

ILLINOIS MUNICIPAL RETIREMENT FUND

MEETING NO. 16-12

REGULAR MEETING

OF THE

BOARD OF TRUSTEES

The Regular Meeting of the Board of Trustees was held at 9:07 a.m. on December 16, 2016, in the Fund Office at 2211 York Road, Suite 400, Oak Brook, Illinois.

Mr. Kuehne presided as Chair and called the meeting to order.

Ms. Enright called the roll:

Present: Kuehne, Miller, Stanish, Thompson, Wallace, Copper, Kuehne, Williams\*  
Absent: None

\*Trustee Williams was present via telephone.

Ms. Becker-Wold and Mr. Ball from Callan Associates, Messrs. Murphy and Pieterse from Gabriel Roeder Smith and Company, Messrs. Winningham and Zweiner from Milliman and representatives from Pensions and Investments and Loop Capital were also present.

(16-12-01) (Actuarial Audit Review - Milliman/Gabriel Roeder Smith & Company) Messrs. Winningham and Zweiner of Milliman presented the results of their limited scope audit of the December 31, 2015 actuarial valuation.

Messrs. Winningham and Zweiner stated the scope of the audit included the following:

- Review and comment on the reasonableness and appropriateness of the valuation methods and assumptions for compliance with generally recognized and accepted actuarial principles and practices.
- Evaluate the data used in performing the valuation and the degree to which the data is sufficient to support our conclusions.
- Perform sample life testing of the 2015 valuation results and evaluate and reconcile any significant differences with results produced by Gabriel Roeder Smith & Company (GRS).
- Provide an opinion as to the accuracy of the actuarial valuation results.
- Assess whether the valuation report reflects information required to be disclosed under current standards.

Mr. Winningham reported that based on their analysis, they believe that the GRS data summaries in the valuation report are reasonable and consistent with the consensus provided by IMRF.

Messrs. Winningham and Zweiner summarized the key findings as follows:

- The December 31, 2015 actuarial valuation provides a fair and reasonable assessment of the financial position of IMRF.
- The member data provided to GRS by IMRF is being processed in a reasonable and accurate manner.
- While Milliman may have arrived at a slightly different set of actuarial assumptions, they are within the range used by similarly situated public sector pension funds.
- The actuarial cost and asset valuation methods are commonly used by similarly situated funds and are being correctly applied.
- Recommendations - No major concerns, all recommendations are modest incremental improvements.

Next, Messrs. Murphy and Pieterse, of GRS stated that GRS is supportive of the actuarial review process. They noted a common purpose of an actuarial review is to double check the retained actuary's technical work and to ensure that the mathematical processes are being carried out correctly and appropriately.

Mr. Murphy further reported that GRS will implement some of the Milliman suggestions and review others.

Discussion followed.

(16-12-02) (Investment Manager Activities - Callan Associates) Mr. Ball of Callan Associates presented the following report to the Board on the activities of IMRF's investment managers for the month of November 2016:

**November 30, 2016**

**Illinois Municipal  
Retirement Fund  
Monthly Performance Report**

**Investment Measurement Service  
Monthly Review**

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The following report was prepared by Callan Associates Inc. ("CAI") using information from sources that include the following: fund trustee(s); fund custodian(s); investment manager(s); CAI computer software; CAI investment manager and fund sponsor database; third party data vendors; and other outside sources as directed by the client. CAI assumes no responsibility for the accuracy or completeness of the information provided, or methodologies employed, by any information providers external to CAI. Reasonable care has been taken to assure the accuracy of the CAI database and computer software. Callan does not provide advice regarding, nor shall Callan be responsible for, the purchase, sale, hedge or holding of individual securities, including, without limitation securities of the client (i.e., company stock) or derivatives in the client's accounts. In preparing the following report, CAI has not reviewed the risks of individual security holdings or the conformity of individual security holdings with the client's investment policies and guidelines, nor has it assumed any responsibility to do so. Advice pertaining to the merits of individual securities and derivatives should be discussed with a third party securities expert. Copyright 2016 by Callan Associates Inc.

**Major Market Returns  
Returns**

**for Periods Ended November 30, 2016**

Index	Last Month	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Russell:3000 Index	4.48	10.58	8.31	8.68	14.41	7.00
Russell:1000 Index	3.94	9.99	8.01	8.88	14.45	7.02
Russell:Midcap Index	5.39	12.52	9.50	8.57	14.43	7.74
Russell:2000 Index	11.15	18.00	12.08	6.45	13.98	6.81
MSCI:ACWI ex US	(2.31)	1.89	(0.03)	(2.31)	4.24	1.02
MSCI:EAFE	(1.99)	(2.34)	(3.66)	(2.22)	5.62	0.72
MSCI:EM	(4.60)	10.94	8.47	(3.10)	0.99	2.27
Blmbg:Aggregate Idx	(2.37)	2.50	2.17	2.79	2.43	4.27
NFI-ODCE Val Gross	—	—	—	—	—	—
FTSE:NAREIT Equity Index	(1.69)	3.65	5.56	11.74	12.00	4.44

The election of Donald Trump shaped markets throughout November. The dollar continued to strengthen, contributing to a stall in the emerging markets rally. Treasuries sold off the day after the election pushing the yield on the 10-year north of 2% for the first time since January. A risk-on mindset fueled by the prospect of decreased business regulation propelled U.S. equities upward. Populist momentum stoked political and economic uncertainty in the euro zone as additional countries prepare for elections in the near future. However, not all aspects of market activity were sentiment driven during the month. The Federal Open Market Committee (FOMC) cited strong fundamentals in their November meeting minutes to support their statement that rates would rise "soon." They voted eight to two to keep the target range at 0.25%-0.50%, stating they are waiting on inflation to solidify before making their next move. The Russell 3000 Index rose 4.5% during the month and the MSCI ACWI ex U.S. Index retreated 2.3%. Emerging markets pulled back 4.6% but are still up 10.9% year to date (MSCI EM Index).

In November, U.S. employers added 178,000 jobs. The unemployment rate dipped to 4.6% but was coupled with a decrease in the labor force participation rate of 0.1%. Inflationary pressure from wage growth backed off as average hourly earnings decreased for the first time this year, falling 0.1%. Increases in the professional services and construction sectors boosted results while retail detracted, indicating stores are not ramping up much for December shopping.

The second reading of third quarter GDP was 3.2%. It received a boost over the first reading from consumer spending. Personal consumption expenditures increased 2.8% during the quarter. Slowing inventory growth also provided a tailwind to expansion. Residential investment improved from last month's doldrums but has yet to edge back into positive territory. Net exports were a slight drag over the period.

Energy prices increased 3.5% in October, pushing month-over-month headline CPI to +0.4%. Health care costs, previously a growth engine, were flat for the month along with food costs. Over the past 12 months headline CPI has increased 1.6%. Core CPI, unaffected by energy prices, grew only 0.1% month-over-month. Year-over-year, it contracted 0.1% to 2.1%.

\*Due to a lag in the reporting of NCREIF Property Index returns, the monthly return shown is deduced from the most recent quarterly return. This monthly return, when compounded over three months, equates to the quarterly return.

**U.S. Equity Overview**

**Returns**

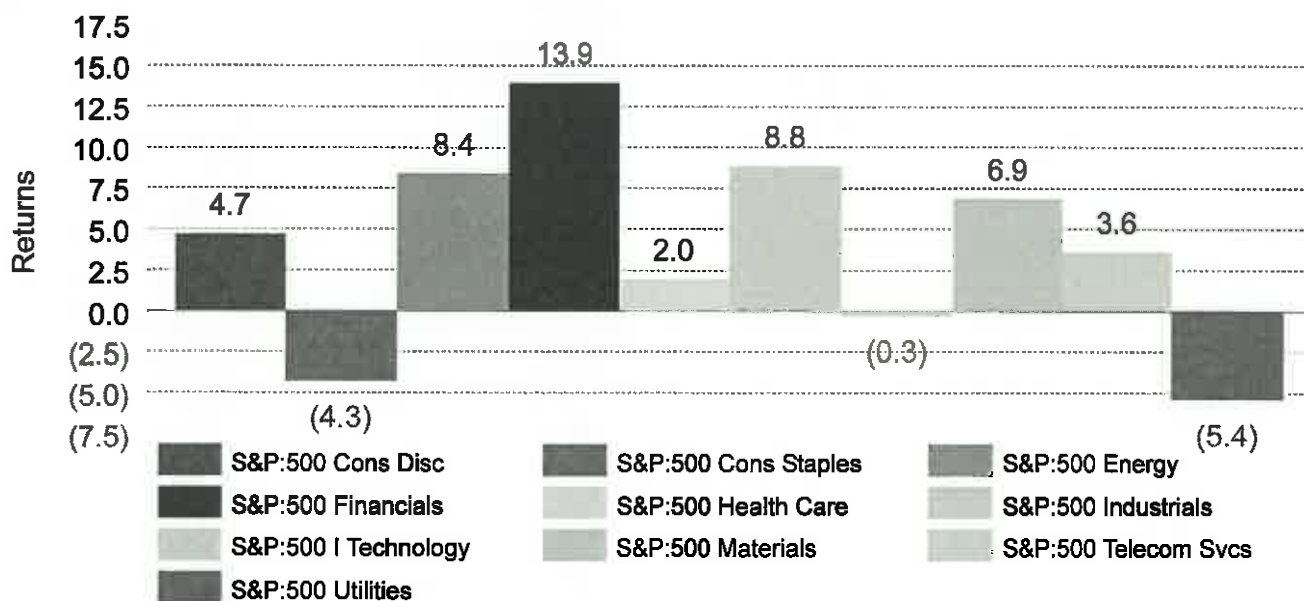
**for Periods Ended November 30, 2016**

Index	Last Month	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Russell:3000 Index	4.48	10.58	8.31	8.68	14.41	7.00
Russell:1000 Index	3.94	9.99	8.01	8.88	14.45	7.02
Russell:1000 Growth	2.18	5.77	4.22	9.13	14.14	8.24
Russell:1000 Value	5.71	14.48	12.02	8.60	14.69	5.70
Russell:Midcap Index	5.39	12.52	9.50	8.57	14.43	7.74
Russell:2000 Index	11.15	18.00	12.08	6.45	13.98	6.81
Russell:2000 Growth	8.95	9.82	4.58	5.29	13.38	7.59
Russell:2000 Value	13.27	26.52	19.85	7.52	14.50	5.92

Domestic equity markets rallied significantly following the surprise outcome of the U.S. presidential election on November 8th. Trump's election may facilitate decreased business regulation and increased infrastructure spending. This could spur economic growth and inflation. Banks surged on the expectation of higher interest rates and biotechs advanced on the thought of less drug pricing restrictions. The Russell 3000 Index rose 4.5%. Small caps outperformed large caps by a wide margin this month (Russell 2000 Index: +11.2%; Russell 1000 Index: +4.0%) as a Trump presidency is seen as a larger benefit to smaller companies. Similar to last month, value stocks beat growth across the cap spectrum and are significantly outperforming year to date. The Russell Midcap Index gained 5.4%.

Correlations between sectors finally broke down after Election Day and volatility was reintroduced to the market. There was a 19.3% spread between the best and worst sector in the S&P 500. Financials lead the way and climbed an impressive 13.9%. Industrials (+8.8%), Energy (+8.4%), and Materials (+6.9%) followed. Utilities lagged, dropping 5.4%.

**S&P 500 Sector Returns for 1 Month Ended November 30, 2016**



**Returns**

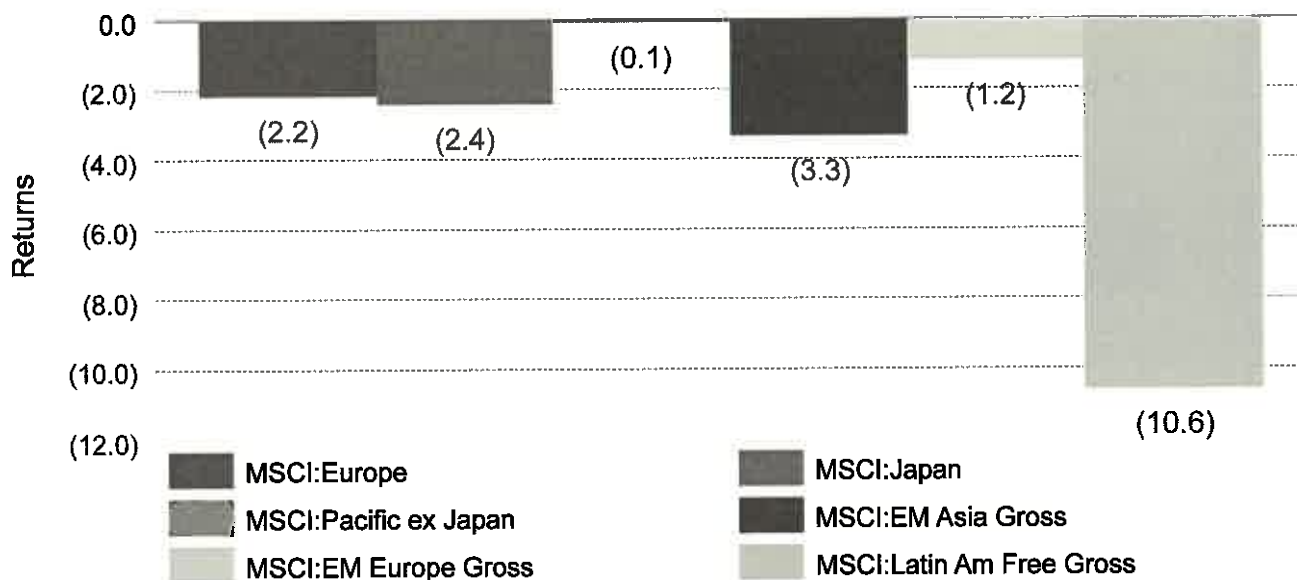
for Periods Ended November 30, 2016

Index	Last Month	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
MSCI:ACWI ex US	(2.31)	1.89	(0.03)	(2.31)	4.24	1.02
MSCI:ACWIxUS Growth Gross	(3.80)	(0.98)	(2.23)	(1.05)	5.06	2.00
MSCI:ACWIxUS Val Gross	(0.84)	5.74	3.15	(2.78)	4.29	0.89
MSCI:EAFE	(1.99)	(2.34)	(3.66)	(2.22)	5.62	0.72
MSCI:EAFE Hedged Gross	1.06	(1.35)	(4.09)	1.75	7.93	(0.25)
MSCI:EM	(4.60)	10.94	8.47	(3.10)	0.99	2.27
MSCI:ACWI ex US Small Cap	(2.97)	1.75	1.85	0.64	6.90	3.03

International equities bucked recent trends and trailed their U.S. counterparts in November (MSCI ACWI x U.S. Index: -2.3%). The U.S. dollar strengthened in the month and local currency returns outpaced dollar denominated returns (MSCI EAFE: -2.0%; MSCI EAFE Hedged: +1.1%). The MSCI Emerging Markets Index had a tough month, declining 4.6% in the wake of the U.S. election on expectations of higher inflation and faster interest rate hikes. Small cap stocks outside of the U.S. also retreated, falling 3.0% in November (MSCI ACWI SC x U.S. Index). On a positive note, OPEC agreed to cut oil production for six months starting at the beginning of 2017, a deal which should help bring supply and demand back into balance.

MSCI regional returns were all negative in November. Emerging markets in Latin America lagged the most and lost 10.6%. Emerging markets in Asia and developed Japan followed, down 3.3% and 2.4%, respectively. Pacific ex Japan fared best, declining only 0.1%.

**Regional Returns for 1 Month Ended November 30, 2016**

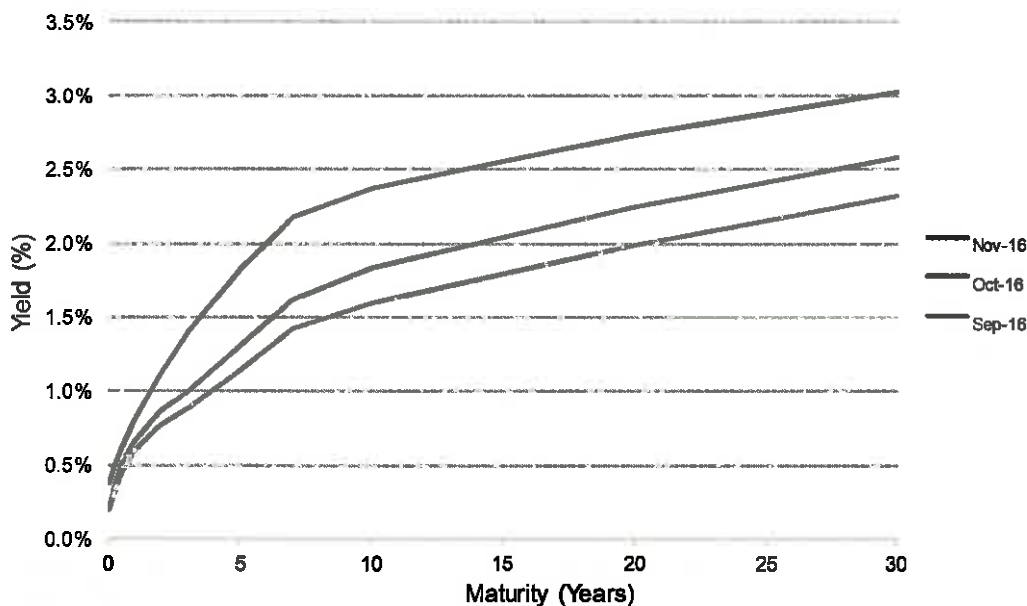


**U.S. Fixed Income Overview  
Returns**

**for Periods Ended November 30, 2016**

Index	Last Month	Year to Date	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Blmbg:Aggregate Idx	(2.37)	2.50	2.17	2.79	2.43	4.27
Blmbg:Govt Index	(2.59)	1.16	0.98	2.00	1.42	3.80
Blmbg:Credit	(2.73)	4.99	4.19	3.77	4.12	5.16
Blmbg:Mortgage Idx	(1.71)	1.67	1.64	2.90	2.20	4.25
BB Barclays:US TIPS Index	(1.92)	4.79	3.96	1.79	0.92	4.13
3 Month T-Bill	0.02	0.28	0.32	0.13	0.11	0.84
ML:High Yield CP Idx	(0.40)	15.09	12.16	4.21	7.41	7.18
CS:Lev Loan	0.32	8.63	7.60	3.54	5.08	4.22
JPM:EMBI Global	(4.17)	8.63	7.00	5.29	5.39	6.67
JPM:GBI-EM Global Dvsfd	(7.03)	7.92	5.52	(4.87)	(1.94)	3.86

**Treasury Yield Curve**



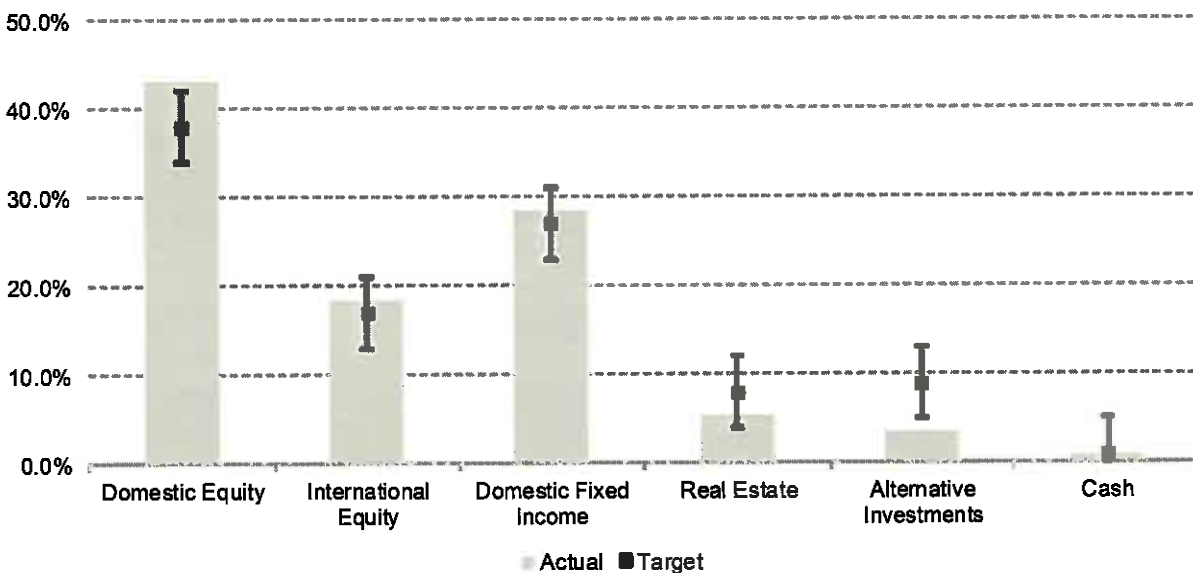
Donald Trump's victory over Hillary Clinton in the presidential election surprised investors and dominated U.S. headlines in November. As a result, fixed income sold off and yields rose across the curve. The 10-year rose 53 bps to 2.37% and the 30-year rose 44 bps to end November at 3.02%. The FOMC left rates unchanged. However, meeting minutes noted improving economic conditions, suggesting a rate hike relatively soon. The market is currently pricing in the probability of a December rate hike at 100%.

U.S. fixed income markets experienced losses almost everywhere in November as positive market sentiment drove risk-on trades. Investment Grade Credit (Bloomberg Barclays Credit Index) and Government bonds (Bloomberg Barclays Government Securities Index) were major losers for the month, down 2.7% and 2.6% respectively. The Bloomberg Barclays U.S. TIPS Index was down 1.9% while Mortgages fell 1.7% (Bloomberg Barclays Mortgage Index). High Yield fell for the first month since January, retreating 0.4%, but remains well in the black for 2016 (ML High Yield CP Index: +15.1%). Levered loans were the lonely bright spot and rose 0.3%. Emerging market debt declined the most.

**Total Fund**

Total Fund assets at the end of November were \$35.90 billion, up from \$35.42 billion at the end of October. The Fund gained 1.53% for the month and outperformed the benchmark return by 75 basis points. The U.S. Equity composite outperformed its benchmark while the non-U.S. Equity slightly underperformed its benchmark. Real Estate returned 1.20% during November, about double the return of the benchmark. Alternatives advanced 0.62%, slightly trailing the 0.72% return of its custom benchmark. Fixed Income fell 1.95% during November, but still outperformed the -2.37% return of the BC Aggregate Index. Over the last year, the Fund has returned 4.84% but trailed the 5.37% return of the benchmark.

Current policy states that when the actual allocations of the asset classes differ by more than four percentage points from their policy targets, a recommendation for rebalancing will be made to the Board of Trustees. As of November, Alternatives was below target allocation by 5.5% and Domestic Equity was below target allocation by 5.1%. All other asset classes were within the allowable range. The Chief Investment Officer and Consultant do not recommend any rebalancing at this time.



**U.S. Equity**

The U.S. Equity composite gained 6.00% during November and outperformed the Russell 3000 Index by 1.52%. Small Cap was the clear winner in November while Value again outperformed Growth across capitalizations.

**Large Cap:** IMRF's Large Cap managers advanced 4.37%, outperforming the Russell 1000 Index return of 3.94%. In aggregate, Growth managers fell 0.15% and underperformed the Russell 1000 Growth Index return of 2.18%. The -2.91% return from Sands caused a drag on performance. On the other hand, Value managers returned 7.49%, outperforming the Russell 1000 Value Index by 1.78%. All of the Value managers posted positive absolute returns and outperformed the Russell 1000 Value Index in November.

**Small Cap:** The Small Cap composite gained 11.47% and outperformed the 11.15% return of the Russell 2000 Index. Small Cap Growth and Value returned 8.88% and 14.51%, respectively. The Micro Cap composite returned 9.35% in November.



**International Equity**

In November, the International Equity composite slightly trailed the MSCI ACWI ex-U.S. (Net) Index, returning -2.44%.

Large Cap: Despite falling 2.14% in November, International Large Cap managers still outperformed the MSCI ACWI ex-U.S. (Net) Index by 17 basis points. International Large Cap Growth managers collectively fell 2.07%. International Large Cap Value fared slightly worse and declined 2.77% for the month. All International Large Cap Value and Growth managers posted negative absolute returns in November.

International Small Cap and Emerging Markets: The International Small Cap managers returned -4.34% compared to the -2.97% return of the ACWI Small Cap ex US Index. The Emerging Markets portfolio, managed by Genesis, fell 3.86% in November but outperformed the MSCI Emerging Markets Index by 74 basis points.

**Fixed Income**

For the month, the total fixed income portfolio returned -1.95% but outperformed the BC Aggregate Index by 42 basis points. The Opportunistic component, managed by Crescent, was the best performer in the composite, returning 0.48%.

Active Core: The Active Core Fixed Income component, which is made up of EARNEST Partners, Piedmont and Garcia Hamilton, fell 2.05% and exceeded the BC Aggregate Index return of -2.37%.

Core Plus: The Core Plus managers fell 1.90%, but outperformed the BC Aggregate Index by 47 basis points. BlackRock, LM Capital, and Taplin, Canada, Habacht all outperformed the BC Aggregate Index.

Bank Loans: The Bank Loans component, managed by Barings, gained 0.43% and outperformed its custom benchmark by 11 basis points.

Emerging Markets: The Emerging Markets component, managed by Standish, declined 5.10% and slightly underperformed the -5.04% return of its custom benchmark.

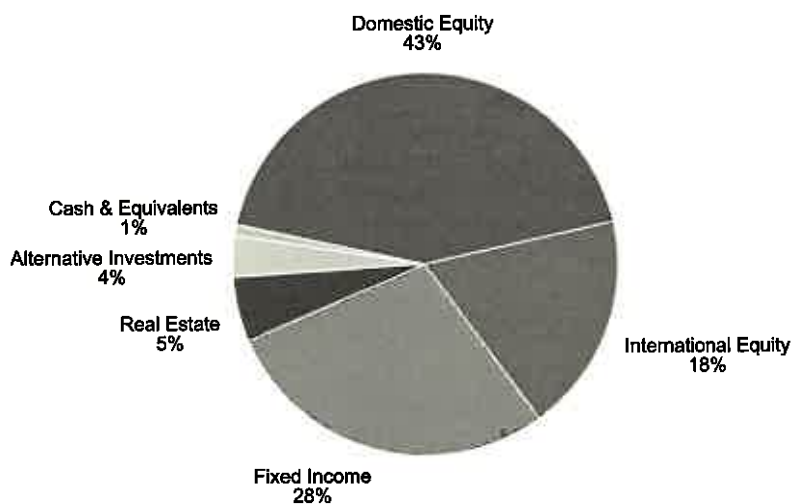
Opportunistic: The Opportunistic component, managed by Crescent, was the top performer of the composite returning 0.48% and outperforming its custom benchmark by 54 basis points.

High Yield: The High Yield manager, MacKay Shields, underperformed the ML High Yield Cash Pay Index by 0.20%.

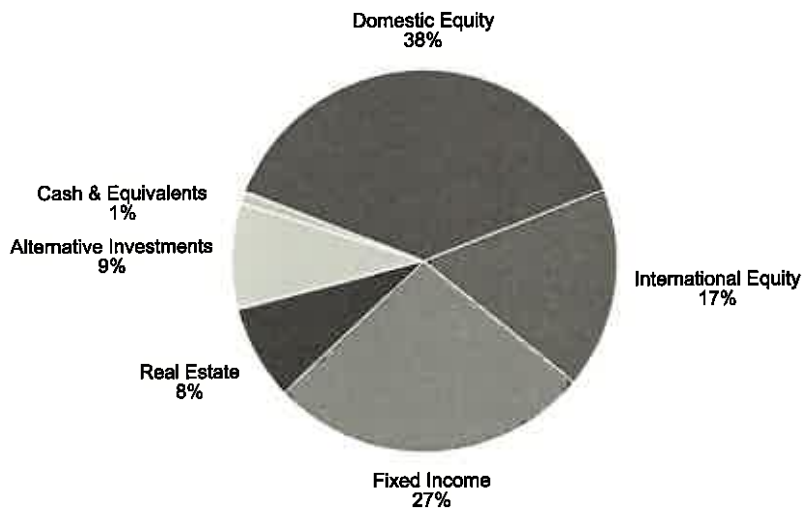
## Actual vs Target Asset Allocation

The first chart below shows the Fund's asset allocation as of November 30, 2016. The second chart shows the Fund's target asset allocation as outlined in the investment policy statement.

### Actual Asset Allocation



### Target Asset Allocation



Asset Class	\$Millions Actual	Percent Actual	Percent Target	Percent Difference	\$Millions Difference
Domestic Equity	15,489	43.1%	38.0%	5.1%	1,849
International Equity	6,626	18.5%	17.0%	1.5%	523
Fixed Income	10,227	28.5%	27.0%	1.5%	535
Real Estate	1,959	5.5%	8.0%	(2.5%)	(913)
Alternative Investments	1,272	3.5%	9.0%	(5.5%)	(1,959)
Cash & Equivalents	324	0.9%	1.0%	(0.1%)	(35)
<b>Total</b>	<b>35,896</b>	<b>100.0%</b>	<b>100.0%</b>		

\* Current Month Target = 38.0% Russell 3000 Index, 27.0% Blmbg Aggregate Idx, 17.0% MSCI ACWI ex US, 9.0% 9% Annually, 8.0% NFI-ODCE Value Weight Net and 1.0% 3-month Treasury Bill.

## Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of November 30, 2016, with the distribution as of October 31, 2016.

### Asset Distribution Across Investment Managers

	November 30, 2016		October 31, 2016	
	Market Value	Percent	Market Value	Percent
<b>Domestic Equity*</b>	<b>\$15,489,243,616</b>	<b>43.15%</b>	<b>\$14,706,976,882</b>	<b>41.52%</b>
<b>Large Cap Growth</b>				
Holland	854,987,776	2.38%	844,564,079	2.38%
NTGI S&P 500 Growth Idx	1,502,126,859	4.18%	1,483,503,536	4.19%
Sands	1,147,413,410	3.20%	1,181,762,685	3.34%
<b>Large Cap Value</b>				
Dodge & Cox	1,275,686,731	3.55%	1,169,246,909	3.30%
BMO	1,281,400,055	3.57%	1,201,209,883	3.39%
LSV	1,316,149,064	3.67%	1,223,078,933	3.45%
NTGI S&P 500 Value Idx	1,493,514,795	4.16%	1,405,470,348	3.97%
<b>Large Cap Core</b>				
NTGI MarketCap Index	2,888,047,813	8.05%	2,764,596,114	7.81%
<b>Small Cap Growth</b>				
Frontier	366,768,256	1.02%	338,331,114	0.96%
FIAM	989,210,839	2.76%	907,069,097	2.56%
<b>Small Cap Value</b>				
Channing	207,245,079	0.58%	181,440,280	0.51%
Dimensional Small Cap Value	824,956,825	2.30%	719,003,492	2.03%
Inv. Counselors of Maryland	682,203,107	1.90%	596,718,948	1.68%
<b>Micro Cap</b>				
Ariel	67,240,578	0.19%	65,797,275	0.19%
Ativo	114,615,085	0.32%	104,752,840	0.30%
Dimensional Micro Cap	361,508,532	1.01%	319,146,646	0.90%
Wall Street	115,883,276	0.32%	200,676,590	0.57%
<b>International Equity</b>	<b>\$6,625,845,996</b>	<b>18.46%</b>	<b>\$6,841,537,738</b>	<b>19.32%</b>
<b>International Large Cap Growth</b>				
EARNEST Partners	504,971,340	1.41%	512,135,075	1.45%
William Blair	576,780,768	1.61%	592,489,028	1.67%
<b>International Large Cap Value</b>				
Brandes	504,929,883	1.41%	516,294,011	1.46%
Lombardia	5,548	0.00%	5,621	0.00%
Mondrian	469,338,702	1.31%	485,593,071	1.37%
Lazard	89,823,458	0.25%	92,534,906	0.26%
<b>International Large Cap Core</b>				
Arrowstreet	530,577,249	1.48%	539,705,479	1.52%
Brown	271,450,981	0.76%	276,132,813	0.78%
GlobeFlex	507,412,278	1.41%	524,477,511	1.48%
NTGI MSCI EAFE Index	1,916,963,377	5.34%	2,005,849,569	5.66%
Progress Intl Equity	240,839,866	0.67%	240,839,866	0.68%
<b>International Small Cap</b>				
Franklin Templeton	181,756,672	0.51%	189,497,198	0.54%
William Blair	222,264,929	0.62%	232,843,052	0.66%
<b>Emerging Markets</b>				
Genesis	608,730,945	1.70%	633,140,538	1.79%

\* includes asset in equity transition account.

## Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of November 30, 2016, with the distribution as of October 31, 2016.

### Asset Distribution Across Investment Managers

	November 30, 2016		October 31, 2016	
	Market Value	Percent	Market Value	Percent
<b>Fixed Income</b>	<b>\$10,227,080,409</b>	<b>28.49%</b>	<b>\$10,446,000,435</b>	<b>29.49%</b>
<b>Domestic Fixed Core</b>				
EARNEST Partners	552,009,701	1.54%	566,069,295	1.60%
Piedmont	547,858,943	1.53%	560,521,257	1.58%
Garcia Hamilton	521,816,876	1.45%	531,961,276	1.50%
<b>Passive Core</b>				
BlackRock US Debt	1,391,664,879	3.88%	1,425,430,339	4.02%
NTGI BC Aggregate Index	1,506,955,948	4.20%	1,544,170,843	4.36%
<b>Domestic Fixed Core Plus</b>				
BlackRock Core Plus	743,696,913	2.07%	762,593,043	2.15%
Brandes Core Plus	245,057,672	0.68%	251,999,348	0.71%
LM Capital	857,247,165	2.39%	879,422,301	2.48%
Progress Fixed Income	866,808,376	2.41%	866,808,376	2.45%
Taplin, Canida, & Habacht	863,779,825	2.41%	884,215,815	2.50%
Western	916,629,806	2.55%	944,678,596	2.67%
<b>Bank Loans</b>				
Barings Global Loan Fund	303,722,725	0.85%	302,431,930	0.85%
<b>Emerging Markets Debt</b>				
Standish	180,142,170	0.50%	189,826,191	0.54%
<b>Opportunistic Fixed Income</b>				
Crescent	115,883,591	0.32%	115,330,847	0.33%
<b>High Yield</b>				
MacKay Shields	612,735,527	1.71%	618,606,639	1.75%
FIAM High Yield	1,070,294	0.00%	1,934,338	0.01%
<b>Real Estate</b>	<b>\$1,958,898,195</b>	<b>5.46%</b>	<b>\$1,890,455,580</b>	<b>5.34%</b>
<b>Real Estate Core</b>				
TA Buckhead Ind. Prop.	384,782,248	1.07%	345,007,030	0.97%
Barings Core Property Fund	142,916,740	0.40%	139,443,358	0.39%
INVESCO Core RE	185,255,397	0.52%	185,255,397	0.52%
AEW Core Property Trust	223,418,592	0.62%	225,738,406	0.64%
CBRE US Core Property Trust	155,826,955	0.43%	155,826,955	0.44%
<b>Real Estate Non-Core</b>				
Artemis MWBE Spruce	3,481,752	0.01%	1,564,413	0.00%
Franklin Templeton EMREFF	39,091,194	0.11%	33,508,210	0.09%
Security Capital	59,115,608	0.16%	58,561,610	0.17%
Dune II	34,637,128	0.10%	34,205,161	0.10%
Non-Core Real Estate Funds*	616,782,783	1.72%	605,221,176	1.71%
Non-Core Intl Real Estate Funds**	63,143,673	0.18%	54,683,146	0.15%
Rockwood Fund VIII	5,897,340	0.02%	5,897,340	0.02%
Almanac ARS V	11,686,840	0.03%	12,449,033	0.04%
TA Fund IX	32,861,945	0.09%	33,094,345	0.09%
<b>Alternative Investments</b>	<b>\$1,271,583,131</b>	<b>3.54%</b>	<b>\$1,268,949,318</b>	<b>3.58%</b>
<b>Absolute Return</b>				
Aurora	79,450,586	0.22%	91,382,586	0.26%
<b>Private Equity</b>				
Abbott	302,564,450	0.84%	309,180,349	0.87%
Muller & Monroe ILPEFF	7,652,626	0.02%	7,652,626	0.02%
Muller & Monroe MPEFF	10,757,354	0.03%	10,757,354	0.03%
Pantheon	198,645,475	0.55%	204,277,975	0.58%
Private Equity Fund - Domestic	392,536,469	1.09%	367,330,534	1.04%
Private Equity Fund - International	22,302,767	0.06%	20,694,491	0.06%
<b>Agriculture</b>				
Premiere Partners IV	183,438,395	0.51%	183,438,395	0.52%
<b>Timberland</b>				
Forest Investment Assoc.	74,235,008	0.21%	74,235,008	0.21%
<b>Cash &amp; Equivalents</b>	<b>\$323,723,609</b>	<b>0.90%</b>	<b>\$265,529,040</b>	<b>0.75%</b>
<b>Total Fund</b>	<b>\$35,896,374,956</b>	<b>100.0%</b>	<b>\$35,419,448,993</b>	<b>100.0%</b>

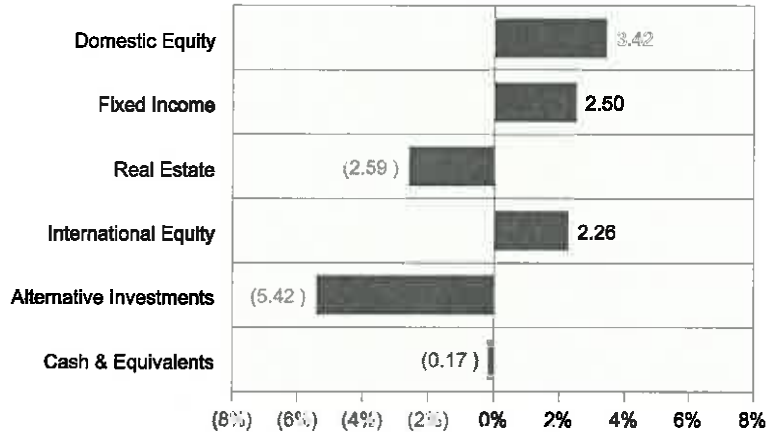
\* Non-Core Real Estate Funds funded since September 2011.

\*\* Non-Core International Real Estate Funds funded since August 2014.

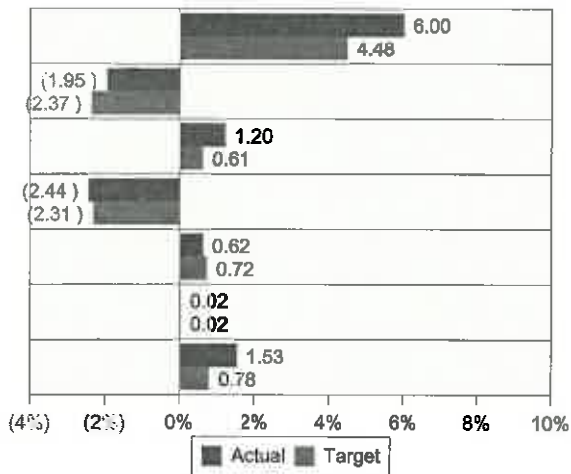
## Monthly Total Fund Relative Attribution - November 30, 2016

The following analysis approaches Total Fund Attribution from the perspective of relative return. Relative return attribution separates and quantifies the sources of total fund excess return relative to its target. This excess return is separated into two relative attribution effects: Asset Allocation Effect and Manager Selection Effect. The Asset Allocation Effect represents the excess return due to the actual total fund asset allocation differing from the target asset allocation. Manager Selection Effect represents the total fund impact of the individual managers excess returns relative to their benchmarks.

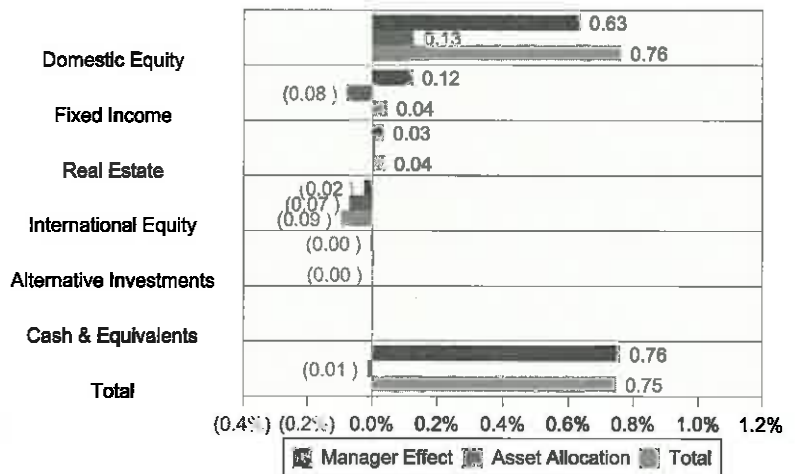
### Asset Class Under or Overweighting



### Actual vs Target Returns



### Relative Attribution by Asset Class



### Relative Attribution Effects for Month ended November 30, 2016

Asset Class	Effective Actual Weight	Effective Target Weight	Actual Return	Target Return	Manager Effect	Asset Allocation	Total Relative Return
Domestic Equity	41%	38%	6.00%	4.48%	0.63%	0.13%	0.76%
Fixed Income	29%	27%	(1.95%)	(2.37%)	0.12%	(0.08%)	0.04%
Real Estate	5%	8%	1.20%	0.61%	0.03%	0.00%	0.04%
International Equity	19%	17%	(2.44%)	(2.31%)	(0.02%)	(0.07%)	(0.09%)
Alternative Investments	4%	9%	0.62%	0.72%	(0.00%)	0.00%	(0.00%)
Cash & Equivalents	1%	1%	0.02%	0.02%	0.00%	0.00%	0.00%
<b>Total</b>			<b>1.53%</b>		<b>0.78%</b>	<b>0.76%</b>	<b>(0.01%)</b>
							<b>0.75%</b>

\* Current Month Target = 38.0% Russell 3000 Index, 27.0% Blmbg Aggregate Idx, 17.0% MSCI ACWI ex US, 9.0% 9% Annually, 8.0% NFI-ODCE Value Weight Net and 1.0% 3-month Treasury Bill.

## Asset Class Returns

The table below details the rates of return for the fund's asset class composites over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
Domestic Equity	6.00%	4.06%	10.49%	7.49%
Blended Benchmark**	4.48%	2.38%	10.58%	8.31%
Domestic Equity - Net	5.97%	4.01%	10.24%	7.25%
International Equity	(2.44%)	(2.42%)	1.13%	(0.24%)
MSCI ACWI x US (Net)	(2.31%)	(2.53%)	1.89%	(0.03%)
International Equity - Net	(2.50%)	(2.51%)	0.81%	(0.57%)
Fixed Income	(1.95%)	(2.37%)	4.52%	3.85%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Fixed Income - Net	(1.97%)	(2.40%)	4.39%	3.72%
Real Estate	1.20%	2.01%	8.17%	9.64%
Blended Benchmark***	0.61%	1.83%	7.09%	8.18%
Real Estate - Net	1.20%	2.01%	8.17%	9.64%
Alternative Investments	0.62%	2.14%	3.21%	4.16%
Alternatives Custom Benchmark****	0.72%	2.18%	8.22%	9.00%
Alternative Investments - Net	0.58%	2.09%	2.91%	3.86%
Absolute Return	0.00%	0.00%	(1.44%)	(1.01%)
HFR Fund-of-Funds Index	(0.17%)	(0.01%)	(0.69%)	(1.11%)
Private Equity	0.84%	3.32%	6.46%	5.04%
Alternatives Custom Benchmark****	0.72%	2.18%	8.22%	9.00%
Agriculture	0.00%	(1.42%)	(1.01%)	12.04%
Blended Benchmark***	0.61%	1.83%	7.09%	8.18%
Timberland	0.00%	(0.48%)	(6.92%)	(7.16%)
Blended Benchmark***	0.61%	1.83%	7.09%	8.18%
<b>Total Fund</b>	<b>1.53%</b>	<b>0.72%</b>	<b>6.42%</b>	<b>4.84%</b>
Total Fund - Net	1.50%	0.67%	6.21%	4.63%
Total Fund Benchmark	0.78%	(0.02%)	6.47%	5.37%

\* Current Month Target = 38.0% Russell 3000 Index, 27.0% Blmgb Aggregate Idx, 17.0% MSCI ACWI ex US, 9.0% 9% Annually, 8.0% NFI-ODCE Value Weight Net and 1.0% 3-month Treasury Bill.

\*\* The Blended Benchmark is currently Russell 3000 Index. Returns prior to January 1, 2015, reflect those of the Dow Jones U.S. Total Stock Market Index.

\*\*\* The Blended Benchmark is currently ODCE Value Weighted Index. Returns between January 1, 2007 and December 31, 2012 reflect NPI+1%. Returns prior to January 1, 2007, reflect those of the Consumer Price Index +5%.

Given that ODCE returns are updated quarterly, an approximation of the Index is used in the monthly reports.

\*\*\*\* The Alternatives Custom Benchmark is based on an annualized rate of return of 9.0%. Prior to July 1, 2010 the Benchmark was based on an annual return of 12.0%. Prior to 2004, the Benchmark was based on an annual return of 13.0%. Prior to 2003, it was based on an annual return of 15.0%.

## Asset Class Returns

The table below details the rates of return for the fund's asset class composites over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception
Domestic Equity	7.68%	14.58%	7.28%	11.50% <sup>(1/82)</sup>
Blended Benchmark**	8.65%	14.37%	7.11%	11.23% <sup>(1/82)</sup>
Domestic Equity - Net	7.41%	14.30%	7.02%	7.66% <sup>(1/05)</sup>
International Equity	(0.80%)	6.42%	1.99%	7.52% <sup>(9/86)</sup>
MSCI ACWI x US (Net)	(2.31%)	4.24%	1.02%	-
International Equity - Net	(1.13%)	6.07%	1.66%	4.58% <sup>(1/05)</sup>
Fixed Income	3.41%	3.75%	5.13%	8.52% <sup>(1/82)</sup>
BC Aggregate Index	2.79%	2.43%	4.27%	8.00% <sup>(1/82)</sup>
Fixed Income - Net	3.27%	3.60%	4.99%	4.90% <sup>(1/05)</sup>
Real Estate - Net	11.31%	11.55%	5.40%	7.05% <sup>(1/05)</sup>
Blended Benchmark***	11.15%	11.60%	7.74%	7.78% <sup>(1/05)</sup>
Alternative Investments	6.58%	7.96%	6.32%	10.62% <sup>(2/88)</sup>
Alternatives Custom Benchmark****	9.00%	9.00%	10.07%	13.03% <sup>(2/88)</sup>
Alternative Investments - Net	6.20%	7.63%	6.01%	7.63% <sup>(1/05)</sup>
Absolute Return	1.88%	3.83%	2.58%	4.24% <sup>(1/02)</sup>
HFR Fund-of-Funds Index	1.23%	3.06%	1.37%	3.24% <sup>(1/02)</sup>
Private Equity	9.30%	9.38%	8.64%	12.75% <sup>(2/88)</sup>
Alternatives Custom Benchmark****	9.00%	9.00%	10.07%	13.03% <sup>(2/88)</sup>
Agriculture	10.02%	18.37%	10.65%	8.68% <sup>(10/97)</sup>
Blended Benchmark***	11.15%	11.60%	7.74%	7.58% <sup>(10/97)</sup>
Timberland	2.07%	2.10%	4.66%	7.95% <sup>(10/82)</sup>
Blended Benchmark***	11.15%	11.60%	7.74%	7.58% <sup>(10/82)</sup>
<b>Total Fund</b>	<b>4.79%</b>	<b>9.33%</b>	<b>6.09%</b>	<b>9.87%</b> <sup>(1/82)</sup>
Total Fund - Net	4.56%	9.08%	5.86%	6.66% <sup>(1/05)</sup>
Total Fund Benchmark	5.45%	8.65%	5.94%	6.53% <sup>(1/05)</sup>

\* Current Month Target = 38.0% Russell 3000 Index, 27.0% BlmBg Aggregate Idx, 17.0% MSCI ACWI ex US, 9.0% 9% Annually, 8.0% NFI-ODCE Value Weight Net and 1.0% 3-month Treasury Bill.

\*\* The Blended Benchmark is currently Russell 3000 Index. Returns prior to January 1, 2015, reflect those of the Dow Jones U.S. Total Stock Market Index.

\*\*\* The Blended Benchmark is currently ODCE Value Weighted Index. Returns between January 1, 2007 and December 31, 2012 reflect NPI+1%. Returns prior to January 1, 2007, reflect those of the Consumer Price Index +5%.

Given that ODCE returns are updated quarterly, an approximation of the Index is used in the monthly reports.

\*\*\*\* The Alternatives Custom Benchmark is based on an annualized rate of return of 9.0%. Prior to July 1, 2010 the Benchmark was based on an annual return of 12.0%. Prior to 2004, the Benchmark was based on an annual return of 13.0%. Prior to 2003, it was based on an annual return of 15.0%.

## Large Cap Equity Returns

The table below details the rates of return for the fund's large cap growth and large cap value managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
<b>Large Cap Equity</b>	<b>4.37%</b>	<b>2.85%</b>	<b>8.91%</b>	<b>6.73%</b>
Russell 1000 Index	3.94%	2.00%	9.99%	8.01%
<b>Large Cap Growth</b>	<b>(0.15%)</b>	<b>(1.72%)</b>	<b>0.78%</b>	<b>(0.81%)</b>
Holland	1.23%	(0.87%)	2.06%	0.77%
LCG Blended Benchmark*	2.18%	0.14%	5.77%	4.22%
Russell 1000 Growth Index	2.18%	0.14%	5.77%	4.22%
Holland - Net	1.18%	(0.97%)	1.85%	0.56%
NTGI S&P 500 Growth Idx	1.26%	(0.50%)	5.46%	3.87%
S&P/Citi 500 Growth Index	1.22%	(0.53%)	5.39%	3.79%
NTGI S&P 500 Growth Idx - Net	1.26%	(0.50%)	5.46%	3.86%
Sands	(2.91%)	(3.89%)	(5.29%)	(7.22%)
LCG Blended Benchmark*	2.18%	0.14%	5.77%	4.22%
Russell 1000 Growth Index	2.18%	0.14%	5.77%	4.22%
Sands - Net	(2.96%)	(3.95%)	(5.52%)	(7.45%)
<b>Large Cap Value</b>	<b>7.49%</b>	<b>6.33%</b>	<b>14.19%</b>	<b>11.51%</b>
Dodge & Cox	9.27%	10.32%	19.53%	16.54%
LCV Blended Benchmark**	5.71%	3.86%	14.48%	12.02%
Russell 1000 Value Index	5.71%	3.86%	14.48%	12.02%
Dodge & Cox - Net	9.21%	10.27%	19.28%	16.30%
BMO	6.78%	4.29%	9.48%	6.61%
LCV Blended Benchmark**	5.71%	3.86%	14.48%	12.02%
Russell 1000 Value Index	5.71%	3.86%	14.48%	12.02%
BMO - Net	6.72%	4.23%	9.23%	6.31%
LSV	7.90%	6.85%	14.55%	11.76%
LCV Blended Benchmark**	5.71%	3.86%	14.48%	12.02%
Russell 1000 Value Index	5.71%	3.86%	14.48%	12.02%
LSV - Net	7.90%	6.79%	14.26%	11.49%
NTGI S&P 500 Value Idx	6.25%	4.35%	14.57%	12.64%
S&P/Citi 500 Value Index	6.30%	4.30%	14.49%	12.56%
NTGI S&P 500 Value Idx - Net	6.25%	4.35%	14.56%	12.63%
<b>Large Cap Passive Core</b>	<b>4.47%</b>	<b>2.37%</b>	<b>10.61%</b>	<b>8.38%</b>
NTGI MarketCap Idx	4.47%	2.37%	10.61%	8.38%
DJ U.S. Total Stock Market Index	4.44%	2.34%	10.47%	8.24%
NTGI MarketCap Idx - Net	4.47%	2.37%	10.60%	8.37%

\* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Growth Index.

\*\* The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.



## Large Cap Equity Returns

The table below details the rates of return for the fund's large cap growth and large cap value managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception	
<b>Large Cap Equity</b>	<b>8.25%</b>	<b>14.60%</b>	<b>7.13%</b>	<b>11.04%</b>	(1/82)
Russell 1000 Index	8.88%	14.45%	7.02%	11.42%	(1/82)
<b>Large Cap Growth</b>	<b>6.40%</b>	<b>12.96%</b>	<b>7.84%</b>	<b>11.32%</b>	(1/82)
Holland	6.84%	11.96%	8.35%	9.85%	(11/94)
LCG Blended Benchmark*	9.13%	14.14%	8.24%	9.39%	(11/94)
Russell 1000 Growth Index	9.13%	14.14%	8.24%	8.62%	(11/94)
Holland - Net	6.61%	11.72%	8.08%	7.28%	(1/05)
NTGI S&P 500 Growth Idx	9.51%	14.33%	8.20%	6.28%	(8/01)
S&P/Citi 500 Growth Index	9.48%	14.30%	8.18%	6.24%	(8/01)
NTGI S&P 500 Growth Idx - Net	9.50%	14.33%	8.19%	8.10%	(1/05)
Sands	3.18%	13.65%	10.01%	10.02%	(11/03)
LCG Blended Benchmark*	9.13%	14.14%	8.24%	8.15%	(11/03)
Russell 1000 Growth Index	9.13%	14.14%	8.24%	8.21%	(11/03)
Sands - Net	2.94%	13.39%	9.74%	8.63%	(1/05)
<b>Large Cap Value</b>	<b>9.06%</b>	<b>16.02%</b>	<b>6.43%</b>	<b>10.36%</b>	(10/82)
Dodge & Cox	9.48%	17.28%	6.60%	9.42%	(9/03)
LCV Blended Benchmark**	8.60%	14.69%	5.70%	8.26%	(9/03)
Russell 1000 Value Index	8.60%	14.69%	5.70%	8.46%	(9/03)
Dodge & Cox - Net	9.26%	17.03%	6.37%	7.46%	(1/05)
BMO	8.69%	15.20%	6.85%	7.79%	(2/01)
LCV Blended Benchmark**	8.60%	14.69%	5.70%	5.26%	(2/01)
Russell 1000 Value Index	8.60%	14.69%	5.70%	6.43%	(2/01)
BMO - Net	8.45%	14.95%	6.81%	7.84%	(1/05)
LSV	9.45%	16.91%	7.11%	11.23%	(2/03)
LCV Blended Benchmark**	8.60%	14.69%	5.70%	9.37%	(2/03)
Russell 1000 Value Index	8.60%	14.69%	5.70%	9.38%	(2/03)
LSV - Net	9.18%	16.62%	6.82%	8.13%	(1/05)
NTGI S&P 500 Value Idx	8.52%	14.61%	5.54%	5.34%	(8/99)
S&P/Citi 500 Value Index	8.44%	14.53%	5.48%	5.32%	(8/99)
NTGI S&P 500 Value Idx - Net	8.51%	14.61%	5.54%	6.60%	(1/05)
<b>Large Cap Passive Core</b>	<b>8.71%</b>	<b>14.44%</b>	<b>7.02%</b>	<b>10.95%</b>	(1/85)
NTGI MarketCap Idx	8.71%	14.44%	7.03%	10.70%	(2/85)
DJ U.S. Total Stock Market Index	8.60%	14.34%	7.10%	10.65%	(2/85)
NTGI MarketCap Idx - Net	8.70%	14.43%	7.02%	7.62%	(1/05)

\* The LCG Blended Benchmark is currently the Russell 1000 Growth Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Growth Index.

\*\* The LCV Blended Benchmark is currently the Russell 1000 Value Index. Returns prior to January 1, 2006, reflect those of the S&P 500/Citigroup Value Index.

## Small Cap Equity Returns

The table below details the rates of return for the fund's small cap growth, small cap value, and micro cap managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
<b>Small Cap Equity</b>	<b>11.47%</b>	<b>8.02%</b>	<b>15.60%</b>	<b>10.19%</b>
Russell 2000 Index	11.15%	7.05%	18.00%	12.08%
<b>Small Cap Growth</b>	<b>8.88%</b>	<b>4.20%</b>	<b>6.72%</b>	<b>2.98%</b>
Frontier	8.41%	3.02%	6.92%	2.75%
Russell 2000 Growth Index	8.95%	3.65%	9.82%	4.58%
Frontier - Net	8.41%	2.82%	6.24%	2.09%
FIAM	9.06%	4.71%	6.27%	2.84%
Russell 2000 Growth Index	8.95%	3.65%	9.82%	4.58%
FIAM - Net	9.06%	4.71%	5.88%	2.46%
<b>Small Cap Value</b>	<b>14.51%</b>	<b>11.99%</b>	<b>25.15%</b>	<b>17.70%</b>
Channing	14.22%	11.55%	25.41%	16.23%
Russell 2000 Value Index	13.27%	10.41%	26.52%	19.85%
Channing - Net	14.22%	11.41%	24.77%	15.64%
DFA Small Cap Value	14.73%	12.97%	24.49%	17.12%
Russell 2000 Value Index	13.27%	10.41%	26.52%	19.85%
DFA Small Cap Value - Net	14.59%	12.83%	23.87%	16.54%
Inv. Counselors of Maryland	14.32%	10.96%	27.13%	20.24%
Russell 2000 Value Index	13.27%	10.41%	26.52%	19.85%
Inv. Couns. of Maryland - Net	14.21%	10.85%	26.37%	19.52%
<b>Micro Cap</b>	<b>9.35%</b>	<b>6.45%</b>	<b>13.63%</b>	<b>8.57%</b>
Ariel	2.19%	(2.10%)	5.31%	0.76%
Russell Microcap Index	11.62%	8.35%	15.12%	9.18%
Russell 2000 Value Index	13.27%	10.41%	26.52%	19.85%
Russell 2000 Index	11.15%	7.05%	18.00%	12.08%
Ariel - Net	1.97%	(2.31%)	4.41%	(0.10%)
Ativo	9.40%	5.67%	10.97%	6.40%
Russell Microcap Index	11.62%	8.35%	15.12%	9.18%
Russell 2000 Growth Index	8.95%	3.65%	9.82%	4.58%
Russell 2000 Index	11.15%	7.05%	18.00%	12.08%
Ativo - Net	9.40%	5.51%	10.23%	5.69%
DFA Micro Cap	13.27%	10.49%	22.15%	16.57%
Russell 2000 Value Index	13.27%	10.41%	26.52%	19.85%
Russell 2000 Index	11.15%	7.05%	18.00%	12.08%
DFA Micro Cap - Net	13.13%	10.35%	21.54%	15.99%
Wall Street	3.72%	1.59%	3.80%	(0.83%)
Russell 2000 Growth Index	8.95%	3.65%	9.82%	4.58%
Russell 2000 Index	11.15%	7.05%	18.00%	12.08%
Wall Street - Net	3.72%	1.39%	2.90%	(1.68%)

## Small Cap Equity Returns

The table below details the rates of return for the fund's small cap growth, small cap value, and micro cap managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception
<b>Small Cap Equity</b>	<b>6.44%</b>	<b>14.81%</b>	<b>8.53%</b>	<b>12.47%</b> (7/88)
Russell 2000 Index	6.45%	13.98%	6.81%	9.51% (7/88)
<b>Small Cap Growth</b>	<b>6.68%</b>	<b>14.28%</b>	<b>8.70%</b>	<b>13.03%</b> (7/88)
Frontier	3.48%	12.19%	8.52%	12.81% (8/88)
Russell 2000 Growth Index	5.29%	13.38%	7.59%	7.89% (8/88)
Frontier - Net	2.88%	11.58%	5.77%	6.56% (1/05)
FIAM	9.48%	16.20%	9.80%	13.83% (8/88)
Russell 2000 Growth Index	5.29%	13.38%	7.59%	7.89% (8/88)
FIAM - Net	8.90%	15.65%	9.21%	11.04% (1/05)
<b>Small Cap Value</b>	<b>8.28%</b>	<b>15.87%</b>	<b>8.17%</b>	<b>12.35%</b> (9/89)
Channing	8.85%	17.32%	-	13.39% (7/11)
Russell 2000 Value Index	7.52%	14.50%	5.92%	11.05% (7/11)
Channing - Net	8.35%	16.67%	-	12.74% (7/11)
DFA Small Cap Value	7.98%	16.73%	7.82%	12.99% (2/98)
Russell 2000 Value Index	7.52%	14.50%	5.92%	10.08% (2/98)
DFA Small Cap Value - Net	7.48%	16.18%	7.29%	8.60% (1/06)
Inv. Counselors of Maryland	9.68%	15.87%	8.81%	12.02% (5/89)
Russell 2000 Value Index	7.52%	14.50%	5.92%	9.64% (5/89)
Inv. Couns. of Maryland - Net	9.16%	15.37%	8.09%	8.89% (1/05)
<b>Micro Cap</b>	<b>2.09%</b>	<b>13.48%</b>	<b>6.08%</b>	<b>11.89%</b> (7/84)
Ariel	(10.97%)	5.25%	-	4.05% (11/10)
Russell Microcap Index	4.97%	14.88%	5.17%	12.29% (11/10)
Russell 2000 Value Index	7.52%	14.50%	5.92%	12.37% (11/10)
Russell 2000 Index	6.45%	13.98%	6.81%	12.48% (11/10)
Ariel - Net	(11.72%)	4.38%	-	3.20% (11/10)
Ativo	7.36%	17.50%	-	14.41% (10/10)
Russell Microcap Index	4.97%	14.88%	5.17%	13.11% (10/10)
Russell 2000 Growth Index	5.29%	13.38%	7.59%	13.09% (10/10)
Russell 2000 Index	6.45%	13.98%	6.81%	13.03% (10/10)
Ativo - Net	6.58%	16.64%	-	13.58% (10/10)
DFA Micro Cap	7.83%	16.37%	8.11%	11.45% (8/87)
Russell 2000 Value Index	7.52%	14.50%	5.92%	10.25% (8/87)
Russell 2000 Index	6.45%	13.98%	6.81%	8.85% (8/87)
DFA Micro Cap - Net	7.30%	15.79%	7.57%	8.12% (1/05)
Wall Street	(1.80%)	11.23%	5.03%	13.16% (8/80)
Russell 2000 Growth Index	5.29%	13.38%	7.59%	7.88% (8/80)
Russell 2000 Index	6.45%	13.98%	6.81%	9.86% (8/80)
Wall Street - Net	(2.61%)	10.35%	4.20%	6.03% (1/05)

## International Equity Returns

The table below details the rates of return for the fund's international large cap growth and international large cap value managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
<b>Intl Large Cap Equity</b>	<b>(2.14%)</b>	<b>(2.15%)</b>	<b>0.43%</b>	<b>(0.96%)</b>
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
<b>Intl Large Cap Growth</b>	<b>(2.07%)</b>	<b>(1.75%)</b>	<b>1.15%</b>	<b>0.04%</b>
EARNEST Partners	(1.40%)	(0.61%)	5.35%	4.19%
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
MSCI ACWI ex-US Growth	(3.80%)	(5.59%)	(0.98%)	(2.23%)
EARNEST Partners - Net	(1.40%)	(0.66%)	5.14%	3.98%
William Blair	(2.65%)	(2.74%)	(2.26%)	(3.33%)
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
MSCI ACWI ex-US Growth	(3.80%)	(5.59%)	(0.98%)	(2.23%)
William Blair - Net	(2.65%)	(2.83%)	(2.62%)	(3.69%)
<b>Intl Large Cap Value</b>	<b>(2.77%)</b>	<b>(2.56%)</b>	<b>2.30%</b>	<b>0.15%</b>
Brandes	(2.20%)	(0.35%)	4.28%	1.49%
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
MSCI ACWI ex-US Value	(0.84%)	0.69%	5.74%	3.15%
Brandes - Net	(2.20%)	(0.41%)	4.12%	1.33%
Mondrian	(3.35%)	(4.44%)	0.77%	(0.55%)
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
MSCI ACWI ex-US Value	(0.84%)	0.69%	5.74%	3.15%
Mondrian - Net	(3.47%)	(4.57%)	0.25%	(1.06%)
Lazard	(2.93%)	(4.62%)	(1.76%)	(3.88%)
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
MSCI ACWI ex-US Value	(0.84%)	0.69%	5.74%	3.15%
Lazard - Net	(2.93%)	(4.62%)	(2.36%)	(4.46%)

## International Equity Returns

The table below details the rates of return for the fund's international large cap growth and international large cap value managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception
<b>Intl Large Cap Equity</b>	(0.75%)	<b>6.61%</b>	<b>1.77%</b>	<b>7.54%</b> (9/88)
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	-
<b>Intl Large Cap Growth</b>	(1.16%)	<b>5.98%</b>	<b>1.99%</b>	<b>7.94%</b> (9/02)
EARNEST Partners	(2.14%)	4.59%	4.81%	<b>8.83%</b> (10/04)
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	<b>5.08%</b> (10/04)
MSCI ACWI ex-US Growth	(1.05%)	<b>5.06%</b>	<b>2.00%</b>	<b>5.77%</b> (10/04)
EARNEST Partners - Net	(2.35%)	4.22%	4.40%	<b>7.31%</b> (1/05)
William Blair	(0.26%)	7.46%	2.77%	<b>9.29%</b> (10/02)
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	<b>7.76%</b> (10/02)
MSCI ACWI ex-US Growth	(1.05%)	<b>5.06%</b>	<b>2.00%</b>	<b>7.81%</b> (10/02)
William Blair - Net	(0.63%)	7.04%	2.38%	<b>5.32%</b> (1/05)
<b>Intl Large Cap Value</b>	(0.87%)	<b>5.70%</b>	<b>0.74%</b>	<b>8.68%</b> (10/95)
Brandes	(0.52%)	<b>6.68%</b>	1.21%	<b>8.98%</b> (1/98)
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	<b>4.58%</b> (1/96)
MSCI ACWI ex-US Value	(2.78%)	4.29%	0.89%	-
Brandes - Net	(0.75%)	6.43%	0.97%	<b>3.61%</b> (1/05)
Mondrian	(0.93%)	-	-	<b>3.39%</b> (4/12)
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	<b>2.44%</b> (4/12)
MSCI ACWI ex-US Value	(2.78%)	4.29%	0.89%	<b>2.46%</b> (4/12)
Mondrian - Net	(1.43%)	-	-	<b>2.88%</b> (4/12)
Lazard	(1.70%)	-	-	<b>4.28%</b> (4/12)
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	<b>2.44%</b> (4/12)
MSCI ACWI ex-US Value	(2.78%)	4.29%	0.89%	<b>2.46%</b> (4/12)
Lazard - Net	(2.28%)	-	-	<b>3.60%</b> (4/12)

## International Equity Returns

The table below details the rates of return for the fund's international large cap core, international small cap, and emerging markets managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
<b>Intl Large Cap Active Core</b>	<b>(1.95%)</b>	<b>(1.38%)</b>	<b>1.84%</b>	<b>0.69%</b>
Arrowstreet	(1.69%)	(0.02%)	4.24%	1.95%
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
Arrowstreet - Net	(1.81%)	(0.14%)	3.75%	1.46%
Brown	(1.69%)	(4.15%)	(5.58%)	(5.92%)
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
Brown - Net	(2.74%)	(5.17%)	(6.76%)	(7.09%)
GlobeFlex	(3.25%)	(2.11%)	1.77%	1.08%
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
GlobeFlex - Net	(3.25%)	(2.11%)	1.45%	0.77%
Progress Intl Equity	0.00%	0.46%	6.03%	5.27%
Custom Benchmark	(1.52%)	(1.37%)	4.24%	2.96%
MSCI ACWI ex-US Index	(2.31%)	(2.53%)	1.89%	(0.03%)
Progress Intl Equity - Net	(0.13%)	0.33%	5.50%	4.74%
<b>Intl Large Cap Pass. Core</b>	<b>(1.98%)</b>	<b>(2.75%)</b>	<b>(1.95%)</b>	<b>(3.27%)</b>
NTGI MSCI EAFE Idx	(1.98%)	(2.75%)	(1.95%)	(3.27%)
MSCI EAFE Index	(1.99%)	(2.82%)	(2.34%)	(3.66%)
NTGI EAFE Idx - Net	(1.98%)	(2.75%)	(1.96%)	(3.28%)
<b>International Small Cap</b>	<b>(4.34%)</b>	<b>(5.00%)</b>	<b>(3.56%)</b>	<b>(3.29%)</b>
Franklin Templeton	(4.08%)	(4.78%)	(2.68%)	(2.72%)
ACWI Small Cap ex US	(2.97%)	(3.19%)	1.75%	1.85%
Franklin Templeton - Net	(4.08%)	(4.96%)	(3.41%)	(3.44%)
William Blair	(4.54%)	(5.18%)	(4.27%)	(3.75%)
ACWI Small Cap ex US	(2.97%)	(3.19%)	1.75%	1.85%
Intl SC Blended Benchmark	(2.97%)	(3.19%)	1.75%	1.85%
William Blair - Net	(4.54%)	(5.37%)	(5.02%)	(4.50%)
<b>Emerging Markets</b>	<b>(3.86%)</b>	<b>(3.07%)</b>	<b>12.23%</b>	<b>9.60%</b>
Genesis	(3.86%)	(3.07%)	12.23%	9.60%
MSCI Emerging Markets Index	(4.60%)	(3.10%)	11.28%	8.86%
Genesis - Net	(3.86%)	(3.07%)	11.78%	9.10%

Brown and GlobeFlex moved to International Large Cap Active Core April 1, 2011.

Progress Custom Benchmark is a comprised of each manager's weighted benchmark.

Intl SC Blended Benchmark consists of the S&P Developed Ex-U.S. Small Cap Index through May 31, 2011 and the MSCI ACWI Ex-U.S. Small Cap Index thereafter.

## International Equity Returns

The table below details the rates of return for the fund's international large cap core, international small cap, and emerging markets managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception
<b>Intl Large Cap Active Core</b>	<b>1.26%</b>	<b>8.61%</b>	<b>-</b>	<b>3.13%</b> <sup>(2/08)</sup>
Arrowstreet	1.40%	8.60%	-	3.25% <sup>(3/08)</sup>
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	(0.11%) <sup>(3/08)</sup>
Arrowstreet - Net	0.92%	8.10%	-	2.76% <sup>(3/08)</sup>
Brown	1.95%	10.15%	3.55%	7.30% <sup>(10/04)</sup>
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	5.08% <sup>(10/04)</sup>
Brown - Net	0.77%	9.08%	2.88%	5.56% <sup>(1/05)</sup>
GlobeFlex	0.85%	7.89%	2.42%	3.63% <sup>(3/06)</sup>
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	2.28% <sup>(3/06)</sup>
GlobeFlex - Net	0.47%	7.47%	1.98%	3.18% <sup>(3/08)</sup>
Progress Intl Equity	-	-	-	(1.75%) <sup>(7/14)</sup>
Custom Benchmark	-	-	-	(3.66%) <sup>(7/14)</sup>
MSCI ACWI ex-US Index	(2.31%)	4.24%	1.02%	(5.36%) <sup>(7/14)</sup>
Progress Intl Equity - Net	-	-	-	(2.18%) <sup>(7/14)</sup>
<b>Intl Large Cap Pass. Core</b>	<b>(1.85%)</b>	<b>6.03%</b>	<b>1.13%</b>	<b>2.44%</b> <sup>(1/00)</sup>
NTGI MSCI EAFE Idx	(1.85%)	6.03%	1.12%	2.85% <sup>(2/00)</sup>
MSCI EAFE Index	(2.22%)	5.62%	0.72%	2.47% <sup>(2/00)</sup>
NTGI EAFE Idx - Net	(1.85%)	6.02%	1.12%	3.81% <sup>(1/05)</sup>
<b>International Small Cap</b>	<b>0.16%</b>	<b>8.65%</b>	<b>1.04%</b>	<b>3.43%</b> <sup>(12/05)</sup>
Franklin Templeton	(0.14%)	8.63%	-	3.77% <sup>(8/11)</sup>
ACWI Small Cap ex US	0.64%	6.90%	3.03%	2.51% <sup>(8/11)</sup>
Franklin Templeton - Net	(0.88%)	7.82%	-	3.02% <sup>(8/11)</sup>
William Blair	0.40%	8.67%	-	8.83% <sup>(9/10)</sup>
ACWI Small Cap ex US	0.64%	6.90%	3.03%	6.04% <sup>(9/10)</sup>
Intl SC Blended Benchmark	0.64%	6.90%	2.11%	6.57% <sup>(9/10)</sup>
William Blair - Net	(0.38%)	7.83%	-	7.99% <sup>(9/10)</sup>
<b>Emerging Markets</b>	<b>(1.72%)</b>	<b>3.08%</b>	<b>5.23%</b>	<b>8.70%</b> <sup>(2/92)</sup>
Genesis	(1.72%)	3.08%	5.25%	10.91% <sup>(5/04)</sup>
MSCI Emerging Markets Index	(2.75%)	1.34%	2.59%	8.39% <sup>(5/04)</sup>
Genesis - Net	(2.25%)	2.52%	4.64%	8.63% <sup>(1/05)</sup>

Brown and GlobeFlex moved to International Large Cap Active Core April 1, 2011.

Progress Custom Benchmark is a comprised of each manager's weighted benchmark.

Intl SC Blended Benchmark consists of the S&P Developed Ex-U.S. Small Cap Index through May 31, 2011 and the MSCI ACWI Ex-U.S. Small Cap Index thereafter.

## Fixed Income Returns

The table below details the rates of return for the fund's domestic fixed core managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
<b>Dom. Fixed Active Core</b>	<b>(2.05%)</b>	<b>(2.77%)</b>	<b>3.20%</b>	<b>2.77%</b>
EARNEST Partners	(2.21%)	(2.85%)	2.29%	2.08%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
EARNEST Partners - Net	(2.21%)	(2.89%)	2.09%	1.88%
Piedmont	(2.05%)	(2.58%)	4.21%	3.36%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Piedmont - Net	(2.05%)	(2.62%)	4.04%	3.19%
Garcia Hamilton	(1.87%)	(2.88%)	3.08%	3.09%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Garcia Hamilton	(1.90%)	(2.91%)	2.96%	2.96%
<b>Dom. Fixed Passive Core</b>	<b>(2.39%)</b>	<b>(3.20%)</b>	<b>2.55%</b>	<b>2.21%</b>
BlackRock US Debt	(2.37%)	(3.16%)	2.61%	2.28%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
BlackRock US Debt - Net	(2.37%)	(3.16%)	2.60%	2.27%
NTGI BC Agg. Index	(2.41%)	(3.24%)	2.51%	2.14%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
NTGI BC Agg. Index - Net	(2.41%)	(3.24%)	2.50%	2.13%



## Fixed Income Returns

The table below details the rates of return for the fund's domestic fixed core managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception
<b>Dom. Fixed Active Core</b>	<b>3.32%</b>	<b>3.24%</b>	<b>4.67%</b>	<b>4.68%</b> (4/01)
EARNEST Partners	3.45%	3.23%	4.77%	4.72% (5/05)
BC Aggregate Index	2.79%	2.43%	4.27%	4.25% (5/05)
EARNEST Partners - Net	3.24%	3.02%	4.56%	4.51% (5/05)
Piedmont	3.17%	3.24%	4.53%	4.47% (6/05)
BC Aggregate Index	2.79%	2.43%	4.27%	4.18% (6/05)
Piedmont - Net	3.02%	3.07%	4.35%	4.27% (6/05)
Garcia Hamilton	-	-	-	2.13% (6/15)
BC Aggregate Index	2.79%	2.43%	4.27%	1.36% (6/15)
Garcia Hamilton	-	-	-	2.04% (6/15)
<b>Dom. Fixed Passive Core</b>	<b>2.89%</b>	<b>2.47%</b>	<b>4.23%</b>	<b>6.15%</b> (1/90)
BlackRock US Debt	2.94%	-	-	2.93% (10/13)
BC Aggregate Index	2.79%	2.43%	4.27%	2.78% (10/13)
BlackRock US Debt - Net	2.94%	-	-	2.93% (10/13)
NTGI BC Agg. Index	2.84%	2.46%	4.22%	6.21% (2/90)
BC Aggregate Index	2.79%	2.43%	4.27%	6.20% (2/90)
NTGI BC Agg. Index - Net	2.83%	2.45%	4.21%	4.16% (1/05)

## Fixed Income Returns

The table below details the rates of return for the fund's domestic fixed core plus and high yield managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last Month	Last 3 Months	Year to Date	Last 12 Months
<b>Domestic Fixed Core Plus</b>	(1.90%)	(2.41%)	4.53%	3.95%
BlackRock Core Plus	(2.32%)	(2.92%)	3.07%	2.66%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
BlackRock Core Plus - Net	(2.33%)	(3.00%)	2.96%	2.55%
Brandes Core Plus	(2.48%)	(3.21%)	-	-
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Brandes Core Plus - Net	(2.48%)	(3.21%)	-	-
LM Capital	(2.18%)	(2.67%)	3.42%	3.02%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
LM Capital - Net	(2.18%)	(2.70%)	3.26%	2.85%
Progress Fixed Income	0.00%	(0.67%)	5.96%	5.38%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Progress Fixed Inc. - Net	(0.08%)	(0.75%)	5.61%	5.04%
Taplin, Canida, Habacht	(2.13%)	(2.40%)	6.57%	5.77%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Taplin, Canida, Hab. - Net	(2.13%)	(2.43%)	6.43%	5.63%
Western	(2.68%)	(3.18%)	4.24%	3.60%
BC Aggregate Index	(2.37%)	(3.17%)	2.50%	2.17%
Western - Net	(2.68%)	(3.18%)	4.21%	3.56%
<b>Bank Loans</b>	<b>0.43%</b>	<b>2.32%</b>	<b>8.87%</b>	<b>7.92%</b>
Barings Global Loan Fund	0.43%	2.32%	8.87%	7.92%
Custom Benchmark	0.32%	1.95%	8.39%	7.49%
Barings Global Loan Fund - Net	0.43%	2.32%	8.92%	7.96%
<b>Emerging Markets</b>	<b>(5.10%)</b>	<b>(4.49%)</b>	<b>9.07%</b>	<b>6.58%</b>
Standish	(5.10%)	(4.49%)	9.07%	6.58%
Custom Benchmark	(5.04%)	(4.73%)	8.68%	6.68%
Standish - Net	(5.19%)	(4.57%)	8.69%	6.21%
<b>Opportunistic Fixed Income</b>	<b>0.48%</b>	<b>2.79%</b>	<b>9.38%</b>	<b>7.46%</b>
Crescent	0.48%	2.79%	9.38%	7.46%
Custom Benchmark	(0.06%)	1.26%	12.04%	10.00%
Crescent - Net	0.48%	2.79%	9.07%	7.15%
<b>High Yield</b>	<b>(0.60%)</b>	<b>0.57%</b>	<b>13.73%</b>	<b>10.83%</b>
MackKay Shields	(0.46%)	1.00%	14.70%	11.91%
ML High Yield Cash Pay Index	(0.40%)	0.55%	15.09%	12.16%
MackKay Shields - Net	(0.55%)	0.91%	14.30%	11.42%

Taplin, Canida, & Habacht moved to Core Plus October 1, 2010.

Barings Custom Benchmark is comprised of the Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.

Standish Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Crescent Custom Benchmark is 50% ML U.S. High Yield Master II Index and 50% S&P/LSTA Leveraged Loan Index.

## Fixed Income Returns

The table below details the rates of return for the fund's domestic fixed core plus and high yield managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized.

### Returns for Periods Ended November 30, 2016

	Last 36 Months	Last 60 Months	Last 120 Months	Since Inception
<b>Domestic Fixed Core Plus</b>	3.73%	3.86%	4.91%	8.37% (1/82)
BlackRock Core Plus	3.26%	3.16%	-	4.83% (4/07)
BC Aggregate Index	2.79%	2.43%	4.27%	4.32% (4/07)
BlackRock Core Plus - Net	3.06%	2.96%	-	4.70% (4/07)
Brandes Core Plus	-	-	-	(0.35%) (3/18)
BC Aggregate Index	2.79%	2.43%	4.27%	0.40% (3/18)
Brandes Core Plus - Net	-	-	-	(0.35%) (3/18)
LM Capital	3.32%	3.54%	5.11%	5.08% (5/05)
BC Aggregate Index	2.79%	2.43%	4.27%	4.25% (5/05)
LM Capital - Net	3.15%	3.37%	4.94%	4.91% (5/05)
Progress Fixed Income	4.01%	3.89%	5.14%	5.26% (1/06)
BC Aggregate Index	2.79%	2.43%	4.27%	4.36% (1/06)
Progress Fixed Inc. - Net	3.66%	3.54%	4.78%	4.91% (1/06)
Taplin, Canida, Habacht	4.16%	4.39%	5.18%	5.09% (5/05)
BC Aggregate Index	2.79%	2.43%	4.27%	4.25% (5/05)
Taplin, Canida, Hab. - Net	4.03%	4.26%	5.05%	4.96% (5/05)
Western	3.93%	4.16%	4.92%	5.53% (11/01)
BC Aggregate Index	2.79%	2.43%	4.27%	4.41% (11/01)
Western - Net	3.82%	4.04%	4.78%	4.91% (1/05)
<b>Bank Loans</b>	-	-	-	3.35% (8/14)
Barings Global Loan Fund	-	-	-	3.35% (8/14)
Custom Benchmark	-	-	-	3.36% (8/14)
Barings Global Loan Fund - Net	-	-	-	3.37% (8/14)
<b>Emerging Markets</b>	-	-	-	(1.59%) (8/14)
Standish	-	-	-	(1.59%) (8/14)
Custom Benchmark	0.07%	1.82%	5.19%	(2.41%) (8/14)
Standish - Net	-	-	-	(1.91%) (8/14)
<b>Opportunistic Fixed Income</b>	-	-	-	2.32% (8/14)
Crescent	-	-	-	2.03% (9/14)
Custom Benchmark	3.81%	6.23%	5.94%	2.94% (9/14)
Crescent - Net	-	-	-	1.82% (9/14)
<b>High Yield</b>	5.26%	7.77%	7.56%	9.77% (4/86)
Mackay Shields	5.43%	7.81%	7.29%	9.15% (11/00)
ML High Yield Cash Pay Index	4.21%	7.41%	7.18%	7.76% (11/00)
Mackay Shields - Net	5.07%	7.40%	6.91%	6.99% (1/05)

Taplin, Canida, & Habacht moved to Core Plus October 1, 2010.

Barings Custom Benchmark is comprised of the Credit Suisse US Leveraged Loan Index and the Credit Suisse Western European Leveraged Loan Index, weighted by the portfolio's market value to each sector.

Standish Custom Benchmark is 50% JPM GBI-EM Index, 25% JPM EMBI Global Index and 25% JPM Corporate EMBI Diversified Index.

Crescent Custom Benchmark is 50% ML U.S. High Yield Master II Index and 50% S&P/LSTA Leveraged Loan Index.

**Five Best Performing Portfolio's vs. Benchmarks**

<b>Manager</b>	<b>Year-to-Date Outperformance</b> (in % points)	<b>Since Inception Outperformance</b> (in % points)	
Dodge & Cox	<b>5.05</b>	<b>1.16</b>	<b>08/31/2003</b>
Taplin, Canida, Habacht	<b>4.06</b>	<b>0.72</b>	<b>04/30/2005</b>
Progress	<b>3.46</b>	<b>0.90</b>	<b>12/31/2005</b>
Earnest Int'l Equity	<b>3.30</b>	<b>3.73</b>	<b>09/30/2004</b>
Arrowstreet	<b>2.35</b>	<b>3.01</b>	<b>02/29/2008</b>

**Five Worst Performing Portfolio's vs. Benchmarks**

<b>Manager</b>	<b>Year-to-Date Underperformance</b> (in % points)	<b>Since Inception Underperformance</b> (in % points)	
Ariel	<b>-21.21</b>	<b>-8.32</b>	<b>10/31/2010</b>
Sands	<b>-11.05</b>	<b>1.87</b>	<b>10/31/2003</b>
Brown	<b>-7.47</b>	<b>2.22</b>	<b>09/30/2004</b>
Wall Street	<b>-6.02</b>	<b>5.28</b>	<b>07/31/1990</b>
William Blair Int'l SC	<b>-6.02</b>	<b>2.79</b>	<b>08/31/2010</b>

**Five Highest Returning Portfolios**

<b>Manager</b>	<b>Year-to-Date Return</b> (in % points)	<b>Since Inception Return</b> (in % points)	
Inv Counselors of MD	<b>27.13</b>	<b>12.02</b>	<b>04/30/1999</b>
Channing	<b>25.41</b>	<b>13.39</b>	<b>06/30/2011</b>
DFA SCV	<b>24.49</b>	<b>12.99</b>	<b>01/31/1996</b>
DFA Micro Cap	<b>22.15</b>	<b>11.45</b>	<b>07/31/1987</b>
Dodge & Cox	<b>19.53</b>	<b>9.42</b>	<b>08/31/2003</b>

**Five Lowest Returning Portfolios**

<b>Manager</b>	<b>Year-to-Date Return</b> (in % points)	<b>Since Inception Return</b> (in % points)	
Brown	<b>-5.58</b>	<b>7.30</b>	<b>09/30/2004</b>
Sands	<b>-5.29</b>	<b>10.02</b>	<b>10/31/2003</b>
William Blair Int'l SC	<b>-4.27</b>	<b>8.83</b>	<b>08/31/2010</b>
Franklin	<b>-3.04</b>	<b>3.70</b>	<b>07/31/2011</b>
William Blair	<b>-2.26</b>	<b>9.29</b>	<b>09/30/2002</b>

Returns are shown gross of investment management fees.

Excludes Real Estate and Alternative Investments portfolios.

(16-12-03) (Approval of 2016 Diversity Report) The Chief Investment Officer presented the 2016 Annual Diversity Report to the Board for approval, noting under Public Act 96-006, IMRF is required to submit an annual report to the Governor and General Assembly.

It was moved by Mr. Miller, seconded by Ms. Copper, to approve the submission of the 2016 Annual Diversity Report to the Governor and General Assembly.

Vote: Unanimous Voice Vote

Absent: None

(16-12-04) (Consent Agenda) The Chair presented an agenda consisting of a Consent Agenda. The following items remained on the Consent Agenda since no Board member asked for their removal.

Approval of Minutes

Regular Meeting 16-11-18

Schedules - Dated December 2016

- Schedule A - Benefit award listing of retirement, temporary disability, death benefits, and refund of employee contributions processed during the preceding calendar month under Article 7 of the Illinois Pension Code.
- Schedule B - Adjustment of Benefit Awards showing adjustments required in benefit awards and the reasons therefore.
- Schedule C - Benefit Cancellations.
- Schedule D - Expiration of Temporary Disability Benefits terminated under the provisions of Section 7-147 of the Illinois Pension Code.
- Schedule E - Total and Permanent Disability Benefit Awards recommended by the Fund's medical consultants as provided by Section 7-150 of the Illinois Pension Code.
- Schedule F - Benefits Terminated.
- Schedule G - Administrative Benefit Denials.
- Schedule P - Administrative Denial of Application for Past Service Credit.
- Schedule R - Prior Service - New Governmental Units

Bids

Construction Services for the Springfield Office  
Approved Bidder: Buraski Builders  
Approved Bid: \$116,832.15

Microsoft Software Assurance  
Approved Bidder: En Pointe  
Approved Bid: \$176,623.90

2017 Member Newsletters  
Approved Bidder: Minors' Printing  
Approved Bid: \$108,500.12

Financial Software Upgrade Phase 2  
Approved Bidder: PeopleSense  
Approved Bid: \$102,061.10.

Participation of New Units of Government

Peru Public Library District  
County: LaSalle & Bureau  
2017 Rate: 8.6%  
Effective Participation Date: January 1, 2017  
Number of Participating Employees: 22

It was moved by Ms. Henry, seconded by Ms. Copper, to approve the items on the consent agenda.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-05) (Financial Reports) The Chair presented the following financial reports for approval.

- Review of December Financial Reporting Packages
- Statement of Fiduciary Net Position for October 2016
- Impact of 2016 Year-To-Date Investment Income on Employer Reserves, Funding Status and Average Employer Contribution Rates
- Schedule T - Report of Expenditures for November

It was moved by Ms. Thompson, seconded by Ms. Copper to approve the Financial Reports as presented.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-06) (Certification of Results of Executive and Employee Trustee Elections) The Legislative Liaison presented the results of the recent Executive Trustee Election.

5 Year Term, commencing January 1, 2017 - One to be Elected

	<u>Votes Received</u>
David C. Miller	830
Brad Trent	210
Write-In Candidates	0
Spoiled Ballots	18

Next, the Legislative Liaison presented the results of the recent Employee Trustee Election.

4 Year Term, commencing January 1, 2017 - One to be Elected

Under the provisions found in Public Act 98-0932, if there is only one candidate for a trustee election, no election need be held.

Furthermore, the Board certifies the following trustee:

- Alex Wallace, Jr. as an Employee Trustee for the term of January 1, 2017 through December 31, 2020.

It was moved by Ms. Henry, seconded by Ms. Stanish, to certify the results of the 2016 Executive Trustee Election, acknowledging the election of David C. Miller (5-Year Term), and acknowledging Alex Wallace, Jr. (4-Year Term) as Employee Trustee.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-07) (Election of 2017 Board Officers & Appointments) The Officer Nominating Committee recommended the Board approve the following Trustees for Board Officers: Sue Stanish for the Office of President of the Board, Natalie Copper for the Office of Vice President of the Board, and David Miller for the Office of Secretary of the Board commencing January 1, 2017.

It was moved by Ms. Henry, seconded by Mr. Miller, to approve the recommendations of the Officer Nominating Committee.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-08) (Funding Policy) The Executive Director presented a Comprehensive Funding Policy to the Board for review. The Policy is a consolidation of current policies adopted by the Board as well as formalizing two practices; the Asset Liability Study and the Actuarial Audit (Peer Review).

After questions and discussion, it was moved by Ms. Stanish, seconded by Mr. Wallace, to adopt the following Actuarial Funding Policy:

## **ACTUARIAL FUNDING POLICY**

### **A. Introduction**

The purpose of this Actuarial Funding Policy is to record the funding objective and policy set by the Board of Trustees (Board) of the Illinois Municipal Retirement Fund (IMRF). The Board establishes this funding policy to help ensure the systematic accumulation of assets needed to pay future benefits for members of IMRF.

This funding policy shall be reviewed by the Board of Trustees every three years in conjunction with the triennial experience study conducted by IMRF's actuaries.

The actuary shall prepare annual actuarial valuations and calculate future employer contribution rates based upon calendar-year data. As required by statute, it shall conduct a triennial experience study to review actuarial assumptions and to recommend appropriate changes.

#### **Summary of Key Actuarial Assumptions:**

- Entry-Age Normal Actuarial Cost Method
- Utilize a 5-year Smoothing Period, subject to a 20% Market v. Actual Corridor
- Amortize over/under funding over a rolling period. Working to a rolling 15-year period as of 2029.
- Funding Target of 100%
- Economic Assumptions:
  - Price Inflation: 2.75%
  - Wage Inflation: 3.50%
  - Investment Return: 7.50%
- Mortality Assumption: RP-2014 projected to current year and MP-2014 projected to current year with administrative factors to be implemented by the actuary when appropriate.



## **ACTUARIAL FUNDING POLICY**

### **B. Funding Objectives**

1. Maintain adequate assets so that current plan assets plus future contributions and investment earnings will be sufficient to fund all benefits expected to be paid to members and beneficiaries when due.
2. Make consistent progress towards 100% funding and maintain 100% funding once it is obtained. In particular, continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL) through use of the Actuarial Determined Employer Contribution Rate (ADEC).
3. Maintain stability of employer contribution rates, consistent with other funding objectives, and avoid sharp increases or decreases due to specific events.
4. Maintain public policy goals of accountability and transparency, meaning that each policy element is to be clear in intent and effect, and each should allow an assessment of whether, how and when the funding requirements of the plan will be met.
5. Monitor material risks to assist in any risk management strategies the Board deems appropriate.
6. Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.
7. Provide a reasonable margin for adverse experience to help offset risks.
8. Review investment return assumption in conjunction with the periodic asset liability study and in consideration of the Board's risk profile.

## **ACTUARIAL FUNDING POLICY**

### **C. Elements**

#### **1. Actuarial Cost Method (i.e. Contribution Budgeting)**

*An aggregate entry age actuarial cost method of valuation* will be used in determining most liabilities and normal cost. An individual entry-age employer normal cost will be determined for each benefit group (Regular Tier 1, Regular Tier 2, SLEP Tier 1, SLEP Tier 2, ECO Tier 1, ECO Tier 2) as a percent of payroll. The normal cost for each employer will be calculated based on the aggregate Tier 1 and Tier 2 normal cost, weighted on the expected payroll of Tier 1 and Tier 2 members for the given employer. The aggregate normal cost rate is then multiplied by the present value of future salary to determine the present value of future normal cost for each employer. The actuarial accrued liability is then calculated by subtracting the present value of future normal cost and present value of future employee contributions from the present value of future benefits.

Differences in the past between assumed experience and actual experience ("actuarial gains and losses") will become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are to be amortized to produce payments (principal & interest) which are level percent of payroll contributions.

Liabilities for lump sum death benefits and temporary disability benefits will be determined using a term cost approach. Under this approach, the funding objective is to receive contributions each year that approximately equal the benefits being paid.

## **ACTUARIAL FUNDING POLICY**

### **C. Elements**

#### **2. Asset Smoothing Method**

The Funding Value of Assets will recognize assumed investment return fully each year. Differences between actual and assumed investment income are to be phased-in over a closed 5-year period subject to a 20% corridor (intended to prevent excess divergence between actuarial and market values). The method also limits the adjustment to the expected actuarial return to the maximum amount of unrecognized gains or losses not yet reflected in the actuarial value of assets. In any year in which the actuarial value minus the market value of assets switches from a positive value to a negative value, or vice-versa, any prior gain/loss bases are to be eliminated and the smoothing mechanism restarts.

## ACTUARIAL FUNDING POLICY

### C. Elements

#### 3. Amortization Method

##### a. General

#### Financing Liabilities and Overfunding

The following procedures will be applied to financing liabilities.

- i. Instrumentalities: 10-year rolling period.
- ii. Early Retirement Incentive (ERI) Plan liabilities: a period up to 10 years selected by the Employer upon adoption of ERI.
- iii. For taxing bodies (Regular, SLEP and ECO rate Groups): 30-year closed period until the remaining period reaches 15 years. After that point a single, rolling 15-year period shall be used for all unfunded liabilities that develop after that point and the schedule for the pre-existing liabilities shall continue until those liabilities are fully extinguished. In the event that a single rolling 15-year period results in negative amortization, the board shall select a lesser period such that negative amortization does not occur.

The following procedures will be applied to financing overfunding.

- i. Instrumentalities: 10-year rolling period.
- ii. For taxing bodies (Regular, SLEP and ECO rate Groups): 30-year closed period until the remaining period reaches 15 years. After that point a single, rolling 15-year period shall be used for all assets exceeding liabilities.
- iii. Assets exceeding liabilities can be used to satisfy Early Retirement Incentive (ERI) costs so long as the reserve balance (on an actuarial basis) does not drop below 100%. Those assets shall be applied to the extent they are available only at the employer's request. If those assets are insufficient to satisfy the ERI costs, then the remaining balance will be amortized for a period up to 10 years as selected by the employer.

##### **b. SLEP Supplemental Liabilities (Public Act 94-712)**

Amortize supplemental liabilities over a closed 30-year period, with an employer option of selecting a period of either 35 or 40 years.

## **ACTUARIAL FUNDING POLICY**

### **C. Elements**

#### **4. Assumed Investment Return**

The assumed rate of return is 7.5%, net of all administrative and investment expenses.

## **ACTUARIAL FUNDING POLICY**

### **C. Elements**

#### **5. Funding Target**

The targeted aggregate funded ration shall be 100%.

## **ACTUARIAL FUNDING POLICY**

### **C. Elements**

#### **6. Computation of Employer Contribution Rates**

The Board shall determine the employer contribution rate annually in consultation with the actuary, based upon the actuarial valuation for the most recent completed calendar year. The rate shall be calculated and communicated to the employer as soon as practical in the following year (known as Preliminary Rate Notice) and finalized by year-end (known as Final Rate Notice). Each rate shall remain in effect for one calendar year.

Annual employer contributions will be calculated utilizing the Actuarially Determined Employer Contribution rate (ADEC). It will be expressed as a percentage of payroll to be calculated so as to include a factor for normal cost for current service for each eligible plan and tier (based upon the benefit provisions in the Illinois Pension Code) and a factor to collect or refund any under or over funded amount.

In situations where the annual contributions based upon the ADEC times employer payroll are deemed insufficient to extinguish an unfunded liability over the course of an amortization period, a minimum contribution will be calculated which will pay down the unfunded liability over a 20 year period.

#### **Economic Assumptions:**

- Price Inflation: 2.75%
- Wage Inflation: 3.50%
- Investment Return: 7.50%

Non-Economic Assumptions will be based upon the latest applicable triennial experience study include:

- Rates of separation from active member status
- Rates of disability among actives
- Patterns of merit and longevity increases among actives
- Rates of retirement

#### **Mortality Assumption:**

- The RP-2014 mortality tables with adjustments for IMRF experience and the MP-2014 projection scale with administrative factors to be implemented by the actuary when appropriate.

## **ACTUARIAL FUNDING POLICY**

### **C. Elements**

#### **7. Risk Management**

##### **a. Assumption Changes**

- i. The actuarial assumptions used shall be those last adopted by the Board based on the most recent experience study and upon the advice and recommendation of the actuary. In accordance with 40 ILCS 5/7-213, the actuary shall conduct an experience study at least every three years. The results of the study shall be the basis for the actuarial assumption changes recommended to the Board.
- ii. The actuarial assumption can be updated during the three-year period if significant plan design changes or other significant events occur, as advised by the actuary.

##### **b. Amortization Method**

The amortization method, Level Percent Closed, will ensure full payment of the UAAL over a finite, systematically decreasing period not to exceed 30 years. Not shorter than a rolling 15-year period.

##### **c. Risk Measures**

The following risk measures will be annually determined to provide quantifiable measurements of risk and their movement over time.

- i. Classic measures currently determined
  - A. Funded Ration (assets/liability)
  - B. UAAL amortization period (years required to pay down the UAAL based on current funding rates)
- ii. Dollar standard deviation of investment return/Total Payroll
  - Measures the risk associated with negative asset returns relative impact on the funded status of the plan. A decrease in this measure indicates a decrease in investment risk.
- iii. Total UAL/Total Payroll
  - Measures the risk associated with contribution decreases relative impact on the ability to fund the UAAL. A decrease in this measure indicates a decrease in contribution risk.
- iv. Total Assets/Total Payroll
  - Measures the risk associated with the ability to respond to asset experience through adjustments in contributions. A decrease in this measure indicates a decrease in asset risk.



- v. Total AAL/Total Payroll
  - Measures the risk associated with the ability to respond to liability experience through adjustments in contributions. A decrease in this measure indicates a decrease in experience risk. This also provides a long-term measure of the asset risk in situations where the System has a funded ration below 100%.
  
- d. Peer Review (Actuarial Audit)  
Conduct a peer review of the Actuary's work every five years.
  
- e. Asset Liability Study  
Conduct an asset liability study at least once every five years or as needed due to economic/financial conditions.

## ACTUARIAL FUNDING POLICY

### D. Glossary

- 1. Actuarial Accrued Liability (AAL):** The difference between (i) the actual present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability”.
- 2. Actuarial Assumptions:** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
- 3. Actuarial Cost Method:** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefit” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometime referred to as the “actuarial funding method”.
- 4. Actuarial Gain (Loss):** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. For example, if during a given year the assets earn more than the investment return assumption, the amount of earnings above the assumption will cause an unexpected reduction in UAAL, or “actuarial gain” as the next valuation. These include contribution gains and losses that result from actual contributions made being greater or less than the level determined under policy.
- 5. Actuary:** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries (MAAA). The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and designation ASA and ultimately to Fellowship with the designation FSA.

## ACTUARIAL FUNDING POLICY

### D. Glossary (cont'd)

- 6. Amortization:** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
- 7. Asset Liability Study:** A comprehensive strategic asset allocation review designed to assess the continuing appropriateness of the Investment Objectives and Asset Allocation Policy. It includes a study of future benefit payments, liabilities, required funding, the appropriateness of the actuarial interest rate assumption and the prospective funded status of liabilities. It may also include a study of portfolio design for optimal diversification and comparisons with peer practices.
- 8. Corridor:** A range described as a percentage beyond which the market value and actuarial value of assets should not exceed without significant changes to the employer contribution rate.
- 9. Entry Age Normal Actuarial Cost Method:** A funding method that calculates the Normal Cost as a level percentage of pay over the working lifetime of the plan's members.
- 10. Experience Study:** An actuarial investigation of demographic and economic experiences of the system during the period studied. The investigation was made for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities.
- 11. Funding Value of Assets:** The value of current plan assets recognized for valuation purposes. Generally based on a phased-in recognition of all or a portion of market related investment return. Sometimes referred to as Actuarial Value of Assets.
- 12. Market Value of Assets:** The fair value of plan assets as reported in the plan's audited financial statements.
- 13. Normal Cost (NC):** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial liability is not part of the normal cost.
- 14. Rolling Period:** An amortization method in which the amortization period is reset each following year for the same period of time.
- 15. Unfunded Actuarial Accrued Liability (UAAL):** The positive difference, if any, between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability".

## **ACTUARIAL FUNDING POLICY**

### **E. Appendix**

Attached are reference materials which shall be updated from time to time, but which are not part of this Policy. Changes/revisions to the reference materials need not be adopted by the Board of Trustees. Substantive changes to this Policy require Board of Trustee approval.

**ILLINOIS MUNICIPAL RETIREMENT FUND  
ASSUMED INVESTMENT RETURN**

11/10/16

YEAR	ASSUMED RATE	YEAR	ASSUMED RATE
1941	3.0%	1980	6.0%
1942	3.0%	1981	6.0%
1943	3.0%	1982	7.0%
1944	3.0%	1983	7.0%
1945	3.0%	1984	7.0%
1946	3.0%	1985	7.0%
1947	2.8%	1986	7.0%
1948	2.9%	1987	7.0%
1949	2.9%	1988	7.0%
1950	2.9%	1989	7.0%
1951	2.9%	1990	7.0%
1952	2.9%	1991	7.0%
1953	2.9%	1992	7.5%
1954	2.9%	1993	7.5%
1955	2.9%	1994	7.5%
1956	2.9%	1995	7.5%
1957	3.0%	1996	7.5%
1958	3.0%	1997	7.5%
1959	3.0%	1998	7.5%
1960	3.0%	1999	7.5%
1961	3.0%	2000	7.5%
1962	3.5%	2001	7.5%
1963	3.5%	2002	7.5%
1964	5.0%	2003	7.5%
1965	5.0%	2004	7.5%
1966	4.0%	2005	7.5%
1967	4.0%	2006	7.5%
1967	4.0%	2007	7.5%
1969	4.0%	2008	7.5%
1970	4.0%	2009	7.5%
1971	4.0%	2010	7.5%
1972	4.5%	2011	7.5%
1973	5.0%	2012	7.5%
1974	5.0%	2013	7.5%
1975	5.0%	2014	7.5%
1976	5.0%	2015	7.5%
1977	5.0%	2016	7.5%
1978	5.0%		
1979	6.0%		

## Actual Average and Compounded IMRF Returns

	IMRF Annualized Time Weighted Returns	Compound Annual Growth Rate (CAGR) Calc
		1,000.00
1983	9.30%	1,093.00
1984	10.60%	1,208.86
1985	22.70%	1,483.27
1986	16.14%	1,722.67
1987	6.04%	1,826.72
1988	12.83%	2,061.09
1989	16.96%	2,410.65
1990	-1.49%	2,374.73
1991	20.98%	2,872.94
1992	5.21%	3,022.62
1993	13.78%	3,439.14
1994	-0.40%	3,425.39
1995	20.68%	4,133.76
1996	15.87%	4,789.78
1997	16.19%	5,565.25
1998	12.63%	6,268.14
1999	20.93%	7,580.06
2000	1.87%	7,721.81
2001	-6.08%	7,252.32
2002	-8.72%	6,619.92
2003	22.56%	8,113.37
2004	12.38%	9,117.81
2005	8.71%	9,911.97
2006	13.87%	11,286.76
2007	8.52%	12,248.39
2008	-24.81%	9,209.57
2009	24.52%	11,467.75
2010	13.60%	13,027.37
2011	-0.29%	12,989.59
2012	13.75%	14,775.66
2013	20.26%	17,769.20
2014	6.01%	18,837.13
2015	0.44%	18,920.02
	325.54%	
<b>AVG</b>	<b>9.86%</b>	<b>9.32%</b>

\*CAGR Calc from internet = \$1,000 to \$18,920.02 over 33 periods.



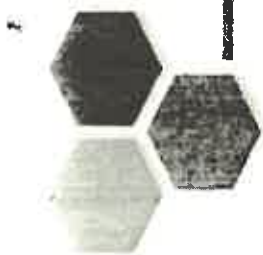
# Evolution of Risk

Year	Expected Values			
	Constant Return		Constant Risk	
	Return	Risk	Return	Risk
1995	7.50%	6.0%	7.50%	6%
2005	7.50%	8.9%	6.50%	6%
2015	7.50%	17.2%	4.80%	6%

Source: Callan power point 2/25/2016 slides 49 and 50

- As measured by the Standard Deviation of Return, earning 7.5% today takes almost triple the risk it did in 1995.
- If we held risk constant at 6% we would expect 1/3rd less return in 2015 than we would have expected in 1995.
- 17.2% volatility reduces return by approximately 148 basis points.
- 6% volatility reduces return by 18 basis points.

# Potential Future Volatility



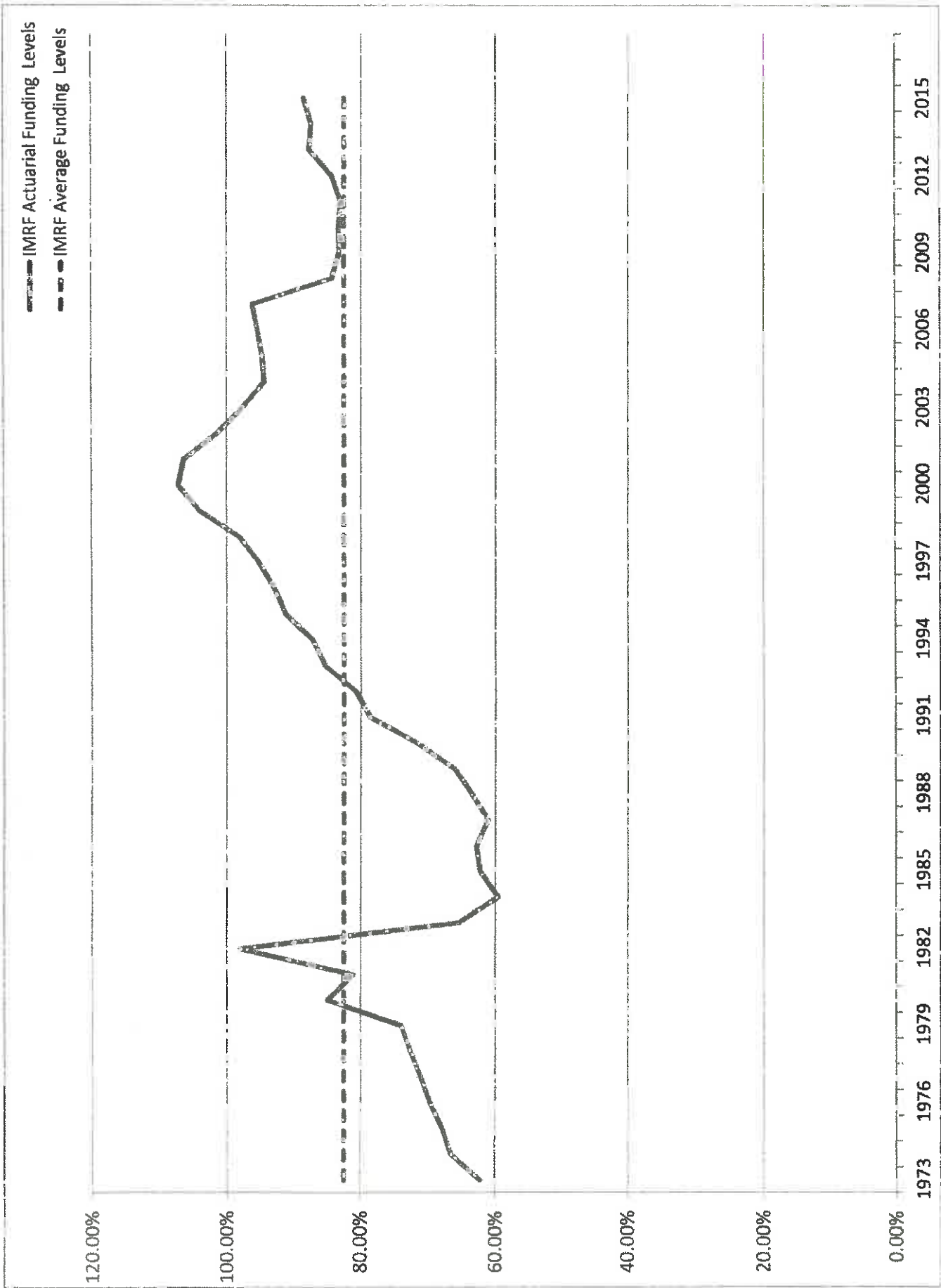
Investment Consultant	Distribution of 10 Year Average Economic Net Nominal Return			Probability of exceeding 7.50%
	40th	50th	60th	
(1)	(3)	(3)	(4)	(5)
1	3.7%	5.0%	6.6%	51.5%
2	5.1%	6.1%	7.16%	46.8%
3	5.4%	6.5%	7.3%	38.3%
4	5.9%	6.9%	7.5%	40.3%
5	5.8%	6.3%	7.56%	43.5%
6	6.1%	7.0%	8.0%	45.2%
7	6.3%	7.1%	8.0%	45.8%
8	6.4%	7.1%	8.5%	49.5%
<b>Average</b>	<b>5.66%</b>	<b>6.65%</b>	<b>7.64%</b>	<b>41.4%</b>

- The chart shows the distribution of expected returns for 8 Investment Consultants that we monitor, based on IMRF's target allocation and the current 2.75% inflation assumption.
- Callan expects 6.7% return with a standard deviation of 13.7% (slide 52 of their 2/25/2016 Power Point), which drags down return by 94 basis points.

- 7.5% is reasonable, but the chances of achieving it are below 50%.
- Since assets are currently 5 times payroll, a one standard deviation move in the assets, which might happen 1/3<sup>rd</sup> of the time, is 68% of payroll.
- 68% can be smoothed but, as we learned following 2008, smoothing tools such as asset smoothing and amortization have their limits.



# IMRF ACTUARIAL FUNDING LEVELS BY YEAR



Vote: Unanimous Voice Vote  
Absent: None

(16-12-09) (Appointment of Consultants to the Board for 2017) It was moved by Ms. Thompson seconded by Mr. Wallace, to appoint Gabriel, Roeder, Smith & Co., as actuary; appoint Rehabilitation Medicine, Dr. Noel Rao as medical consultant/physical medicine; and, appoint Dr. Rachele Miller, as medical consultant/psychiatry, to assist the fund in 2017.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-10) (Report of the Audit Committee) The Chair of the Audit Committee reported on the meeting held on December 16, 2016.

General Counsel reported on several items including Code of Conduct Compliance Training completed by all employees; receipt of one complaint alleging a violation of IMRF's Code of Conduct and Values, which was investigated with appropriate action taken as deemed necessary.

Next representatives from Crowe Horwath presented information regarding their work covering three areas: Network Security; Internal Penetration Assessment; and, External Penetration Assessment, summarizing some high, moderate and low risk areas that were identified during their testing.

Representatives from Crowe Horwath presented information regarding the Internal Audit proposed work plan for 2017.

It was the consensus of the Audit Committee to recommend the Board accept Crowe Horwath's arrangement letter for internal control testing of the IS operations for 2017 for the agreed upon cost of \$85,000.

Representatives from IMRF's external auditors, RSM, outlined the scope and timing of their engagement for 2017 regarding the 2016 Financial Statement Audit, GASB 68 Reporting Requirements, including Census Data Attestation and Report on the Schedule of Changes in Net Fiduciary Position by Employer, and also the Agreed-Upon Procedures related to the Illinois Department of Insurance Reports.

RSM representatives also acknowledged that the SOC-1 Type 2 Report for Fiscal Year 2016-2017 will be conducted by a separate audit team, and should be completed in April 2017.

It was the consensus of the Audit Committee to recommend the Board accept RSM's 2017 contract for the audit of IMRF's financials for the agreed upon cost of \$205,600.

IMRF's Chief Audit Officer presented the 2017 internal audit plan which will focus on the risk assessment process and other areas of emphasis including employer audits.

Lastly, private sessions were conducted separately with both internal and external auditors.

It was moved by Mr. Wallace, seconded by Ms. Stanish, to accept Crowe Horwath's 2017 Arrangement Letter with the agreed upon cost of \$85,000, and to accept RSM's 2017 contract with the agreed upon cost of \$205,600.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-11) (Benefit Review Committee Meeting) The Chair of the Benefit Review Committee reported on the Benefit Review Committee Meeting held on December 15, 2016.

It was moved by Mr. Miller, seconded by Mr. Wallace, to accept the following recommendations of the Benefit Review Committee:

- To defer making a decision regarding staff's original determination to deny Laurie A. Rayborn's temporary disability benefits and obtain additional documentation from the member.
- To uphold the original staff determination to deny temporary disability benefits to Beth A. Walker.
- To overturn staff's original determination to deny Rosemary N. Ryba's temporary disability benefits.
- To adopt the written findings and conclusions of the hearing officer in the Carrie McHugh case.
- To adopt the written findings and conclusions of the hearing officer in the Garrett Peck case.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-12) (Report of the Executive Director Search Committee) The Chair of the Executive Director Search Committee reported on the meeting held December 15, 2016.

The Committee reviewed a Timeline for the Executive Search

It was the consensus of the Committee to recommend the Board approve the following Executive Search Timeline:



### **Executive Director Search Time Line**

December 16, 2016	Committee update to full Board. Establish official time line.
January 1, 2017 - February 9, 2017	Revise Executive Director Job Description; revise Performance Appraisal Form; develop Request For Proposal (Executive Search Firm)
February 17, 2017	Full Board approval of RFP; Job Description; Performance Appraisal Form.
April 10, 2017	Release RFP with a May 1, 2017 Response Date.
May 5, 2017	Search Committee selects Executive Director Search Firm and submits recommendation to full Board.
May 19, 2017	Full Board approves Contract with Executive Director Search Firm.
June 1, 2017	Executive Director Search Firm begins work. <ul style="list-style-type: none"><li>- Define objectives, strategy and leadership characteristics</li><li>- Obtain consensus on specifications</li><li>- Initiate research and outreach</li><li>- Contact candidates; conduct initial telephone evaluations</li></ul>
July, 2017 – August 2017	Executive Director Search Committee and Executive Search Firm <ul style="list-style-type: none"><li>- Schedule meetings to prioritize candidates; review progress</li><li>- Conduct face-to-face interviews with priority candidates</li><li>- Conduct interviews with top three candidates (full Board)</li><li>- Select candidate</li><li>- Check references; verify education and background</li></ul>
September, 2017	Executive Director Search Firm <ul style="list-style-type: none"><li>- Based on direction from Executive Director Search Committee conduct compensation negotiation; extending offer to selected candidate</li></ul>
October, 2017	Negotiate Contract with selected candidate
November 17, 2017	Full Board approves Contract with selected candidate
January 2, 2018	New Executive Director assumes responsibilities

Lastly, the Committee reviewed the Executive Director Job description that was last updated in February 2016.

It was moved by Ms. Henry, seconded by Mr. Wallace, to approve the recommendation of the Executive Director Search Committee.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-13) (Report of the Investment Committee Meeting) The Chair of the Investment Committee reported on the meeting held December 15, 2016.

The Investment Committee heard presentations from two private equity managers, Encap Energy Capital Partners Fund XI, L.P. and ABRY Senior Equity Fund V, L.P., followed by recommendations from staff.

It was the consensus of the Investment Committee to recommend the Board approve the following recommendations:

- For Private Equity
  - allocate up to \$35 million to EnCap Energy Capital Fund XI, L.P., subject to satisfactory legal due diligence;
  - allocate up to \$25 million to ABRY Senior Equity V, L.P., subject to satisfactory legal due diligence; and,
  - authorize staff to complete all documentation necessary to execute these recommendations.

Next, the Investment Committee heard presentations from two real estate managers, Crow Holdings Realty Partners VIII, L.P. and Oak Street Real Estate Capital Fund IV, L.P., followed by recommendations from staff.

It was the consensus of the Investment Committee to recommend the Board approve the following recommendations:

- For Real Estate
  - allocate up to \$75 million to Crow Holdings Realty Partners VIII, L.P., subject to satisfactory legal due diligence;
  - allocate up to \$75 million to Oak Street Real Estate Capital Fund IV, L.P., subject to satisfactory legal due diligence; and,
  - authorize staff to complete all documentation necessary to execute these recommendations.

The Investment Committee heard a presentation from FactSet, a Risk Management Service Provider, along with a recommendation from staff.

It was the consensus of the Investment Committee to recommend the Board approve the following recommendations:

- For Multi-Asset Class Investment Management Risk Management System
  - authorize the hiring of FactSet, and the engagement of eVestment, subject to satisfactory legal due diligence;
  - authorize the hiring of BlackRock Aladdin, if contract negotiations become unmanageable with FactSet, subject to satisfactory legal due diligence; and,
  - authorize staff to complete all documentation necessary to execute these recommendations.

It was moved by Mr. Miller, seconded by Ms. Copper, to approve the recommendations of the Investment Committee.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-14) (IMRF Trustee Travel Policy) The Chief Financial Officer presented a revised IMRF Trustee Travel Policy to the Board for approval.

After questions and discussion, it was moved by Mr. Miller, seconded by Ms. Copper, to approve the following revised IMRF Trustee Travel Policy:

## **BOARD POLICY MANUAL**

### **BOARD TRAVEL POLICY**

**As of December 16, 2016**

**Statute [Ill. Rev. Stat. 40 ILCS 5/7-174 (g)]**

Trustees shall serve without compensation, but shall be reimbursed for any reasonable expenses incurred in attending meetings of the Board and in performing duties on behalf of the Fund and for the amount of any earnings withheld by any employing municipality or participating instrumentality because of attendance at any Board Meeting.

#### **General Policies**

1. Trustees are fiduciaries, accountable to the beneficiaries of the Fund, who serve without compensation and/or financial gain.
2. "Reimbursement" of reasonable expenses means IMRF will pay back to the Trustee such expenses he or she incurs as a result of his or her activities as a Board Member subject to dollar limits adopted in this policy by the Board.
3. "Documented" means submission of factual or substantial support for expenses acceptable to the internal auditor. Receipts for items of \$25.00 or more are required.
4. Typically, travel is limited to one day before and after the event scheduled dates. However, an exception is allowed to travel earlier or later when there is a savings to IMRF in an amount which exceeds the cost of an additional night's stay plus meals and incidental expenses, as determined by the Board.
5. Board Members may request an advance not in excess of the estimated travel expenses, lodging, registration fee and \$100.00 per day. Any difference between the advance and the itemized expenses shall be either returned to the Fund or reimbursed to the Trustee as the case may be.
6. When a Trustee travels on Fund Business by commercial airlines, he or she may stop over at other cities as long as the airfare does not exceed the cost of economy plus fare obtained with a two week advance purchase or such other advance purchase standard recognized at that time by the airline industry. No expenses at such other cities are reimbursable.

7. Trustees can use IMRF office telephones for any purpose. While traveling on Fund Business, Trustees will be reimbursed for all business calls. Personal call reimbursement limits appear in "Incidental Expenses."
8. Trustees are encouraged to submit requests for reimbursement of travel expenses periodically (within 30 days of the event), but not later than 30 days after the end of the calendar year. Requests for reimbursement submitted 30 days after the end of the calendar year will be submitted to the Board for approval.
9. Requests for reimbursements to the Trustee's employer should be submitted on a timely basis. Requests submitted more than 30 days after the close of a calendar year will be submitted to the Board for approval.
10. Trustee travel must have prior approval by the Board of Trustees. Trustees shall submit travel requests to be placed on a Board Meeting Agenda for Board action. Trustee travel expense reports are to be reviewed by the Chief Financial Officer for conformance to this policy. Any issues will be addressed with Trustee; the Board President may be consulted.

### **Board and Committee Meetings**

1. **Transportation Expenses:** Actual transportation expenses are reimbursable. For use of a personal automobile, reimbursement of mileage will be at the current amount permitted by the Internal Revenue Service.
2. **Lodging:** Board Members residing within 50 miles from the meeting place will receive no reimbursement for lodging for a one day meeting. For a two day meeting, lodging for one night will be reimbursable. Lodging reimbursement will be limited to the government rate or, if not available, a hotel within 5 miles of the IMRF office.

For Board Members residing more than 50 miles from the meeting place, normally one night's lodging is reimbursable. However, if travel arrangements necessitate two nights, lodging will be reimbursed. One additional night's lodging before or after the meeting may be reimbursed if there is a medical need.

3. **Meals:** Actual meal expenses are reimbursable up to \$100.00 per day.
4. **Incidental Expenses:** Reasonable tips, personal phone calls, and other incidentals not specified above shall be reimbursed up to a limit of \$25.00 per day for those days when overnight lodging is reimbursable.



## **Other Events**

1. **Limitations:** Trustees are permitted to attend two out-of-state and two in-state events per calendar year: conferences, seminars, investments seminars, and client conferences. There are no limits on attending IMRF programs and other events organized by IMRF staff, speaking engagements related to IMRF, and meetings with members of the Illinois General Assembly. No foreign travel is permitted.
2. **Transportation Expenses:** Actual transportation expenses shall be reimbursed, but the amount reimbursable shall not exceed economy plus airfare. For automobile travel, reimbursement of mileage will be at the current amount permitted by the Internal Revenue Service. Automobile travel reimbursement cannot exceed the highest airfare incurred by a Trustee attending the event, or if no other Trustee attends, then to an amount equal to airfare charges based on a two week advance purchase or such other advance purchase standard recognized at that time by the airline industry, plus the normal and reasonable charges which would have been incurred for transportation to and from the airport, parking, tolls and cabs at the destination.
3. **Lodging:** Reimbursement for lodging shall be limited to event hotels at rates for double rooms. For events, reimbursement shall be allowed for one day prior through the one day after the event period only at the event hotel. If a Trustee's personal choice is to stay at a different hotel, reimbursement will be limited to the government rate or event hotel rate.
4. **Meals:** Actual meal expenses are reimbursable up to \$100.00 per day.
5. **Incidental Expenses:** Reasonable tips, personal phone calls, and other incidentals not specified above shall be reimbursed up to a limit of \$25.00 per day for those days when overnight lodging is reimbursed.

## **U.S. General Services Administration (GSA) Per Diem**

In lieu of the meal and incidental expense reimbursement limits set forth above, a trustee, in his or her discretion, may request reimbursement following the GSA per diem without submitting documentation or receipts. This election applies only to the travel indicated. It is not a permanent election.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-15) (IMRF Staff Travel Policy) The Chief Financial Officer presented a revised IMRF Staff Travel Policy to the Board for approval.

After questions and discussion, along with suggested changes from Board Members, it was the consensus of the Board to direct staff to incorporate the Board's suggested changes to the IMRF Staff Travel Policy and bring it back to the Board for review at the February 17<sup>th</sup> Board Meeting.

(16-12-16) (Modernization Update) The Request For Proposal (RFP) to complete the Horizon project includes a Proof of Concept phase for up to two finalist vendors.

The Chief Information Officer reported that a "Proof of Concept" is a limited scope demonstration to confirm that a proposed solution can actually meet the key requirements.

He presented a recommendation to the Board to approve a contract with up to two of the Horizon project bidders for a Proof of Concept phase at a cost not to exceed \$100,000 each.

After questions and discussion, it was the consensus of the Board to direct staff to notify them of the finalists before they take action on the recommendation.

(16-12-17) (Executive Session) The Chair asked for a motion to go into executive session for the purpose of discussing pending litigation, under section 2(c)(11) of the Open Meetings Act.

Motioned by: Copper  
Seconded by: Wallace

Vote:  
Aye: Miller, Stanish, Thompson, Wallace, Copper, Henry, Williams, Kuehne  
Nay: None  
Absent: None

It was moved by Ms. Henry, seconded by Ms. Copper, that the Board go back into open session.

Vote:  
Aye: Miller, Stanish, Thompson, Wallace, Copper, Henry, Williams, Kuehne  
Nay: None  
Absent:None

It was moved by Mr. Miller, seconded by Ms. Henry, to authorize settlement with Deloitte as outlined by staff.

Vote: Unanimous Voice Vote  
Absent: None

(16-12-18) (Litigation Update) The following is an update of the currently pending or recently concluded litigation:

**IN RE TRIBUNE CO, ET AL. , THE OFFICIAL COMMITTEE OF UNSECURED CREDITORS OF TRIBUNE CO, ET AL. VS. FITZSIMONS, ET AL.**

**Summary:** The unsecured creditors in the Tribune bankruptcy sued investors who sold their Tribune stock at the time of the buyout. The plaintiff's theory is that the buyout was fraudulent and therefore a portion of those stockholders' proceeds from the stock sale was due to the fraud and should be returned to the Tribune's bankruptcy estate.

**Status:** The portion of the creditors' complaint based on the theory of constructive fraudulent transfer was dismissed on motions and that decision has now been upheld on appeal. A motion to dismiss the intentional fraudulent transfer claim is pending.

**VILLAGE OF OAK BROOK V. THOMAS SHEAHAN, ET. AL. (13 MR 942) DUPAGE CO.**

**Summary:** This is an administrative review action challenging the IMRF Board's decision upholding the granting of MEABF and Deerfield credit transfers to Thomas Sheahan, the former police chief of Oak Brook and denying the Village's request to recalculate their liability excluding the service credits transferred from MEABF and Deerfield.

**Status:** On June 26, 2015 the Second District Appellate Court upheld Judge Sheen's decision to overturn the decision of the IMRF Board and found the transfers invalid. The Supreme Court declined to hear the case.

**Status:** IMRF's motion to dismiss Sheahan's Second Amended Counterclaim was granted and Sheahan was given leave to file a Third Amended Counterclaim. IMRF has filed a motion to dismiss the Third Amended Counterclaim which is set for a hearing on November 9, 2016, this hearing was continued to a December 8, 2016 status date.

**KATHLEEN KONICKI V. IMRF (14 MR 32) (SANGAMON CO)**

**Summary:** Administrative review challenging the Board's decision that Ms. Konicki was not eligible to convert service into Original ECO.

**Status:** On July 29, 2016, Judge Belz upheld the IMRF Board's decision finding that the law clearly did not allow Plaintiff to participate in Original ECO and that the law creating Revised ECO did not violate the Pension Protection Clause. Plaintiff had 30 days from July 29, 2016 to file a notice of appeal. She did not do so, however, it was discovered that the court clerk never mailed Plaintiff the judge's order. There may be an issue regarding Plaintiff's ability to file a notice of appeal. Konicki has filed a motion for relief from Judgment which is set for presentation on December 14 in Sangamon County.

**ROGER C. BOLIN v. IMRF (PUTNAM COUNTY 14 MR 23)**

**Summary:** Appeal of Board decision to deny omitted service application and enrollment of Putnam County Public Defender

**Status:** This case is currently being briefed. IMRF has filed its brief. IMRF has motioned the case up for a hearing on 1/19/2017.

**MCLEAN COUNTY V. IMRF (MCLEAN COUNTY 2016 MR 563)**

**Summary:** This is an appeal from the IMRF Board's decision denying an exemption from the AP for a charge to McLean County that resulted from a payment of back wages under a collective bargaining agreement that was entered into after January 1, 2012. The County also charges a violation of the Open Meetings Act by IMRF claiming that its Board Agenda was not sufficiently detailed regarding the decision.

**Status:** IMRF and McLean County are working on the details based on the Board Resolution allowing certain back wages to be allocated to prior months when AP charges are involved and a new case management date is set for April 2017.

**MOTORS LIQUIDATION COMPANY AVOIDANCE ACTION TRUST VS. JP MORGAN CHASE, ET AL. (US BANKRUPTCY CT., SO. DIST. OF N.Y.)**

**Summary:** This is an adversary action stemming from the General Motors bankruptcy. A loan in which IMRF was an investor was paid off after the bankruptcy filing. It was later discovered that an error, before the bankruptcy, had released part of the security. A group of unsecured creditors sued to force the recipients of the loan pay-off proceeds to return them.

**Status:** The parties are currently litigating the value of the remaining security, which if it is sufficient would end the case. We are sharing our defense counsel with several other public pension funds.

**THERESA MILLER V. IMRF (16 MR 58 MONROE COUNTY)**

This is an administrative review of the Board's decision to deny total and permanent disability benefits to Ms. Miller. IMRF's answer and appearance were filed on 11/28/2016.

**KATHERINE HADLER V. IMRF (16 MR 1375) DUPAGE COUNTY**

This is an administrative review of the Board's decision to deny total and permanent disability benefits to Ms. Hadler. IMRF's answer and appearance were filed on 11/21/2016

(16-12-19) (Legislative Update) The Legislative Liaison updated the Board on current legislative activity.

She noted the General Assembly completed its final week of session for 2016 on December 1<sup>st</sup>. They will return for two days in January to conclude the 99<sup>th</sup> General Assembly before convening the 100<sup>th</sup> General Assembly on January 11<sup>th</sup>.

The Legislative Liaison reported that two new bills affecting IMRF were introduced (SB 3455 - requiring most police and fire funds to transfer their investment authority to IMRF, and SB 3457 - requiring all pension systems, except Article 3 & 4 police and fire funds, to determine the financial risk of climate change on their investments), but because of the limited days of session remaining, they will not be moving during this session.

Discussion followed.

(16-12-20) (Trustee Forum) The Chair reported the following Trustees requested authorization from the Board for the following conferences:

Gwen Henry                      World Investment Forum 2017  
    FTSE Russell  
    June 4-7, 2017  
    Newport Coast, CA

Tom Kuehne                      Investments Institute  
    International Foundation  
    March 13-15, 2017  
    Phoenix, AZ

It was moved by Ms. Thompson, seconded by Ms. Copper, to approve the above Trustee requests.

Vote:    Unanimous Voice Vote  
Absent: None

(16-12-21) (Board Self-Evaluation) Board Members along with Ms. Cullins from Aon Hewitt, conducted a self-evaluation.



(16-12-22) (Adjournment) It was the consensus of the Board to adjourn the Board Meeting at 11:30 a.m., to reconvene in the Fund offices, 2211 York Road, Suite 400, Oak Brook, Illinois, at 9:00 a.m. on February 17, 2017.

Vote: Unanimous Voice Vote  
Absent: None

Sue Stanich  
President

[Signature]  
Secretary

2/17/17  
Date

2/17/17  
Date

