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University of Maine System

Asset Allocation Discussion

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Jay E. Roney, CTP, Partner
Kelly Regan, Senior Consultant

255 State Street, Boston, MA 02109 | TEL: 617.374.1300 | FAX: 617.374.1313 | www.nepc.com
BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | SAN FRANCISCO

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Introduction

- **On an periodic basis, NEPC recommends revisiting Portfolio Goals & Objectives as well as Asset Allocation**

- **This presentation explores modifications to the current asset allocation**
  - Managed Investment Pool (MIP)
    - International Equity allocation
    - Core Bonds and TIPS
    - Bank Loans

  - Pension Plan
    - Core Bonds and TIPS
    - Bank Loans

  - Operating Fund
    - Core Bonds and TIPS

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NEPC 2017 Themes, Actions and Opportunities for Clients

Key Market Themes

Key Market Themes are factors that define global markets and can be expected to both evolve and remain relevant without a clear timeline of conclusion. At times, themes may be challenged. Disruption of a theme will likely produce significant volatility and change market dynamics.

- **Extended U.S. Economic Cycle**
- **Federal Reserve Gradualism**
- **China Transitions**
- **Globalization Backlash**

Strategic Policy Actions

Strategic Policy Actions are asset allocation focused resolutions designed to address systematic issues within the capital markets, the regulatory environment, and conventional wisdom associated with investing. They seek to improve efficiency and clarify the purpose of an asset allocation with a focus on meeting long-term objectives.

- **Evaluate Feasibility of Objectives**
- **Reassess Investment Structure**
- **Examine the Cost of Core Exposures**
- **Review Investment Program Governance**

Current Opportunities

Current Opportunities are investment ideas that represent an action with the goal of improving investment outcomes relative to an investor's strategic asset allocation. These investment ideas are likely to change more frequently as market dynamics and valuations shift over time.

- **Trim U.S. Equity Gains**
- **Overweight Non-U.S. Developed Market Equities**
- **Emerging Market Equities Remain Attractive**
- **Allocate to TIPS from Core Bonds**
- **Reduce High Yield for Other Credit Strategies**
- **Fund Emerging Local Debt from Risk Assets**
- **Add Macro Hedge Fund Strategies**

NEPC 2017 Key Market Themes

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Key Market Themes

Extended US Economic Cycle

Economic cycles don't die of old age

We believe the US economy is in an extended expansionary cycle despite being eight years removed from the last recession

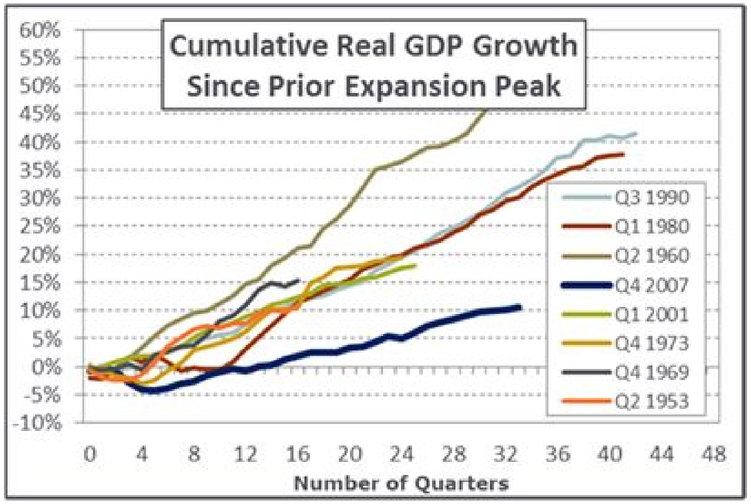
The health of US consumers continue to drive economic growth given relatively low debt levels

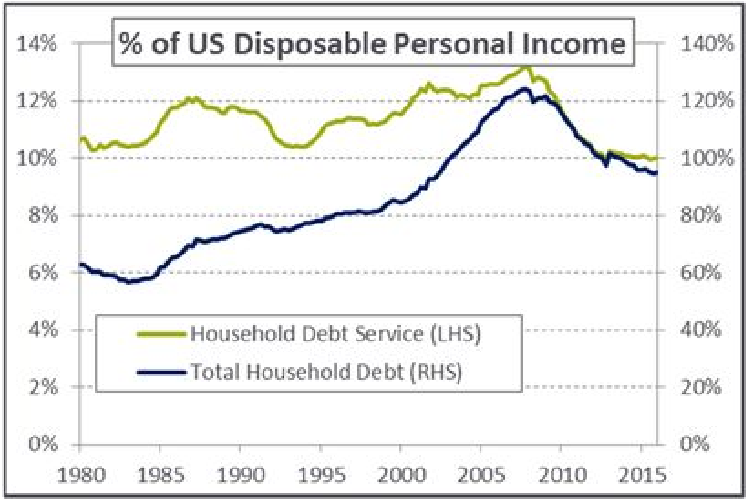
A prolonged US economic expansion can support a continued rally for US equities despite elevated valuation levels

We anticipate inflation will shift marginally higher in the coming years

Improvements in wage growth and the ongoing recovery in housing further support modest upticks in inflation

The strength of the US dollar is likely to restrain inflationary pressures and offset the potential impact of fiscal stimulus in the US





Source: (Top) Federal Reserve Bank of St. Louis
Source: (Bottom) FRED

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Key Market Themes

Federal Reserve Gradualism

The Federal Reserve is expected to slowly increase interest rates

Expected path of Fed policy through 2019 matters more than timing of the next hike

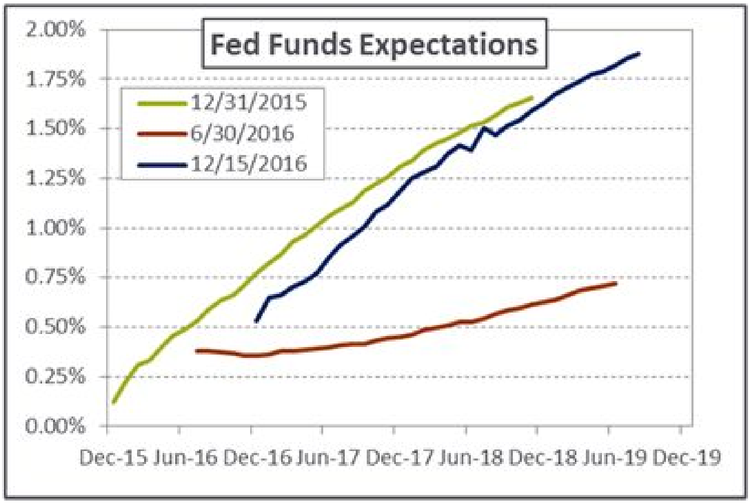
Fed has stated a willingness to let the economy "run hot" and accept some inflation to repair the deflationary effects of the past eight years

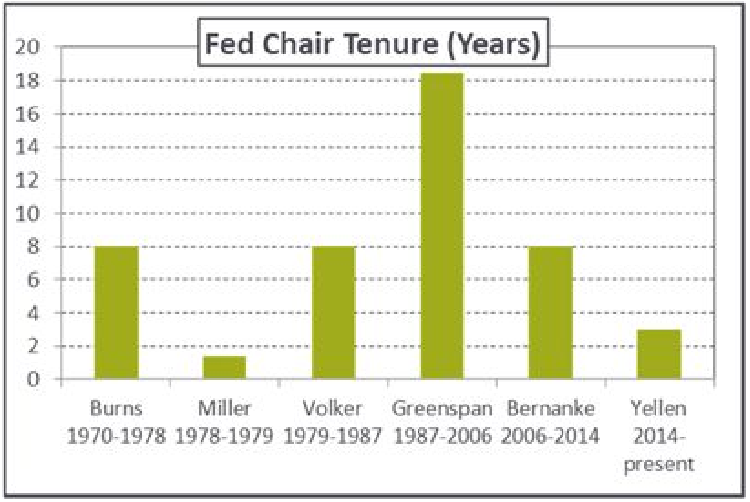
A relatively accommodative Fed is likely to continue, unless there is a dramatic acceleration in inflation

2017 is likely to be a year for greater uncertainty regarding Fed policy

Politics could intersect with Fed policy due to more vocal executive branch and conclusion of Janet Yellen's term in February 2018

The path of Fed rate hikes in 2017 and beyond is less clear due to the potential impact of fiscal stimulus





Source: (Top) Federal Reserve, Bloomberg
Source: (Bottom) Federal Reserve

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Key Market Themes

China Transitions

China is the global growth engine but faces fundamental transitions

Economic evolution: Intrinsic need to evolve from focus on manufacturing – long the driver of growth – to services and innovation

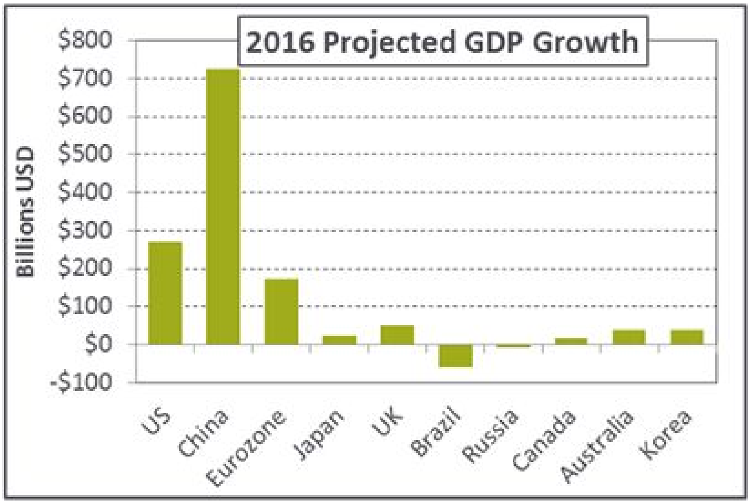
Monetary policy progression: Pressure on the People's Bank of China (PBOC) to balance the status quo and encourage free market reforms

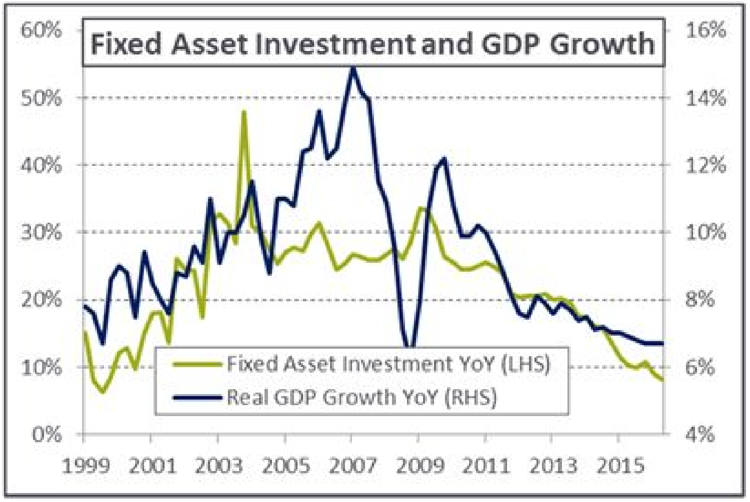
Any disruption to these transitions will have global repercussions due to China's size and role in the global economy

China must manage competing social goals in attempting to sustain growth

Production based economy requires fixed investment to support employment as the rural population moves to urban centers

Future growth in a services based economy requires advancement in productivity, technology, and a more skilled labor force





Source: (Top) IMF, Bloomberg
Source: (Bottom) National Bureau of Statistics of China, Bloomberg

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Key Market Themes

Globalization Backlash

Weak economic growth and uneven wage gains over the last decade have fueled political discontent in the West

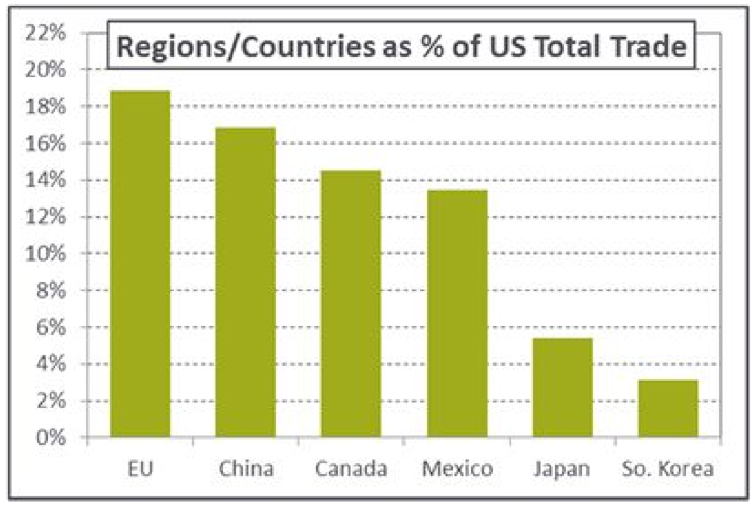
The backlash against globalization does not materially alter the fundamentals of the global capital markets, but does increase economic and market uncertainty

Have we reached "Peak Trade"?

A secular transition is underway and a shift from free trade policies in the West may reduce long-term economic growth rates

Free trade is blamed but automation is perhaps a greater source of social disruption and job losses

A strong US pivot away from global trade is a tail-risk for the global economy and would likely impact capital markets negatively in the emerging world



Source: (Top) Bureau of Economic Analysis, Eurostat, Bloomberg
Source: (Bottom) IMF, Bloomberg

Actions for Clients

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Strategic Policy Actions

Evaluate Feasibility of Objectives

Asset returns offer less support for investors to achieve target objectives

Asset growth post-2008 is without historical precedent relative to economic growth

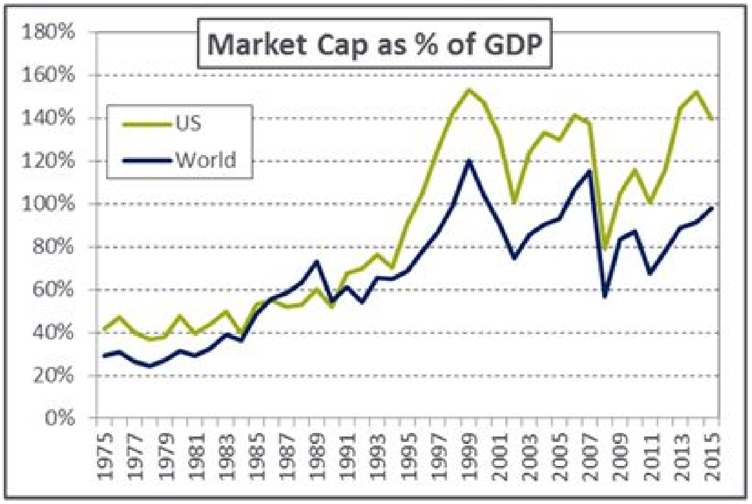
Investment program goals are influenced by capital inflows, spending obligations, and asset returns

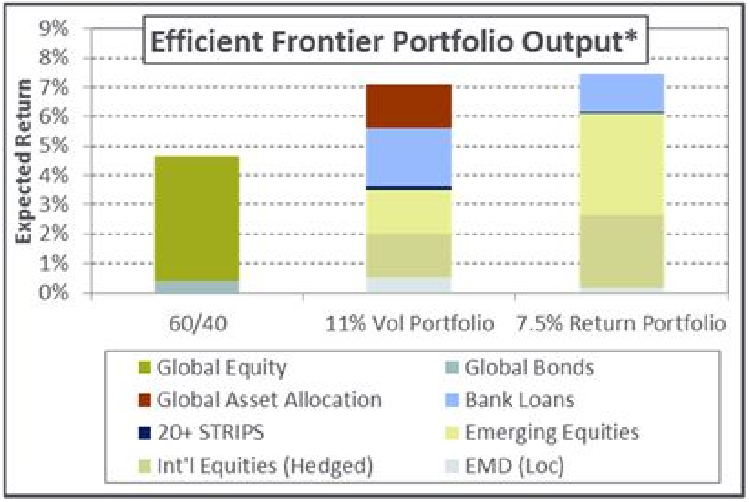
Future growth is likely to be more dependent on increasing capital inflows and reducing spending commitments

Expected returns greater than 7.5% (5% real) will be a high hurdle for diversified investors to realize

Optimization of public market asset classes will not be sufficient to meet elevated return expectations for risk aware investors

Improving the return outlook may involve increasing portfolio risk, expanding alpha opportunities, and/or expanding the use of portfolio leverage





Source: (Top) World Bank

**Liquid unconstrained portfolio uses 0% allocation to hedge funds and private market investments; Source: (Bottom) NEPC*

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Strategic Policy Actions

Review Investment Program Governance

Consider delegating some responsibilities from committees

Committee experience and oversight best served with a focus on strategic efforts such as asset allocation and investment policies

Institutionalize a strategic rebalance policy to mitigate behavioral bias such as loss aversion and recency bias

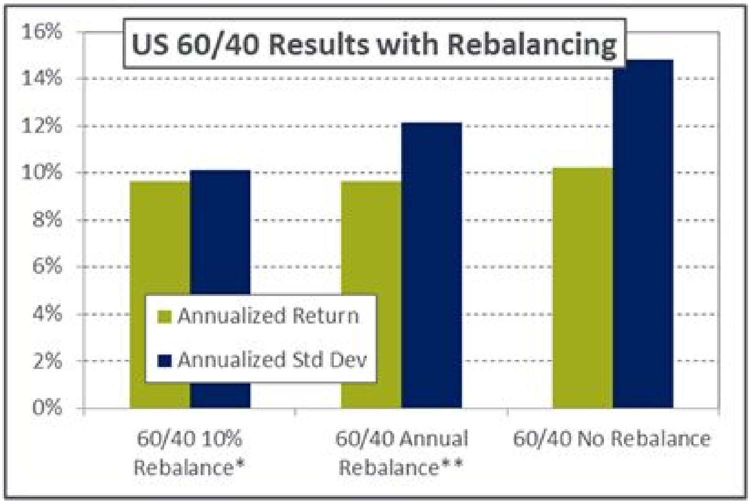
Optimize committee governance time by expanding staff/executive role to approve investment managers and rebalance assets

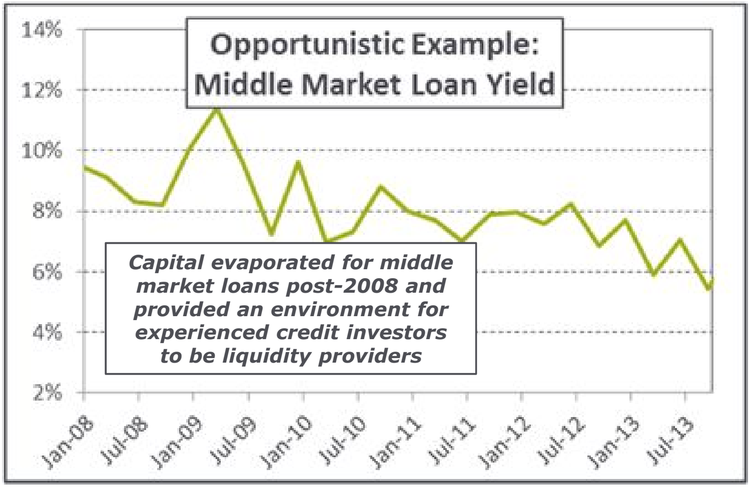
Define an Opportunistic sleeve in the investment policy

Allows for an override to the strategic asset allocation and requires affirmation of the concept prior to a market event

Opportunistic defined by unique strategies and/or dislocations in capital markets that require expertise to extract value over time

We encourage committees to review each opportunity due to the multi-year time horizon and significance of allocations





Source: (Top) Ibbotson-Morningstar, NEPC
Source: (Bottom) S&P Capital IQ LCD

**Rebalances halfway to targets when part of portfolio exceeds +/- 10 percentage point range **Rebalances back to 60/40 every 12 months*

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Current Opportunities

Overweight Non-US Developed Market Equities

Europe and Japan carry risks but offer a meaningful return opportunity

Catalysts for outperformance are present with shareholder friendly actions in Japan and macroeconomic improvement in Europe

Central bank support and US dollar strength provide a positive economic backdrop as both the ECB and BoJ are likely to maintain accommodative monetary policies

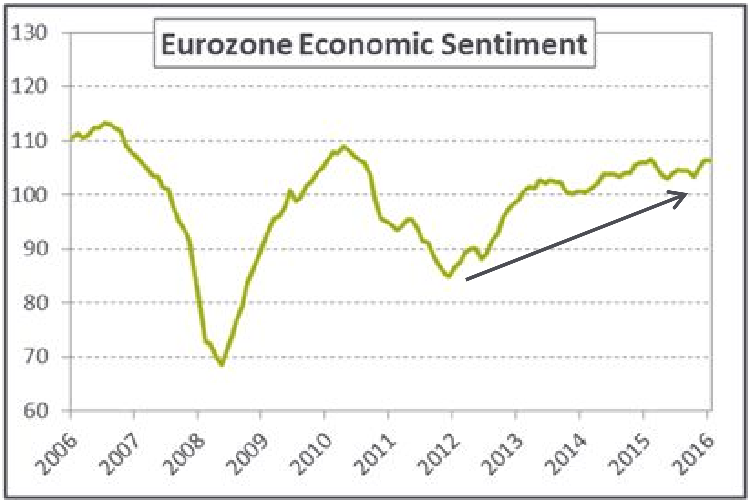
Anti-establishment political parties represent a tail-risk for the stability of the Eurozone with major elections across Europe in 2017

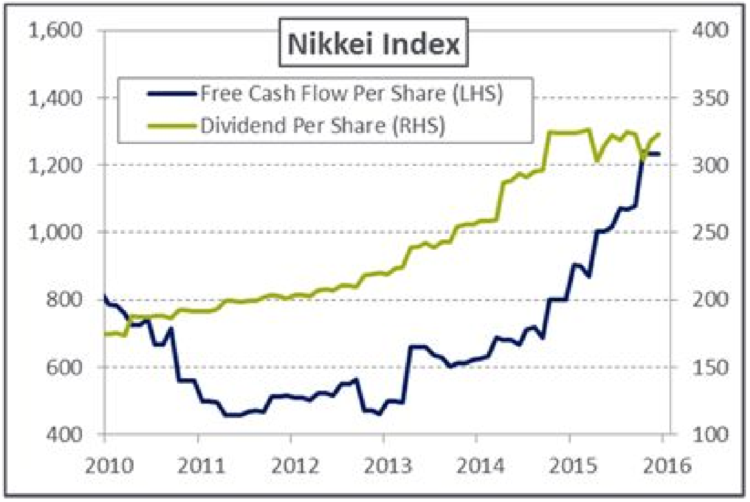
Recommend a gradual shift from the US to non-US equities as European elections are likely to generate volatility

Small-cap equity and global equity are preferred implementation approaches

These strategies offer the best opportunity to exploit valuation discrepancies among stocks across countries and sectors

Hedging a portion of non-US developed currency exposure remains a strategic goal





Source: (Top) European Commission, Bloomberg
Source: (Bottom) Bloomberg

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Current Opportunities

Emerging Market Equities Remain Attractive

Emerging equities offer the highest total return potential for investors

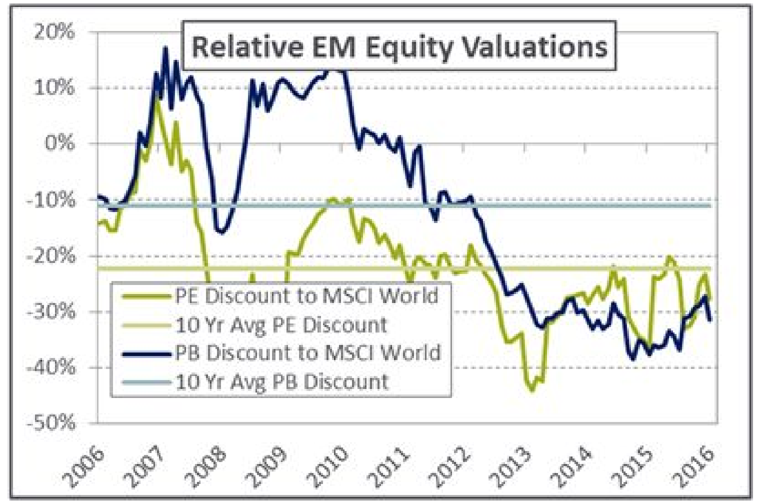
Valuation levels and long-term fundamentals suggest an overweight relative to global market cap weights (e.g. 15% to 20%)

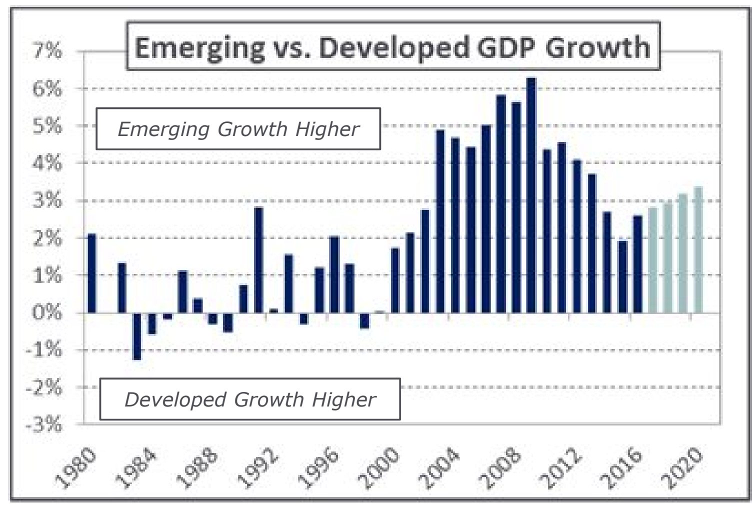
China's depreciating currency, broad US dollar strength and US-Asia trade policy concerns temper our excitement

Growth premium relative to the developed world is advancing as emerging market economic conditions improve off fiscal and currency adjustments of recent years

Overweight small-cap and consumer focused strategies relative to broad benchmark mandates

Small-cap and emerging market consumer strategies offer a structural bias away from commodity exposures and state owned enterprises





Source: (Top) MSCI, Bloomberg
Source: (Bottom) IMF

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Current Opportunities

Allocate to TIPS from Core Bonds

Preserve US duration exposure with a bias towards TIPS over core bonds

TIPS offer safe haven exposure with an explicit hedge for realized inflation and can be sourced with a low cost passive strategy

A meaningful allocation to TIPS diversifies core bond exposure and improves risk balance across economic environments

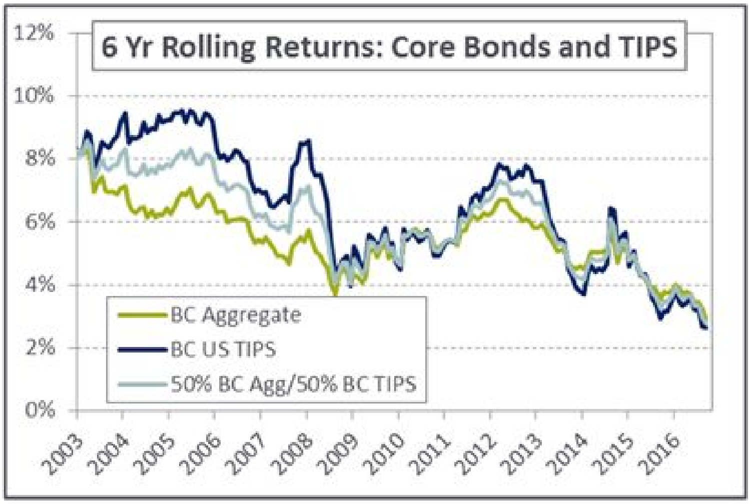
Despite concern of higher interest rates, duration exposure remains a critical asset allocation building block for a portfolio

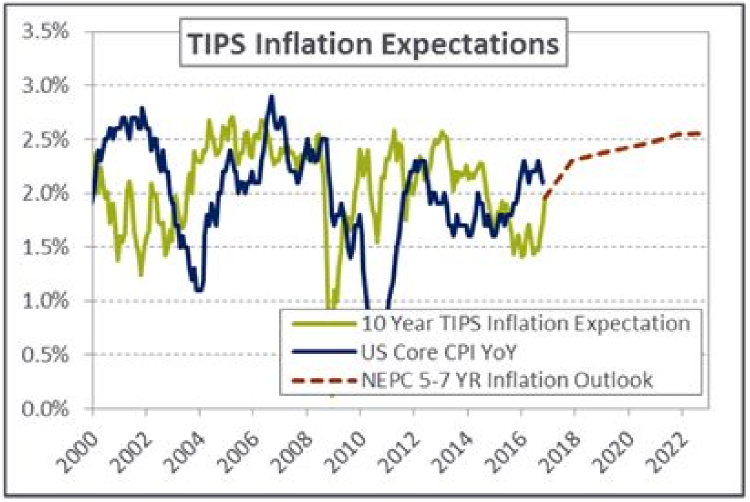
Higher inflation expectations favor TIPS over nominal bonds

Rising inflation assumptions imbedded in fixed income markets are more likely to negatively impact nominal interest rates

TIPS yields are based on real rates and prices are sensitive to Fed tightening

Core bond yields include real rates and inflation expectations; prices are negatively impacted by increases in both





Source: (Top) Barclays, Bloomberg, NEPC
Source: (Bottom) Bureau of Labor Statistics, Bloomberg, NEPC

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Current Opportunities

Reduce High Yield for Other Credit Strategies

Index aware high yield strategies enjoyed exceptional returns in 2016

Outsized credit spreads fell to historic median levels as the energy market and economic outlook improved in 2016

Extended US economic growth cycle supports positive returns and can push credit spreads below long-term levels

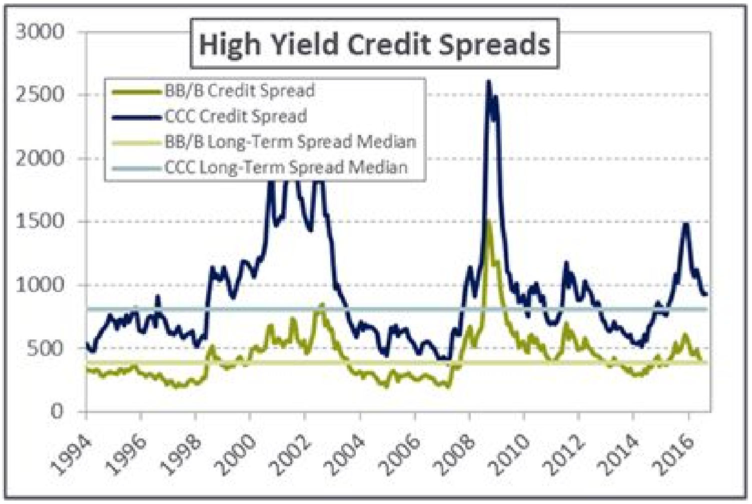
Credit markets continue to benefit from high demand in a low rate environment, but current spread levels are less compelling

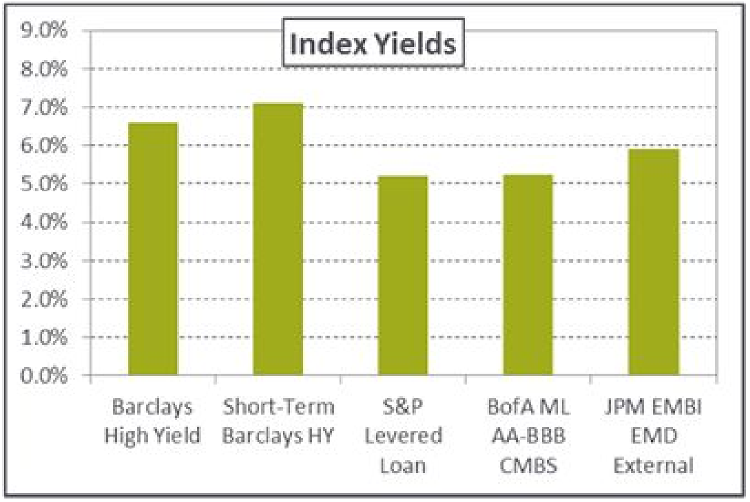
Make use of other credit strategies to capture pockets of value

Bank loans and short duration high yield offer higher expected returns than high yield due to limited duration exposure

Security selection is critical as some credit sub-sectors such as structured credit provide a better return/risk profile

Credit focused multi-sector strategies can effectively allocate across credit markets to seek pockets of opportunity





Source: (Top) Barclays, Bloomberg

Source: (Bottom) Barclays, Standard & Poors, BofA/ML, JP Morgan, Bloomberg

2017 Asset Class Assumptions

2017 5-to-7 Year Return Forecasts

Geometric Expected Return			
Asset Class	**2016**	**2017**	**2017-2016**
Cash	1.50%	1.75%	0.25%
Treasuries	1.75%	2.00%	0.25%
IG Corp Credit	3.75%	3.75%	-
MBS	2.00%	2.25%	0.25%
Core Bonds*	2.46%	2.65%	0.19%
TIPS	2.50%	3.00%	0.50%
High-Yield Bonds	5.25%	4.75%	-0.50%
Bank Loans	5.50%	5.25%	-0.25%
Global Bonds (Unhedged)	1.00%	1.00%	-
Global Bonds (Hedged)	1.09%	1.09%	-
EMD External	4.75%	4.75%	-
EMD Local Currency	6.50%	6.75%	0.25%
Large Cap Equities	6.00%	5.75%	-0.25%
Small/Mid Cap Equities	6.25%	6.00%	-0.25%
Int'l Equities (Unhedged)	7.25%	7.25%	-
Int'l Equities (Hedged)	7.57%	7.57%	-
Emerging Int'l Equities	9.75%	9.50%	-0.25%
Private Equity	8.50%	8.25%	-0.25%
Private Debt	7.50%	7.25%	-0.25%
Real Estate	6.50%	6.00%	-0.50%
Commodities	4.50%	4.75%	0.25%
Hedge Funds**	5.75%	5.95%	0.20%

* Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).
** Hedge Funds is a calculated blend of 40% Equity, 40% Credit, 20% Macro-related strategies.

2017 Volatility Forecasts

Volatility			
Asset Class	**2016**	**2017**	**2017-2016**
Cash	1.00%	1.00%	-
Treasuries	5.50%	5.50%	-
IG Corp Credit	7.50%	7.50%	-
MBS	7.00%	7.00%	-
Core Bonds*	6.03%	6.03%	-
TIPS	6.50%	6.50%	-
High-Yield Bonds	13.00%	13.00%	-
Bank Loans	9.00%	9.00%	-
Global Bonds (Unhedged)	8.50%	8.50%	-
Global Bonds (Hedged)	5.00%	5.00%	-
EMD External	13.00%	13.00%	-
EMD Local Currency	15.00%	15.00%	-
Large Cap Equities	17.50%	17.50%	-
Small/Mid Cap Equities	21.00%	21.00%	-
Int'l Equities (Unhedged)	21.00%	21.00%	-
Int'l Equities (Hedged)	18.00%	18.00%	-
Emerging Int'l Equities	27.00%	28.00%	1.00%
Private Equity	23.00%	23.00%	-
Private Debt	15.00%	14.00%	-1.00%
Real Estate	15.00%	15.00%	-
Commodities	19.00%	19.00%	-
Hedge Funds**	9.00%	8.74%	-0.26%

* Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).
** Hedge Funds is a calculated blend of 40% Equity, 40% Credit, 20% Macro-related strategies.

Managed Investment Pool

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MIP Asset Allocation Overview

- **The Portfolio's current policy allocation is well diversified but may fall short of the System's return goal**
  – MIP long-term nominal return goal is 7.5% (equates to 5.0% real return)
    - The System utilizes a 4.5% spending rate
    - NEPC's U.S. inflation assumption is 2.5%
  – Short Term: NEPC forecasts a 6.3% expected return over a 5-7 year time frame
  – Long Term: NEPC forecasts a 7.4% nominal expected return based on 30 year
    - Beta only, additional return may be assumed for active management

- **NEPC is recommending small adjustments to the MIP's asset allocation based on our 2017 key market themes and actions for clients**
  – Expand International Equity exposure by adding an International Small Cap Equity mandate
  – Diversity Fixed Income allocation
    - Reduce Core Bonds in lieu of TIPS
    - Explore dedicated Bank Loan mandate

- **The changes noted above marginally improve the Portfolio's 5-7 year return expectation and maintain the same expected asset volatility**
  – Supporting information detailed on the following pages

- **The Committee may want to re-visit the feasibility of expanding the private markets program in light of the expected low return market environment**

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MIP Asset Allocation Recommendation

	MIP Policy Target	MIP Recommendation
Cash	**0%**	**0%**
Large Cap Equities	16%	16%
Small/Mid Cap Equities	6%	6%
Int'l Equities (Unhedged)	16%	11%
Int'l Sm Cap Equities (Unhedged)	0%	5%
Emerging Int'l Equities	4%	4%
Emerging Int'l Sm Cap Equities	4%	4%
Private Equity	2%	2%
Total Equity	**47%**	**47%**
Core Bonds	10%	5%
TIPS	3%	8%
Bank Loans	0%	5%
Global Multi-Sector Fixed Income	5%	0%
Total Fixed Income	**18%**	**18%**
Private Real Assets - Infrastructure/Land	3%	3%
Total Real Assets	**3%**	**3%**
Global Asset Allocation	20%	20%
Hedge Funds - Long/Short	6%	6%
Hedge Funds - Credit	6%	6%
Total Multi Asset	**32%**	**32%**
Expected Return 5-7 yrs	**6.3%**	**6.4%**
Expected Return 30 yrs	**7.4%**	**7.4%**
Standard Dev	**12.5%**	**12.5%**
Sharpe Ratio (5-7 years)	**0.37**	**0.38**

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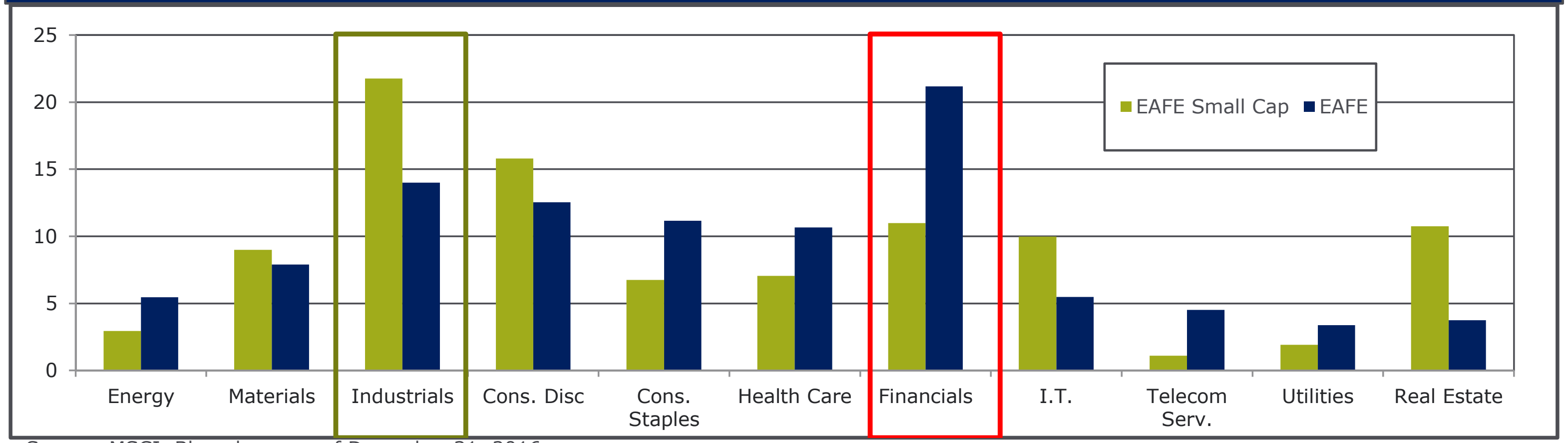
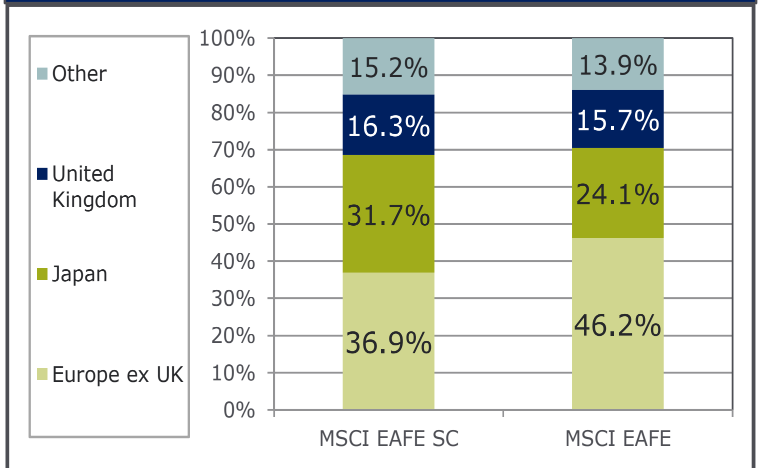
International Small Cap Equity

MSCI EAFE Small Cap vs. MSCI EAFE: Trading Financials for Industrials



Source: MSCI, Bloomberg, as of December 31, 2016

MSCI Small Cap: More Japan less Europe



Source: MSCI, Bloomberg, as of December 31, 2016

Commentary

- **Relative to US markets International markets are trading at a valuation discount**
  - Catalysts for outperformance: shareholder friendly actions in Japan and macroeconomic improvement in Europe
  - ECB and BoJ are likely to maintain accommodative monetary policies
- **Small-cap equity is one of the preferred implementation approaches**
  - Small cap offers a more diversified exposure
  - Managers have shown a strong ability to add value down the cap spectrum

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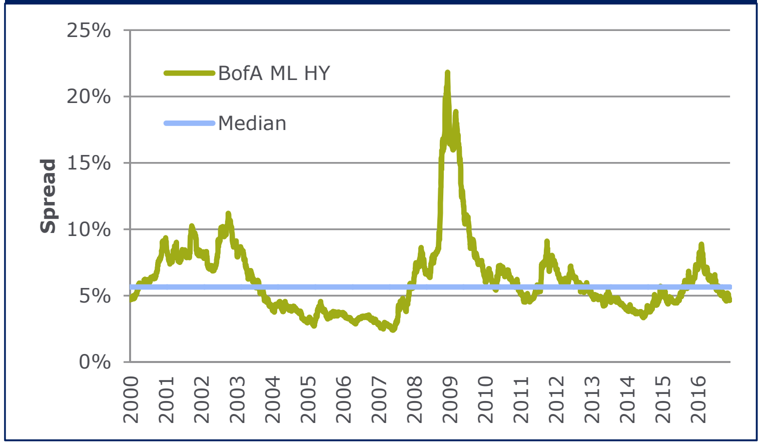
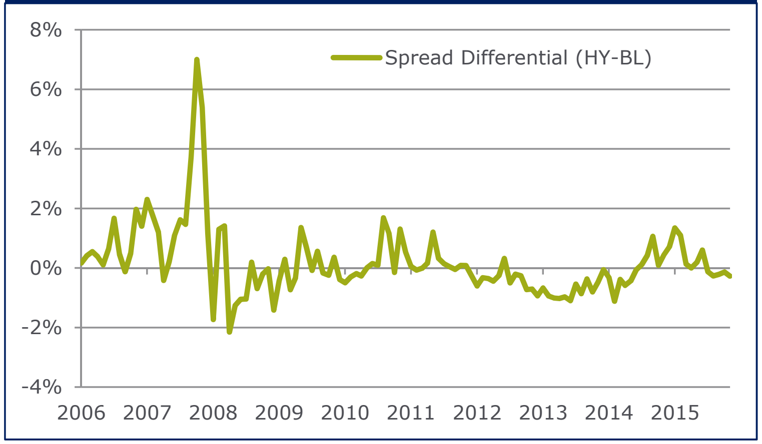
High Yield and Bank Loans

- **High Yield - Richly priced compared to last year; fundamental outlook mixed; sector and company selection key**
- **Bank Loans - Valuations relatively attractive; seniority in the capital structure beneficial; rising rate benefit**
- **CCC-rated loans remaining relatively wide**
  - BB- and B-rated loans below long-term median
  - CCC around 150 bps wide
- **Relative value to HY yield tilting in favor of loans**

High Yield Spreads



Relative Value Comparison



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Manager Universe

Loomis Sayles Fixed Income Fund

- **Benchmark: Barclays Gov't/Credit**
- **Yield: 3.8%**
- **Duration: 4.0 years**
- **High Yield Allocation: 28% as of 12/31/16**
- **Bank Loan Allocation: 0.5% as of 12/31/16**
- **Fees: 57 bps**

NEPC FPL Bank Loan Managers

- **Benchmark: Credit Suisse Leveraged Loan Index**
- **Yield: 4.5% - 5.6%**
- **Duration: 0.1 – 0.7 years**
- **Fees: 45 – 65 bps**

Pension Fund

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Pension Fund Asset Allocation Overview

- **The Fund's current policy allocation is well diversified and meets the System's long term actuarial return goal**
  - Actuarial rate of return = 6.25%
  - NEPC forecasts a 6.5% nominal expected return for the current Pension Fund policy allocation based on 30 year
    - Beta only assumptions, additional return may be assumed for active management

- **NEPC is recommending small adjustments to the Pension Fund's asset allocation based on our 2017 key market themes and actions for clients**
  - Diversity Fixed Income allocation
    - Reduce Core Bonds in lieu of TIPS
    - Explore dedicated Bank Loan mandate

- **The changes noted above slightly increase the return profile and slightly reduce the expected asset volatility (standard deviation) with an improved Sharpe Ratio**
  - Supporting information detailed on the following pages

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Pension Fund Assumptions

As of July 1, 2016, Actuarial Valuation Report

- **Funded Status: 76.3%**
  - Actuarial Value of Assets: $32,763,517
  - Liabilities: $42,934,311
  - Unfunded Amount: $10,170,794
- **Closed Plan: 1998**
  - Not frozen as the Plan is still accruing future benefits
    - Service Cost of $5 thousand/year
- **Mature Plan: Estimated 9 year duration**
  - Terminated Vested: 343 participants, Average Age 60
  - Retirees: 788 participants, Average Age 77
  - Active: 11 participants, Average Age 66
- **Discount Rate: 6.25% (Reduced from 6.75% in 2016)**
- **Annual Benefit Payments: $4.6 million/year or $0.4 million/month**
  - 15% of Plan assets/year or >1% of Plan assets/month
  - Annual benefit payments are starting to reduce from their peak and are expected to continue to decline roughly $100k/year
- **Contributions: Annual contributions of roughly $735k**
  - Contribution funding strategy adopted in February 2014
  - Contribution schedule recently updated to increase by roughly $200k/a year (up from $540k)

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Pension Fund Asset Allocation Recommendation

	Pension Policy Target	Pension Recommendation
Cash	**3%**	**3%**
Large Cap Equities	8%	8%
Small/Mid Cap Equities	4%	4%
Int'l Equities (Unhedged)	7%	7%
Emerging Int'l Sm Cap Equities	3%	3%
Total Equity	**22%**	**22%**
Core Bonds	27%	20%
TIPS	0%	7%
Bank Loans	0%	5%
Global Multi-Sector Fixed Income	5%	0%
Total Fixed Income	**32%**	**32%**
Global Asset Allocation	25%	25%
Real Estate (Core)	8%	8%
Hedge Funds - Long/Short	5%	5%
Hedge Funds - Credit	5%	5%
Total Multi Asset	**43%**	**43%**
Expected Return 5-7 yrs	**5.4%**	**5.5%**
Expected Return 30 yrs	**6.5%**	**6.5%**
Standard Dev	**8.9%**	**8.8%**
Sharpe Ratio (5-7 years)	**0.40**	**0.42**

Operating Cash Fund

University of Maine System

Operating Cash Fund Asset Allocation Overview

- **The Fund's current policy allocation is well diversified and meets the System's return goals**
  - Return goal = 4.0%
  - Short Term: NEPC forecasts a 3.7% expected return over a 5-7 year time frame
  - Long Term: NEPC forecasts a 4.7% nominal expected return based on 30 year
    - Beta only, additional return may be assumed for active management
- **NEPC is recommending small adjustments to the Operating Fund's asset allocation based on our 2017 key market themes and actions for clients**
  - Diversity Fixed Income allocation
    - Reduce Core Bonds in lieu of TIPS
- **The changes noted above maintain the return profile and slightly reduce the expected asset volatility (standard deviation)**
  - Supporting information detailed on the following pages

University of Maine System

Operating Cash Fund Asset Allocation Options

	Operating Fund Policy Target	Operating Fund Recommendation
Cash	**25%**	**25%**
Global Equity	8%	8%
Total Equity	**8%**	**8%**
Core Bonds	10%	5%
TIPS	0%	5%
Short Treasuries (1-3 yr)	13%	13%
Short Credit (1-3 yr)	13%	13%
Bank Loans	7%	7%
Absolute Return Fixed Income	7%	7%
Total Fixed Income	**50%**	**50%**
Global Asset Allocation	10%	10%
Hedge Funds - Long/Short	4%	4%
Hedge Funds - Credit	4%	4%
Total Multi Asset	**18%**	**18%**
Expected Return 5-7 yrs	**3.7%**	**3.7%**
Expected Return 30 yrs	**4.7%**	**4.7%**
Standard Dev	**4.2%**	**4.1%**
Sharpe Ratio (5-7 years)	**0.46**	**0.46**

NEPC, LLC

University of Maine System

Information Disclaimer and Reporting Methodology

Information Disclaimer

- Past performance is no guarantee of future results.
- All investments carry some level of risk. Diversification and other asset allocation techniques are not guaranteed to ensure profit or protect against losses.
- Some index returns displayed in this report or used in calculation of a policy, allocation or custom benchmark may not be available from the source or may be preliminary and subject to change.
- NEPC's source for portfolio pricing, calculation of accruals, and transaction information is the plan's custodial bank. Information on market indices and security characteristics is received from other sources external to NEPC. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.
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Reporting Methodology

- The client's custodian bank is NEPC's preferred data source unless otherwise directed. NEPC reconciles custodian data to manager data. If the custodian cannot provide accurate data, manager data may be used.
- Trailing time period returns are determined by geometrically linking the holding period returns, from the first full month after inception to the report date. Rates of Return are annualized when the time period is longer than a year. Performance is presented gross and/or net of manager fees as indicated on each page.
- For managers funded in the middle of a month, the "since inception" return will start with the first full month, although actual inception dates and cash flows are taken into account in all Composite calculations.
- This report may contain forward-looking statements that are based on NEPC's estimates, opinions and beliefs, but NEPC cannot guarantee that any plan will achieve its targeted return or meet other goals.