
International Social Security Conference 2015

Investment Strategies for Pension Plans – Living in a Low Return World

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Anthony S. Gould, CFA, CAIA
Managing Director
Head of Global Pensions Solutions & Advisory

Summary

- The past twenty years has been challenging for pension plans:-
 - Increasing life expectancy (longevity)
 - Falling bond yields (discount rates)
 - Declining economic growth rates

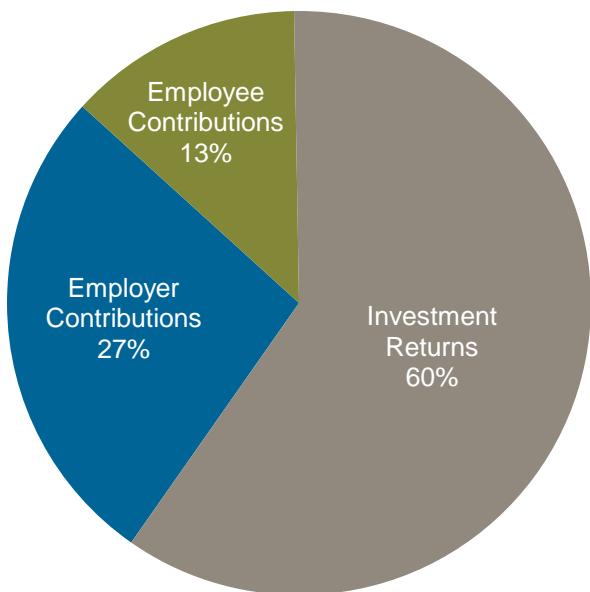
- But, at least asset returns have been acceptable

- What is the longer term outlook?
 - Increasing life expectancy (longevity)
 - Still declining economic growth rates
 - Lower asset returns

- How to cope with this environment?
 - Liability management (raise retirement age, reduce benefits)
 - Increase contributions
 - Change asset management approaches

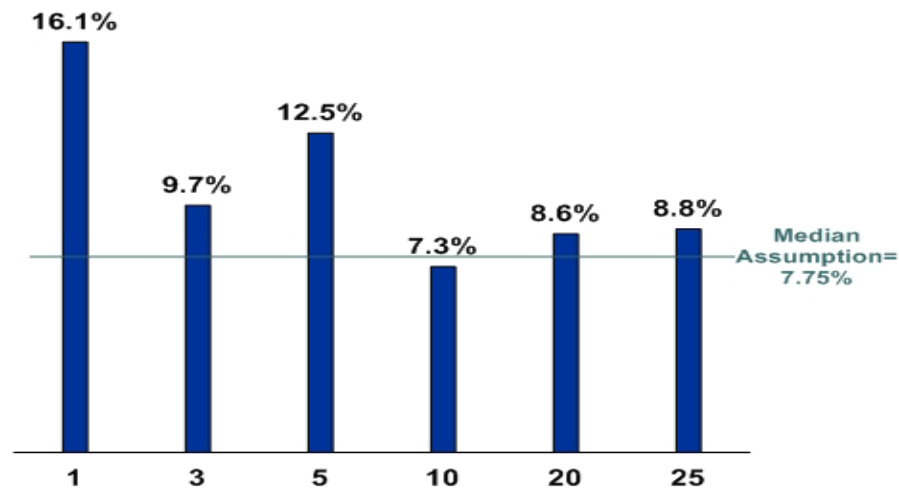
Dependency of Investment Returns for Pension Financing – U.S.

Public Pension Sources of Revenue, 1983-2012

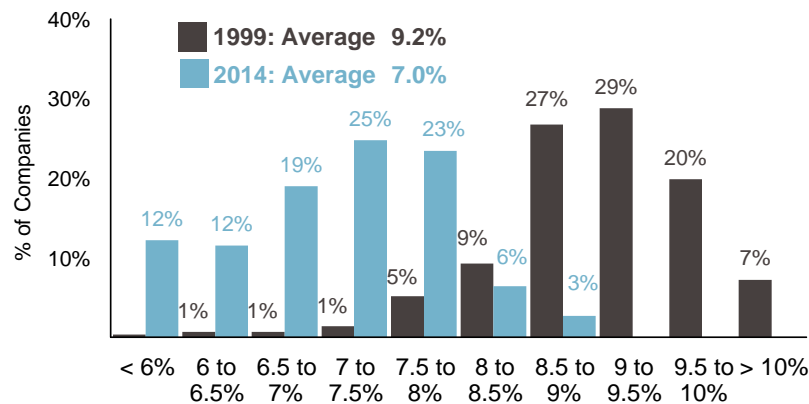


Source: J.P. Morgan Asset Management

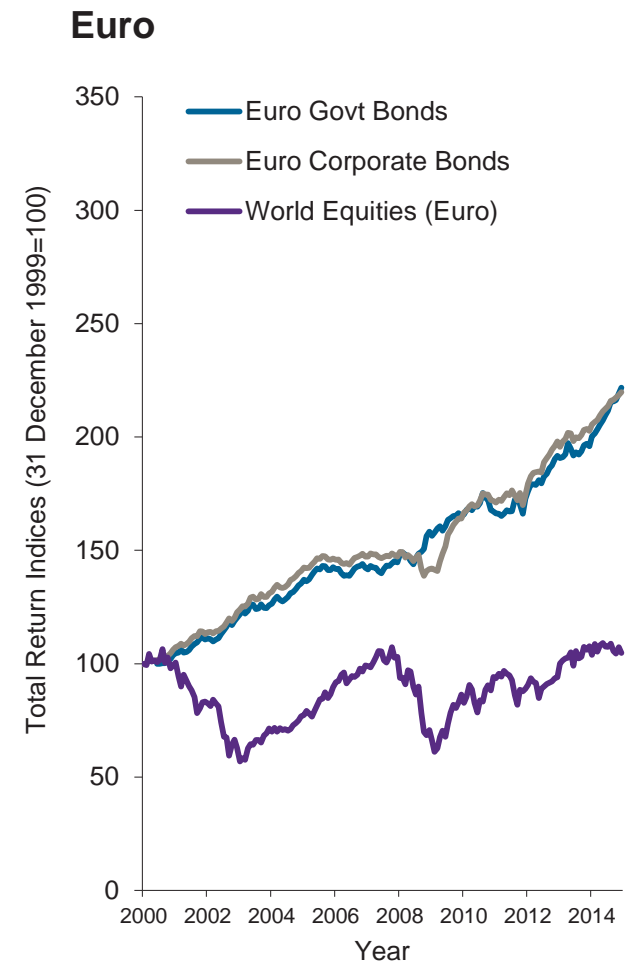
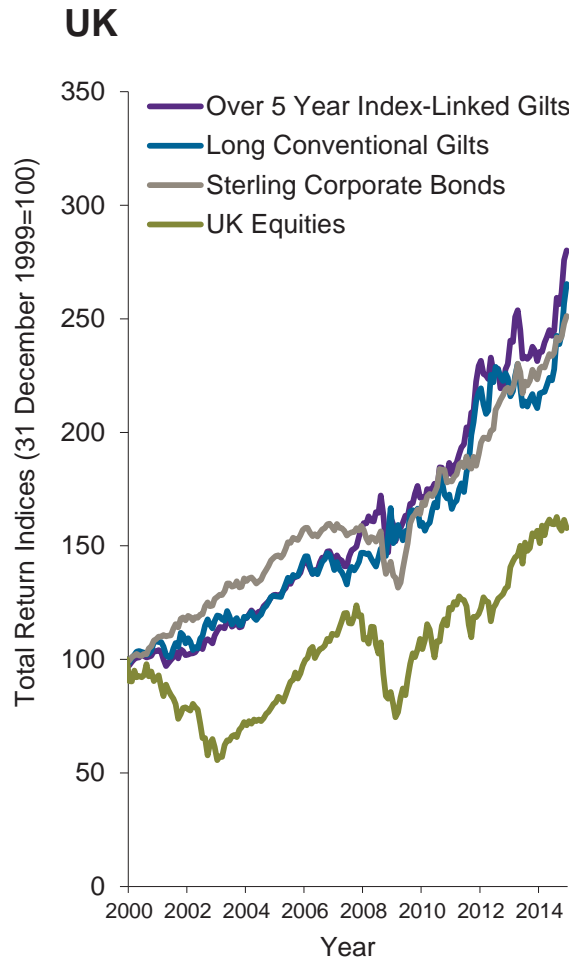
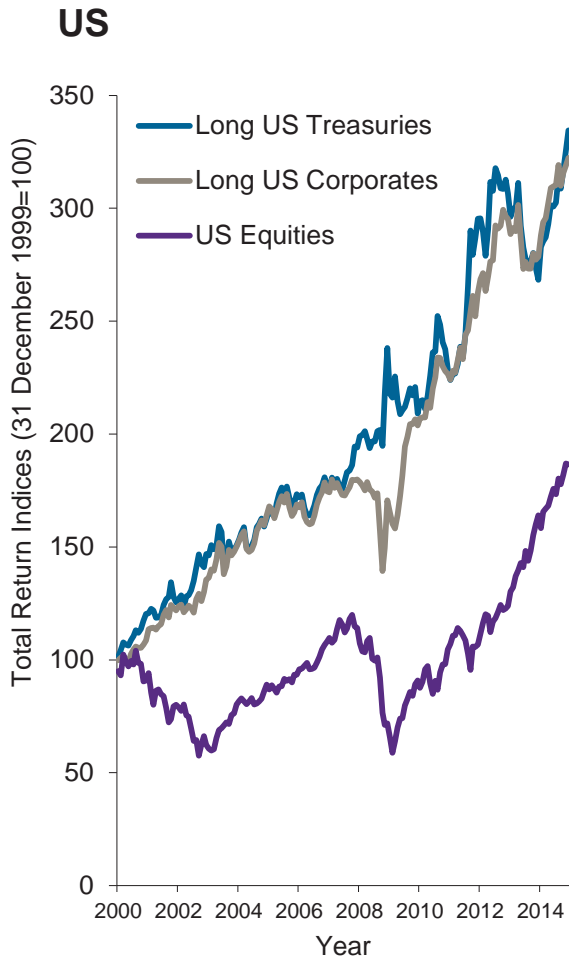
Public pension median annualized investment returns for periods ended 6/30/2014



Corporate pension return assumptions (S&P500 companies)



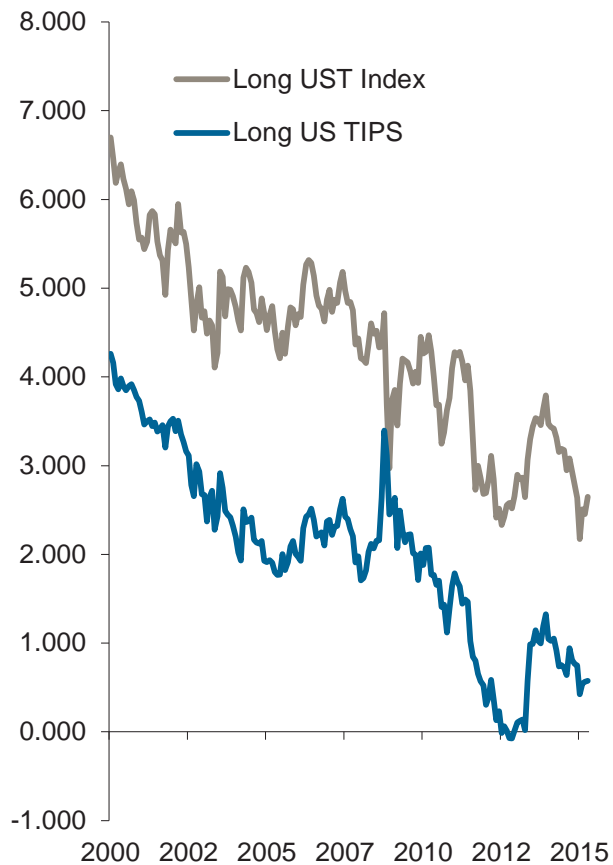
Bonds (and Liabilities) Have Outperformed Equities



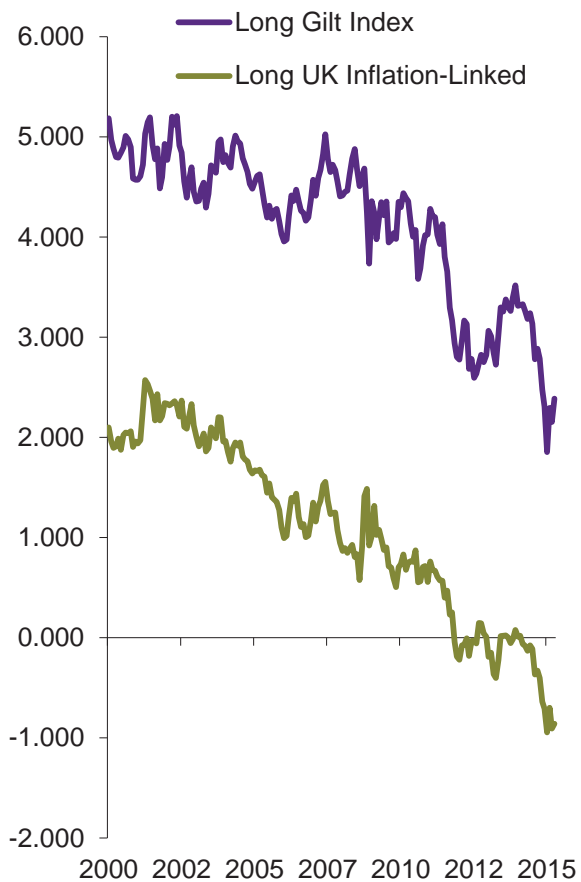
Source: Bloomberg; data from January 2000 to December 2014; for illustration only

Long Govt, and Long Inflation-Linked Yields

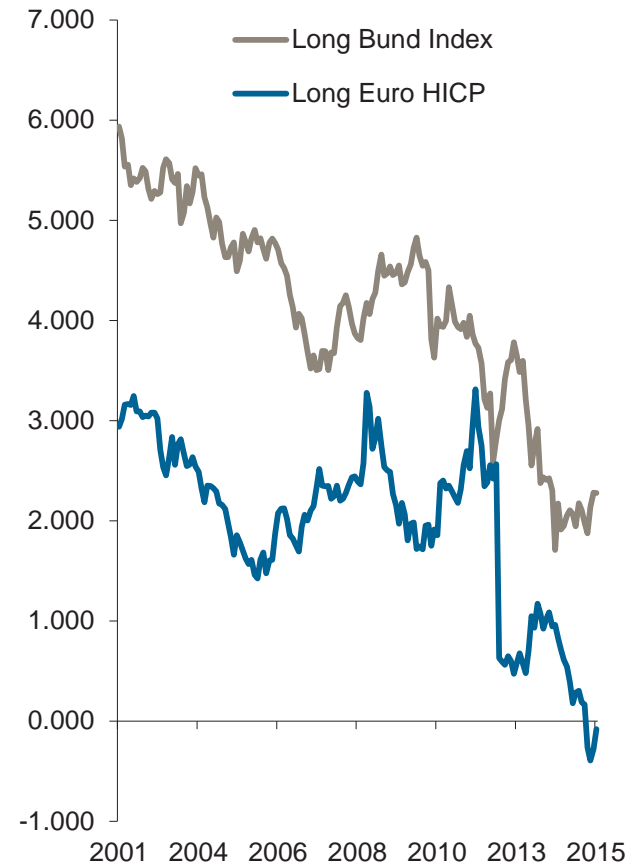
US



UK



Euro

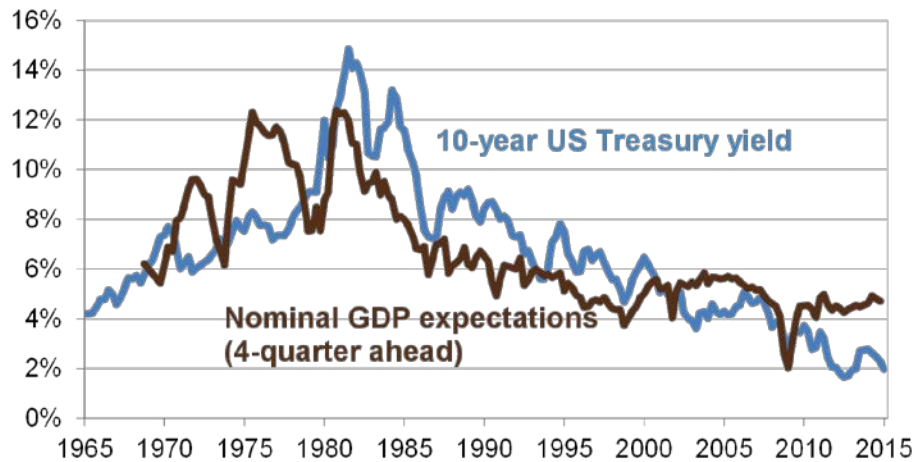


Source: Barclays data from January 2000 to April 2015; for illustration only

Bond Yields and Economic Growth

Long-term yields are correlated with nominal growth

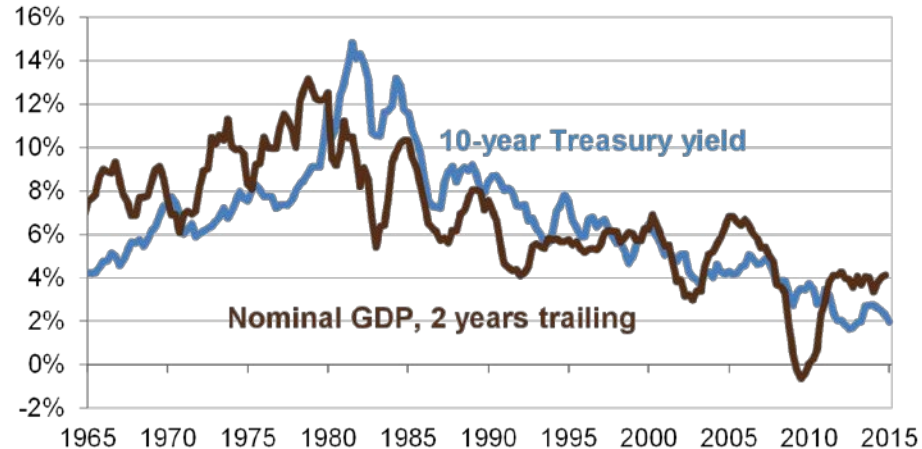
Percent



Source: Survey of Prof. Forecasters, Federal Reserve Board. Q4 2014.

Long-term yields are correlated with nominal growth

Percent



Source: Bureau of Economic Analysis, Federal Reserve Board. Q4 2014.

- Long term US bond yields have moved roughly in line with actual and expected GDP growth rates. Why?
 - If yields are above nominal GDP growth rates, there is an incentive for companies, and households to save rather than to invest, or for corporates to buy back issued bonds, reducing yields.
 - If yields are below nominal GDP rates, there is an incentive for companies, and households to invest rather than to save, or for corporates to issue bonds to invest, increasing yields.

Source: J.P. Morgan Asset Management.

Forward-looking Equity Returns: S&P500 Valuation Measures

U.S. Equity: Valuation Measures

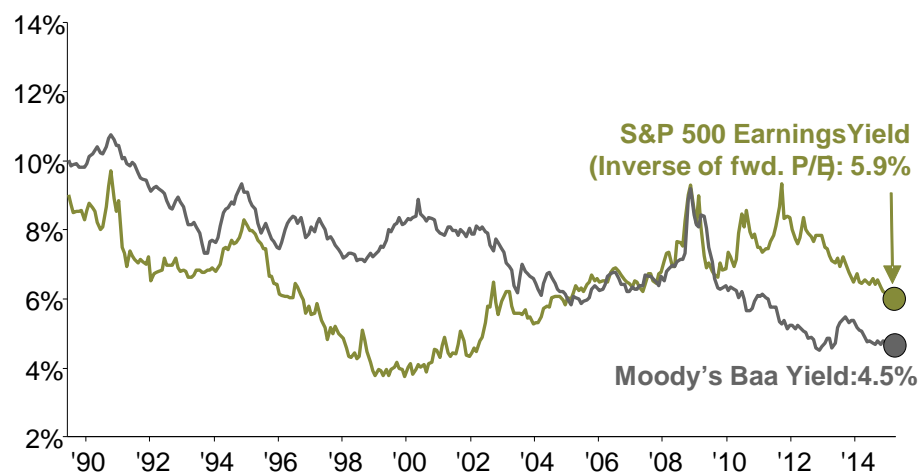
Historical Averages

Valuation Measure	Description	Latest	1-year ago	5-year avg.	10-year avg.	25-year avg.*
P/E	Price to Earnings	16.9x	15.5x	13.6x	13.8x	15.7x
CAPE	Shiller's P/E	27.8	25.9	22.7	22.9	25.4
Div. Yield	Dividend Yield	1.9%	1.9%	2.0%	2.0%	2.1%
REY	Real Earnings Yield	3.9%	4.2%	5.0%	4.5%	2.9%
P/B	Price to Book	2.8	2.7	2.3	2.4	2.9
P/CF	Price to Cash Flow	11.8	11.1	9.4	9.7	11.3
EY Spread	EY Minus Baa Yield	1.4%	1.7%	2.2%	1.3%	-0.6%

S&P 500 Index: Forward P/E Ratio



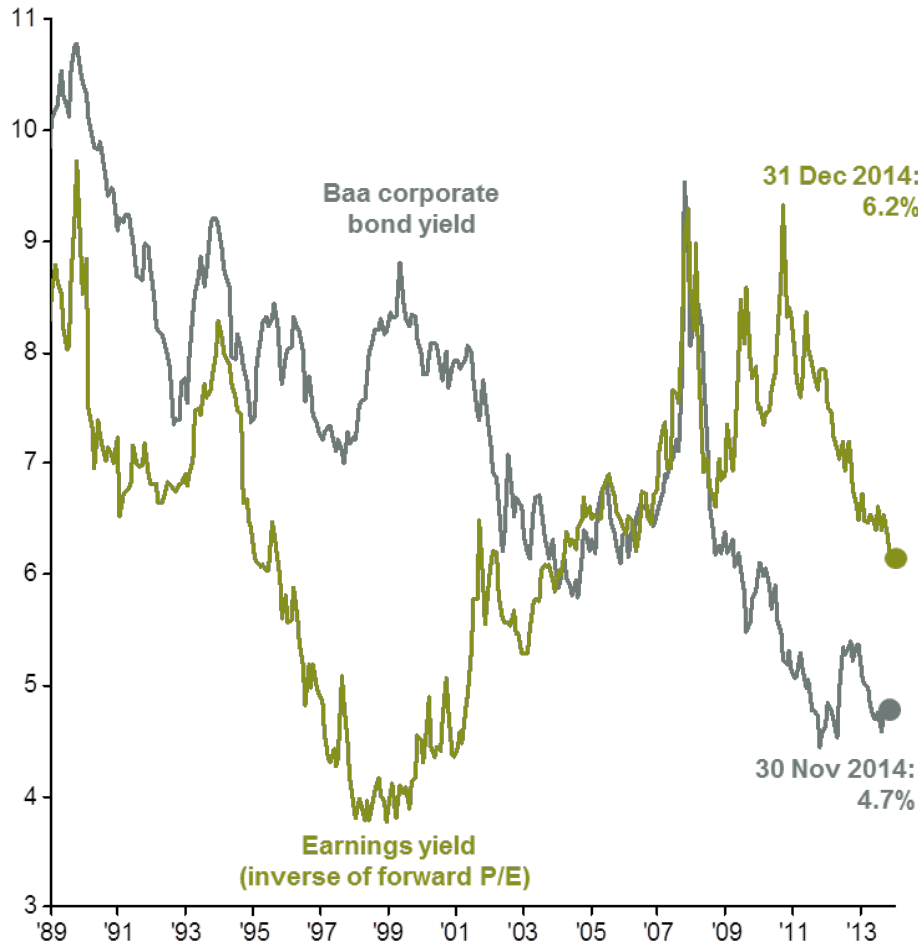
S&P 500 Earnings Yield vs. Baa Bond Yield



Source: Standard & Poor's, FactSet, Robert Shiller, FRB, J.P. Morgan Asset Management. Price to Earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months. Shiller's P/E uses trailing 10-years of inflation adjusted earnings as reported by companies. Dividend Yield is calculated as the trailing 12-month average dividend divided by price. Real Earnings Yield is defined as (trailing four quarters of reported earnings/price) - year over year core CPI inflation. Price to Book Ratio is the price divided by book value per share. Price to Cash Flow is price divided by NTM cash flow. EY Minus Baa Yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) minus the Moody's Baa seasoned corporate bond yield. *P/CF is a 20-year avg. due to cash flow data availability. Data are as of March 31, 2015.

Forward-looking Equity Returns: S&P500 Valuation Measures

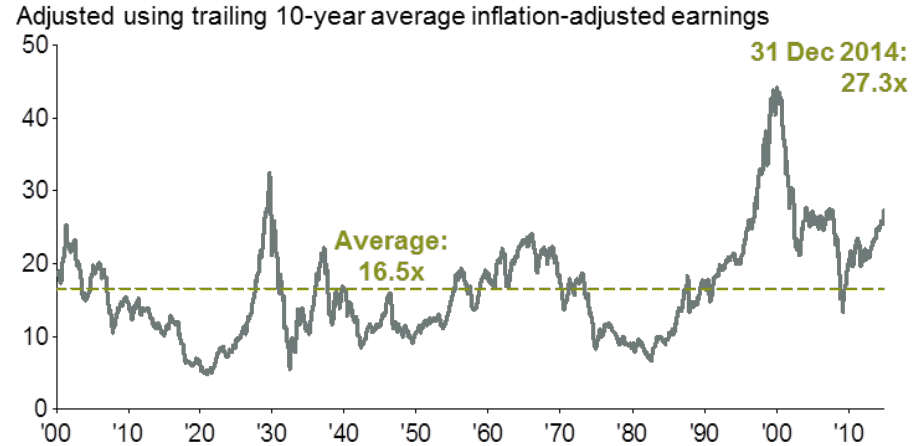
Earnings yield and Baa corporate bond yield



Forward P/E ratio



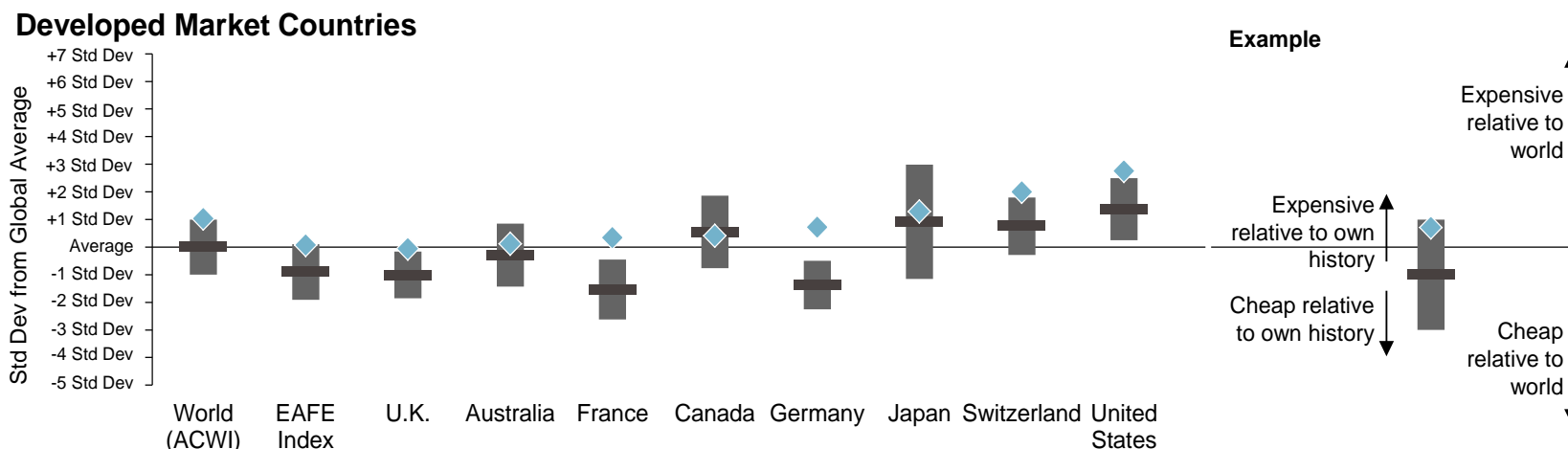
S&P 500 Shiller cyclically adjusted P/E



Source: J.P. Morgan Asset Management. For illustrative purposes only.

Source: (Left) Standard & Poor's, Moody's, IBES, FactSet, J.P. Morgan Asset Management. (Top right) Standard & Poor's, FactSet, J.P. Morgan Asset Management. Forward P/E ratio is a bottom-up calculation based on the most recent price data divided by consensus estimates for earnings in the next 12 months and is provided by FactSet Market Aggregates. (Bottom right) Robert Shiller, FactSet, J.P. Morgan Asset Management. *Guide to the Markets - UK*. Data as at 31 December 2014.

Forward-looking Equity Returns: Global Valuation Measures



	Current Composite Index	Current				10-year avg.			
		Fwd. P/E	P/B	P/CF	Div. Yld.	Fwd. P/E	P/B	P/CF	Div. Yld.
World (ACWI)	1.03	16.0	2.1	8.8	2.4%	13.1	2.0	7.5	2.5%
EAFE Index	0.07	15.9	1.7	7.8	3.1%	12.7	1.7	6.7	3.2%
U.K.	-0.06	15.3	1.9	8.8	3.8%	11.5	2.0	7.4	3.7%
Australia	0.12	16.3	2.1	8.9	4.5%	13.5	2.2	9.1	4.4%
France	0.33	16.5	1.7	8.4	2.9%	11.6	1.6	5.9	3.5%
Germany	0.41	17.0	1.9	7.0	2.8%	13.8	2.1	8.4	2.3%
Canada	0.72	15.5	2.0	8.5	2.5%	11.6	1.6	5.8	3.1%
Japan	1.29	15.2	1.5	9.0	1.7%	16.1	1.4	6.5	1.7%
Switzerland	1.99	17.6	2.6	12.3	3.1%	13.6	2.4	9.9	2.8%
United States	2.75	17.1	2.8	10.8	1.9%	14.0	2.4	8.8	2.0%

Source: MSCI, FactSet, J.P. Morgan Asset Management.

Note: Each valuation index shows an equally weighted composite of four metrics: price to forward earnings (Fwd. P/E), price to current book (P/B), price to last 12 months' cash flow (P/CF) and price to last 12 months' dividends (Div. Yld.). Results are then normalized using means and average variability over the last 10 years.

The grey bars represent one standard deviation in variability relative to that of the MSCI All Country World Index (ACWI).

See disclosures page at the end for metric definitions.

Data are as of March 31, 2015.

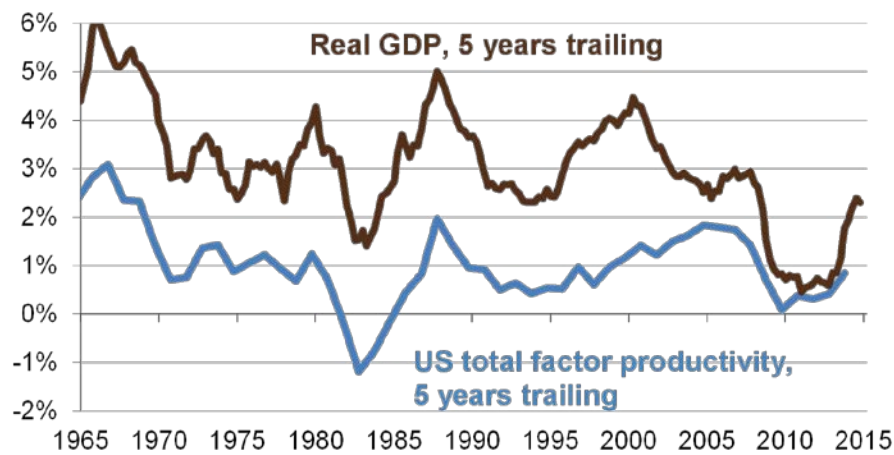
Demographic and Productivity Trends

Demographics and Economic Growth Intertwined

	YEAR			
	1	1000	1820	2008
World Population (mm)	225	267	1,042	6,694
World GDP/capita (1990 USD)	467	425	666	7,614
Average Life Expectancy (years)	24	24	26	66

Source: Angus Maddison, The World Economy: A Millennial Perspective

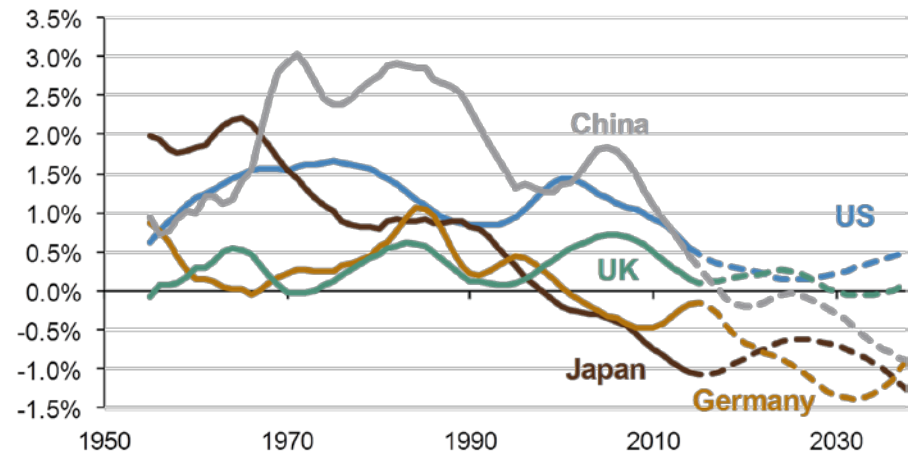
GDP growth and total factor productivity



Source: Bureau of Economic Analysis, BLS. Q4 2014.

Working-age population growth

5-year annualized % change in population ages 15-64

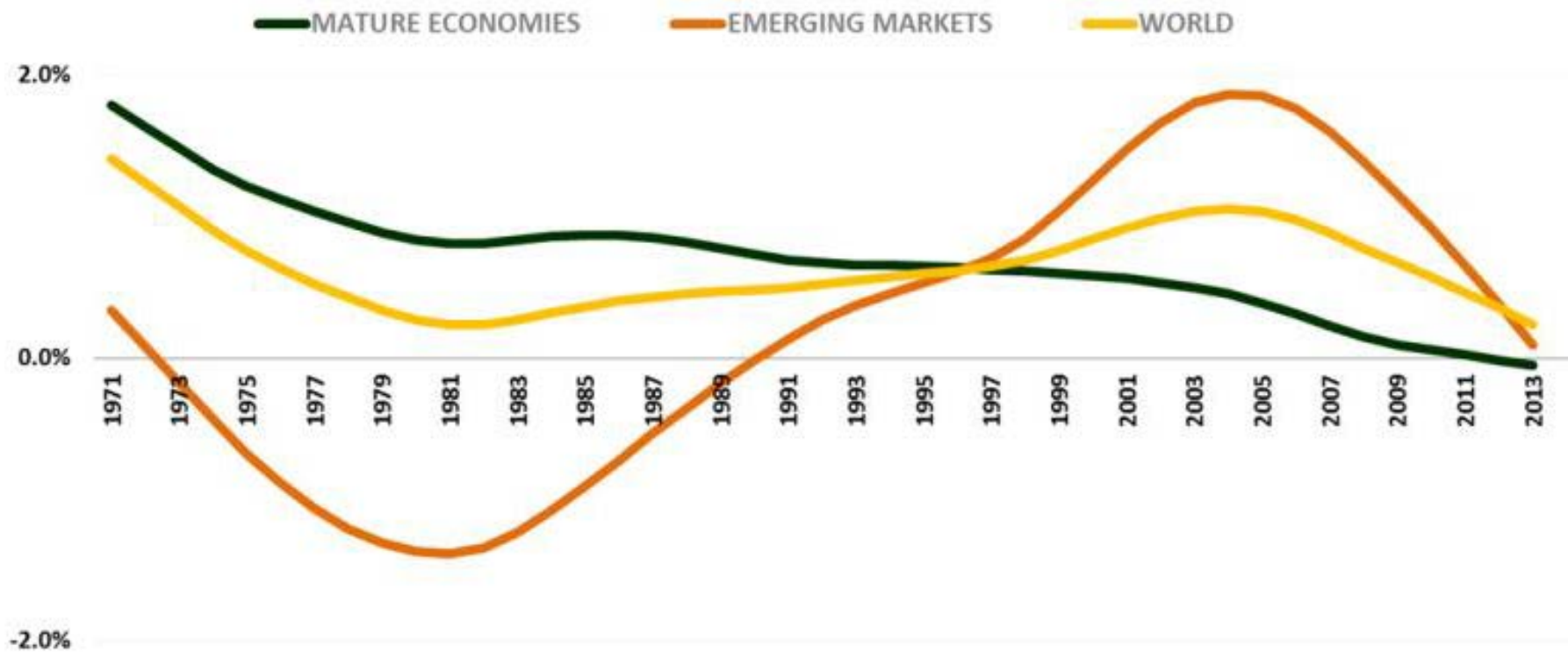


Source: United Nations data and forecasts. 2014.

Source: J.P. Morgan Asset Management.

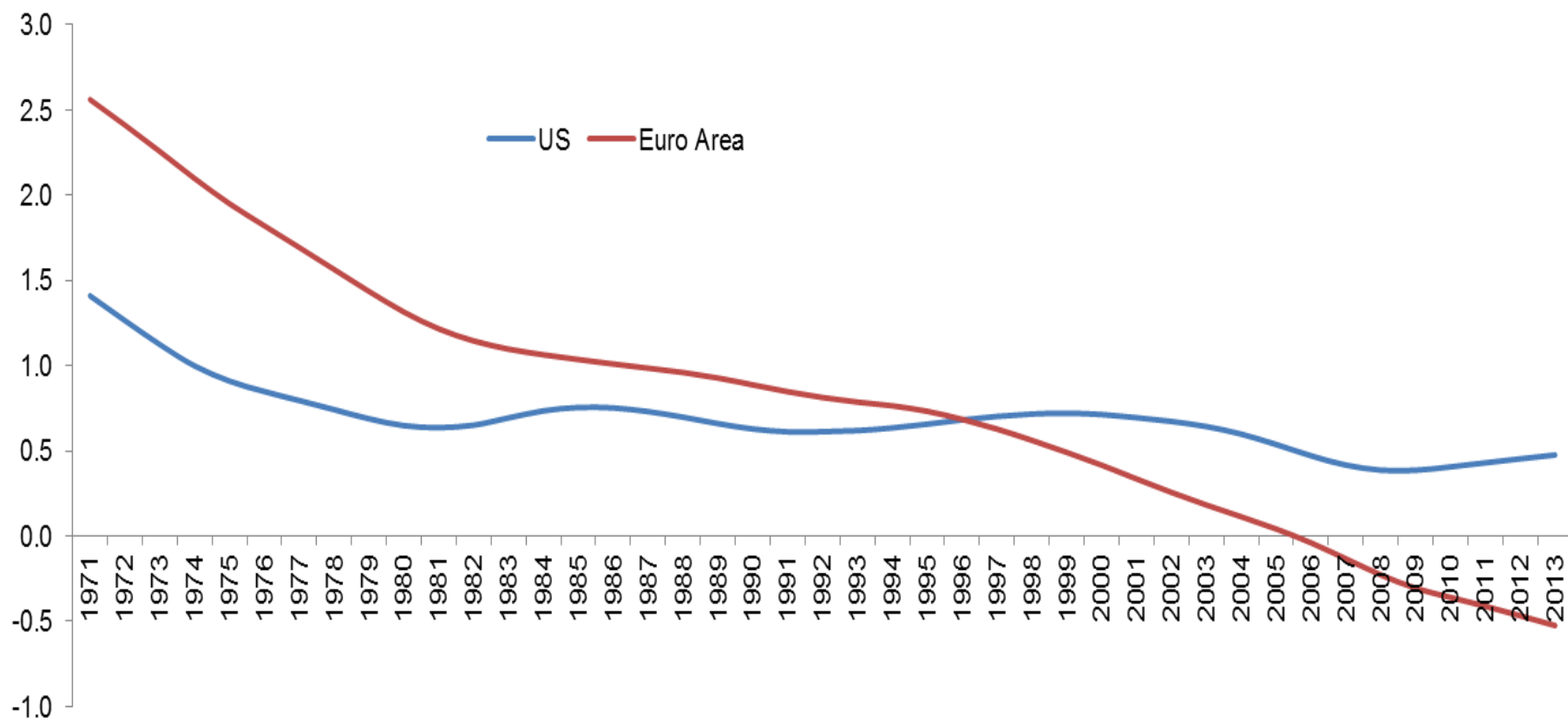
Productivity Trends – Global

Smoothed trend in global TFP growth: 1972 - 2013



Source: J.P. Morgan Asset Management, The U.S. Conference Board

Productivity Trends – Europe Has a Problem

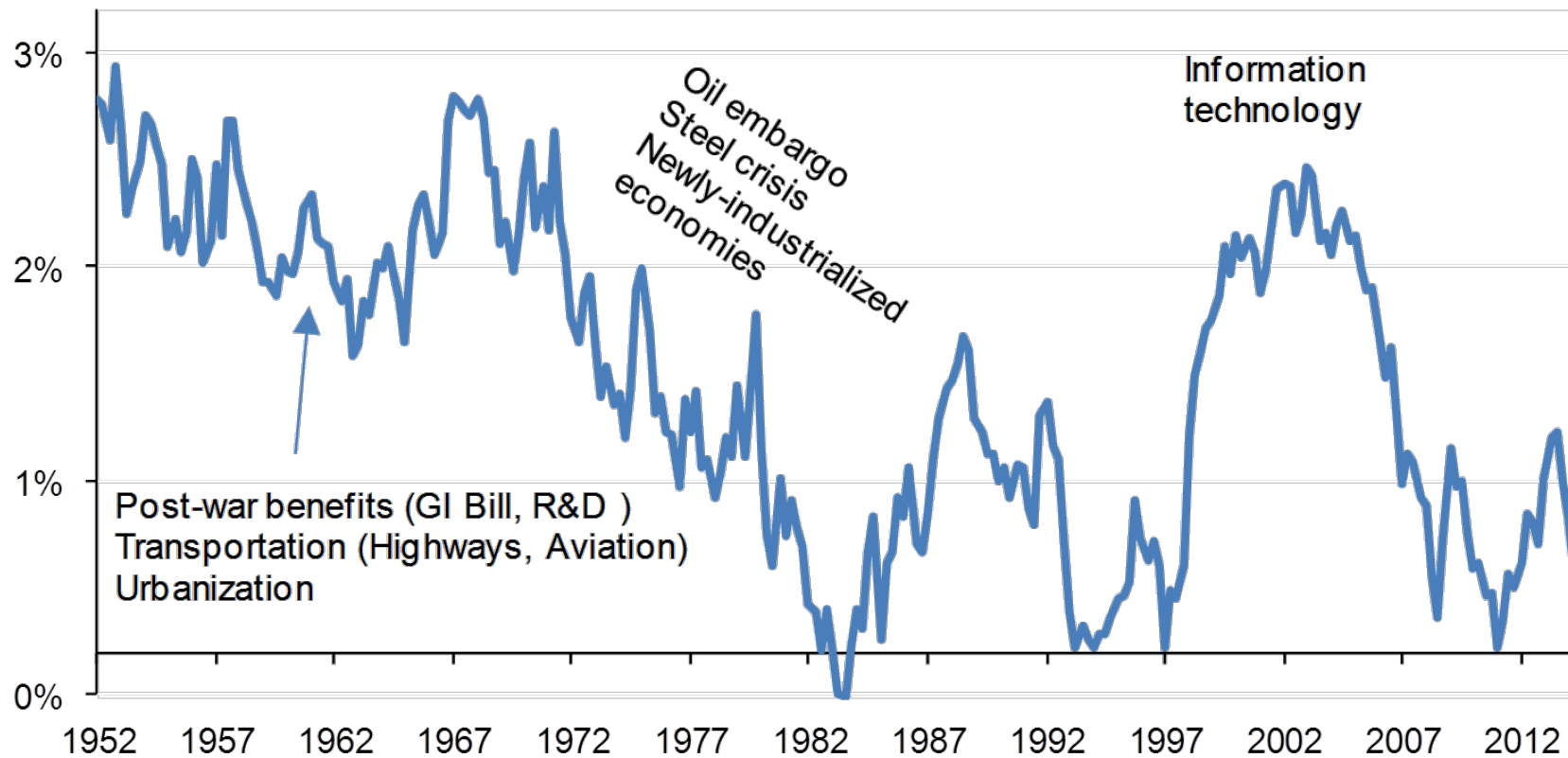


Source: J.P. Morgan Asset Management, The U.S. Conference Board

U.S. Productivity Focus

Have the low-hanging fruits of productivity already been picked?

Utilization-adjusted total factor productivity, % change, saar, 5yr average

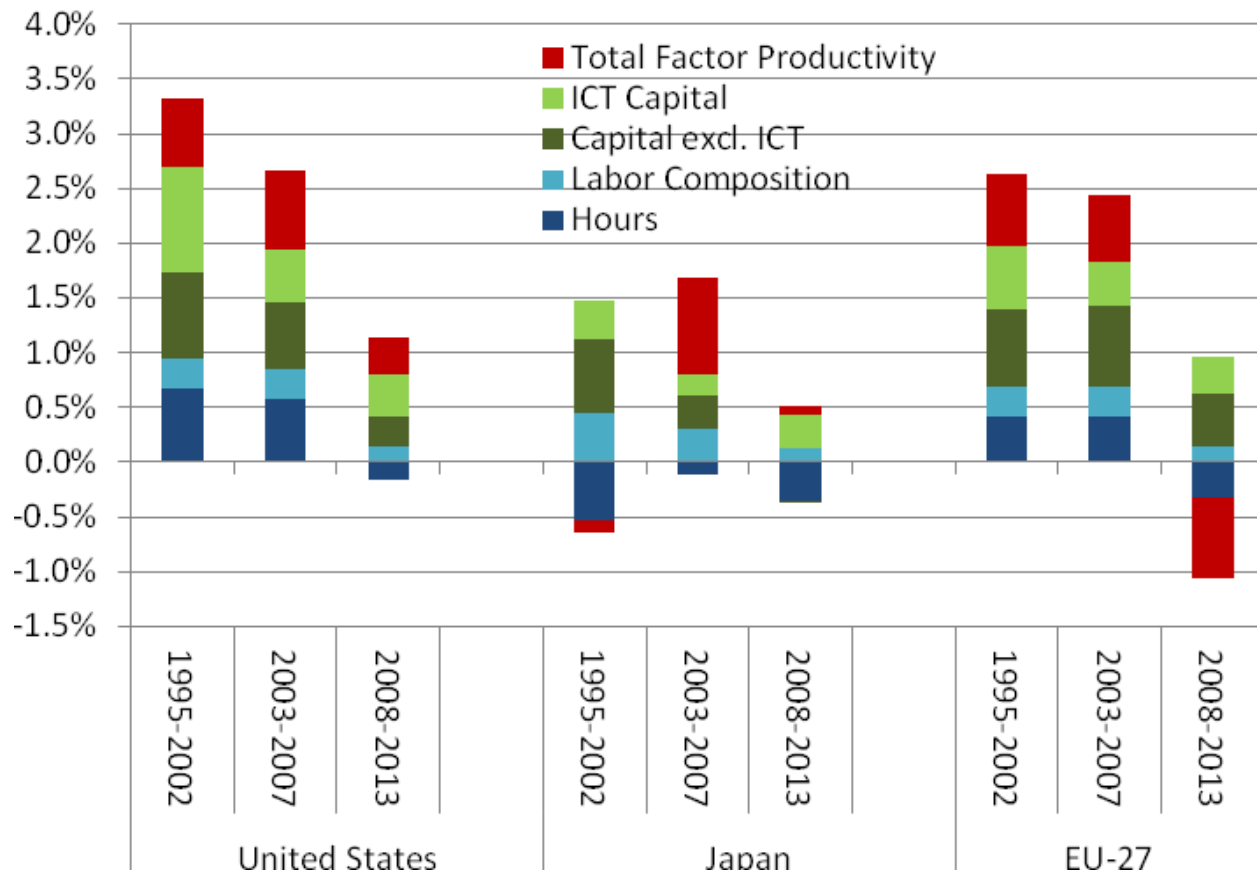


Source: Federal Reserve Bank of San Francisco. Q4:201

Source: J.P. Morgan Asset Management.

GDP Trends – Significant Slowdown

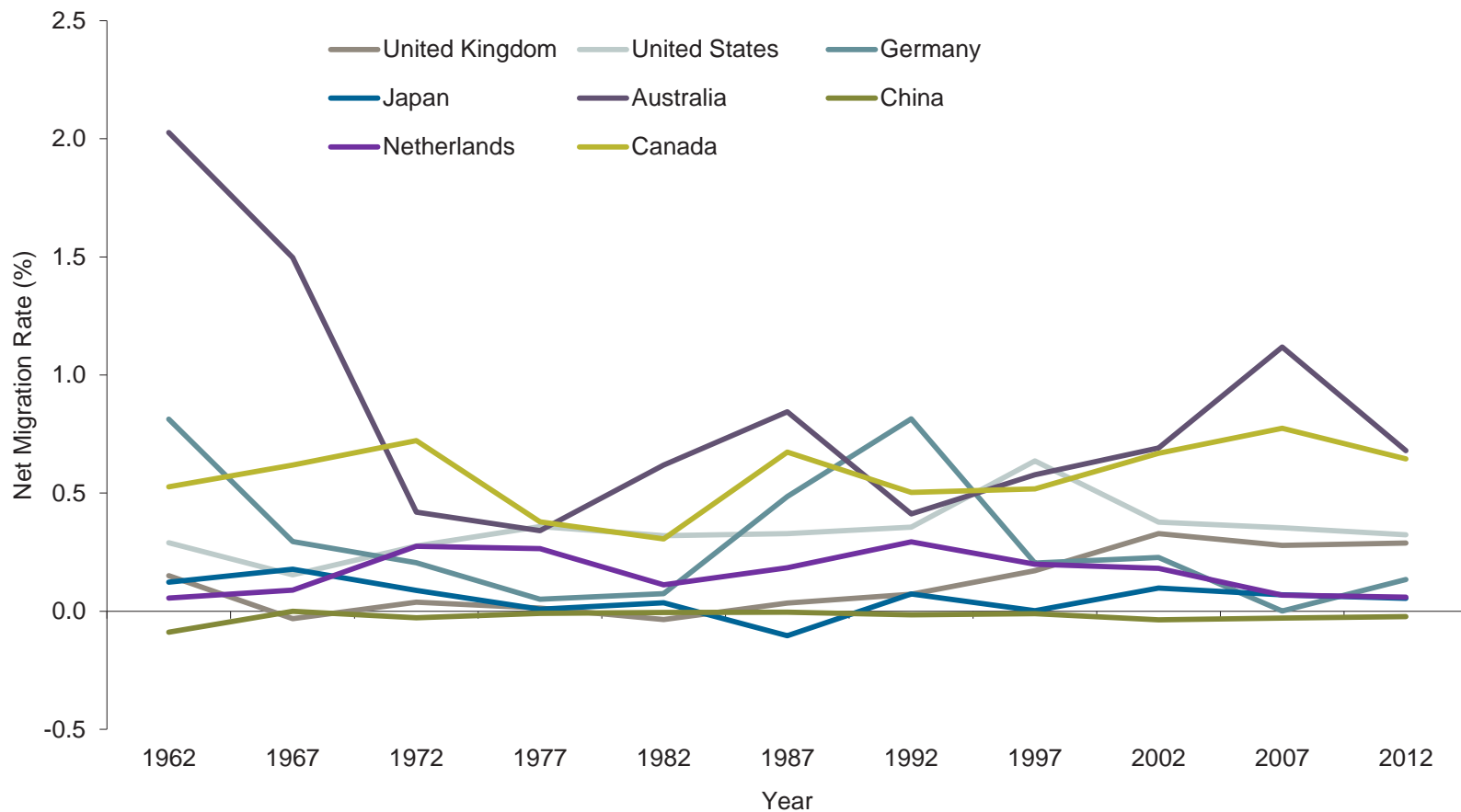
Sources of GDP Growth, average annual contribution % change



Source: J.P. Morgan Asset Management, The U.S. Conference Board

The Impact of Immigration

**Net Migration Rates
(As at end 2012)**



Source: The World Bank; data from 1962 to 2012; for illustration only

Long-term Capital Market Return Assumptions

FOR INSTITUTIONAL/WHOLESALE OR PROFESSIONAL CLIENT USE ONLY-NOT FOR RETAIL DISTRIBUTION

Long-term capital market return assumptions

2015 estimates and the thinking behind the numbers



J.P.Morgan
Asset Management

Source: J.P. Morgan Asset Management.

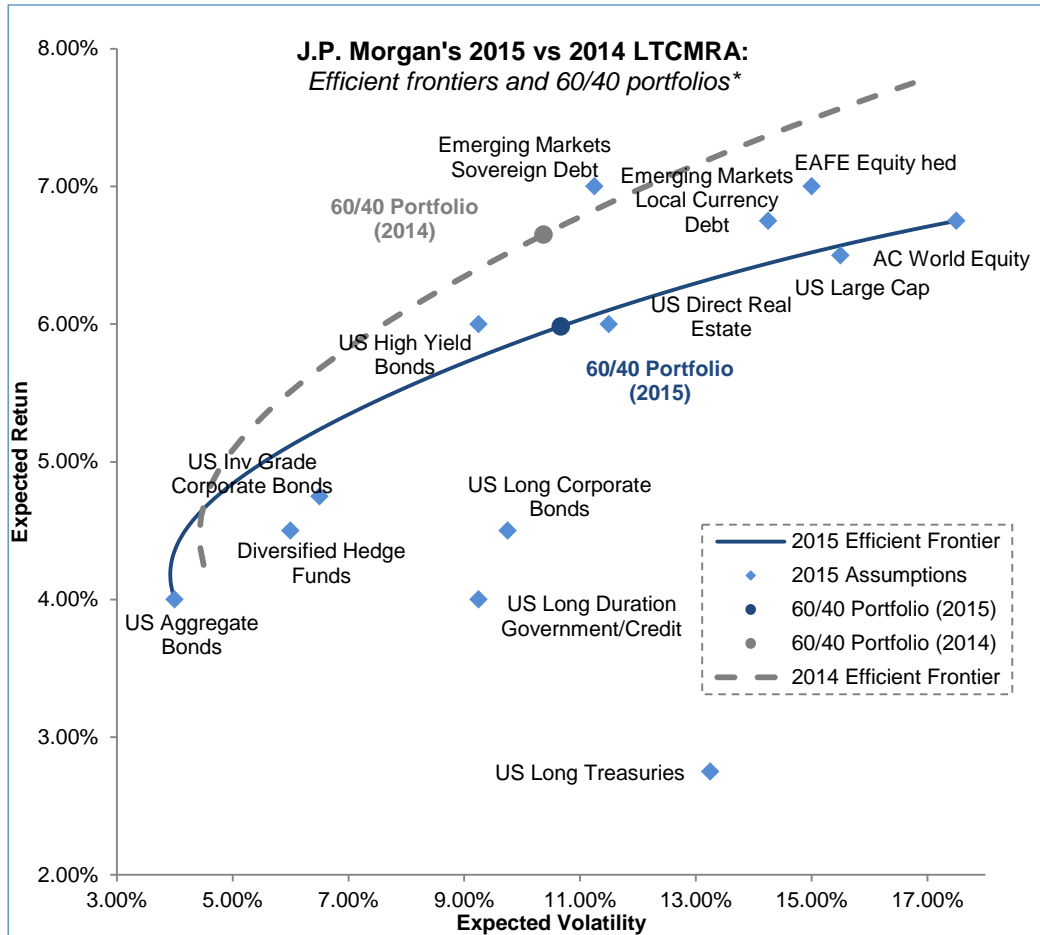
Our Capital Market Return Assumptions reflect the best thinking throughout J.P. Morgan Asset Management.

They provide comprehensive coverage of approximately 50 asset classes and strategies and are derived from a transparent and accessible building-block process.

The Assumptions committee includes representatives from the firm's Global Investment Management Solutions Group, Endowment and Foundations Group, Global Strategy Team and Private Bank.

Long-term Capital Market Return Assumptions

The 2015 Long-term Capital Market Return Assumptions (LTCMRA) has shifted the efficient frontier downwards relative to the 2014 LTCMRA

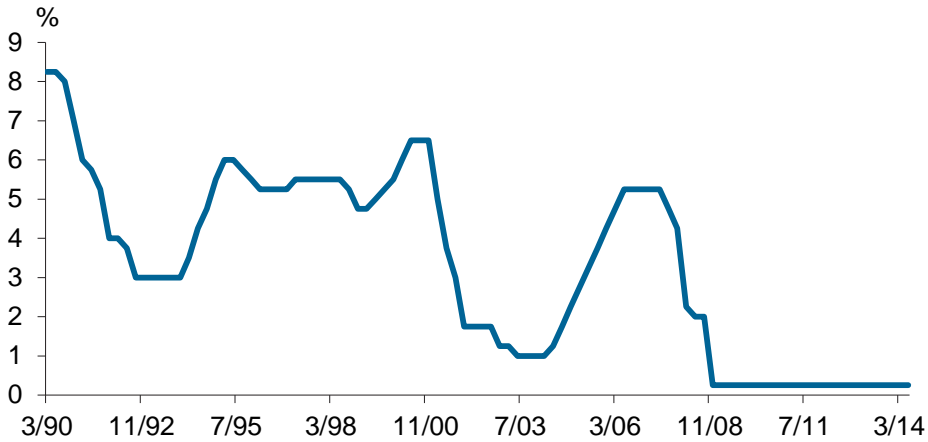


- ### Return Levers
- 1. Leverage**
Adjust risk exposures through the prudent use of derivatives
 - 2. Illiquidity**
Earn illiquidity premia over the long-term
 - 3. Opportunistic Investing**
Capture market dislocations
 - 4. Asset Allocation Alpha**
Actively express asset allocation views
 - 5. Manager Selection**
Select managers with consistent alpha

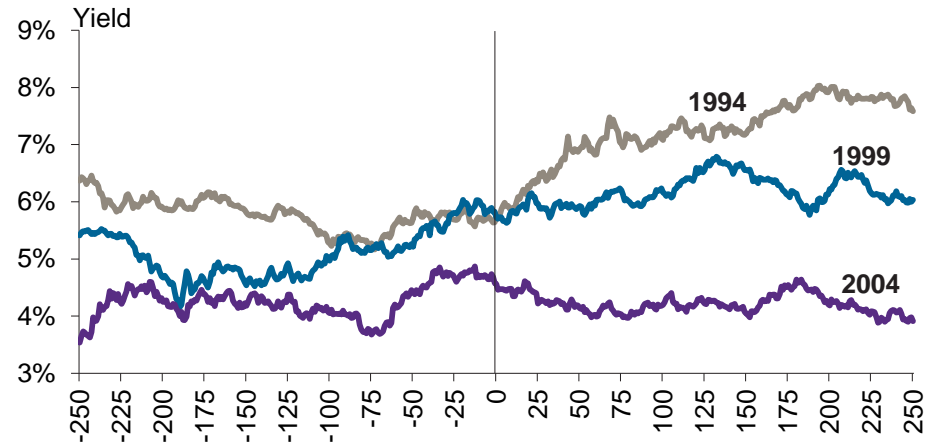
Source: J.P. Morgan Asset Management. For illustrative purposes only. Expected risk and returns are based on J.P. Morgan's 2015 Long-term Capital Market Return Assumptions (LTCMRA)
* 60/40 portfolio compositions: 60% AC World Equity, 40% US Aggregate Bonds. Efficient frontiers based on portfolio combinations of AC World Equity and US Aggregate Bonds.

Fed Tightening: Lessons from the Past Three Cycles

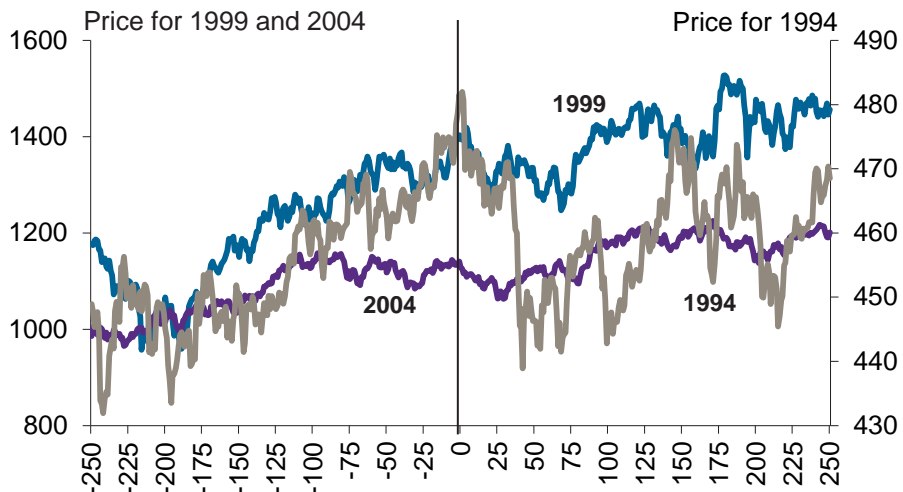
Fed Funds Target Rate



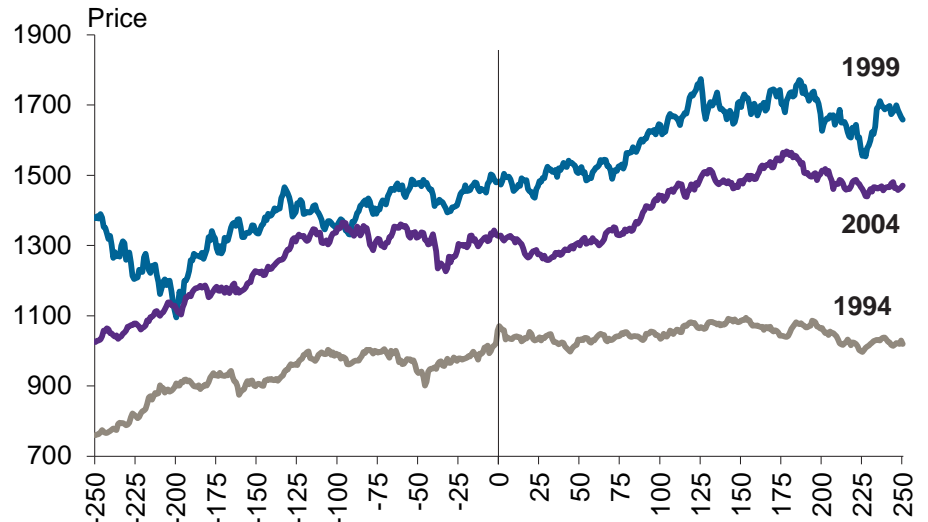
US 10yr Bond yields – 1 yr before and after first rate hike



U.S. Equities – 1 yr before and after first rate hike



International Equities – 1 yr before and after first rate hike



Note: Unless a date, X-axis on charts show 250 days before and after point of Fed tightening.
US Equities represented by S&P 500 index, International Equities represented by the MSCI EAFE Index Source: J.P. Morgan, Bloomberg

Summary

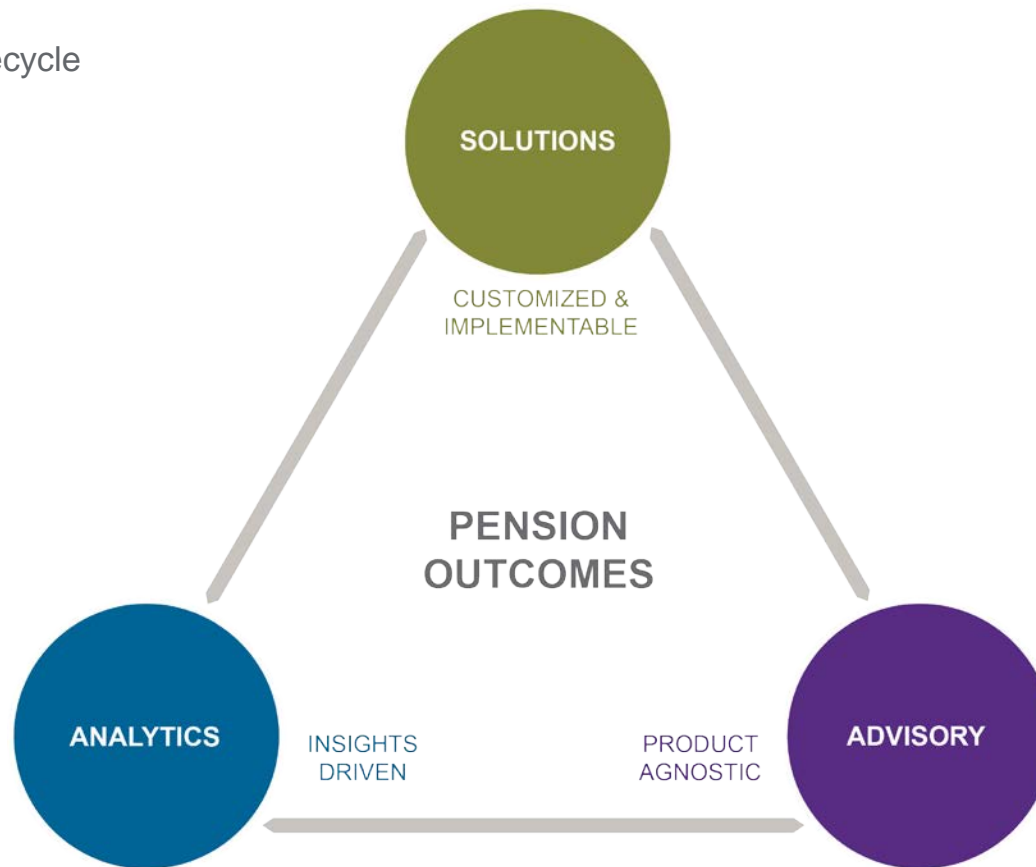
- Long-term trend growth rates around the World are falling due to low/negative growth in labor force and productivity.
- Low rates of trend growth imply that bond yields are more likely to remain at low levels than to return to a “normal” level.
- Equity valuations suggest that risk assets will not offer a risk premium above long-term averages.
- Pension Investors must accept a World of lower returns, and develop investment strategies to deal with this World.
- Pension sponsors must either change benefit formulas, increase contributions or change investment approaches. In practice many likely choose all three.
- The Fed approaches...which is not necessarily bad.

Appendix I

Supplemental Information

J.P. Morgan Asset Management: Pension Solutions & Advisory

We believe combining **proprietary analytics** and **product-agnostic advice** to develop a **total portfolio solution** will ultimately serve to meet our client's objectives throughout the pension lifecycle



2015 J.P. Morgan's Long-term Capital Market Return Assumptions

As of September 30, 2014*

	Annualised Volatility: Square Root of 12													
	Annualised Volatility													
	Arithmetic Return 2015 (%)													
	Compound Return 2015 (%)													
	Compound Return 2014 (%)													
FIXED INCOME	Inflation	2.25	2.25	2.26	1.50	1.50	1.00	Inflation						
	U.S. Cash	2.00	2.00	2.00	0.50	0.50	0.10	U.S. Cash	1.00					
	U.S. Intermediate Treasuries	4.25	4.00	4.29	7.75	7.50	-0.22	U.S. Intermediate Treasuries	0.03	1.00				
	U.S. Long Treasuries	3.25	2.75	3.59	13.25	12.25	-0.25	U.S. Long Treasuries	0.00	0.90	1.00			
	TIPS	4.75	4.25	4.50	7.25	7.00	0.01	TIPS	-0.02	0.68	0.53	1.00		
	U.S. Aggregate Bonds	4.25	4.00	4.08	4.00	3.75	-0.21	U.S. Aggregate Bonds	0.00	0.86	0.76	0.78	1.00	
	U.S. Short Duration Government/Credit	2.50	2.75	2.77	2.00	1.75	-0.20	U.S. Short Duration Government/Credit	0.29	0.64	0.41	0.65	0.74	1.00
	U.S. Long Duration Government/Credit	4.75	4.00	4.41	9.25	8.75	-0.23	U.S. Long Duration Government/Credit	-0.07	0.83	0.86	0.66	0.90	0.51
	U.S. Inv Grade Corporate Bonds	5.00	4.75	4.95	6.50	6.25	-0.21	U.S. Inv Grade Corporate Bonds	-0.13	0.50	0.45	0.64	0.82	0.60
	U.S. Long Corporate Bonds	5.00	4.50	4.95	9.75	9.00	-0.25	U.S. Long Corporate Bonds	-0.14	0.55	0.58	0.57	0.81	0.47
	U.S. High Yield Bonds	6.00	6.00	6.40	9.25	8.50	0.00	U.S. High Yield Bonds	-0.16	-0.22	-0.29	0.27	0.19	0.11
	U.S. Leveraged Loans	4.50	4.50	4.67	6.00	5.75	0.26	U.S. Leveraged Loans	-0.10	-0.44	-0.43	0.03	-0.08	-0.15
	World Government Bonds hedged	3.25	2.75	2.80	3.25	3.25	-0.30	World Government Bonds hedged	0.05	0.87	0.83	0.55	0.79	0.58
	World Government Bonds	3.25	2.50	2.72	6.75	6.50	-0.06	World Government Bonds	0.05	0.57	0.43	0.63	0.64	0.62
	World ex-U.S. Government Bonds hedged	3.25	2.50	2.54	3.00	3.00	-0.30	World ex-U.S. Government Bonds hedged	0.02	0.76	0.73	0.45	0.71	0.50
	World ex-U.S. Government Bonds	3.25	2.25	2.58	8.25	7.75	-0.02	World ex-U.S. Government Bonds	0.04	0.46	0.31	0.58	0.56	0.56
	EM Sovereign Debt	6.75	7.00	7.58	11.25	10.50	-0.13	EM Sovereign Debt	-0.07	0.29	0.17	0.56	0.60	0.43
	EM Local Currency Debt	7.00	6.75	7.68	14.25	13.25	0.01	EM Local Currency Debt	0.05	0.08	-0.04	0.38	0.34	0.30
	EM Corporate Bonds	6.25	6.00	6.36	8.75	8.25	-0.08	EM Corporate Bonds	-0.14	0.18	0.05	0.51	0.56	0.45
	U.S. Muni 1-15 Yr Blend	3.75	3.25	3.33	4.00	3.75	-0.12	U.S. Muni 1-15 Yr Blend	-0.05	0.52	0.45	0.55	0.66	0.47
	U.S. Muni High Yield	5.25	5.00	5.25	7.25	6.75	0.18	U.S. Muni High Yield	-0.09	-0.01	-0.03	0.30	0.23	0.02
	U.S. Large Cap	7.50	6.50	7.60	15.50	14.00	0.01	U.S. Large Cap	-0.06	-0.29	-0.37	0.04	-0.02	-0.05
	U.S. Mid Cap	7.75	6.75	8.34	18.75	16.50	0.04	U.S. Mid Cap	-0.08	-0.32	-0.39	0.04	-0.04	-0.08
	U.S. Small Cap	7.50	6.75	8.81	21.50	19.00	0.01	U.S. Small Cap	-0.07	-0.34	-0.41	-0.05	-0.11	-0.15
	U.S. Large Cap Value	7.75	6.75	7.95	16.25	14.75	0.01	U.S. Large Cap Value	-0.06	-0.29	-0.36	0.01	-0.02	-0.06
U.S. Large Cap Growth	7.25	6.25	7.39	15.75	14.25	0.02	U.S. Large Cap Growth	-0.08	-0.31	-0.40	0.06	-0.04	-0.09	
Europe ex-UK Large Cap	7.75	7.25	8.83	18.75	17.25	0.03	Europe ex-UK Large Cap	-0.24	-0.33	-0.31	0.05	0.08	-0.01	
Japan Equity	6.75	6.25	6.47	16.25	15.50	0.01	Japan Equity	-0.02	-0.18	-0.21	0.01	0.08	0.05	
UK Large Cap	8.00	6.75	8.34	18.75	17.00	0.07	UK Large Cap	-0.01	-0.39	-0.08	0.02	0.01	-0.03	
EAFE Equity hedged	7.75	7.00	8.03	15.00	13.75	-0.02	EAFE Equity hedged	-0.02	-0.37	-0.39	-0.06	-0.06	-0.10	
EAFE Equity	7.75	6.75	8.10	17.25	16.00	0.03	EAFE Equity	0.02	-0.25	-0.33	0.12	0.07	0.07	
Emerging Markets Equity	9.00	8.75	11.77	26.50	22.50	0.03	Emerging Markets Equity	0.08	-0.22	-0.30	0.17	0.07	0.08	
Asia ex-Japan Equity	9.25	9.75	12.48	25.25	21.75	-0.03	Asia ex-Japan Equity	0.06	-0.20	-0.28	0.16	0.10	0.05	
AC World Equity	7.75	6.75	8.14	17.50	15.75	0.03	AC World Equity	-0.01	-0.28	-0.37	0.10	0.03	0.02	
Private Equity	8.00	7.75	9.89	22.00	20.00	0.05	Private Equity	-0.11	-0.39	-0.44	-0.03	-0.13	-0.13	
U.S. Direct Real Estate	6.00	6.00	6.61	11.50	10.75	0.00	U.S. Direct Real Estate	-0.01	-0.03	-0.06	0.04	0.05	0.00	
U.S. Value Added Real Estate	7.75	7.75	8.84	15.50	14.25	0.00	U.S. Value Added Real Estate	-0.01	-0.03	-0.06	0.04	0.05	0.00	
European Direct Real Estate	5.75	5.75	6.89	15.75	14.75	-0.04	European Direct Real Estate	0.00	-0.03	-0.04	0.03	0.06	0.02	
U.S. REITs	6.75	6.50	8.17	19.25	17.75	-0.03	U.S. REITs	-0.04	-0.04	-0.11	0.14	0.17	0.03	
Global Infrastructure	7.25	6.75	7.47	12.50	11.75	0.10	Global Infrastructure	-0.01	-0.11	-0.14	0.01	-0.03	-0.04	
Diversified Hedge Funds	5.25	4.50	4.67	6.00	5.75	0.16	Diversified Hedge Funds	0.01	-0.41	-0.43	0.03	-0.14	-0.12	
Event Driven Hedge Funds	6.00	6.00	6.23	7.00	6.50	0.14	Event Driven Hedge Funds	0.00	-0.46	-0.51	0.01	-0.14	-0.12	
Long Bias Hedge Funds	6.25	5.25	5.82	11.00	10.50	0.10	Long Bias Hedge Funds	0.02	-0.42	-0.49	0.04	-0.11	-0.06	
Relative Value Hedge Funds	4.75	5.00	5.16	5.75	5.50	0.17	Relative Value Hedge Funds	-0.03	-0.40	-0.45	0.11	-0.02	-0.03	
Macro Hedge Funds	5.25	4.75	5.22	10.00	9.50	-0.02	Macro Hedge Funds	0.20	-0.09	-0.10	0.16	0.01	0.13	
Commodities	3.75	3.50	5.22	19.25	17.25	0.22	Commodities	0.08	-0.15	-0.24	0.23	0.05	0.12	
Gold	4.25	4.00	6.11	21.50	18.50	0.08	Gold	0.01	0.20	0.08	0.39	0.27	0.31	

* Source: J.P. Morgan Asset Management. Data as of 30 September 2014, except hedge funds (diversified, event driven, long bias, and relative value) as of 30 June 2014 and hedge fund (macro) as of 31 May 2014. U.S. Intermediate Treasury returns based on Barclays Capital U.S. Treasury: 7–10 Year Index. TIPS=Treasury Inflation Protected Securities.

Private equity, hedge funds, real estate, infrastructure and commodities are unlike other asset categories shown above in that there is no underlying investable index. Hedge fund returns are shown net of manager fees. The return estimates shown for these alternative asset classes and strategies are our estimates of industry medians—the dispersion of returns among managers in these asset classes and strategies is typically far wider than for traditional asset classes.

J.P. Morgan Asset Management – Index Definitions

All indexes are unmanaged and an individual cannot invest directly in an index. Index returns do not include fees or expenses.

The **S&P 500 Index** is widely regarded as the best single gauge of the U.S. equities market. This world-renowned index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. Although the S&P 500 Index focuses on the large-cap segment of the market, with approximately 75% coverage of U.S. equities, it is also an ideal proxy for the total market. An investor cannot invest directly in an index.

The **S&P 400 Mid Cap Index** is representative of 400 stocks in the mid-range sector of the domestic stock market, representing all major industries.

The **Russell 3000 Index®** measures the performance of the 3,000 largest U.S. companies based on total market capitalization.

The **Russell 1000 Index®** measures the performance of the 1,000 largest companies in the Russell 3000.

The **Russell 1000 Growth Index®** measures the performance of those Russell 1000 companies with higher price-to-book ratios and higher forecasted growth values.

The **Russell 1000 Value Index®** measures the performance of those Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.

The **Russell Midcap Index®** measures the performance of the 800 smallest companies in the Russell 1000 Index.

The **Russell Midcap Growth Index®** measures the performance of those Russell Midcap companies with higher price-to-book ratios and higher forecasted growth values. The stocks are also members of the Russell 1000 Growth index.

The **Russell Midcap Value Index®** measures the performance of those Russell Midcap companies with lower price-to-book ratios and lower forecasted growth values. The stocks are also members of the Russell 1000 Value index.

The **Russell 2000 Index®** measures the performance of the 2,000 smallest companies in the Russell 3000 Index.

The **Russell 2000 Growth Index®** measures the performance of those Russell 2000 companies with higher price-to-book ratios and higher forecasted growth values.

The **Russell 2000 Value Index®** measures the performance of those Russell 2000 companies with lower price-to-book ratios and lower forecasted growth values.

The **Russell Top 200 Index®** measures the performance of the largest cap segment of the U.S. equity universe. It includes approximately 200 of the largest securities based on a combination of their market cap and current index membership and represents approximately 68% of the U.S. market.

The **MSCI® EAFE** (Europe, Australia, Far East) Net Index is recognized as the pre-eminent benchmark in the United States to measure international equity performance. It comprises 21 MSCI country indexes, representing the developed markets outside of North America.

The **MSCI Emerging Markets IndexSM** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets. As of June 2007, the MSCI Emerging Markets Index consisted of the following 25 emerging market country indices: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey.

The **MSCI ACWI (All Country World Index) Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of June 2009 the **MSCI ACWI** consisted of 45 country indices comprising 23 developed and 22 emerging market country indices.

The **MSCI Small Cap IndicesSM** target 40% of the eligible Small Cap universe within each industry group, within each country. MSCI defines the Small Cap universe as all listed securities that have a market capitalization in the range of USD200-1,500 million.

The **MSCI Value and Growth IndicesSM** cover the full range of developed, emerging and All Country MSCI Equity indexes. As of the close of May 30, 2003, MSCI implemented an enhanced methodology for the MSCI Global Value and Growth Indices, adopting a two dimensional framework for style segmentation in which value and growth securities are categorized using different attributes - three for value and five for growth including forward-looking variables. The objective of the index design is to divide constituents of an underlying MSCI Standard Country Index into a value index and a growth index, each targeting 50% of the free-float adjusted market capitalization of the underlying country index. Country Value/Growth indices are then aggregated into regional Value/Growth indices. Prior to May 30, 2003, the indices used Price/Book Value (P/BV) ratios to divide the standard MSCI country indices into value and growth indices. All securities were classified as either "value" securities (low P/BV securities) or "growth" securities (high P/BV securities), relative to each MSCI country index.

The following **MSCI Total Return IndicesSM** are calculated with gross dividends:

This series approximates the maximum possible dividend reinvestment. The amount reinvested is the dividend distributed to individuals resident in the country of the company, but does not include tax credits.

The **MSCI Europe IndexSM** is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe. As of June 2007, the MSCI Europe Index consisted of the following 16 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The **MSCI Pacific IndexSM** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the Pacific region. As of June 2007, the MSCI Pacific Index consisted of the following 5 Developed Market countries: Australia, Hong Kong, Japan, New Zealand, and Singapore.

Credit Suisse/Tremont Hedge Fund Index is compiled by Credit Suisse Tremont Index, LLC. It is an asset-weighted hedge fund index and includes only funds, as opposed to separate accounts. The Index uses the Credit Suisse/Tremont database, which tracks over 4500 funds, and consists only of funds with a minimum of US\$50 million under management, a 12-month track record, and audited financial statements. It is calculated and rebalanced on a monthly basis, and shown net of all performance fees and expenses. It is the exclusive property of Credit Suisse Tremont Index, LLC.

The **NFI-ODCE**, short for NCREIF Fund Index - Open End Diversified Core Equity, is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NFI-ODCE Index is capitalization-weighted and is reported gross of fees. Measurement is time-weighted.

The **NAREIT EQUITY REIT Index** is designed to provide the most comprehensive assessment of overall industry performance, and includes all tax-qualified real estate investment trusts (REITs) that are listed on the NYSE, the American Stock Exchange or the NASDAQ National Market List.

The **Dow Jones Industrial Average** measures the stock performance of 30 leading blue-chip U.S. companies.

The **Bloomberg Commodity Index** is composed of futures contracts on physical commodities and represents twenty two separate commodities traded on U.S. exchanges, with the exception of aluminum, nickel, and zinc

J.P. Morgan Asset Management – Index Definitions

All indexes are unmanaged and an individual cannot invest directly in an index. Index returns do not include fees or expenses.

The **S&P GSCI Index** is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment. Individual components qualify for inclusion in the index on the basis of liquidity and are weighted by their respective world production quantities.

The **Barclays Capital U.S. Aggregate Index** represents securities that are SEC-registered, taxable, and dollar denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities. These major sectors are subdivided into more specific indexes that are calculated and reported on a regular basis.

This **U.S. Treasury Index** is a component of the U.S. Government index.

West Texas Intermediate (WTI) is the underlying commodity for the New York Mercantile Exchange's oil futures contracts.

The **Barclays Capital High Yield Index** covers the universe of fixed rate, non-investment grade debt. Pay-in-kind (PIK) bonds, Eurobonds, and debt issues from countries designated as emerging markets (e.g., Argentina, Brazil, Venezuela, etc.) are included, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included. Original issue zeroes, step-up coupon structures, and 144-As are also included.

The **Barclays Capital 1-3 Month U.S. Treasury Bill Index** includes all publicly issued zero-coupon U.S. Treasury Bills that have a remaining maturity of less than 3 months and more than 1 month, are rated investment grade, and have \$250 million or more of outstanding face value. In addition, the securities must be denominated in U.S. dollars and must be fixed rate and non convertible.

The **Barclays Capital General Obligation Bond Index** is a component of the **Barclays Capital Municipal Bond Index**. To be included in the index, bonds must be general obligation bonds rated investment-grade (Baa3/BBB- or higher) by at least two of the following ratings agencies: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least \$7 million and be issued as part of a transaction of at least \$75 million. The bonds must be fixed rate, have a dated-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives, are excluded from the benchmark.

The **Barclays Capital Revenue Bond Index** is a component of the **Barclays Capital Municipal Bond Index**. To be included in the index, bonds must be revenue bonds rated investment-grade (Baa3/BBB- or higher) by at least two of the following ratings agencies: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least \$7 million and be issued as part of a transaction of at least \$75 million. The bonds must be fixed rate, have a dated-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives, are excluded from the benchmark.

The **Barclays High Yield Municipal Index** includes bonds rated Ba1 or lower or non-rated bonds using the middle rating of Moody's, S&P and Fitch.

The **Barclays Capital Taxable Municipal Bond Index** is a rules-based, market-value weighted index engineered for the long-term taxable bond market. To be included in the index, bonds must be rated investment-grade (Baa3/BBB- or higher) by at least two of the following ratings agencies if all three rate the bond: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least \$7 million and be issued as part of a transaction of at least \$75 million. The bonds must be fixed rate and must be at least one year from their maturity date. Remarketed issues (unless converted to fixed rate), bonds with floating rates, and derivatives, are excluded from the benchmark.

Municipal Bond Index: To be included in the index, bonds must be rated investment-grade (Baa3/BBB- or higher) by at least two of the following ratings agencies: Moody's, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least \$7 million and be issued as part of a transaction of at least \$75 million. The bonds must be fixed rate, have a dated-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives are excluded from the benchmark.

The **Barclays Capital Emerging Markets Index** includes USD-denominated debt from emerging markets in the following regions: Americas, Europe, Middle East, Africa, and Asia. As with other fixed income benchmarks provided by Barclays Capital, the index is rules-based, which allows for an unbiased view of the marketplace and easy replicability.

The **Barclays Capital MBS Index** covers the mortgage-backed pass-through securities of Ginnie Mae, Fannie Mae, and Freddie Mac. Aggregate components must have a weighted average maturity of at least one year, must have \$250 million par amount outstanding, and must be fixed rate mortgages.

The **Barclays Capital Corporate Bond Index** is the Corporate component of the U.S. Credit index.

The **Barclays Capital TIPS Index** consists of Inflation-Protection securities issued by the U.S. Treasury.

The **J.P. Morgan EMBI Global Index** includes U.S. dollar denominated Brady bonds, Eurobonds, traded loans and local market debt instruments issued by sovereign and quasi-sovereign entities.

The **J.P. Morgan Domestic High Yield Index** is designed to mirror the investable universe of the U.S. dollar domestic high yield corporate debt market.

The **CS/Tremont Equity Market Neutral Index** takes both long and short positions in stocks with the aim of minimizing exposure to the systematic risk of the market (i.e., a beta of zero).

The **CS/Tremont Multi-Strategy Index** consists of funds that allocate capital based on perceived opportunities among several hedge fund strategies. Strategies adopted in a multi-strategy fund may include, but are not limited to, convertible bond arbitrage, equity long/short, statistical arbitrage and merger arbitrage.

The **Barclays U.S. Dollar Floating Rate Note (FRN) Index** provides a measure of the U.S. dollar denominated floating rate note market.

*Market Neutral returns for November 2008 are estimates by J.P. Morgan Funds Market Strategy, and are based on a December 8, 2008 published estimate for November returns by CS/Tremont in which the Market Neutral returns were estimated to be +0.85% (with 69% of all CS/Tremont constituents having reported return data). Presumed to be excluded from the November return are three funds, which were later marked to \$0 by CS/Tremont in connection with the Bernard Madoff scandal. J.P. Morgan Funds believes this distortion is not an accurate representation of returns in the category. CS/Tremont later published a finalized November return of -40.56% for the month, reflecting this mark-down. CS/Tremont assumes no responsibility for these estimates.

J.P. Morgan Asset Management – Index Definitions, Risks and Disclosures

Bonds are subject to interest rate risks. Bond prices generally fall when interest rates rise.

The price of **equity** securities may rise, or fall because of changes in the broad market or changes in a company's financial condition, sometimes rapidly or unpredictably. These price movements may result from factors affecting individual companies, sectors or industries, or the securities market as a whole, such as changes in economic or political conditions. Equity securities are subject to "stock market risk" meaning that stock prices in general may decline over short or extended periods of time.

Small-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies since smaller companies generally have a higher risk of failure. Historically, smaller companies' stock has experienced a greater degree of market volatility than the average stock.

Mid-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies. Historically, mid-cap companies' stock has experienced a greater degree of market volatility than the average stock.

Real estate investments may be subject to a higher degree of market risk because of concentration in a specific industry, sector or geographical sector. Real estate investments may be subject to risks including, but not limited to, declines in the value of real estate, risks related to general and economic conditions, changes in the value of the underlying property owned by the trust and defaults by borrower.

International investing involves a greater degree of risk and increased volatility. Changes in currency exchange rates and differences in accounting and taxation policies outside the U.S. can raise or lower returns. Also, some overseas markets may not be as politically and economically stable as the United States and other nations.

Investments in **emerging markets** can be more volatile. As mentioned above, the normal risks of investing in foreign countries are heightened when investing in emerging markets. In addition, the small size of securities markets and the low trading volume may lead to a lack of liquidity, which leads to increased volatility. Also, emerging markets may not provide adequate legal protection for private or foreign investment or private property.

Investments in **commodities** may have greater volatility than investments in traditional securities, particularly if the instruments involve leverage. The value of commodity-linked derivative instruments may be affected by changes in overall market movements, commodity index volatility, changes in interest rates, or factors affecting a particular industry or commodity, such as drought, floods, weather, livestock disease, embargoes, tariffs and international economic, political and regulatory developments. Use of leveraged commodity-linked derivatives creates an opportunity for increased return but, at the same time, creates the possibility for greater loss.

Investing in **alternative assets** involves higher risks than traditional investments and is suitable only for sophisticated investors. Alternative investments involve greater risks than traditional investments and should not be deemed a complete investment program. They are not tax efficient and an investor should consult with his/her tax advisor prior to investing. Alternative investments have higher fees than traditional investments and they may also be highly leveraged and engage in speculative investment techniques, which can magnify the potential for investment loss or gain. The value of the investment may fall as well as rise and investors may get back less than they invested.

Derivatives may be riskier than other types of investments because they may be more sensitive to changes in economic or market conditions than other types of investments and could result in losses that significantly exceed the original investment. The use of derivatives may not be successful, resulting in investment losses, and the cost of such strategies may reduce investment returns.

Price to forward earnings is a measure of the price-to-earnings ratio (P/E) using forecasted earnings. **Price to book value** compares a stock's market value to its book value. **Price to cash flow** is a measure of the market's expectations of a firm's future financial health. **Price to dividends** is the ratio of the price of a share on a stock exchange to the dividends per share paid in the previous year, used as a measure of a company's potential as an investment.

There is no guarantee that the use of **long and short positions** will succeed in limiting an investor's exposure to domestic stock market movements, capitalization, sector swings or other risk factors. Using long and short selling strategies may have higher portfolio turnover rates. Short selling involves certain risks, including additional costs associated with covering short positions and a possibility of unlimited loss on certain short sale positions.

The **HFRI Monthly Indices (HFRI)** are equally weighted performance indexes, utilized by numerous hedge fund managers as a benchmark for their own hedge funds. The HFRI are broken down into 4 main strategies, each with multiple substrategies. All single-manager HFRI Index constituents are included in the HFRI Fund Weighted Composite, which accounts for over 2200 funds listed on the internal HFR Database.

Equity Market Neutral Strategies employ sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, select securities for purchase and sale. Equity Market Neutral Strategies typically maintain characteristic net equity market exposure no greater than 10% long or short.

Distressed Restructuring Strategies employ an investment process focused on corporate fixed income instruments, primarily on corporate credit instruments of companies trading at significant discounts to their value at issuance or obliged (par value) at maturity as a result of either formal bankruptcy proceeding or financial market perception of near term proceedings.

Merger Arbitrage Strategies which employ an investment process primarily focused on opportunities in equity and equity related instruments of companies which are currently engaged in a corporate transaction.

Global Macro Strategies trade a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets.

Relative Value Strategies maintain positions in which the investment thesis is predicated on realization of a valuation discrepancy in the relationship between multiple securities.

The **Cambridge Associates LLC U.S. Private Equity Index®** is an end-to-end calculation based on data compiled from 1,052 U.S. private equity funds (buyout, growth equity, private equity energy and mezzanine funds), including fully liquidated partnerships, formed between 1986 and 2013.

The **Alerian MLP Index** is a composite of the 50 most prominent energy Master Limited Partnerships (MLPs) that provides investors with an unbiased, comprehensive benchmark for the asset class.

J.P. Morgan Asset Management – Risks and Disclosures

The Market Insights program provides comprehensive data and commentary on global markets without reference to products. Designed as a tool to help clients understand the markets and support investment decision-making, the program explores the implications of current economic data and changing market conditions.

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JPMAM Long Term Capital Market Assumptions: Given the complex risk-reward trade-offs involved, we advise clients to rely on judgment as well as quantitative optimization approaches in setting strategic allocations. Please note that all information shown is based on qualitative analysis. Exclusive reliance on the above is not advised. This information is not intended as a recommendation to invest in any particular asset class or strategy or as a promise of future performance. Note that these asset class and strategy assumptions are passive only—they do not consider the impact of active management. References to future returns are not promises or even estimates of actual returns a client portfolio may achieve. Assumptions, opinions and estimates are provided for illustrative purposes only. They should not be relied upon as recommendations to buy or sell securities. Forecasts of financial market trends that are based on current market conditions constitute our judgment and are subject to change without notice. We believe the information provided here is reliable, but do not warrant its accuracy or completeness. This material has been prepared for information purposes only and is not intended to provide, and should not be relied on for, accounting, legal or tax advice. The outputs of the assumptions are provided for illustration/discussion purposes only and are subject to significant limitations. “Expected” or “Alpha” return estimates are subject to uncertainty and error. For example changes in the historical data from which it is estimated will result in different implications for asset class returns. Expected returns for each asset class conditional on an economic scenario; actual returns in the event the scenario comes to pass could be higher or lower, as they have been in the past, so an investor should not expect to achieve returns similar to the outputs shown herein. References to future returns for either asset allocation strategies or asset classes are not promises of actual returns a client portfolio may achieve. Because of the inherent limitations of all models, potential investors should not rely exclusively on the model when making a decision. The model cannot account for the impact that economic, market, and other factors may have on the implementation and ongoing management of an actual investment portfolio. Unlike actual portfolio outcomes, the model outcomes do not reflect actual trading, liquidity constraints, fees, expenses, taxes and other factors that could impact the future returns. The model assumptions are passive only—they do not consider the impact of active management. A manager’s ability to achieve similar outcomes is subject to risk factors over which the manager may have no or limited control.

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**Past performance is no guarantee of comparable future results.
Diversification does not guarantee investment returns and does not eliminate the risk of loss.**

Prepared by: Andrew D. Goldberg, Anastasia V. Amoroso, James C. Liu, Gabriela D. Santos, David M. Lebovitz, Hannah J. Anderson, Abigail B. Dwyer, Ainsley E. Woolridge and David P. Kelly.

Unless otherwise stated, all data are as of March 31, 2015 or most recently available.

Guide to the Markets – U.S.

JP-LITTLEBOOK

J.P. Morgan Asset Management – Disclosure

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