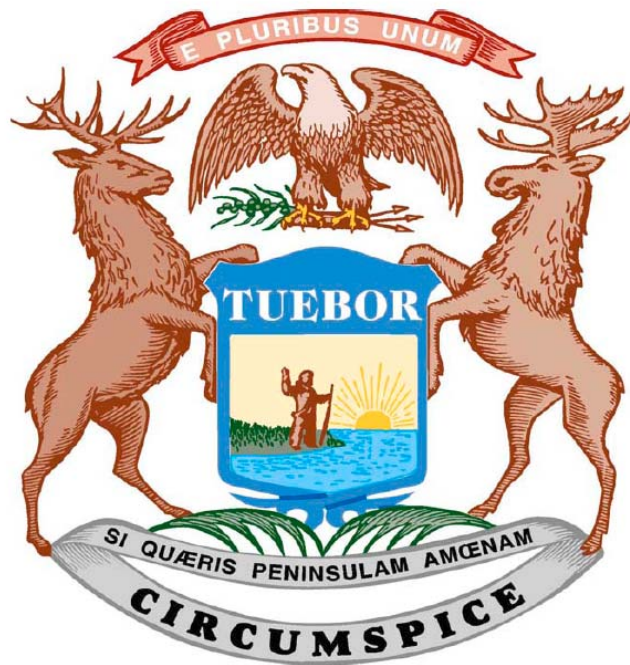




Michigan Department of Treasury Bureau of Investments



Gregory J. Parker
Senior Director of Investments
Bureau of Investments
March 27, 2018



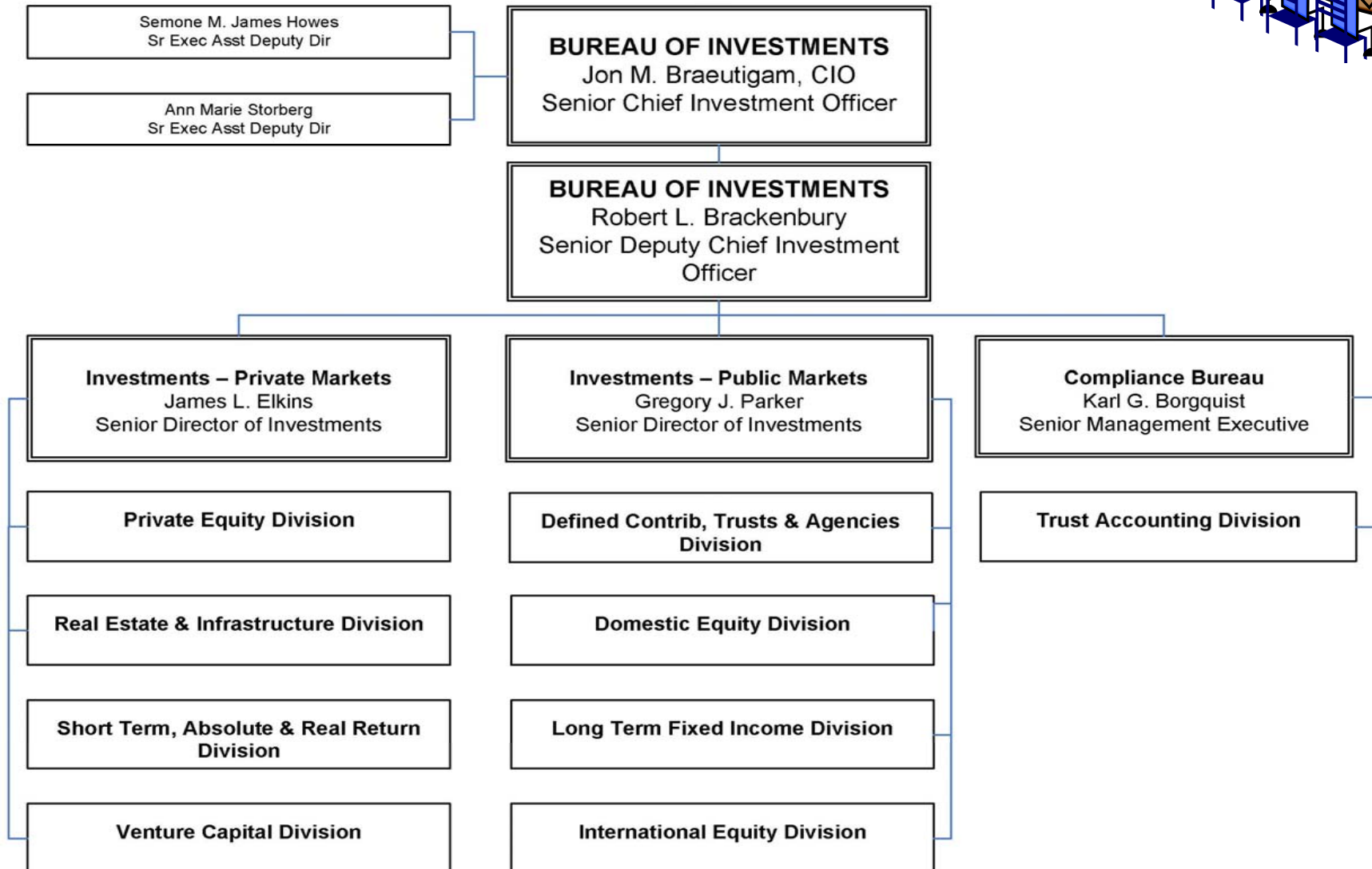
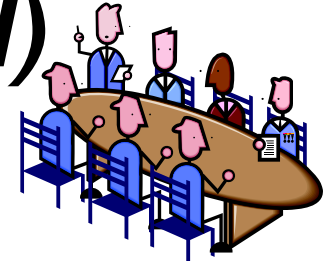
Executive Summary

- Market returns have been robust and next ten years most industry experts expect lower going forward returns
- The plans substantially beat peers in longer time periods



Bureau of Investments (BOI)

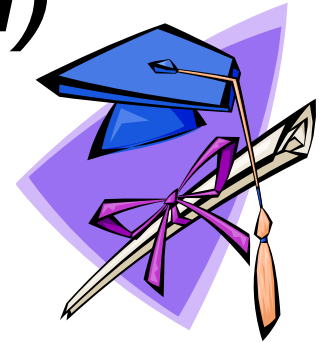
As of January 30, 2018





Bureau of Investments (BOI)

As of February 2018



- 75 BOI Employees
- 45 Investment Professionals
- 30 Individuals with a Masters Degree or higher
- 15 CFA Charter holders
- 15 Other professional designations
- Total of \$92.4 billion assets under management (as of 12/31/17)
- The large investment pool is an advantage for the plans



Funded Ratio State Employees

Year	Market Value of Assets	Actuarial Value of Assets	Actuarial Accrued Liability	Funded Ratio Based on Actuarial Value
2016	\$10,980	\$10,937	\$17,016	64.3%
2015	\$10,732	\$10,417	\$16,237	64.2%
2014*	\$10,975	\$9,962	\$16,173	61.6%
2013	\$9,923	\$9,438	\$15,648	60.3%
2012	\$9,272	\$9,447	\$15,654	60.3%
2011	\$8,655	\$10,212	\$15,597	65.5%
2010	\$8,940	\$10,782	\$14,860	72.6%
1983	\$1,842	\$1,752	\$2,369	74.0%
<i>MSERS Estimated Market Value Funded Ratio</i>				
12/31/2017	\$12,072	- - -	\$17,016	70.9%

(\$ in Millions)

*Revised actuarial assumptions and/or methods.

Source: Pension Plans Component Unit Financial Reports and Actuarial Valuations, years ending in September

Pension Plan only



Funded Ratio

Judges

Year	Market Value of Assets	Actuarial Value of Assets	Actuarial Accrued Liability	Funded Ratio Based on Actuarial Value
2016	\$255	\$254	\$251	101.1%
2015	\$257	\$249	\$257	96.9%
2014*	\$271	\$246	\$257	95.8%
2013	\$253	\$240	\$252	95.1%
2012	\$240	\$246	\$250	98.5%
2011	\$224	\$267	\$252	106.0%
2010	\$233	\$284	\$252	112.7%
1983	\$57	\$57	\$81	70.4%
<i>MJRS Estimated Market Value Funded Ratio</i>				
12/31/2017	\$269	- - -	\$251	107.2%

(\$ in Millions)

*Revised actuarial assumptions and/or methods.

Pension Plans Component Unit Financial Reports and Actuarial Valuations, years ending in September

Pension Plan only



Contributions and Distributions

FY 2017

State Employees

Judges

Contributions

Members	\$40.8
Employer	<u>703.1</u>

Total Contributions \$743.9

Pension Benefit Distributions 1,322.3

Net **(\$578.4)**

- Equal to (per quarter on average) (\$144.6)
- Or about 4.6% of total market value of fund

Figures are in thousands

Contributions

Members	\$0.7
Employer	<u>1.0</u>

Total Contributions \$1.7

Pension Benefit Distributions 23.7

Net **(\$22.0)**

- Equal to (per quarter on average) (\$5.5)
- Or about 8.6% of total market value of fund

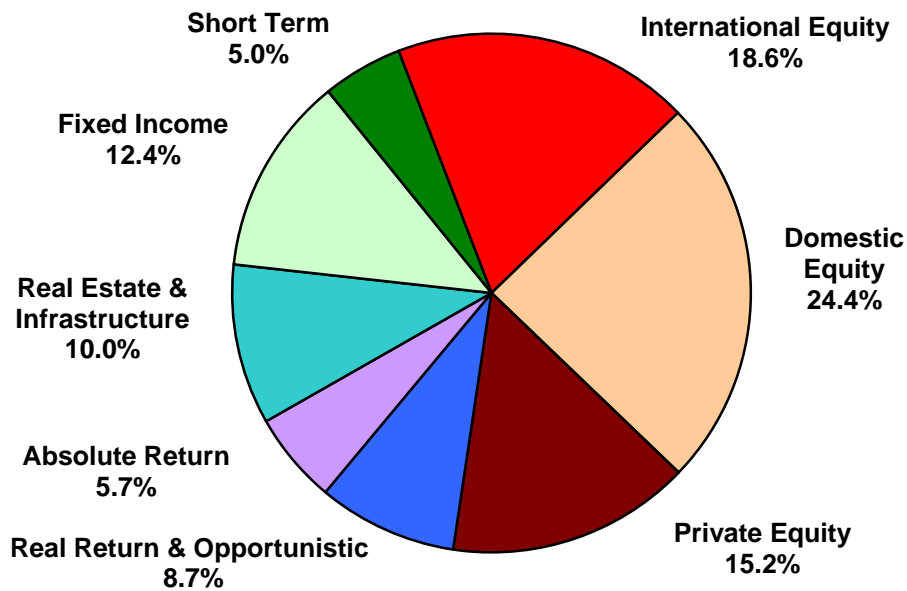
Figures are in thousands



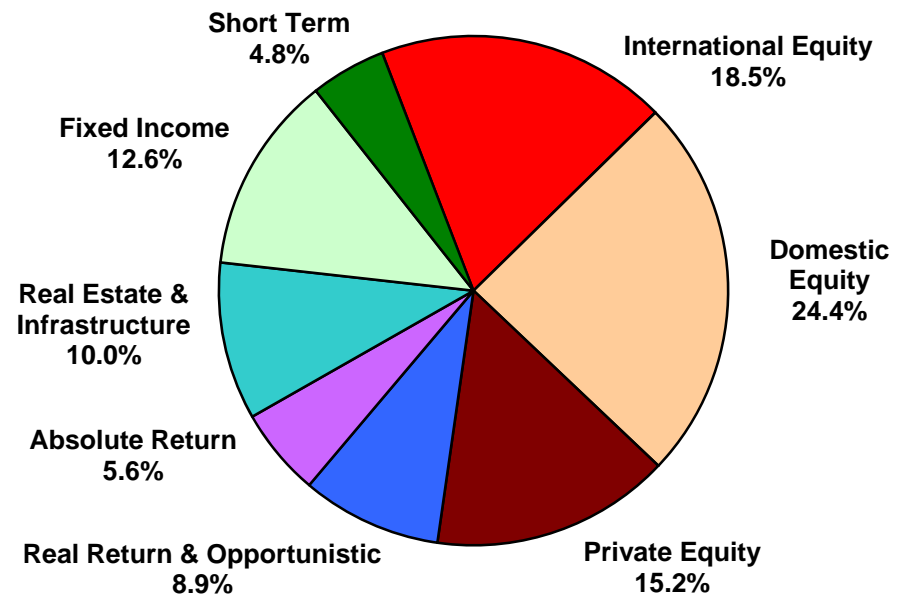
Asset Allocation

As of December 31, 2017

State Employees



Judges



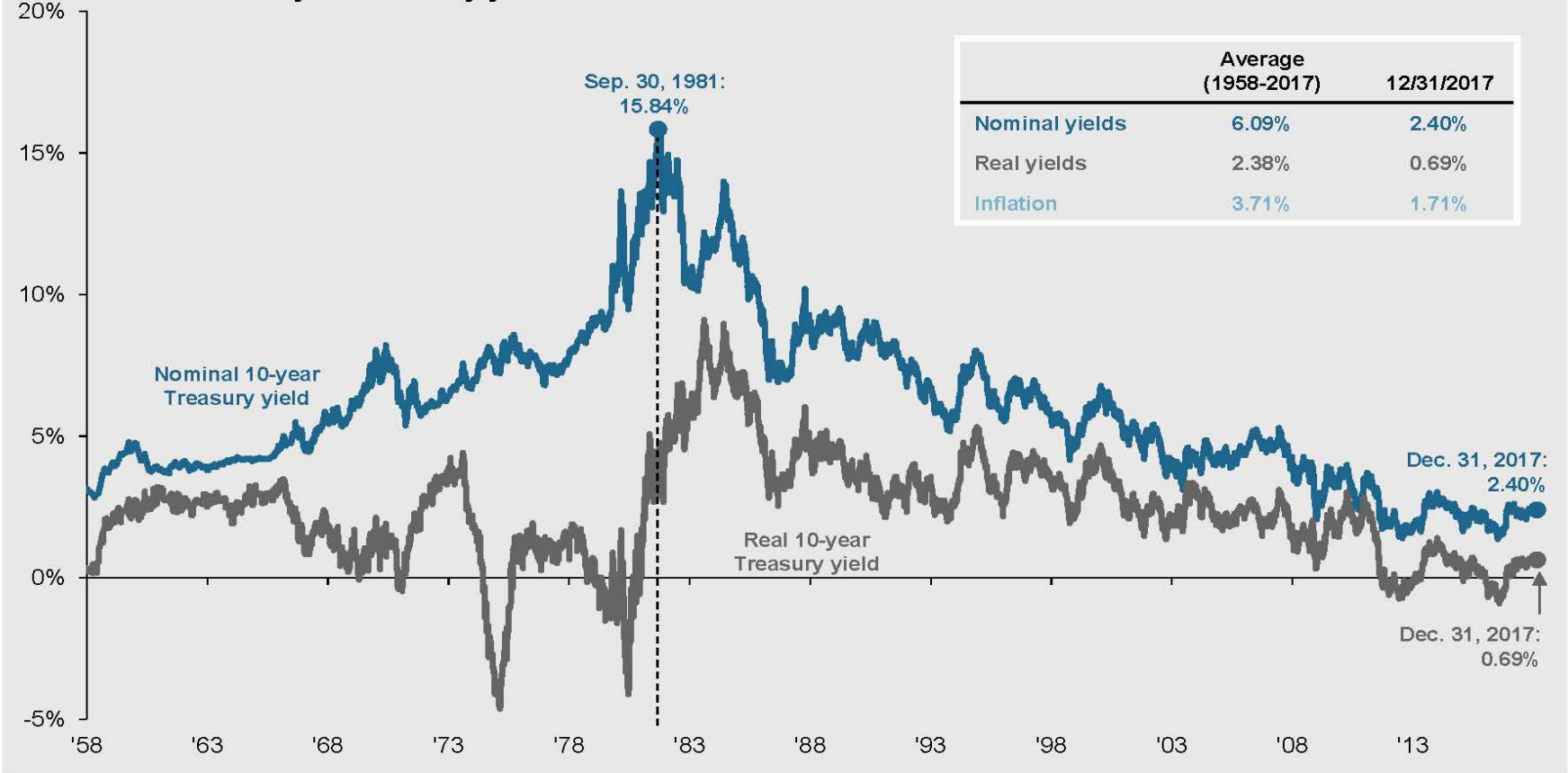
Diversification is essential to protect the funds. However, still reliant on equity markets.



Interest Rates and Inflation

Fixed income

Nominal and real 10-year Treasury yields



Source: BLS, Federal Reserve, FactSet, J.P. Morgan Asset Management.
 Real 10-year Treasury yields are calculated as the daily Treasury yield less year-over-year core CPI inflation for that month except for December 2017, where real yields are calculated by subtracting out November 2017 year-over-year core inflation.
 Guide to the Markets – U.S. Data are as of December 31, 2017.



S&P 500 – Last 10 Years





Time-Weighted Rates of Return

Public Funds (DB) > \$10 Billion

As of December 31, 2017

State Employees

Asset Class w/Benchmark	CY 2017									
	One Year*		Three Years*		Five Years*		Seven Years*		Ten Years*	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
Total Plan	16.2%	33	8.7%	15	10.7%	13	9.9%	11	6.3%	30
Median - Greater than \$10 Billion	15.2%		7.9%		9.1%		8.5%		5.9%	

Judges

Asset Class w/Benchmark	CY 2017									
	One Year*		Three Years*		Five Years*		Seven Years*		Ten Years*	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
Total Plan	16.3%	31	8.7%	15	10.5%	22	9.7%	18	6.1%	34
Median - Greater than \$10 Billion	15.2%		7.9%		9.1%		8.5%		5.9%	

*Annualized Returns

Source: State Street Investment Analytics



Time-Weighted Rates of Return

Individual asset classes doing well on a relative basis

State Employees

Asset Class w/Benchmark	CY 2017	
	Five Years	One Year
	Rate	Rate
Total Plan*	10.7%	16.2%
Median*	9.1%	15.2%
Domestic Equities	15.7%	22.3%
S&P 1500 Index	15.7%	21.1%
International Equities	8.1%	28.6%
MSCI ACWI Ex USA	7.0%	27.2%
Bonds	3.5%	5.5%
Barclays Aggregate	2.1%	3.5%

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



Time-Weighted Rates of Return ***State Employees***

Asset Class w/Benchmark	CY 2017	
	Five Years Rate	One Year Rate
Private Equity	14.3%	17.5%
Alternative Blended Benchmark	17.4%	22.1%
Real Estate & Infrastructure	11.9%	8.7%
NCREIF Open Fund Index Net	10.5%	6.7%
Absolute Return	5.4%	9.2%
HFRI FOF Cons 1 month lag	3.5%	4.4%
Real Return and Opportunistic	11.4%	12.0%
Benchmark	7.3%	7.6%
Cash Equivalents	0.6%	1.2%
30-Day T-Bill	0.2%	0.8%

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



Time-Weighted Rates of Return

Individual asset classes doing well on a relative basis

Judges

Asset Class w/Benchmark	CY 2017	
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Time-Weighted Rates of Return Judges

Asset Class w/Benchmark	CY 2017	
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U.S. Economy

- Forecasted for modest higher growth
- Housing continues to do well
- Auto sales are doing ok
- Tax cut will provide fiscal stimulus this year
- Labor market has tightened significantly and may increase inflation
- World economy doing well currently



Still Needed

- Need to address U.S. long-term liabilities
- World is uncertain (Iran, North Korea, Syria, etc.)
- Tariff concerns



Conclusion

- We have experienced a ‘Bull Market’ since 2009, one of the longest ever
- The longer-term returns are higher than peer median
- Going forward, with the 10-Year Treasury at 2.9%, achieving 7% is challenging for a diversified portfolio
- The U.S. and world economy is growing at a decent rate, and most economists predict moderate economic growth in 2018 and 2019