CalPERS Trust Level Review

Period Ending June 30, 2016

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Investment Committee
August 2016

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Executive Summary

Economic and Market Conditions

- US indicators edge toward late cycle performance. Economic policies here and abroad tilt further toward mitigating multiple risks.

Trust Level Performance

- Public Employees' Retirement Fund (PERF) returned 0.61% for the 1 year period ending June 30, 2016
- Affiliate Plans experienced positive returns ranging from 0.3% to 6.0%

Portfolio Risk

- PERF Portfolio volatility continues to be driven predominantly by Growth assets

Review Outline

I. Economic and Market Overview
   i. Economic Environment
   ii. Market Environment

II. Investment Review
   i. Performance
   ii. Positioning and Risk

I. Economics and Market Overview

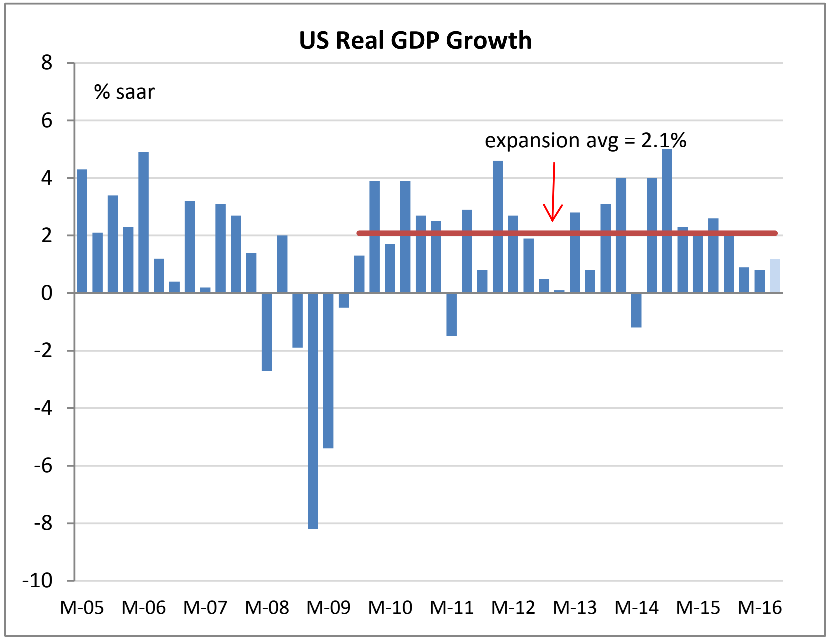
Economic Trends

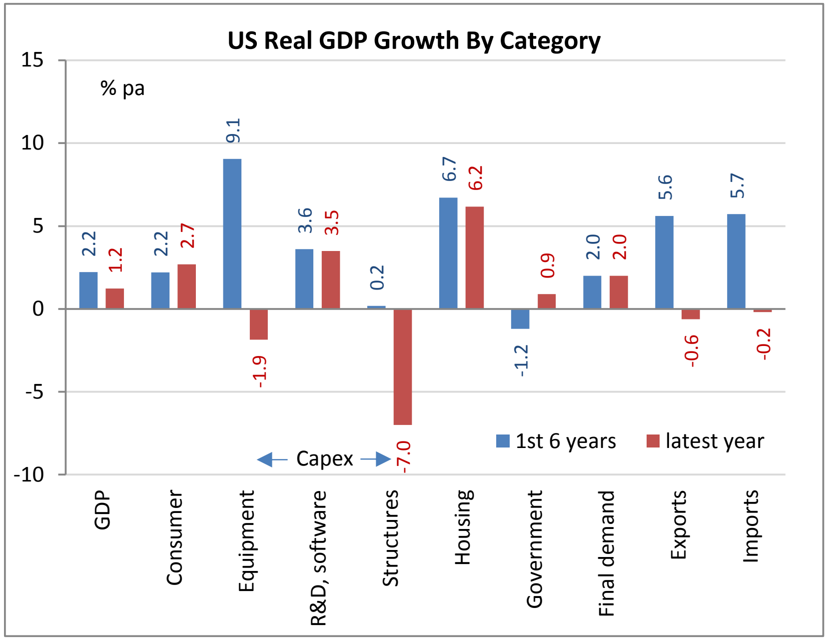
- Negatives could have larger market impact than positives.

Positive	Same Trend	Negative
- Stronger consumer Real consumer spending averaged 3% in 1H16 and tracking at that or higher in 3Q16. **- Modest improvement in 2Q16 profits** It looks as though 1Q16 profits and sales were at least a temporary bottom **- Drag from mining investment set to dissipate** Mining activity is so low that it could at worst stabilize. **- Reemergence of some inflation** More stable commodity prices, stronger wages (3.6%) and higher core services inflation (3.2%). **- Further policy responses abroad** US, UK, BoJ, ECB, BoE, China and othr PacRim all still in easing mode **- US borrowing costs remain low** Arguably US 10yr bond yield is 200 bps lower because of easy policy abroad (+ US HH sector).	**- Low productivity** Has averaged less than 1% pa during current economic expansion vs 2.5% in the last one **- Household incomes and balance sheet** Steady real disposable income drives risk buffer and a domestic savings pool for asset markets. **- Steady and manageable global trade imbalances** US deficit in 2-3%/GDP range whilst Euro area, Japan and China all at 2-3% surpluses.	**- US growth weakens** US GDP growth averaged just 1% in first half and 1.2% YoY **- Soft capex** Led by weaker investment in mining sector but now others have softened. **- Tight labor markets** Available persons to fill job openings very tight at 2.4 … exacerbated by skills mismatch. **- Modest tightening of credit conditions ….** … according to the Senior Loan Officers's Survey … however corporate borrowing costs remain low. **- Multiple global economic downside risks** Amongst these … Brexit, faltering Japanese growth and China debt **- Geopolitical challenges** Trend toward isolationism and protectionism may gather steam

US Economic Growth Slows In Past Year

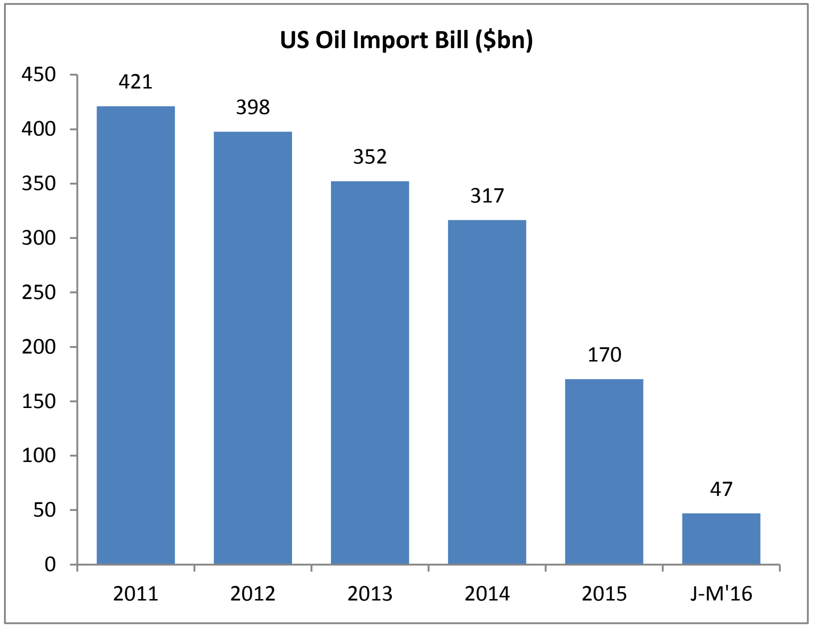
- The US economic expansion is now 7 years long.
- The past year has been slower than the first six. Soft business investment and inventory reduction have been key reasons.

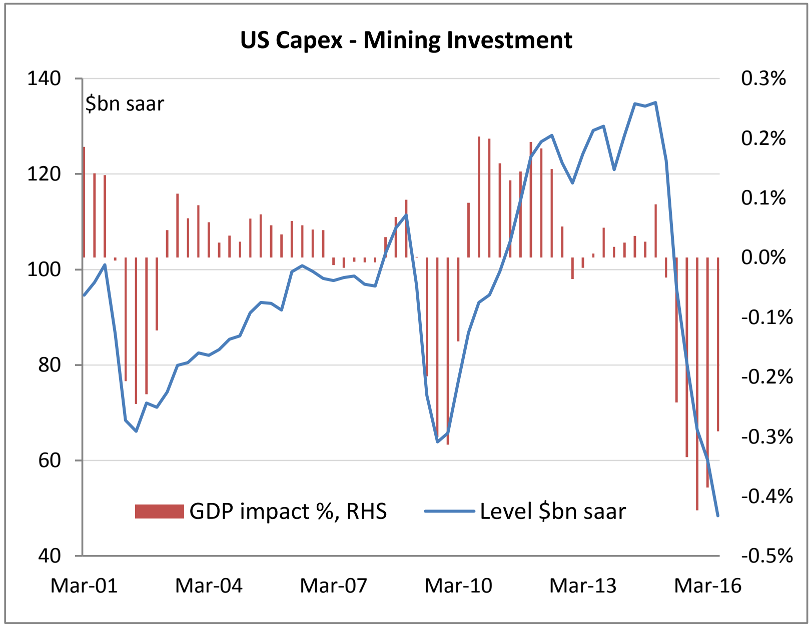




Mixed Economic Impact From Lower Oil Prices

- Lower Oil prices and higher domestic production have sharply reduced the US' oil import bill.
- However the ensuing sharp reduction in mining investment hurts GDP.





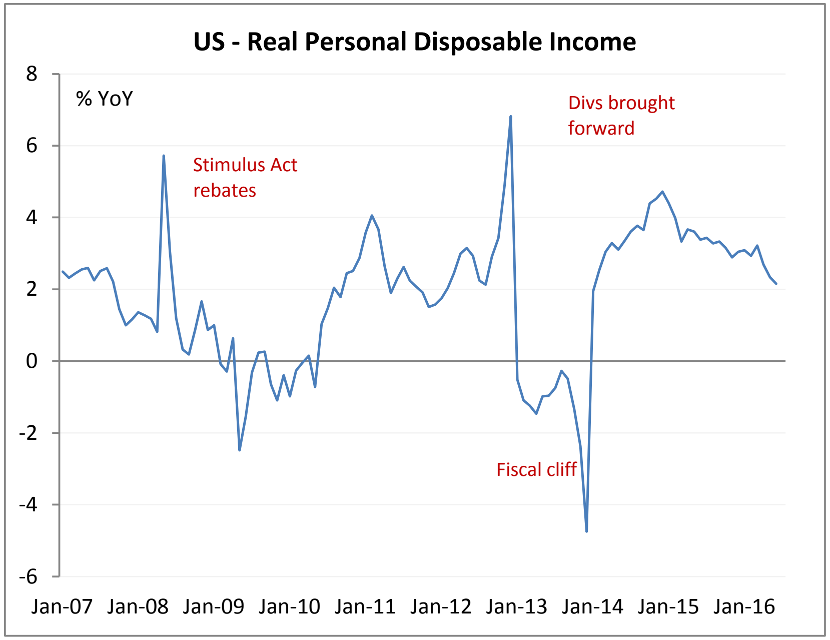
Domestic Drivers of Growth During Past Year

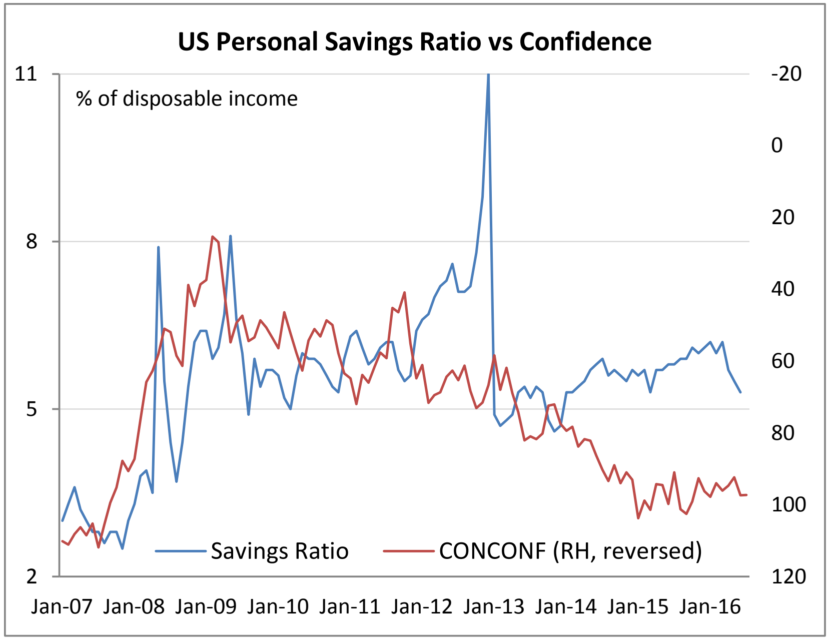
- Household (+3%) – With real disposable income growing strongly, households have been spending more on electronics, furniture, air travel, healthcare etc.
- Business (-1%) – Capex softness spreading… mining related, aircraft and heavy machinery. IT and Autos topping out.
- Housing (+6%) – Better household formation and high appetite to buy have driven a gradual acceleration of building.
- Government (+1%) – Improved State and Local revenues and recent budget agreements have modestly reversed fiscal drag.

(bracketed numbers are estimated real growth rates in the year to June 2016)

Household Spending Has Strong Underpinnings

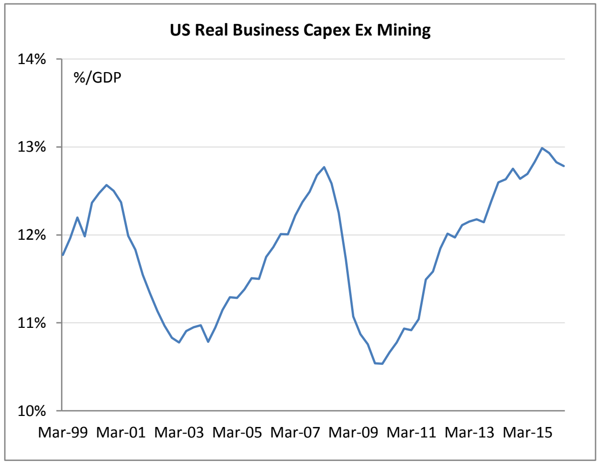
- Consumer buying power has been enhanced by strong incomes growth vs low inflation.
- Unlike the back end of the last expansion, this time householders have also saved a good portion of their improved incomes.

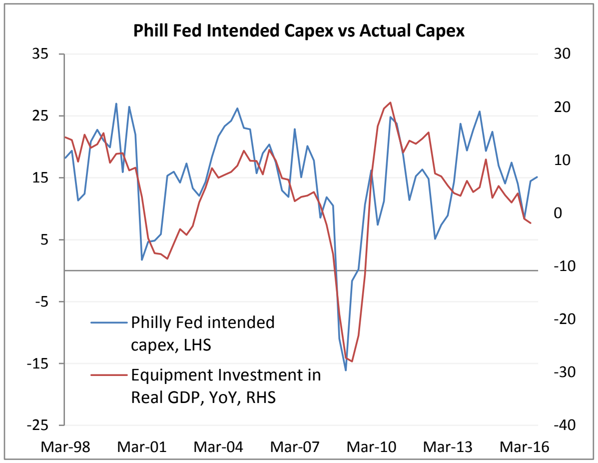




Business Spending Is Cooling Off

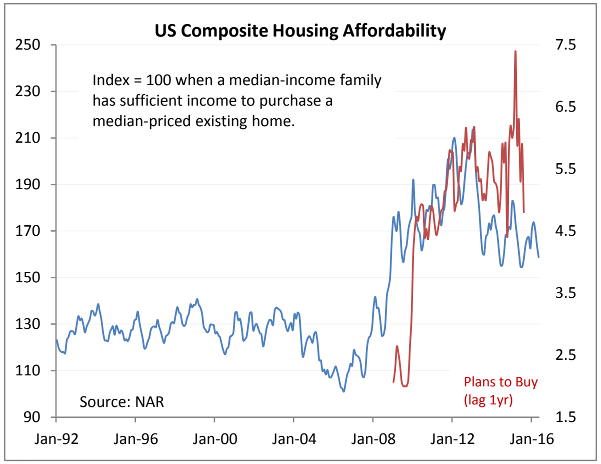
- Real business capex (ex mining) is operating at a high GDP share.
- However, strong cash reserves and increased corporate borrowing have not been recycled into productivity enhancing investments.
- Surveys suggest that capex going forward will be quite soft.

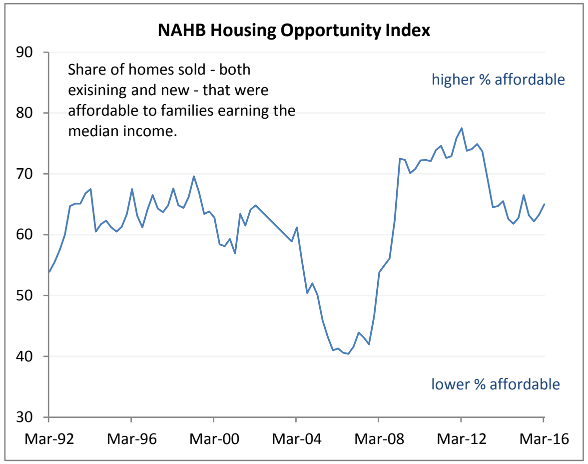


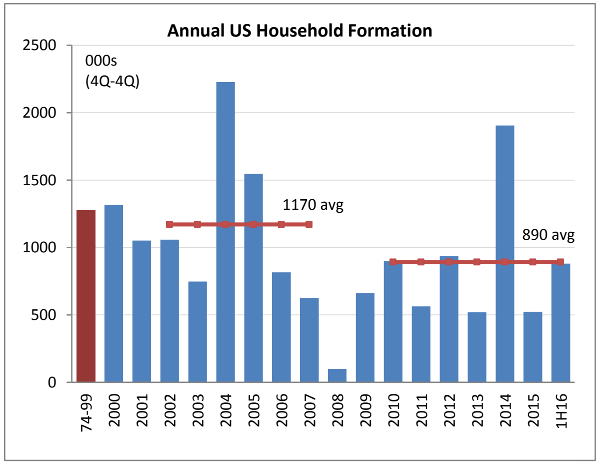


Housing is Still An Upside Growth Contributor

- Housing remains significantly more affordable than at the peak of the 2000s ‘bubble’.
- Household formation has rebounded to around 1 million per year, double the rate during the recession but half the rate during the prior boom.







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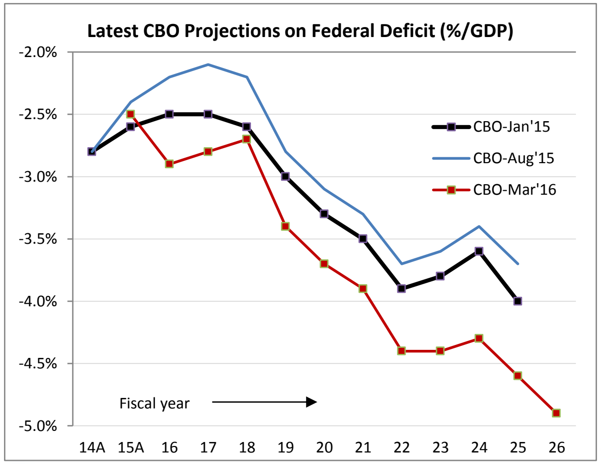
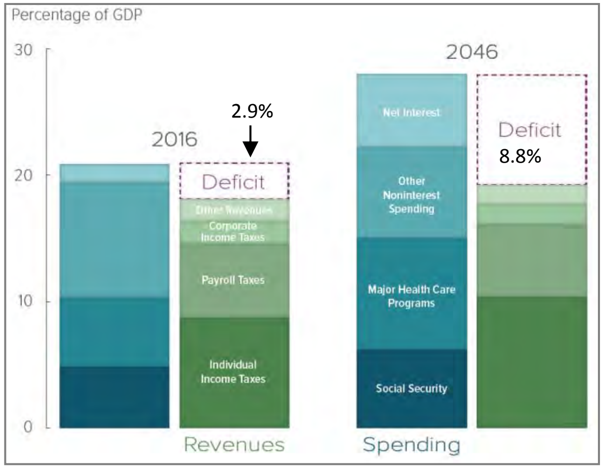
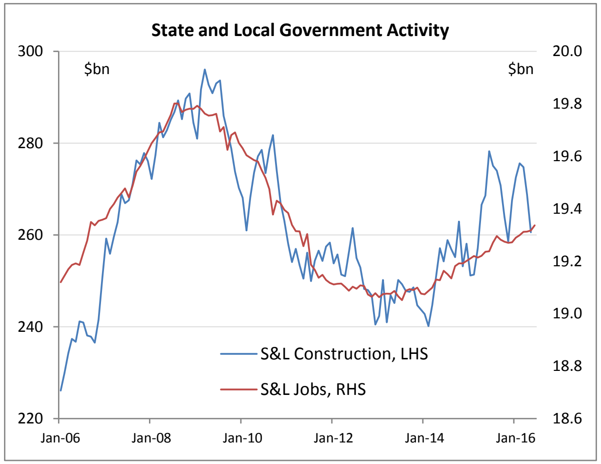
Government – Long Term Challenges for the Federal Budget

- Obligations arising from major healthcare programs and social security are projected to rise by 5 points of GDP in the next 30 years.
- State and Local Government activity has recovered somewhat.

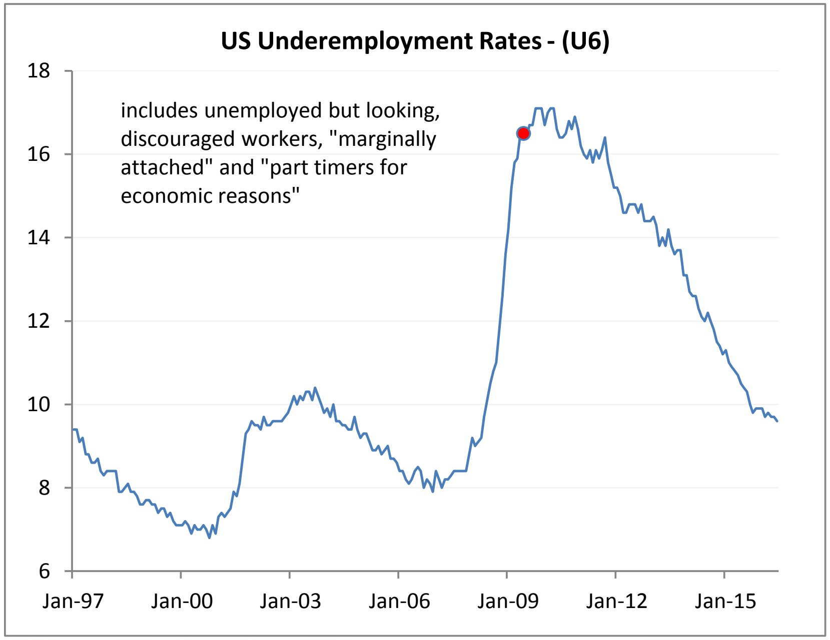


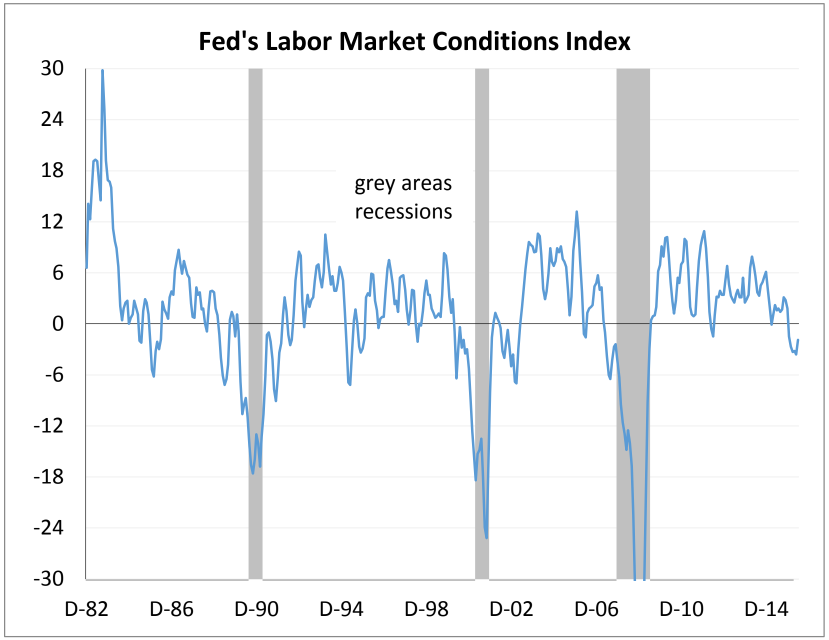




US Labor Market is Tightening

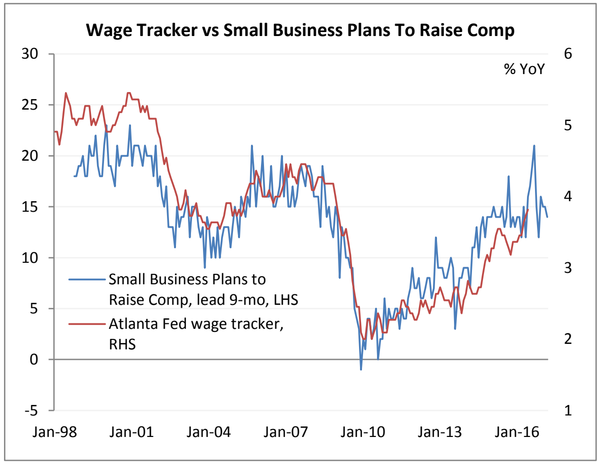
- The labor market continues to strengthen.
- Although its rate of improvement has slowed as ‘full employment’ is approached.

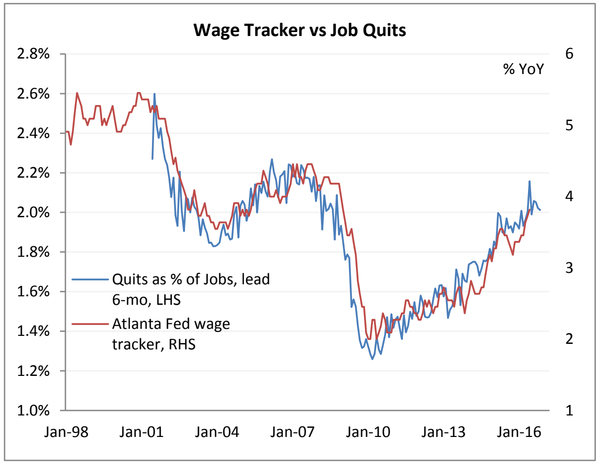


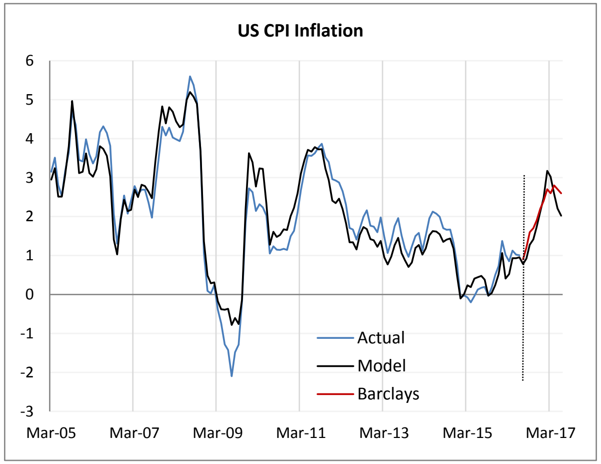


Tight Labor Market Will Create Some Inflation

- Wages growth for individuals has accelerated as businesses are finding it more difficult to hire and retain workers.
- By later this year the result could well be a meaningful rise in US headline inflation.

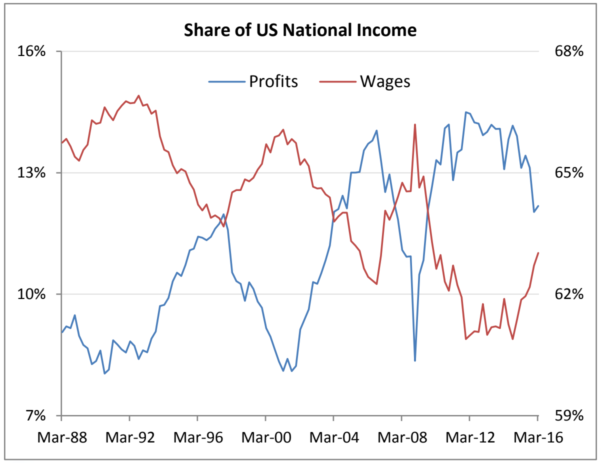


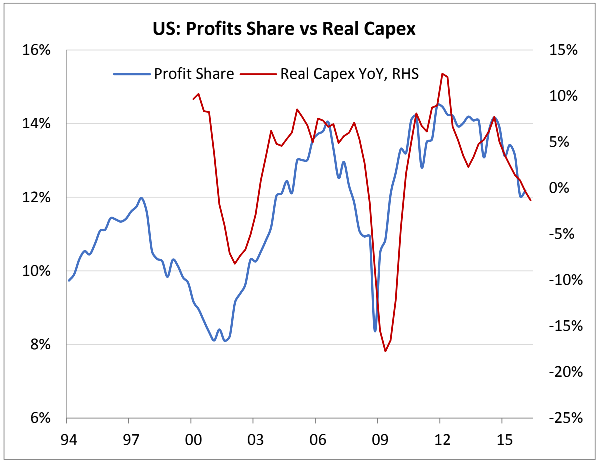


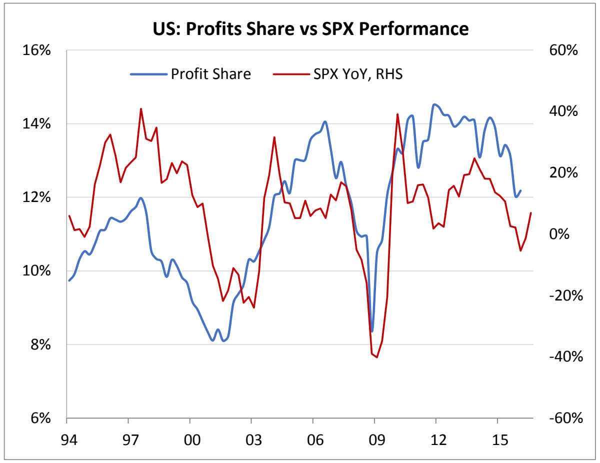


It also Shifts Income Share to Wages and Away From Profits

- Wages share of national income has improved, at the expense of profits (the latter also impacted by a rising dollar).
- This can have negative effects on business investment and equity returns.

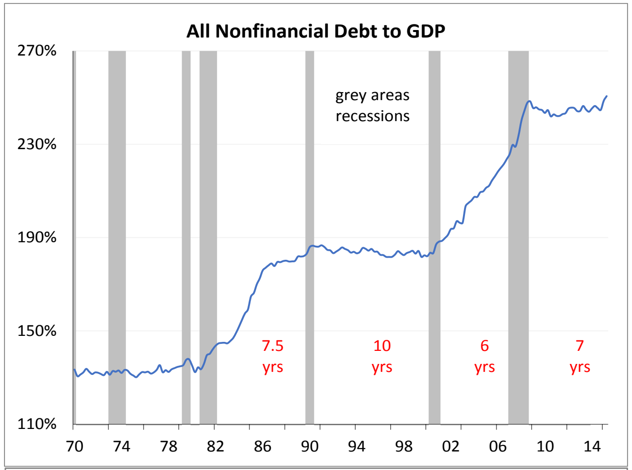


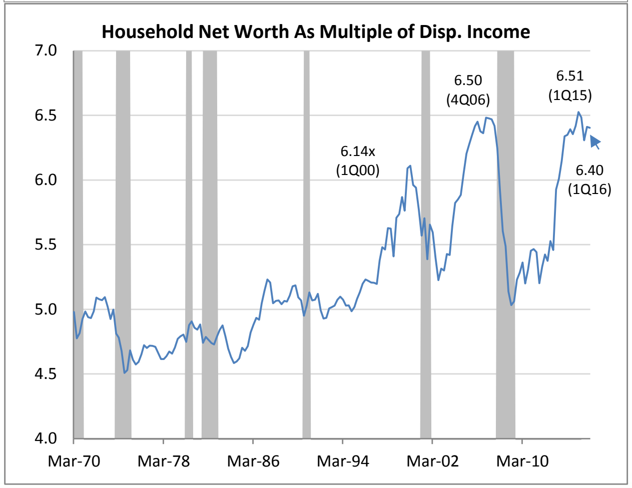




Imbalances Manageable but Valuations Challenging

Expansion	Length	Expansion	Length
4Q01 to 4Q07	73-mo	2Q09 to 2Q16	84-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	6%
Foreign Trade	%/GDP	Foreign Trade	%/GDP
Start	-3.3%	Start	-2.5%
Peak	-6.2%	Now	-2.8%
Federal Budget	$B	Federal Budget	$B
Start	+100	Start	-1255
End	-190	Now	-525
Net Worth to Income		Net Worth to Income	
Start	5.4	Start	5.1
End	6.5	Now	6.4
U-rate		U-rate	
High	6.3%	High	10.0%
Low	4.4%	Now	4.9%
CPI Inflation	YoY	CPI Inflation	YoY
Start	1.9%	Start	-1.4%
End	4.3%	Now	1.0%
Potential GDP	YoY	Potential GDP	YoY
Average	2.75%	So far	1.35%
		Projected	2.00%





- 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.

Global Factors Will Remain a Headwind

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

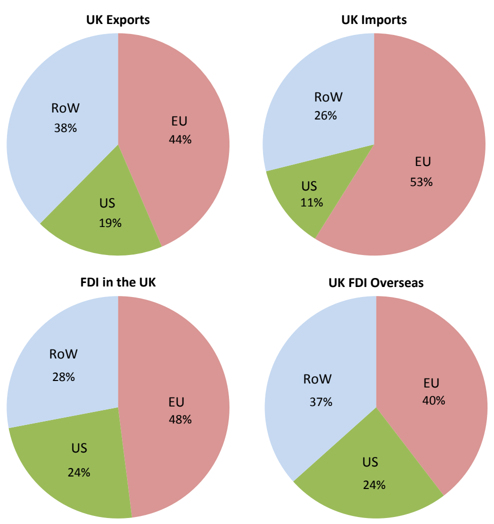
	Year over Year					
			Projections		Difference from April 2016 WEO Projections 1/	
	2014	2015	2016	2017	2016	2017
World Output	**3.4**	**3.1**	**3.1**	**3.4**	**–0.1**	**–0.1**
Advanced Economies	**1.9**	**1.9**	**1.8**	**1.8**	**–0.1**	**–0.2**
United States	2.4	2.4	2.2	2.5	–0.2	0.0
Euro Area	0.9	1.7	1.6	1.4	0.1	–0.2
Germany	1.6	1.5	1.6	1.2	0.1	–0.4
France	0.6	1.3	1.5	1.2	0.4	–0.1
Italy	–0.3	0.8	0.9	1.0	–0.1	–0.1
Spain	1.4	3.2	2.6	2.1	0.0	–0.2
Japan	0.0	0.5	0.3	0.1	–0.2	0.2
United Kingdom	3.1	2.2	1.7	1.3	–0.2	–0.9
Canada	2.5	1.1	1.4	2.1	–0.1	0.2
Other Advanced Economies 3/	2.8	2.0	2.0	2.3	–0.1	–0.1
Emerging Market and Developing Economies	**4.6**	**4.0**	**4.1**	**4.6**	**0.0**	**0.0**
Commonwealth of Independent States	1.1	–2.8	–0.6	1.5	0.5	0.2
Russia	0.7	–3.7	–1.2	1.0	0.6	0.2
Excluding Russia	1.9	–0.6	1.0	2.5	0.1	0.2
Emerging and Developing Asia	6.8	6.6	6.4	6.3	0.0	0.0
China	7.3	6.9	6.6	6.2	0.1	0.0
India 4/	7.2	7.6	7.4	7.4	–0.1	–0.1
ASEAN-5 5/	4.6	4.8	4.8	5.1	0.0	0.0
Emerging and Developing Europe	2.8	3.6	3.5	3.2	0.0	–0.1
Latin America and the Caribbean	1.3	0.0	–0.4	1.6	0.1	0.1
Brazil	0.1	–3.8	–3.3	0.5	0.5	0.5
Mexico	2.2	2.5	2.5	2.6	0.1	0.0
Middle East, North Africa, Afghanistan, and Pakistan	2.7	2.3	3.4	3.3	0.3	–0.2
Saudi Arabia	3.6	3.5	1.2	2.0	0.0	0.1
Sub-Saharan Africa	5.1	3.3	1.6	3.3	–1.4	–0.7
Nigeria	6.3	2.7	–1.8	1.1	–4.1	–2.4
South Africa	1.6	1.3	0.1	1.0	–0.5	–0.2

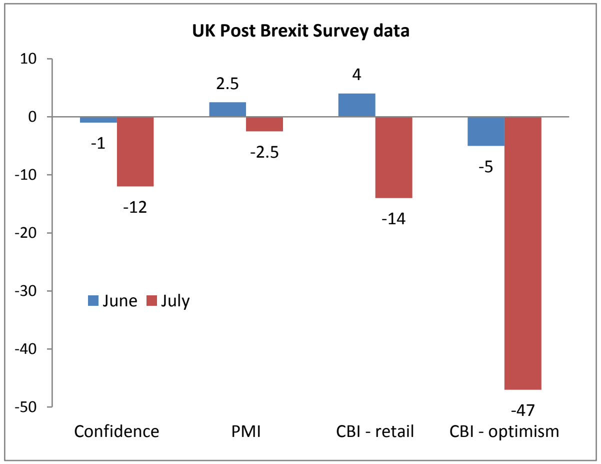
Source: International Monetary Fund, July 19, 2016

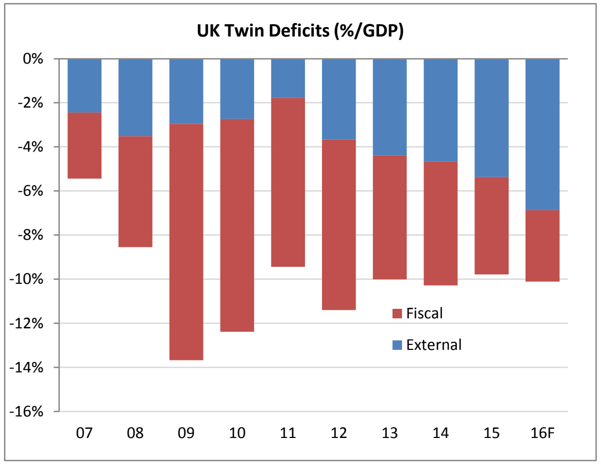
- IMF still looks for solid but unspectacular global growth.
- Downgrade since April is based on the unexpected UK decision to exit EU.

Brexit Will Compromise European Growth

- UK has a 3.5%/GDP deficit in goods trade with the rest of the EU … but a 1%/GDP services surplus (largely financial services).
- Bank of England report suggests banks have adequate coverage of short term foreign currency liabilities. However, financing future “twin deficits” will be more problematic.

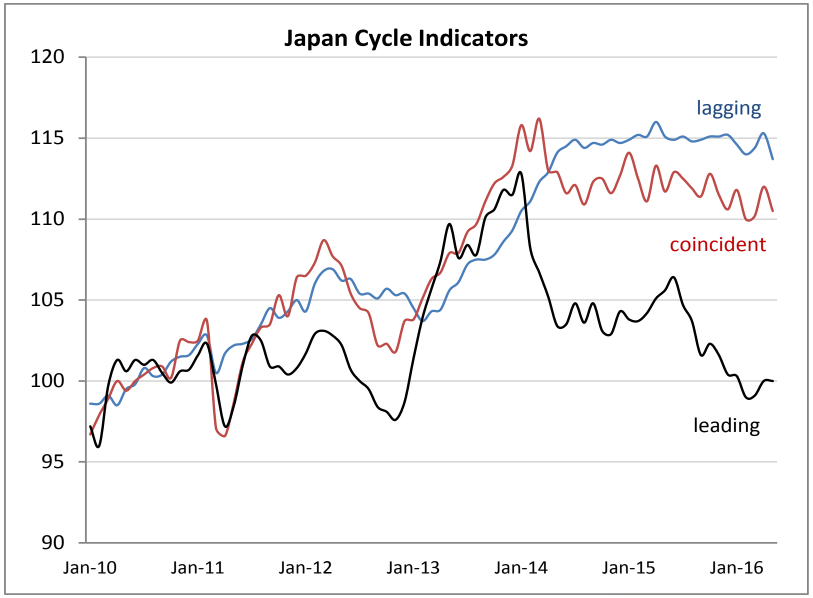


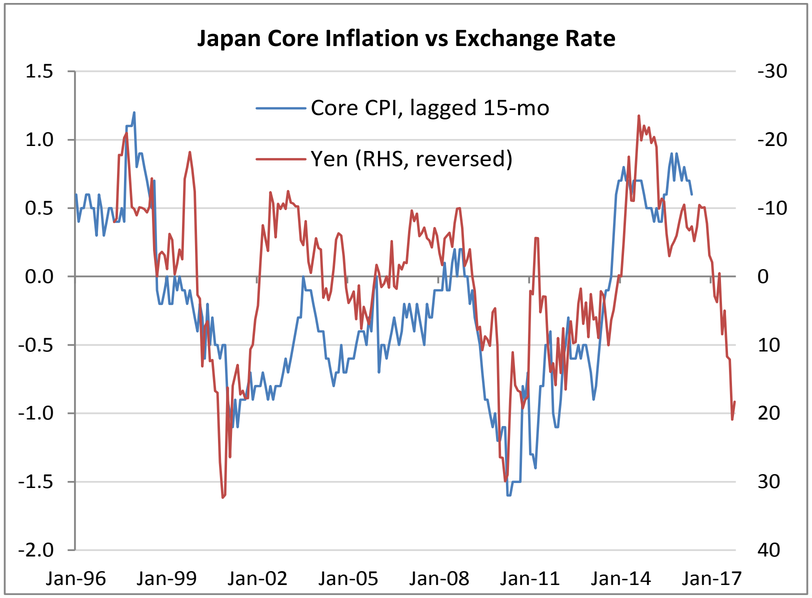




Absence of Lift-off in Japan Drives Extra Support

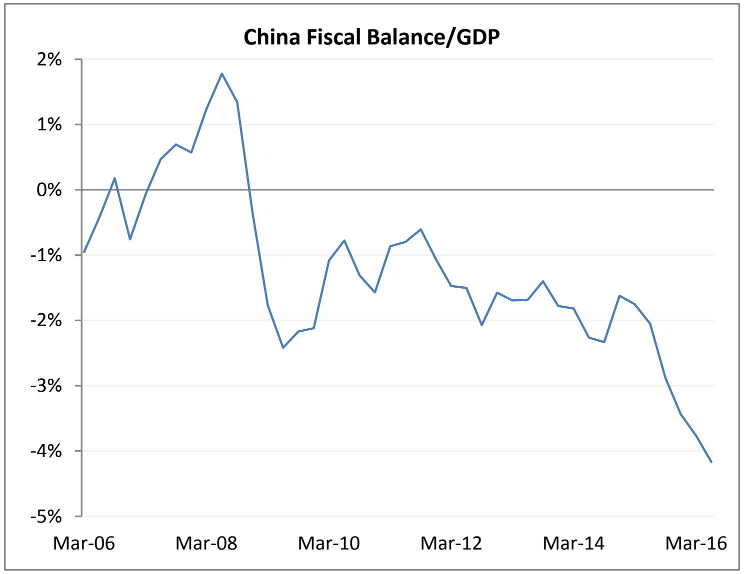
- Government implemented more budget and monetary support after larger mandate from July Upper House election.
- However the economy is struggling and the rebound in the Yen may reintroduce deflation.

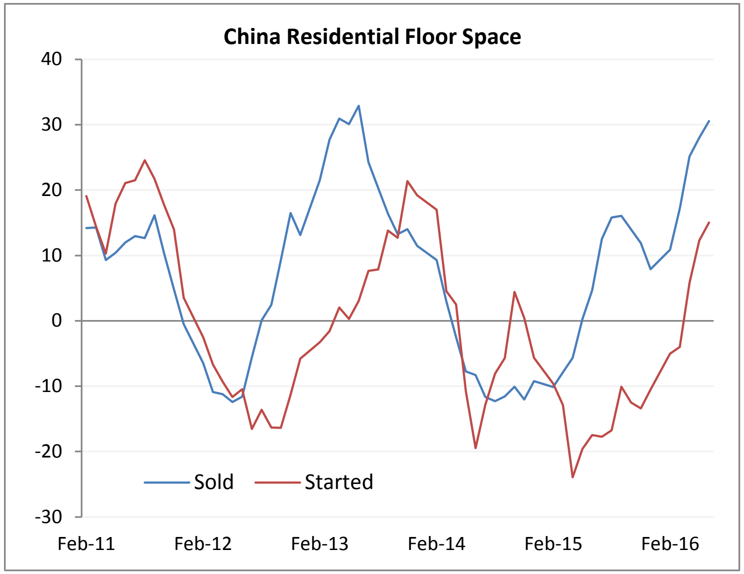




China's additional stimulus keeps debt growth high

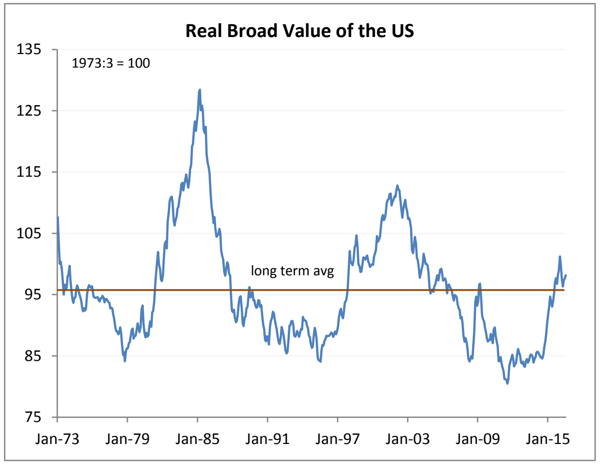
- China again pulling the debt lever to support Fixed Asset Investment and Real Estate.
- However debt to GDP continues to rise, especially in corporate sector.

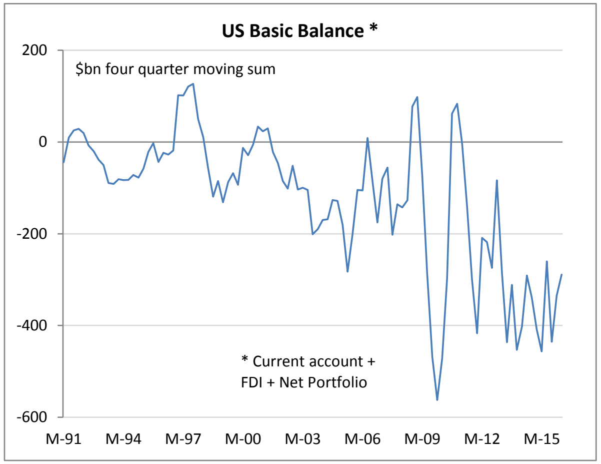


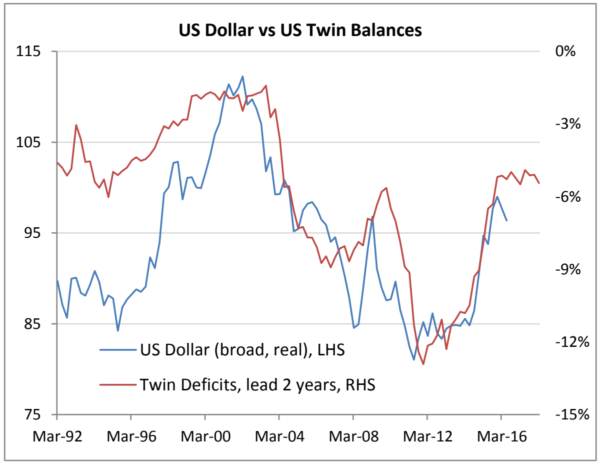


The Dollar

- The US dollar is now sitting close to its long term average.
- Current account and direct investment deficits are not being covered by longer term portfolio transactions and are thus dependent on short term financing flows.
- Slowing improvement in “twin deficits” may cap the dollar’s recovery.







Conclusion – Most Likely to Stay in a 'Challenging Returns' World

DOWNSIDE (30%)	CENTRAL (55%)	UPSIDE (15%)
"Business cycle near reversal"	"Challenging Returns"	"Headwinds recede"
Slow growth (1.2%) morphs into recession within a year	Still in mid to late cycle in US expansion, allowing 2+yrs more growth	Drags on growth unwind, delivering a potential doubling of GDP growth in the year ahead
Wages, $ and energy resume a dampening efect on profits	Household sector continues to provide strong savings pool to the economy and financial assets	New US Administration unlocks HH formation and labor force participation
FOMC pedantic about higher headline inflation and hikes faster	The Fed lets a recovery of inflation run for some time.	Significantly more fiscal stimulus.
Protectionist and isolationist trends in the US and UK continue, spreading to core Europe elections/ policy	Incremental gains in the labor market become gradually smaller.	Possible incentives to put corporate cash to work have self fulfilling impacts on activity.
China's public sector and real estate stimulus wanes	Housing has positive multiplier effects into rest of the economy.	EM cycle turn positive after rebalancing phase of the past few years.
Excessive valuation supported by global liqudity expansion gives way.	Profits share of GDP stabilizes along with the dollar and energy prices.	
	Japan, Euro Area, UK, China and other PacRim all still in easing mode	

II. Investment Review

Performance Summary

- Public Employees' Retirement Fund (PERF) returned 0.61% for the one year period ending June 30, 2016
  - Strong returns in Fixed Income (+9.3%) and Real Estate (+7.1%) offset a weak year for public equities (-3.4%)
  - Though the year ended relatively flat, the Fund experienced volatility along the way, as global equity markets saw several drawdowns exceeding -10%
- PERF 5-year returns were 6.8%, 10-year returns were 5.1%, and 20-year returns were 7.0%
  - Highlighting today's challenging return environment, Global Equity 5-year returns were 6.1%, below the 2013 ALM assumption of 9.2%
- Relative to benchmark, PERF excess returns were -41 bps this fiscal year; -4 bps for the past three years; and +13 bps for the past five years
  - One year excess returns were impacted by Real Estate underperforming its benchmark, contributing -49 bps
  - Over three years, public programs contributed +28 bps. Private programs contributed -25 bps from performance relative to their benchmarks and -13 bps from being underweight relative to policy (due to insufficient opportunities meeting our standards). Despite underperforming their own benchmarks, private assets outperformed publics
  - Over five years, public programs contributed +24 bps, private programs relative to benchmark contributed -18bps, and underweights to private programs contributed -19bps. The impact of the currency overlay in the benchmark calculation pre-2014 contributed +26 bps
- The Affiliate Plans all generated positive net total returns over 1- through 10-year periods. The plans have tracked their benchmarks closely, with most outperforming slightly

PERF Positioning

- PERF asset allocation is closely aligned with the 2013 ALM workshop interim targets
  - Starting the year we were slightly overweight Growth, underweight Income, and underweight Inflation. The Growth/Income positioning detracted from performance as stocks fell while bonds rallied. The Inflation underweight helped as commodity prices fell during the year
  - We remain slightly underweight to Private Equity and Real Assets relative to Interim targets. Capital deployment to these assets is constrained by limited opportunities that meet our underwriting standards
- 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 and risk

Trust Characteristics

As of June 30, 2016

• Trust Assets Managed	$306.3B
– PERF	$295.1B
– Long-Term Care Fund	$4.3B
– CERBT Funds	$5.1B
– Judges' Retirement System Fund II	$1.2B
– Health Care Fund	$0.4B
– Legislators' Retirement System Fund	$0.12B
– Judges' Retirement Fund	$0.04B

PERF Performance Summary

- PERF returned 0.61% for the one year period ending June 30, 2016
- Longer term, PERF generated solid returns over the 5-,10-, and 20-year periods but fell short of the 7.5% actuarial target
- 10- year and 20-year returns underperformed the 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	**0.6%**	**6.9%**	**6.8%**	**5.1%**	**7.0%**
POLICY INDEX	**1.0%**	**6.9%**	**6.6%**	**6.2%**	**7.2%**
Excess Return	(0.4%)	(0.0%)	0.1%	(1.1%)	(0.2%)

Affiliate Plans Performance Summary

- Affiliate Plans generated positive net total returns over 1-, 3-, 5-, and 10-year periods. Return differences are primarily a function of varying asset allocations
- Plans have tracked their benchmarks closely and mostly outperformed

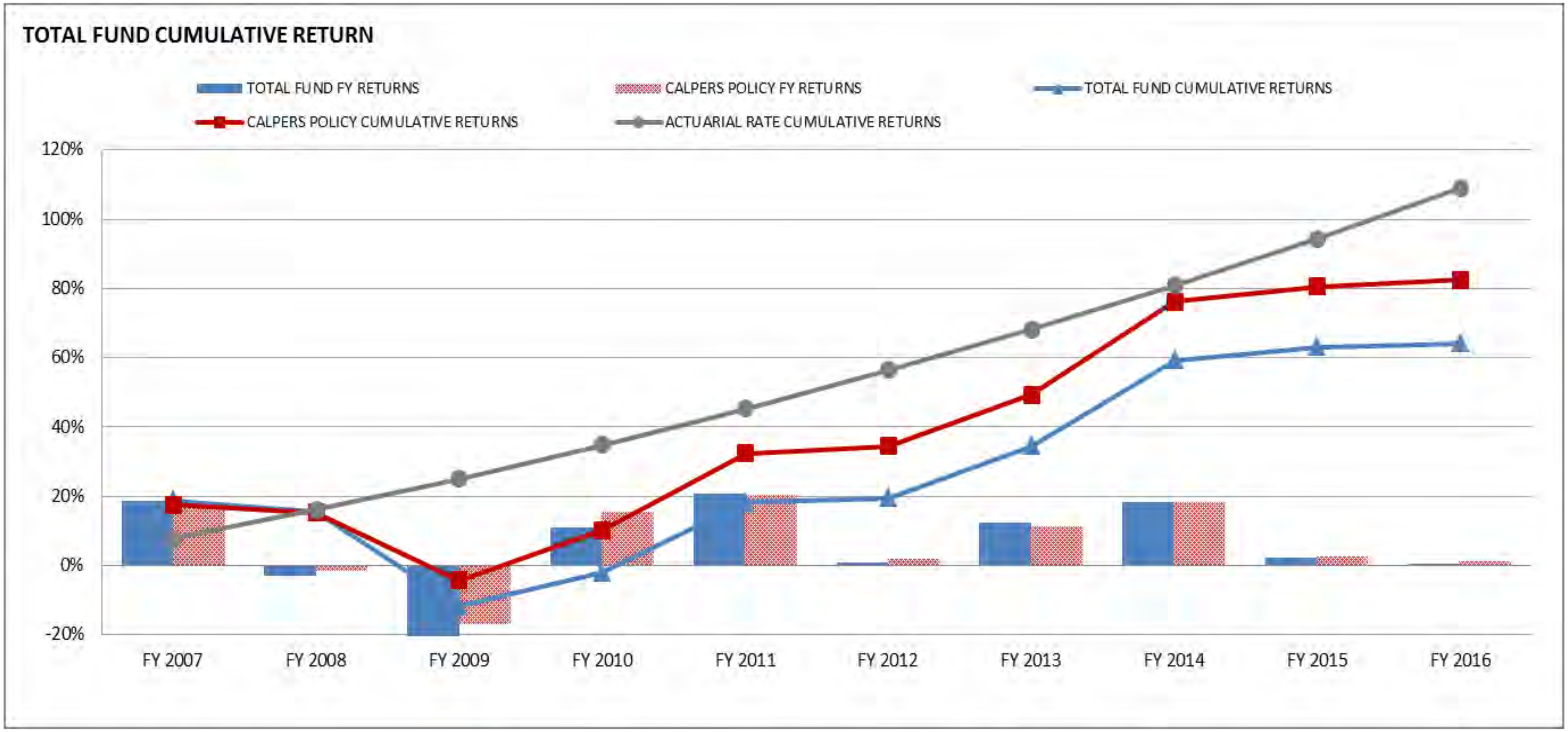
	1-YR		3-YR		5-YR		10-YR	
Defined Benefit Plans	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS	Net Return	Excess BPS
JUDGES' RETIREMENT FUND	0.3%	15	0.2%	7	0.1%	3	1.2%	14
JUDGES' RETIREMENT SYSTEM II FUND	1.6%	(7)	6.4%	14	6.6%	1	5.6%	(5)
LEGISLATORS' RETIREMENT SYSTEM FUND	4.0%	(11)	5.6%	24	5.8%	13	6.1%	21
CERBT STRATEGY 1	1.0%	29	6.1%	38	6.0%	19	-	-
CERBT STRATEGY 2	2.9%	16	5.8%	30	-	-	-	-
CERBT STRATEGY 3	4.1%	8	5.5%	40	-	-	-	-
CALPERS HEALTH CARE BOND FUND	6.0%	(1)	4.5%	43	4.3%	50	5.1%	(3)
LONG-TERM CARE FUND	5.5%	27	4.9%	29	4.3%	16	5.0%	13

PERF Contribution to Fiscal Year Return

Asset Class	Average Weight (%)	1-Year Return (%)	Contribution to Return (%)
GROWTH	**62.5**	**-2.6**	**-1.6**
PUBLIC EQUITY	*52.9*	*-3.4*	*-1.8*
PRIVATE EQUITY	*9.5*	*1.7*	*0.2*
INCOME	**19.4**	**9.3**	**1.8**
REAL ASSETS	**10.7**	**6.0**	**0.6**
REAL ESTATE	*9.2*	*7.1*	*0.6*
FORESTLAND	*0.7*	*-9.6*	*-0.1*
INFRASTRUCTURE	*0.8*	*9.0*	*0.1*
LIQUIDITY	**1.5**	**0.4**	**0.0**
INFLATION	**5.3**	**-3.6**	**-0.2**
TRUST LEVEL	**0.6**	**-3.8**	**0.0**
TOTAL FUND	**100**	**0.6**	**0.6**

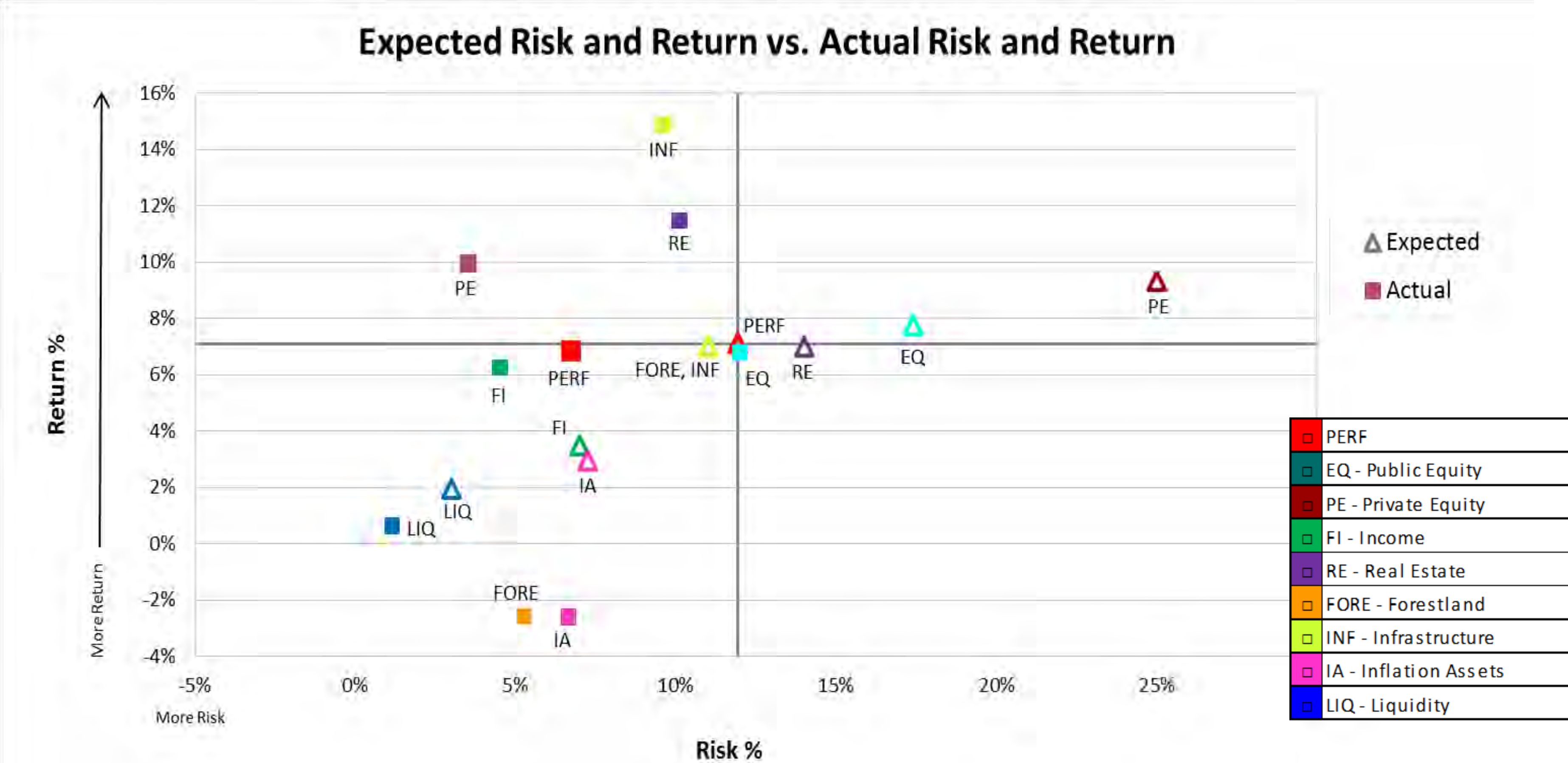
- At more than 50% of the portfolio, Public Equity was the primary negative contributor
- Despite relatively smaller weights, Fixed Income and Real Assets diversified the fund and delivered positive overall performance

PERF 10 Year Cumulative Returns



Note: Actuarial Rate of Return FY 2007-12 was 7.75%. FY 2013-16 rate is 7.5%

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; observed risk and return figures are 3 year figures

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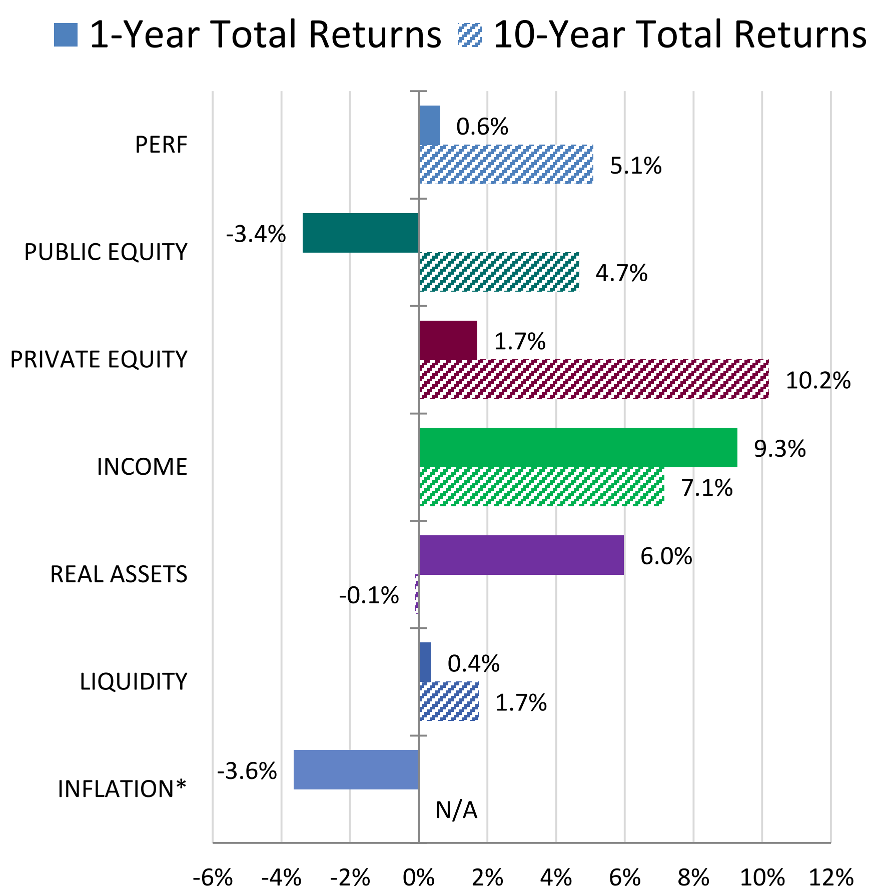
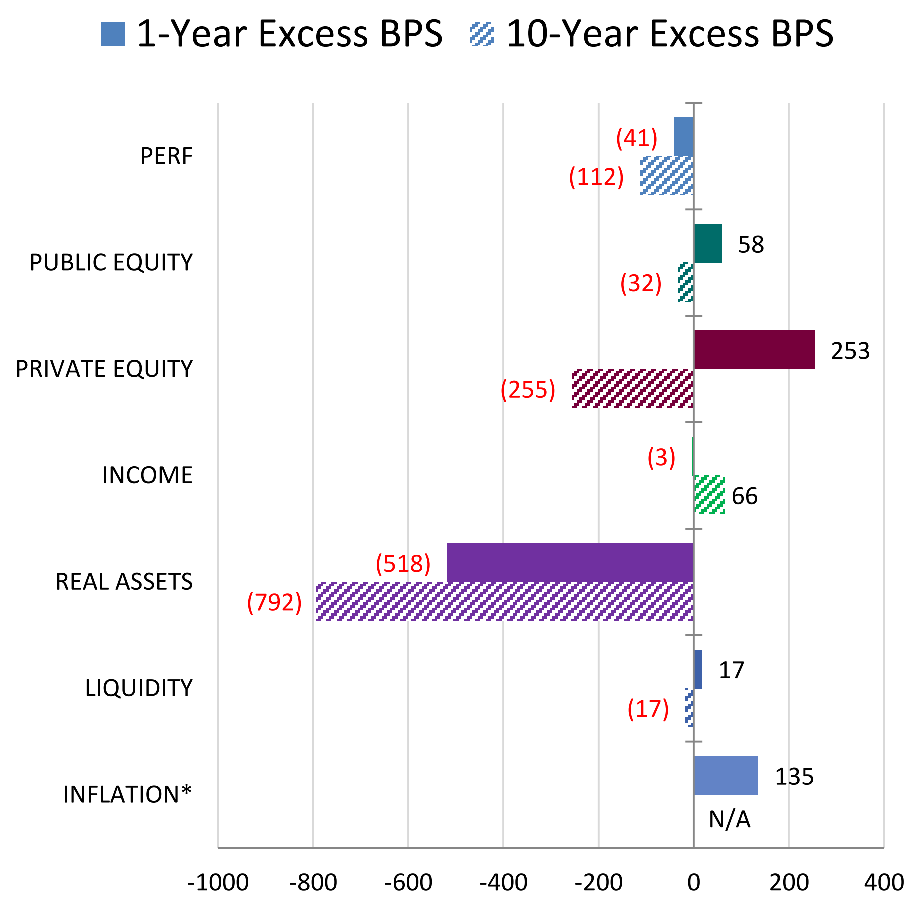
PERF Short-Term vs. Long-Term Performance





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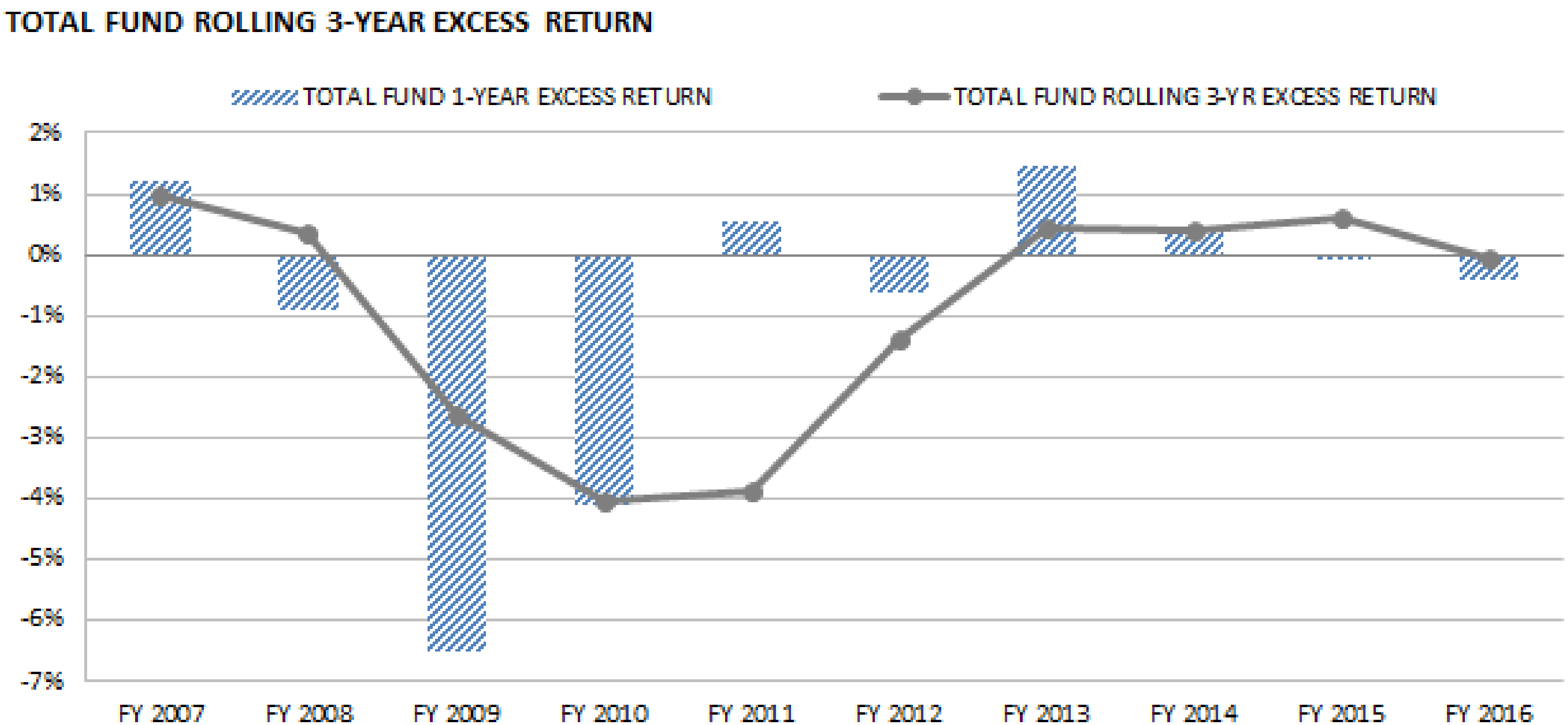
*Inflation has an inception date of October 2007, therefore 10-year returns and excess BPS are unavailable

PERF Rolling 3-Year Excess Return



Excess Returns Attribution

As of June 30, 2016 (Annualized)

	Average Weight in Plan	Program Excess Return (bps)			Contribution to Plan Excess (bps) [1]		
	5 Year	1 Year	3 Year	5 Year	1 Year	3 Year	5 Year
Total Excess Return (bps)					**(41)**	**(4)**	**13**
Program Contributions*					**3**	**7**	**7**
PUBLIC EQUITY	52%	58	25	23	31	12	12
PRIVATE EQUITY	12%	253	(81)	(88)	19	(12)	(15)
INCOME	17%	(3)	70	59	1	11	9
REAL ESTATE	9%	(557)	(112)	29	(49)	(10)	2
FORESTLAND	1%	(1,247)	(1,030)	(924)	(10)	(8)	(8)
INFRASTRUCTURE	1%	402	1,005	632	3	6	3
INFLATION	4%	135	103	45	7	5	3
OTHER					1	3	(0)
Allocation Impact*					**(20)**	**4**	**(2)**
Private Asset Class "Proxy" Shortfall [2]					**(21)**	**(13)**	**(19)**
Other/Residual [3]					**(3)**	**(2)**	**27**

[1] Contribution figures are calculated on monthly basis and aggregated over the respective period.

[2] Impact of not obtaining full desired interim policy exposure to private asset classes and proxying these with public assets. Includes the impact of lagged reporting of private asset benchmarks relative to current month reporting of public proxies.

[3] Includes impact of 2009-2013 benchmark currency hedge calculation and compounding residual.

* Contribution from MAC and ARS Programs are included in Allocation Impact

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PERF Asset Allocation

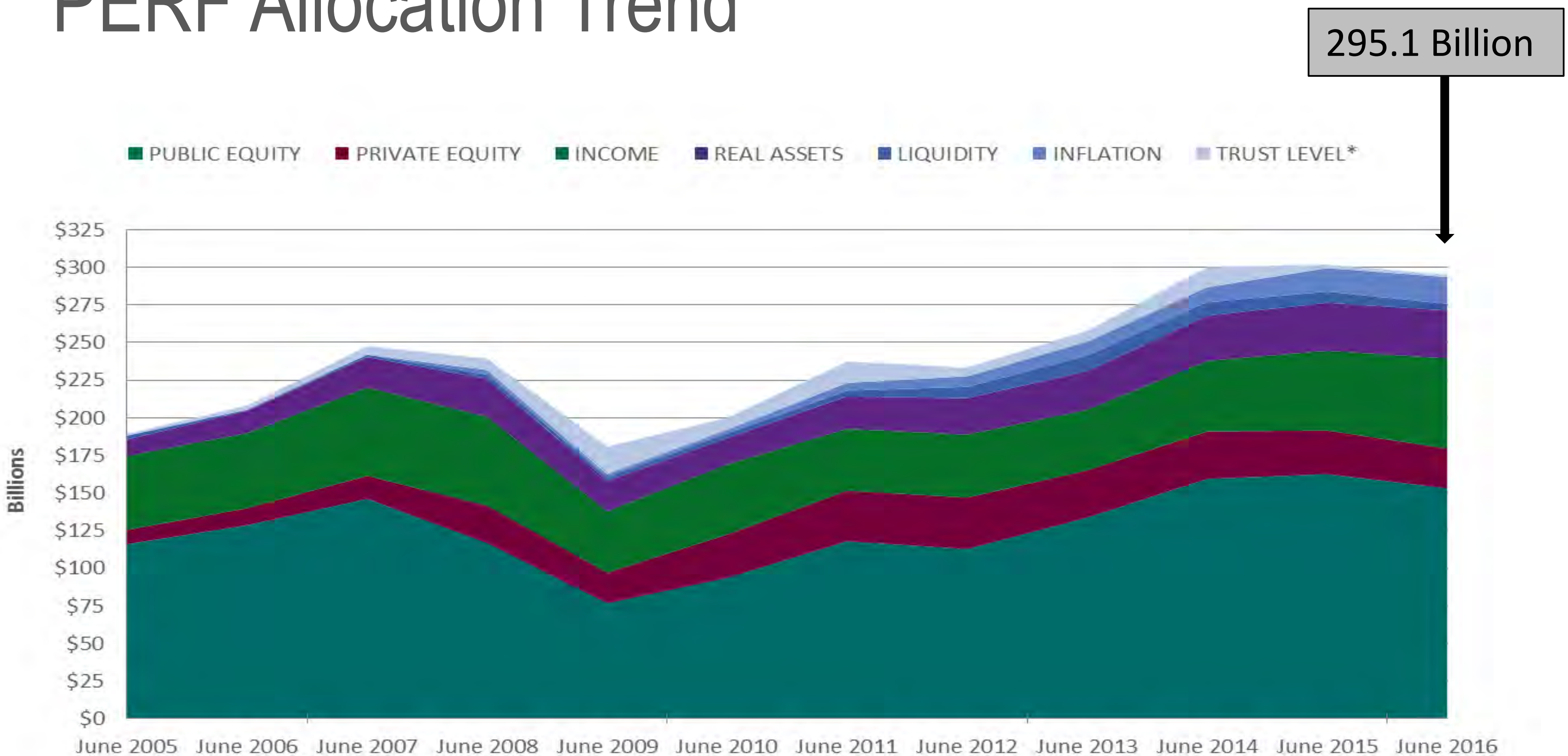
As of June 30, 2016

	Actual Allocation (%)	Interim Strategic Target (%)*	Variance (%)
GROWTH	**60.8%**	**61%**	**-0.2%**
PUBLIC EQUITY	*51.9%*	*51%*	*0.9%*
PRIVATE EQUITY	*8.9%*	*10%*	*-1.1%*
INCOME	**20.3%**	**20%**	**0.3%**
REAL ASSETS	**10.8%**	**12%**	**-1.2%**
REAL ESTATE	*9.3%*	*10%*	*-0.7%*
FORESTLAND	*0.7%*	*1%*	*-0.3%*
INFRASTRUCTURE	*0.9%*	*1%*	*-0.1%*
INFLATION	**6.0%**	**6%**	**0.0%**
LIQUIDITY	**1.5%**	**1%**	**0.5%**
TRUST LEVEL	**0.5%**	**N/A**	**0.5%**
ARS	*0.1%*	*N/A*	*0.1%*
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.

*Volatility numbers are as of 05/31/16

PERF Allocation Trend



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

PERF Risk Highlights

Volatility

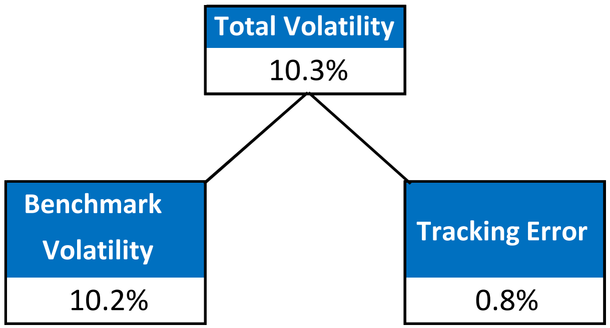
- Current forecast volatility of 10.3% (vs. 11.9% at last ALM and 9.8% at 12/31/15)
- Current forecast active tracking error of 0.8%, within guidelines
- $14.5b one month Value at Risk (VaR), up $1b from 12/31/2015 due to volatile recent months in equity markets
- Equity volatility is the primary driver of total volatility

Fundamental

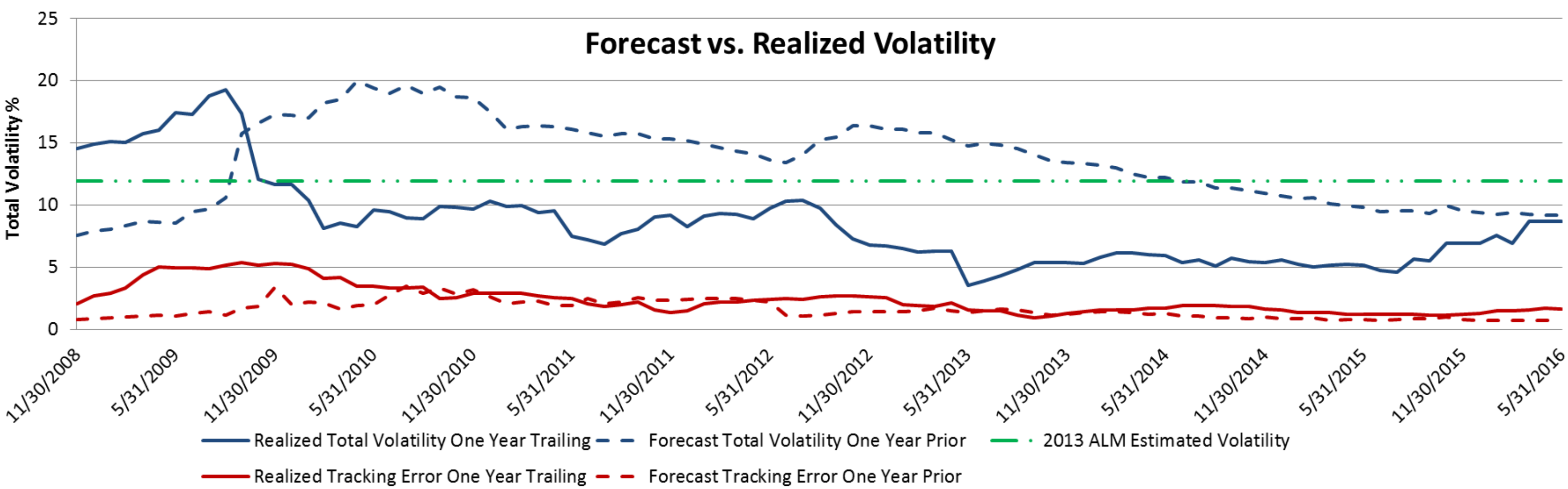
- Well diversified across individual issuers/companies
- Geographically tilted to US
- Liquidity profile & coverage currently adequate
- Counterparty risk remains modest
- Longer term risks covered in individual asset class and program reviews

PERF Volatility Profile

As of May 31, 2016



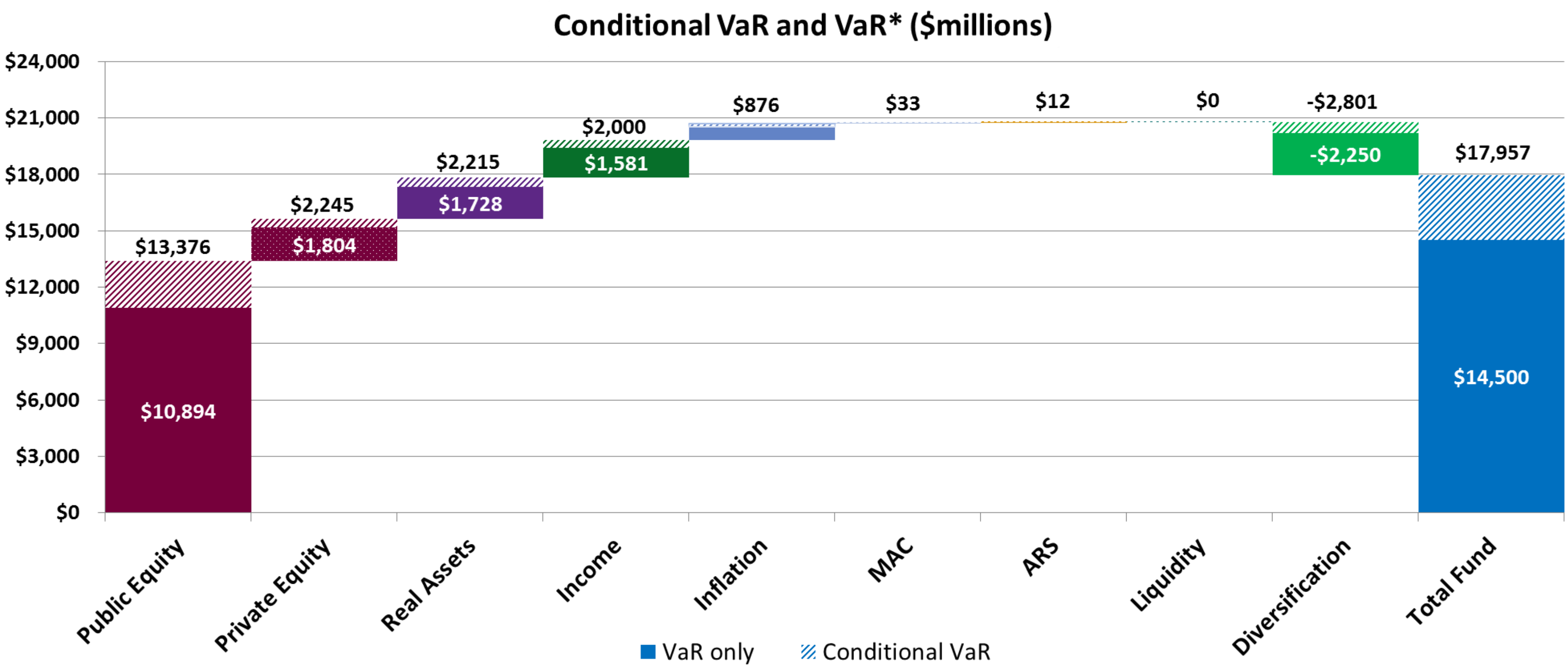
- Forecast Volatility of 10.3%, implies 25% chance of negative plan returns in a given year*
- Forecast Tracking Error of 0.8% is within guidelines of less than 1.5%



* Probability based on a 10.3% standard deviation around a 6.4% expected geometric annual return (Wilshire return expectation June 2016)

Absolute Value at Risk Estimate (1-month)

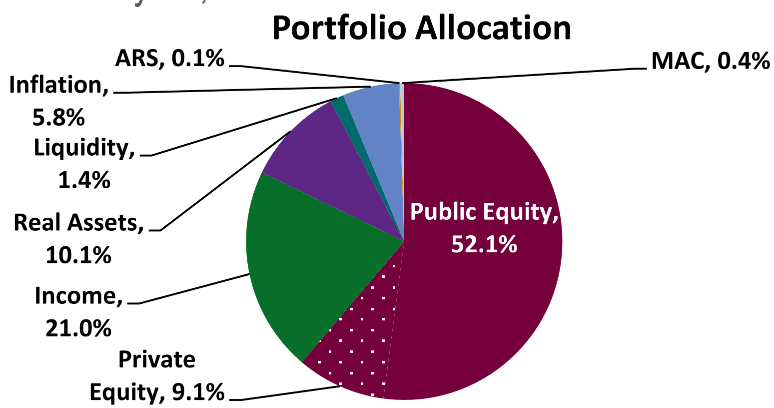
As of May 31, 2016

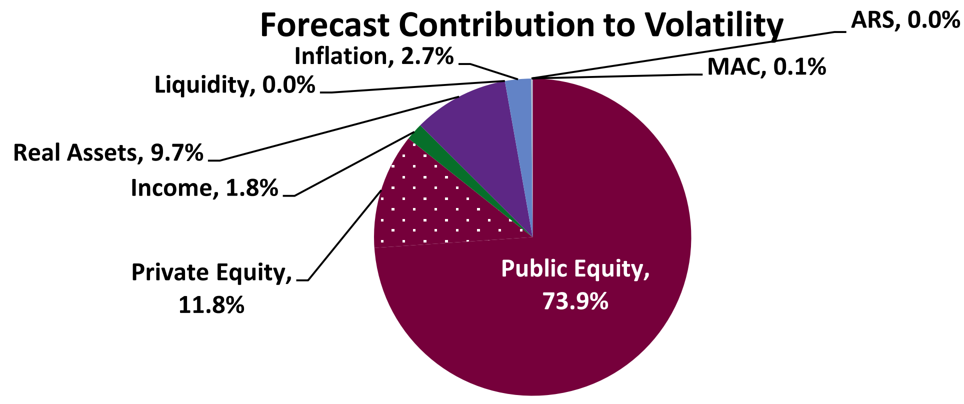


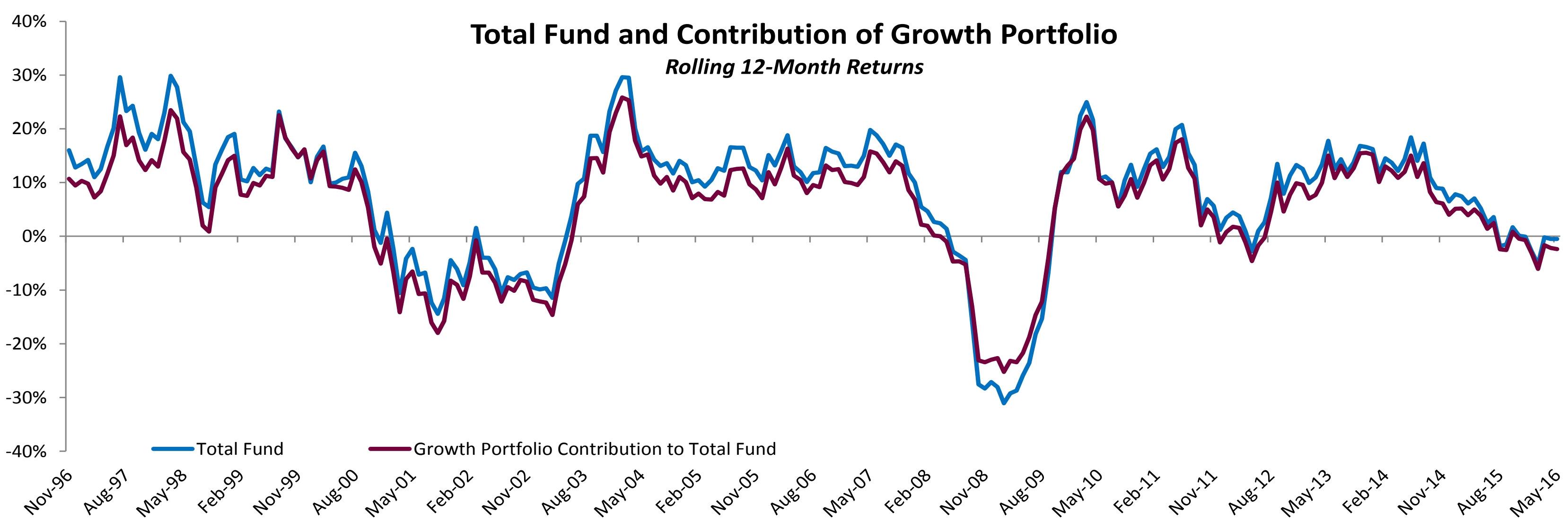
*1 month, 95% confidence Value at Risk. Conditional Value at Risk measures the mean of the tail distribution beyond the 95% confidence level

Growth Assets Dominate Volatility and Return

As of May 31, 2016







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Recent Equity Market Volatility

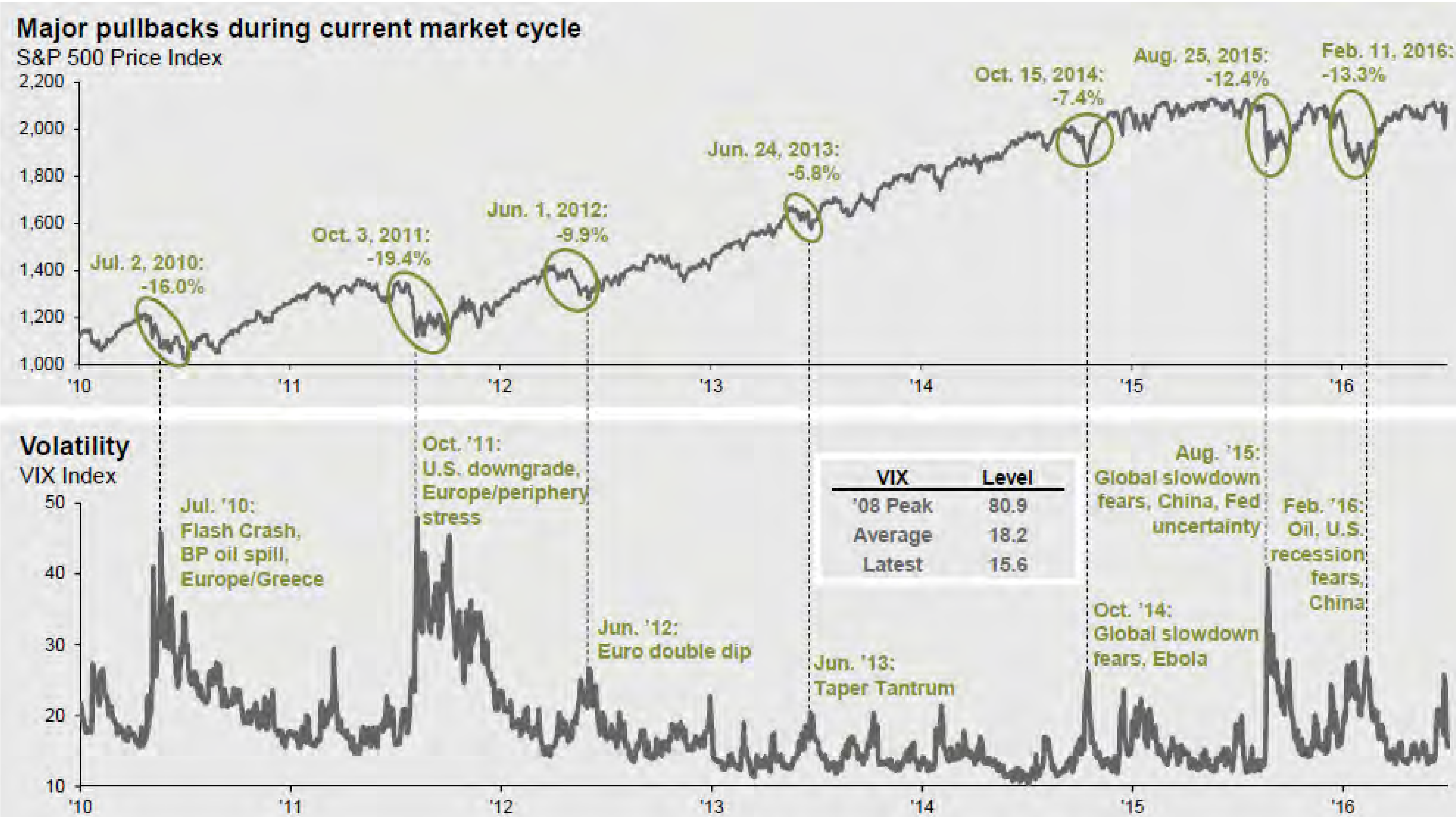
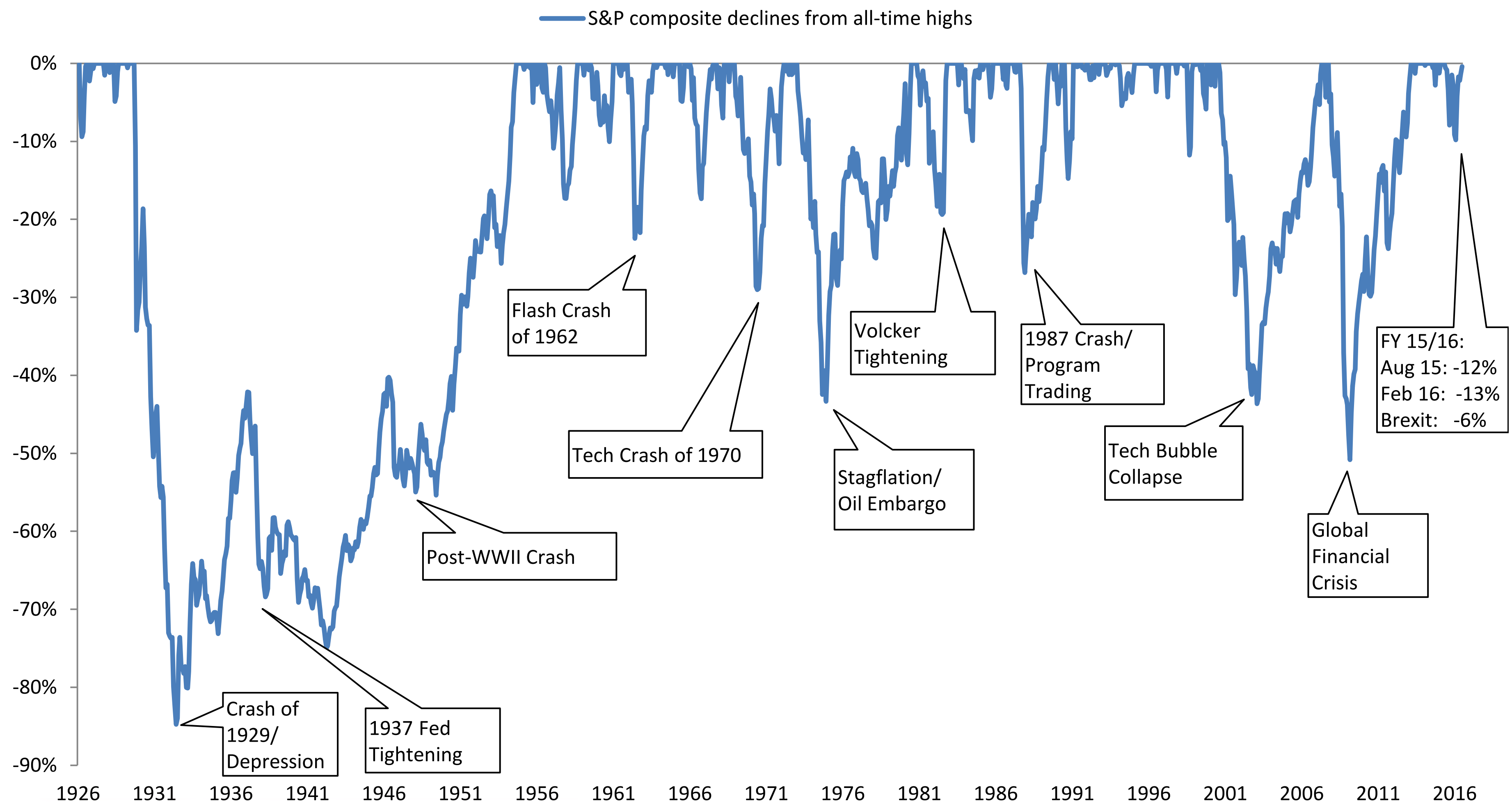


Chart Source: J.P. Morgan Asset Management's *Guide to the Markets,* June 30, 2016

Historical Equity Market Drawdowns

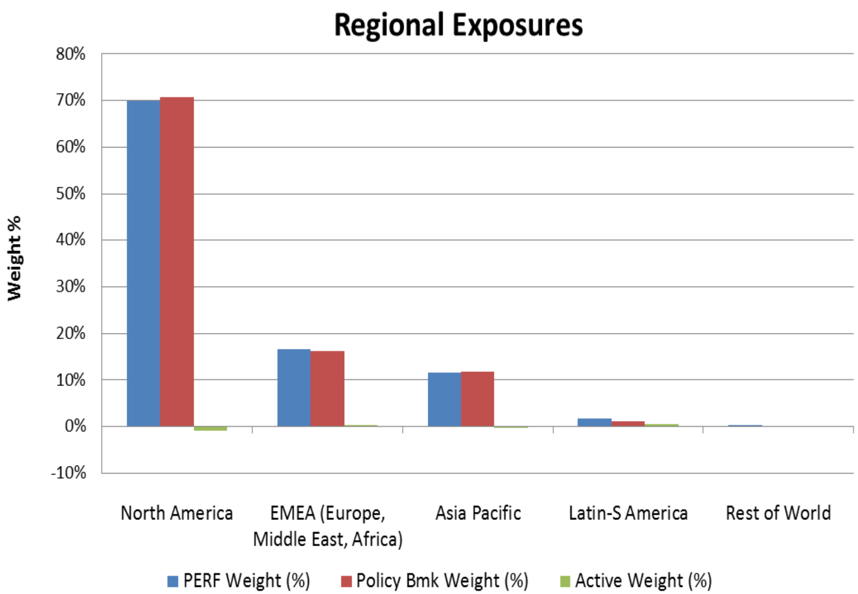


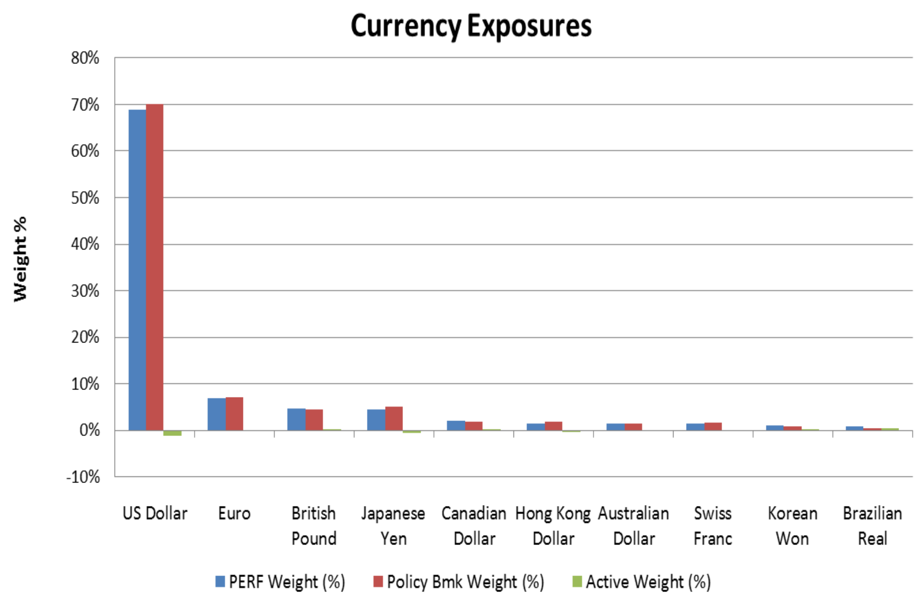
Source: Robert Shiller, Bloomberg, J.P. Morgan Asset Management

Regional and Currency Exposures

As of May 31, 2016

- Geographically, the portfolio is primarily concentrated in US
- Currency exposure largely follows the geographic mix, with 31% non-USD exposure





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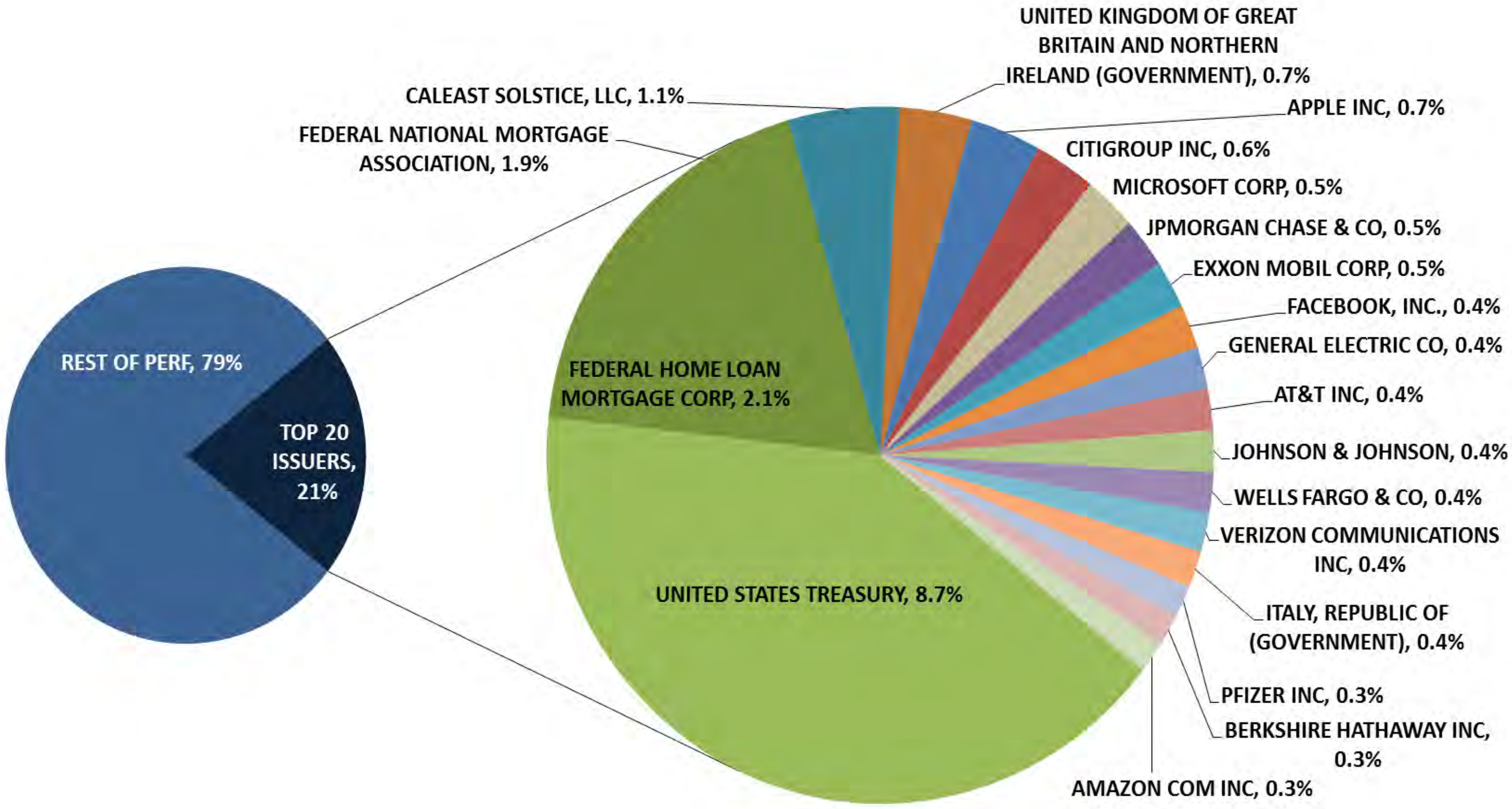
Top 20 Issuer Exposure

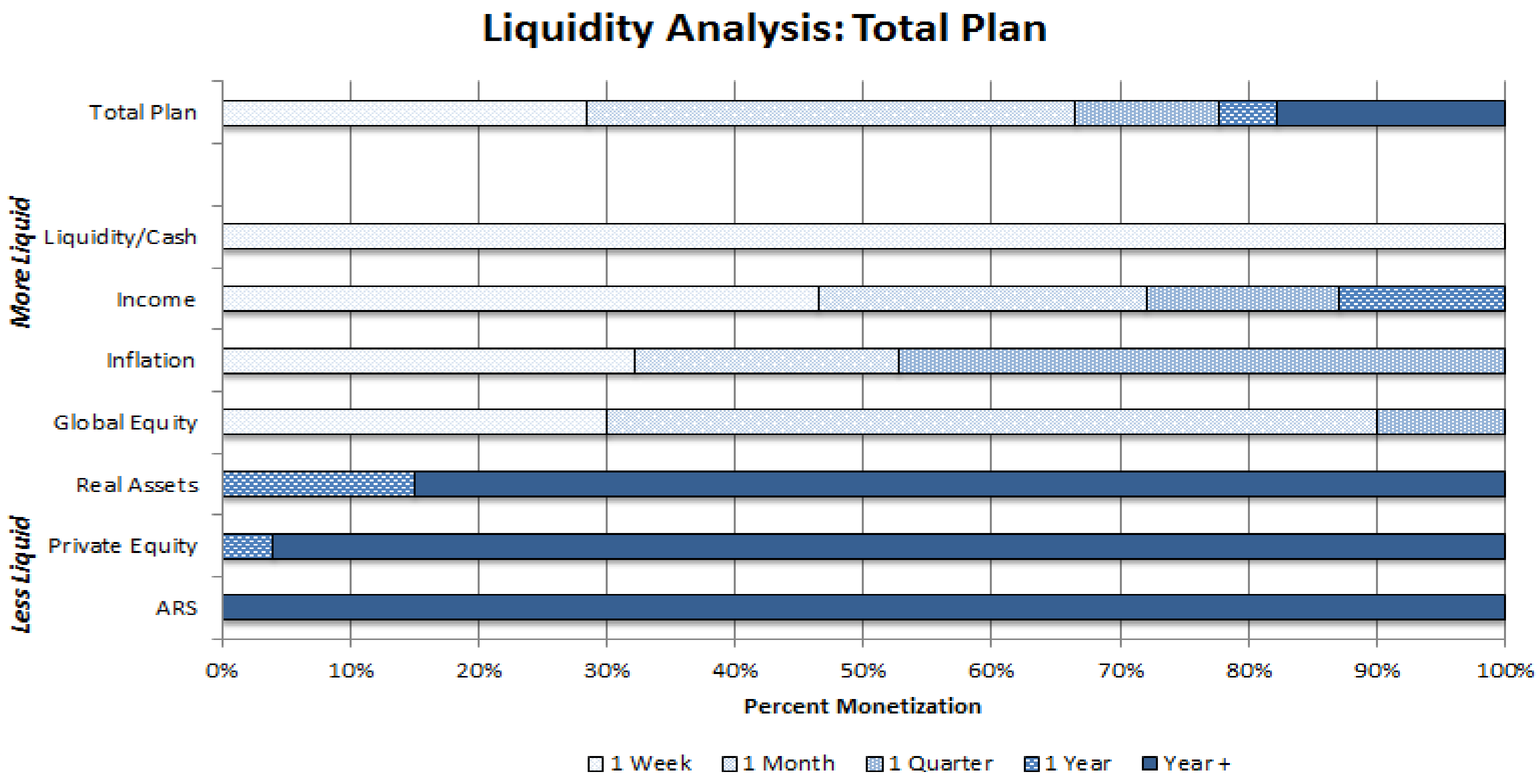
As of May 31, 2016



Liquidity Profile

As of May 31, 2016

- Most of the fund is invested in liquid assets (~75% could be liquidated in less than a quarter in a normal environment)



Transactional liquidity is estimated for each asset class /strategy based on the current market environment while also accounting for legal structures or other factors that may impact liquidity.

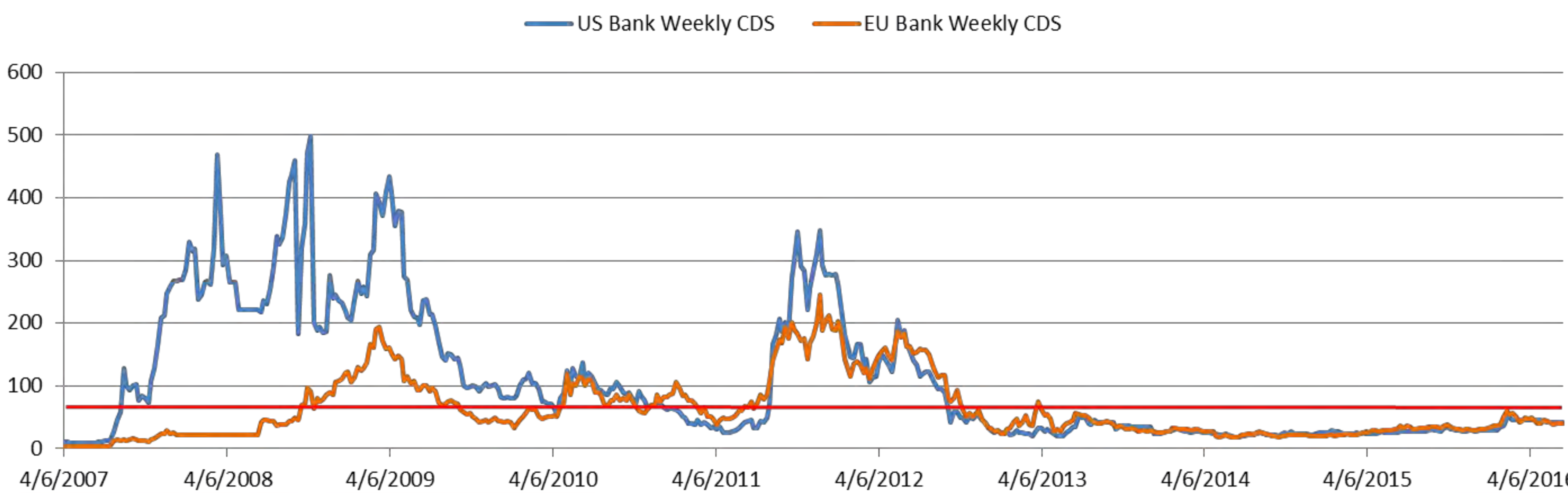
Liquidity coverage

- Current liquid cash and equivalents could cover projected 1-month cash needs by about 2.8x

	PERF TACTICAL LIQUIDITY SNAPSHOT As of June 1, 2016			
		Overnight	2 days - EOM	
	Sources:			
a	Sources Total (cash flow in)	-	$ 2,011,890,675	
b	Uses Total (cash flow out)	-	$ (2,122,028,824)	
c	Sources in Excess (Deficit) of Uses		$ (110,138,149)	= a+b
d	Contingency Use*		$ (43,098,824)	
e	Total Cash and Cash Equivalents	$ 4,115,445,199	$ 4,005,307,050	
	Liquidity Coverage Ratio		283%	= (a+e)/(b+d)
	* Contingency Use is based on a 10 Day, 99% confidence VaR of derivatives positions + contingent exposure estimates			

Counterparty Risk

- Overall counterparty risk levels remain muted
- CalPERS monitors each counterparty individually using a variety of risk and exposure metrics



Appendix

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

Investment Strategy

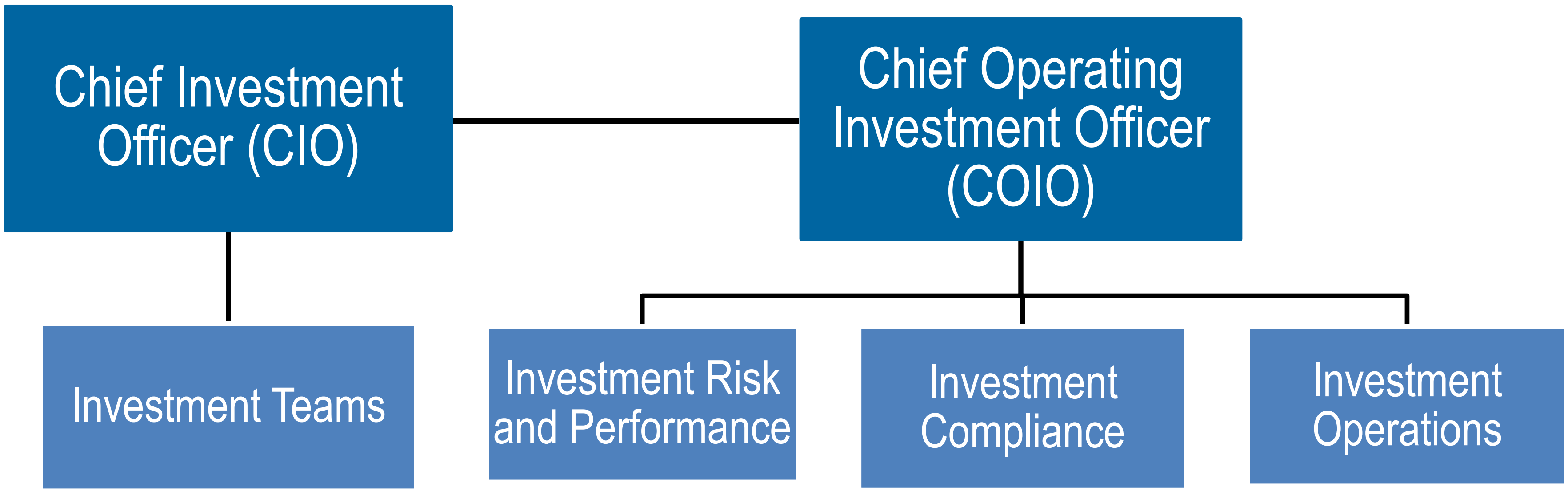
- Implementation Strategy & Capital Deployment
- Macro Economic Research
- Asset Class Research and Views
- Tactical Positioning

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

S&P Composite Index since 1900

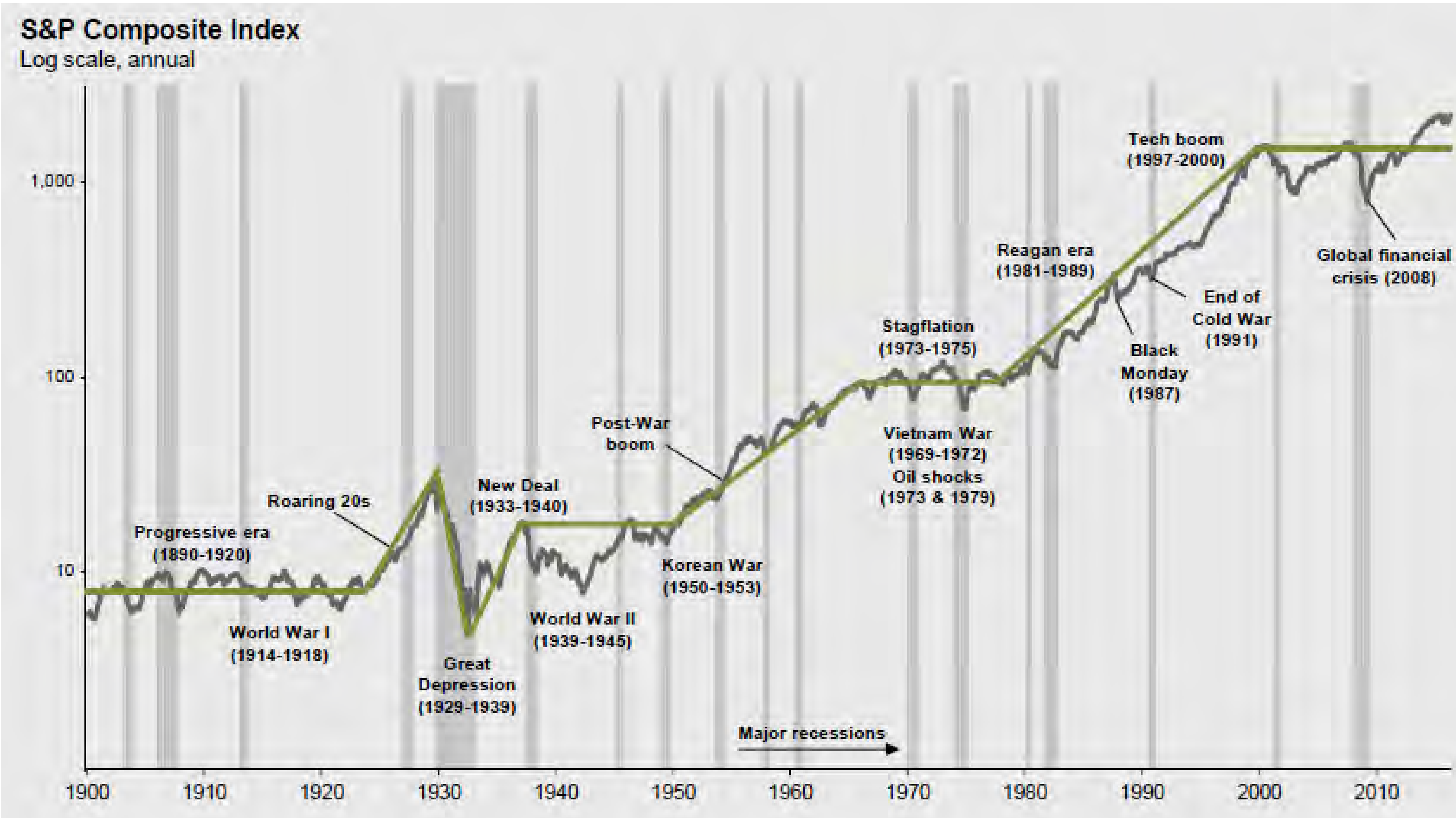
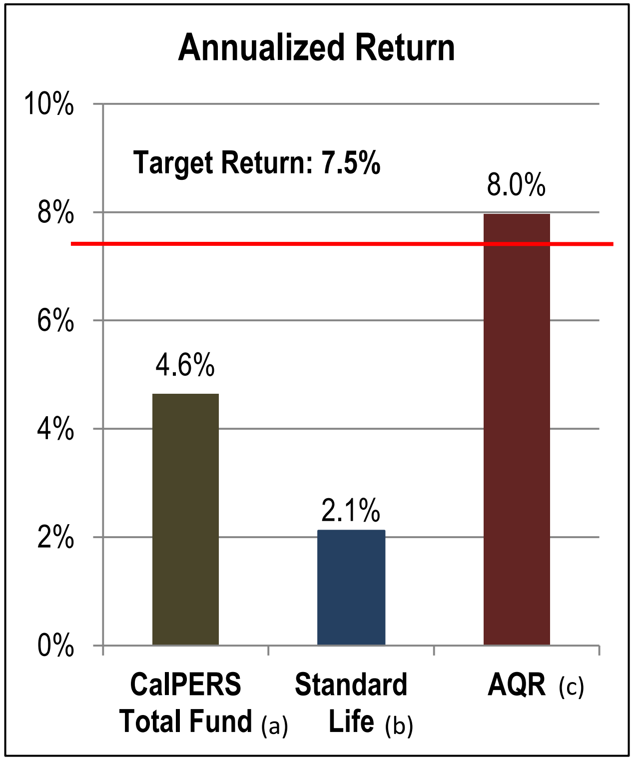
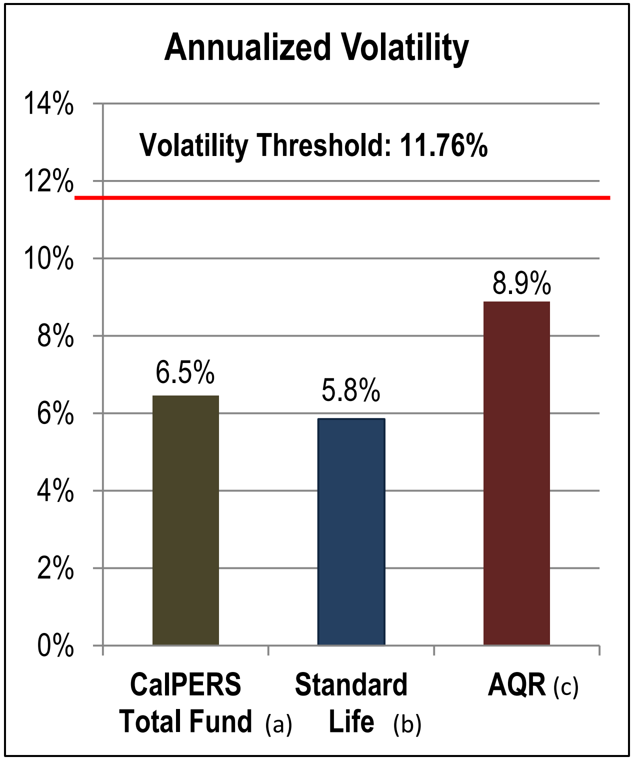


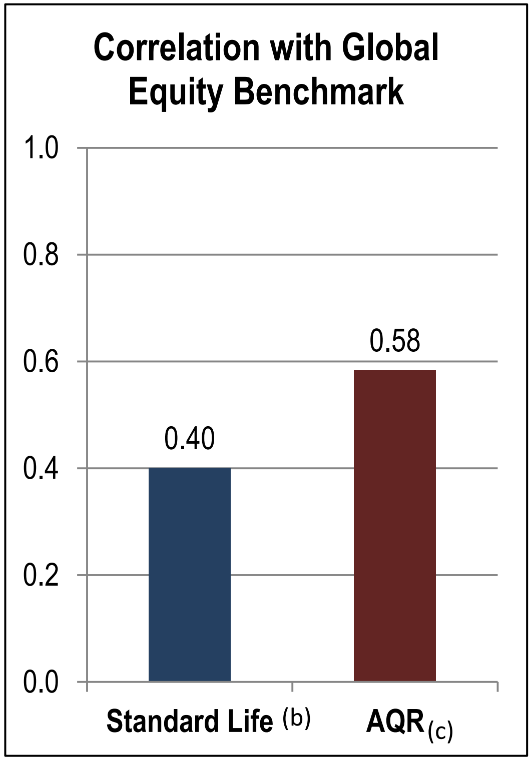
Chart Source: J.P. Morgan Asset Management's *Guide to the Markets,* June 30, 2016

MAC Partners Performance Summary

As of June 30, 2016



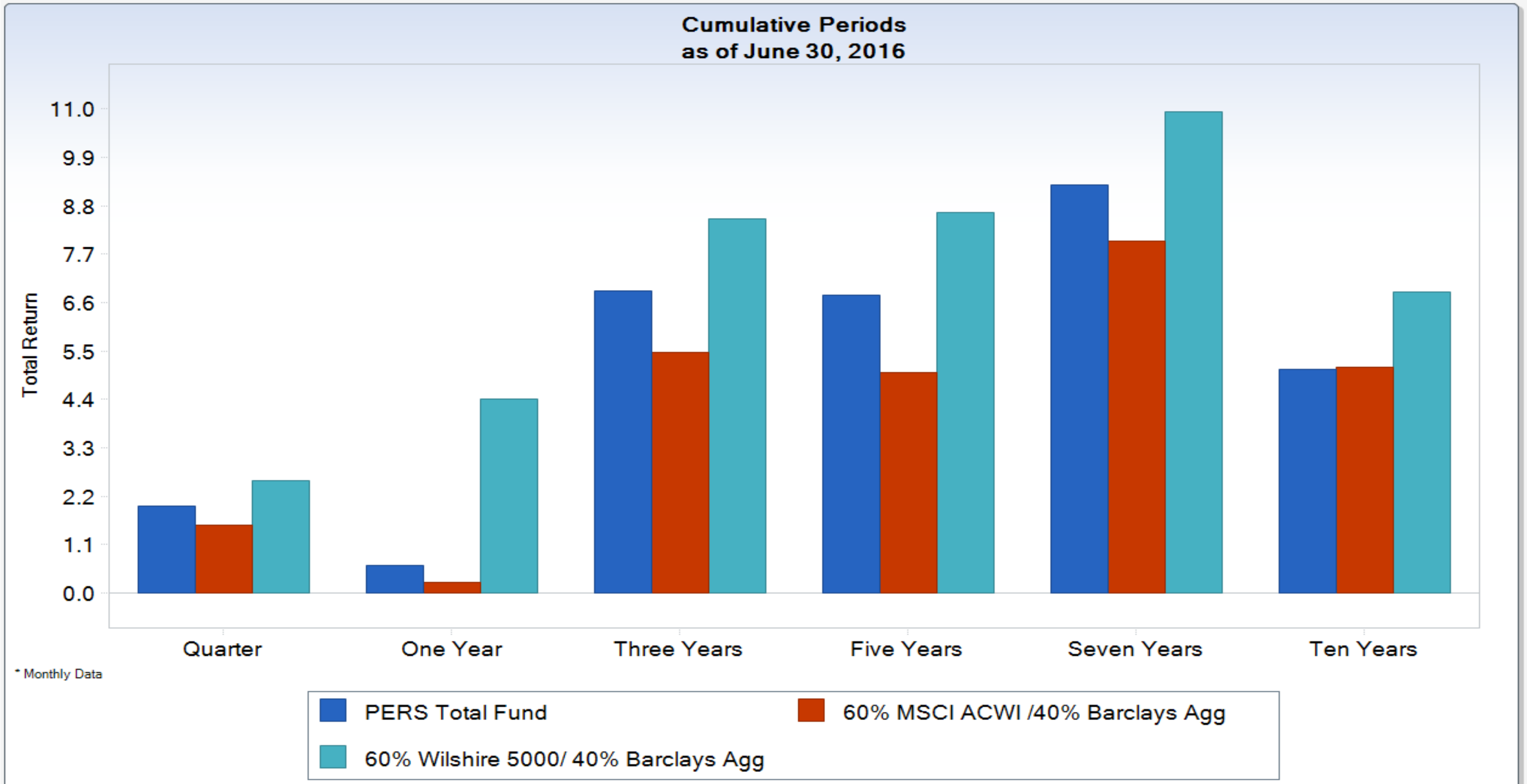




	CalPERS Total Fund	Standard Life	AQR
Sharpe Ratio(d)	0.72	0.36	0.90

(a) Source: State Street – Monthly net returns from Nov. 2013 to June 2016 (32 data points) – Fund ID: SJ1CA1
(b) Source: State Street – Monthly net returns from Nov. 2013 to June 2016 (32 data points) – Fund ID: SWTD
(c) Source: State Street – Monthly net retuns from Nov. 2013 to June 2016 (32 data points) – Fund ID: SWUB
(d) Assume the risk-free rate is 0%;

Index Returns for a 60% Equity/ 40% Bond



	Quarter	One Year	Three Years	Five Years	Seven Years	Ten Years
PERS Total Fund	2.0	0.6	6.9	6.8	9.3	5.1
60% MSCI ACWI /40% Barclays Agg	1.5	0.2	5.5	5.0	8.0	5.1
60% Wilshire 5000/ 40% Barclays Agg	2.6	4.4	8.5	8.6	10.9	6.8

Source: Wilshire Associates Consulting

One Year Allocation Contribution to Excess Returns

- Net contribution of -20 bps, driven by overweight to stocks (-27 bps) and underweight to bonds (-5 bps) offset by gains on inflation underweight (+12 bps)
- Allocation Contribution measures impact of positioning in liquid asset classes relative to policy targets, adjusted to account for any underweights in private assets (e.g. target additional Public Equity to extent that Private Equity is below policy target)

Program	Avg Portfolio Weight	Avg Target Weight	(Under)/ Over Weight	Benchmark Return	[redacted]	Contribution (bps)
PUBLIC EQUITY	52.91%	52.32%	0.59%	-3.97%		(26.6)
INCOME	19.39%	20.33%	-0.94%	9.31%		(4.7)
INFLATION	5.31%	6.10%	-0.79%	-5.00%		11.5
LIQUIDITY	1.52%	1.00%	0.52%	0.19%		0.1
MULTI-ASSET CLASS*	0.41%	0.00%	0.41%	-1.18%		(0.2)
ABSOLUTE RETURN STRATEGIES*	0.19%	0.00%	0.19%	-1.67%		(0.4)
PLAN LEVEL/OTHER	0.02%	0.00%	0.02%	-		0.2
				Total Allocation Management		**(20.3)**

*Entire impact of ARS and MAC Programs is included in the Allocation process and return.