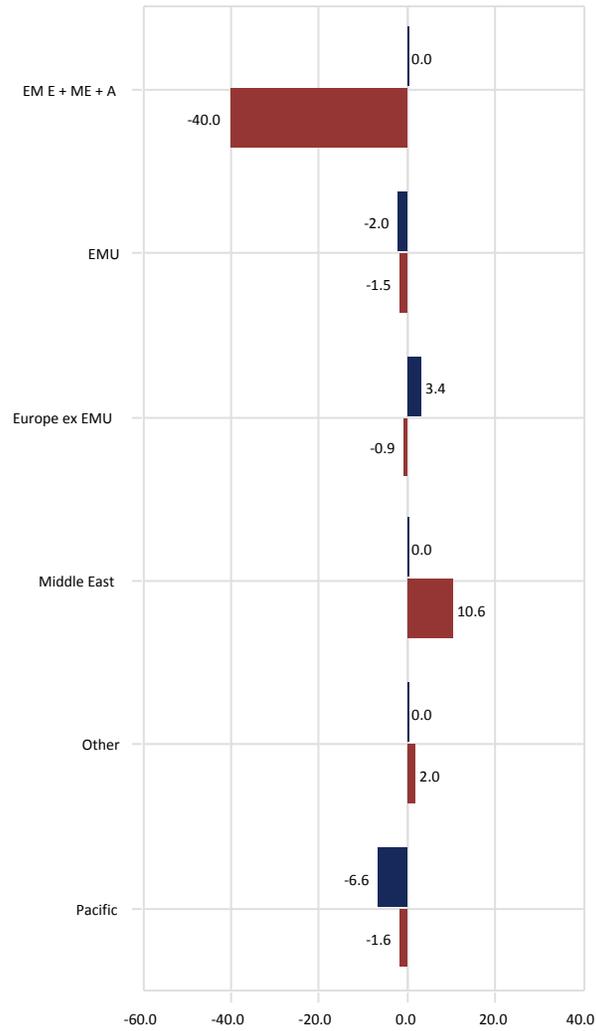
Mondrian International vs. MSCI EAFE Index (Net)

June 30, 2018

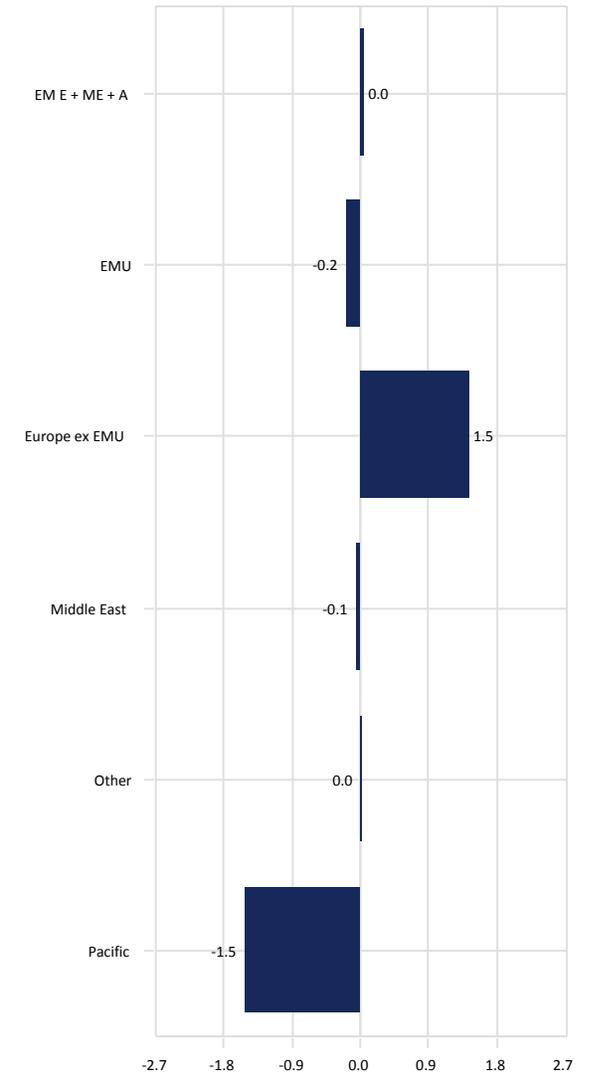
Allocation Quarterly



Performance Quarterly



Attribution Quarterly



■ Mondrian International ■ MSCI EAFE Index (Net)

■ Mondrian International ■ MSCI EAFE Index (Net)

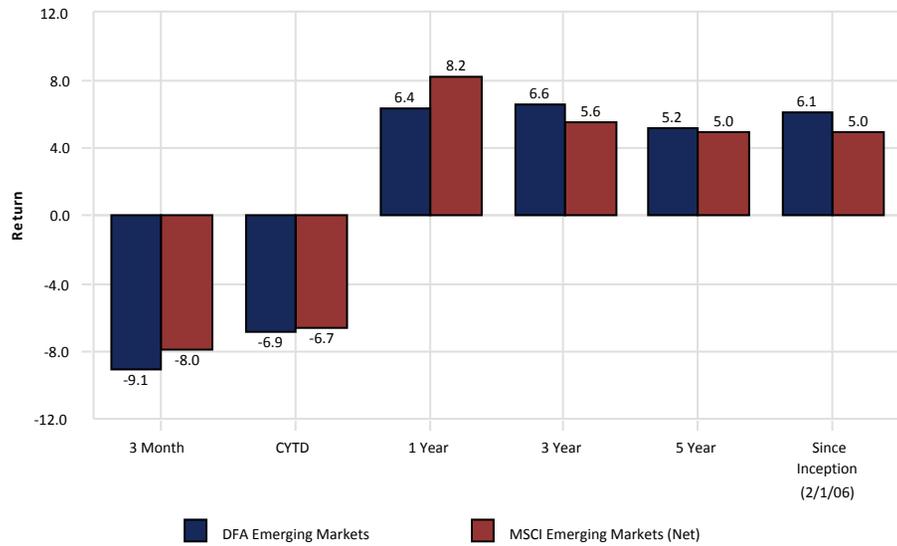
gross of fees

# Howard County Retirement Plans

## DFA Emerging Markets vs. IM Emerging Markets Equity (SA+CF)

June 30, 2018

### Comparative Performance



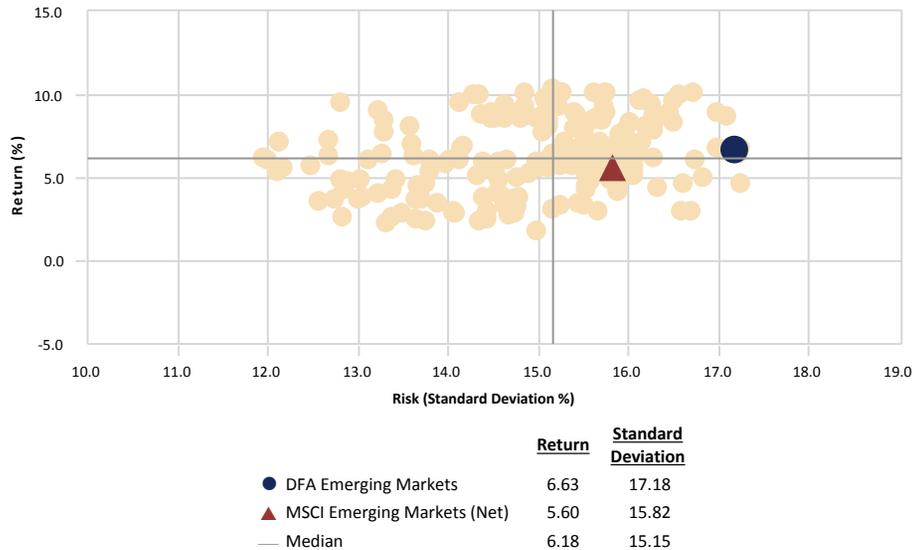
### 1 Year Rolling Percentile Ranking



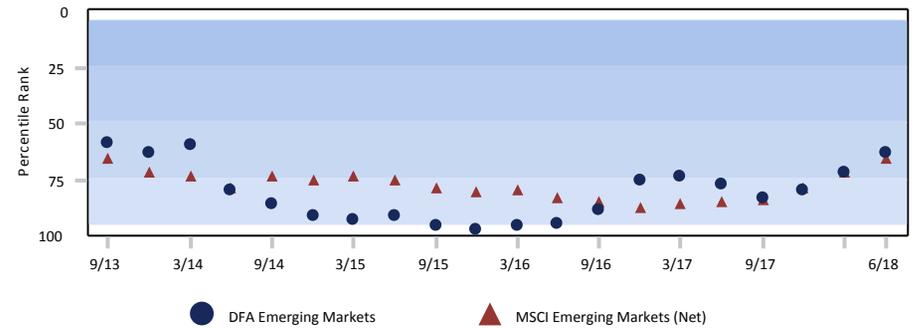
### 3 Year Rolling Percentile Ranking



### Risk/Return (07/01/15 - 06/30/18)



### 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

## DFA Emerging Markets

June 30, 2018

### Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>DFA Emerging Markets</b>	<b>-9.07</b>	<b>-6.89</b>	<b>6.38</b>	<b>6.63</b>	<b>5.21</b>
<i>MSCI Emerging Markets (Net)</i>	-7.96	-6.66	8.20	5.60	5.01
<i>IM Emerging Markets Equity (SA+CF) Median</i>	-8.40	-6.72	7.07	6.18	5.88
<b>DFA Emerging Markets Rank</b>	<b>66</b>	<b>54</b>	<b>57</b>	<b>45</b>	<b>63</b>

### Top 10 Positions

	Portfolio Weight (%)	Benchmark Weight (%)	Active Weight (%)	Quarterly Return (%)
Reliance Industries Ltd	2.74	0.77	1.97	5.37
China Construction Bank Corp	2.20	1.70	0.50	-10.03
Industrial & Commercial Bank of China Ltd	2.04	0.99	1.05	-12.75
Vale SA	1.86	0.77	1.09	-0.29
Standard Bank Group Ltd	1.36	0.35	1.01	-22.50
Vale SA	1.30	0.77	0.53	0.79
PTT Public Co Ltd	1.12	0.29	0.83	-17.38
Posco	1.02	0.44	0.58	-3.06
Bank of China Ltd	0.96	0.75	0.21	-7.79
Cnooc Ltd	0.93	0.59	0.34	19.77

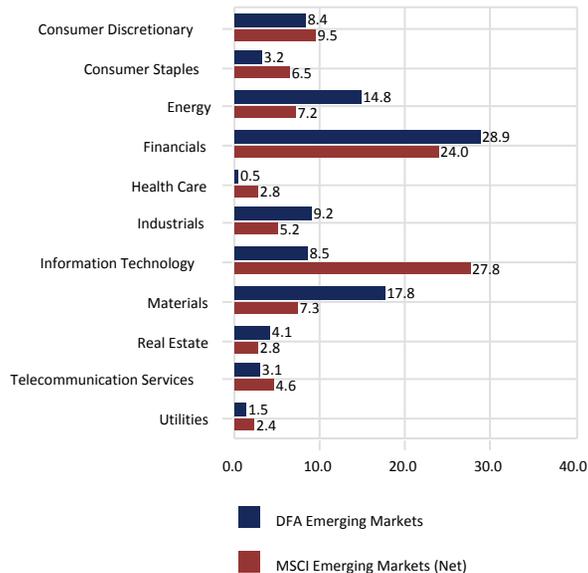
### Historical Statistics (3 Year)

	Alpha	Beta	Standard Deviation	R-Squared	Information Ratio	Up Capture	Down Capture
DFA Emerging Markets	0.79	1.06	17.18	0.96	0.32	110.42	107.69
<i>MSCI Emerging Markets (Net)</i>	0.00	1.00	15.82	1.00	-	100.00	100.00

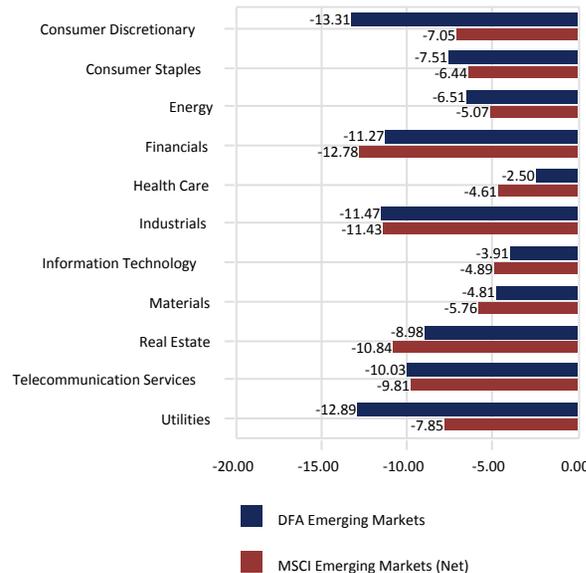
### Portfolio Characteristics

	Portfolio	Benchmark
Wtd. Avg. Mkt. Cap (\$000)	23,139,272	87,534,290
Median Mkt. Cap (\$000)	385,891	5,227,077
Price/Earnings ratio	10.24	13.39
Price/Book ratio	1.46	2.58
5 Yr. EPS Growth Rate (%)	6.06	15.38
Current Yield (%)	3.31	2.65
Beta (5 Years, Monthly)	1.08	1.00
Number of Stocks	2,456	1,138

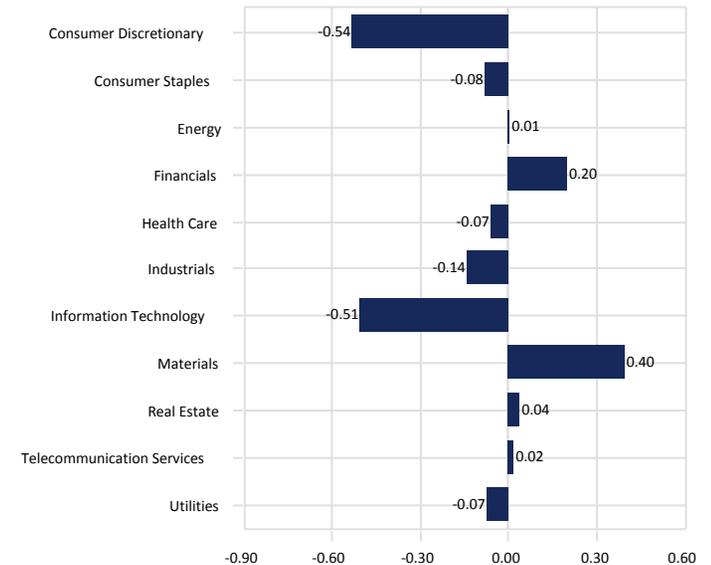
### Sector Allocation



### Sector Performance



### Total Sector Attribution



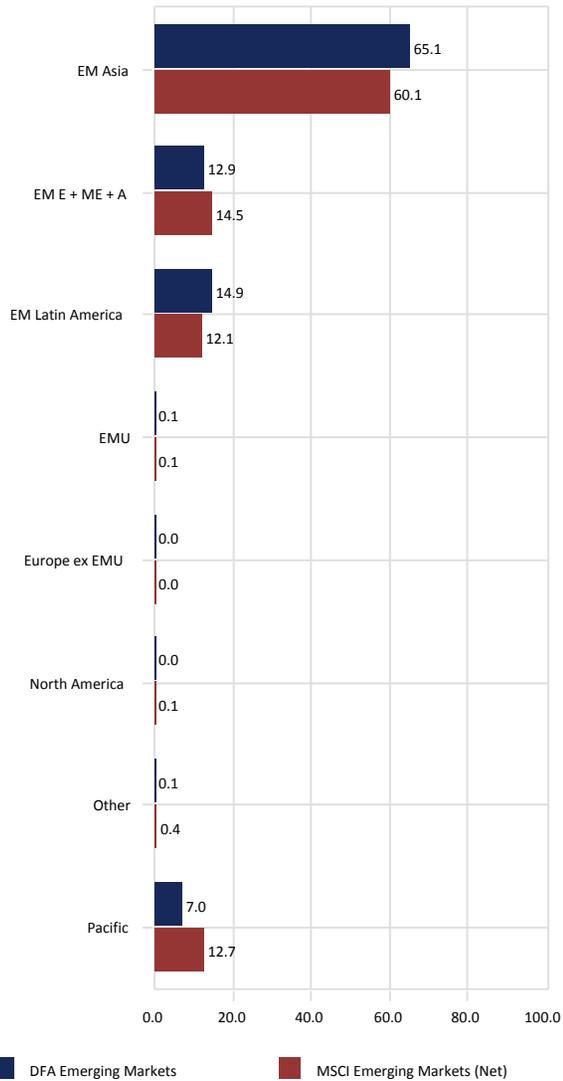
gross of fees

# Howard County Retirement Plans

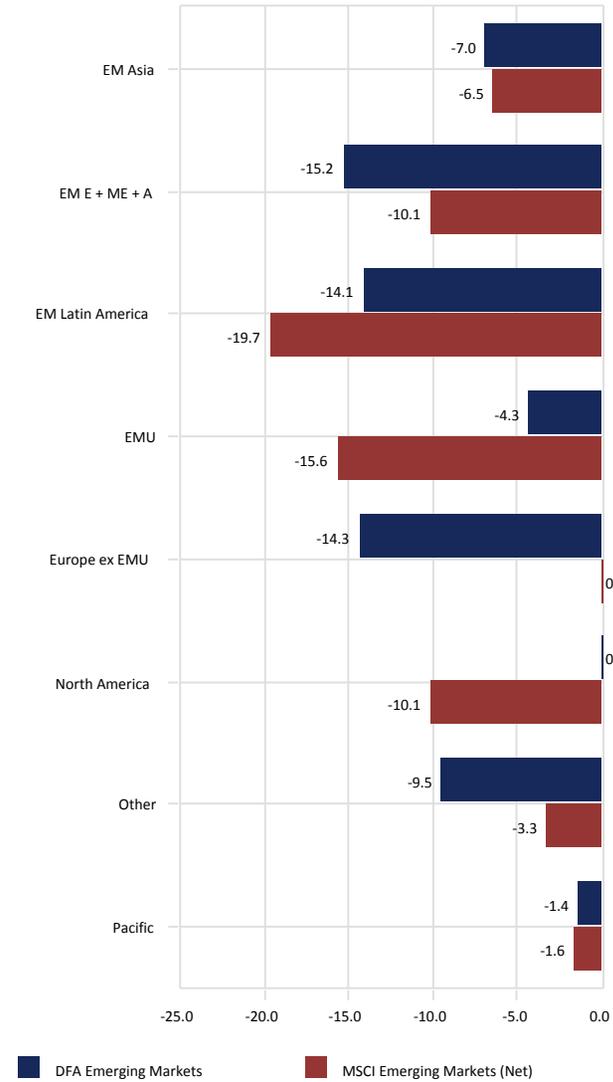
DFA vs. MSCI Emerging Markets Index (Net)

June 30, 2018

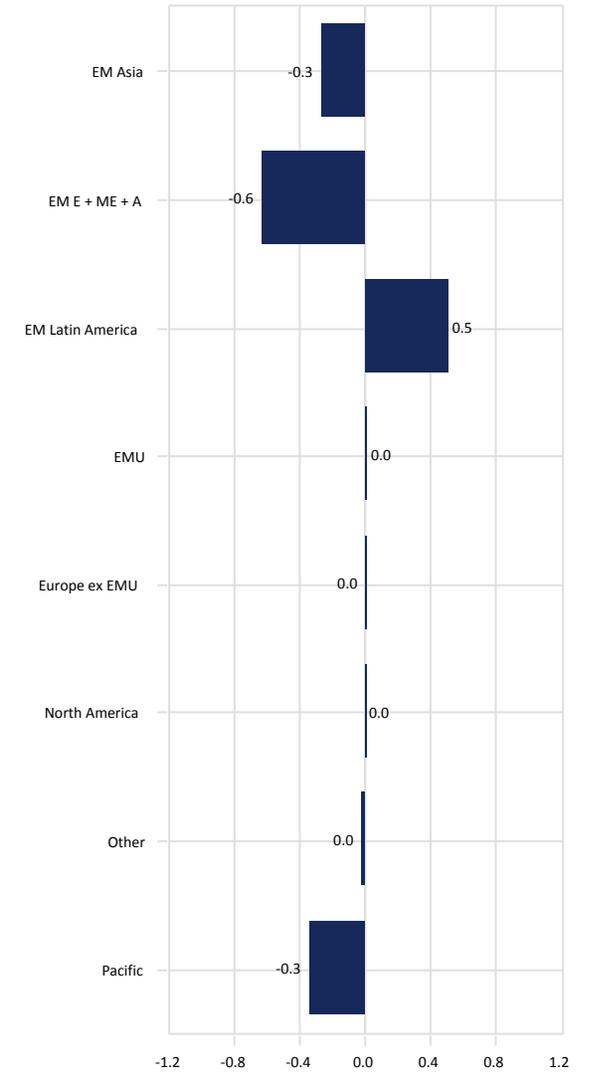
Allocation Quarterly



Performance Quarterly



Attribution Quarterly



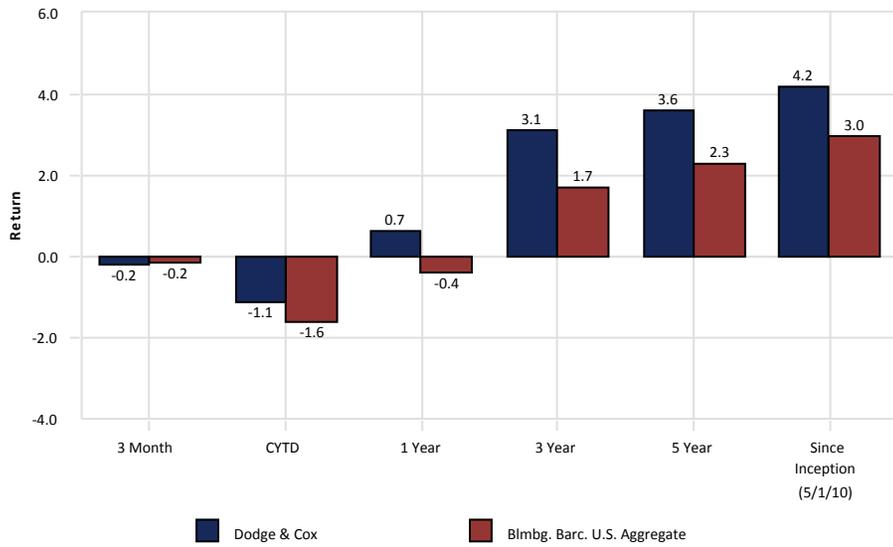
gross of fees

# Howard County Retirement Plans

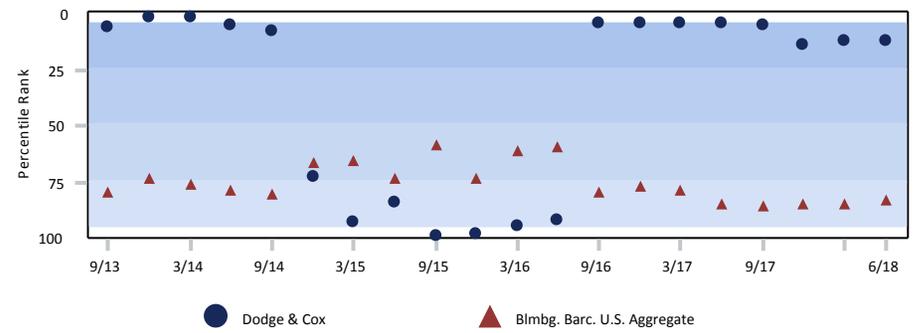
Dodge & Cox vs. IM U.S. Broad Market Core Fixed Income (SA+CF)

June 30, 2018

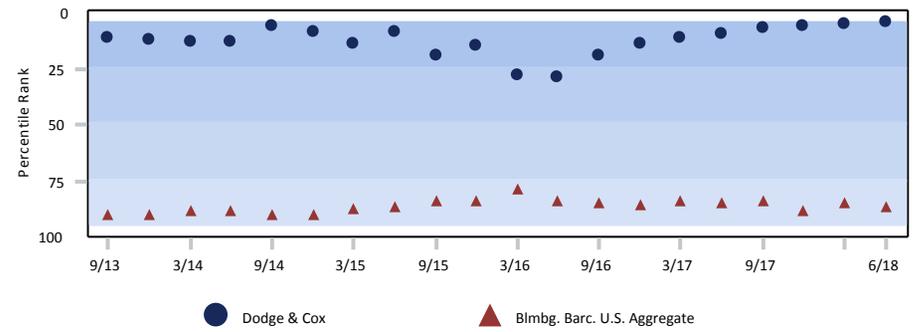
## Comparative Performance



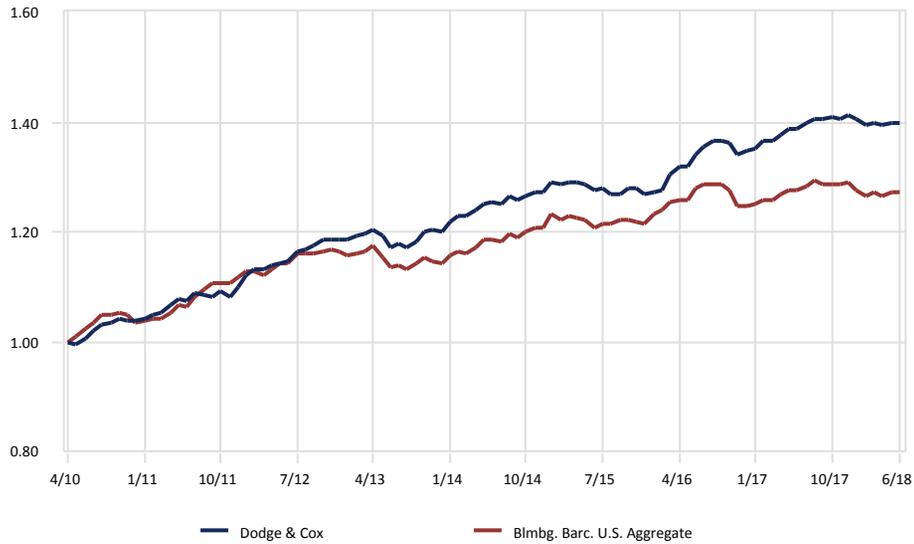
## 1 Year Rolling Percentile Ranking



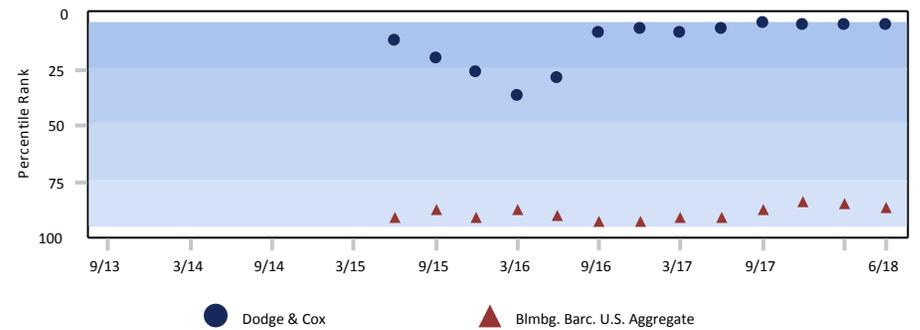
## 3 Year Rolling Percentile Ranking



## Growth of \$1



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

Dodge & Cox

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>Dodge &amp; Cox</b>	<b>-0.18</b>	<b>-1.11</b>	<b>0.65</b>	<b>3.10</b>	<b>3.59</b>
<i>Blmbg. Barc. U.S. Aggregate</i>	-0.16	-1.62	-0.40	1.72	2.27
<i>IM U.S. Broad Mkt Core Fixed Income (SA+CF)</i>	-0.09	-1.44	0.00	2.09	2.67
<b>Dodge &amp; Cox Rank</b>	<b>81</b>	<b>14</b>	<b>12</b>	<b>4</b>	<b>5</b>

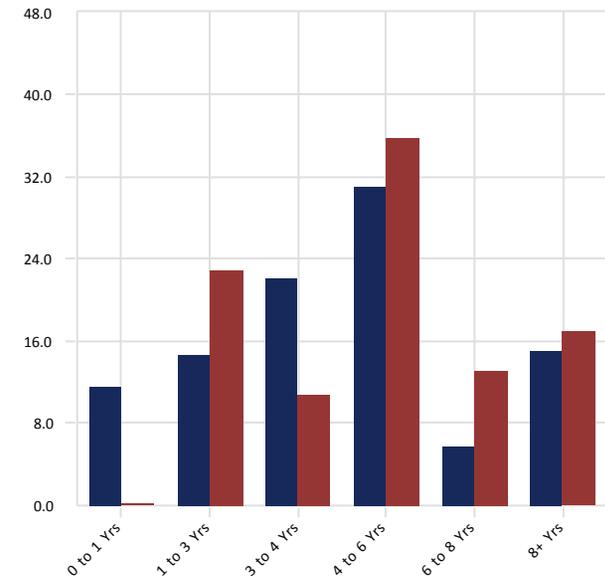
## Portfolio Characteristics

	Portfolio	Benchmark
Modified Duration	4.66	6.07
Yield To Maturity (%)	3.72	3.28
Avg. Maturity	7.88	8.08
Avg. Quality	AA-	AA
Coupon Rate (%)	4.14	3.10

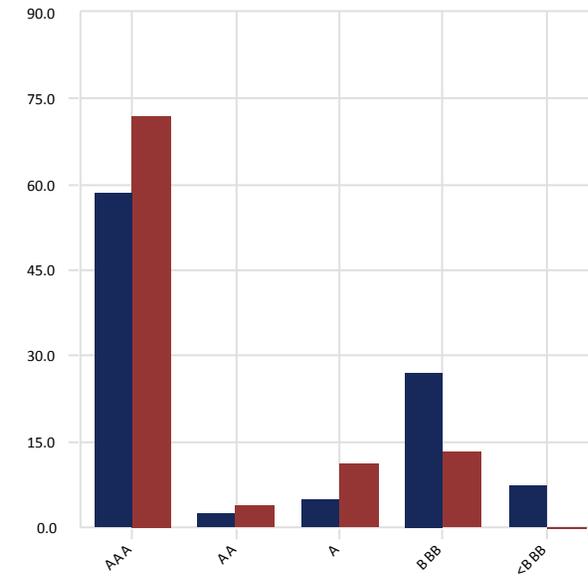
## Historical Statistics (3 Year)

	Sharpe Ratio	Information Ratio	Standard Deviation
Dodge & Cox	0.97	0.77	2.50
<i>Blmbg. Barc. U.S. Aggregate</i>	0.42	-	2.61
FTSE 3 Month T-Bill	-	-0.42	0.16

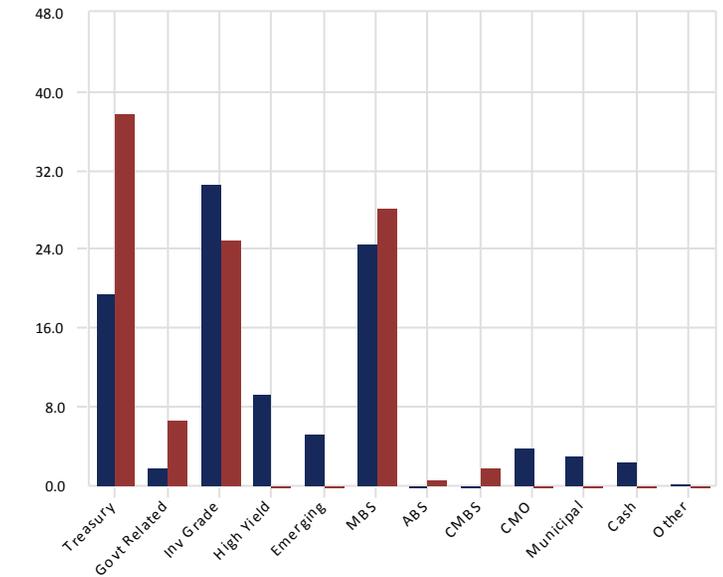
## Duration Distribution (%)



## Credit Quality Distribution (%)



## Sector Distribution (%)



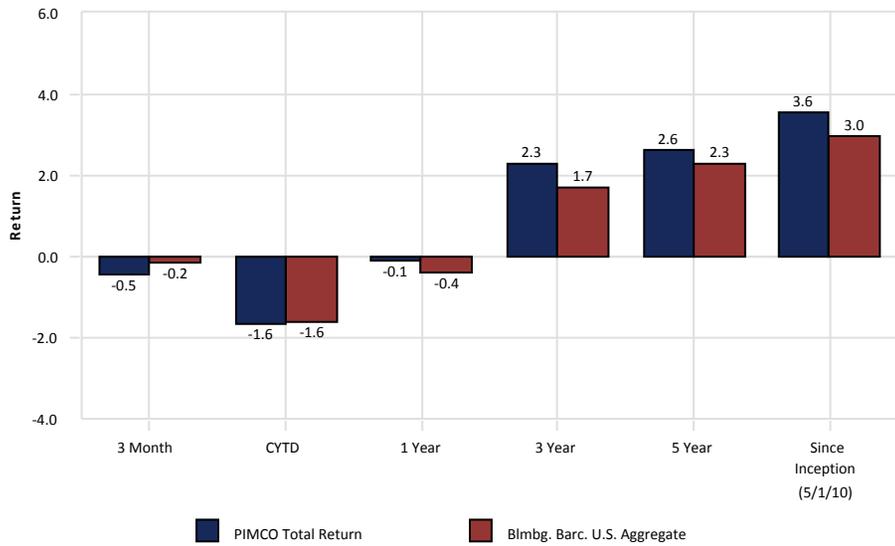
gross of fees

# Howard County Retirement Plans

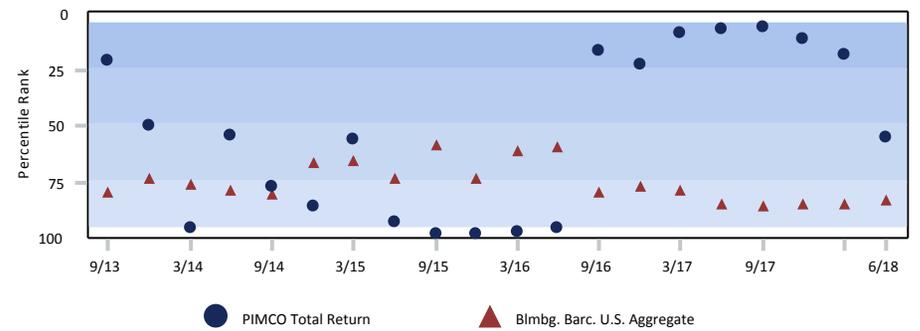
PIMCO Total Return vs. IM U.S. Broad Market Core Fixed Income (SA+CF)

June 30, 2018

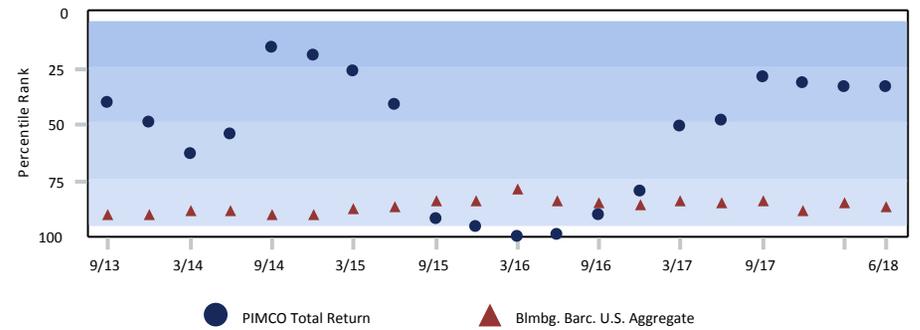
## Comparative Performance



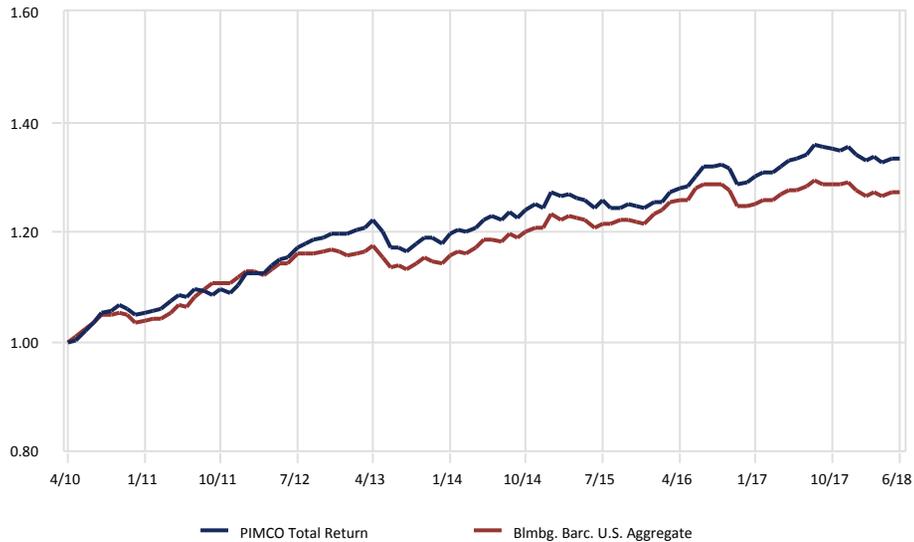
## 1 Year Rolling Percentile Ranking



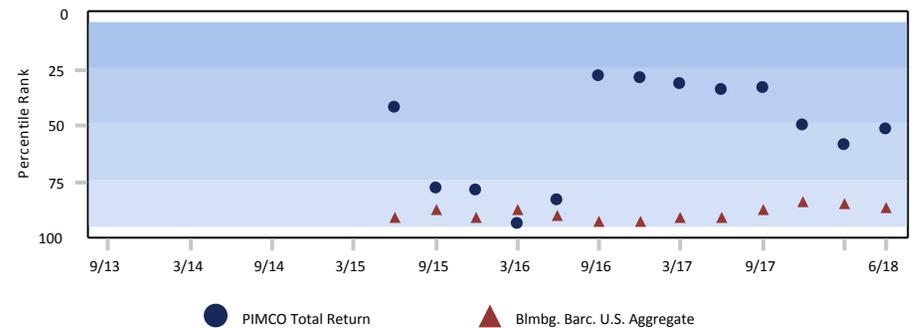
## 3 Year Rolling Percentile Ranking



## Growth of \$1



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

## PIMCO Total Return

June 30, 2018

### Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>PIMCO Total Return</b>	<b>-0.46</b>	<b>-1.64</b>	<b>-0.10</b>	<b>2.31</b>	<b>2.64</b>
<i>Blmbg. Barc. U.S. Aggregate</i>	-0.16	-1.62	-0.40	1.72	2.27
<i>IM U.S. Broad Mkt Core Fixed Income (SA+CF)</i>	-0.09	-1.44	0.00	2.09	2.67
<b>PIMCO Total Return Rank</b>	<b>96</b>	<b>81</b>	<b>55</b>	<b>33</b>	<b>52</b>

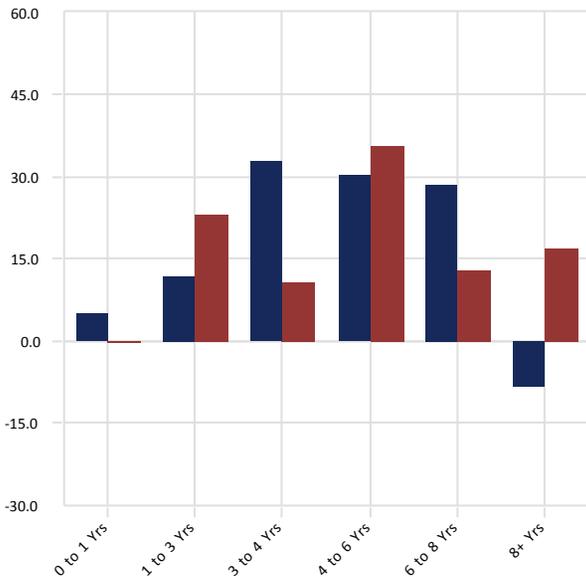
### Portfolio Characteristics

	Portfolio	Benchmark
Modified Duration	-	6.07
Yield To Maturity (%)	4.24	3.28
Avg. Maturity	9.17	8.08
Avg. Quality	AA-	AA
Coupon Rate (%)	3.30	3.10

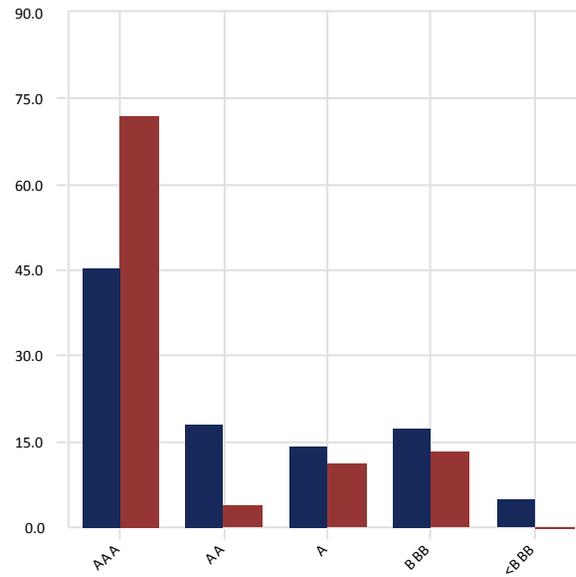
### Historical Statistics (3 Year)

	Sharpe Ratio	Information Ratio	Standard Deviation
PIMCO Total Return	0.61	0.48	2.72
<i>Blmbg. Barc. U.S. Aggregate</i>	0.42	-	2.61
FTSE 3 Month T-Bill	-	-0.42	0.16

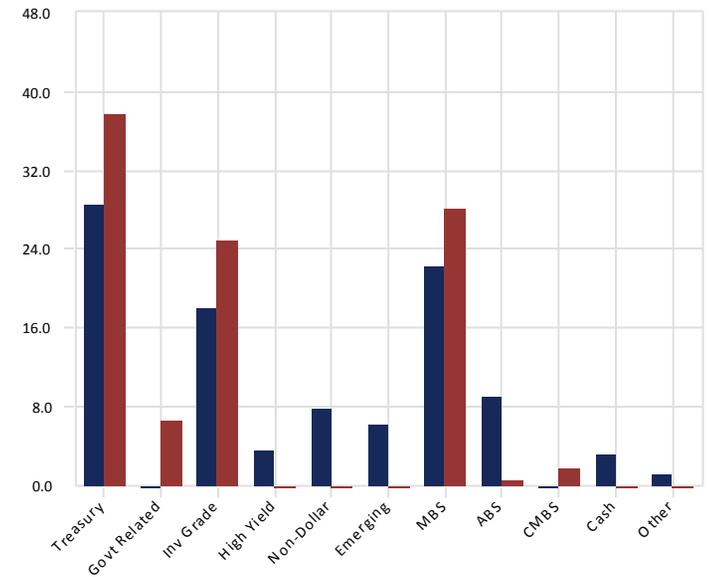
### Duration Distribution (%)



### Credit Quality Distribution (%)



### Sector Distribution (%)



gross of fees

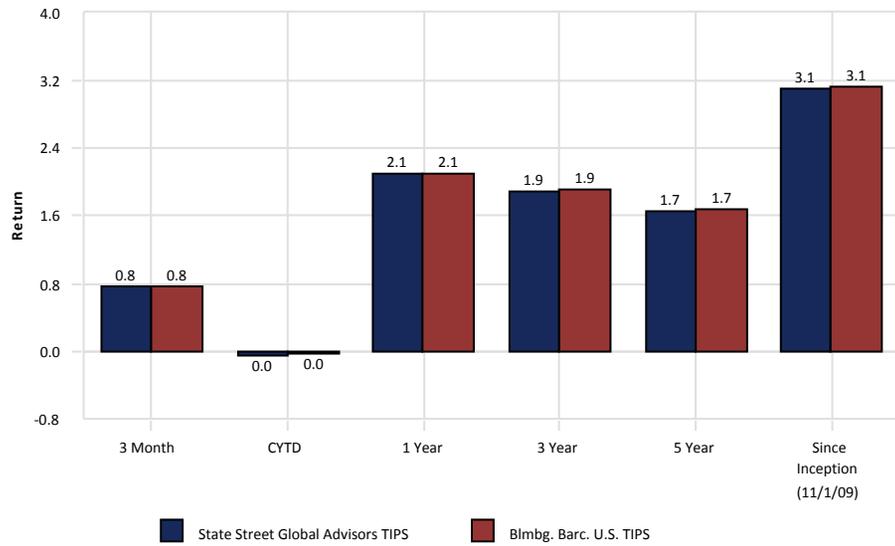
Blmbg. Barc. U.S. Aggregate

# Howard County Retirement Plans

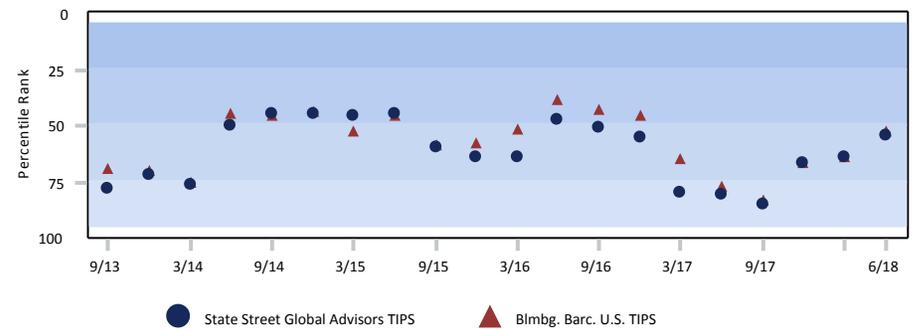
State Street Global Advisors TIPS vs. IM U.S. TIPS (SA+CF)

June 30, 2018

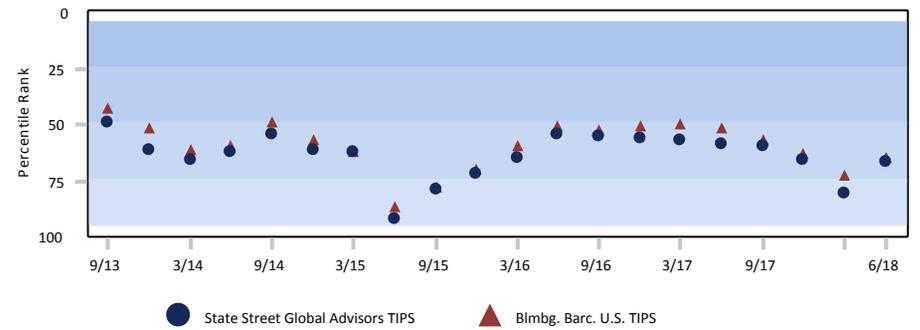
## Comparative Performance



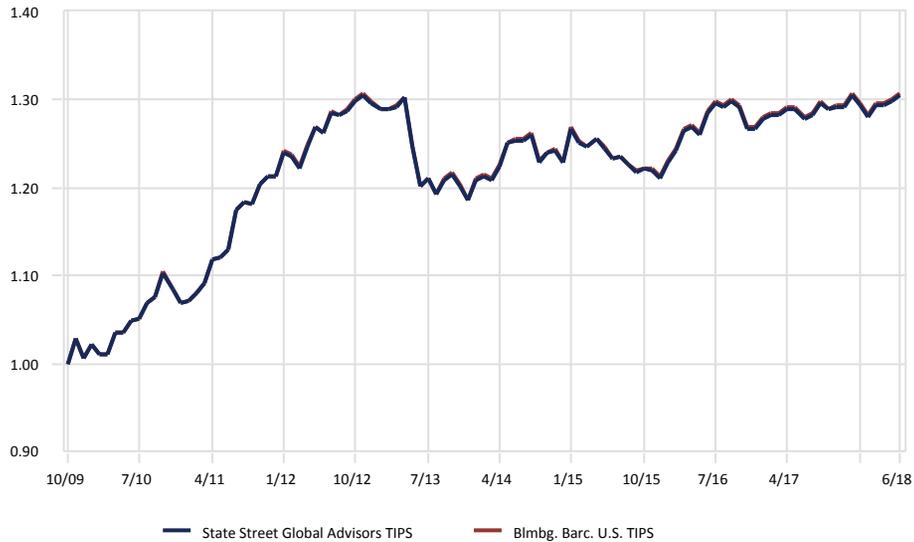
## 1 Year Rolling Percentile Ranking



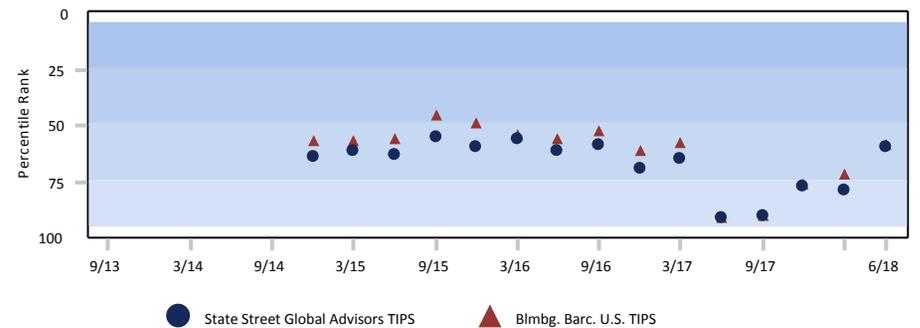
## 3 Year Rolling Percentile Ranking



## Growth of \$1



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

State Street Global Advisors TIPS

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>State Street Global Advisors TIPS</b>	<b>0.78</b>	<b>-0.04</b>	<b>2.11</b>	<b>1.90</b>	<b>1.66</b>
<i>Blmbg. Barc. U.S. TIPS</i>	<i>0.77</i>	<i>-0.02</i>	<i>2.11</i>	<i>1.93</i>	<i>1.68</i>
<i>IM U.S. TIPS (SA+CF) Median</i>	<i>0.74</i>	<i>0.07</i>	<i>2.14</i>	<i>1.97</i>	<i>1.71</i>
<b>State Street Global Advisors TIPS Rank</b>	<b>34</b>	<b>79</b>	<b>54</b>	<b>67</b>	<b>60</b>

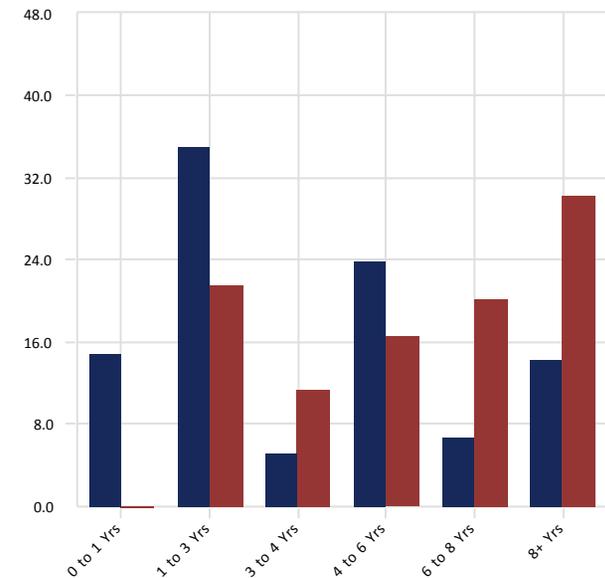
## Portfolio Characteristics

	<u>Portfolio</u>	<u>Benchmark</u>
Modified Duration	4.88	4.89
Yield To Maturity (%)	3.04	2.96
Avg. Maturity	8.40	8.39
Avg. Quality	AAA	AAA/AAA
Coupon Rate (%)	0.84	0.78

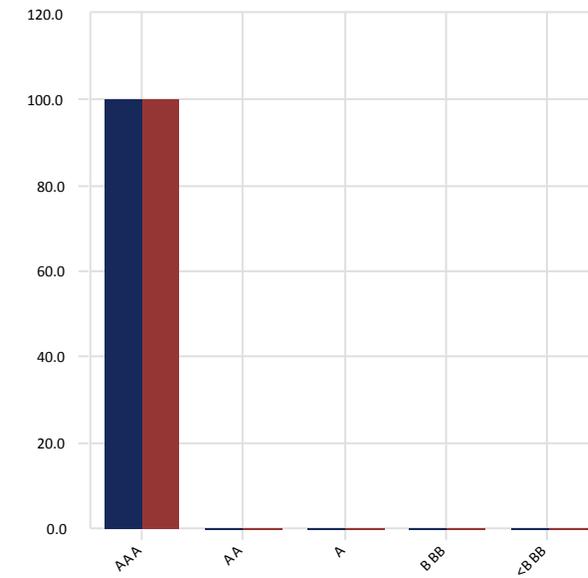
## Historical Statistics (3 Year)

	Sharpe Ratio	Information Ratio	Standard Deviation
State Street Global Advisors TIPS	0.44	-0.64	2.91
<i>Blmbg. Barc. U.S. TIPS</i>	<i>0.45</i>	<i>-</i>	<i>2.91</i>
FTSE 3 Month T-Bill	-	-0.45	0.16

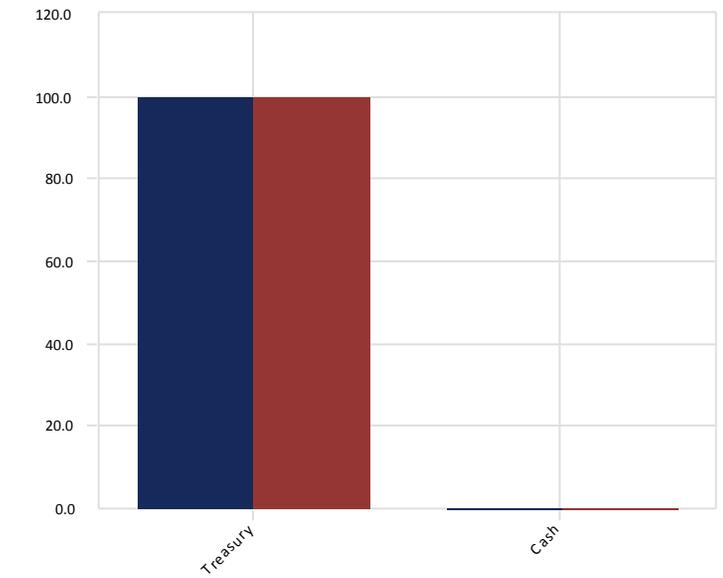
## Duration Distribution (%)



## Credit Quality Distribution (%)



## Sector Distribution (%)



■ State Street Global Advisors TIPS      ■ Blmbg. Barc. U.S. TIPS

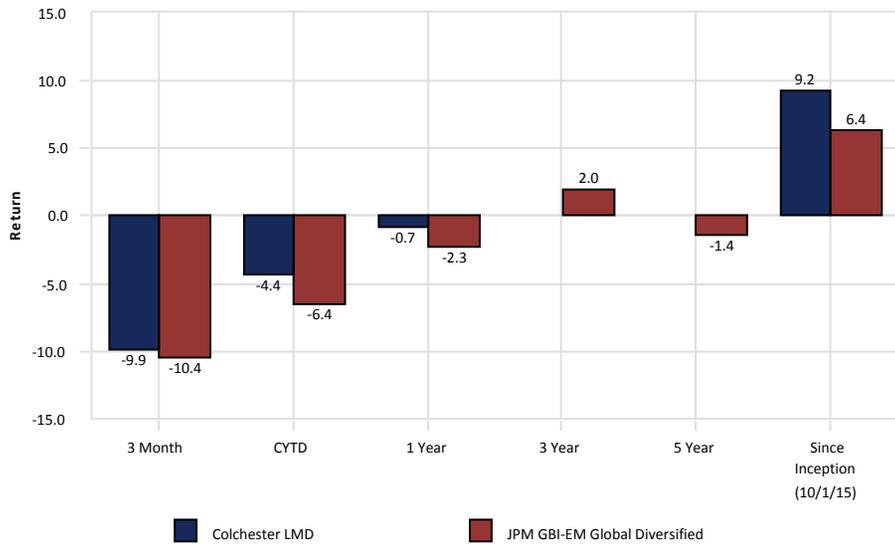
gross of fees

# Howard County Retirement Plans

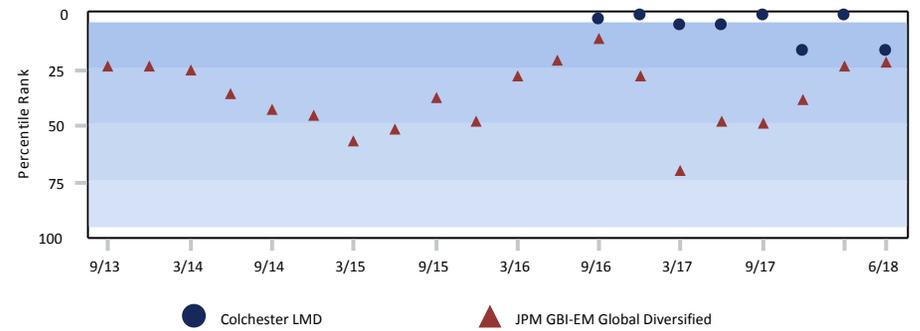
Colchester LMD vs. IM Emerging Markets Debt - LC (MF)

June 30, 2018

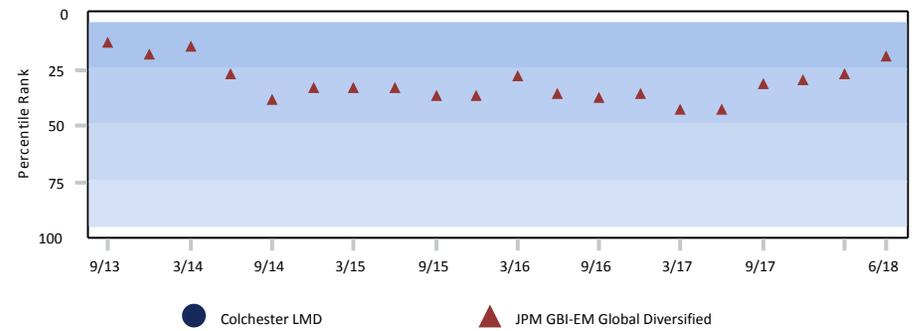
## Comparative Performance



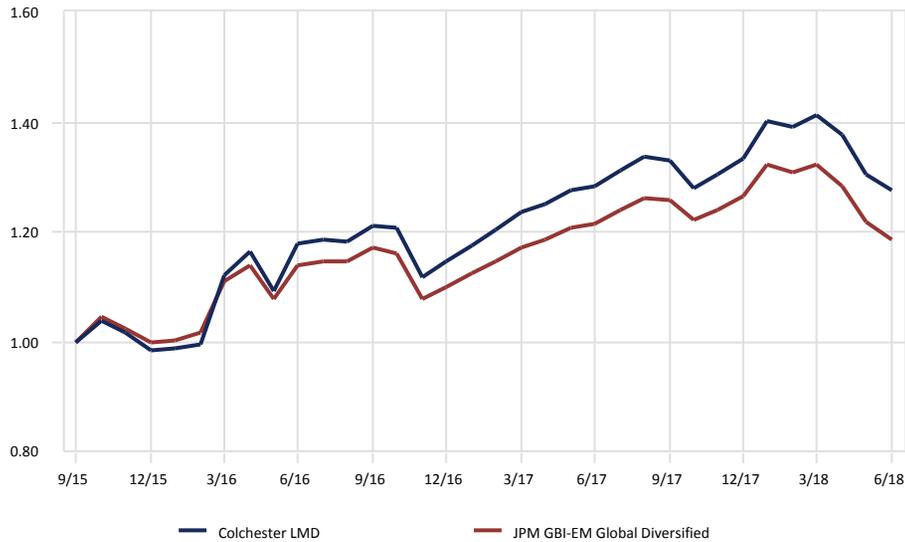
## 1 Year Rolling Percentile Ranking



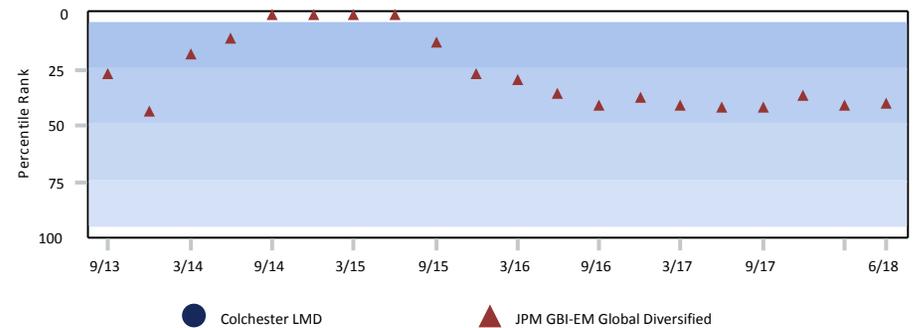
## 3 Year Rolling Percentile Ranking



## Growth of \$1



## 5 Year Rolling Percentile Ranking



gross of fees

# Howard County Retirement Plans

Colchester LMD

June 30, 2018

## Comparative Performance

	3 Month	CYTD	1 Year	3 Year	5 Year
<b>Colchester LMD</b>	<b>-9.86</b>	<b>-4.35</b>	<b>-0.74</b>	-	-
<i>JPM GBI-EM Global Diversified</i>	-10.42	-6.44	-2.33	1.96	-1.40
<i>IM Emerging Markets Debt - LC (MF) Median</i>	-11.05	-7.26	-3.28	0.92	-1.58
<b>Colchester LMD Rank</b>	<b>22</b>	<b>19</b>	<b>17</b>	-	-

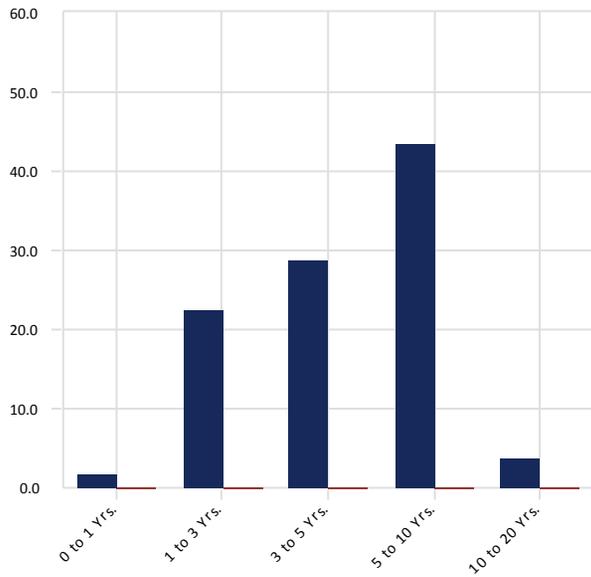
## Portfolio Characteristics

	<u>Portfolio</u>	<u>Benchmark</u>
Modified Duration	5.11	5.87
Yield To Maturity (%)	7.14	6.56
Avg. Maturity	7.64	9.25
Avg. Quality	BBB	BBB-
Coupon Rate (%)	6.75	6.04

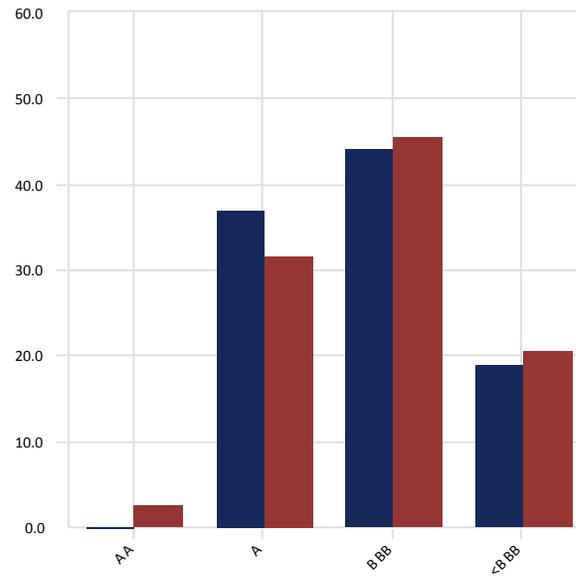
## Historical Statistics (3 Year)

	Sharpe Ratio	Information Ratio	Standard Deviation
Colchester LMD	-	-	-
<i>JPM GBI-EM Global Diversified</i>	0.17	-	11.42
FTSE 3 Month T-Bill	-	-0.17	0.16

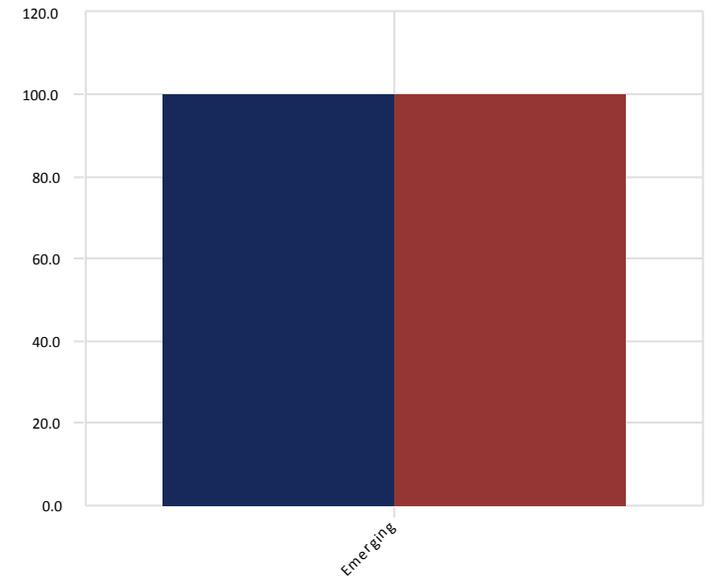
## Duration Distribution (%)



## Credit Quality Distribution (%)



## Sector Distribution (%)



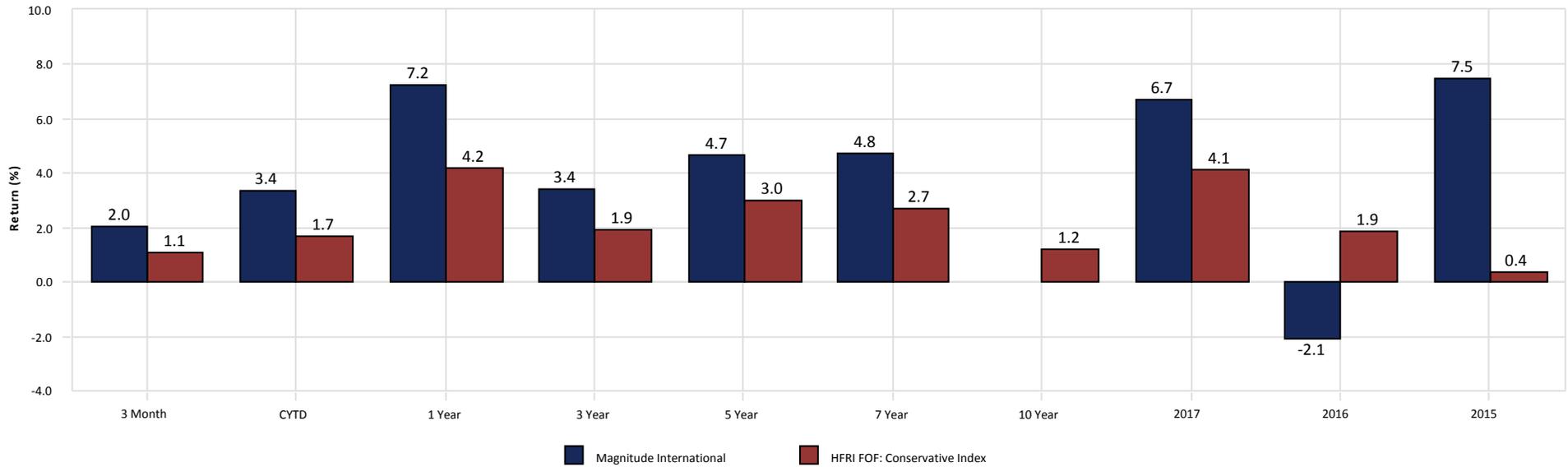
gross of fees

# Howard County Retirement Plans

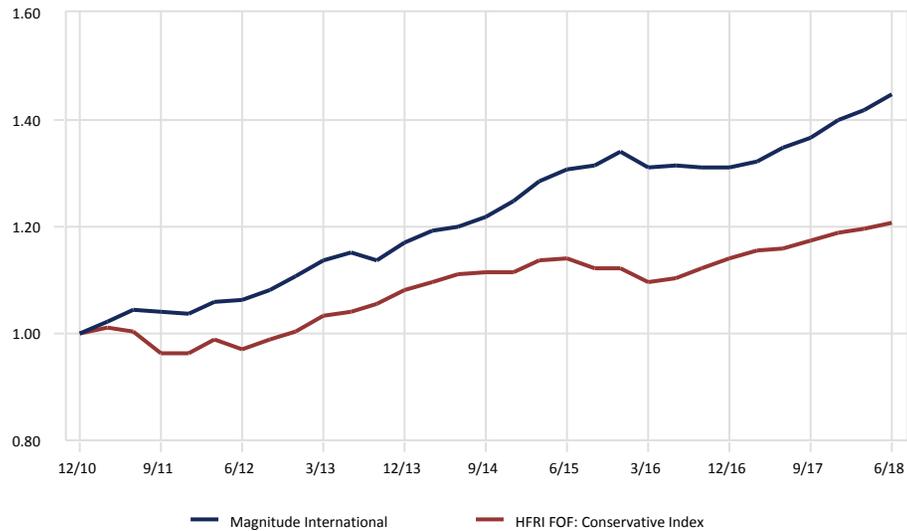
Magnitude International

June 30, 2018

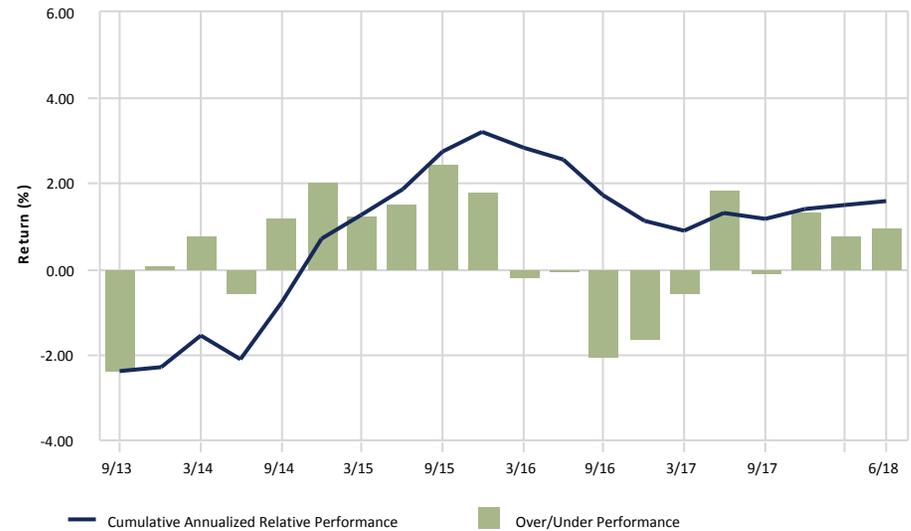
## Comparative Performance



## Growth of \$1 - Since Inception (01/01/11)



## Relative Performance vs. HFRI FOF: Conservative Index



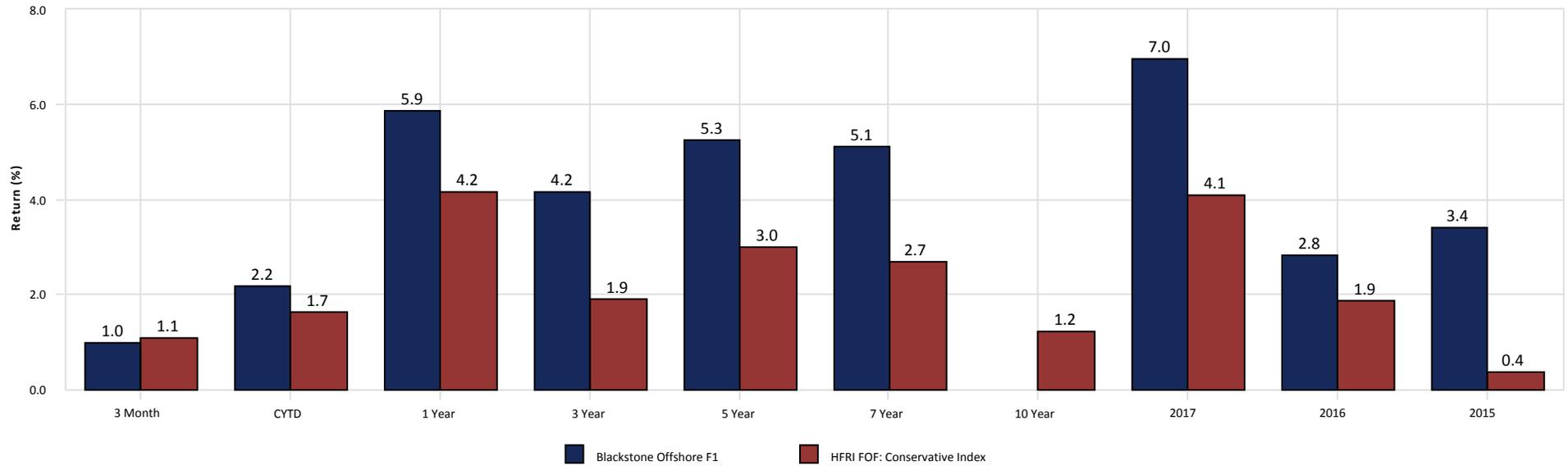
net of fees

# Howard County Retirement Plans

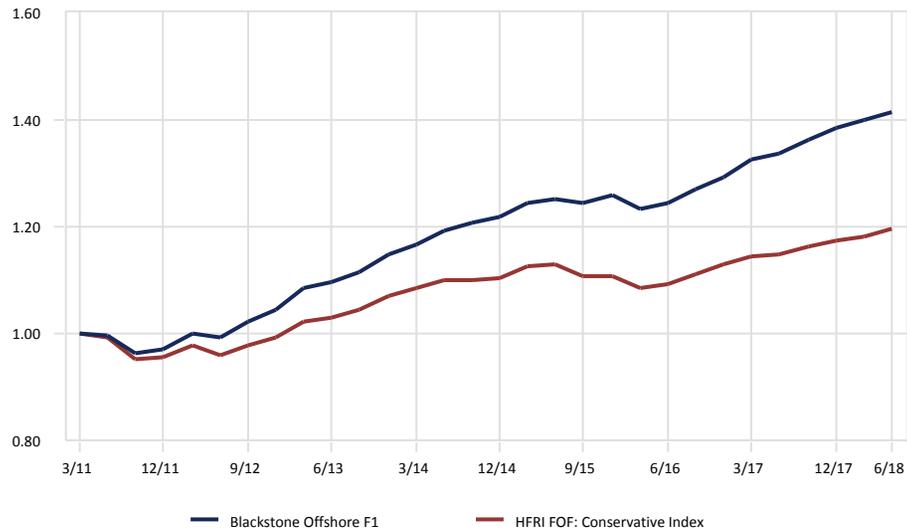
Blackstone Offshore F1

June 30, 2018

## Comparative Performance



## Growth of \$1 - Since Inception (03/01/11)



## Relative Performance vs. HFRI FOF: Conservative Index



net of fees

## Appendix

# Howard County Retirement Plans

Composite Asset Allocation & Performance % | Net of Fees

June 30, 2018

	Asset \$	Asset %	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
<b>Total Fund Composite</b>	<b>1,011,277,239</b>	<b>100.00</b>	<b>0.69</b>	<b>1.37</b>	<b>8.70</b>	<b>8.70</b>	<b>7.31</b>	<b>8.05</b>	<b>7.01</b>	<b>Apr-1997</b>
<i>Total Implementation Index</i>			<i>0.45</i>	<i>0.40</i>	<i>6.92</i>	<i>6.92</i>	<i>6.46</i>	<i>7.47</i>	<i>6.81</i>	
Excess Return			0.24	0.97	1.78	1.78	0.85	0.58	0.20	
<i>Total Policy Index</i>			<i>0.27</i>	<i>0.37</i>	<i>6.97</i>	<i>6.97</i>	<i>6.47</i>	<i>7.47</i>	<i>7.32</i>	<i>Apr-1997</i>
Total Fund EX Alternatives	774,510,613	76.59	-0.11	0.28	7.81	7.81	6.92	7.63	6.17	Jul-2008
Total Fund EX Real Assets	976,411,055	96.55	0.52	1.08	8.31	8.31	7.08	7.98	6.85	Jan-2004
Total Equity Composite	445,021,840	44.01	0.57	1.05	12.61	12.61	9.15	10.45	8.11	Jan-2004
US Equity Composite	254,130,624	25.13	3.97	4.70	17.40	17.40	12.40	14.09	9.85	Jan-2004
<i>Russell 3000 Index</i>			<i>3.89</i>	<i>3.22</i>	<i>14.78</i>	<i>14.78</i>	<i>11.58</i>	<i>13.29</i>	<i>8.82</i>	
Excess Return			0.08	1.48	2.62	2.62	0.82	0.80	1.03	
<i>US Equity Allocation Index</i>			<i>4.33</i>	<i>3.82</i>	<i>15.34</i>	<i>15.34</i>	<i>11.57</i>	<i>13.20</i>	<i>9.15</i>	<i>Jan-2004</i>
Large Cap Composite	194,967,293	19.28	2.79	2.92	15.95	15.95	11.49	13.63	9.11	Jan-2004
<i>Russell 1000 Index</i>			<i>3.57</i>	<i>2.85</i>	<i>14.54</i>	<i>14.54</i>	<i>11.64</i>	<i>13.37</i>	<i>8.79</i>	
Excess Return			-0.78	0.07	1.41	1.41	-0.15	0.26	0.32	
Non-Large Cap Composite	59,163,332	5.85	8.06	11.04	22.42	22.42	15.41	15.85	11.12	Jan-2004
<i>Russell 2500 Index</i>			<i>5.71</i>	<i>5.46</i>	<i>16.24</i>	<i>16.24</i>	<i>10.30</i>	<i>12.29</i>	<i>9.72</i>	
Excess Return			2.35	5.58	6.18	6.18	5.11	3.56	1.40	
International Equity Composite	190,891,216	18.88	-3.62	-3.41	6.82	6.82	5.02	5.72	5.81	Jan-2004
<i>MSCI AC World ex USA (Net)</i>			<i>-2.61</i>	<i>-3.77</i>	<i>7.28</i>	<i>7.28</i>	<i>5.07</i>	<i>5.99</i>	<i>6.24</i>	
Excess Return			-1.01	0.36	-0.46	-0.46	-0.05	-0.27	-0.43	
International Developed Markets Composite	126,518,917	12.51	-0.46	-1.34	7.43	7.43	4.53	6.20	-	Dec-2007
<i>MSCI EAFE Index (Net)</i>			<i>-0.97</i>	<i>-2.37</i>	<i>7.37</i>	<i>7.37</i>	<i>5.41</i>	<i>6.93</i>	<i>1.84</i>	
Excess Return			0.51	1.03	0.06	0.06	-0.88	-0.73	-	
International Emerging Markets Composite	64,372,299	6.37	-9.21	-7.17	5.74	5.74	5.99	4.57	5.63	Feb-2006
<i>MSCI Emerging Markets Index (Net)</i>			<i>-7.86</i>	<i>-6.51</i>	<i>8.59</i>	<i>8.59</i>	<i>5.98</i>	<i>5.39</i>	<i>5.32</i>	
Excess Return			-1.35	-0.66	-2.85	-2.85	0.01	-0.82	0.31	
Fixed Income Composite	283,488,640	28.03	-1.78	-1.98	-0.18	-0.18	3.21	3.28	4.20	Jan-2004
<i>Fixed Income Policy Index</i>			<i>-0.16</i>	<i>-1.62</i>	<i>-0.40</i>	<i>-0.40</i>	<i>1.72</i>	<i>2.27</i>	<i>3.99</i>	
Excess Return			-1.62	-0.36	0.22	0.22	1.49	1.01	0.21	

## Howard County Retirement Plans

Composite Asset Allocation & Performance % | Net of Fees

June 30, 2018

	Asset \$	Asset %	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
Real Assets Composite	34,866,184	3.45	5.52	10.26	20.76	20.76	13.26	10.19	7.28	Jul-2003
<i>NCREIF Property Index [3 Month Lag]</i>			1.70	3.53	7.12	7.12	8.72	10.00	9.09	
Excess Return			3.82	6.73	13.64	13.64	4.54	0.19	-1.81	
<i>NCREIF Fund Index-ODCE (VW) [M]</i>			2.05	4.30	8.44	8.44	9.37	11.04	8.29	Jul-2003
Alternatives Composite	238,720,713	23.61	3.33	5.05	11.64	11.64	8.77	9.54	8.63	Jul-2008
Private Equity Composite	121,423,194	12.01	5.19	7.38	17.18	17.18	15.10	16.11	12.54	Jul-2008
Hedge Fund Composite	117,297,518	11.60	1.50	2.78	6.54	6.54	3.79	4.98	4.92	Jan-2011
<i>HFRI FOF: Conservative Index</i>			1.09	1.65	4.19	4.19	1.93	3.02	2.56	
Excess Return			0.41	1.13	2.35	2.35	1.86	1.96	2.36	
Cash Composite	9,179,862	0.91	0.29	0.54	0.91	0.91	0.38	0.23	1.30	Jan-2004
<i>FTSE 3 Month T-Bill</i>			0.44	0.79	1.33	1.33	0.64	0.39	1.23	
Excess Return			-0.15	-0.25	-0.42	-0.42	-0.26	-0.16	0.07	

# Howard County Retirement Plans

## Manager Allocation & Performance % | Net of Fees

June 30, 2018

	Asset \$	Asset %	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
<b>US Equity</b>										
Invesco	63,870,577	6.32	3.24	2.42	15.48	15.48	11.16	12.93	8.77	Jan-2004
<i>S&amp;P 500</i>			3.43	2.65	14.37	14.37	11.93	13.42	8.58	
Excess Return			-0.19	-0.23	1.11	1.11	-0.77	-0.49	0.19	
LSV Asset Management*	61,094,492	6.04	-0.44	-2.25	10.54	10.54	9.34	12.07	9.52	Jan-2004
<i>Russell 1000 Value Index</i>			1.18	-1.69	6.77	6.77	8.26	10.34	7.80	
Excess Return			-1.62	-0.56	3.77	3.77	1.08	1.73	1.72	
Westfield	70,002,224	6.92	5.34	8.40	21.61	21.61	13.85	15.84	16.25	Jul-2010
<i>Russell 1000 Growth Index</i>			5.76	7.25	22.51	22.51	14.98	16.36	17.22	
Excess Return			-0.42	1.15	-0.90	-0.90	-1.13	-0.52	-0.97	
William Blair	18,329,172	1.81	5.46	11.16	23.63	23.63	13.90	16.25	11.53	Jun-2006
<i>Russell 2500 Growth Index</i>			5.53	8.04	21.53	21.53	10.86	13.87	9.99	
Excess Return			-0.07	3.12	2.10	2.10	3.04	2.38	1.54	
Investment Counselors of Maryland	24,225,260	2.40	9.01	7.25	18.35	18.35	14.40	13.78	11.77	Apr-1993
<i>Russell 2000 Value Index</i>			8.30	5.44	13.10	13.10	11.22	11.18	10.45	
Excess Return			0.71	1.81	5.25	5.25	3.18	2.60	1.32	
Brown Capital Management	16,608,900	1.64	9.65	16.95	27.40	27.40	19.03	19.18	19.30	Aug-2011
<i>Russell 2000 Growth Index</i>			7.23	9.70	21.86	21.86	10.60	13.65	13.31	
Excess Return			2.42	7.25	5.54	5.54	8.43	5.53	5.99	
<b>International Equity</b>										
Mondrian International	59,795,548	5.91	-2.12	-3.91	4.61	4.61	3.66	5.87	1.17	Dec-2007
<i>MSCI EAFE Index (Net)</i>			-0.97	-2.37	7.37	7.37	5.41	6.93	1.84	
Excess Return			-1.15	-1.54	-2.76	-2.76	-1.75	-1.06	-0.67	
Baillie Gifford	66,723,369	6.60	-	-	-	-	-	-	0.92	May-2018
<i>MSCI EAFE Index (Net)</i>			-	-	-	-	-	-	-3.44	
Excess Return			-	-	-	-	-	-	4.36	
DFA Emerging Markets	64,372,299	6.37	-9.21	-7.17	5.74	5.74	5.99	4.57	5.54	Feb-2006
<i>MSCI Emerging Markets (Net)</i>			-7.86	-6.51	8.59	8.59	5.98	5.39	5.32	
Excess Return			-1.35	-0.66	-2.85	-2.85	0.01	-0.82	0.22	

All returns are time-weighted and calculated using custodian data.

\* Inception date differs from manager; Summit does not calculate partial month returns.

# Howard County Retirement Plans

## Manager Allocation & Performance % | Net of Fees

June 30, 2018

	Asset \$	Asset %	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
<b>Fixed Income</b>										
Dodge & Cox	114,679,918	11.34	-0.23	-1.21	0.44	0.44	2.87	3.38	3.98	May-2010
<i>Blmbg. Barc. U.S. Aggregate</i>			-0.16	-1.62	-0.40	-0.40	1.72	2.27	2.98	
Excess Return			-0.07	0.41	0.84	0.84	1.15	1.11	1.00	
PIMCO Total Return	107,292,999	10.61	-0.53	-1.79	-0.38	-0.38	2.00	2.35	3.28	May-2010
<i>Blmbg. Barc. U.S. Aggregate</i>			-0.16	-1.62	-0.40	-0.40	1.72	2.27	2.98	
Excess Return			-0.37	-0.17	0.02	0.02	0.28	0.08	0.30	
State Street Global Advisors TIPS	21,510,491	2.13	0.78	-0.05	2.06	2.06	1.85	1.61	3.06	Nov-2009
<i>Blmbg. Barc. U.S. TIPS</i>			0.77	-0.02	2.11	2.11	1.93	1.68	3.13	
Excess Return			0.01	-0.03	-0.05	-0.05	-0.08	-0.07	-0.07	
Colchester LMD	40,005,233	3.96	-10.02	-4.69	-1.45	-1.45	-	-	8.45	Oct-2015
<i>JPM GBI-EM Global Diversified</i>			-10.42	-6.44	-2.33	-2.33	-	-	6.36	
Excess Return			0.40	1.75	0.88	0.88	-	-	2.09	
<b>Real Assets</b>										
TA Realty Associates VIII	1,678,862	0.17	3.41	6.74	11.46	11.46	9.34	9.37	1.25	Jul-2007
TA Realty Associates IX	61,092	0.01	-5.78	0.86	-0.48	-0.48	5.41	8.24	7.97	Apr-2010
Partners Group Global RE 2011	8,403,677	0.83	3.21	7.22	24.76	24.76	12.81	9.31	7.71	Mar-2012
Partners Group Global RE 2014	17,253,997	1.71	5.18	11.66	19.88	19.88	15.44	-	10.58	Dec-2014
Commonfund Natural Resources X	3,794,505	0.38	17.50	17.50	24.91	24.91	-	-	23.86	Apr-2016
Aether Real Assets IV	3,674,052	0.36	3.15	4.96	17.07	17.07	-	-	1.90	Jun-2016
<b>Private Equity</b>										
Siguler Guff Distressed Opps III	1,822,039	0.18	4.18	6.14	10.40	10.40	7.60	8.46	9.03	Jul-2008
Greenspring IV	4,816,159	0.48	2.42	2.42	8.20	8.20	9.18	20.20	15.49	Jul-2009
Pantheon Global Secondaries IV	638,974	0.06	7.92	7.92	19.97	19.97	11.13	10.93	13.09	Sep-2010
LGT Crown Asia-Pacific II	14,125,605	1.40	4.39	7.98	16.30	16.30	14.01	15.03	-11.47	Jul-2011
Greenspring V	7,401,105	0.73	7.24	7.24	16.68	16.68	19.07	21.45	17.87	Sep-2011
Adveq Europe V	7,505,422	0.74	6.49	13.76	38.72	38.72	16.26	7.47	8.43	Jan-2013
LGT Crown Global Secondaries III	5,352,408	0.53	1.58	2.42	11.89	11.89	14.04	15.02	16.38	Feb-2013

All returns are time-weighted and calculated using custodian data.

\* Inception date differs from manager; Summit does not calculate partial month returns.

# Howard County Retirement Plans

## Manager Allocation & Performance % | Net of Fees

June 30, 2018

	Asset \$	Asset %	3 Month	CYTD	FYTD	1 Year	3 Year	5 Year	Since Inception	Inception Date
Flag Private Equity V	12,836,258	1.27	6.97	6.97	23.20	23.20	17.05	-	15.41	Oct-2013
HarbourVest Partners 2013 Direct	16,325,930	1.61	3.20	3.20	13.30	13.30	17.78	-	18.55	Jan-2014
Greenspring VI	7,901,666	0.78	12.68	12.68	18.48	18.48	18.73	-	15.95	Apr-2014
Greenspring Secondaries Fund I	3,086,336	0.31	4.66	14.16	13.06	13.06	18.91	-	20.49	May-2014
Greenspring VIII	858,507	0.08	-2.77	-2.77	-	-	-	-	-18.48	Sep-2017
Adveq Europe VI	3,237,503	0.32	5.24	16.02	25.15	25.15	-6.37	-	6.04	Feb-2015
Flag Private Equity VI	10,412,317	1.03	7.42	14.31	19.05	19.05	-	-	16.56	Aug-2015
57 Stars	4,105,815	0.41	-2.36	-2.36	11.50	11.50	-	-	-1.66	Oct-2015
NB Crossroads XXI	8,367,053	0.83	5.48	5.48	19.47	19.47	-	-	4.60	Oct-2015
LGT Crown Asia-Pacific III	3,941,585	0.39	11.84	18.47	31.32	31.32	-	-	22.86	Nov-2015
HarbourVest IV	7,592,933	0.75	0.96	0.96	1.72	1.72	-	-	10.11	Jan-2017
Aberdeen US PE VII	1,095,580	0.11	-0.66	-0.66	-	-	-	-	-0.66	Dec-2017
<b>Hedge Funds</b>										
Magnitude International	58,260,955	5.76	2.03	3.38	7.22	7.22	3.41	4.69	5.05	Jan-2011
<i>HFRI FOF: Conservative Index</i>			<i>1.09</i>	<i>1.65</i>	<i>4.19</i>	<i>4.19</i>	<i>1.93</i>	<i>3.02</i>	<i>2.56</i>	
Excess Return			<i>0.94</i>	<i>1.73</i>	<i>3.03</i>	<i>3.03</i>	<i>1.48</i>	<i>1.67</i>	<i>2.49</i>	
Blackstone Offshore F1	59,036,564	5.84	0.98	2.20	5.88	5.88	4.18	5.26	4.86	Mar-2011
<i>HFRI FOF: Conservative Index</i>			<i>1.09</i>	<i>1.65</i>	<i>4.19</i>	<i>4.19</i>	<i>1.93</i>	<i>3.02</i>	<i>2.42</i>	
Excess Return			<i>-0.11</i>	<i>0.55</i>	<i>1.69</i>	<i>1.69</i>	<i>2.25</i>	<i>2.24</i>	<i>2.44</i>	
<b>Cash</b>										
Cash - General Employees	3,574,918	0.35	0.34	0.61	1.02	1.02	0.43	0.27	1.30	Jan-2004
Cash - Police & Fire	4,584,682	0.45	0.33	0.56	0.90	0.90	0.36	0.22	1.26	Jan-2004

All returns are time-weighted and calculated using custodian data.

\* Inception date differs from manager; Summit does not calculate partial month returns.

## Howard County Retirement Plans

Historical Footnotes

June 30, 2018

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All asset class and master trust returns prior to 4/1/00 were approximated by using the actual quarterly returns from each plan and weighting them by the plans' beginning of period asset values.

Large Cap and Non-Large Cap Composites prior to 12/31/03 are approximated by using the actual quarterly returns for each manager and weighting them by the the accounts' beginning of period asset values.

## Howard County Retirement Plans

US Equity Policy Index

June 30, 2018

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	(%)
<b>Jul-2006</b>	
Russell 3000 Index	100.00
<b>Jun-2002</b>	
S&P 500	55.60
S&P MidCap 400	22.20
Russell 2000 Index	22.20
<b>May-1992</b>	
S&P 500	80.00
Russell 2000 Index	20.00

## Howard County Retirement Plans

Fixed Income Policy Index

June 30, 2018

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	(%)
<b>Jul-2006</b>	
Blmbg. Barc. U.S. Aggregate	100.00
<b>Jun-2002</b>	
Blmbg. Barc. U.S. Aggregate	85.70
Blmbg. Barc. U.S. Corp: High Yield	14.30
<b>Apr-2002</b>	
Blmbg. Barc. U.S. Aggregate	87.50
Blmbg. Barc. U.S. Corp: High Yield	12.50
<b>Dec-1993</b>	
Blmbg. Barc. U.S. Aggregate	100.00

## Howard County Retirement Plans

### Total Implementation Index

June 30, 2018

	(%)		(%)
<b>Dec-2015</b>		<b>Sep-1986</b>	
Russell 3000 Index	20.00	Russell 3000 Index	45.00
MSCI AC World ex USA (Net)	20.00	MSCI EAFE Index	15.00
Blmbg. Barc. U.S. Aggregate	25.00	Blmbg. Barc. U.S. Aggregate	30.00
JPM GBI-EM Global Diversified	5.00	ICE BofAML High Yield Master II	5.00
NCREIF Property Index [3 Month Lag]	7.50	NCREIF Property Index [3 Month Lag]	5.00
Private Equity Composite	10.00		
HFRI FOF: Conservative Index	12.50		
FTSE 3 Month T-Bill	0.00		
<b>Jan-2012</b>			
Russell 3000 Index	22.50		
MSCI AC World ex USA (Net)	22.50		
Blmbg. Barc. U.S. Aggregate	32.50		
NCREIF Property Index [3 Month Lag]	5.00		
Private Equity Composite	10.00		
HFRI FOF: Conservative Index	7.50		
FTSE 3 Month T-Bill	0.00		
<b>Dec-2007</b>			
Russell 3000 Index	39.00		
MSCI World ex US	21.00		
Blmbg. Barc. U.S. Aggregate	35.00		
NCREIF Property Index [3 Month Lag]	5.00		
FTSE 3 Month T-Bill	0.00		
<b>Jul-2006</b>			
Russell 3000 Index	39.00		
MSCI World ex US	21.00		
Blmbg. Barc. U.S. Aggregate	35.00		
NCREIF Property Index [3 Month Lag]	5.00		

## Howard County Retirement Plans

### Total Fund Policy Composition

June 30, 2018

	(%)		(%)
<b>Dec-2015</b>		<b>Dec-2007</b>	
S&P 500	15.00	S&P 500	24.00
Russell 2500 Index	5.00	Russell 2500 Index	15.00
MSCI EAFE Index (Net)	13.00	MSCI EAFE Index	16.00
MSCI Emerging Markets (Net)	7.00	MSCI Emerging Markets Index	5.00
Blmbg. Barc. U.S. Aggregate	25.00	Blmbg. Barc. U.S. Aggregate	35.00
JPM GBI-EM Global Diversified	5.00	NCREIF Property Index [3 Month Lag]	5.00
NCREIF Property Index [3 Month Lag]	7.50	FTSE 3 Month T-Bill	0.00
Private Equity Composite	10.00		
HFRI FOF: Conservative Index	12.50	<b>Jul-2006</b>	
FTSE 3 Month T-Bill	0.00	S&P 500	24.00
		Russell 2500 Index	15.00
<b>Jan-2012</b>		MSCI EAFE Index	16.00
S&P 500	16.90	MSCI Emerging Markets Index	5.00
Russell 2500 Index	5.60	Blmbg. Barc. U.S. Aggregate	35.00
MSCI EAFE Index (Net)	14.60	NCREIF Property Index [3 Month Lag]	5.00
MSCI Emerging Markets (Net)	7.90		
Blmbg. Barc. U.S. Aggregate	32.50	<b>Oct-2003</b>	
NCREIF Property Index [3 Month Lag]	5.00	S&P 500	25.00
Private Equity Composite	10.00	S&P MidCap 400	10.00
HFRI Fund of Funds Composite Index	7.50	Russell 2000 Index	10.00
FTSE 3 Month T-Bill	0.00	MSCI EAFE Index	15.00
		Blmbg. Barc. U.S. Aggregate	30.00
<b>Jul-2008</b>		Blmbg. Barc. U.S. Corp: High Yield	5.00
S&P 500	22.00	NCREIF Property Index [3 Month Lag]	5.00
Russell 2500 Index	13.80		
MSCI EAFE Index	14.70		
MSCI Emerging Markets Index	4.50		
Blmbg. Barc. U.S. Aggregate	35.00		
NCREIF Property Index [3 Month Lag]	5.00		
FTSE 3 Month T-Bill	5.00		
FTSE 3 Month T-Bill	0.00		

## Howard County Retirement Plans

### Total Fund Policy Composition

June 30, 2018

	(%)		(%)
<b>Jun-2002</b>		<b>Jul-1990</b>	
S&P 500	26.00	S&P 500	55.00
S&P MidCap 400	11.00	Blmbg. Barc. U.S. Aggregate	45.00
Russell 2000 Index	11.00		
MSCI EAFE Index	15.00		
Blmbg. Barc. U.S. Aggregate	32.00		
Blmbg. Barc. U.S. Corp: High Yield	5.00		
<b>Apr-2002</b>			
S&P 500	40.00		
Russell 2000 Index	10.00		
MSCI EAFE Index	10.00		
Blmbg. Barc. U.S. Aggregate	35.00		
Blmbg. Barc. U.S. Corp: High Yield	5.00		
<b>Jul-1998</b>			
S&P 500	40.00		
Russell 2000 Index	10.00		
MSCI EAFE Index	10.00		
Blmbg. Barc. U.S. Aggregate	40.00		
<b>Jan-1997</b>			
S&P 500	60.00		
Blmbg. Barc. U.S. Aggregate	40.00		
<b>Jan-1996</b>			
S&P 500	50.00		
Blmbg. Barc. U.S. Aggregate	50.00		
<b>Oct-1994</b>			
S&P 500	55.00		
Blmbg. Barc. U.S. Aggregate	45.00		

## Glossary

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<u>Term</u>	<u>Description</u>
Simple Alpha (Excess or Relative Return)	The arithmetic difference between the portfolio's return and the benchmark's return.
Alpha	A measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. It is a measure of the portfolio's historical performance not explained by movements of the market, or a portfolio's non-systematic return.
Asset Allocation Effect	In attribution analysis, the incremental return attributable to diverging from the target weights of the policy benchmark holding all other factors constant.
Beta	Also called systematic risk or non-diversifiable risk, beta measures the sensitivity of asset returns to the market (benchmark). In isolation a lower beta is considered less risky but does not distinguish between upside and downside risk.
Consistency	The percentage of periods that a product achieved a rate of return higher than that of its benchmark. The higher the consistency figure, the more value a manager has contributed to the product's performance.
Down Market Capture	The ratio of average portfolio return over the benchmark during periods of negative benchmark return. Lower values indicate better product performance.
Excess Risk	A measure of the standard deviation of a portfolio's performance relative to the risk free return.
Information Ratio	Measured by dividing the active rate of return by the tracking error. The higher the Information Ratio, the more value-added contribution by the manager. Negative Information Ratios are difficult to interpret.
Manager Value-Added (Selection Effect)	In attribution analysis, the incremental return attributable to active management; the result of diverging from the benchmark allocation within a given asset class.
Market Timing / Other	In attribution analysis, represents the impact of intra-period shifts in asset allocation. For example a rapidly appreciating asset could have markedly different weights throughout the analysis period (which looks at fixed points in time).

## Glossary

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R-Squared	The percentage of portfolio performance explained by the performance of its benchmark; measured on a scale of 0 to 100, with 100 indicating that the portfolio's performance is entirely determined by the benchmark.
Sharpe Ratio	Also called the reward-to-variability ratio, Sharpe Ratio measures the absolute rate of return per unit of risk and is calculated as the Excess Return vs. the Risk Free Rate divided by the standard deviation of the Excess Return. Investors prefer higher Sharpe Ratios (more return per unit of risk).
Standard Deviation	Typically referred to as Volatility or Risk, standard deviation measures the dispersion of actual returns around their average.
Tracking Error	A measure of the standard deviation of a portfolio's performance relative to the performance of an appropriate market benchmark.
Treynor Ratio	Similar to Sharpe ratio, but focuses on beta rather than excess risk (standard deviation). Represents the excess rate of return over the risk free rate divided by the beta. The result is the absolute rate of return per unit of risk. The higher the value, the better the product's historical risk-adjusted performance.
Up Market Capture	The ratio of average portfolio return over the benchmark during periods of positive benchmark return. Higher values indicate better product performance.

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