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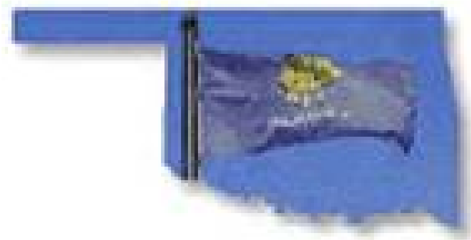

Oklahoma State Pension Commission

Low Return Environment

June 8, 2016

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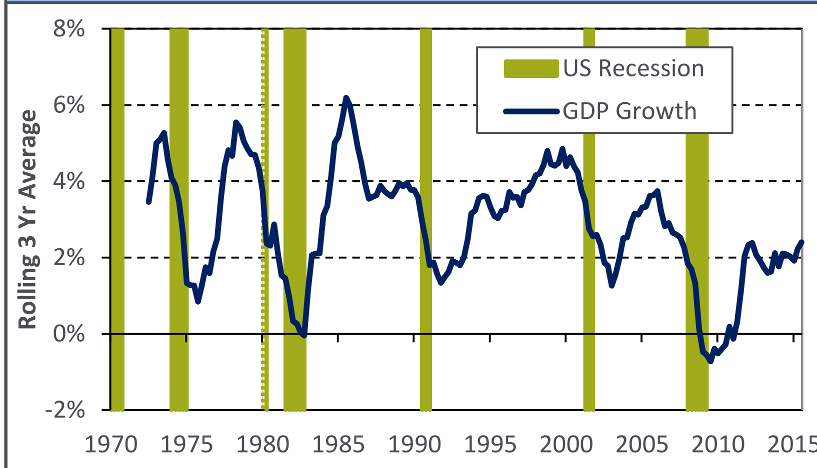
Key Themes and Background

Key Themes and Background for 2016

- **NEPC's 2016 Assumptions and Actions cover both an intermediate (5-7 years) and long term (30 years) forecast horizon**
  - Similar to prior years, November 30 market data is used for all assumption inputs
- **US economic cycle and US central bank policy are at the forefront of major cyclical and secular forces informing our Assumptions and Actions**
  - These factors interact to create a supportive environment for risk assets in the near term but ultimately push long term capital market forecasts lower relative to history
- **The US economy is nearly 7 years removed from the previous recession but the health of US consumers can extend the expansion**
  - Prolonged US economic cycle has the potential to push the US dollar higher straining commodity markets and international borrowers with dollar based debt
- **Influence of central bank policies in the developed world remain broadly supportive for risk assets but come with long term effects**
  - US policy is diverging from Europe and Japan but slow expected pace of hikes provides a positive backdrop for US equities and credit in the near term
- **Emerging Market growth compressed yet still stronger than developed; fears of further adjustments in China remain a near-term concern**
  - Large currency adjustments across most emerging countries healthy for future prospects
  - Chinese Yuan (RMB) devaluation has been incremental relative to other EM FX adjustments

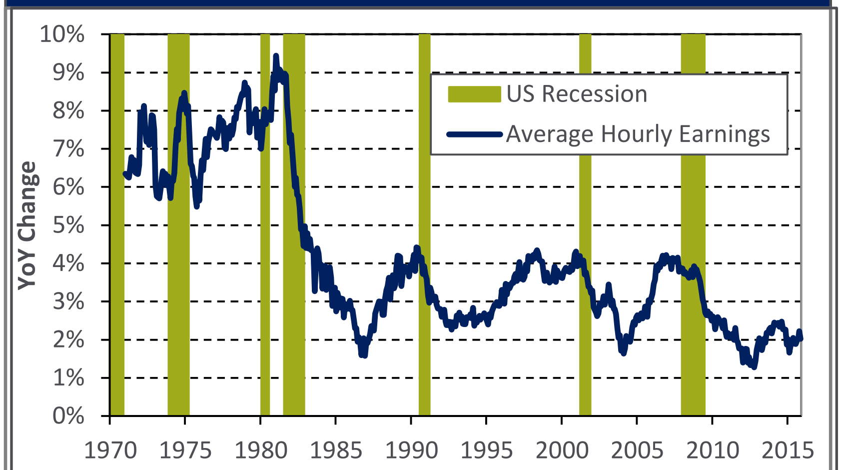
Tale of Two Economies: Corporate Sector and the US Consumer

Source: St. Louis Federal Reserve



Source: St. Louis Federal Reserve

Wage Growth: Early Cycle

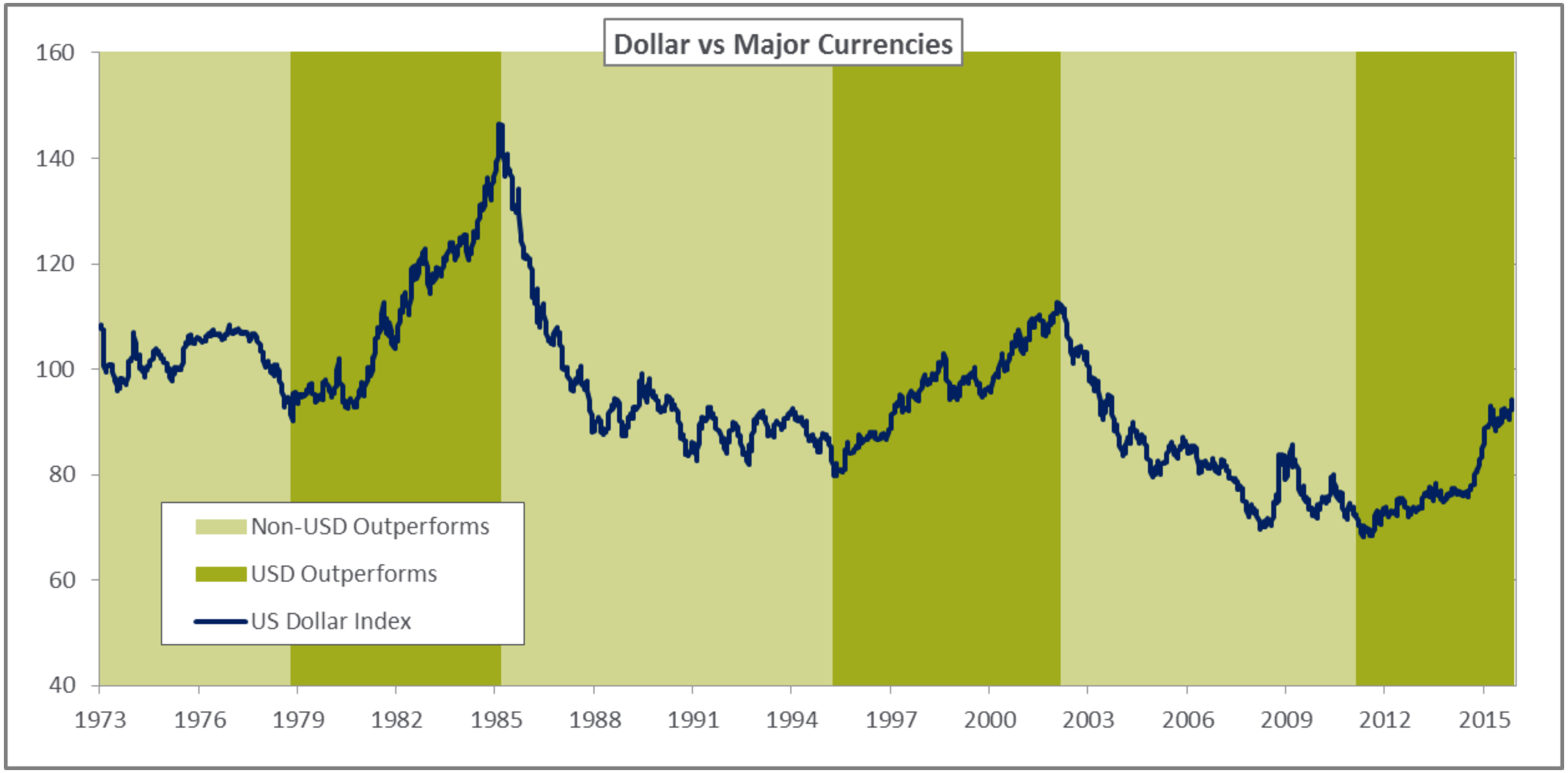


Source: St. Louis Federal Reserve

Where Are We In the Economic Cycle?

- **Relative to the average length of economic cycles the US expansion is in its later stages**
- **Improvements in wage growth and consumer spending can potentially extend expansion**
- **Continued US expansion provides a positive foundation for US risk assets**

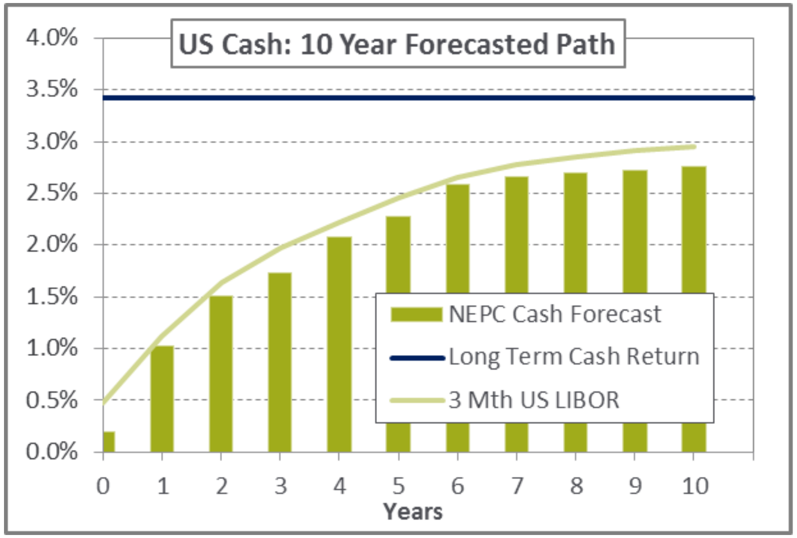
US Dollar Cycle Characterized by Peaks of Overvaluation



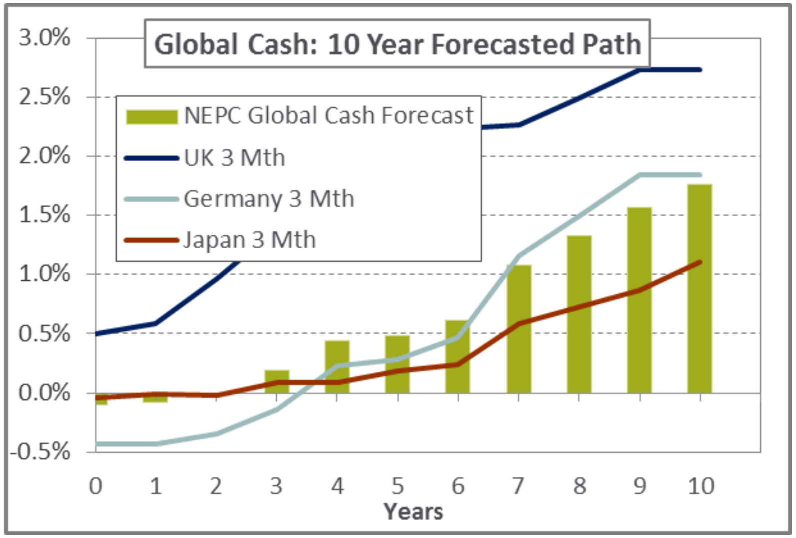
Source: Bloomberg, NEPC

- **A prolonged US economic expansion is likely to have a significant influence on the US dollar cycle**
  - Continued growth in consumer spending and US economy have the potential to push the US dollar to levels last seen in the late 1990's
- **US dollar strength is interconnected with US Federal Reserve policy**
  - Fed must balance the path of future interest rate increases relative to the disruptive effects of a strong dollar on global markets

Global Central Bank Policy: "Lower for Longer"



Source: Bloomberg, NEPC

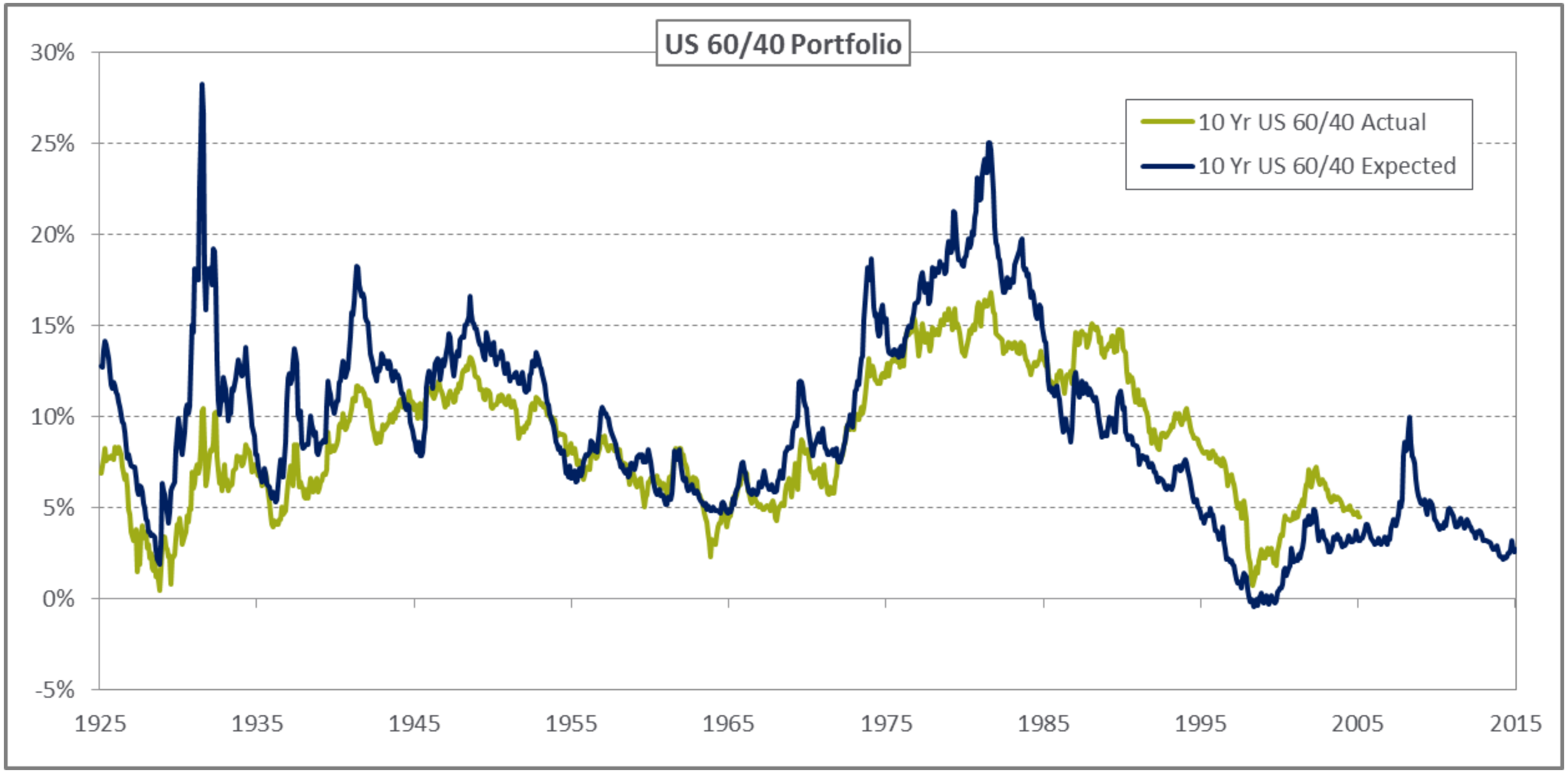


Source: Bloomberg, NEPC

- **Accommodative global monetary policies flow through to markets distorting the traditional asset return profile**
  - QE and negative interest rates suppress income while supporting higher valuations
  - Provides near term support for market conditions in Europe and Japan

- **Potential extended period of low cash rates beyond the market expectations pose challenges for all investors**
  - Subdued long term cash expectations in the developed world compress long term expected returns for both fixed income and equity

Low Global Cash Rates Suppress Long Term Return Expectations



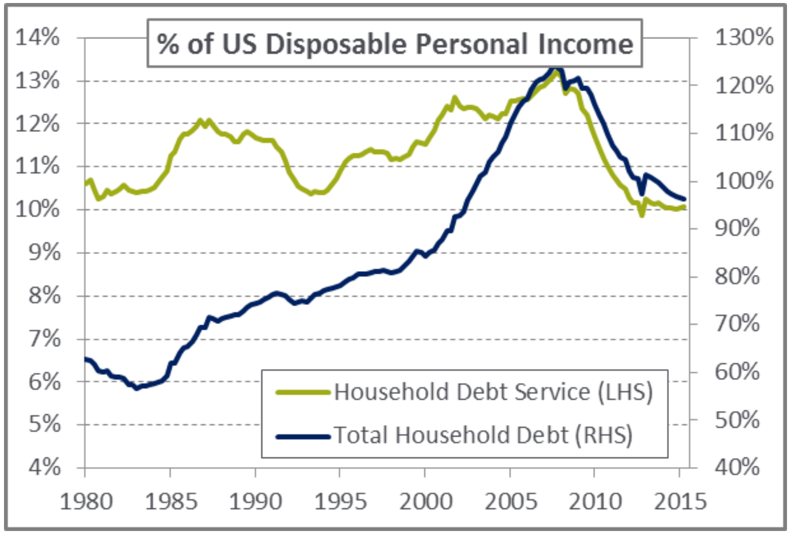
Source: Shiller Data, NEPC

- **US centric portfolios like 60/40 have worked historically but forward looking return prospects are subdued**
  - Asset prices can be sustained but low yields portend below average expected returns

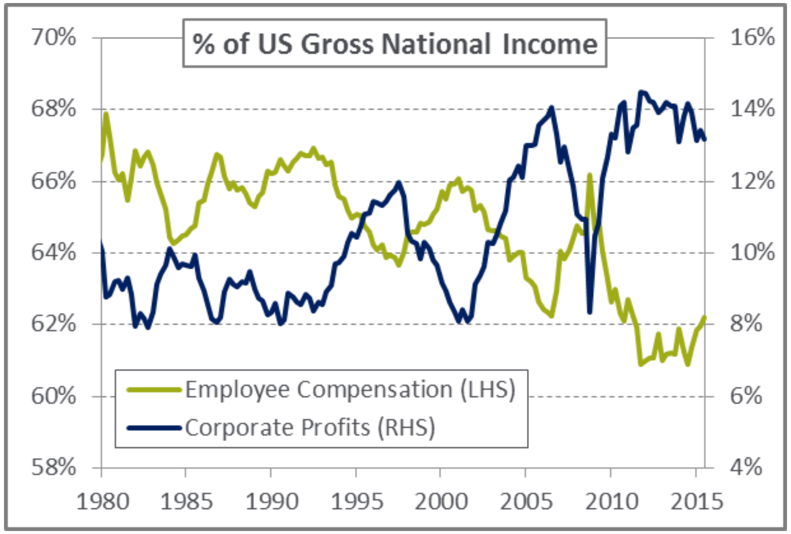
- **Conventional investment approaches may fall short going forward**
  - Index focused approaches, such as core bonds, suboptimal in current environment
  - Adjustments will be necessary to effectively meet and exceed long-term objectives

Capital Market Observations

- **US GDP continues to strengthen modestly**
  - Consumer spending supported by healthy balance sheets
  - Low energy prices and debt service have provided stimulation
- **US economy shows resilience against headwinds**
  - Fed support through quantitative easing has been removed
  - Dollar strength pressures profit margins of global companies
  - Subdued global growth and challenges in certain emerging markets
- **Corporate profits begin to lag from secular highs**
  - Buybacks and financial engineering have buttressed earnings per share
  - Profitability has begun to slow from rising dollar and wage pressures

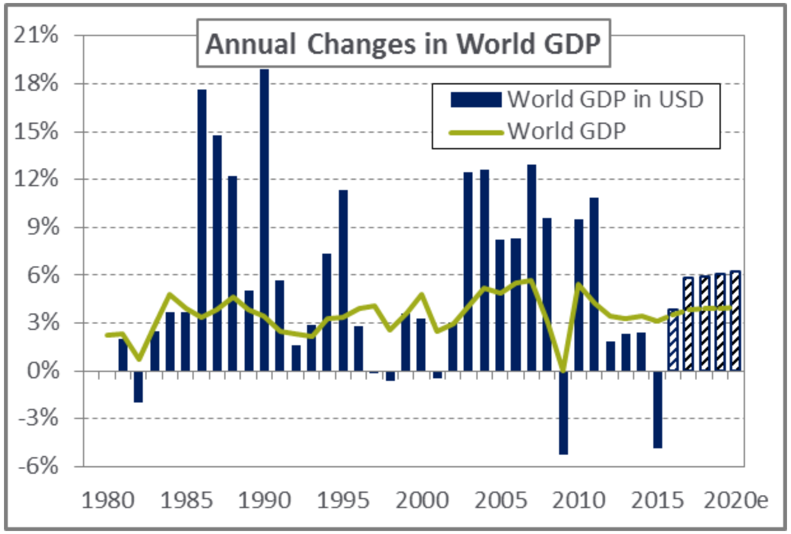


Source: St. Louis Federal Reserve



Source: St. Louis Federal Reserve

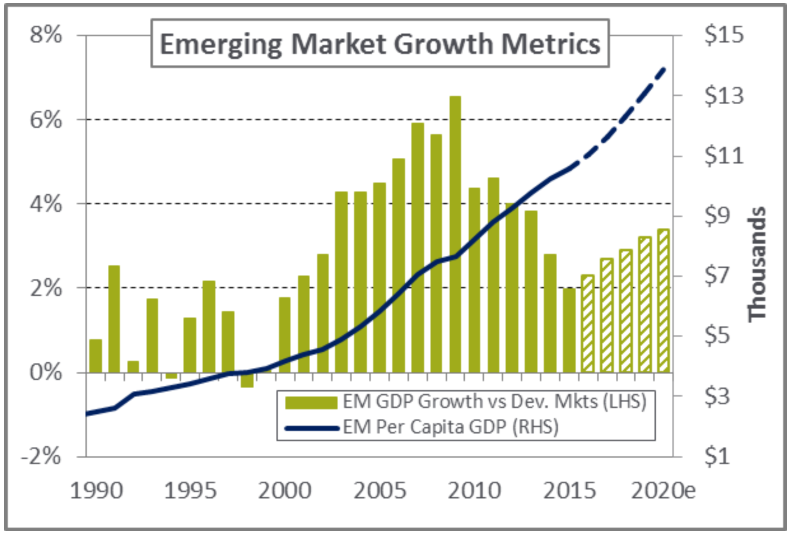
- **Positive global GDP growth masks challenges of a strong dollar**
- **World economy has suffered a "dollar recession" as global GDP in USD terms has declined by nearly $4 trillion**
  - Appreciation in US dollar strains global liquidity and reveals underlying market weakness
  - Pressures commodity markets and credit growth for international borrowers holding dollar based debt
- **Dollar strength impacts global economy in meaningful ways**
  - Improves competitiveness for countries and companies heavily reliant on exports to the US
  - Represents a headwind to US corporate earnings and exports
  - Fed is forced to balance slower interest rate increases or pushing the dollar higher



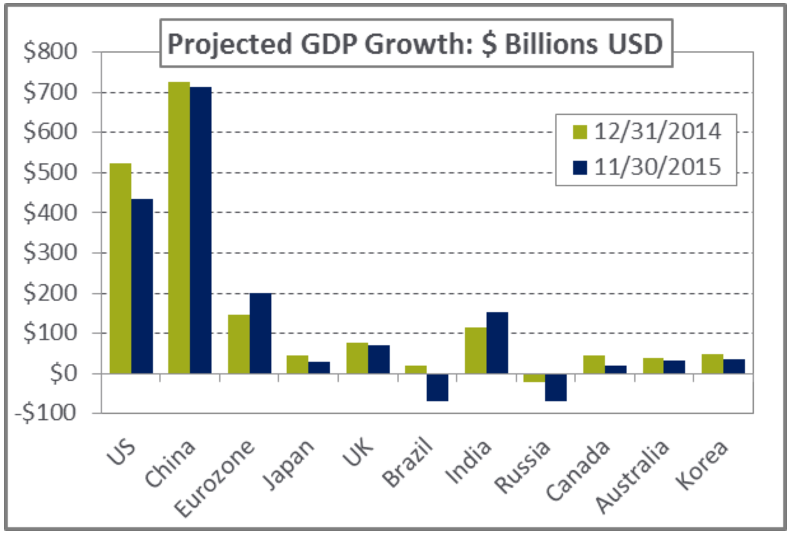
Source: IMF

Source: St. Louis Federal Reserve

- **Emerging market growth premium relative to developed world remains but is subdued**
  - Per Capita GDP continues to rise, pushing standard of living higher and supporting consumer growth
- **Initiative to reform reflects the distinct and varied outlook across countries**
  - Political challenges and commodity market distress are material risks for both Russia and Brazil
  - Reform minded countries are realizing economic adjustments necessary for sustainable growth and economic success
- **Economic conditions across emerging world are distinct but China is the focus**
  - China remains the growth engine for the world but is transitioning to a new economic model

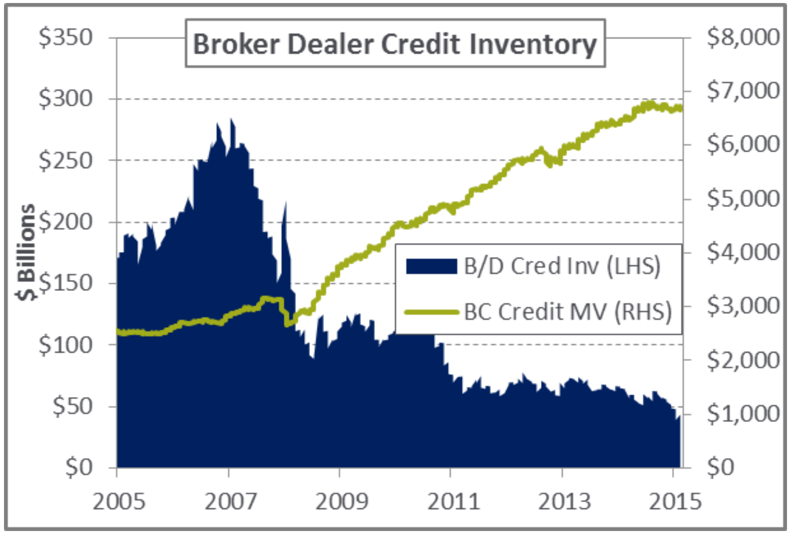


Source: IMF

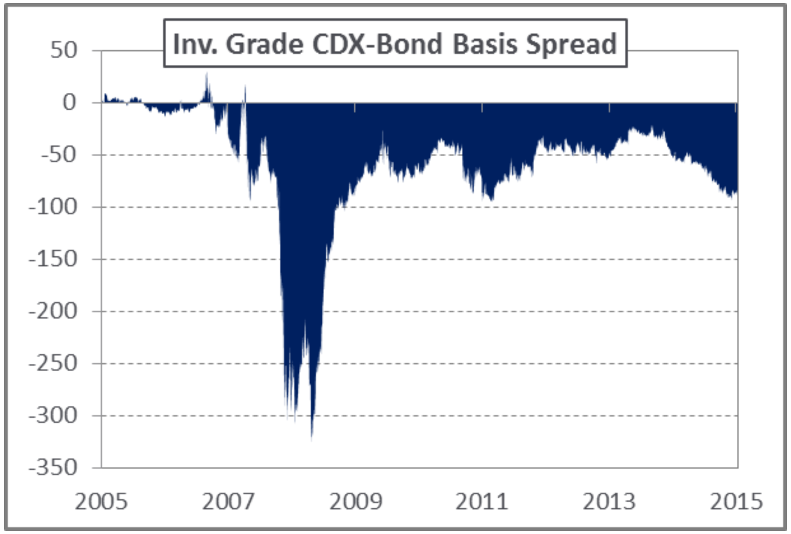


Source: Bloomberg

- **Underlying market conditions remain fragile despite rebound from August sell-off**
  - Credit markets' could be challenged to absorb exodus from crowded positions
- **Credit inventories lower today with less bank capital at risk**
  - Liquidity provisions of new regulatory model are untested in true crisis
- **Derivative exposure less reliable**
  - Variable and negative CDX basis makes hedging unpredictable
- **Certain factors in place that can help stave off a liquidity crisis**
  - Low rate policies, bullish sentiment, positive economic results
- **Dynamic active strategies with disciplined credit approach can exploit periods of stress**



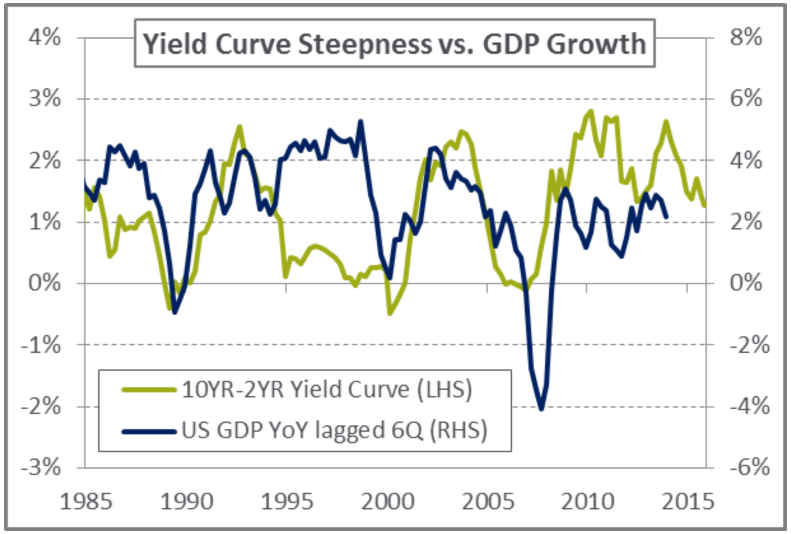
Source: NY Federal Reserve



Source: Barclays Capital

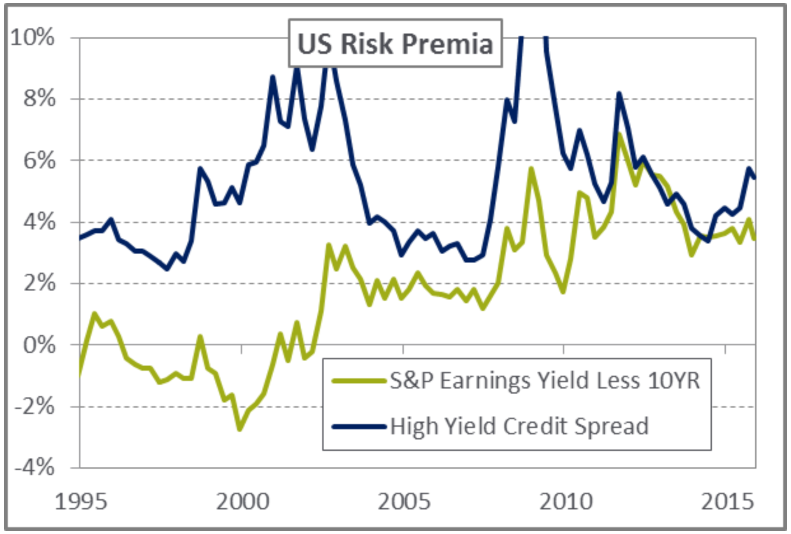
General Client Actions

- **Influence of monetary policy provides basis for extended US economic cycle**
  - Continued growth supports accrual of risk premia even in a low expected return environment
  - Profit margin pressures and enhanced credit risk are challenges of a maturing economic cycle



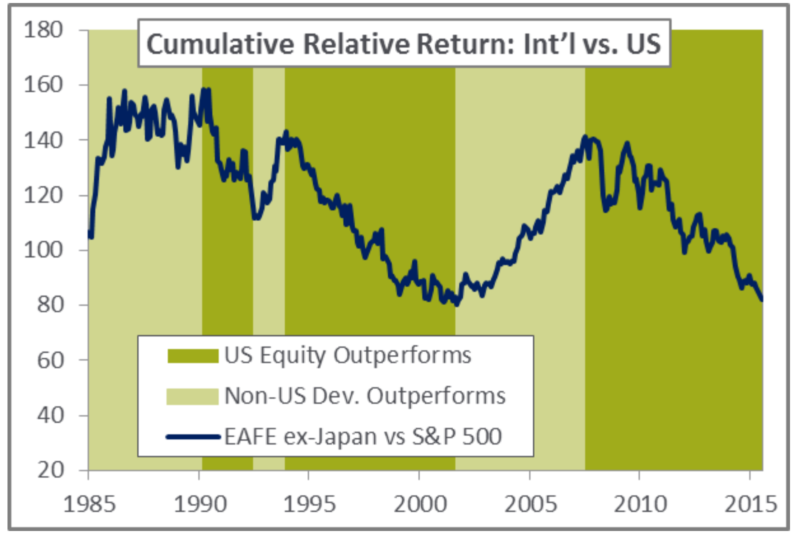
Source: Bloomberg

- **US equity and credit markets offer reasonable risk premia**
  - Equity markets are near fair value but distortion from monetary policy supports continued positive returns
  - Pressure of stronger dollar and energy market distress are a headwind for returns
  - Focus on niche strategies and hedge funds to exploit potential volatility in equity and credit markets

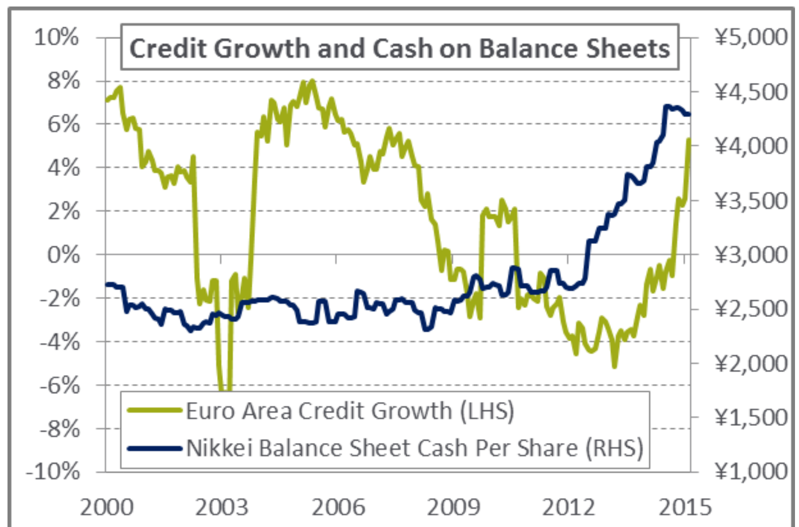


Source: Bloomberg

- **Europe and Japan have faced major economic challenges**
  - For Japan, these challenges extend over the previous two decades
  - Non-US equity returns relative to domestic are highly cyclical
- **Success of US monetary action galvanized unprecedented action by the European Central Bank and Bank of Japan**
  - Seeking positive response in both capital markets and real economy
- **Equities and other risky asset markets likely to benefit**
  - Stimulus promotes credit growth, spending and earnings
  - Japanese companies flush with cash also seeking improved profitability
- **Hedging a portion of non-US developed currency exposure remains a strategic goal**
  - Dollar strength likely to persist as Fed policy lifts off

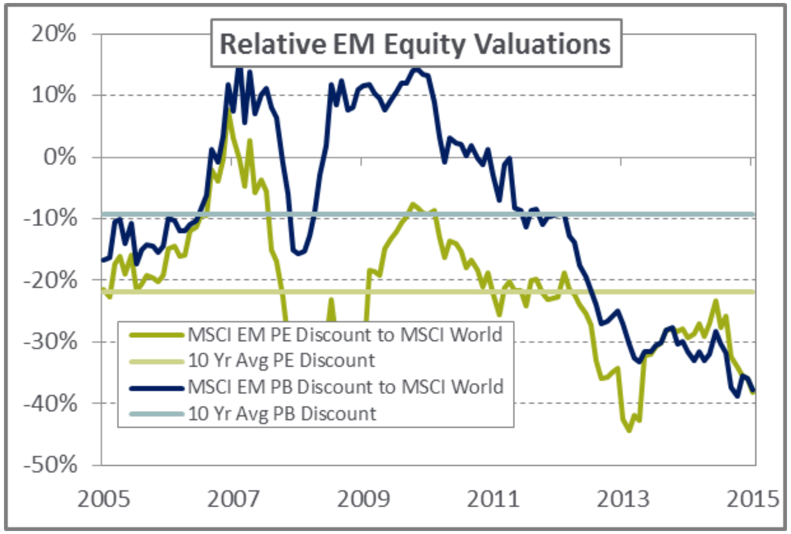


Source: Standard & Poors, MSCI, Bloomberg



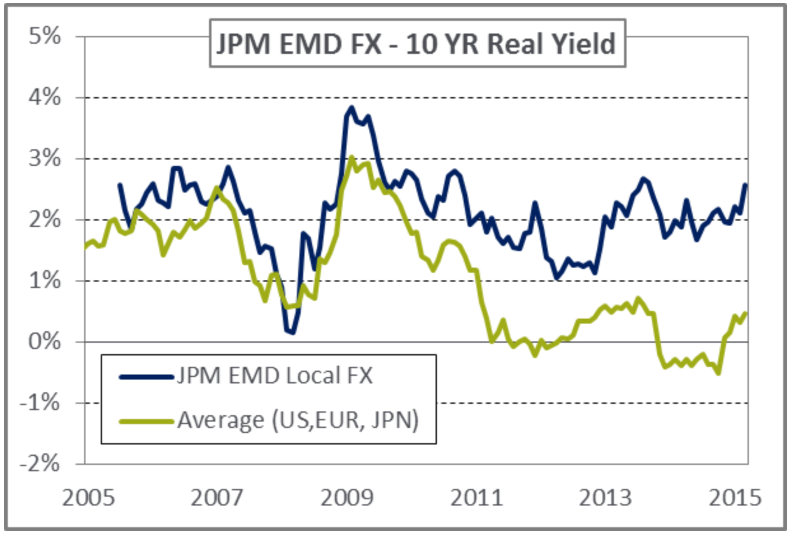
Source: TSE, ECB, Bloomberg

- **Fundamentals of emerging markets suggest higher return potential than developed world**
  - Valuations appear reasonable especially versus developed world
  - Superior real yields and fundamentals expected to flow through to higher returns over time



Source: MSCI, Bloomberg

- **Unique risks across countries suggest caution and patience**
  - China continues slow process to delicately rebalance economy
  - Commodity dependent countries face financial challenges as they adjust to lower prices
  - Credit dependence, particularly for dollar based borrowers could cause further strain



Source: JP Morgan, Bloomberg

2016 Asset Class Assumptions

- **We use November 30 market data for all asset class assumptions**
- **Combination of historical data and forward looking analysis**
  - Expected returns based on current market pricing and forward looking estimates
  - Volatility and correlations based on history, while recognizing current uncertainty
- **Historical data is used to frame current market environment as well as to compare to similar historical periods**
  - Incorporates historical index returns, volatility, correlations, valuations, and yields
- **Forward-looking analysis is based on current market pricing and a building blocks approach**
  - Return equals yield + changes in price (valuation, defaults, etc.)
  - Use of key economic observations (inflation, real growth, dividends, etc.)
  - Structural themes (supply and demand imbalances, capital flows, etc.)
- **Assumptions prepared by Asset Allocation Committee**
  - Asset Allocation team plus members of various consulting practice groups meet to develop themes and assumptions
  - Public markets, hedge fund and private market research teams provide insights
- **Assumptions and Actions reviewed and approved by Partners Research Committee**

Themes for 2016 Asset Class Assumptions

- **5-7 year return expectations moderately higher among global equity and credit assets relative to prior year**
  - Expected return outlook broadly remains subdued
  - Recent performance of emerging markets leads to increase in expectations
  - Expectations of slow Fed policy tightening reduce cash forecasts
  - Increase in expectations for credit markets reflect higher credit spread levels
  - Hedge Fund expectations unchanged but incorporate anticipation of greater divergences across and within global markets

- **30-year returns have similar themes to 5-7 year forecasts**
  - Lower cash assumption flows through to long-term fixed income returns
  - Equity market assumptions largely unchanged

- **Volatility expectations reduced incrementally in certain asset classes**
  - Private Market reductions echo normalized environment and asset class experience
  - Volatility for emerging markets and commodities increased to reflect probability of higher risk moments

2016 5-to-7 Year Return Forecasts

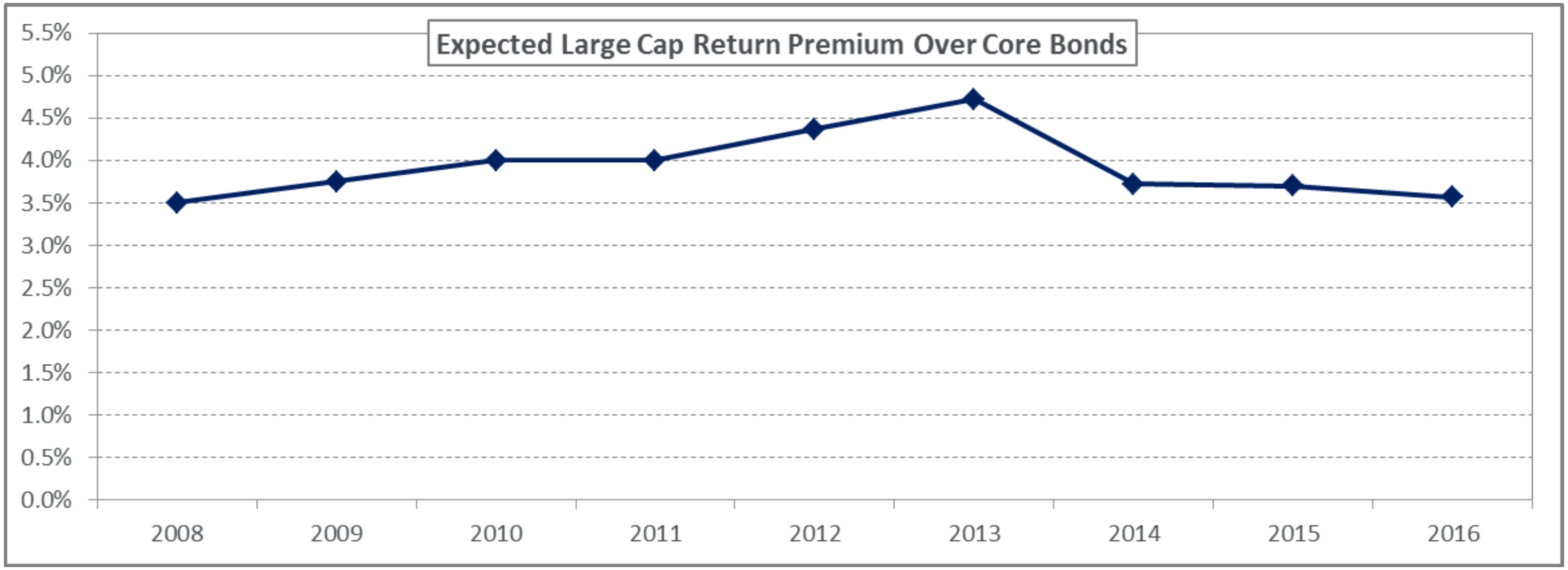
Geometric Expected Return			
Asset Class	**2015**	**2016**	**2016-2015**
Cash	1.75%	1.50%	-0.25%
Treasuries	1.75%	1.75%	
IG Corp Credit	3.25%	3.75%	0.50%
MBS	2.00%	2.00%	
*Core Bonds**	*2.30%*	*2.46%*	0.16%
TIPS	2.25%	2.50%	0.25%
High-Yield Bonds	4.00%	5.25%	1.25%
Bank Loans	4.50%	5.50%	1.00%
Global Bonds (Unhedged)	1.00%	1.00%	
Global Bonds (Hedged)	1.13%	1.09%	-0.04%
EMD External	4.50%	4.75%	0.25%
EMD Local Currency	5.50%	6.50%	1.00%
Large Cap Equities	6.00%	6.00%	
Small/Mid Cap Equities	6.00%	6.25%	0.25%
Int'l Equities (Unhedged)	7.00%	7.25%	0.25%
Int'l Equities (Hedged)	7.39%	7.57%	0.18%
Emerging Int'l Equities	9.00%	9.75%	0.75%
Private Equity	8.50%	8.50%	
Private Debt	7.50%	7.50%	
Private Real Assets	8.00%	8.25%	0.25%
Real Estate	6.50%	6.50%	
Commodities	5.25%	4.50%	-0.75%
Hedge Funds	5.75%	5.75%	

* Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).

2016 30-Year Return Forecasts

Geometric Expected Return			
Asset Class	**2015**	**2016**	**2016-2015**
Cash	3.25%	3.00%	-0.25%
Treasuries	3.50%	3.25%	-0.25%
IG Corp Credit	4.75%	5.00%	0.25%
MBS	3.75%	3.50%	-0.25%
*Core Bonds**	*3.98%*	*3.89%*	*-0.09%*
TIPS	4.00%	4.00%	
High-Yield Bonds	5.75%	5.75%	
Bank Loans	6.00%	6.00%	
Global Bonds (Unhedged)	2.25%	2.75%	0.50%
Global Bonds (Hedged)	2.41%	2.87%	0.46%
EMD External	6.00%	6.00%	
EMD Local Currency	6.75%	6.50%	-0.25%
Large Cap Equities	7.50%	7.50%	
Small/Mid Cap Equities	7.75%	7.75%	
Int'l Equities (Unhedged)	8.00%	8.00%	
Int'l Equities (Hedged)	8.47%	8.39%	-0.08%
Emerging Int'l Equities	9.25%	9.50%	0.25%
Private Equity	9.50%	9.50%	
Private Debt	8.00%	8.00%	
Private Real Assets	7.75%	7.75%	
Real Estate	6.50%	6.50%	
Commodities	5.75%	5.50%	-0.25%
Hedge Funds	6.75%	6.50%	-0.25%

* Core Bonds assumption based on market weighted blend of components of Aggregate Index (Treasuries, IG Corp Credit, and MBS).



Source: Bloomberg, Morningstar Direct, NEPC

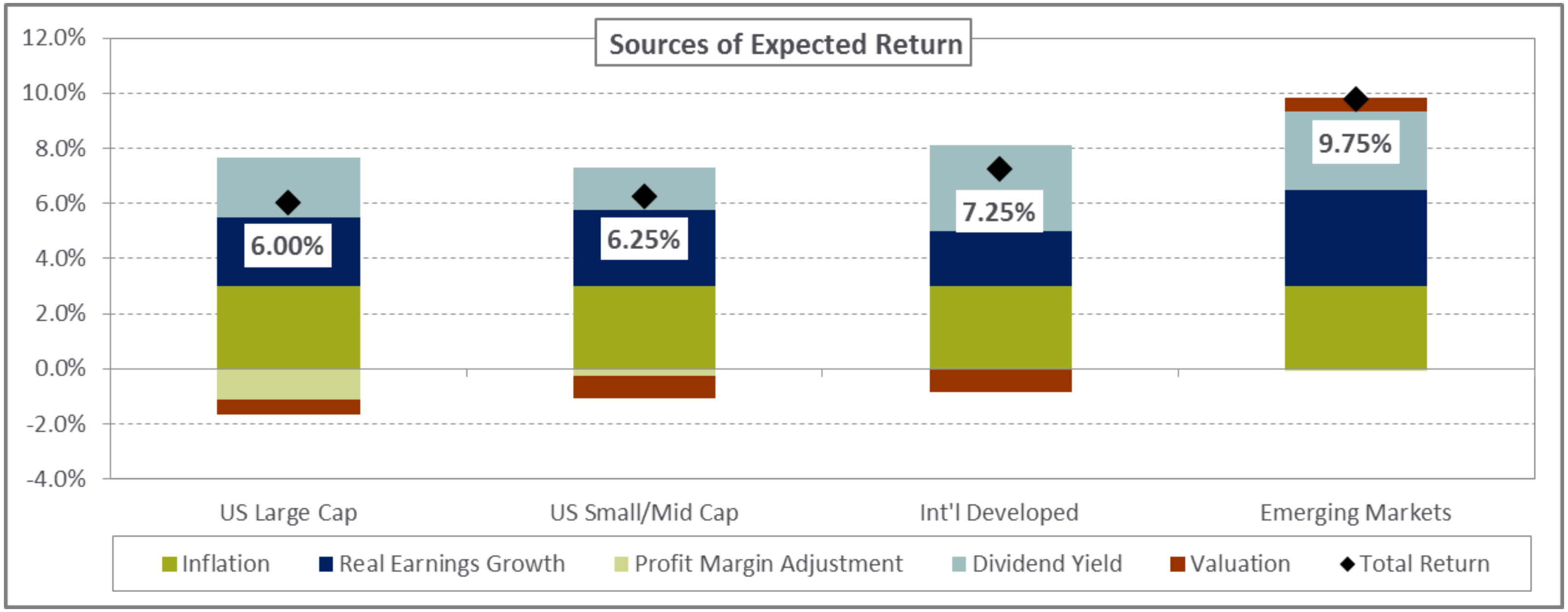
NEPC 5-7 Year Assumptions

	Long Term Avg	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cash	**3.42%[1]**	4.00%	3.00%	2.00%	2.00%	1.25%	0.75%	1.50%	1.75%	1.50%
Core Bonds	**7.70%[2]**	5.00%	5.50%	3.75%	3.00%	2.88%	2.03%	2.53%	2.30%	2.43%
Large Cap	**10.05%[1]**	8.50%	9.25%	7.75%	7.00%	7.25%	6.75%	6.25%	6.00%	6.00%
Int'l Developed	**8.84%[3]**	9.00%	9.75%	8.00%	7.00%	7.75%	7.75%	7.25%	7.00%	7.25%

1. Reflects average annual return since 1926
2. Reflects average annual return since 1976
3. Reflects average annual return since 1970

Assumption Development

Assumption Development – Global Equities



Index Current	US Large Cap	US Small/Mid Cap	Int'l Developed	Emerging Markets
Forward P/E	17.6	23.3	15.8	11.6
Profit Margins	8.3%	2.8%	6.0%	8.1%
Dividend Yield	2.1%	1.6%	3.2%	3.1%

- **Real earnings growth assigned to each market over forecast period**
- **Valuation input based on current P/E trending to forecast value**
- **Profit margin adjustment shifts from current to forecast value**
- **Dividend yield based on current yield trending to forecast value**
- **Global inflation input of 3.0% flows through all global equity markets**

- **Past performance is no guarantee of future results.**
- **The goal of this report is to provide a basis for substantiating asset allocation recommendations. The opinions presented herein represent the good faith views of NEPC as of the date of this report and are subject to change at any time.**
- **Information on market indices was provided by 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.**
- **All investments carry some level of risk. Diversification and other asset allocation techniques do not ensure profit or protect against losses.**
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It is important that investors understand the following characteristics of non-traditional investment strategies including hedge funds and private equity:

1. **Performance can be volatile and investors could lose all or a substantial portion of their investment**
2. **Leverage and other speculative practices may increase the risk of loss**
3. **Past performance may be revised due to the revaluation of investments**
4. **These investments can be illiquid, and investors may be subject to lock-ups or lengthy redemption terms**
5. **A secondary market may not be available for all funds, and any sales that occur may take place at a discount to value**
6. **These funds are not subject to the same regulatory requirements as registered investment vehicles**
7. **Managers may not be required to provide periodic pricing or valuation information to investors**
8. **These funds may have complex tax structures and delays in distributing important tax information**
9. **These funds often charge high fees**
10. **Investment agreements often give the manager authority to trade in securities, markets or currencies that are not within the manager's realm of expertise or contemplated investment strategy**