

Global Equity Annual Program Review

Dan Bienvenue, Managing Investment Director

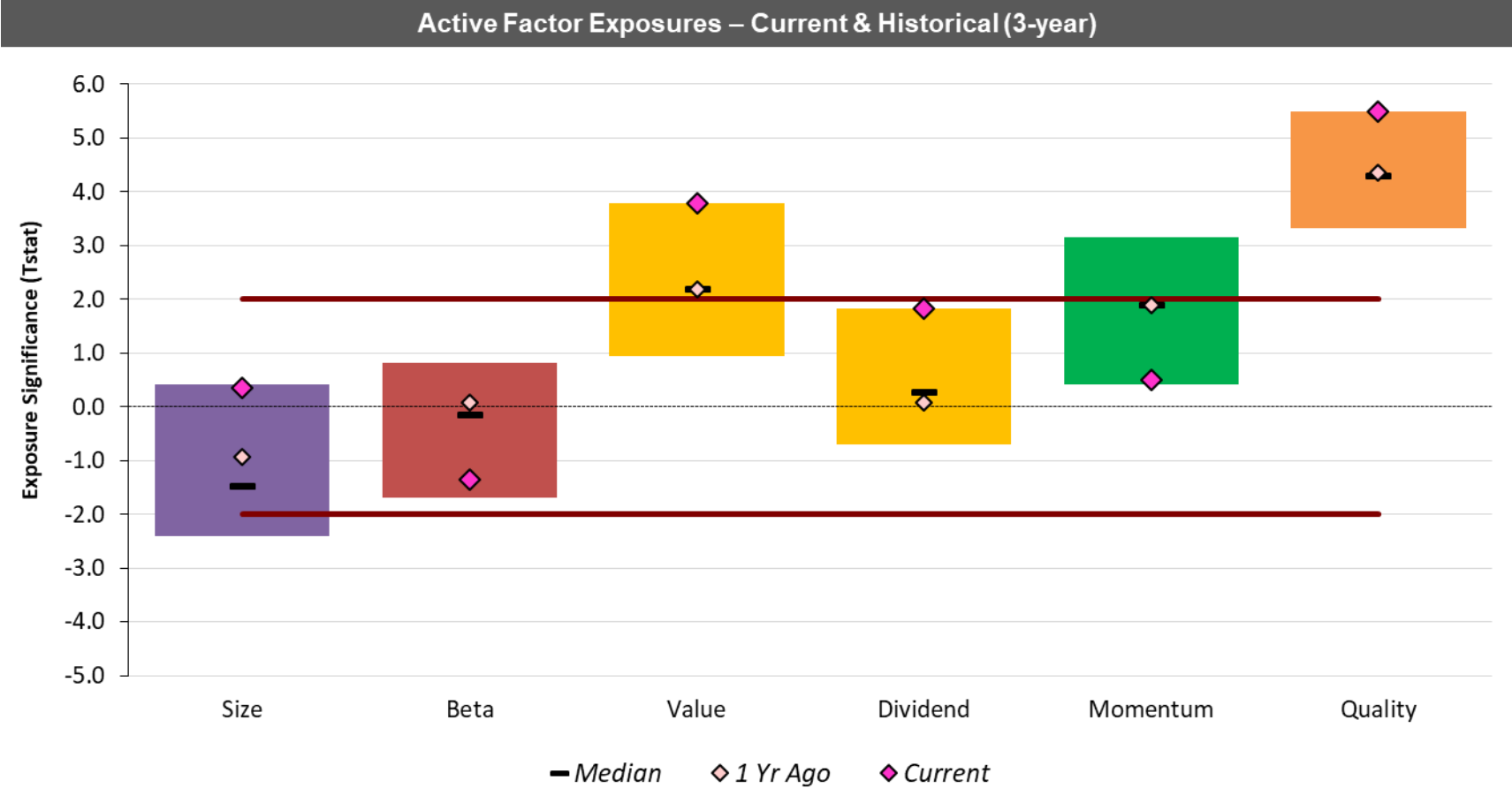
November 13, 2018

Global Equity Performance Summary

- Strong absolute return of 11.5% in FY 17/18
- 0.4% underperformance from slight defensive, “value-oriented” positioning in a strongly rising, “growth-oriented” market

	One-Year Net Return	Three-Year Net Return	Five-Year Net Return	Ten-Year Net Return	Twenty-Year Net Return	Since Inception (July 1989) Net Return
Global Equity (\$172 B)	11.5%	8.8%	10.2%	6.7%	5.9%	9.1%
Policy Benchmark	11.9%	8.8%	10.2%	7.0%	5.9%	8.4%
Excess Return	-0.4%	0.0%	0.0%	-0.3%	0.0%	0.7%
Active Risk (Realized)	0.3%	0.4%	0.3%	0.8%	0.8%	1.9%

Portfolio Positioning



Business Update

- Fiscal Year 2017-2018 Major Accomplishments
 - Launched Two Internally-Managed ESG-Based Strategies
 - Strategy Rationalization (Internalization, Closures, Collapses, Launches)
 - Affiliate ALM Review Process
- Fiscal Year 2018-2019 Major Initiatives
 - Transition Manager Search and Emerging Manager Review
 - Implementation of ALM Outcomes for PERF, Affiliates
 - Continue Strategy and Risk Rationalization
 - Continue ESG Strategic Plan Implementation (Integration, Board Diversity, Executive Compensation, Climate Action 100+, etc.)

Appendix

Review Outline

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- 1** Liabilities
- 2** Long-Term Horizon
- 3** Stakeholders
- 4** Three Forms of Capital
- 5** Accountability
- 6** Strategic Allocation
- 7** Risk Reward
- 8** Costs Matter
- 9** Multi-faceted Risk
- 10** Resources/Process

Investment Beliefs Key

	Short Name	Investment Belief
1	Liabilities	Liabilities must influence the asset structure.
2	Long-Term Horizon	A long time investment horizon is a responsibility and an advantage.
3	Stakeholders	CalPERS investment decisions may reflect wider stakeholder views.
4	Three Forms of Capital	Long-term value creation requires effective management of three forms of capital: financial, physical, and human.
5	Accountability	CalPERS must articulate its investment goals and performance measure and ensure clear accountability for their execution.
6	Strategic Allocation	Strategic asset allocation is the dominant determinant of portfolio risk and return.
7	Risk Reward	CalPERS will take risk only where we have a strong belief we will be rewarded.
8	Costs Matter	Costs matter and need to be effectively managed.
9	Multi-faceted Risk	Risk of CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error.
10	Resources / Process	Strong processes and teamwork and deep resources are needed to achieve CalPERS' goals and objectives.

I. Program Overview

Program Role

- Primary role
 - The role of equities is “total return oriented and to capture the equity risk premium (ERP), defined as the excess return over risk-free government bonds, by means of ownership risk in companies and exposure to corporate earnings growth. The major driver is appreciation, with some cash yield (growth and liquidity)” - 2017 Asset Liability Management (ALM)
- Drivers of total performance
 - Price appreciation
 - Cash yield
- Risks
 - Economic: High sensitivity to global economic growth variability
 - Liquidity: Portfolio expected to remain highly liquid

Program Investment Philosophy

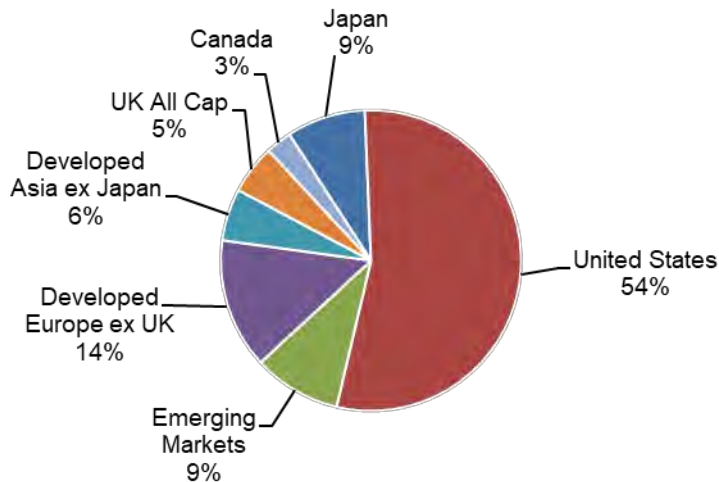
- Global Equity markets are difficult to predict
 - Priority on the efficient delivery of equity market returns through a risk-managed combination of index-oriented, alternative beta, and traditional active management
- Alpha opportunities are multi-faceted and time-varying
 - Structural alpha: systematic market structures and behaviors
 - Tactical alpha: market dislocations
 - Time-varying opportunities; risk-taking based on opportunity set
- Focus on holistic portfolio, net of costs
 - 80% of the portfolio is invested in cost-efficient, internally-managed strategies
 - Capital allocation decisions are based on holistic portfolio risk, opportunities, and implementation capabilities

Policy Benchmark

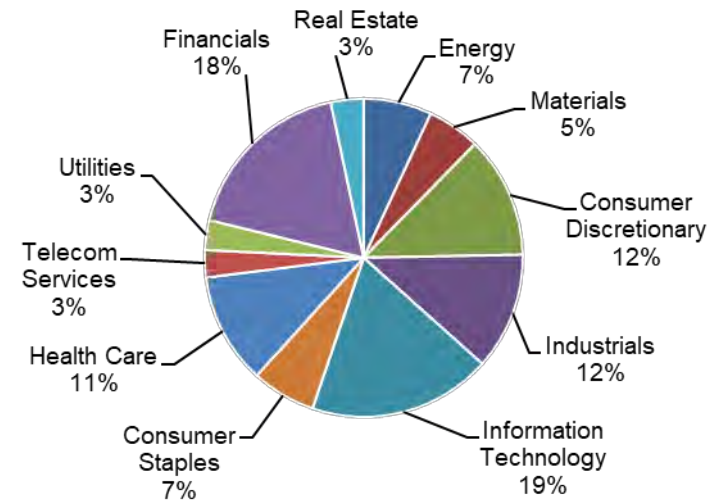
CalPERS Custom FTSE All World, All Capitalization

- Excludes tobacco, firearms, thermal coal, Iran/Sudan
- Complies with emerging market principles
- Covers 47 countries, 36 currencies
- Holds approximately 10,000 securities, weighted by market-capitalization

GE Holdings By Region



GE Holdings By Sector



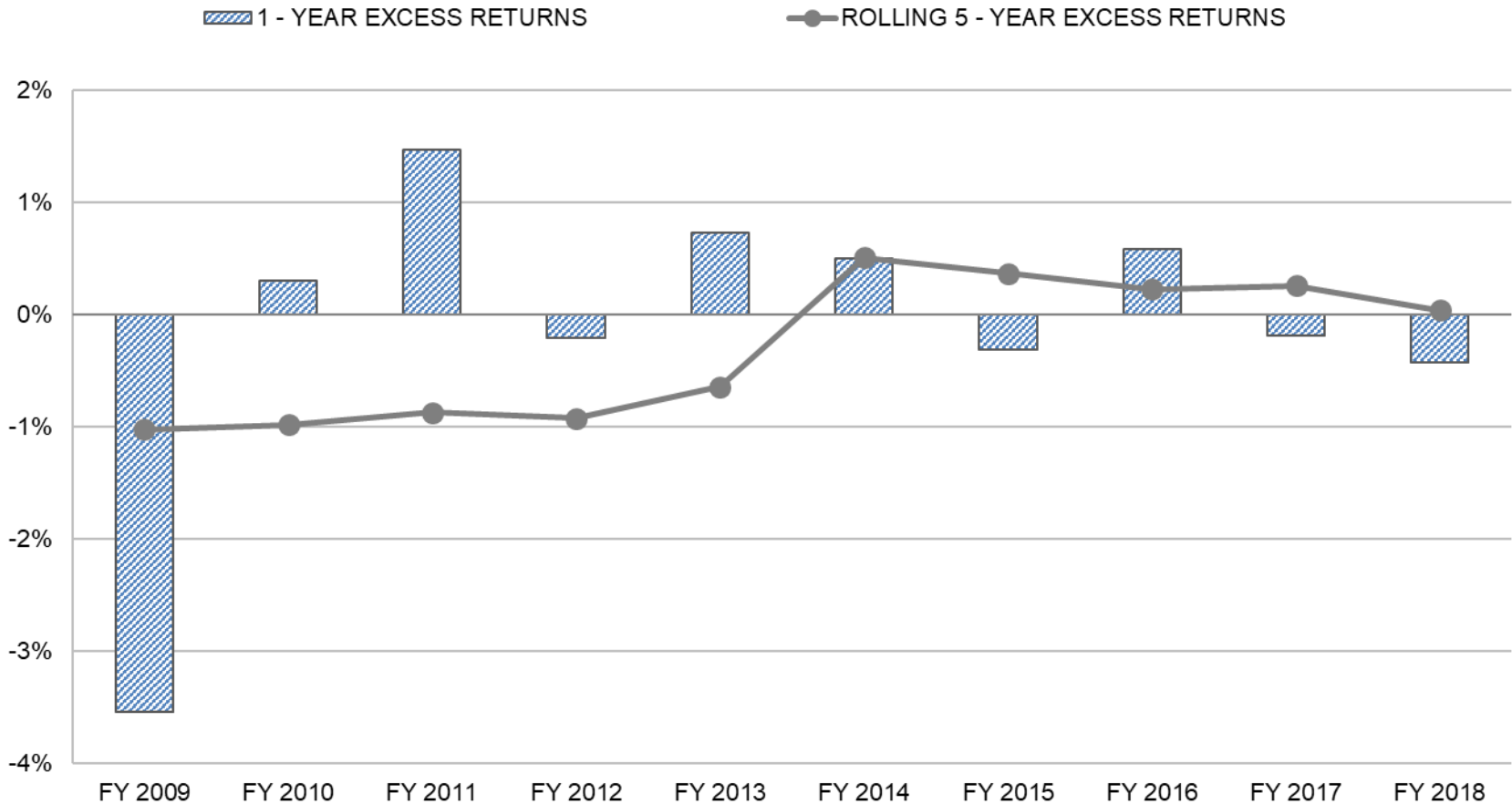
Program Characteristics

- Total assets: \$172 billion
- 80% internally managed, 20% externally managed

	Index-Oriented	Alternative Beta	Traditional Active	Emerging Managers	Total
% of Assets Under Management (AUM)	56%	15%	26%	2%	\$172 B
Forecast Active Risk (bps)	11	97	60	101	26
Mandate Mix					
Global	\$0 B	\$11 B	\$23 B	\$0.2 B	\$34 B
US	\$57 B	\$7 B	\$7 B	\$2 B	\$73 B
International Developed	\$35 B	\$7 B	\$9 B	\$1 B	\$52 B
Emerging Markets	\$5 B	\$2 B	\$6 B	\$0.3 B	\$13 B
FEES					
One-Year Fees Paid	\$10.5 MM	\$4.4 MM	\$91.2 MM	\$24 MM	\$130.1 MM
Cost / AUM (bps)	1	2	20	67	8

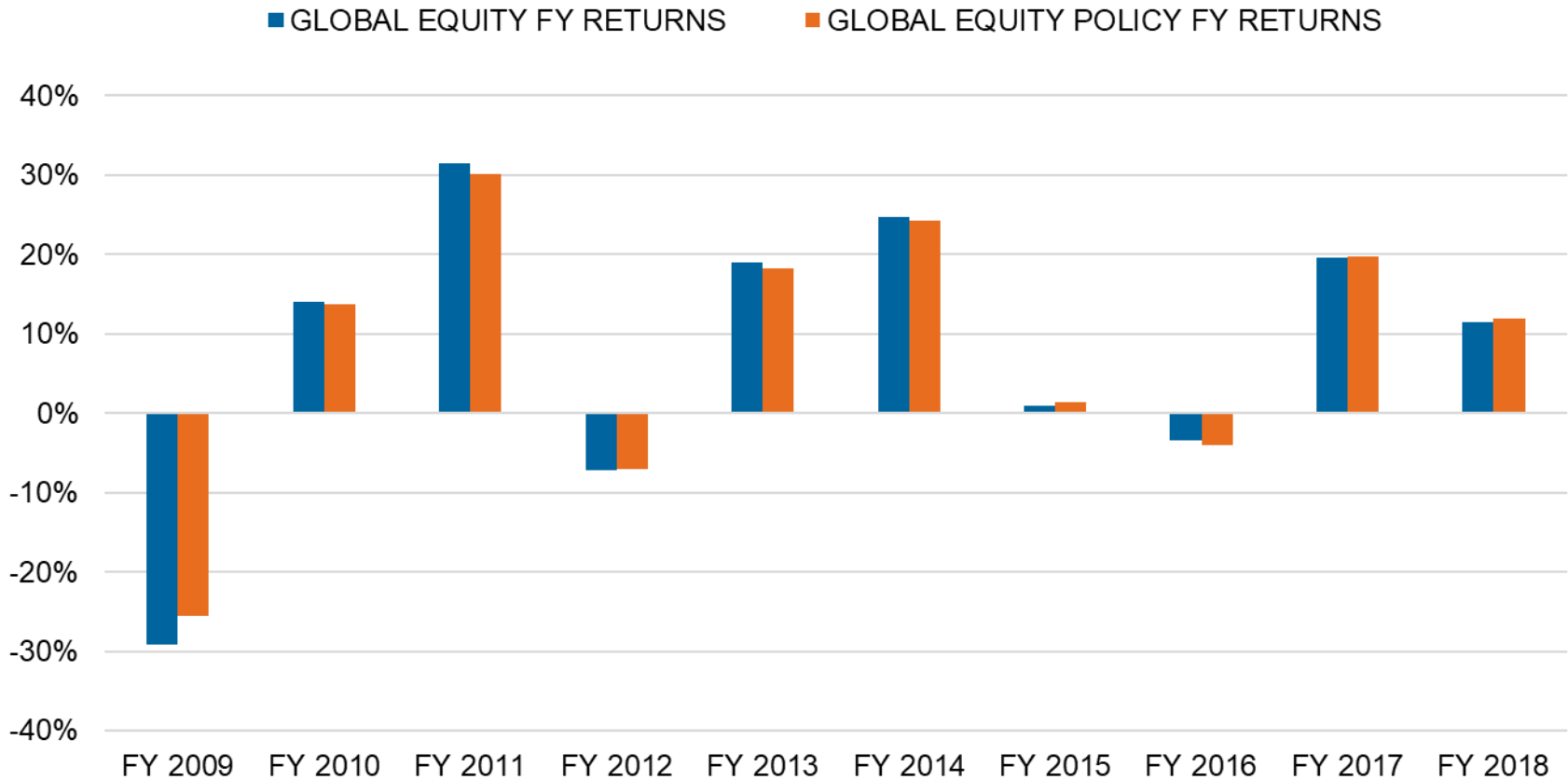
II. Investment Review

Global Equity Rolling 5-Year Active Return



Global Equity Annual Returns

Total Global Equity Annual Returns – Fiscal Year



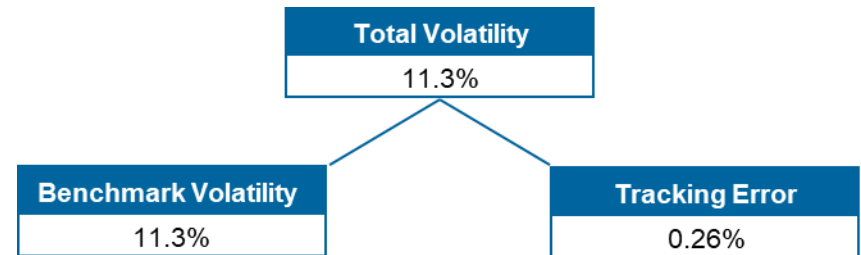
One-Year Excess Return Contributors

Positive Contributors	Negative Contributors
Momentum Alternative Beta (+8 bps)	Emerging Markets Active Strategies (-16 bps)
Securities Lending (+7 bps)	Value Alternative Beta (-15 bps)
Developed International Active Strategies (+5 bps)	Global Active Strategies (-10 bps)
Structured Products (+5 bps)	U.S. Active Strategies (-5 bps)

Global Equity Risk Profile

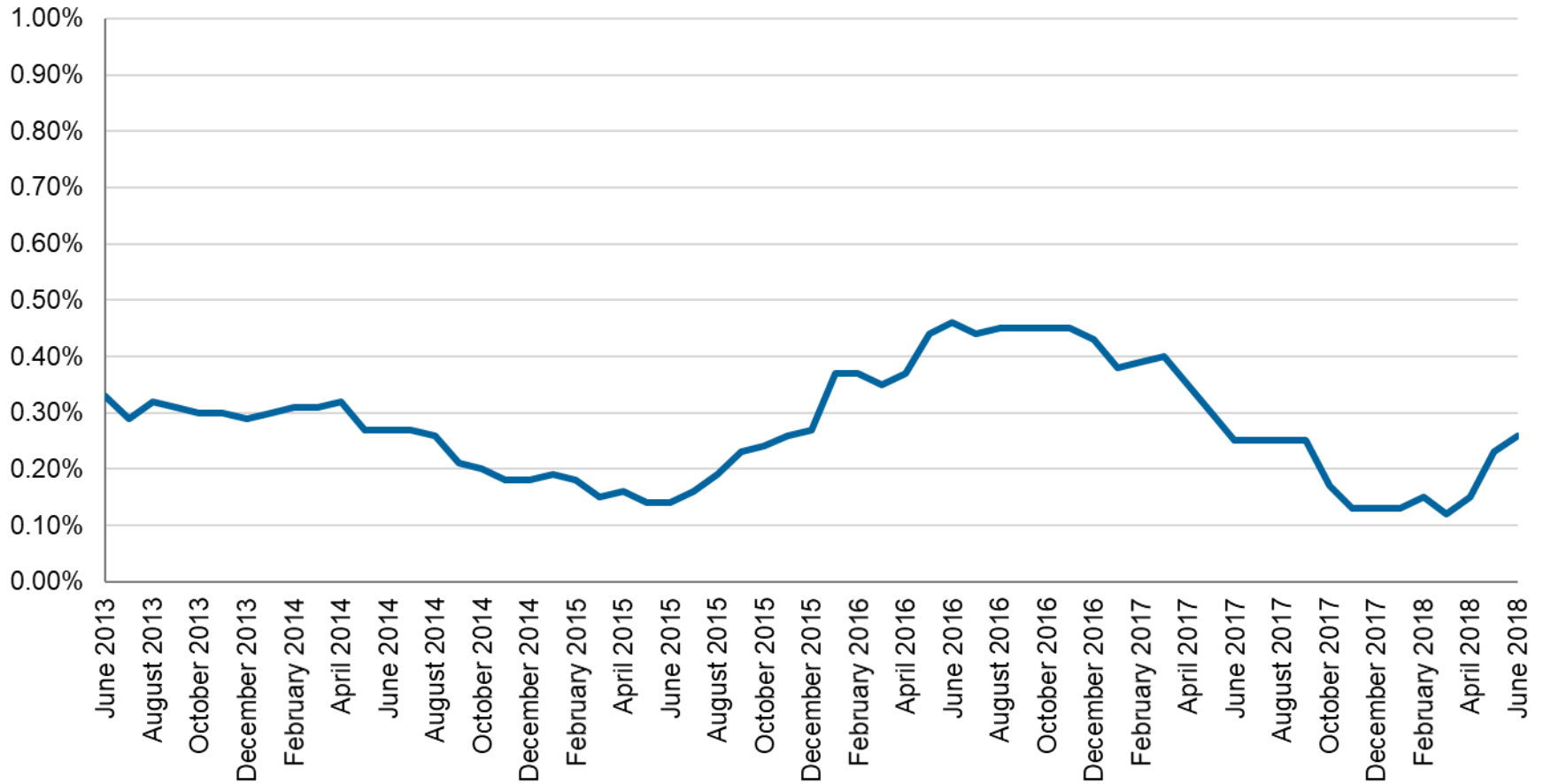
As of June 30, 2018

- Global Equity Forecasted Volatility is 11.3%
- Forecasted Tracking Error is 0.26% and is within expectations
- Correlation vs. the entire PERF portfolio is 0.97
- Stress Scenarios:
 - Tech Crash and Recession (Jan 00 – Mar 03)
 - Estimated drawdown is \$80B (+54 bps relative)
 - Subprime and Credit Crisis (Oct 07 – Mar 09)
 - Estimated drawdown is \$95B (+45 bps relative)



Portfolio Active Risk

Five-Year Trend in Realized Active Risk



Global Equity Research | Mission and Agenda

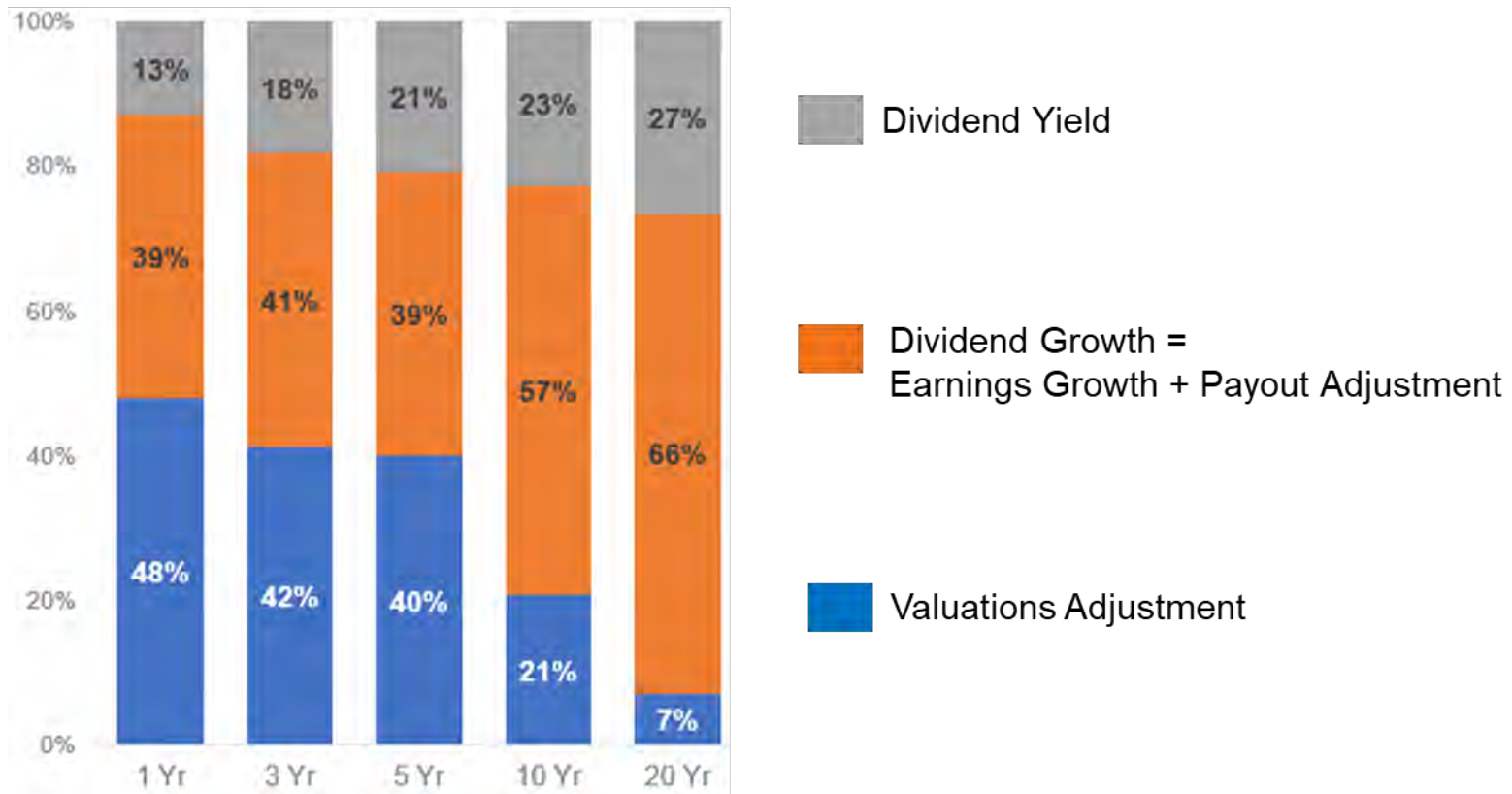
Mission

Produce quality research to support CalPERS Global Equities portfolio management

Guiding Principles	FY18/19 Objectives
<ul style="list-style-type: none"> • Successful beta management requires active stewardship of “passive” indices 	<ul style="list-style-type: none"> • House View <ul style="list-style-type: none"> – 1-5 year horizon asset class views, leveraging internal research and strategic partners insights • Long Horizon Growth <ul style="list-style-type: none"> – Identify 10+ years global growth drivers and map potential index solutions
<ul style="list-style-type: none"> • Active management seeks to maximize return on capital and alignment with Total Fund priorities and beliefs 	<ul style="list-style-type: none"> • Enhance internal style-based investing capabilities <ul style="list-style-type: none"> – Styles/Factor Allocation – ESG integration • Support external manager portfolio selection and rationalization

House View | Equity Return Drivers

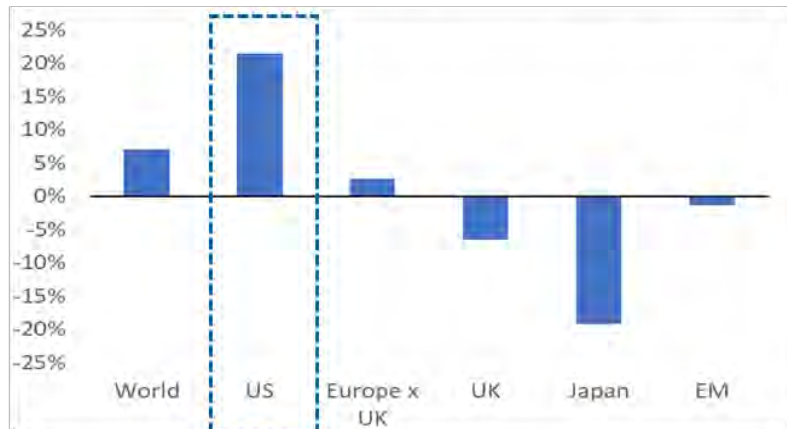
Global Equity Average Absolute Return Contribution by Horizon ¹



House View | Increased Fragility

- Public Equities' upside more fragile due to:
 - Above average valuations, especially in the US
 - Elevated earnings expectations vs. GDP growth forecasts

Global Equity Valuation vs. Long-Term Levels¹



¹ Average difference between current vs. long-term level across various valuation metrics (PE, PFE, PB, PS, PCE, CAPE). Look-back periods range from 20-35+ years based on available data. Source: MSCI, Bloomberg and JPM.

US Earnings Growth vs. US Economic Growth²

	EPS Growth	GDP Growth
Long Term Annualized *	6.7%	6.5%
Since Last Peak **	3.9%	3.0%
FY18/19 ***		
U.S.	10.2%	2.6%
World	9.7%	3.7%

² US Earnings proxied by S&P500 index Earnings

* From Dec1960-Dec2017

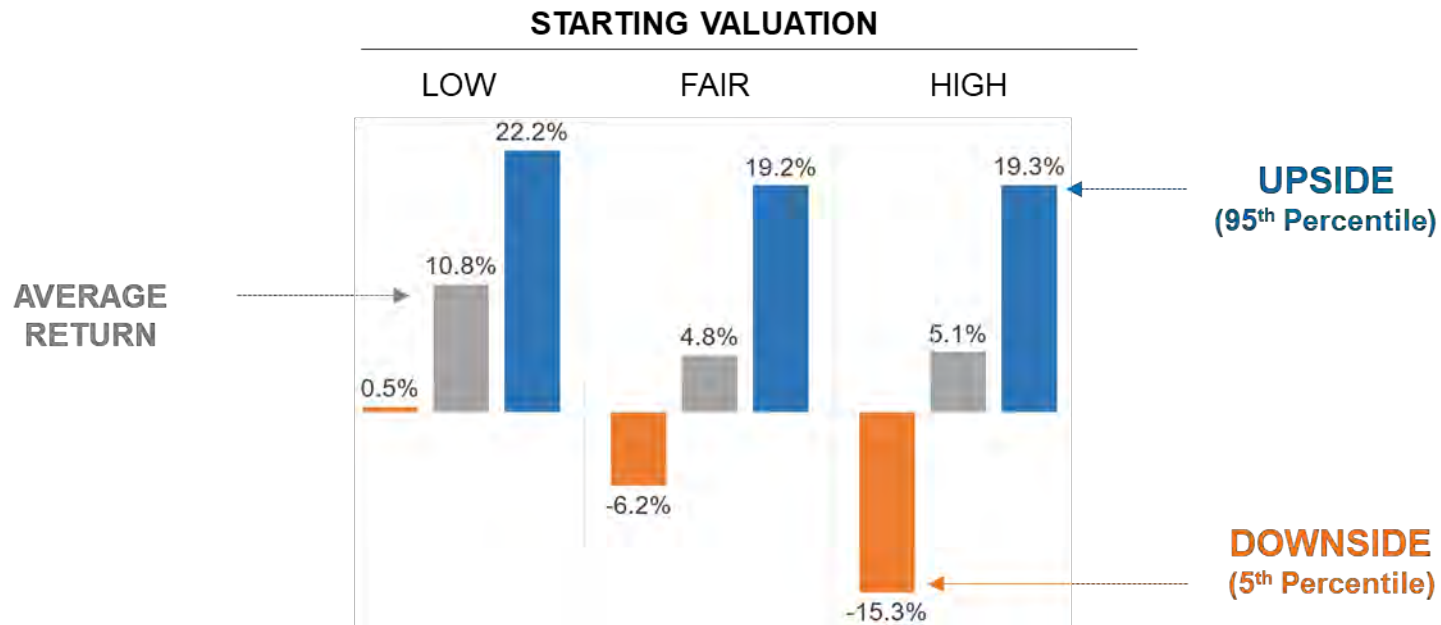
** From Dec 2007-Dec 2017

*** Source: IBES earnings estimates

House View | Increased Fragility (Continued)

- Low valuations = HIGH average returns, HIGH upside + LOW downside potential
- High valuations = MODERATE average returns, HIGH upside + HIGH downside potential

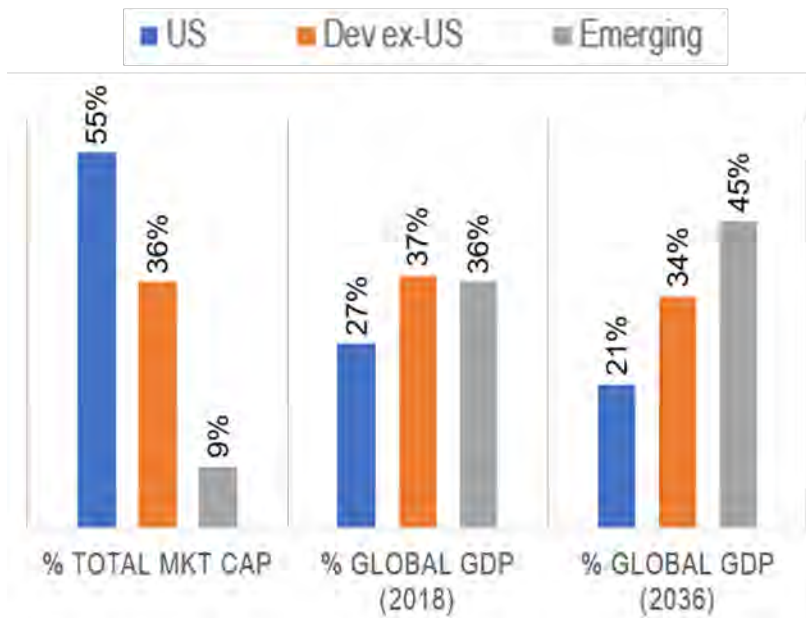
Starting Valuations vs. 5-Year Forward Returns¹



Long-Horizon Growth | Economic vs. Index Weights

- EM contribution to Global GDP contrasts with its weight in the Global Equity benchmark

Regional Index Weights vs. Economic Weights¹

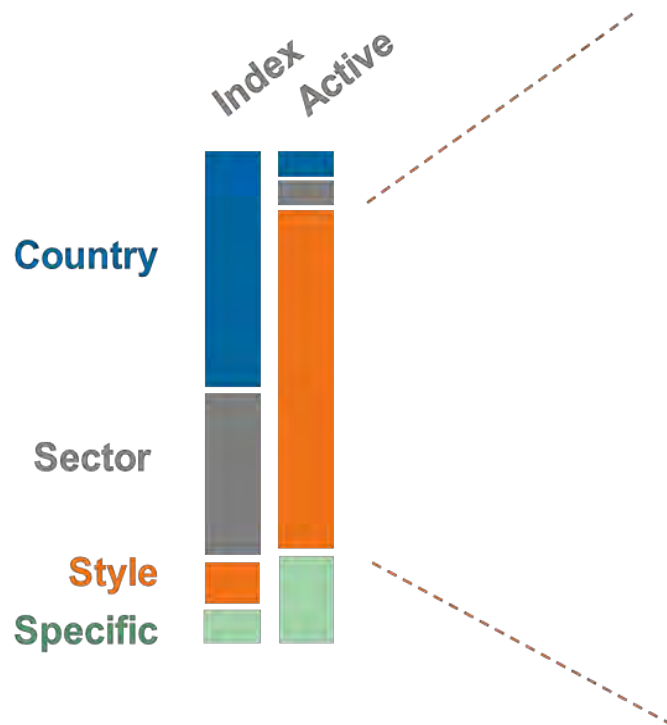


GDP Ranking: Current vs. Long-Run Estimates²

GDP World Rank	2018	2036
1	US	US/China
2	China	
3	Japan	India
4	Germany	Japan
5	UK	Germany/Brazil

Active Management | Style Investing

Index & Active Risk Decomposition ¹



Equity Styles: Attractive Risk-Reward Potential

- Styles: alternative risk premia (Value, Growth, Quality) and market anomalies (Momentum, Low Volatility) with a history of low correlations
- Disciplined, repeatable, low cost allocation to diversifying sources of attractive risk-premia

	Index	Multi-Style Portfolio ²
Avg 5yr Sharpe Ratio	0.52	0.95
Avg 5yr Information Ratio	-	1.01

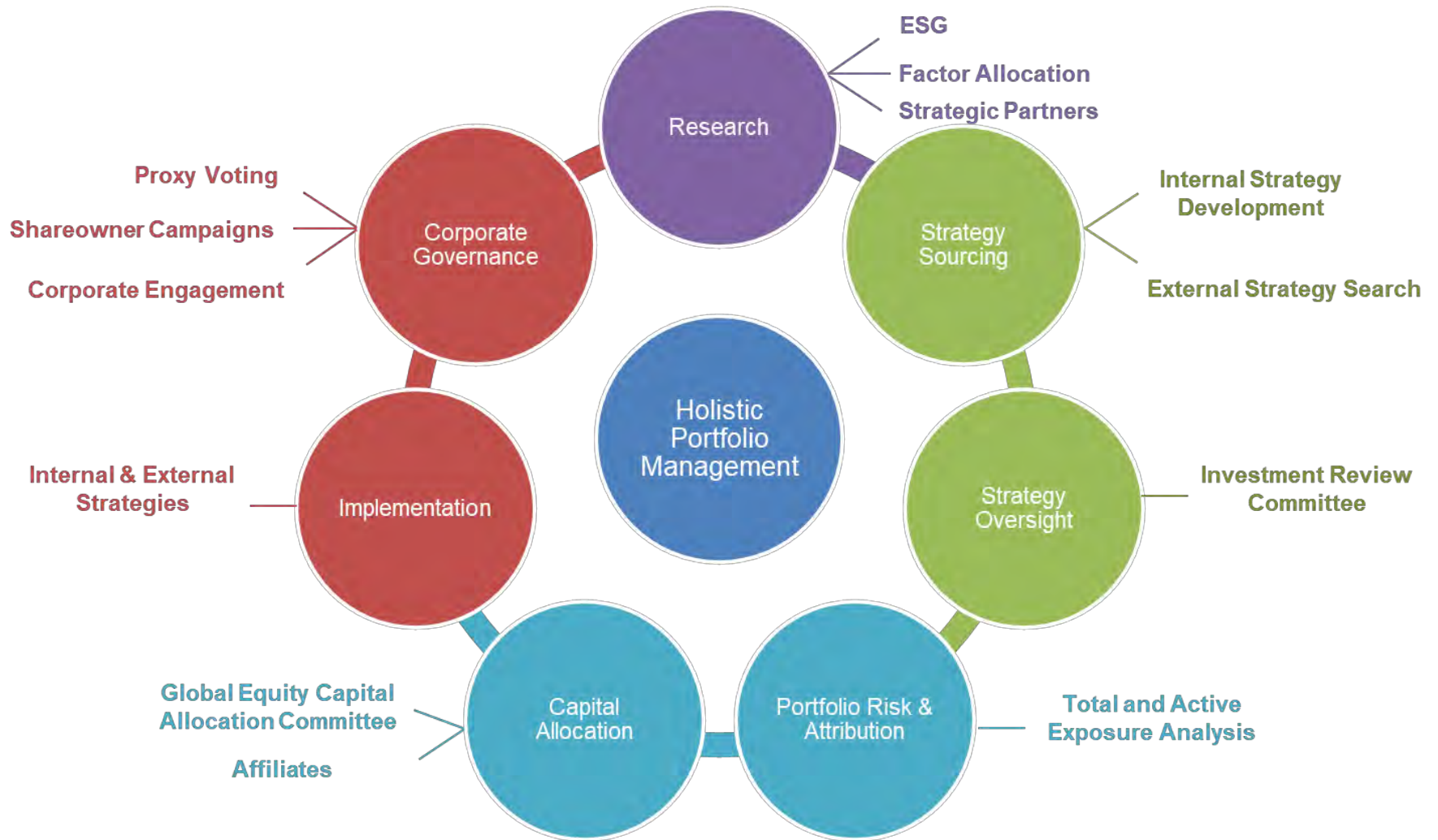
- Priorities:
 - Enhance styles allocation process
 - Integration of ESG considerations

III. Business Review

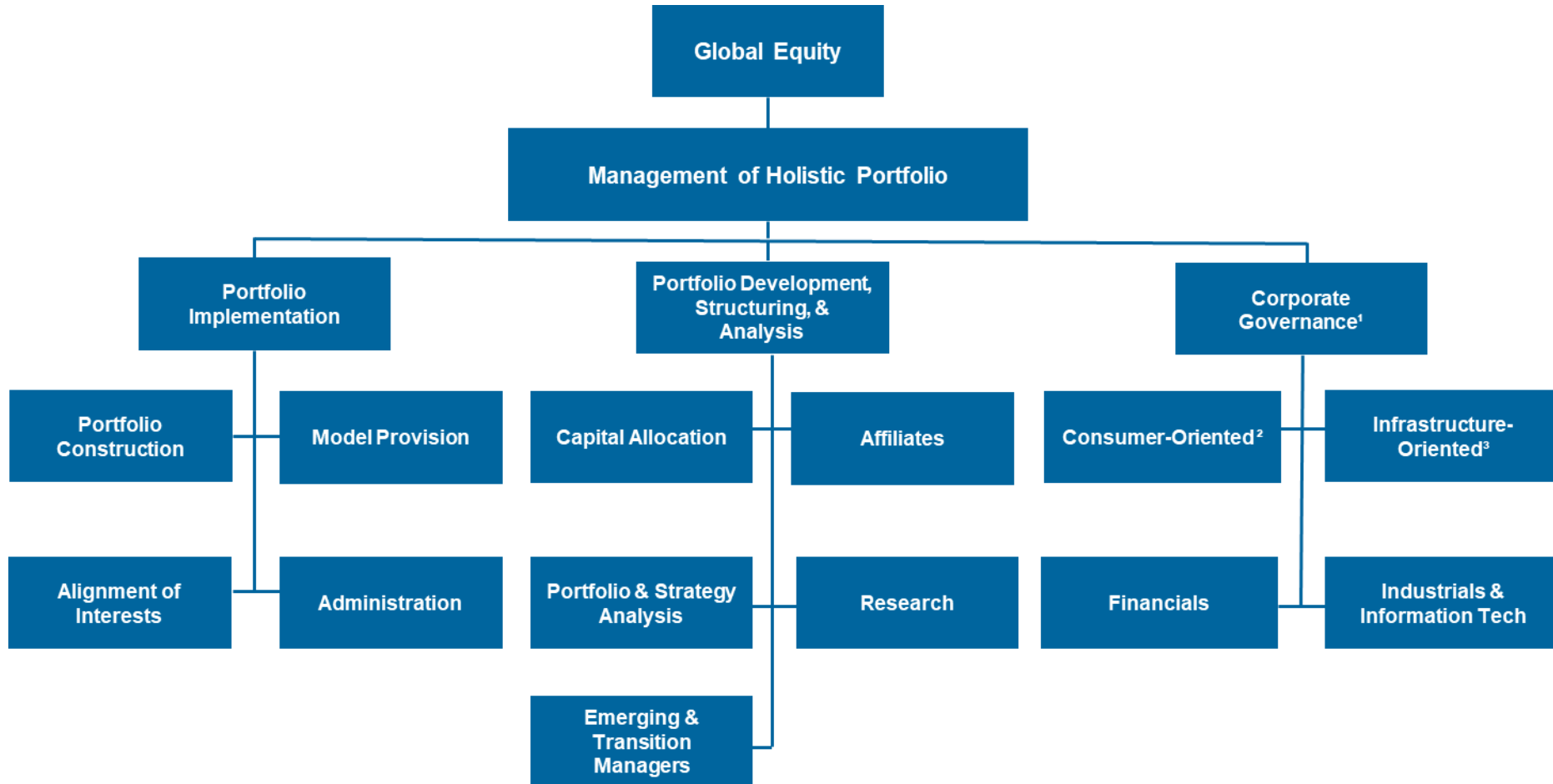
Business Philosophy

- Management of the holistic portfolio
 - Disciplined and inclusive capital allocation process
 - Multi-dimensional risk management
- Capitalize on strengths
 - Long horizon investor
 - Utilize natural “long” positioning
 - Systematic harvesting of market risk premiums
- Efficient deployment of the business model
 - “One Team, One Mission” culture
 - Heavy use of technology and automation
 - Continuous improvement

Investment Model Elements



Functional Organizational Chart



Staffing Overview

TOTAL PROGRAM¹

- Total Global Equity Positions: 54
 - Global Equity Investment Positions: 37
 - Public Assets Administrative Positions: 17

STAFFING UPDATES¹

- Appointed 7 Investment Staff
- Transferred 14 Investment Staff
- Appointed 7 Administrative Staff
- Transferred 1 Administrative Staff

CURRENT VACANCIES¹

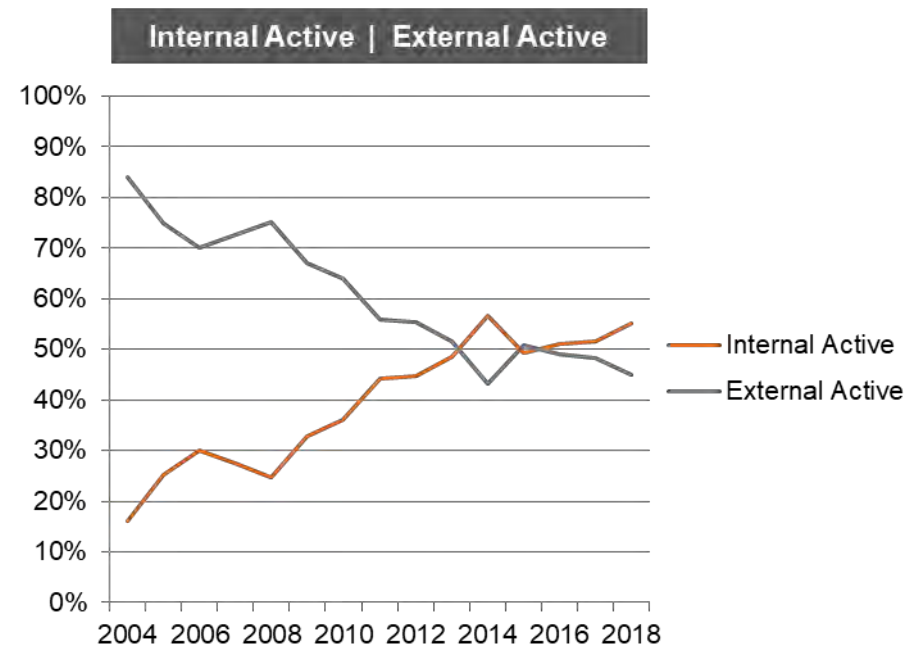
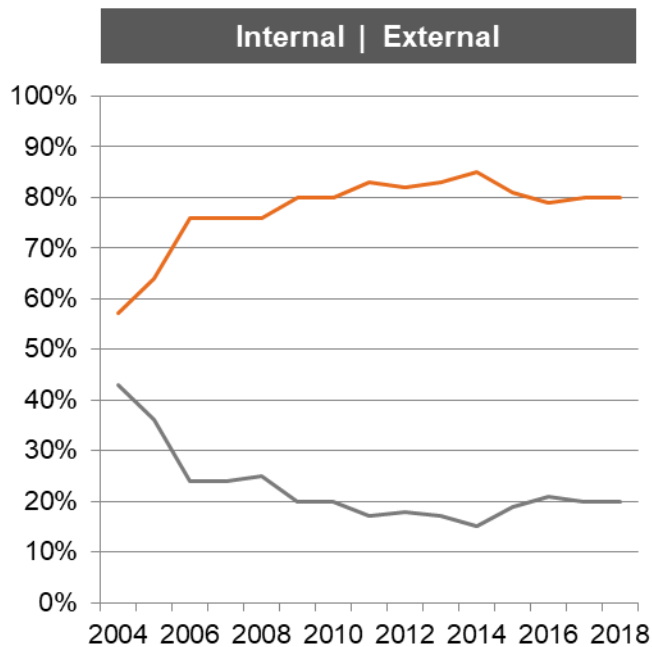
- 1 Investment Manager
- 1 Associate Investment Manager
- 4 Investment Officers
- 2 Administrative Staff

Program Expenses

	FY 2017-18			FY 2016-17		
	AUM (\$billions)	Fees Paid (\$millions)	Fees Paid (BPS)	AUM (\$billions)	Fees Paid (\$millions)	Fees Paid (BPS)
Index Oriented	\$ 96.5	\$ 10.5	1	\$ 90.6	\$ 11.0	1
Alternative Beta	\$ 26.6	\$ 4.4	2	\$ 22.3	\$ 4.7	2
Traditional Active	\$ 45.2	\$ 91.2	20	\$ 40.1	\$ 82.4	21
Emerging Managers	\$ 3.6	\$ 24.0	67	\$ 3.2	\$ 22.9	72
Consultants Expense	N/A	\$ 2.0	0.1	N/A	\$ 1.7	0.1
Technology & Operating Expense	N/A	\$ 15.4	0.9	N/A	\$ 14.9	1
Total Program	\$ 171.8	\$ 147.5	9	\$ 156.2	\$ 137.7	9

Trend in Implementation

- The percentage of assets managed in-house (80% today) has increased over time
- 55% of Global Equity's active strategies are now managed in-house



IV. Governance & Sustainability Integration

Progress on ESG Strategic Plan Initiatives

- Global Equity ESG Strategies
 - Implemented two new internally-managed systematic ESG strategies, each funded with \$1B
 - Total ESG-oriented allocation across four strategies (2 systematic and 2 fundamental) now stands at \$3.5B
- Integration of Corporate Governance into Global Equity
 - Implemented a new sector-based corporate governance business model
 - Implemented enhanced voting practices on corporate board diversity & inclusion and executive compensation