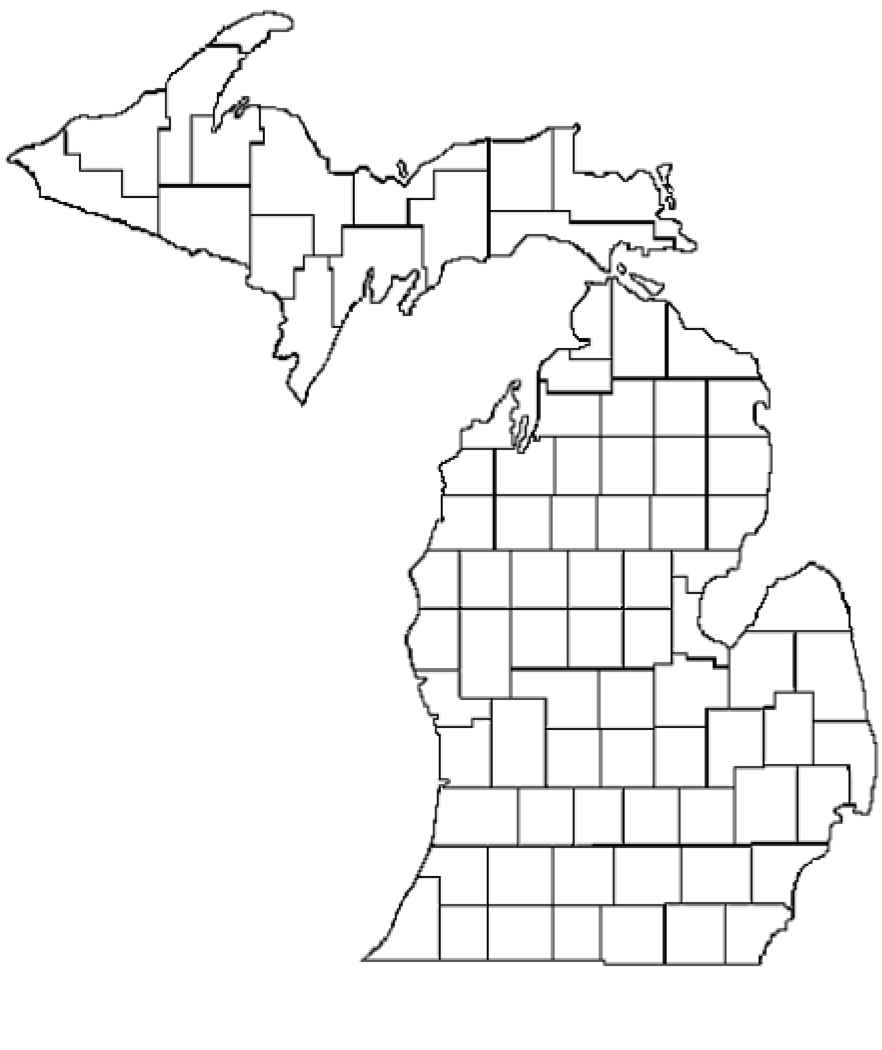
State of Michigan Retirement Systems

MARKETS REVIEW AND OUTLOOK

Investment Advisory Committee Meeting

March 9, 2017



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

CAPITAL MARKETS

Return and Risk Assumptions, Benchmark and Outlook

A starting point.

MPSERS Plan	Assumed Return* (Arithmetic)	Standard Deviation*	Trailing 10-Year (Benchmark**)	Tactical (Short Term) Expectations***
Private Equity	11.0%	24.0%	10.2%	Hold
International Equity	9.4%	20.0%	1.0%	Hold
Domestic Equity	7.9%	17.0%	7.2%	Hold
Real Estate (Core)	6.1%	12.5%	5.6%	Trim
Absolute Return	5.7%	9.0%	1.3%	Trim
Real Ret/Opportunistic	8.8%	12.1%	7.4%	Add
Long-Term Fixed	3.1%	4.0%	4.3%	Hold
Short-Term	2.5%	1.0%	0.6%	Hold

* Aon Hewitt Investment Consultants 2016 Long-Term Return/Risk Assumptions
** Investment Policy Statement; Annualized Returns
*** Actual investments may differ due to changing conditions and the availability of new information

Overview

Softening the outlook for risk assets.

- Capital market assumptions used for determining strategic asset allocations are being reduced across the board, and especially for safer, publicly traded fixed income securities. This is the general opinion for most consultants, investment banks, and other market participants. The reason for this phenomenon is the low interest rate environment caused by the policies of the Federal Reserve and other central banks, as well as the run-up in prices for most risk assets over the past five years after the depths of the Great Recession.

- The broad U.S. stock market return for 2016 was 13.0%, which was entirely due to multiple expansion. Year over year earnings growth of U.S. equities has actually averaged close to 0% over the past few years.

- International equities continue to underperform domestic. Currency has played a major role with the underperformance of international equities compared to U.S. equities. Approximately one-quarter of the underperformance over the past one and ten years, and roughly half- to two-thirds of the underperformance over the past three, five, and seven years was due to the strengthening dollar.

- The 10-year U.S. Treasury ended December 2016 at 2.4%, about 20 bps higher than one year prior and in line with the December rate hike. The curve is a little bit steeper than average, potentially an indicator of continued economic growth.

- The publicly traded FTSE NAREIT REITs Index was up 8.8% over the past year ending December 2016. However the index lost nearly 9.6% on a price basis since July 2016 as the market came to the realization that interest rates were on the rise.

- The price for crude oil was especially volatile in 2016. For the year, the price for crude oil increased from $37.04 to $53.72 per barrel from the beginning to end of 2016, and more than doubled from its February 2016 low.

Domestic Equity

Value beating growth style.

- The broad U.S. stock market return for 2016 was 13.0%, which was entirely due to multiple expansion. Year-over-year earnings growth of U.S. equities has actually averaged close to 0% over the past few years.

- Nearly half of the 2016 returns were earned after the U.S. presidential election, despite the fact that many market prognosticators predicted a severe market correction should Trump be elected. Though there may be many reasons, many attribute President Trump's proposed economic agenda that includes tax reforms and increased government spending as the reasons why the stock market accelerated into year's end.

- Valuation metrics are above average and the absolute returns over the next cycle will not likely be as strong as the historical average of 11 – 12% year-over-year total returns.

- Over the past year, ending December 2016, small cap stocks significantly out-returned large cap stocks by 9.4%. Over the past five and ten years, only tenths of an annual percentage point separate large and small-cap stocks. Because of 2016 returns, small-cap stocks look expensive both relative to large caps and in absolute terms.

- Over the past year, value style beat growth by 10.6%, and may be a sign of things to come. Timing style factors is difficult at best, however in June 2016 it was remarked that after a ten year period of growth dominance, historically value has outperformed growth for the next five years by 10% annualized. The relative returns of value stocks still have a long way to go to get back to historical averages.

International Equity

Currency impacting returns.

- International equities continue to underperform domestic. Over the past one, three, five, seven, and ten years ending December 2016, the international market index, MSCI ACWI ex USA, underperformed the S&P 1500 index by -8.2%, -10.9%, -9.3%, -9.8%, and -6.2% annualized respectively.

- Currency has played a major role with the underperformance of international equities compared to U.S. equities. Approximately one-quarter of the underperformance over the past one and ten years, and roughly half- to two-thirds of the underperformance over the past three, five, and seven years was due to the strengthening dollar.

- Within international equities, in a slight reversal of trend, emerging markets outperformed developed markets over the past year by 8.2%. Over the past three, five, and seven years developed has outperformed emerging by 1.0%, 4.5%, and 3.1% on an annualized basis, though underperforming emerging the past ten years by -1.0%.

- International equity small-cap stocks slightly underperformed the broader MSCI ACWI ex USA index last year by -0.6%. However, the returns for international small caps were 2.6%, 2.6%, 2.8% and 1.9% higher over the past three, five, seven, and ten years respectively on an annualized basis.

- The plan is underweight international equity against a global benchmark (approximately 38% versus 48%) though close to the weight of peers; 15.6% versus 17.8%.

- Based on a price-to-earnings valuation multiple, excluding non-earning companies, developed international equity markets trade at approximately a 15% discount to the U.S. counterparts, while emerging markets trade at more than a 30% discount.

Interest Rates

Rising rates.

- At its December 2016 meeting, the Federal Reserve Board voted to raise its key interest rate for the second time in as many years, and just its second hike since 2006.

- The 10-year U.S. Treasury ended December 2016 at 2.4%, about 20 bps higher than one year prior and in line with the December rate hike. The curve is a little bit steeper than average, potentially an indicator of continued economic growth.

- By January 2017, spreads in high yield bonds contracted nearly 350 bps since one year prior. By historical standards, they are fairly tight and they now are at levels not seen since August 2014. The plan continues to sell into market strength, and high yield bonds now constitute roughly only 7.5% of the total fixed income portfolio.

- Spreads on investment-grade fixed income securities are at historical averages, having rallied by 65 bps since a year ago. The demand for high-grade corporate debt remains strong especially at longer maturities as corporate pension plans continue to de-risk their investment portfolios.

- Inflation expectations are finally being priced higher in the bond markets. The ten-year breakeven rates at the end of December 2016 were priced just below 2.0%, and right at the long-term inflation target of the Federal Reserve. This is also 80 bps higher than the low point of 2016.

- The Barclays Aggregate Index's sensitivity to changes in interest rates has slightly decreased since last year as measured by the modified adjusted duration. At the end of December 2016, the Index had a duration of 5.9 compared to 6.0 a year ago.

Real Estate

Rich valuations.

- The publicly traded FTSE NAREIT REITs Index was up 8.8% over the past year ending December 2016. However the index lost nearly 9.6% on a price basis since July 2016 as the market came to the realization that interest rates were on the rise. It had been noted before how the movement in the REITs Index and the interest rates were closely related.

- The REIT Index is priced slightly cheap compared to bonds, while other valuation metrics indicate that the index is very expensively priced. In other words, real estate is not expected to deliver high absolute returns over the longer term. However stretched the valuations have become, timing of the softer than normal returns is tricky.

Commodities

A cyclical rebound.

- Commodities broadly made a cyclical bounce in 2016. The Thomson Reuters CRB Commodity Index increased more than 24% from the February 2016 lows, and more than 9% for the year. However, the longer term trend in commodity prices remains to the downside.

- The price for crude oil was especially volatile in 2016. For the year, the price for crude oil increased from $37.04 to $53.72 per barrel from the beginning to end of 2016, and more than doubled from its February 2016 low.

- Since its 2008 all-time low, the U.S. dollar has increased in value by more than 40%. The ascension has not been a steady trip. There have been periods of fierce appreciation, periods of moderation, and periods of steadiness. From March of 2015 through mid-November 2016, the value of the U.S. dollar was stable. However, by late December 2016, the U.S. dollar hit its highest value since 2002.

ECONOMIC OUTLOOK

Select Historic Economic Growth with Forecasts

An eye to 2017.

Real GDP % Growth Actual/Forecasts	2014	2015	2016	2017	2018
World	3.4	3.2	3.1	3.2	3.4
U.S.	2.4	2.6	1.6	2.3	2.3
Developed (G8)	1.8	1.9	1.4	1.8	1.8
Asia	4.9	5.0	4.5	4.7	4.7
EMEA	2.2	1.2	1.3	2.2	2.6
Europe	1.2	2.0	1.6	1.5	1.5
Latin America	0.8	-0.3	-2.0	1.5	2.6
China	7.3	6.9	6.7	6.5	6.2

*Source: Bloomberg

Economic Overview

U. S. economy continues to expand.

- The most recent reading of the annualized U.S. GDP growth was 1.9%, below the consensus estimate of 2.2%. Current estimates for 2017 GDP growth for the U.S. is 2.3%. Coincidental economic indicators such as the Institute for Supply Management's Manufacturing and Non-Manufacturing PMI Indexes are well above 50, indicating that the U.S. economy is likely to continue to grow.

- The current economic expansion in the U.S. is into its seventh year, ranking it the fourth longest economic expansion in the past seventy years. The last expansion ending in 2008 was also the longest and lasted another seventeen years. There are however signs of the cycle being in the later innings.

- The jobs market is very healthy. The national unemployment rate is 4.9% and the three-month average figures for initial jobless claims is at its lowest level since 1973. In December 2016, there were 5.6 million job openings in the U.S. according to the Labor Department, just below an all-time record. The Federal Reserve Bank of Atlanta tracks wage growth of individuals and the trend in wage growth is accelerating. Its three-month median wage growth hit 3.9% in November 2016, an eight year high.

- Housing prices in the U.S are high. This is good for household balance sheets, but may act as a headwind for household formations. According to the U.S. Bureau of the Census the median sales price of houses sold in the U.S. is $308,500, up nearly 20% from the 2007 peak. Low interest rates make housing as affordable as it has been in the past eight years, but less affordable compared to historical trends going back to the 1980s.

Annual Total Returns of Key Asset Classes 1997 - 2016

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Best	U.S. Equity 32.94%	U.S. Equity 26.33%	Int'l Equity 26.97%	Gov't Bonds 13.23%	Corp. Bonds 10.40%	Gov't Bonds 11.50%	Int'l Equity 40.82%	Int'l Equity 20.90%	Real Estate 20.06%	Int'l Equity 26.65%
	Hedge Funds 14.95%	Int'l Equity 19.97%	U.S. Equity 20.27%	Real Estate 12.24%	Real Estate 7.28%	Corp. Bonds 10.52%	U.S. Equity 29.58%	Real Estate 14.48%	Int'l Equity 16.62%	Real Estate 16.59%
	Real Estate 13.91%	Real Estate 16.24%	Hedge Funds 18.93%	Corp. Bonds 9.40%	Gov't Bonds 7.24%	Real Estate 6.74%	Hedge Funds 9.01%	U.S. Equity 11.78%	U.S. Equity 5.65%	U.S. Equity 15.34%
	Corp. Bonds 10.23%	Gov't Bonds 9.85%	Real Estate 11.36%	Cash 6.16%	Cash 4.43%	Hedge Funds 3.57%	Real Estate 8.99%	Hedge Funds 5.83%	Hedge Funds 5.13%	Hedge Funds 9.21%
	Gov't Bonds 9.58%	Corp. Bonds 8.59%	Cash 4.83%	Hedge Funds 5.77%	Hedge Funds 3.11%	Infla-tion 2.39%	Corp. Bonds 7.69%	Corp. Bonds 5.25%	Infla-tion 3.42%	Cash 4.81%
	Cash 5.35%	Cash 5.24%	Infla-tion 2.68%	Infla-tion 3.39%	Infla-tion 1.55%	Cash 1.79%	Gov't Bonds 2.36%	Gov't Bonds 3.48%	Cash 3.06%	Corp. Bonds 4.27%
	Int'l Equity 1.77%	Infla-tion 1.60%	Corp. Bonds -1.94%	U.S. Equity -6.98%	U.S. Equity -10.64%	Int'l Equity -14.95%	Infla-tion 1.88%	Infla-tion 3.25%	Gov't Bonds 2.65%	Gov't Bonds 3.46%
Worst	Infla-tion 1.70%	Hedge Funds -1.61%	Gov't Bonds -2.25%	Int'l Equity -15.31%	Int'l Equity -19.74%	U.S. Equity -21.30%	Cash 1.16%	Cash 1.33%	Corp. Bonds 1.95%	Infla-tion 2.55%

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Best	Int'l Equity 16.65%	Gov't Bonds 12.38%	Int'l Equity 41.44%	U.S. Equity 16.38%	Real Estate 14.26%	Int'l Equity 16.83%	U.S. Equity 32.80%	U.S. Equity 13.08%	Real Estate 13.32%	U.S. Equity 11.93%
	Real Estate 15.84%	Cash 2.05%	U.S. Equity 27.24%	Real Estate 13.11%	Gov't Bonds 9.02%	U.S. Equity 16.17%	Int'l Equity 15.29%	Real Estate 11.81%	U.S. Equity 1.01%	Real Estate 7.97%
	Gov't Bonds 8.67%	Infla-tion 0.10%	Corp. Bonds 16.05%	Int'l Equity 11.15%	Corp. Bonds 8.35%	Real Estate 10.54%	Real Estate 10.99%	Corp. Bonds 7.53%	Gov't Bonds 0.86%	Corp. Bonds 5.63%
	Hedge Funds 7.68%	Corp. Bonds -3.07%	Hedge Funds 9.65%	Corp. Bonds 8.46%	Infla-tion 2.96%	Corp. Bonds 9.37%	Hedge Funds 7.69%	Gov't Bonds 4.92%	Infla-tion 0.66%	Int'l Equity 4.50%
	U.S. Equity 5.47%	Real Estate -6.46%	Infla-tion 2.72%	Gov't Bonds 5.52%	U.S. Equity 1.75%	Hedge Funds 4.06%	Infla-tion 1.49%	Hedge Funds 3.41%	Hedge Funds 0.51%	Hedge Funds 2.30%
	Corp. Bonds 5.10%	Hedge Funds -19.86%	Cash 0.19%	Hedge Funds 5.07%	Cash 0.10%	Gov't Bonds 2.02%	Cash 0.07%	Infla-tion 0.68%	Cash 0.01%	Infla-tion 2.10%
	Cash 5.03%	U.S. Equity -36.72%	Gov't Bonds -2.19%	Infla-tion 1.50%	Hedge Funds -3.55%	Infla-tion 1.70%	Corp. Bonds -2.01%	Cash 0.04%	Corp. Bonds -0.77%	Gov't Bonds 1.05%
Worst	Infla-tion 4.06%	Int'l Equity -45.52%	Real Estate -16.86%	Cash 0.13%	Int'l Equity -13.71%	Cash 0.11%	Gov't Bonds -2.60%	Int'l Equity -3.87%	Int'l Equity -5.67%	Cash 0.27%

Annualized Returns 1997 - 2016

	Infl.	Cash	Hedge	Int'l.	Gov't.	Corp.	US Eq.	R.E.
Return	2.14%	2.19%	4.24%	4.72%	4.93%	5.93%	7.68%	9.78%
Risk	1.27%	0.62%	6.70%	17.31%	4.09%	5.07%	15.29%	8.48%

- Hedge Funds are represented by the HFRI FOF Conservative Index
- Inflation is represented by the U.S. Consumer Price Index
- International Equity is represented by the MSCI EAFE Index
2000 Forward - Int'l Equity is represented MSCI - AC World EX-USA Index
- Cash is represented by 30-day T-Bills
- U.S. Equity is represented by the S&P 1500
- Real Estate is represented by the NPI
- Corporate Bonds are represented by the Barclays Capital - Credit Index
- Government Bonds are represented by the Barclays Capital U.S. Government