CalPERS Trust Level Review

Period Ending December 31, 2015

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Investment Committee

February 2016

CalPERS | Investment Office

Executive Summary

Trust Level Performance

- Public Employees' Retirement Fund (PERF) returned -0.09% for the 1 year period ending December 31, 2015
- Most Affiliate Plans experienced negative 1-year returns but have captured strong relative performance over the 3-year and 5-year return periods

Economic and Market Conditions

- Global factors are the main threat to a continued US expansion

Portfolio Risk

- Portfolio volatility continues to be driven almost entirely by Growth assets

Review Outline

I. Economic and Market Overview
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   ii. Market Environment

II. Trust Level Overview
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III. Investment Review
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I. Economics and Market Overview

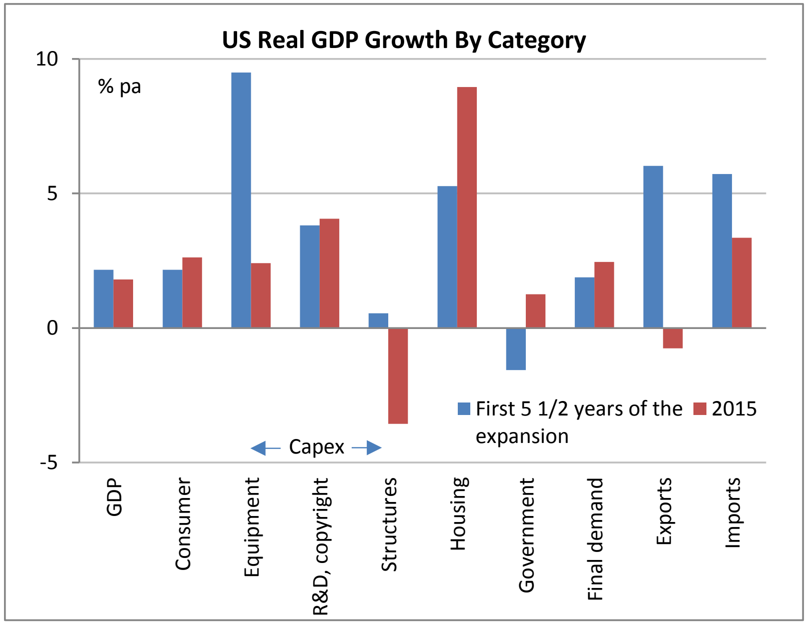
Economic Trends

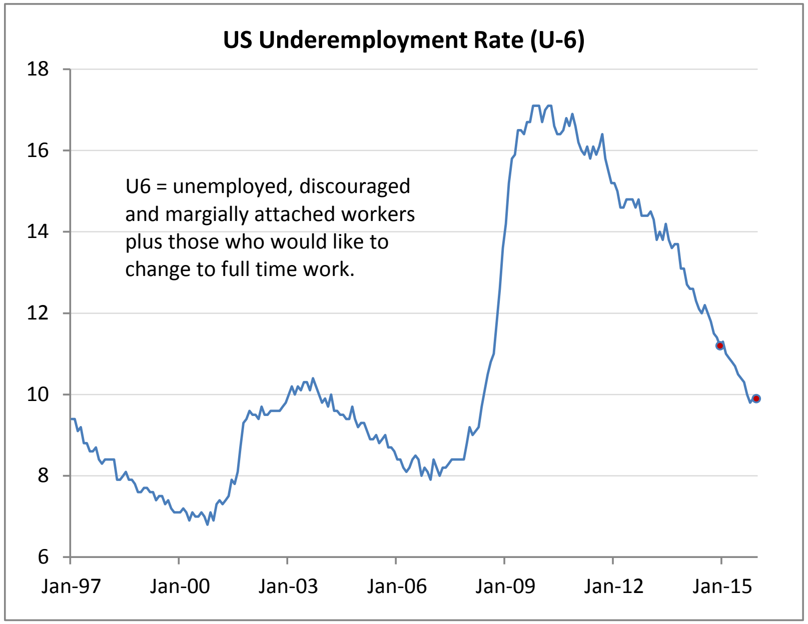
- Global factors are the main threat to a continued US expansion.

Positive	Same Trend	Negative
- Persistent improvement in US labor market Underutilized labor and low participation are the only laggards in jobs market strength. **- Housing cycle on the uptick** Starts, sales, formation, prices and plans-to-buy improved, while affordability remains OK. **- Household incomes and balance sheet** Strong real disposable income drives risk buffer and a domestic savings pool for asset markets. **- Global trade imbalances manageable** US deficit in 2-3%/GDP range whilst Euro area, Japan and China all at 2-3% surpluses.	**- Slow but stable US growth** US economy delivered another year of slow growth, circa 2%. **- Benign inflation** Core services inflation 3% but weak energy, food and core goods keeps Fed on slow path.	**- Weak capex** It's been mining and aircraft, may bleed into other sectors this year **- Too tight labor markets** Available persons to fill job openings very tight at 2.5 … exacerbated by skills mismatch. **- Profits recession** Soft top line growth and more challenging costs could weaken hiring. **- Long term budget outlook** CBO report says new President will confront a steep budget blowout after 2017. **- China** Aggressive capital leakages and high debt make it difficult for China to right its slowing ship. **- Other tail risks** Including US election, political pushback in Europe, Middle East politics and EM transitions.

US Economic Growth and Employment

- The US economic expansion is now 6 ½ years and counting but 2015 was a sub-par year, held back by business investment and foreign trade.
- Still, the labor market continued to improve, with 200K per month jobs created and the broad measure of unemployment falling below 10%.





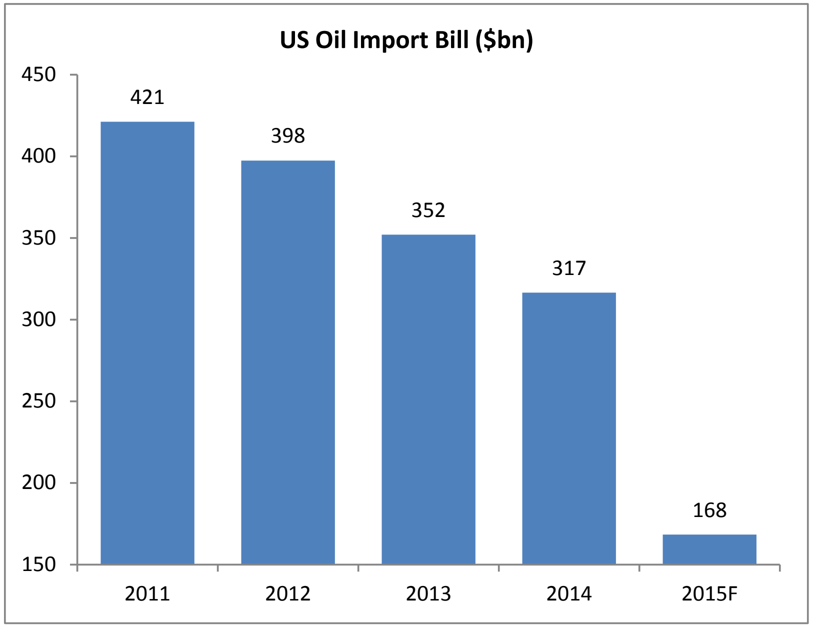
Domestic drivers of growth during 2015

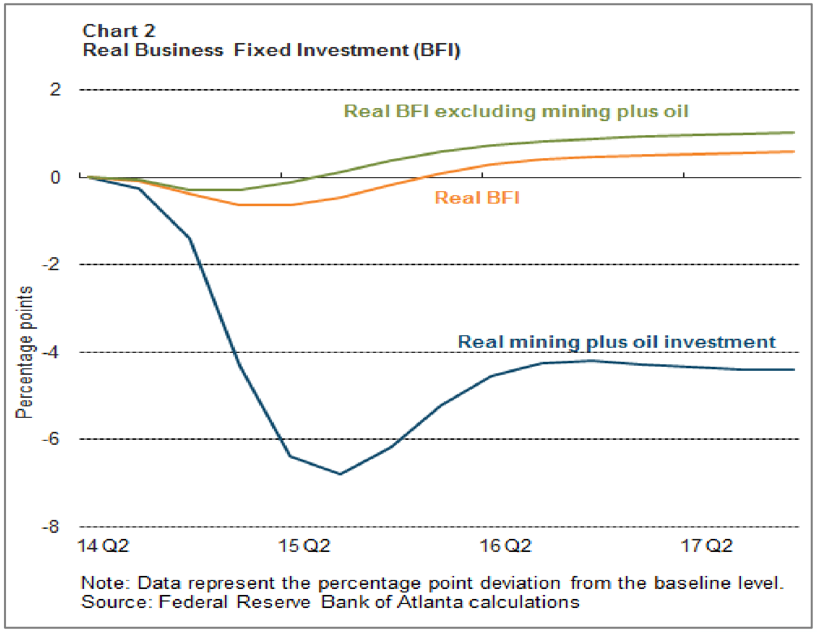
- Household (+2.6%) – Households saved a lot of the windfall benefits of cheaper gas and imported consumer goods … but did spend more on healthcare and recreation.
- Corporate (+1.6%) – Capex soft in key areas … mining related, aircraft and heavy machinery.
- Housing (+9.0%) – Stronger household formation and high appetite to buy have driven a gradual acceleration of building.
- Government (+1.3%) – Improved State and Local revenues and recent budget agreements have modestly reversed fiscal drag.

(bracketed numbers are growth rates during 2015)

• Lower Oil prices take time to boost GDP

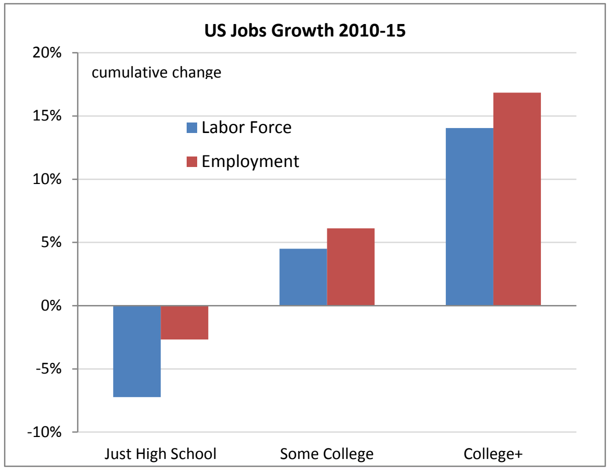
- Lower Oil prices and higher domestic production have reduced the US' oil import bill by around $150 billion in 2015, a good thing.
- However the initial impacted is dominated by lower investment and, in this cycle the contagion into credit costs for other sectors.

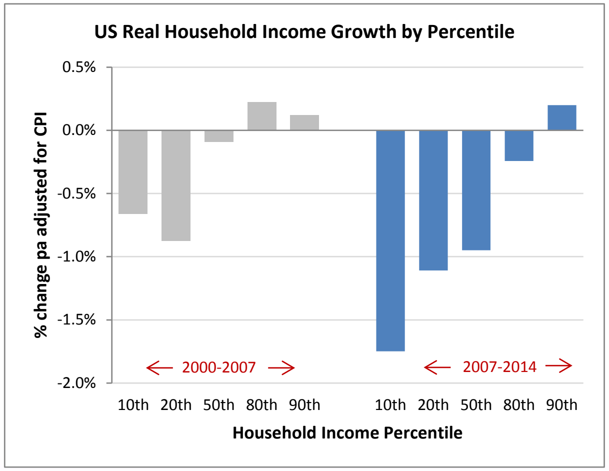


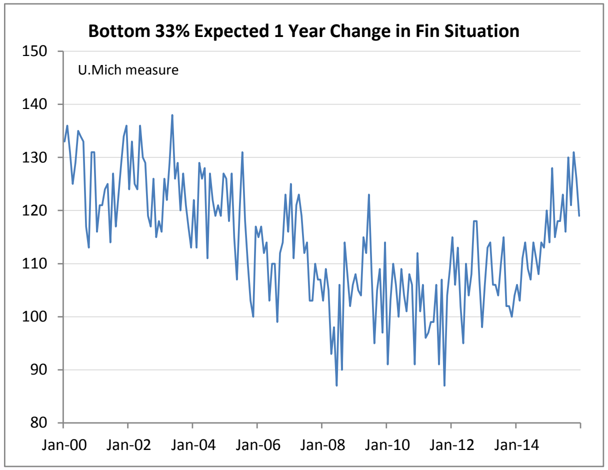


Income dispersion still an issue but lower earners more confident

- Since great recession, engagement with labor market now being driven by going to college first.
- Income dispersion has increased since the great recession; however lower income earners are feeling better about their prospects.

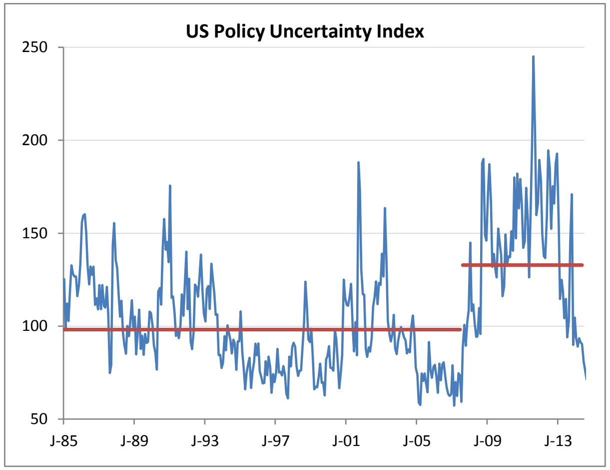


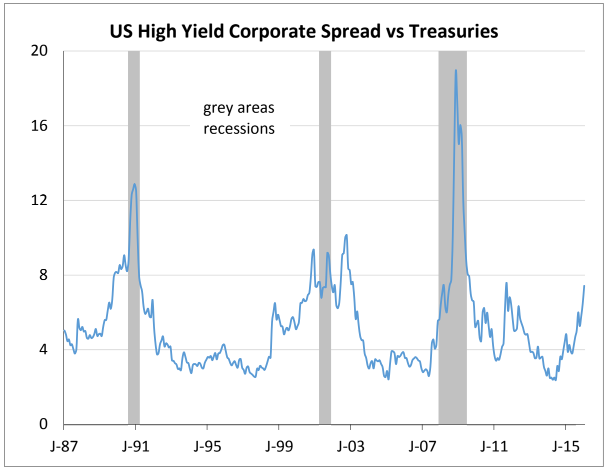


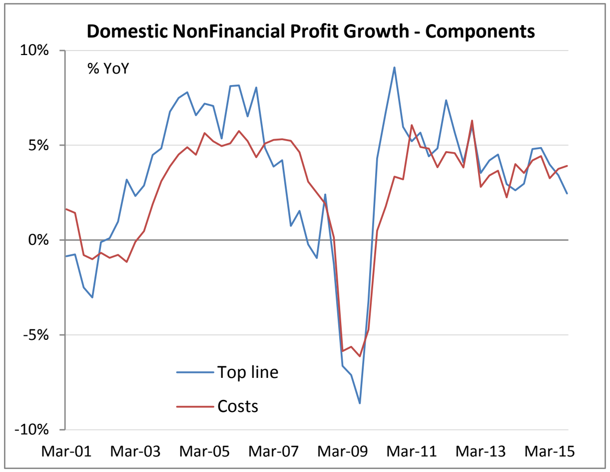


Business capex is a question mark

- Aside from energy, US business capex may face more headwinds in the next couple of years
  - More policy uncertainty around the election cycle;
  - Higher borrowing costs for corporates …
  - … against the backdrop of soft top line growth.

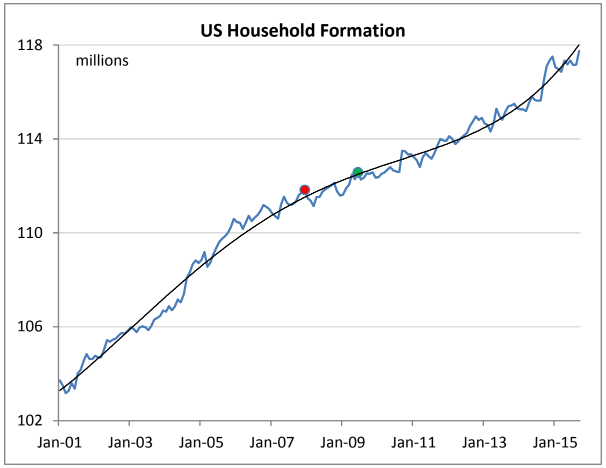


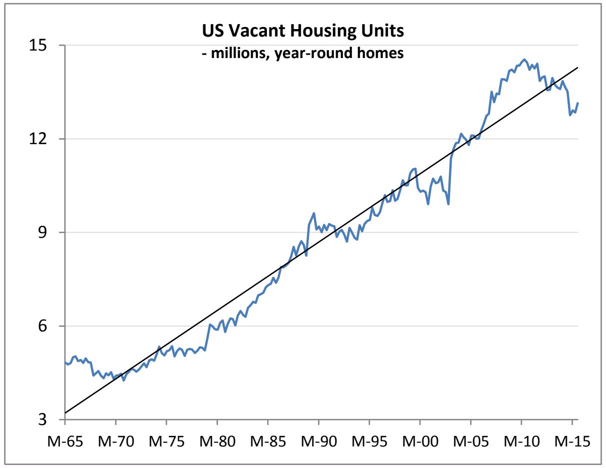


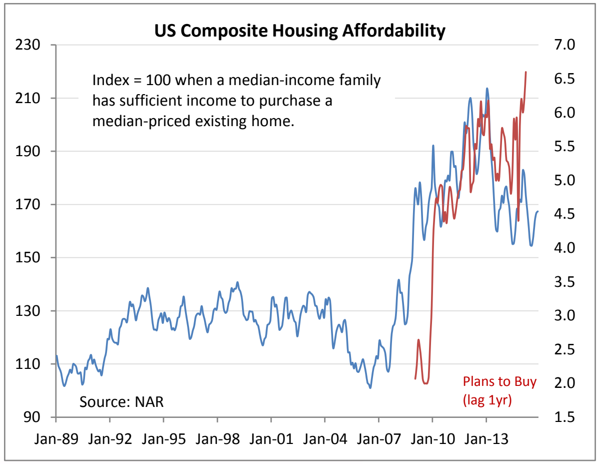


Encouraging developments in housing

- A rise in household formation against a slowly responding homebuilding cycle, resulted in a significant reduction in vacant homes = more building.
- Median housing affordability has been fairly steady and buyers remain highly motivated.
- Rentals and multis still dominate activity but single family owned homes segment is finally improving.

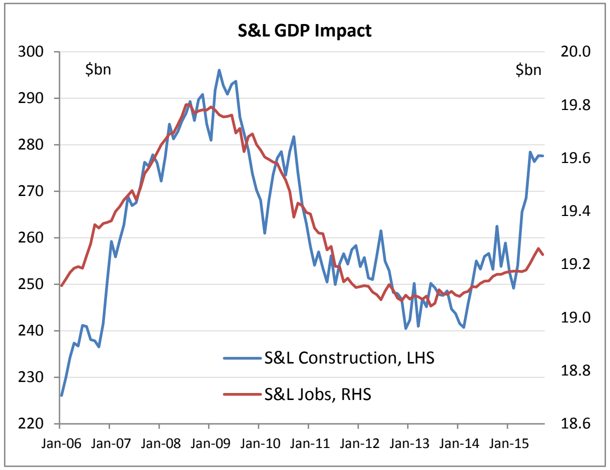


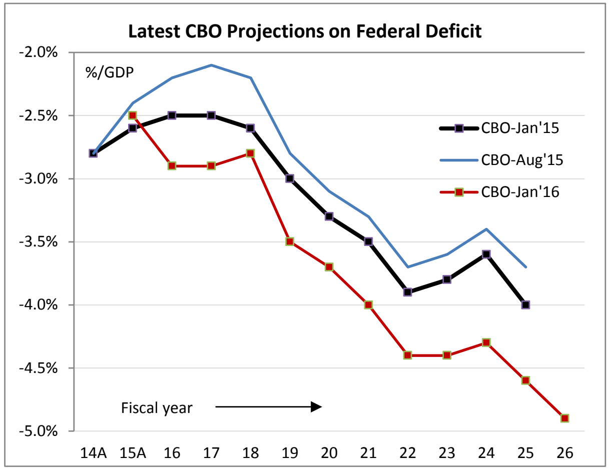


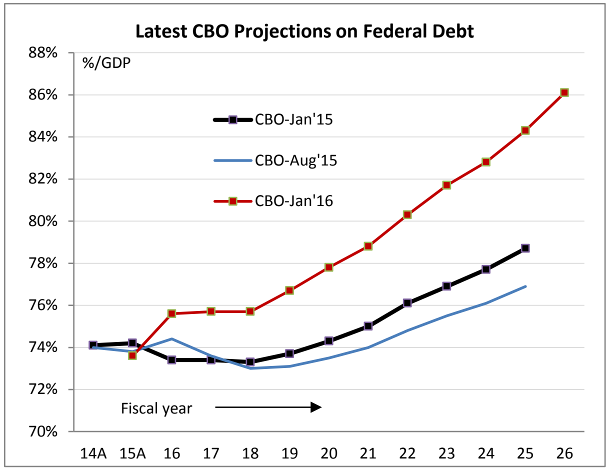


Government ... short term boost, long term problem

- The recovery in state and local revenues are finally boosting investment and hiring in that space.
- The federal budget will be a tailwind for a while on recent fiscal agreements in the House but the Congressional Budget Office has flagged serious challenges to correct the debt trajectory after 2017.





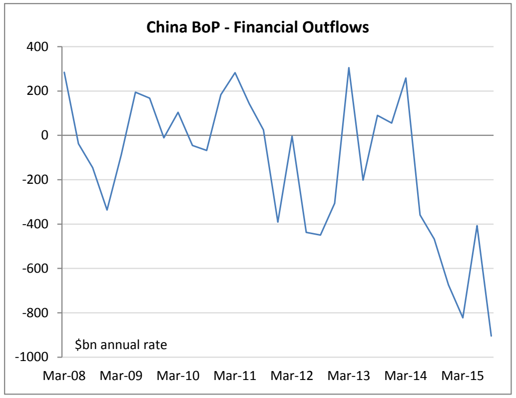


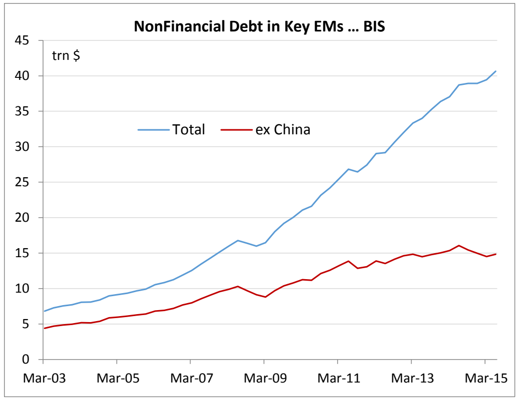
Global factors will remain a headwind

- China is key …. capital outflows and high debt compromise policy options.

Table 1. Overview of the *World Economic Outlook* Projections
(Percent change unless noted otherwise)

	Year over Year					
		Estimates	Projections		Difference from October 2015 WEO Projections 1/	
	2014	2015	2016	2017	2016	2017
World Output 2/	**3.4**	**3.1**	**3.4**	**3.6**	**–0.2**	**–0.2**
Advanced Economies	**1.8**	**1.9**	**2.1**	**2.1**	**–0.1**	**–0.1**
United States	2.4	2.5	2.6	2.6	–0.2	–0.2
Euro Area	0.9	1.5	1.7	1.7	0.1	0.0
Germany	1.6	1.5	1.7	1.7	0.1	0.2
France	0.2	1.1	1.3	1.5	–0.2	–0.1
Italy	–0.4	0.8	1.3	1.2	0.0	0.0
Spain	1.4	3.2	2.7	2.3	0.2	0.1
Japan	0.0	0.6	1.0	0.3	0.0	–0.1
United Kingdom	2.9	2.2	2.2	2.2	0.0	0.0
Canada	2.5	1.2	1.7	2.1	0.0	–0.3
Other Advanced Economies 3/	2.8	2.1	2.4	2.8	–0.3	–0.1
Emerging Market and Developing Economies 4/	**4.6**	**4.0**	**4.3**	**4.7**	**–0.2**	**–0.2**
Commonwealth of Independent States	1.0	–2.8	0.0	1.7	–0.5	–0.3
Russia	0.6	–3.7	–1.0	1.0	–0.4	0.0
Excluding Russia	1.9	–0.7	2.3	3.2	–0.5	–0.8
Emerging and Developing Asia	6.8	6.6	6.3	6.2	–0.1	–0.1
China	7.3	6.9	6.3	6.0	0.0	0.0
India 5/	7.3	7.3	7.5	7.5	0.0	0.0
ASEAN-5 6/	4.6	4.7	4.8	5.1	–0.1	–0.2
Emerging and Developing Europe	2.8	3.4	3.1	3.4	0.1	0.0
Latin America and the Caribbean	1.3	–0.3	–0.3	1.6	–1.1	–0.7
Brazil	0.1	–3.8	–3.5	0.0	–2.5	–2.3
Mexico	2.3	2.5	2.6	2.9	–0.2	–0.2
Middle East, North Africa, Afghanistan, and Pakistan	2.8	2.5	3.6	3.6	–0.3	–0.5
Saudi Arabia	3.6	3.4	1.2	1.9	–1.0	–1.0
Sub-Saharan Africa	5.0	3.5	4.0	4.7	–0.3	–0.2
Nigeria	6.3	3.0	4.1	4.2	–0.2	–0.3
South Africa	1.5	1.3	0.7	1.8	–0.6	–0.3
Memorandum						
Low-Income Developing Countries	6.0	4.6	5.6	5.9	–0.2	–0.2
World Growth Based on Market Exchange Rates	2.7	2.5	2.7	3.0	–0.3	–0.2
World Trade Volume (goods and services)	**3.4**	**2.6**	**3.4**	**4.1**	**–0.7**	**–0.5**





Source: International Monetary Fund, January 2016

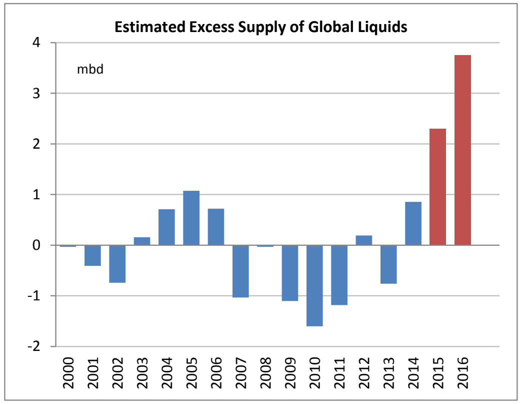
Inflation – Oversupplied energy might keep prices low

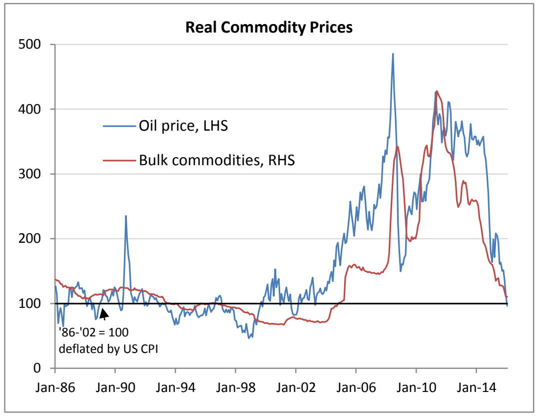
Global Liquids Demand and Supply (million barrels per day unless otherwise noted)

	2014	2015	Change	2016	Change
World liquids demand*					
North America	21.4	21.7	0.3	21.9	0.2
Europe	14.3	14.3	0.0	14.2	-0.1
OECD Asia	7.8	7.8	-0.1	7.7	0.0
Non-OECD Asia	22.9	23.3	0.4	23.9	0.6
China	10.8	10.8	-0.1	11.1	0.3
India	3.9	4.0	0.2	4.2	0.2
Latin America	8.9	9.2	0.3	9.3	0.1
Middle East	8.6	8.9	0.3	9.3	0.4
Eurasia/CIS	4.4	4.3	-0.1	4.3	0.0
Africa	3.7	3.9	0.1	4.0	0.1
Total world liquids demand	**92.0**	**93.3**	1.3	**94.5**	1.1
World liquids production	**2014**	**2015**	**Change**	**2016**	**Change**
Non-OPEC crude, of which ...	**45.5**	**46.3**	0.9	**45.9**	-0.4
North America	12.5	13.1	0.6	13.0	0.0
United States	*8.7*	*9.3*	0.6	*9.3*	0.0
Canada	*3.7*	*3.8*	0.0	*3.7*	0.0
Eurasia/CIS	13.4	13.5	0.1	13.4	-0.1
Latin America	6.4	6.5	0.1	6.5	-0.1
Brazil	*2.3*	*2.5*	0.2	*2.6*	0.1
Mexico	*2.4*	*2.3*	-0.2	*2.1*	-0.1
Europe	2.9	3.0	0.1	2.8	-0.2
Asia Pacific	7.1	7.2	0.2	7.3	0.1
Africa	1.9	1.9	0.0	1.8	-0.1
Middle East	1.3	1.2	-0.1	1.2	0.0
OPEC crude, of which ...	**30.2**	**31.4**	1.3	**33.5**	2.1
Saudi Arabia	*9.7*	*10.2*	0.4	10.8	0.6
Iraq	*3.2*	*4.0*	0.8	4.2	0.1
Iran	*2.8*	*2.9*	0.0	3.7	0.8
Kuwait	*2.8*	*2.8*	-0.1	2.7	0.0
UAE	*2.8*	*2.9*	0.1	2.9	0.0
Libya	*0.5*	*0.4*	-0.1	0.4	0.0
Nigeria	*2.0*	*1.9*	0.0	1.9	0.0
OPEC condensate and NGLs	**6.1**	**6.3**	0.3	**6.5**	0.3
Non-OPEC condensate and NGLs	**6.4**	**6.8**	0.3	**7.0**	0.3
Total world liquids production	**92.9**	**95.6**	2.7	**98.2**	2.6
Demand Vs Production (Green = Excess Supply)	**0.9**	**2.3**	**1.4**	**3.8**	**1.4**

Sources: CERA and CalPERS Internal estimates

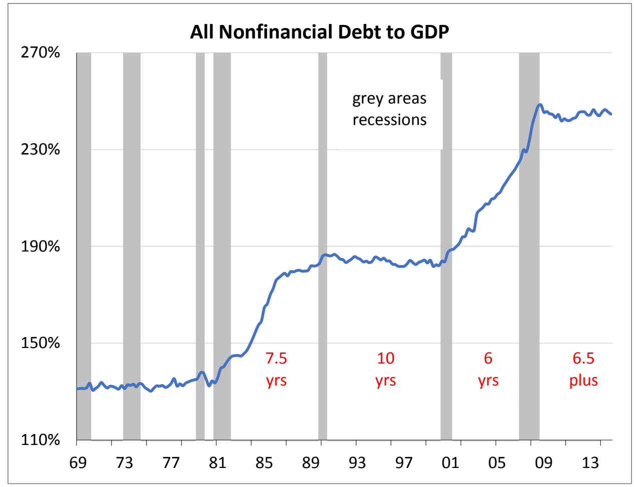
- "Super-cycle" commodity prices from the 2000s have completely retraced.

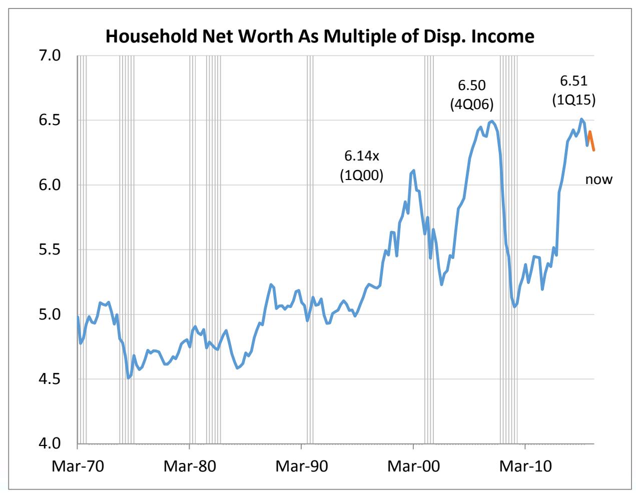




Domestic imbalances manageable but valuations are challenging

Expansion 4Q01 to 4Q07	Length 73-mo	Expansion 2Q09 to 4Q15	Length 78-mo
Household Debt	%/GDP	Household Debt	%/GDP
Start	102%	Start	128%
End	135%	Now	106%
Corporate Debt	YoY	Corporate Debt	YoY
Start	3%	Start	-1%
End	12%	Now	7%
Foreign Trade	%/GDP	Foreign Trade	%/GDP
Start	-3.3%	Start	-2.5%
Peak	-6.2%	Now	-2.7%
Federal Budget	$B	Federal Budget	$B
Start	+100	Start	-1255
End	-190	Now	-478
Net Worth to Income		Net Worth to Income	
Start	5.4	Start	5.1
End	6.5	Now	6.3
U-rate		U-rate	
High	6.3%	High	10.0%
Low	4.4%	Now	5.0%
CPI Inflation	YoY	CPI Inflation	YoY
Start	1.9%	Start	-1.4%
End	4.3%	Now	0.7%
Potential GDP	YoY	Potential GDP	YoY
Average	2.75%	So far	1.35%
		Expected	2%





- US leverage remains steady, like the 10 year expansion in the 1990s.
- A year ago, net worth looked elevated as an income multiple, and has since retraced.

II. Trust Level Overview

Program Role and Scope

Investment Program Strategic Objective

The overall objective of CalPERS' investment program is to provide members and beneficiaries with benefits as required by law. This will be accomplished through a carefully planned and executed long-term investment program that efficiently and effectively allocates and manages the assets of CalPERS.

Key Risks and Program Characteristics:

- Broad diversification of assets to minimize impact of individual security losses
- Prudent risk taking within the context of long-term investment horizon

PERF Policy Benchmark

CalPERS' Custom Policy Benchmark

- 5 Policy Asset Classes aligned with Asset Liability Management Target Weights

Asset Class	Interim Target Weight (Effective 7/1/2015)
GROWTH	61%
INCOME	20%
REAL ASSETS	12%
INFLATION	6%
LIQUIDITY	1%

- 14 Individual Benchmarks aligned with Strategies
- Customizations: Tobacco, Firearms, Iran/Sudan, Applies Emerging Market Principles

Investment Model

Guiding Philosophy

The Strategic Asset Allocation process seeks to support the long-term health and sustainability of the public pension system by deploying capital across asset classes in a manner that meets the long-term return expectations while taking prudent levels of risk and balancing the needs of beneficiaries and employer agencies.

Asset Liability Workshop

- Investable Asset Evaluation
- Long-Term Capital Market Assumptions
- Define Investment Constraints
- Portfolio Optimization
- Benchmark Evaluation

Investment Strategy

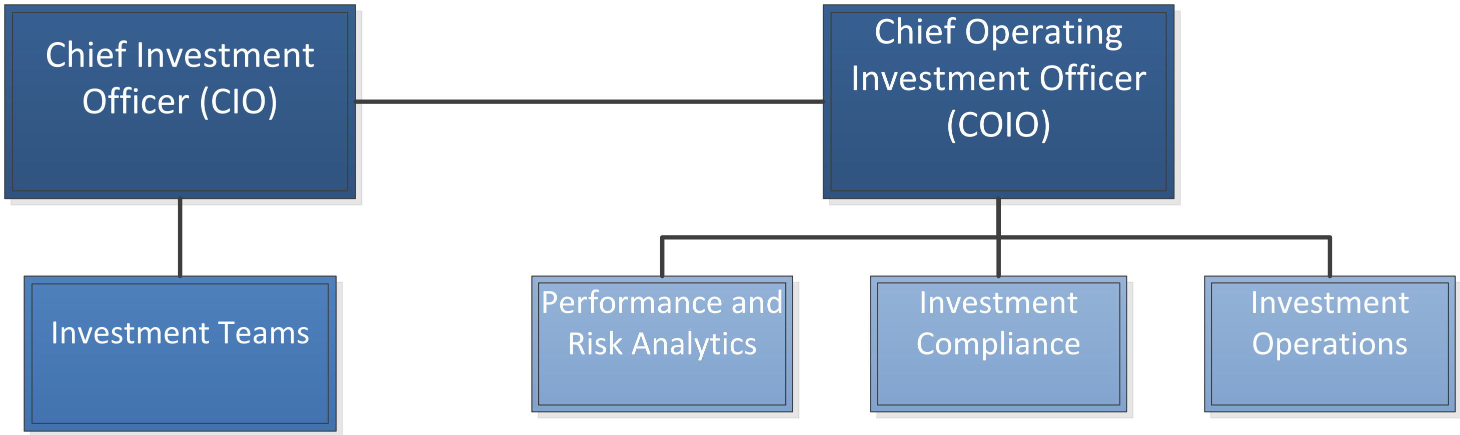
- Implementation Strategy & Capital Deployment
- Macro Economic Research
- Asset Class Research and Views
- Tactical Positioning

Monitoring and Evaluation

- Capital Market Assumption Evaluation
- Asset Class Evaluation
- Independent Risk and Analytics Engagement

Organizational Alignment

Investment Teams Supported by Dedicated Functional Groups



Team Oriented Approach with Support Areas that act as Key Internal Partners While Maintaining Clear Segregation of Duties

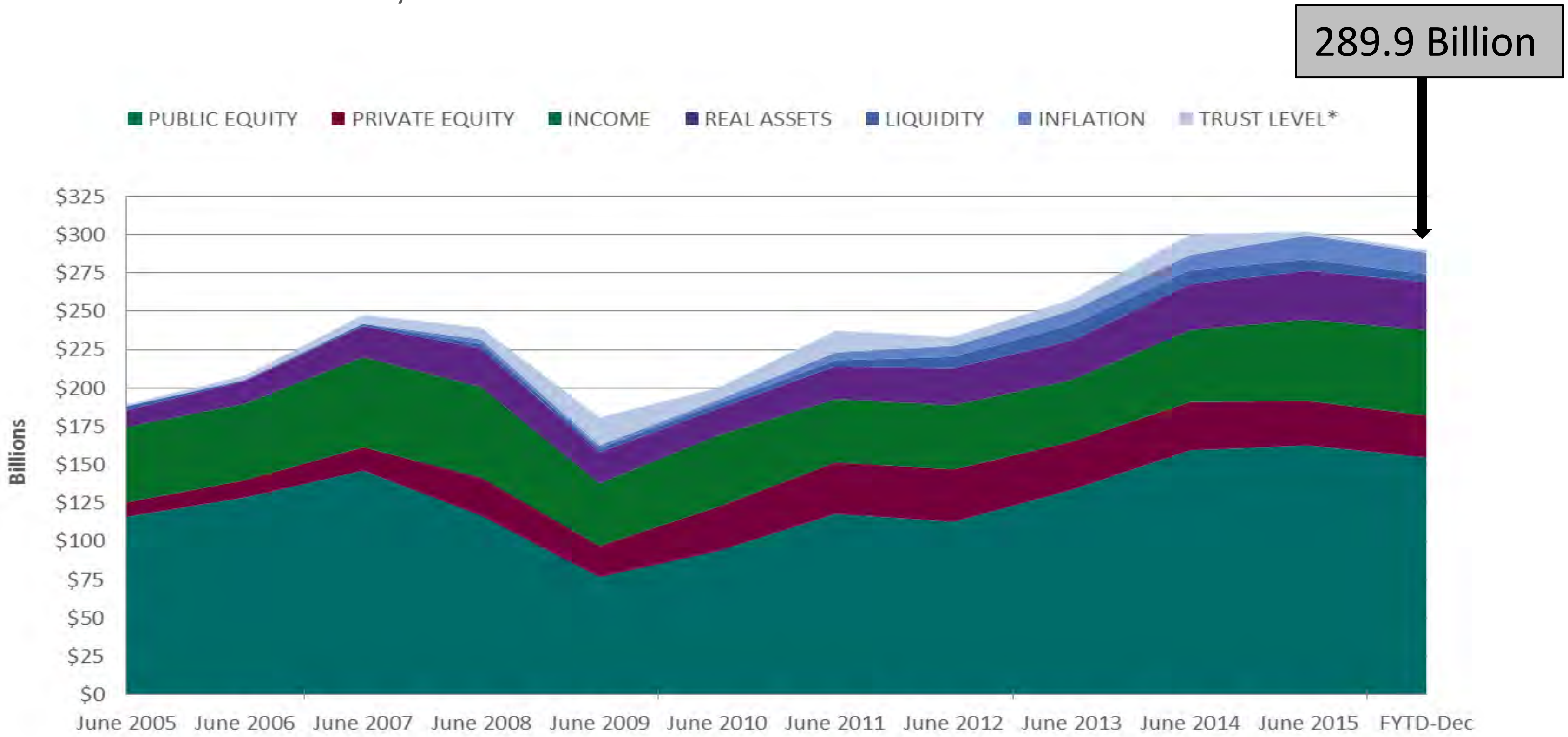
Trust Characteristics

As of December 31, 2015

• Trust Assets Managed	$300.1B
– PERF	$289.9B
– Long-Term Care Fund	$4.0B
– CERBT Funds	$4.5B
– Judges' Retirement System Fund II	$1.1B
– Health Care Fund	$0.4B
– Legislators' Retirement System Fund	$0.12B
– Judges' Retirement Fund	$0.04B

PERF Allocation Trend

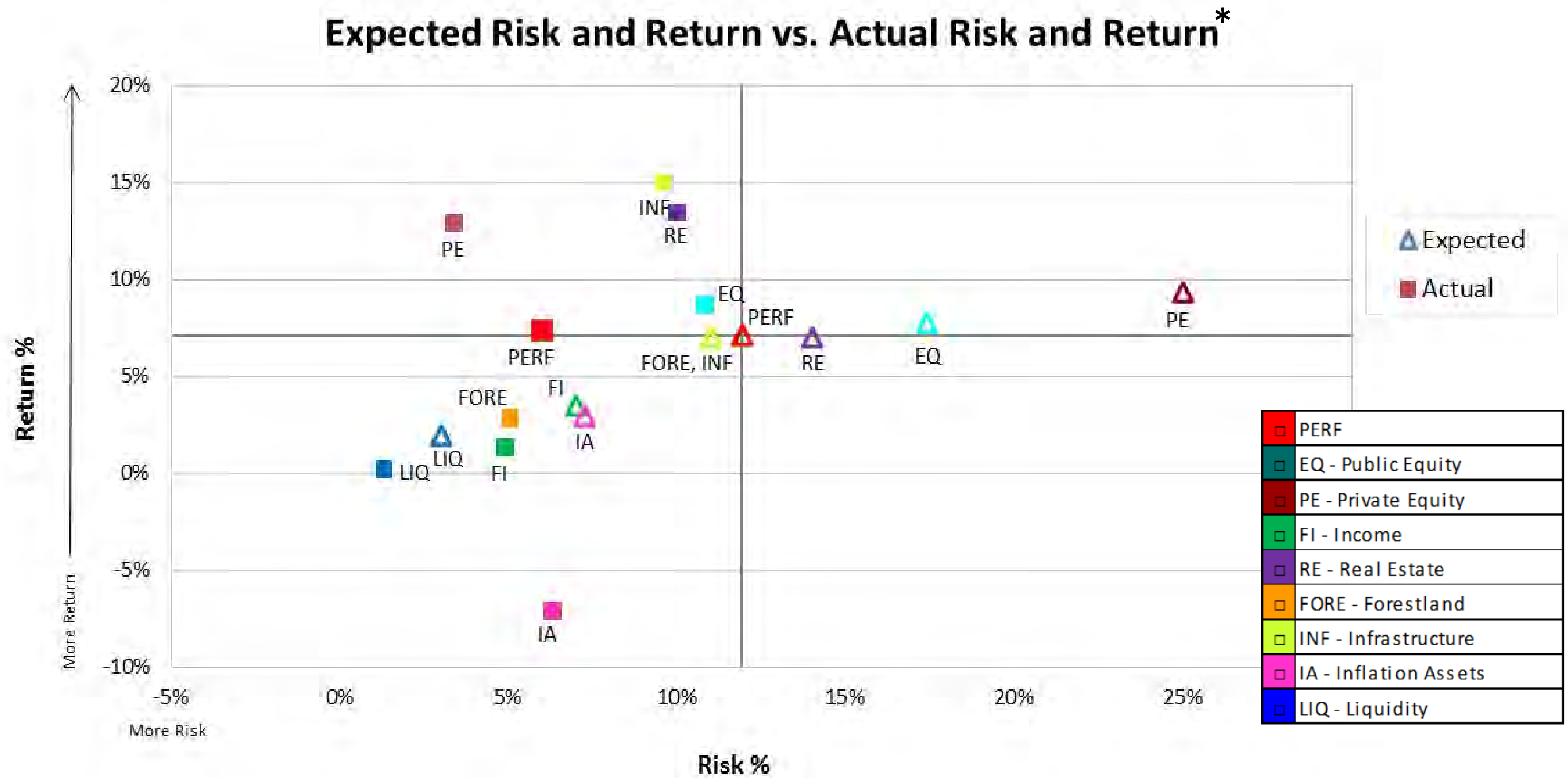
As of December 31, 2015



* Trust Level includes ARS, Multi-Asset Class (MAC), Overlay, Transition, and Plan Level Portfolios

III. Investment Review

PERF Asset Liability Management Assumptions



*Expected risk and return is based on the 2013 ALM Workshop and uses the short-term (1-10year) expected return from capital market assumptions; actual risk and return figures are 3 year figures

PERF Performance Summary

- The PERF generated -9 bps for the 1-year period ending December 31, 2015 and outperformed the Policy Benchmark by 54 bps
- Over the long-term, the 10- year and 20-year returns underperformed the strategic policy benchmark, primarily due to poor real estate returns in the mid-2000's

	1-YR Net Return	3-YR Net Return	5-YR Net Return	10-YR Net Return	20-YR Net Return
PERF	**(0.1%)**	**7.3%**	**7.2%**	**5.1%**	**7.1%**
POLICY INDEX	**(0.6%)**	**6.8%**	**7.1%**	**6.2%**	**7.3%**
Excess Return	0.5%	0.5%	0.1%	(1.1%)	(0.2%)

Affiliate Plans Performance Summary

- Most Affiliate Plans outperformed their respective benchmarks over the 1-year period
- The 3 & 5-year year return periods for all Affiliate Plans outperformed their respective benchmarks

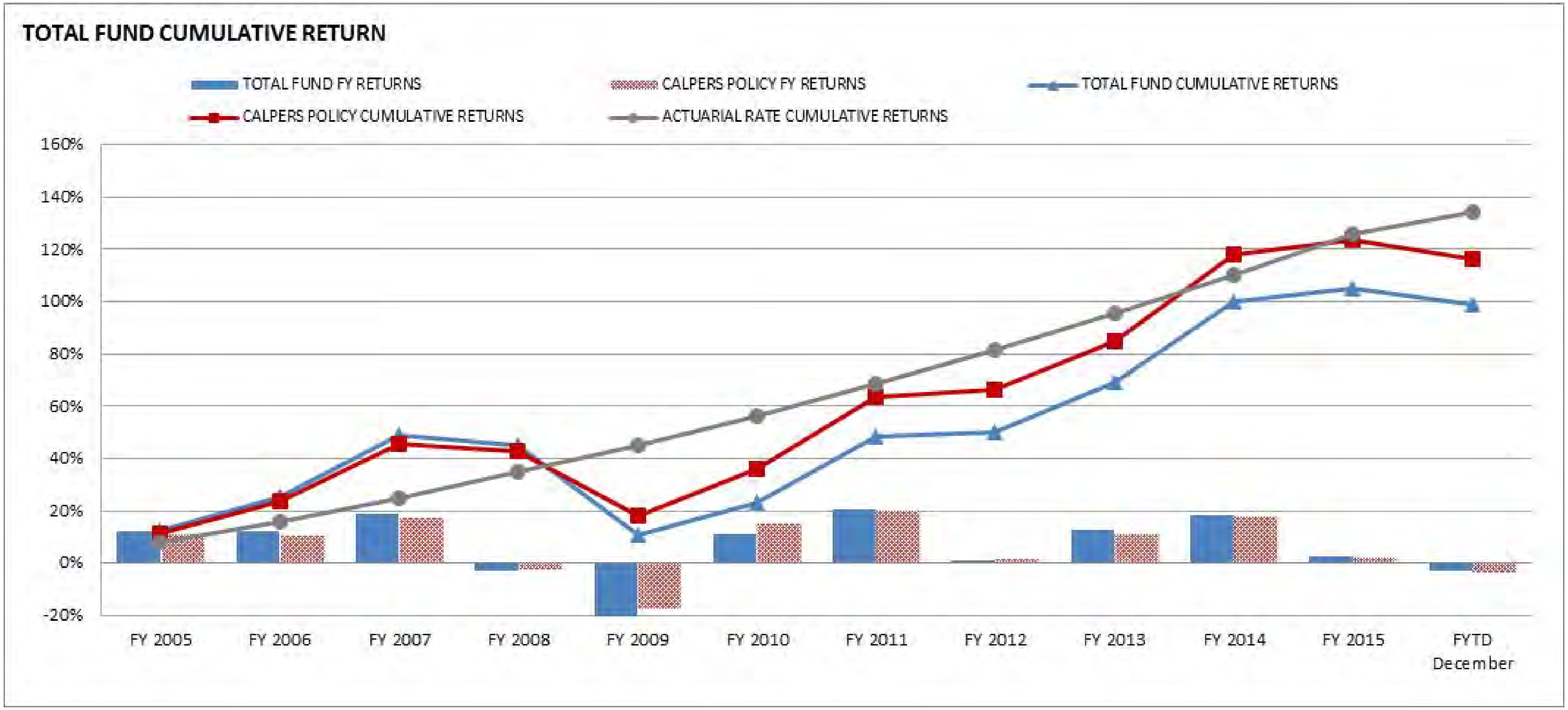
	1-YR		3-YR		5-YR		10-YR	
Affiliate Plans	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS
JUDGES' RETIREMENT FUND	0.2%	11	0.1%	3	0.1%	1	1.4%	13
JUDGES' RETIREMENT SYSTEM II FUND	-2.2%	0	5.6%	18	6.6%	2	5.5%	(5)
LEGISLATORS' RETIREMENT SYSTEM FUND	-2.1%	(3)	3.1%	32	5.4%	15	5.4%	21
CERBT STRATEGY 1	-2.2%	24	5.5%	34	6.1%	15	-	-
CERBT STRATEGY 2	-2.1%	9	4.1%	29	-	-	-	-
CERBT STRATEGY 3	-2.0%	7	2.9%	37	-	-	-	-
CALPERS HEALTH CARE BOND FUND	0.6%	9	2.0%	59	3.8%	56	4.8%	29
LONG-TERM CARE FUND	-2.6%	28	1.5%	36	3.8%	21	4.5%	15

PERF Contribution to Return

Asset Class	Average Weight (%)	1-Year Return (%)	Contribution to Return (%)
GROWTH	63.1	-1.2	-0.7
PUBLIC EQUITY	*53.7*	*-2.3*	*-1.2*
PRIVATE EQUITY	*9.4*	*5.5*	*0.5*
INCOME	19.0	-1.4	-0.3
REAL ASSETS	10.7	14.0	1.5
REAL ESTATE	*9.2*	*15.5*	*1.4*
FORESTLAND	*0.8*	*-0.0*	*0.0*
INFRASTRUCTURE	*0.8*	*11.0*	*0.1*
LIQUIDITY	1.7	0.6	0.0
INFLATION	4.9	-11.3	-0.6
TRUST LEVEL	0.6		0.0
PERF	100	-0.1	-0.1

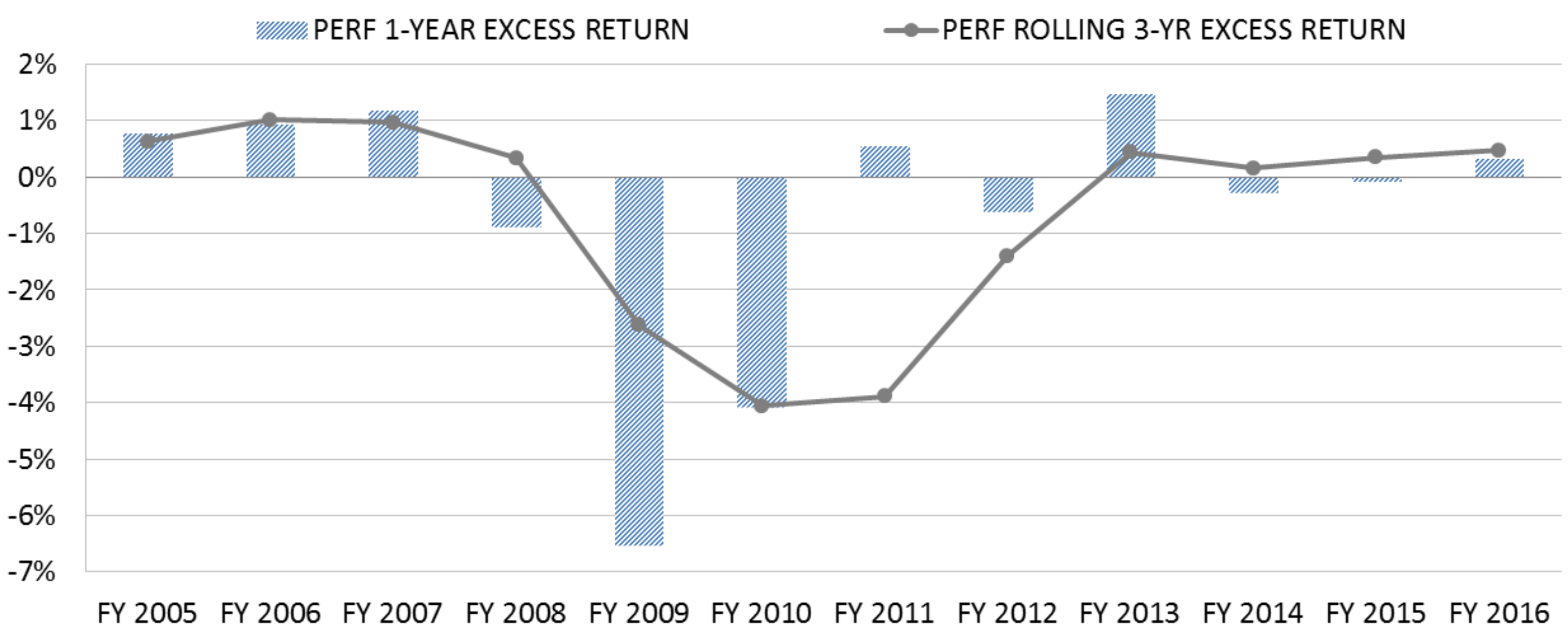
- Public Equity (-1.2%) and Real Estate (1.4%) were primary contributors to returns

PERF Cumulative Returns

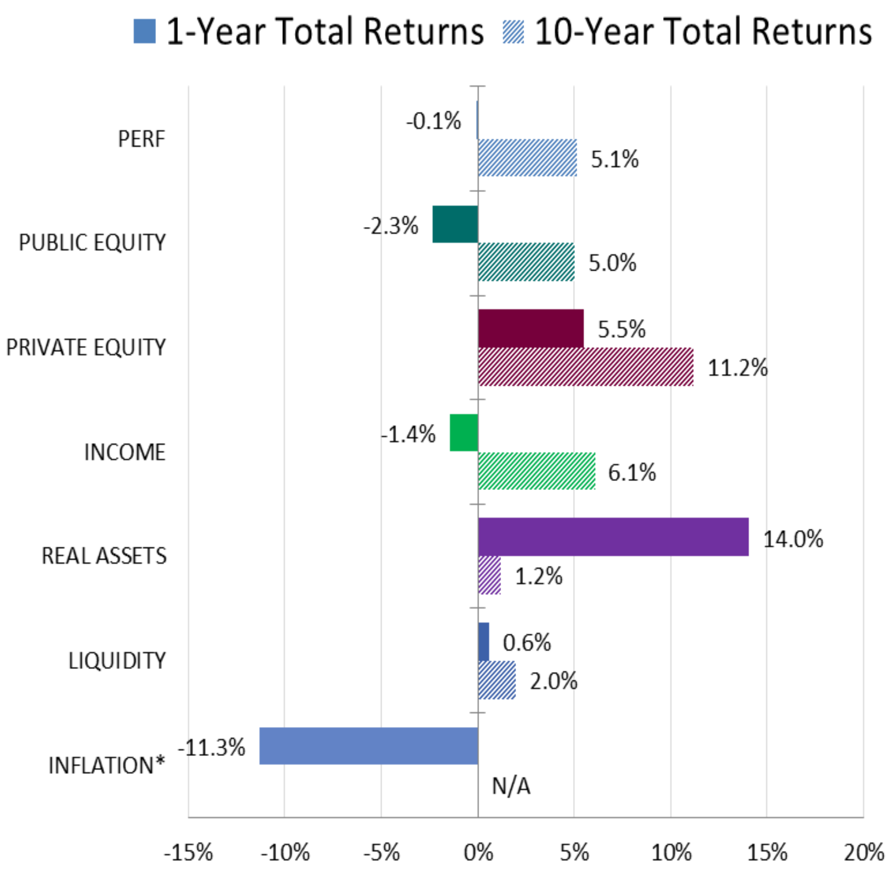


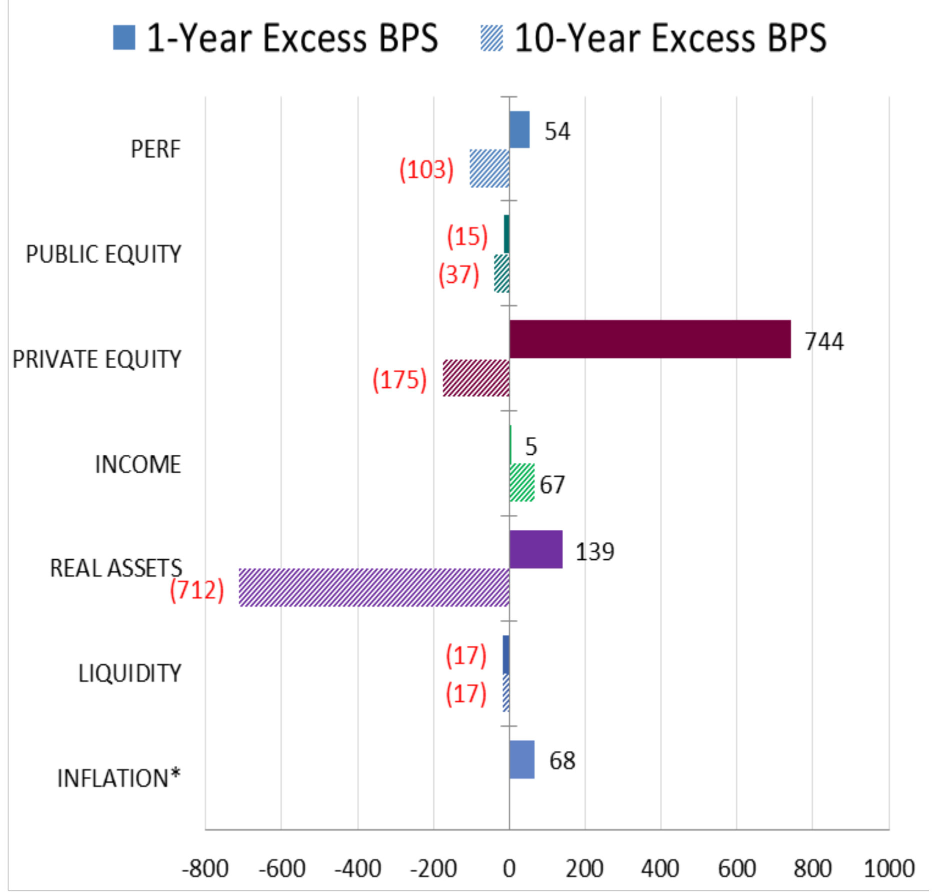
Note: Actuarial Rate of Return FY 2003-12 was 7.75%. FY 2012-FY2015 rate is 7.5%. :

PERF Rolling 3-Year Excess Return



PERF Short-Term vs. Long-Term Performance





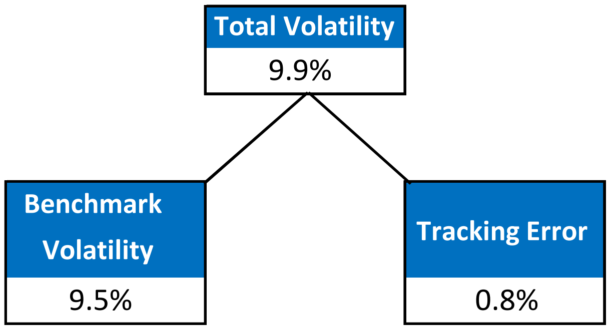
*Inflation has an inception date of October 2007, therefore 10-year returns and excess BPS are unavailable

PERF Risk Highlights

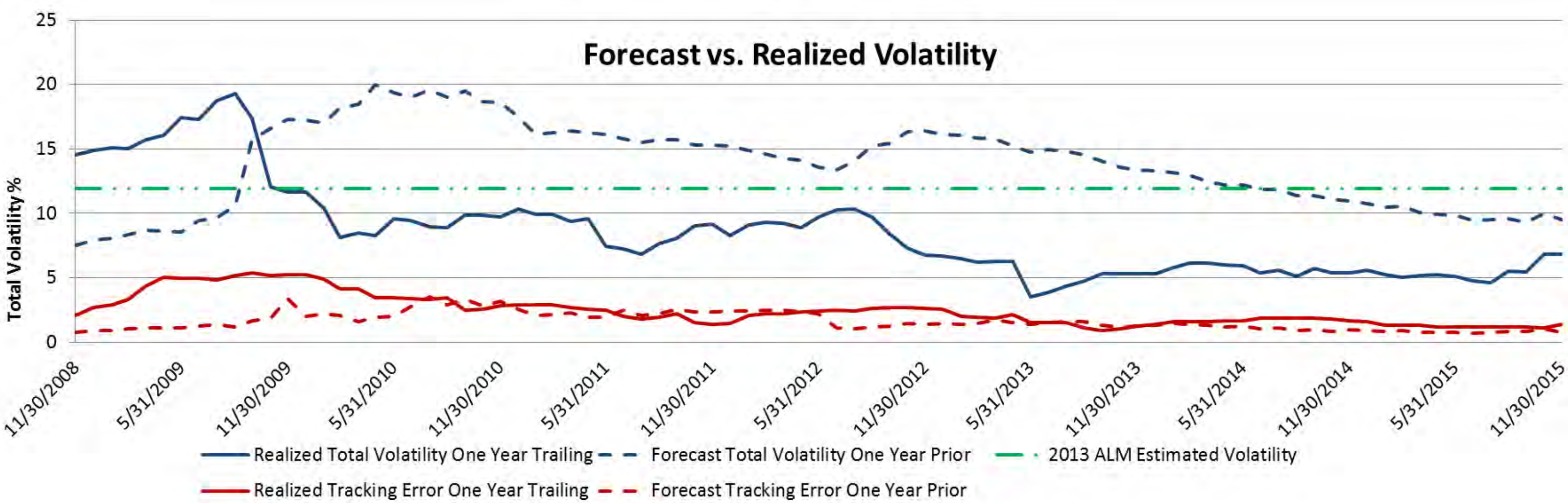
- Total plan forecast volatility was 9.9%, still below the 11.9% ALM estimate
  - Recent increases in market volatility will lead this projection to rise modestly
- Forecast active tracking error of 0.8% remains within guidelines of 1.5%
- The Growth portfolio (Public Equity + Private Equity) contributes 86% of expected volatility
- The January 2016 stock market decline was a “VaR event”: for the 10 days preceding January 15, the Public Equity portfolio lost $13.5bn or 8.8%, exceeding the most recent VaR estimate of $7.2bn
  - Equity losses of this magnitude are not unusual. We expect to exceed our VaR thresholds slightly more than once per year
  - During the same 10 day period, Fixed Income generated a positive $0.5bn
- Counterparty risk remains within tolerances, despite elevated market volatility. As of January 29, US bank CDS spreads averaged 29 bps
- Liquidity coverage remains adequate. As of December 31, one month projected cash flow was 2.0x our projected cash needs

PERF Volatility Profile

As of November 30, 2015

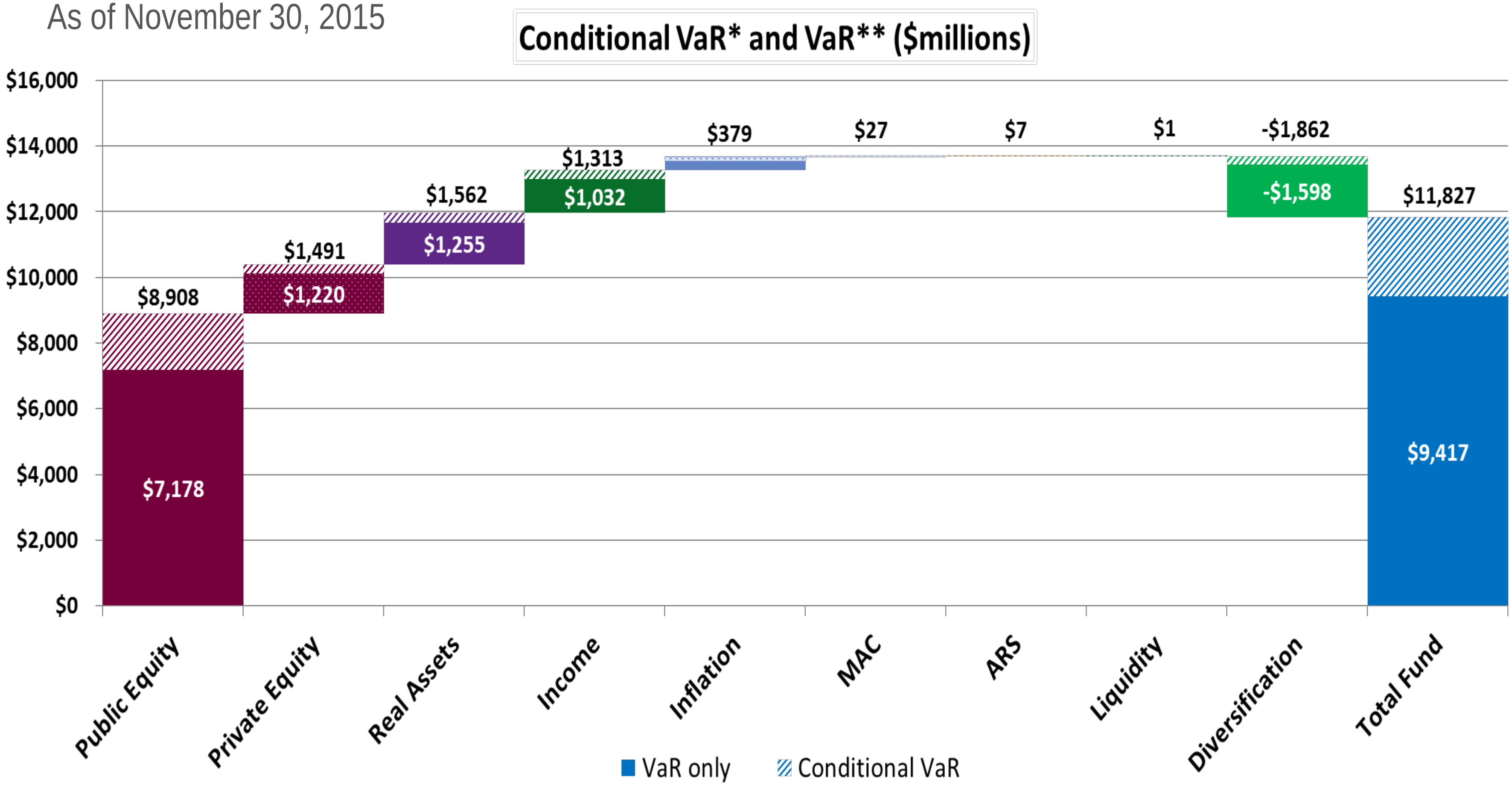


- Total Fund Forecast Volatility of 9.9% is below the 11.9% ALM Estimated Volatility
- Forecast Tracking Error of 0.8% is within guidelines of less than 1.5%



Absolute Value at Risk Estimate

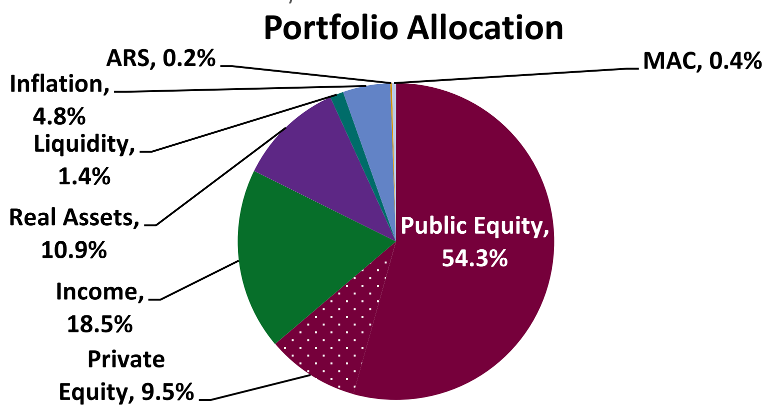
As of November 30, 2015

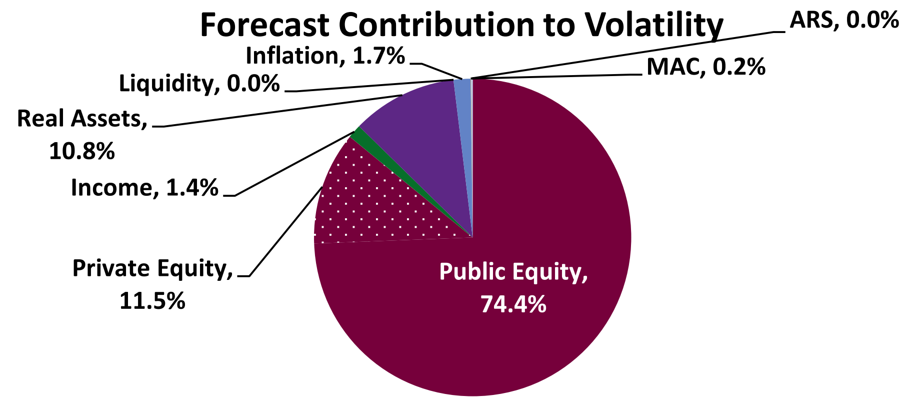


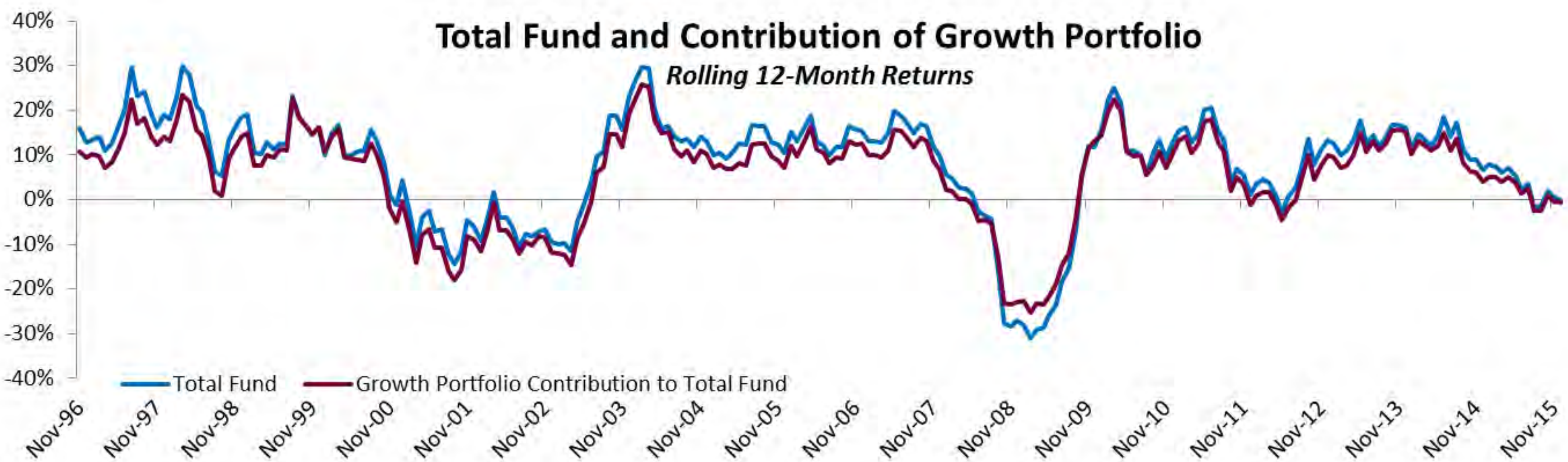
*10 day, 95% confidence Value at Risk simulation. Conditional Value at Risk measures the mean of the tail distribution beyond the 95% confidence level.
**10 day, 95% confidence Value at Risk.

Growth Assets Dominate Risk and Return

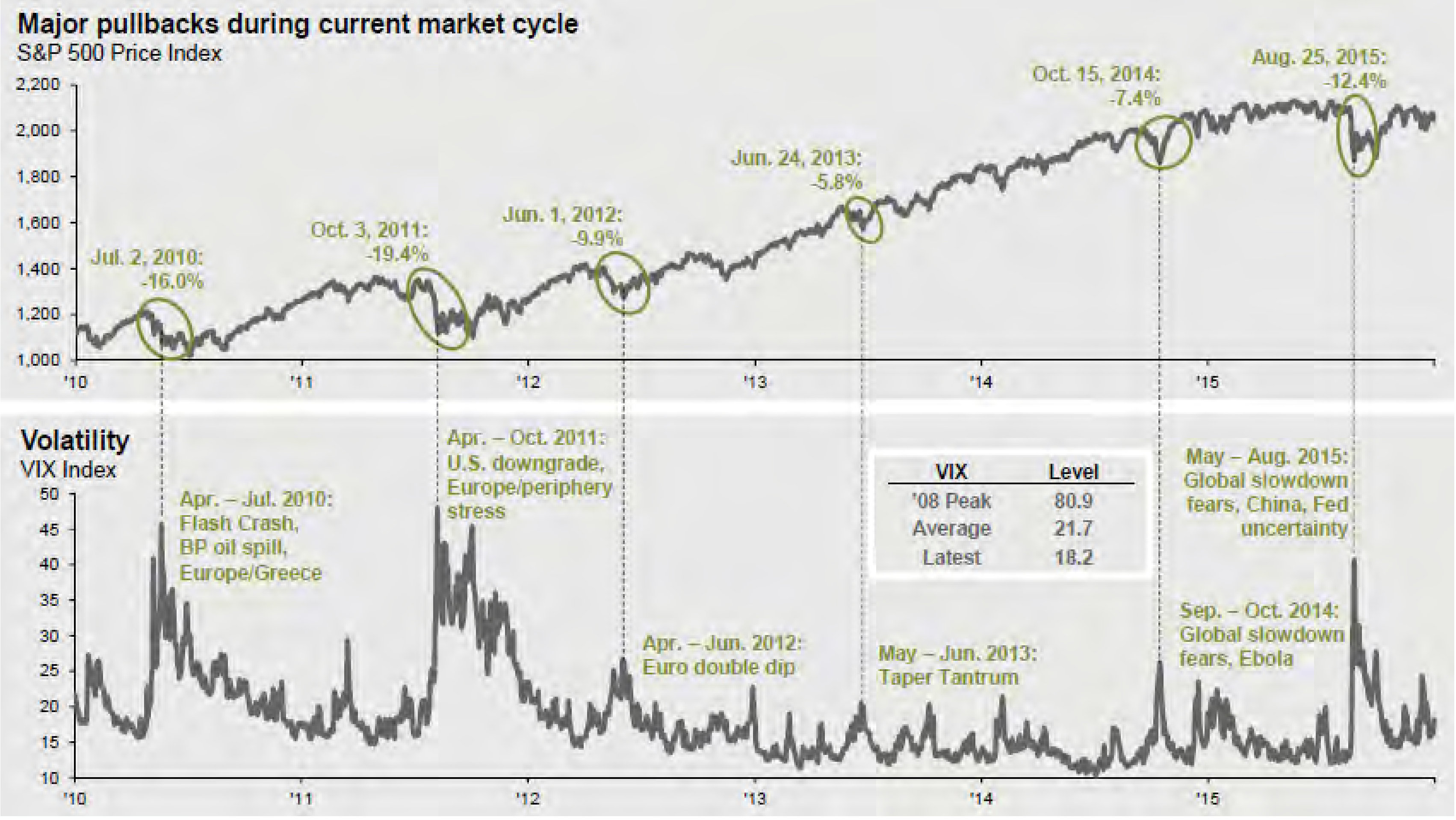
As of November 30, 2015







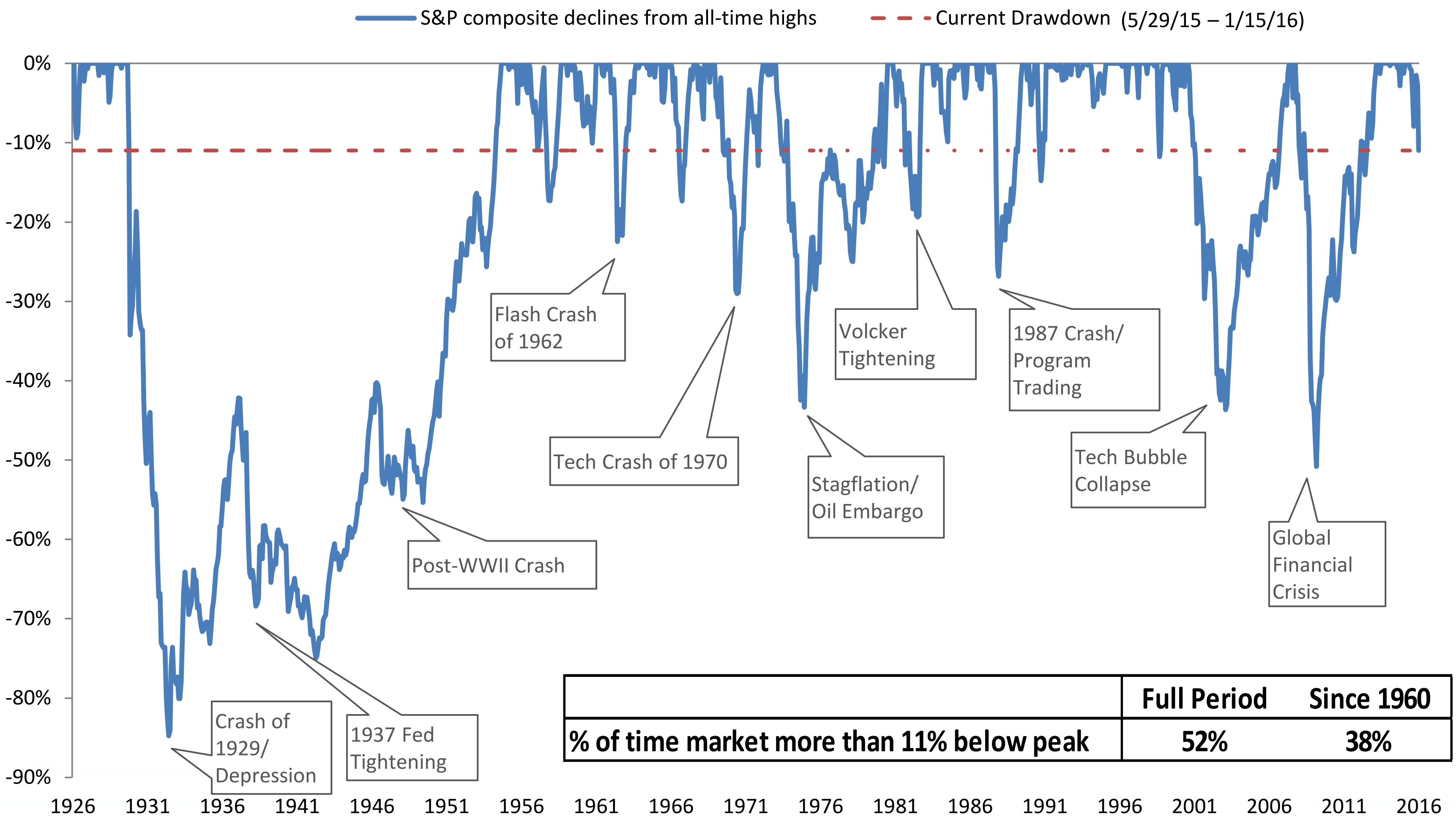
Equity Market Volatility



VIX	Level
'08 Peak	80.9
Average	21.7
Latest	18.2

Chart Source: J.P. Morgan Asset Management's *Guide to the Markets,* December 31, 2015

Current Equity Drawdown in Perspective



	Full Period	Since 1960
% of time market more than 11% below peak	52%	38%

Source: Robert Shiller, Bloomberg, J.P. Morgan Asset Management

S&P Composite Index since 1900

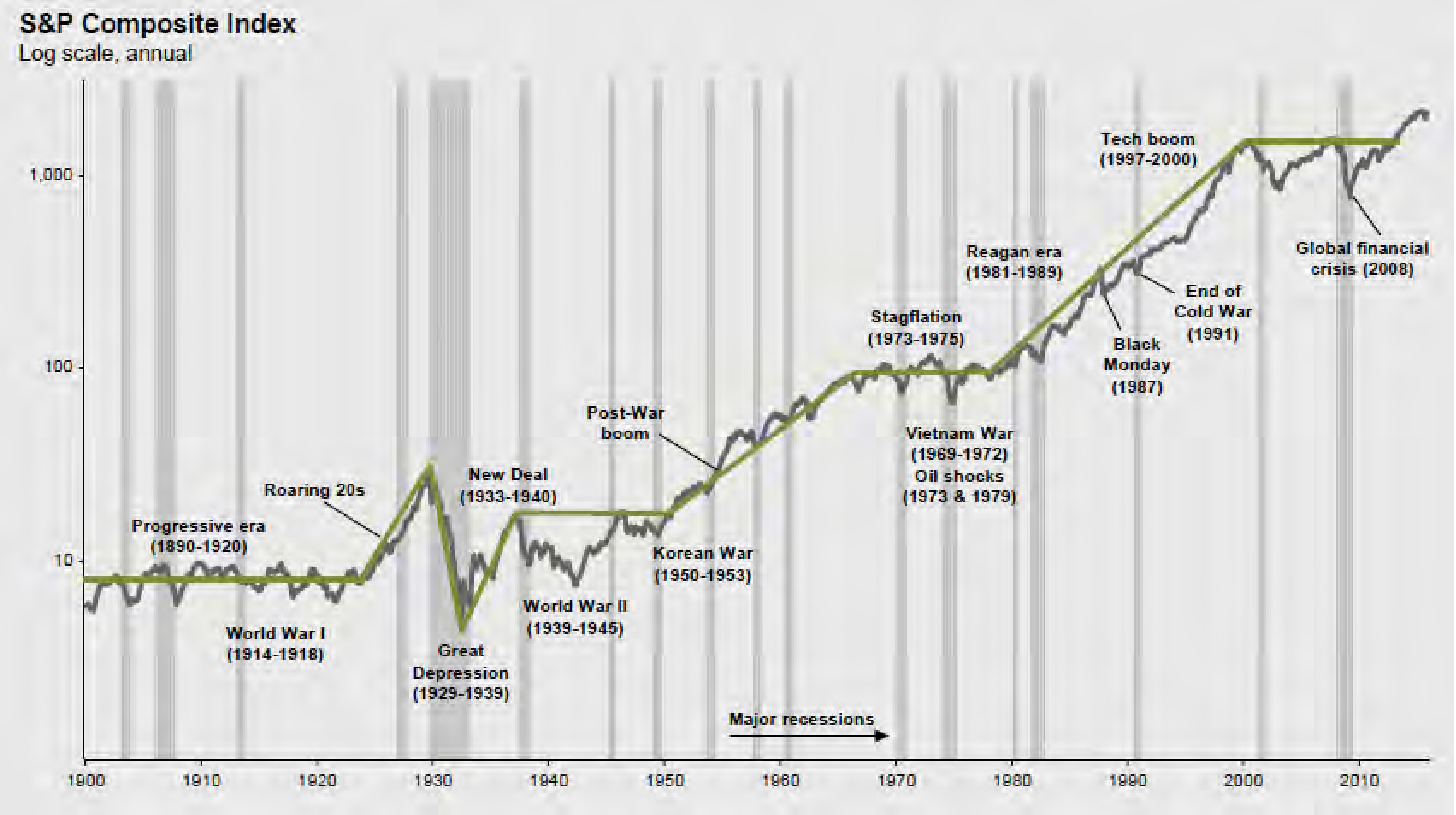
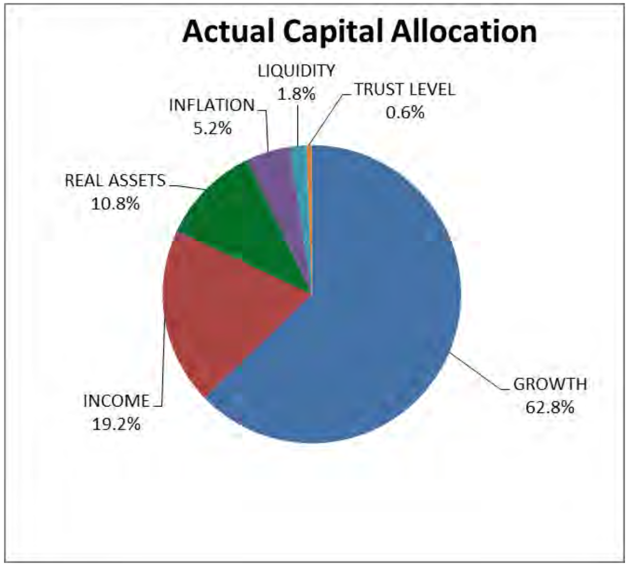


Chart Source: J.P. Morgan Asset Management's *Guide to the Markets,* December 31, 2015

PERF Asset Allocation

As of December 31, 2015

	Actual Allocation (%)	Interim Strategic Target (%)*	Variance (%)
GROWTH	**62.8%**	**61%**	**1.8%**
PUBLIC EQUITY	*53.4%*	*51%*	*2.4%*
PRIVATE EQUITY	*9.4%*	*10%*	*-0.6%*
INCOME	**19.2%**	**20%**	**-0.8%**
REAL ASSETS	**10.8%**	**12%**	**-1.2%**
REAL ESTATE	*9.3%*	*10%*	*-0.7%*
FORESTLAND	*0.8%*	*1%*	*-0.2%*
INFRASTRUCTURE	*0.8%*	*1%*	*-0.2%*
INFLATION	**4.8%**	**6%**	**-1.2%**
LIQUIDITY	**1.8%**	**1%**	**0.8%**
TRUST LEVEL	**0.6%**	**N/A**	**0.6%**
ARS	*0.2%*	*N/A*	*0.2%*
MAC	*0.4%*	*N/A*	*0.4%*
OVERLAY+TRANS+PLAN	*0.0%*	*N/A*	*0.0%*
TOTAL FUND	**100.0%**	**100.0%**	**0.0%**



*Interim strategic targets were adopted by the Board and effective July 1, 2015.

PERF Positioning

- Asset allocations are closely aligned with the 2013 ALM workshop interim targets, reflecting on slower illiquid asset class deployment
- More than 60% of the portfolio is allocated to Growth Assets; Public Equity and Private Equity will continue to be the primary contributors and drivers of performance
- The over allocation to Public Equity and under-allocation to Real Assets and Fixed Income during the year had a negative impact on returns, partially offset by a positive impact from an under-allocation to Inflation relative to the Policy Benchmark

Conclusion

- The PERF generated -9 bps for the 1-year period ending December 31, 2015 and outperformed the Policy Benchmark by 54 bps
- Affiliate Plans captured strong relative performance over the 3-year and 5-year return periods
- Portfolio volatility continues to be driven almost entirely by Growth assets