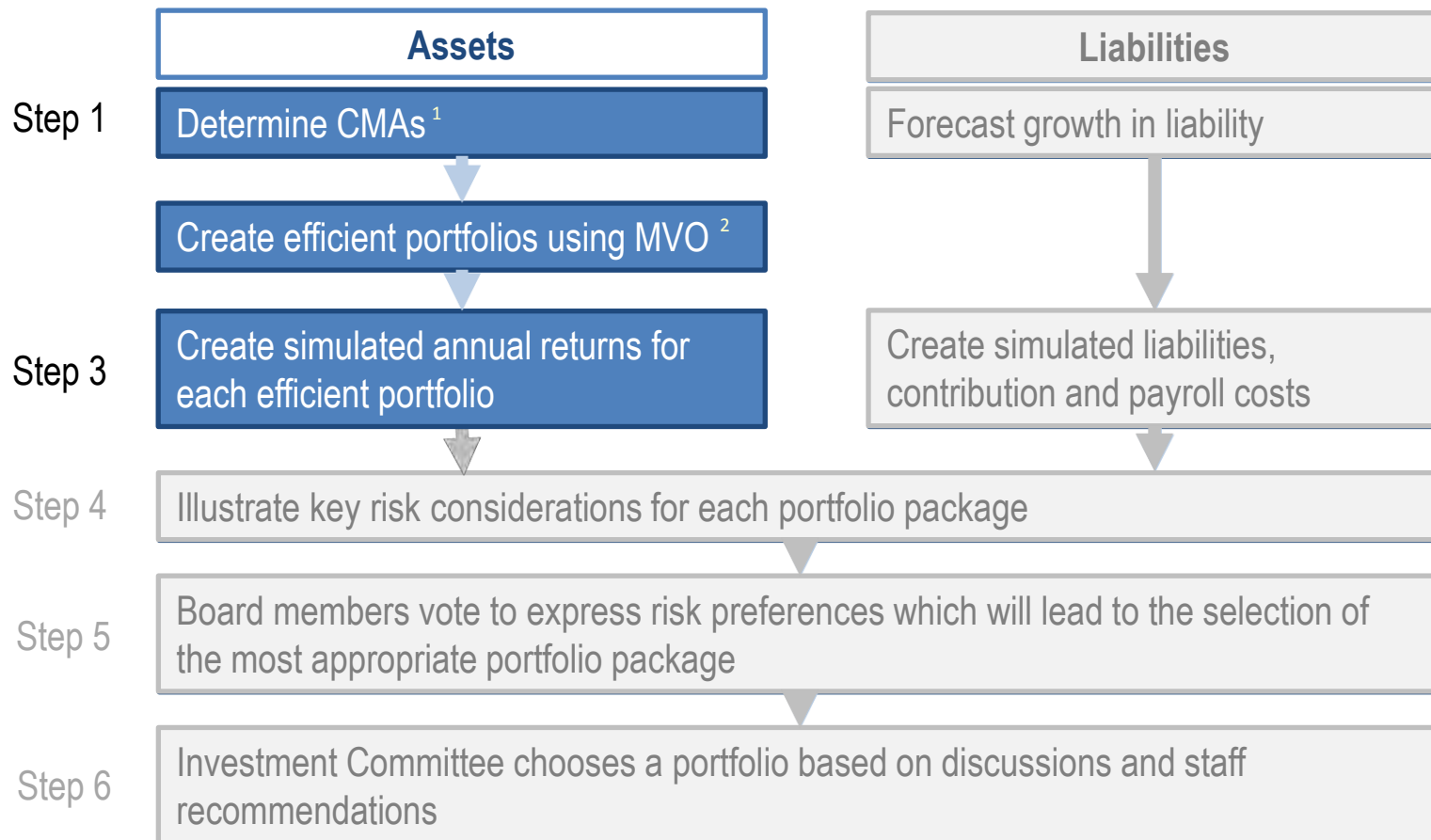


2017 10-Year Capital Market Assumptions

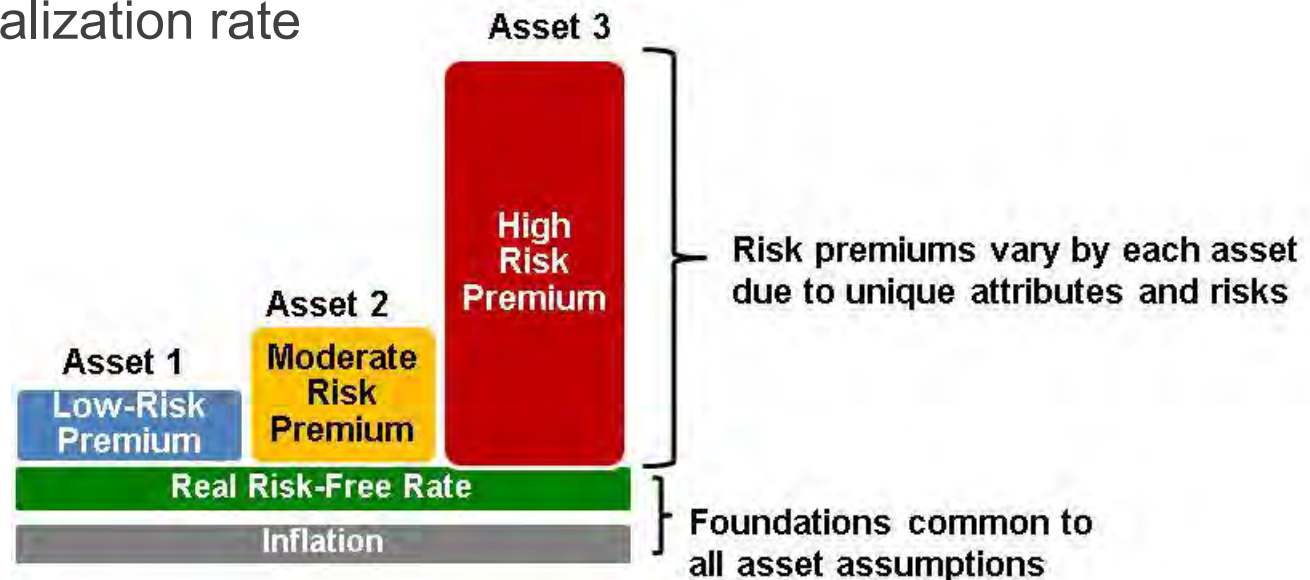
June 19, 2017

Steps to Obtain Policy Portfolio in ALM Workshops



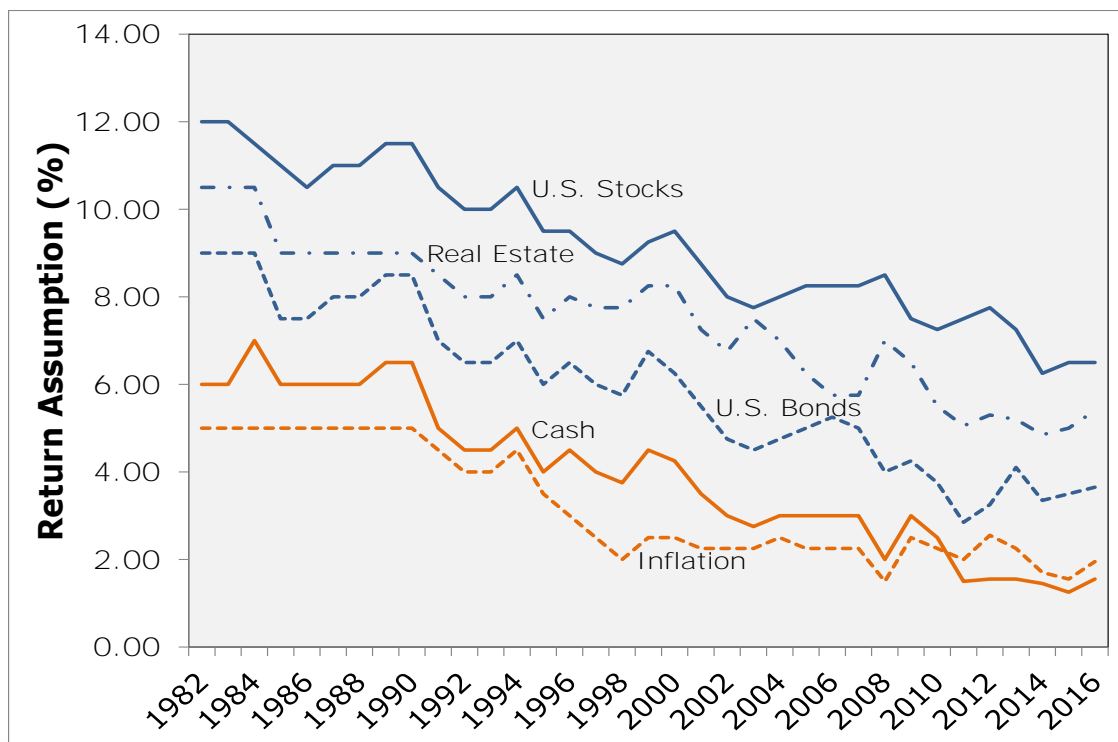
Methodology for Expected Returns

- Building Blocks Approach
- Various Fundamental Valuations Models
- Predictions on valuation metrics, such as earnings yield, credit spread and capitalization rate
- Industry survey



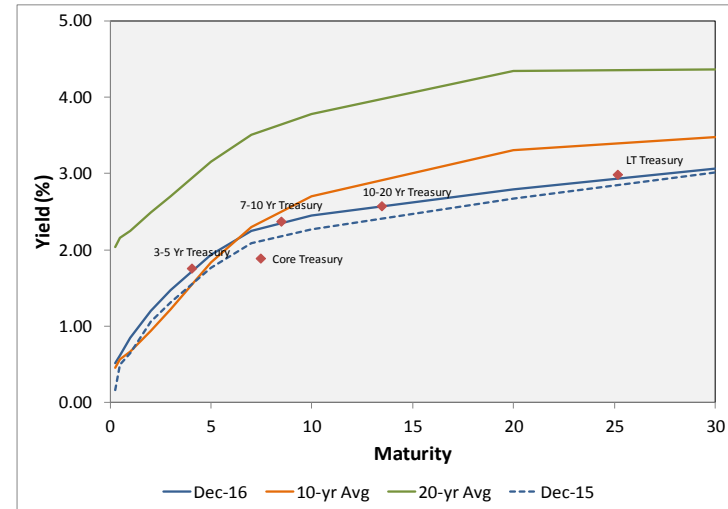
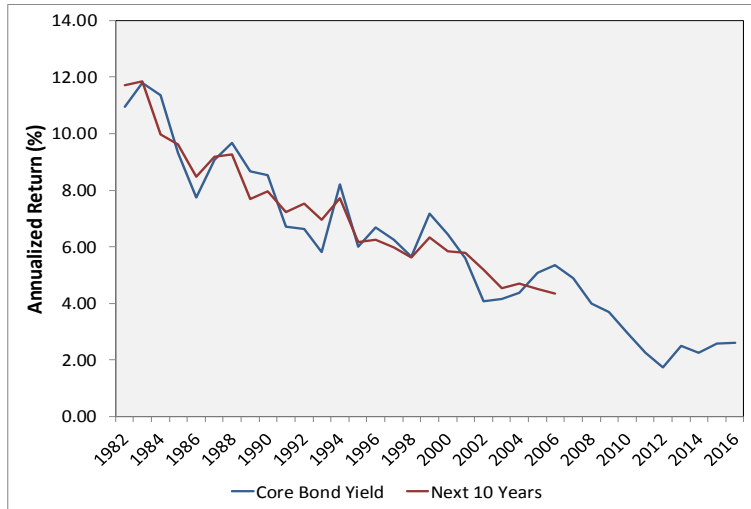
Wilshire Forecasts through Time

- Return prospects have been declining for decades, following the downward trend in interest rates



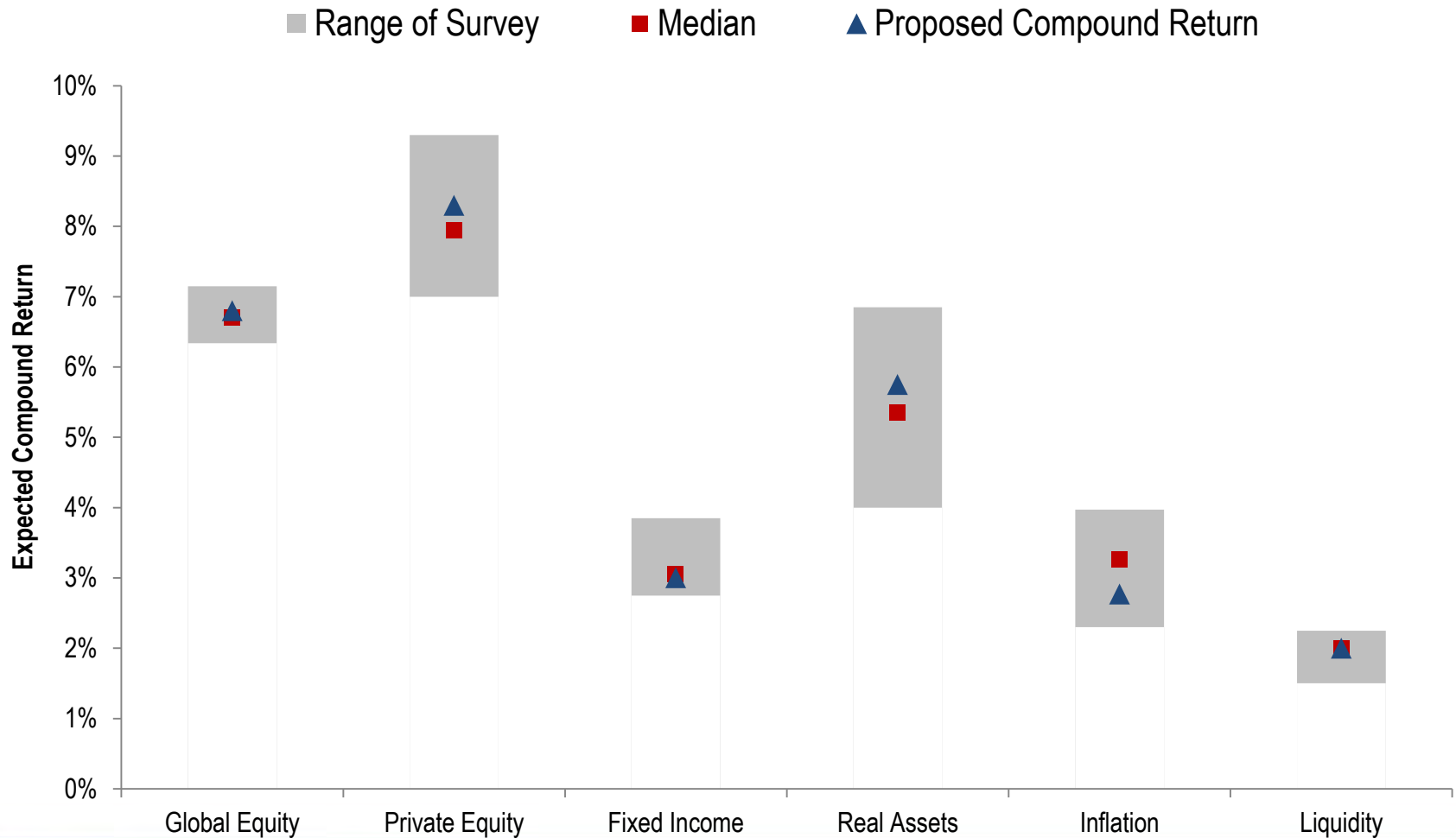
Source: Wilshire

Core Fixed Income Forecasts Remain Low

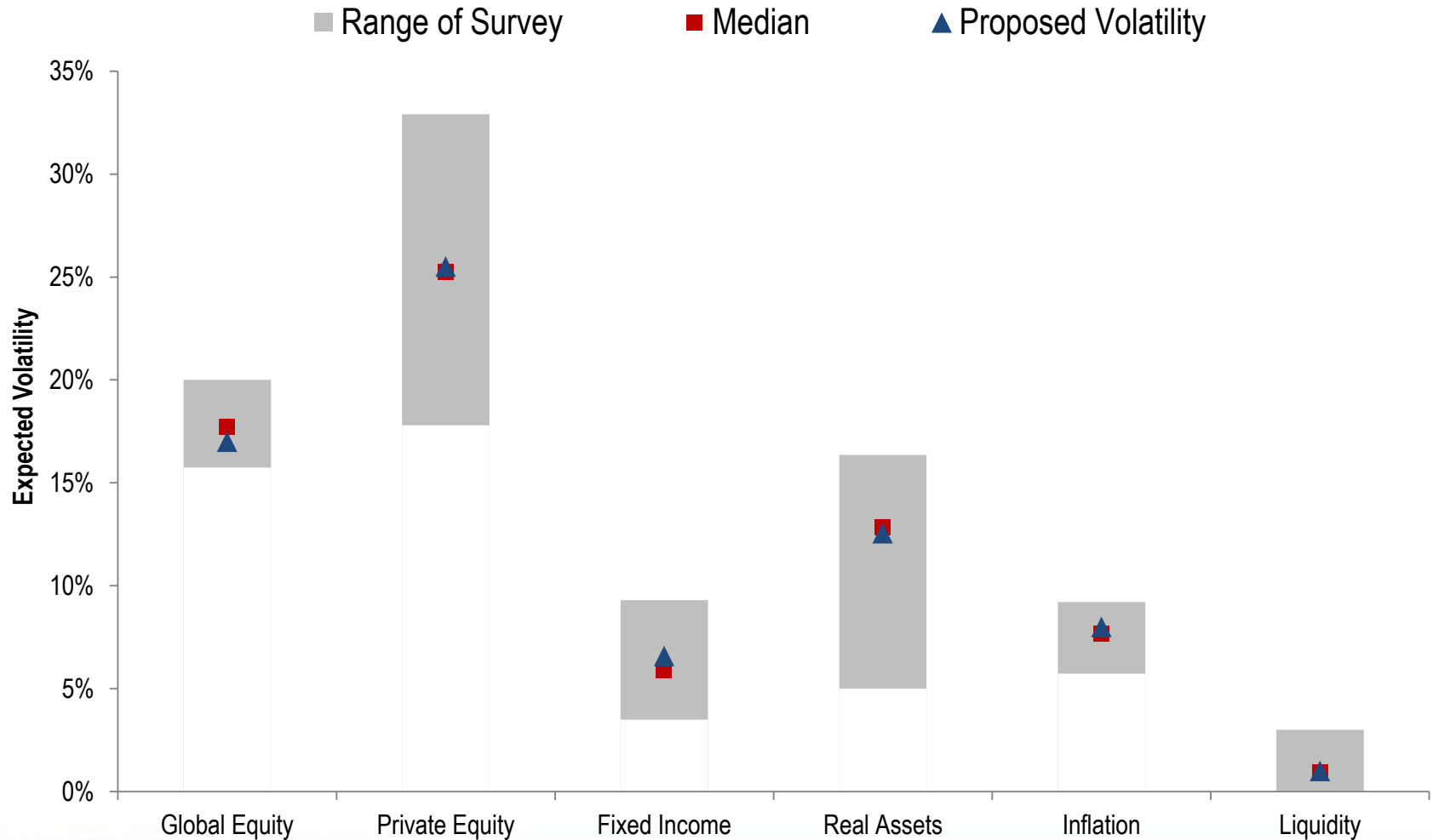


- Fixed income assets (and return prospects) are anchored by current interest rates (i.e. the “going in” yield)
- Risk premium for every other asset classes is anchored relative to fixed income assets

Range of Surveyed Expected Returns



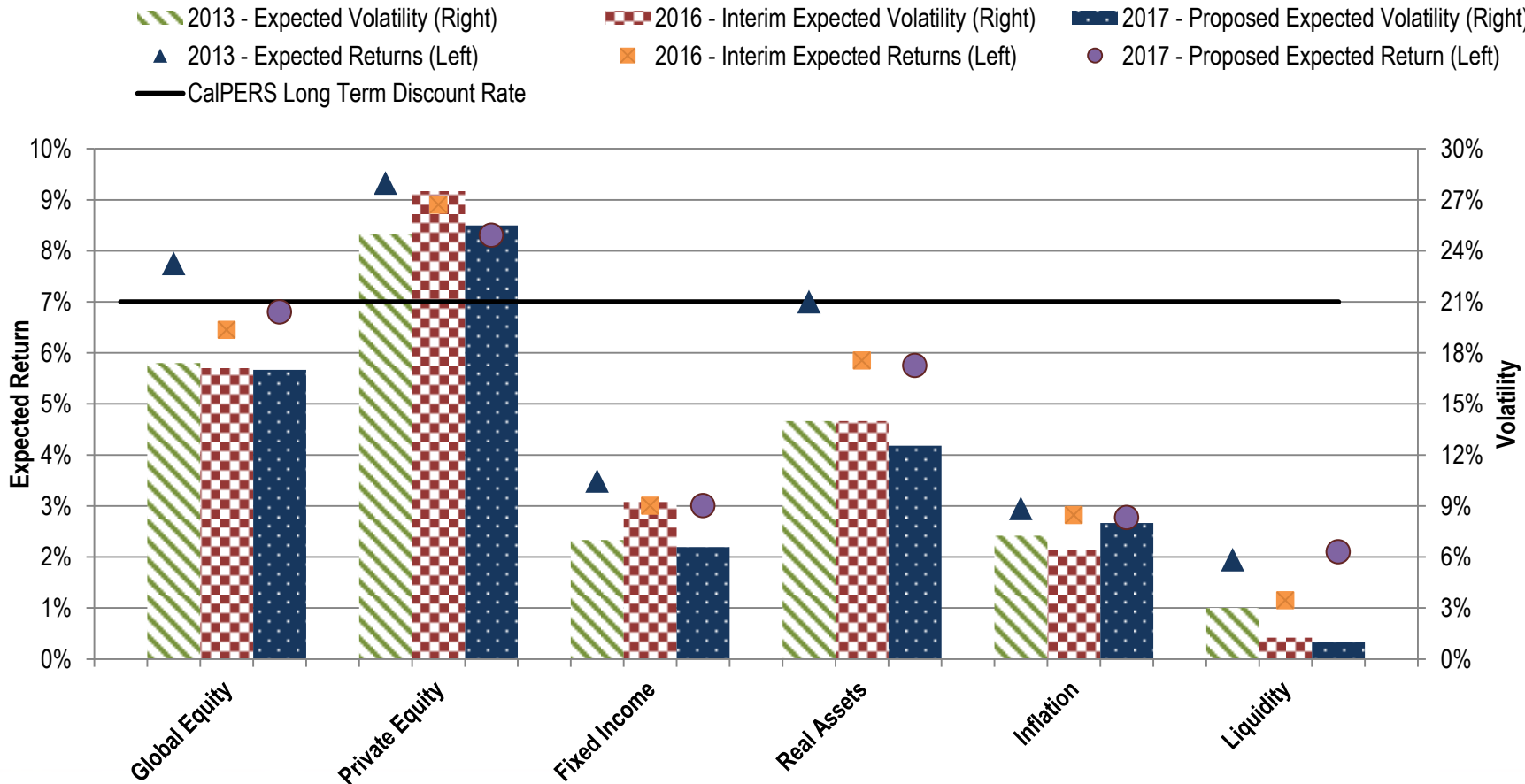
Range of Surveyed Expected Volatility



Proposed Capital Market Assumptions (CMAs)

Asset Class	Compound Return	Volatility (Std. Dev)	Correlation					
			Global Equity	Private Equity	Fixed Income	Real Assets	Inflation	Liquidity
Global Equity	6.8%	17.0%	1.00					
Private Equity	8.3%	25.5%	0.81	1.00				
Fixed Income	3.0%	6.6%	0.01	0.00	1.00			
Real Assets	5.8%	12.6%	0.59	0.48	0.09	1.00		
Inflation	2.8%	8.0%	0.39	0.33	0.40	0.21	1.00	
Liquidity	2.0%	1.0%	0.00	0.00	0.31	0.00	0.08	1.00
U.S. Inflation Assumption: 2.00%								

10-Year Expected Returns & Volatilities: 2017 vs. 2013 CMA's and 2016 Interim Expectations



Appendix

Most Common Expected Return Approaches

Fixed Income

- Yield-to-maturity plus spread adjustment

Real Assets

- Capitalization rate forecast adjusted for capex + cash flow forecast
- Risk premium between Equity and Fixed Income

Inflation

- Commodity estimated as a function of spot return + collateral return + roll return
- TIPS and Global Linkers are a function of current yields and inflation expectations

Public Equity

- Dividend Discount Model
- Inflation + Real Risk Free Rate of Cash + Risk Premium

Private Equity

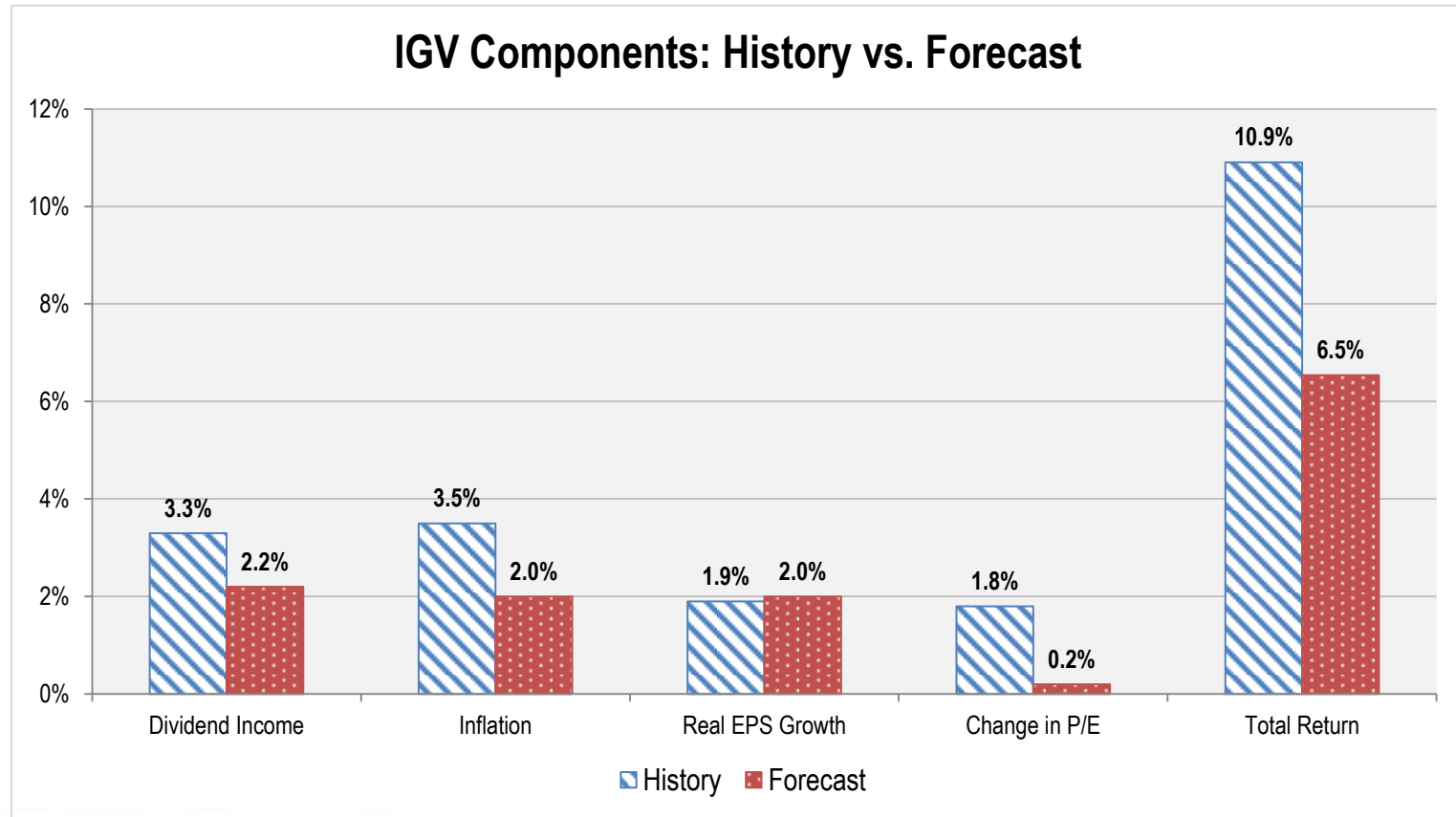
- Private Equity is a weighted average of levered equity and fixed income index
- Public Equity plus illiquidity premium and other adjustments

Risks and Correlations Estimation

- Is largely based on observed historical asset class behavior and an understanding of the response of individual asset classes to changes in economic factors
- Adjusts the historical asset class behavior to account for evident trends and recent abnormalities
- For correlations, mostly relied on the BarraOne risk system

Example Equity Forecast

- Historical results helped by valuation shifts plus higher dividend yields and inflationary growth



Source: Wilshire