

Joint Meeting of the ERS Board of Trustees and Investment Advisory Committee

March 11, 2020



Public Agenda #7

Call Meeting of the Board of Trustees to Order

March 11, 2020

Public Agenda #8

Call Meeting of the Investment Advisory Committee to Order

March 11, 2020

Public Agenda #9

*Review and Approval of the Minutes to the December 11,
2019 Joint Meeting of the Board of Trustees and
Investment Advisory Committee - (**Action**)*

March 11, 2020

Questions?
Action Item

Public Agenda Item #10

*Review and Consideration of New Appointment to the
Investment Advisory Committee - (**Action**)*

March 11, 2020

Tom Tull, CFA, Chief Investment Officer

IAC Skills Assessment

	Term Expiration	Investment Experience	Global Equity	Fixed Income	Private Equity	Real Estate	Hedge Funds	Infrastructure	Derivatives
IAC Chair, Bob Alley, CFA Retired from AIM Advisors, Inc. as Chief Fixed Income Officer	8/31/2021	43 years	X	X	X				
IAC Vice-Chair, Gene L. Needles, Jr. Chairman and CEO Resolute Investment Management	5/31/2020	25 years	X	X	X	X	X		X
Caroline Cooley Managing Partner – Hedge Funds Crestline Investors, Inc.	12/31/2022	34 years		X			X		X
James Hille, CFA, CAIA CIO Texas Christian University Endowment	8/31/2020	27 years	X	X	X	X	X		
Ken Mindell Sr. VP, Treasurer & Director of Investments Rosewood Management Corporation	5/31/2022	38 years	X	X	X	X	X	X	X
Laurie Dotter Retired from Transwestern Corporation Properties as President	5/31/2022	35 years				X		X	
Didi Weinblatt, Ph.D., CFA Retired from USAA Investment Mgmt Co as Vice President, Mutual Fund Portfolios	8/31/2020	38 years	X	X					
Milton Hixson, CPA, CFP CEO FMP Wealth Advisors	3/31/2023	46 years	X	X	X	X	X	X	

Questions?
Action Item

Public Agenda Item #11

Review of ERS' Asset Allocation and Implementation

March 11, 2020

Tom Tull, CFA, Chief Investment Officer
Sam Austin and Michael Malchenko, NEPC

NEPC 2020 INVESTMENT OUTLOOK

EMPLOYEES RETIREMENT SYSTEM OF TEXAS



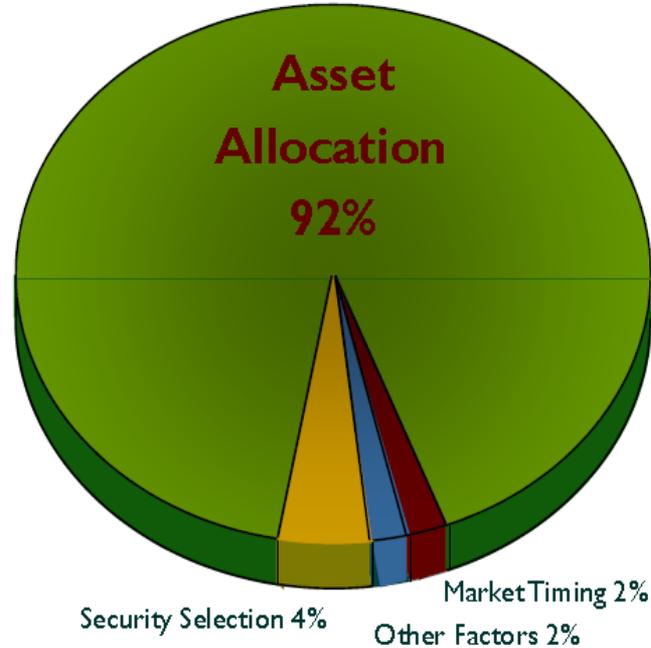
BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

CURRENT ASSET ALLOCATION POLICY & RANGES

	Long-Term Target	Current Actual Allocation 12/31/2019	Long-Term Target Range	Benchmark
Return Seeking Assets				
Public Equity	37.0%	39.0%	27.0% - 47.0%	MSCI ACWI IMI
Private Equity	13.0%	14.7%	8.0% - 18.0%	Wilshire TUCS Public: Plans > \$5 Billion
Global Credit	11.0%	9.6%	1.0% - 21.0%	Barclays US HY 2%
Private Real Estate	9.0%	7.6%	4.0% - 14.0%	NCREIF – ODCE
Public Real Estate	3.0%	3.2%	0.0% - 13.0%	FTSE EPRA / NAREIT
Private Infrastructure	7.0%	3.0%	2.0% - 12.0%	CPI + 400 bps
Opportunistic Credit	3.0%	-	0.0% - 8.0%	S&P LSTA Leveraged Loan Index + 1.5%
Risk Assets: Reduction/Liquidity				
Total Rates	11.0%	17.1%	--	Barclays Intermediate Treasury
Absolute Return	5.0%	3.6%	0.0% - 10.0%	3-Month T-bill + 3.5%
Cash	1.0%	1.9%	0.0% - 1.0%	91 Day Treasury bill

ASSET ALLOCATION: THE KEY INVESTMENT DECISION

Determinants of Portfolio Performance



Source: *Determinants of Portfolio Performance II: An Update*, Binson, et al, *Financial Analysts Journal*, May/June 1991, pp 40-48.

CAPITAL MARKET FORECAST COMPARISON

	Asset Class	Policy Asset Allocation	2019 (5-7 Yr)		2020 (10 Yr)	
			Return	Risk	Return	Risk
Risk Seeking: 79%	Global Equity	37	7.00%	17.60%	6.21%	17.79%
	Private Equity	13	8.80%	19.60%	8.11%	19.66%
	Total Global Equity	50	7.50%	17.80%	6.67%	17.98%
	Global Credit	11	5.50%	11.80%	4.45%	11.89%
	Opportunistic Credit	3	6.80%	8.70%	6.04%	9.26%
	REITs	3	6.80%	20.00%	5.42%	20.00%
	Private Real Assets - Infrastructure/Land	7	6.30%	12.00%	5.91%	12.00%
	Private Real Estate	9	6.70%	14.50%	6.05%	15.87%
Real Assets	19	6.80%	12.30%	6.19%	12.77%	
Risk Reduction/ Liquidity Assets: 21%	Fixed Income - Rates	11	2.50%	4.70%	1.97%	4.65%
	Absolute Return**	5	6.50%	3.60%	6.50%	3.41%
	Cash	1	2.50%	1.00%	1.81%	1.00%

Expected Return (Geometric)
Standard Deviation (Asset)
Sharpe Ratio

20 Year Expected Return

30 Year Expected Return

Probability of 1-Year Return Under 0%
Probability of 1-Year Return Under 7.5%
Probability of 10-Year Return Under 7.5%
Probability of 30-Year Return Over 7.5%

5 - 7 Year Statistics

6.68%
12.00%
0.35

20 Yr Expected Return

7.51%

30 Yr Expected Return

7.75%

2019 Probabilities

28.97%
52.73%
56.65%
45.45%

10 Yr Statistics

6.06%
12.04%
0.35

20 Yr Expected Return

6.41%

30 Yr Expected Return

7.14%

2020 Probabilities

30.76%
54.77%
64.78%
43.51%

Note: Modeling assumptions are found on the next page
** Sourced from ERS Texas



EXPECTED RETURN COMPARISON 2019 VS 2020

Expected Return (Geometric)
Standard Deviation (Asset)
Sharpe Ratio

20 Year Expected Return

30 Year Expected Return

Probability of 1-Year Return Under 0%
Probability of 1-Year Return Under 7.5%
Probability of 10-Year Return Under 7.5%
Probability of 30-Year Return Over 7.5%
Probability of 10-Year Return Over 7.0%
Probability of 30-Year Return Over 7.0%

2019
5 - 7 Year Statistics
6.68%
12.00%
0.35
20 Yr Expected Return
7.51%
30 Yr Expected Return
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2019 Probabilities
28.97%
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45.45%

2020
10 Yr Statistics
6.06%
12.04%
0.35
20 Yr Expected Return
6.41%
30 Yr Expected Return
7.14%
2020 Probabilities
30.76%
54.77%
64.78%
43.51%
40.21%
52.55%

ASSET MIX SCENARIOS

	Policy Target	Mix 1	Mix 2	Mix 3
Cash	1%	1%	1%	1%
Global Public Equity	37%	32.50% 	33.00% 	35% 
Private Equity	13%	17.5% 	15.5% 	15% 
Total Equity	50%	50%	49% 	50%
Rates	11%	11%	11%	11%
High-Yield Bonds	7%	7%	7%	7%
EMD (External)	2%	2%	2%	2%
EMD (Local Currency)	2%	2%	2% 	2%
Private RE Debt	1.5%	1.5%	0% 	1.5%
Private Debt	1.5%	1.5%	4.5% 	1.5%
Credit	14%	14%	16% 	14%
REITs	3%	3%	3% 	3%
Core Real Estate	4%	4%	2% 	4%
Non-Core Real Estate	5%	5%	7%	5%
Private Real Assets - Infrastructure/Land	7%	7%	7%	7%
Total Real Assets	19%	19%	19%	19%
Absolute Return	5%	5%	5%	5%
Expected Return 10 yrs	6.06%	6.43%	6.41%	6.15%
Expected Return 30 yrs	7.14%	7.50%	7.50%	7.25%
Standard Dev	12.04%	12.92%	12.83%	12.32%
Sharpe Ratio (10 years)	0.35	0.36	0.36	0.35
Sharpe Ratio (30 years)	0.40	0.40	0.40	0.40
Probability of 1-Year Return Under 0%	30.76%	30.94%	30.86%	30.9%
Probability of 1-Year Return Under 7.5%	54.77%	53.32%	53.38%	54.3%
Probability of 10-Year Return Under 7.5%	64.78%	60.38%	60.59%	63.5%
Probability of 30-Year Return Over 7.5%	43.51%	50.08%	49.95%	54.5%
Probability of 10-Year Return Over 7.0%	40.21%	44.40% 	44.22% 	41.42%

Note: arrows indicate move up or down vs. Policy Target



MODELING ASSUMPTIONS

- Global Equity is modeled using NEPC Global Equity assumption; uses MSCI ACWI IMI Weights
- Private Equity is modeled using 13% VC, 46% Buyouts, 7% Distressed Debt, 3% Mezzanine, 8% Natural Resources (Infrastructure), 23% Secondaries
- Global Credit is modeled using 7% High Yield, 4% EMD
- Opportunistic Credit is modeled using 1.5% Direct Lending + 1.5% Real Estate Debt
- Private Real Estate is modeled using 42.8% Core RE + 57.2% Non-Core RE. This is derived from the 30/40/30 Core, Non-Core/REIT assumption
- Fixed Income- Rates is modeled using a 5 yr Duration Treasuries assumption
- 2020 Absolute Return uses ERS Texas Absolute Return capital market assumption.
- Unless otherwise stated, the underlying capital market assumption source is constructed using NEPC's 2020 capital market assumptions



INTRODUCTION TO NEPC CAPITAL MARKET ASSUMPTIONS

2020 ASSET CLASS OVERVIEW

2019 was a year of robust returns across most asset classes

Investors were rewarded with lucrative returns as global equities and bonds rallied

Falling global yields were a powerful tailwind

Fixed income benefitted as prices rose with falling yields

The discounting of future cash flows with lower rates, supports higher equity valuations

The economic backdrop weakened globally, but remains net positive

Accommodative monetary policy in the developed world was a positive for risk assets

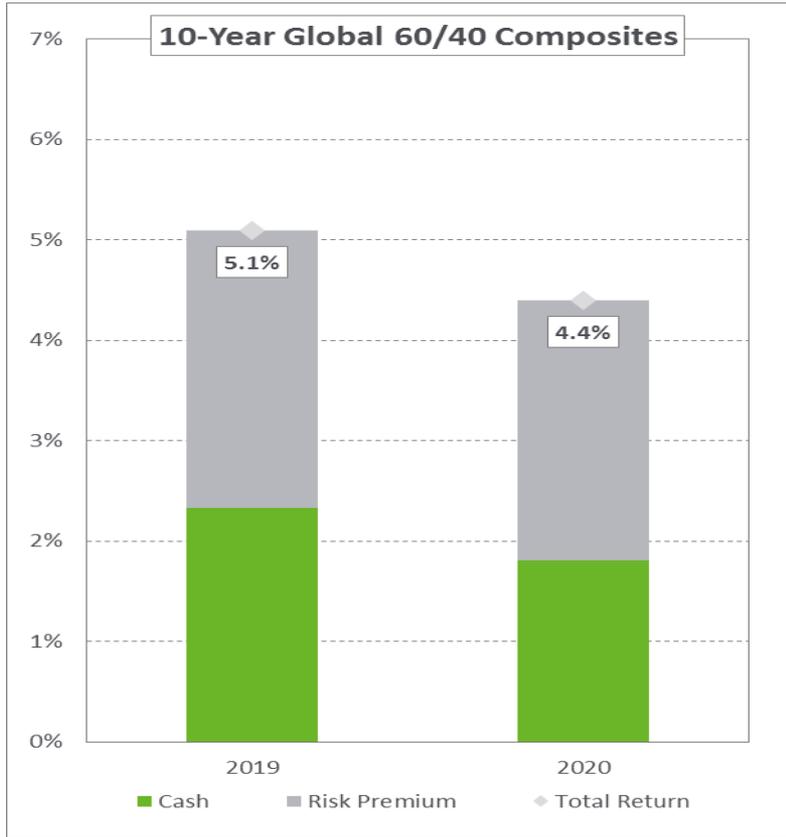
Market-based inflation expectations have declined considerably and reflect a lower expected inflation path over the long-term

The “lower for longer” period has extended out a decade due to central bank intervention

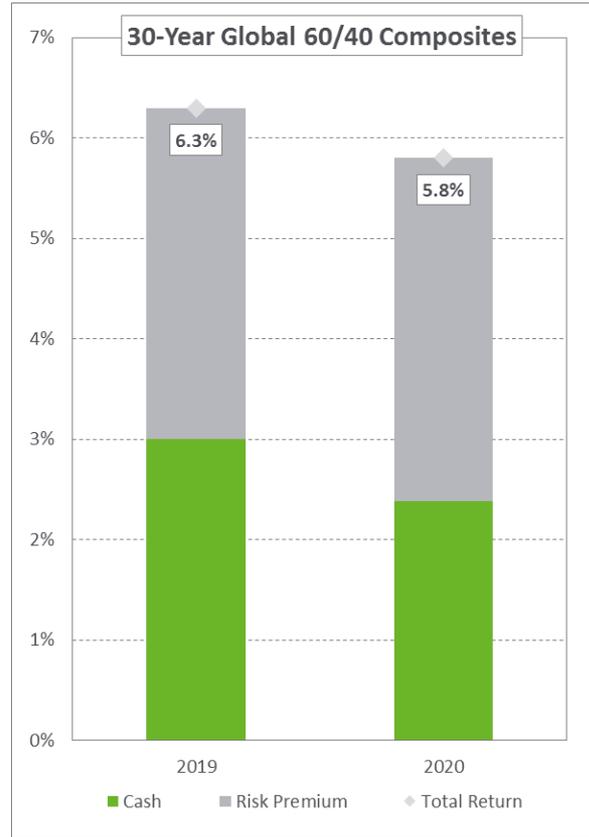
The combination of falling interest rates, robust returns in the prior year, and lower growth and inflation expectations generate declining return expectations for nearly all asset classes

These significant market movements resulted in a secular decline in NEPC’s outlook – impacting both the 10-year and 30-year assumptions

THE IMPACT OF LOWER CASH RATES



Source: NEPC



Source: NEPC

FORECAST TIME HORIZON ADJUSTMENT

NEPC has adopted a 10-year return horizon and shifted from a 5-7 year outlook for capital market assumptions

The 5-7 year time horizon was intended to correspond to the approximate length of the market cycle; recent structural changes in the economic environment signal longer cycles

Themes and valuation shifts are likely to play out over a more extended time frame

This adjustment allows clients to more easily reconcile forecasts from multiple sources

The 10-year horizon is representative of a long-term strategic view and should not be conflated with shorter-term market views

Forecasts are influenced by the path of key inputs such as growth, rates, and inflation, as well as terminal values of valuations, spreads, and profit margins

This change in methodology introduces nuances relative to prior years:

The change in assumptions over time should be muted as convergence toward a terminal value is incorporated over a longer time frame

For 2020, 10-year forecasts would be slightly higher than a 5-7 year forecast as capital markets are assumed to normalize over time

The decline in 2020 capital market expectations is predominantly driven by changes from the 2019 market environment rather than longer time horizon

2020 ADDITIONAL ENHANCEMENTS

The Asset Allocation Committee continues to refine the process

The rounding convention for capital market return assumptions have been changed to the nearest 10 basis points

Historically, return assumptions were rounded to the nearest 25 basis points and this change should not be viewed as a message of increased precision

New asset class assumptions were added to assist in portfolio modeling

Global Listed Infrastructure, Natural Resource Equities, Short TIPS, and Long TIPS

Adjustments were made to some asset classes to provide a better reflection of the underlying investment beta

China Equity: Represents all shares, rather than a local-only investment mandate

Private Debt – Credit Opportunities: Includes investment areas outside of direct lending and distressed debt. The opportunity represents mezzanine and other niche approaches



ASSUMPTION DEVELOPMENT

Capital market assumptions are published for over 65 asset classes

Assumptions include 10-year and 30-year return forecasts, volatility expectations, and correlations

NEPC publishes both 10- and 30-year return forecasts

10-year forecasts are appropriate for strategic asset allocation analysis and are influenced by global forecasts/pricing of growth, inflation, and yields, while valuations and spreads converge to NEPC-defined terminal values

30-year forecasts are appropriate for actuarial inputs and long-term planning

Based on data as of November 30

Assumptions are developed by the Asset Allocation Committee and approved by the Partners Research Committee (PRC)

Assumptions are developed with proprietary valuation models and rely on a core building block methodology

Asset Allocation Committee	
September	Asset Allocation Committee Assumptions Kickoff Finalize List of New Asset Class Assumptions
October	Review Draft of Asset Class Return Assumptions Discuss Outlook with NEPC Research Beta Groups
November	Finalize Volatility and Correlation Assumptions Final Update of Asset Class Models (As of 11/30)
December	Review Model Output and Create Return Assumptions Present Draft to the PRC Publish Assumptions on December 16 th



BUILDING BLOCKS METHODOLOGY

Forward-looking asset class models incorporate current and forecasted market and economic data to inform expected returns

Quantitative inputs combined with a conversion to long-term terminal values drive the 10-year outlook

Asset components are aggregated to capture core drivers of return across asset classes – forming the foundation of our building blocks framework

Building block components will differ for equity, fixed income, and real assets



CORE GEOMETRIC RETURN ASSUMPTIONS

	Asset Class	10-Year Return	30-Year Return	Volatility
	Cash	1.8%	2.4%	1.00%
	US Inflation	2.3%	2.5%	-
Equity	Large Cap Equities	5.0%	6.7%	16.50%
	International Equities (Unhedged)	6.0%	7.0%	20.50%
	Emerging International Equities	9.0%	9.2%	28.00%
	<i>Global Equity*</i>	6.2%	7.5%	17.79%
	<i>Private Equity*</i>	9.4%	10.7%	24.58%
Fixed Income	Treasuries	1.9%	2.7%	5.50%
	<i>Core Bonds*</i>	2.5%	3.4%	6.01%
	TIPS	2.2%	2.7%	6.50%
	High Yield Bonds	4.1%	5.6%	12.50%
	<i>Private Debt*</i>	6.7%	7.8%	11.54%
Real Assets	Commodities	4.0%	4.8%	19.00%
	REITs	5.4%	6.5%	20.00%
	Core Real Estate	5.2%	6.0%	13.00%
	Private Real Assets: Infrastructure/Land	5.9%	6.7%	12.00%
Multi-Asset	<i>US 60/40*</i>	4.3%	5.7%	10.37%
	<i>Global 60/40*</i>	4.4%	5.8%	11.53%
	<i>Hedge Funds**</i>	6.50%	6.50%	2.1%

*Calculated as a blend of other asset classes
 ** Sourced from ERSTexas



EMPLOYEES RETIREMENT SYSTEM OF TEXAS

LIQUIDITY ANALYSIS

March 2020

NEPC Research



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

ASSUMPTIONS

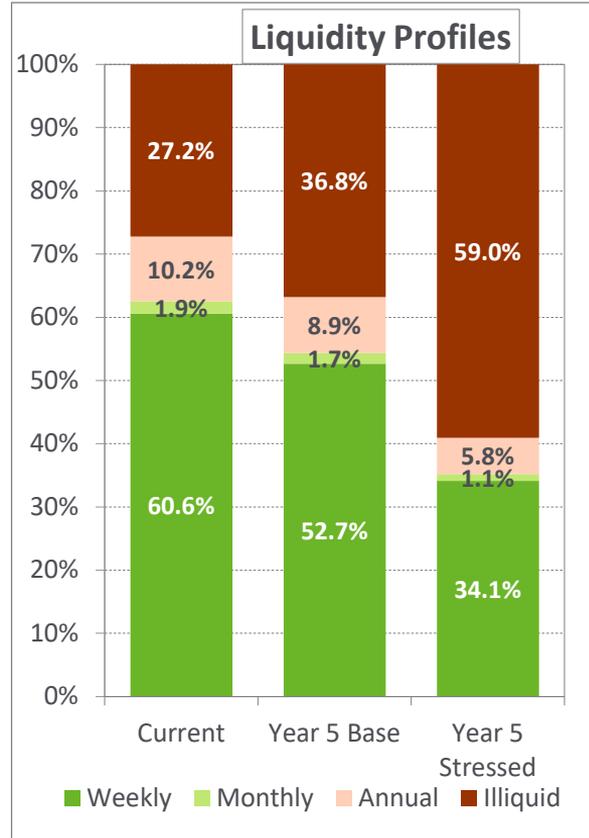
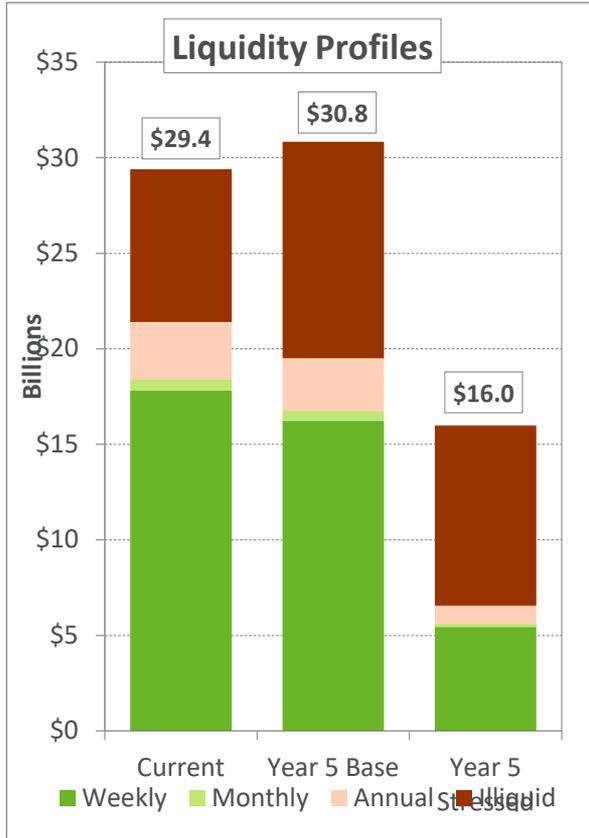
- **Base Case**

- Returns: NEPC 10 year expected returns used
 - Total portfolio expected to return 6.0% per year
- Benefit Payments and Expenses: based on actuarial projections, averaging \$1,427M per year
- Contributions: based on actuarial projections, averaging \$2,910M per year
- Commitments: based on client's pacing plan
 - Private Equity: averaging \$980M per year for the next five years
 - Private Debt: \$100M and \$150M in the year 2020 and 2021, respectively
 - Private Real Estate: averaging \$430M per year for the next five years
 - Private Real Assets: averaging \$446M per year for the next five years
- Capital Calls and Distributions: based on standard industry averages

- **Stressed Case**

- Returns: 0.0% in Year 1, -18.0% in Year 2 (-2 standard deviations), -6.0% in Year 3 (-1 standard deviation), 6.0% in Year 4 (expected return), and -6.0% in Year 5 (-1 standard deviation)
- Benefit Payments: Same as base case
- Contributions: Same as base case
- Commitments: Same as base case
- Capital Calls and Distributions: Same as base case except capital calls are doubled in Year 2 and distributions are halved in Year 2 and Year 3

CHANGE IN LIQUIDITY PROFILE



SUMMARY

- **The fund is projected to run net negative cash flows averaging \$1.5B per year in the base case**
 - Returns are expected to offset this imbalance, affording some flexibility
 - Private investments are expected to provide returns in excess of public markets
 - Illiquid investments have an attractive diversification profile with a low correlation to other public asset classes
- **While true that some liquid assets must be sold in a stressed environment...**
 - The fund currently has 60.6% of assets with weekly or better liquidity
 - Mature illiquid programs can provide distributions that are additive to liquidity
- **In the base scenario, the fund may benefit from maintaining a diversified allocation to illiquid assets but should exercise caution with future illiquid commitments that may cause liquidity issues in a stressed environment**

Questions?

*Public Agenda Item #12

Review of Pension Experience Study Process and Preliminary Results

March 11, 2020

Ariana Whaley, Pension Policy Analyst
Ryan Falls, Senior Consultant, Gabriel Roeder & Smith
Joe Newton, Pension Practice Leader, Gabriel Roeder & Smith

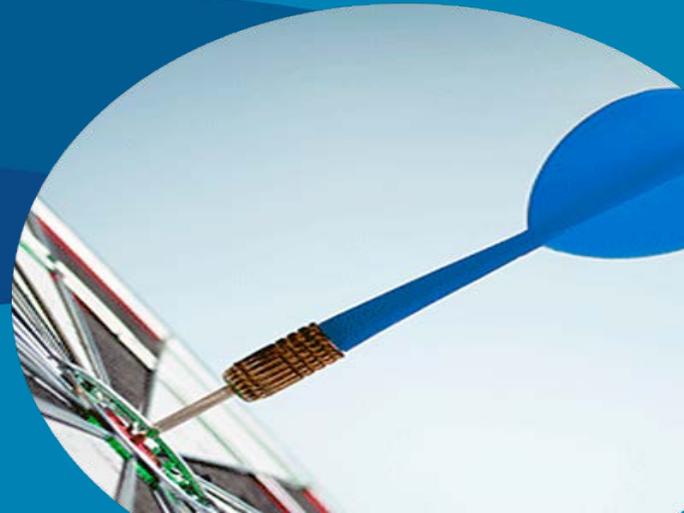


ERS of Texas Experience Study Preliminary Findings

March 11, 2020

Ryan Falls, FSA, EA, MAAA

Joseph Newton, FSA, EA, MAAA



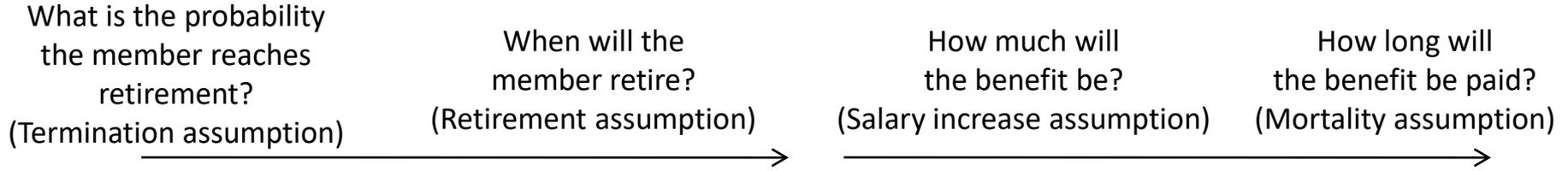
Agenda

- Review of Purpose
- Preliminary Findings
- Individual Assumptions
 - Inflation
 - Investment Return
 - Wage Assumptions

Reminder

- The *primary* purpose of the annual actuarial valuation is to either (1) set or (2) assess the adequacy of the contribution policy
 - “Funding” or “contribution allocation procedure”
- For ERS, the historical funding policy has been a level “fixed rate” from the employer, and so the valuation is assessing the appropriateness of the current fixed rate

Inside the Actuarial Valuation: Projecting the Liability for Each Member



Hired at age 30

**Retire
with annual benefit**

**Receive benefit
for remaining lifetime**

**What investment earnings will be
available to help pay the benefits?**

**What overall payroll will be available
to provide contributions?**

How assumptions factor in...

- Over time, the true cost of benefits will be borne out in actual experience
 - Ultimate benefits paid are NOT affected by actuarial assumptions or methods
 - Determined by actual participant behavior (termination, retirement), plan provisions, and actual investment returns
- Assumptions help us develop a reasonable starting point for decision making today

“Projections are difficult, especially ones about the future”

Purpose of Experience Study

- Assumptions should occasionally change to reflect
 - New information and changing knowledge
 - Changing patterns of retirements, terminations, mortality, etc.
- Experience study is a regularly scheduled review of the assumptions and methods
 - GFOA recommends at least once every five years
 - ERS will conduct studies at least every four years based on current statute
- General process for setting assumptions and methods
 - Actuary makes recommendations
 - Board considers actuary's recommendation and makes the final decision for the system

Experience Study Process

- Compare actual experience to current actuarial assumptions and recommend changes to assumptions if necessary to better align with future expectations
- Reviewed past experience over a given timeframe
 - Identified how many members retired, terminated, became disabled, or died, including their age/service
 - Identified salary increases received by active members
 - Greater emphasis on forward-looking expectations for economic assumptions

Actuarial Standards of Practice

- Guidelines for the assumption setting process are set by the Actuarial Standards of Practice
 - ASOP #4 Measuring Pension Obligations
 - ASOP #25 Credibility
 - ASOP #27 Selection of Economic Assumptions
 - ASOP #35 Selection of Demographic and Other Noneconomic Assumptions
 - ASOP #44 Selection and Use of Asset Valuation Methods

Reasonable Assumptions, per ASOP 27

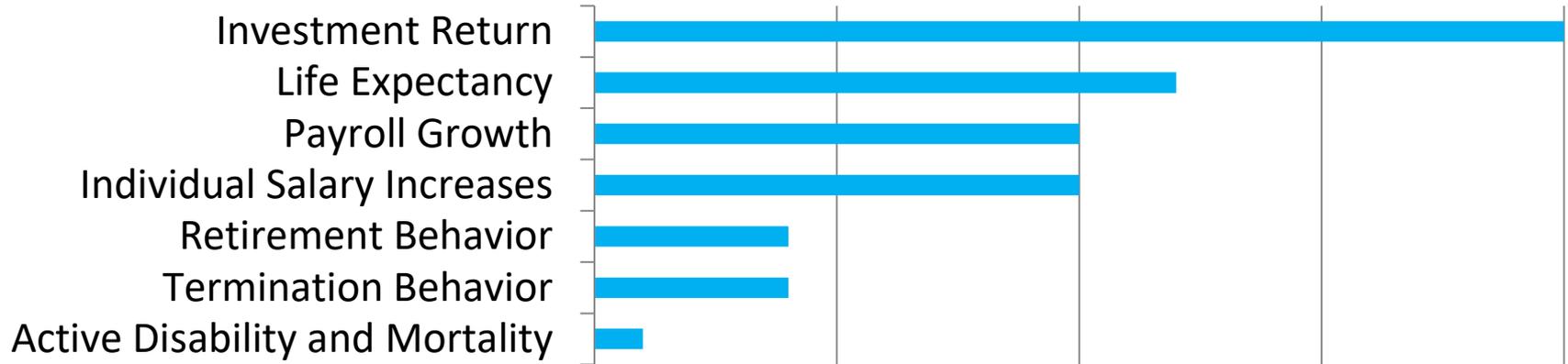
- An assumption is reasonable if
 - It is appropriate for the purpose of the measurement
 - It reflects the actuary's professional judgement
 - It takes into account historical and current economic data that is relevant as of the measurement date
 - It reflects the actuary's estimate of future experience
 - It has no significant bias (i.e., it is not significantly optimistic or pessimistic)
 - Although some allowance for adverse experience may be appropriate

Reasonable Assumptions, per ASOP 27(cont.)

- Each individual assumption must satisfy the standards
- From ASOP 4: Actuary should select assumptions such that the combined effect of the assumptions selected by the actuary has no significant bias (i.e., it is not significantly optimistic or pessimistic) except when provisions for adverse deviation are included

Magnitude of Individual Assumptions

Impact on Determination of Funding Period



- *Each individual assumption must satisfy the Actuarial Standards*
- *Assumption set should be internally consistent*

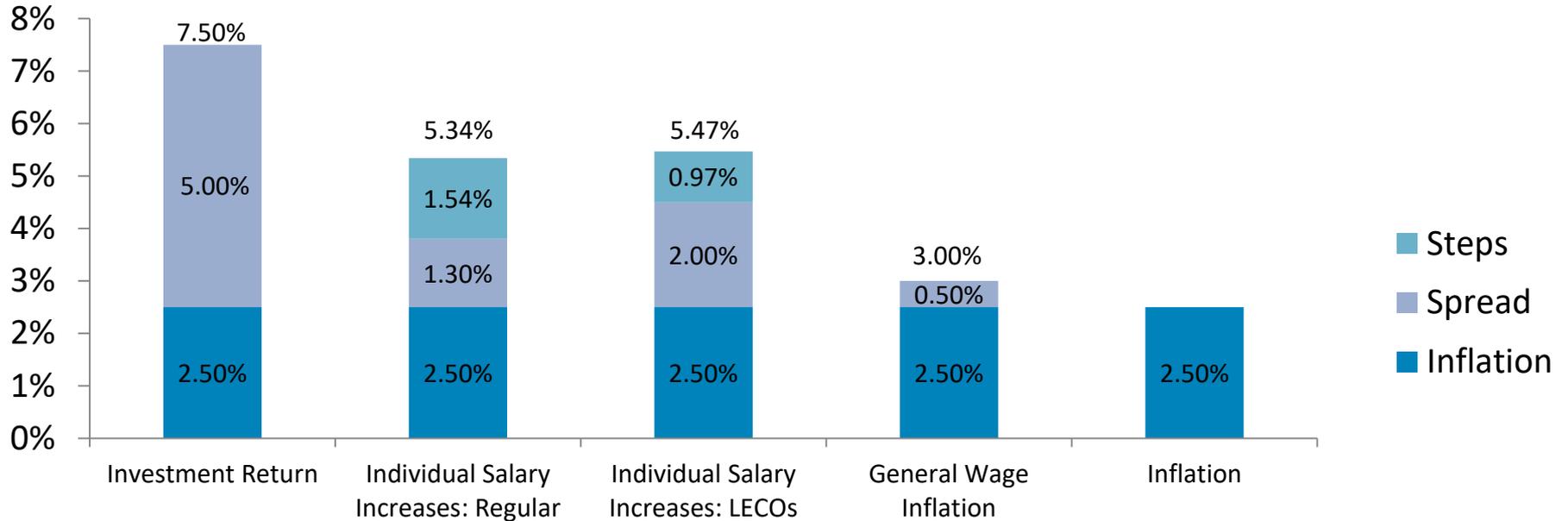
Summary of Preliminary Findings

- Notable Findings
 - Most sources of inflation expectations are lower than the current assumption of 2.50%
 - Most sources anticipate all economic assumptions will continue to be lower than previously anticipated
 - Consistent with what we observed with the ERS experience
 - Both the nominal value assumptions (including inflation) and the “real” value assumptions (net of inflation, or spreads)
- Minor Findings
 - Turnover rates (pre-retirement) continue to be high for the LECO groups
 - Small modifications to assumed retirement patterns for LECOs in Groups 2 and 3
- Confirmation of Current Assumptions
 - Mortality and retirement experience continue to be right in line with new assumptions adopted in 2017
- Full detail will be in the report

Inflation

- The assumed core inflation rate (currently 2.50% per year) is not used directly in the actuarial valuation, but it impacts the development of:
 - Investment return assumption
 - Salary increase assumptions
 - Overall payroll growth rate
 - Inflation assumption has a different impact on a plan like ERS compared to one that has a regular CPI based COLA
- Actual core inflation measured by the CPI-U during:
 - Last 10 years: 1.75%
 - Last 20 years: 2.14%
 - Last 30 years: 2.40%

Inflation is the first building block for other economic assumptions



Current Assumption Set for ERS

“Steps” refer to pay increases associated with merit, promotion and longevity.



Sources (Inflation)

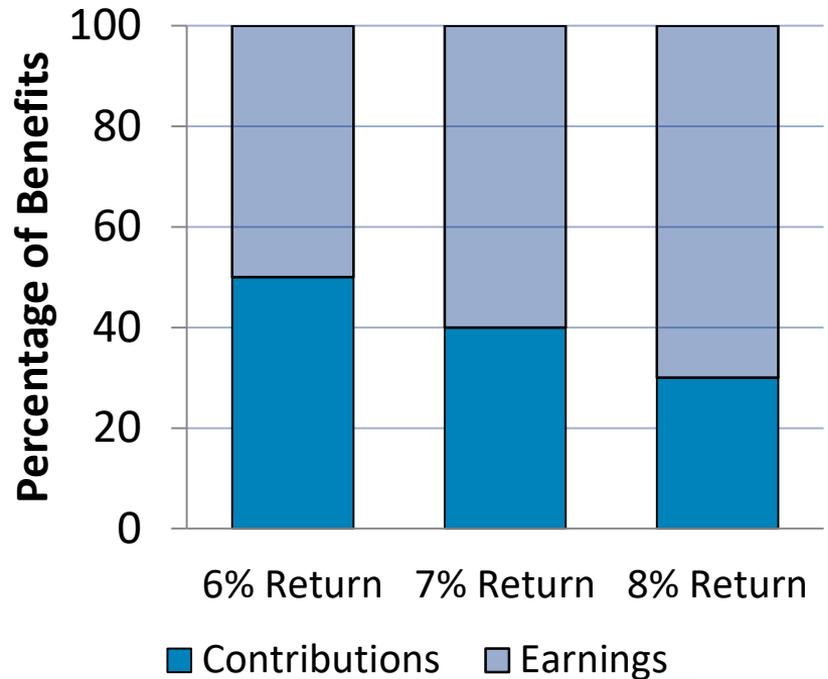
- NEPC Expectation (2020): 2.30% (10 year) and 2.50% (30 year)
- GRS Survey of Investment Firms: 1.70% - 2.50%, 2.18% average
- Social Security Trustee's Report: 2.60% (intermediate)
- TIPs vs. Nominal US Treasuries: 1.85% (20 year)
- Professional Forecasters: 2.20% (10 year)
- Horizon Survey (Summer 2019): 2.21% (10 year) to 2.29% (20 year)

Preliminary Finding

- Most sources appear to be lower than the current 2.50%
- Deflation is a bigger risk to ERS than high inflation
- 2.30% would be closer to most sources, including ERS' investment consultant
 - Most “*sources*” decreased assumption by 0.10% to 0.20% since 2017

Investment Return Assumption

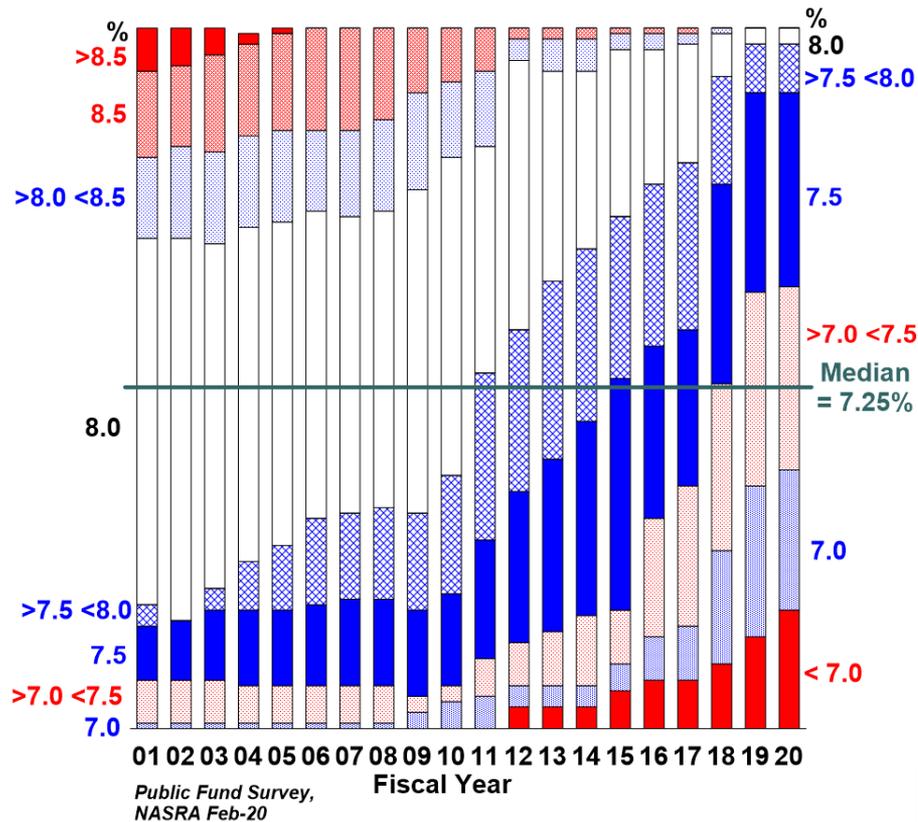
- This assumption is used to predict what percentage of a future benefit payments will be covered by investment return and what percentage by contributions.
- Lower Returns/Higher Contributions



Investment Return Assumption

- The assumption selected should be reasonable
 - Not necessarily a single “correct” answer
- Assumption is selected using a process that considers:
 - ERS target asset allocation
 - Capital market expectations
 - Utilize a building block approach that reflects expected inflation, real rates of return, and plan related expenses
 - Take into account the volatility of the expected returns produced by the investment portfolio
- Other factors to consider
 - Historical investment performance
 - Comparison with peers

Investment Return Assumption - National Trends



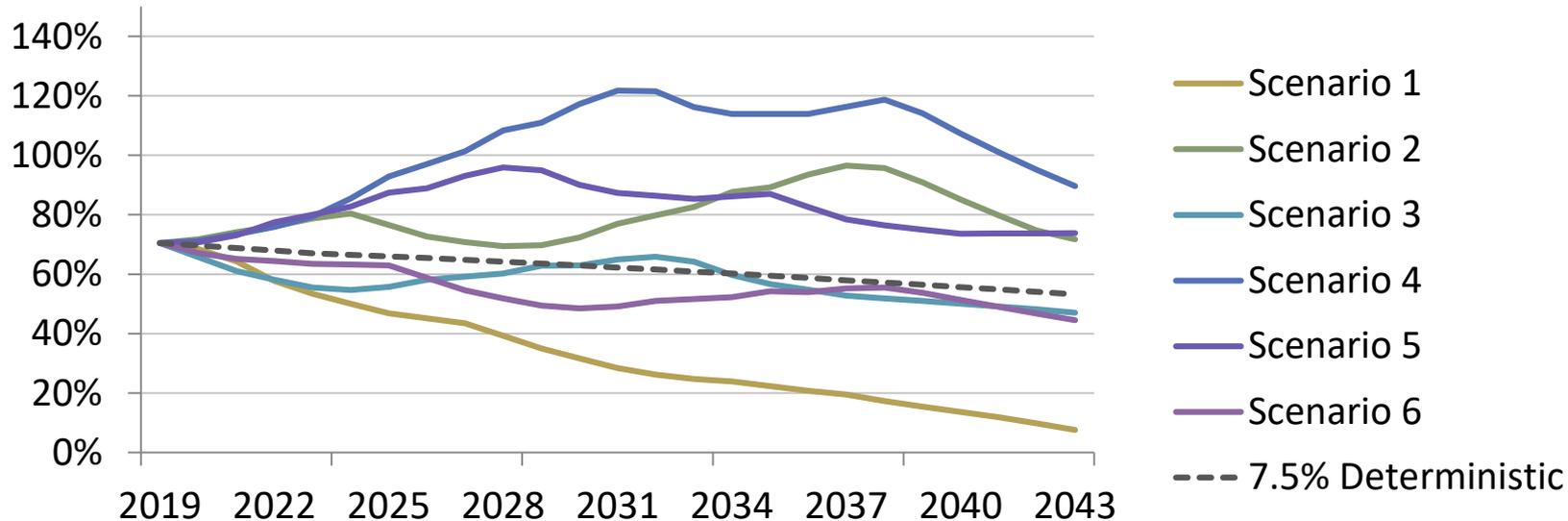
Volatility Scenarios

- Investment Risk is typically illustrated based on absolute return
 - If the System actually earns 6% over time, the outcome would look like this.....
- However, there is more than that, especially when negative cash flows are introduced
 - Volatility can put a drag on actual asset values
 - Order matters
- To illustrate these other areas of risk, we have prepared illustrative projections using ERS' 2019 valuation results
 - Scenarios that all achieve an 7.5% return over a 20 year time horizon
 - In fact, all scenarios have the same annual returns, just in a different order

Projection Scenarios Based on Historical Volatility Patterns

All scenarios generate 7.5% compound return over 20 years

Funded Ratio



The above scenarios all achieve an 7.5% compound return over a 20 year period. All scenarios have the same annual returns, just in a different order.

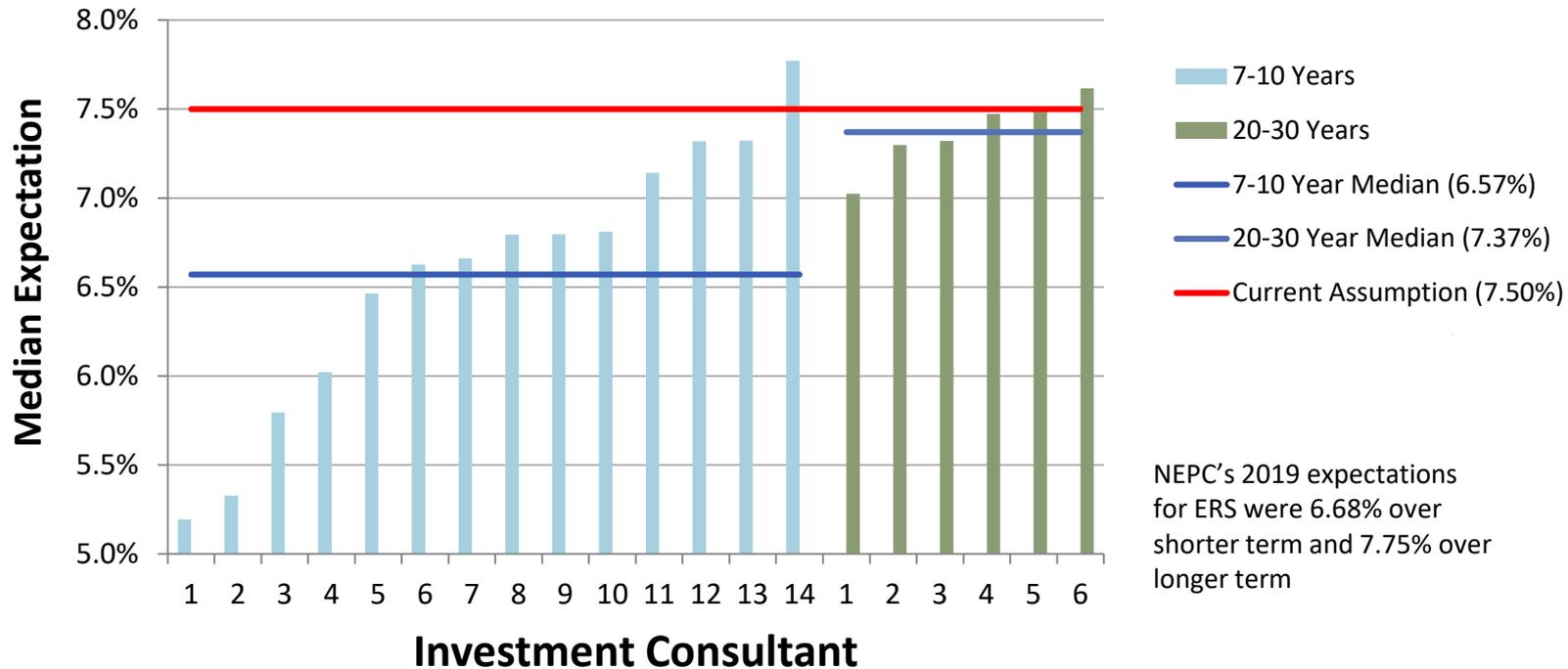
Volatility Scenarios

- Takeaway:
 - Without cash flows, order doesn't matter when compounding returns
 - With cash flows, ORDER MATTERS!
 - Benefits will be paid with trust assets (dollars), not returns
 - Two scenarios can have the same “rate of return” and produce very different ending asset values
 - Not enough to just say, we are “long term” investors, must also pay attention to the shorter to intermediate term

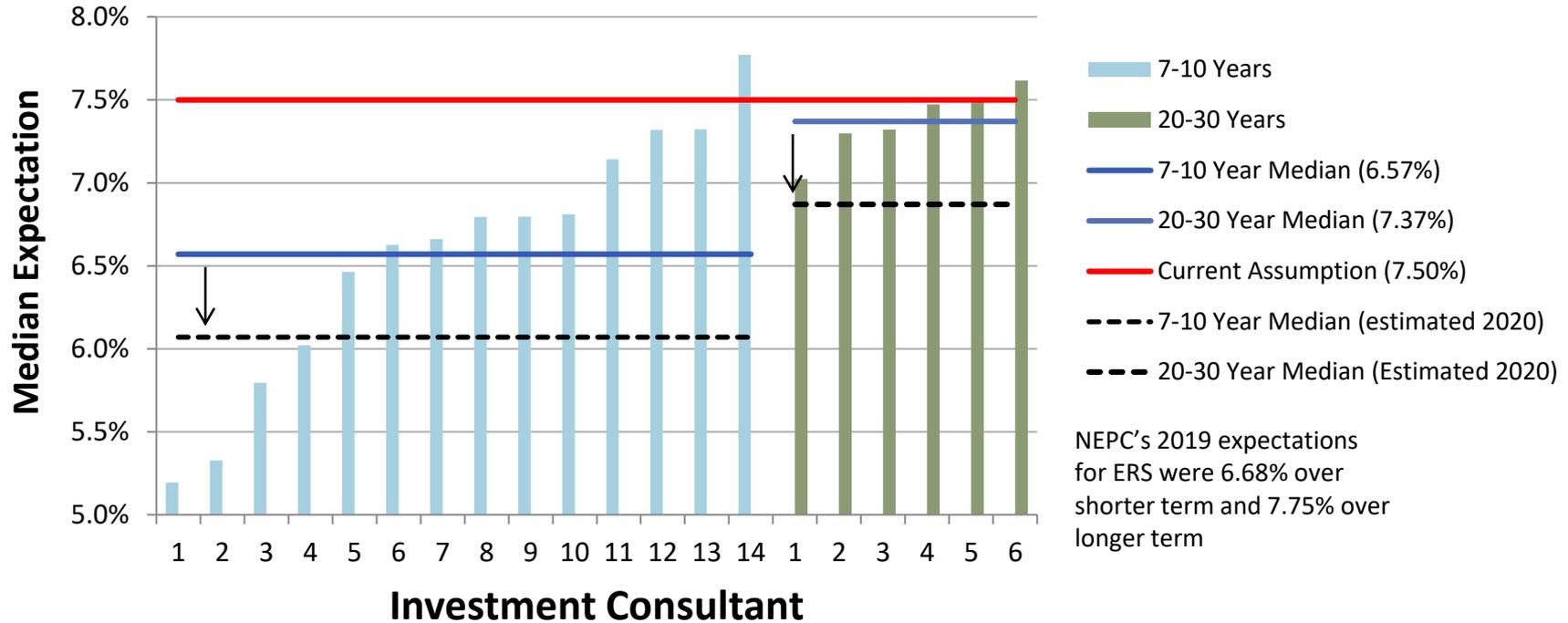
GRS Survey of Investment Consultants

- We analyzed the current asset allocation
- Projected real returns were developed using ERS Long-Term Target Asset Allocation and 2019 capital market return assumptions
 - 2019 GRS Survey of 14 investment consulting firms
 - Generally 10-20 year time horizons
 - Includes ERS Investment Consultant, NEPC
- This process typically has a “mapping bias”, meaning asset classes always don’t map one-to-one, and the industry average will typically underestimate the expected returns when compared to the individual System’s consultant

GRS Survey: Distribution of Forward-Looking Returns Expectations



GRS Survey: Distribution of Forward-Looking Returns Expectations



Range of Expected Returns

	2019	2020	Comment
NEPC – Short Term	6.68%	6.06%	<i>5-7 years in 2019, 10 years in 2020</i>
NEPC – Longer Term	7.75%	7.14%	<i>30 years</i>
GRS Survey Results – Short Term	6.57%	<i>Not yet available</i>	<i>Generally, 7 to 10 year horizon</i>
GRS Survey Results – Longer Term	7.37%	<i>Not yet available</i>	<i>Generally, 20 to 30 year horizon</i>

- Midpoint of NEPC's expectations are 7.22% in 2019 and 6.60% in 2020. To consider the volatility in these estimates, average of the midpoints from the two years would be 6.91%.
- General industry trend is 2020 market expectations are roughly 50-70 basis points less than 2019 expectations

Preliminary Finding

- Reasonable investment return assumption appears to be 7.00%, or less

- Per NEPC's expectations for ERS based on 2020 return projections:

	Expected Return	Probability of achieving 7.5%	Probability of achieving 7.0%
10 Year Period	6.06%	35%	40%
30 Year Period	7.14%	44%	53%

- If the Board is uncomfortable with much lower probability achieving assumption over the shorter term, should consider something lower than 7.00%
- Given the funding strategy used by the Legislature to finance ERS, if the Board feels the likelihood of having to eventually decrease from 7.00% in a future experience study is high, should consider something lower than 7.00% now

	Current	Consideration @7.00%	Consideration @6.75%
Inflation	2.50%	2.30%	2.30%
Real Return	<u>5.00%</u>	<u>4.70%</u>	<u>4.45%</u>
Nominal Return	7.50%	7.00%	6.75%

Wage Assumptions

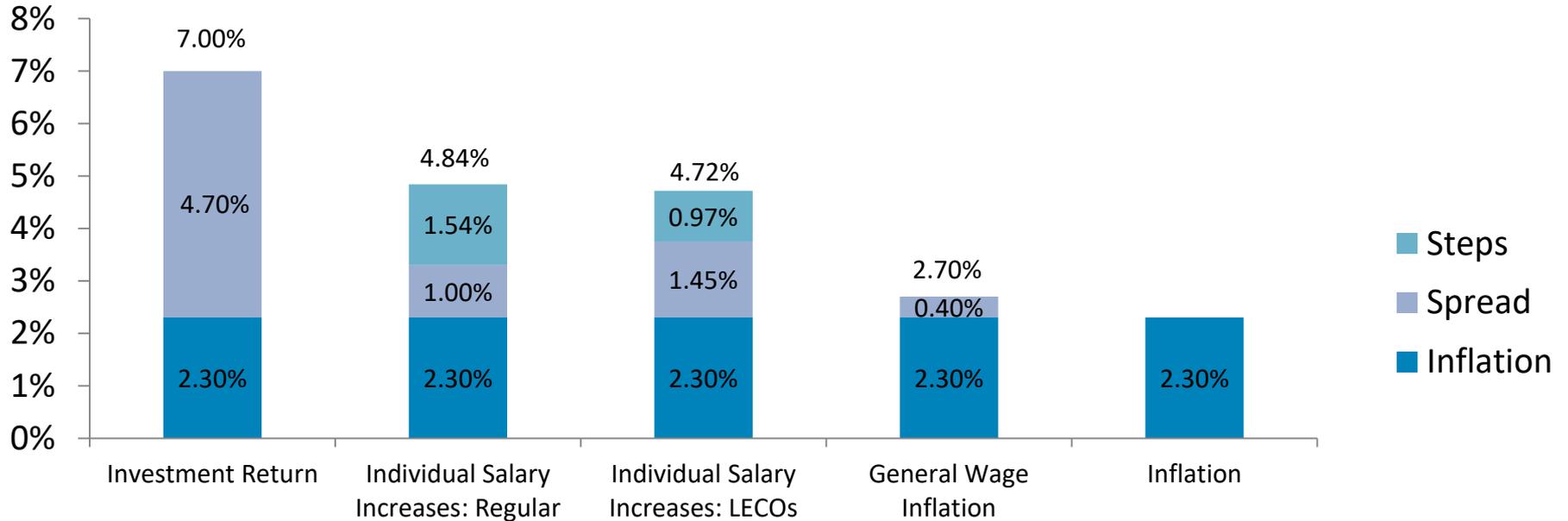
FY 2012-2019 (actual inflation has been 1.57% during this period)

Annualized Assumption	Current Assumed	Actual	Preliminary Recommendation**
Overall Active Membership Growth	0.00%	-0.24%*	0.00%
Overall Payroll Growth (Based on Open Group Projection)	3.06%	2.36%	2.70%
Growth in Average Salary	3.00%	2.12%	2.70%
Year over Year Entrant Level Salary Growth	3.00%	2.90%	2.70%
Non-Step related Salary increases: Regular	3.80%	2.91%	3.30%
Non-Step related Salary increases: LECOs	4.50%	2.82%	3.75%

* Net of removal of 90 day wait in 2015

** Preliminary recommendation includes an inflation change from 2.50% to 2.30%. Additional change in the recommendation is based on actual experience of ERS.

Illustrated Package of Economic Assumptions



Assumption Set for ERS reflecting preliminary recommendations



Discussion and Next Steps

- The Board will be asked to adopt a new set of assumptions at the May meeting
- The new assumptions will be used in the August 31, 2020 valuations

Actuary's Qualifications

- We believe the recommended set of actuarial assumptions should present a more accurate portrayal of ERS's financial condition and should reduce the magnitude of future experience gains and losses.
- The study was conducted in accordance with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board
- Ryan and Joe meet the Qualification Standards of the American Academy of Actuaries

Questions?

*Public Agenda Item #13

Review and Discussion of the ERS Investment Compliance Program

March 11, 2020

Aaron Ismail, Investment Compliance Officer

ERS Compliance Program Overview



Purpose: To ensure compliance with applicable laws, regulations, ERS policies and investment guidelines.

Mission:

- Prevent, detect and address issues of non-compliance.
- Help ERS meet its fiduciary, regulatory and contractual obligations.
- Align policies and procedures with high ethical conduct.
- Effectively educate, train and communicate the program to the organization and Board.

ERS takes its financial responsibility to its beneficiaries seriously.

Compliance Program Elements



Reviewing and
Developing Policies
and Procedures

Investment
Compliance
Monitoring and
Oversight

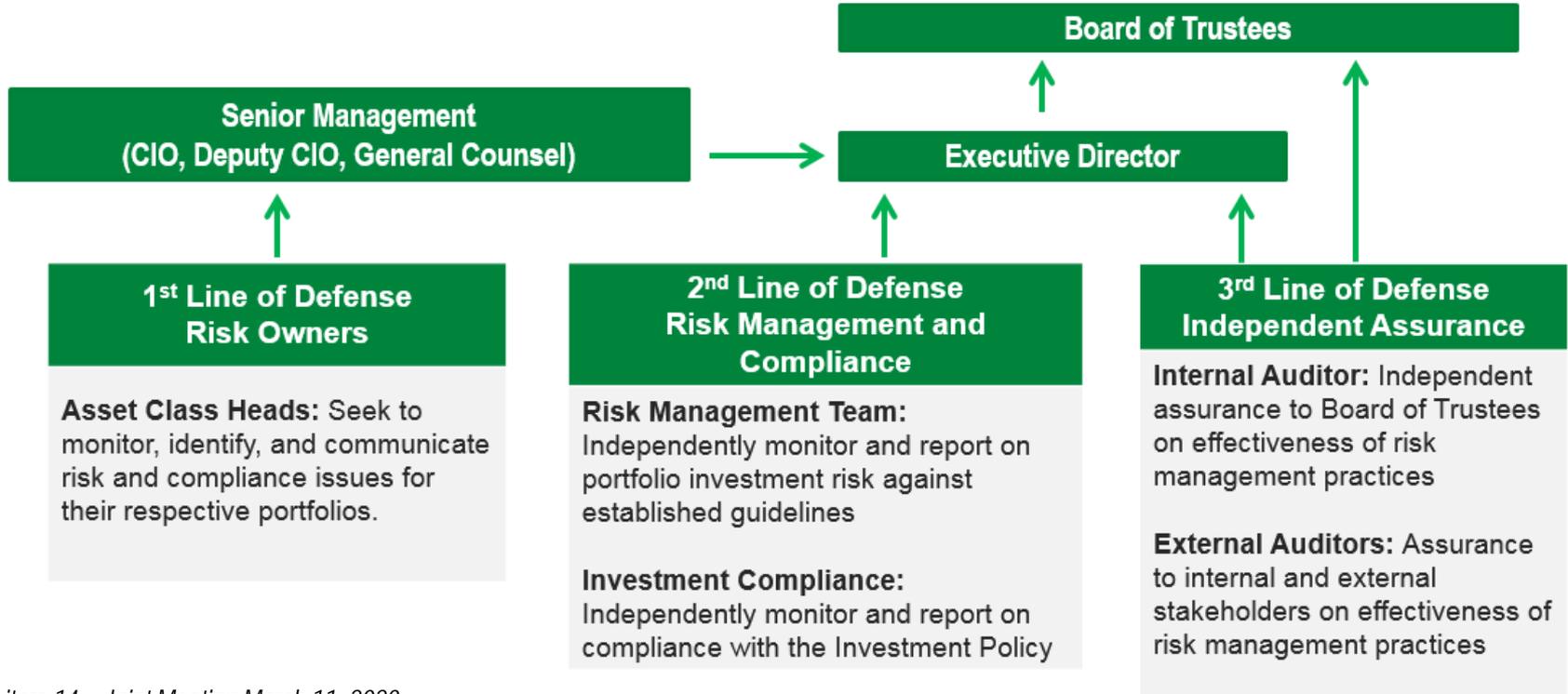
Code of Ethics and
Personal Trading

Quarterly and Annual
Compliance Reporting

Advising on
Compliance Related
Issues

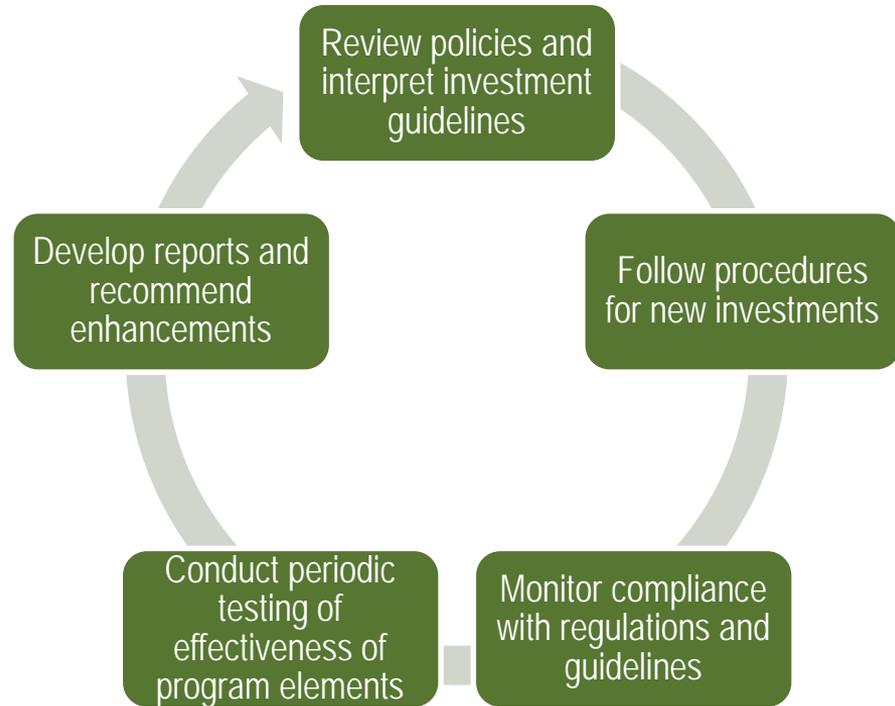
Asset Class
Investment Committee
Compliance &
Governance

Compliance Risk Control Framework



Annual Compliance Review

- Provides an overview of ERS's compliance infrastructure
- A review of key developments to the program during the Period
- Results of assessments to determine whether any improvements to the program are necessary or desirable



Compliance Program Roadmap

Key Accomplishments



Investment Compliance Monitoring

- Reconciled internal compliance guidelines and rules.
- Enhanced compliance procedures related to the restricted securities list.
- Improved tracking and documentation of ERS Scrutinized Holdings.

Code of Ethics Reporting and Oversight

- Participated in new employee onboarding and training on Code of Ethics policies.
- Addressed and documented issues of non-compliance with the personal trading policy.

Development of Policies and Procedures

- Completed annual update of Investment Policy Statement with Investments staff.
- Collaborated with Investment staff to revise asset class guidelines.
- Developed compliance standard operating procedures.

Compliance Reporting & Board Engagement

- Coordinated the completion of the Evaluation of Investment Policies, Procedures and Practices Report.
- Revised the Asset Class Investment Committee Charter and presented to the Board.

Compliance Program Roadmap



Action Plan

Summary Finding: ERS's compliance policies and procedures are reasonably designed to prevent, detect and cure violations of applicable laws, regulations and policies.

Action Plan:

- Continue to enhance policies related to Code of Ethics, Personal Trading and Insider Trading.
- Review investment program guidelines to improve consistency and clarity.
- Expand testing to support ongoing compliance monitoring efforts.
- Continue to improve reporting to Executive Office and the Board.

Questions?

Public Agenda Item #14

Review and Discussion of Eligibility and Compliance for Calendar Year 2020 of the IAC

March 11, 2020

Aaron Ismail, Investment Compliance Officer

Investment Advisory Committee Requirements



The Investment Advisory Committee (IAC) assists the Board in carrying out its fiduciary duties with regard to the investment of the Trust and related duties.

Pursuant to Texas Government Code §§ 815.5092 and 815.5093, the Board shall review the eligibility status of IAC members at least annually.

Criteria for the eligibility status include:

- Review of potential of conflicts of interest between the IAC members and ERS.
- Review of IAC Members' ability to fully execute his or her duties.
- Record of attendance for scheduled Board Meetings.

IAC Skills Assessment

	Term Expiration	Investment Experience	Global Equity	Fixed Income	Private Equity	Real Estate	Hedge Funds	Infrastructure	Derivatives
IAC Chair, Bob Alley, CFA Retired from AIM Advisors, Inc. as Chief Fixed Income Officer	8/31/2021	43 years	X	X	X				
IAC Vice-Chair, Gene L. Needles, Jr. Chairman and CEO Resolute Investment Management	5/31/2020	25 years	X	X	X	X	X		X
Caroline Cooley Managing Partner – Hedge Funds Crestline Investors, Inc.	12/31/2022	34 years		X			X		X
James Hille, CFA, CAIA CIO Texas Christian University Endowment	8/31/2020	27 years	X	X	X	X	X		
Ken Mindell Sr. VP, Treasurer & Director of Investments Rosewood Management Corporation	5/31/2022	38 years	X	X	X	X	X	X	X
Laurie Dotter Retired from Transwestern Corporation Properties as President	5/31/2022	35 years				X		X	
Didi Weinblatt, Ph.D., CFA Retired from USAA Investment Mgmt Co as Vice President, Mutual Fund Portfolios	8/31/2020	38 years	X	X					
Milton Hixson, CPA, CFP CEO FMP Wealth Advisors	3/31/2023	46 years	X	X	X	X	X	X	

Questions?

***Public Agenda Item #15**

*Review of the Investment Performance for Fourth Calendar
Quarter of 2019 and Risk Update*

March 11, 2020

Tom Tull, CFA, Chief Investment Officer

Carlos Chujoy, CFA, Risk Officer, Risk Management and Applied Research

Sam Austin and Michael Malchenko, NEPC

QUARTERLY PERFORMANCE REPORT

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

March 11, 2020



Sam Austin, Partner
Michael Malchenko



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

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Total Fund Performance Summary	2
Appendix and Disclosures	3

EXECUTIVE SUMMARY

NEPC, LLC

ERS TRUST DASHBOARD

	CYTD	FYTD
Fund Performance	14.4%	4.8%
Policy Benchmark	16.6%	5.3%
Excess Return	-2.2%	-0.5%

3 Yr Tracking Error 1.67%

5 Yr Sharpe Ratio 1.10

5 Yr Sortino Ratio 1.75

Largest Contributors (Quarter)

Private Real Estate outperformed and contributed +0.1% versus the policy benchmark

Largest Detractors (Quarter)

Private Equity underperformed and detracted -0.3% versus the policy benchmark

Profile

Market Value at 9/30/2019:

\$29.4 Billion

Actuarial Accrued Liability 8/31/19:

\$39.8 Billion

Actuarial Assumed Rate of Return:

7.50%

Retirees and Beneficiaries 8/31/2019:

115,155

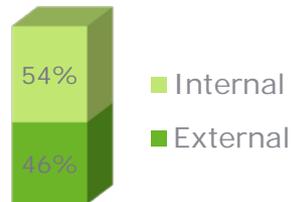
Retirement Payments Year Ended 8/31/2019:

\$2.62 Billion

ERS Trust Funding Ratio 8/31/2019

70.5%

Management



Allocation



Liquidity



TOTAL FUND PERFORMANCE DETAIL (NET OF FEES)

	Market Value(\$)	3 Mo(%)	Fiscal YTD(%)	1 Yr(%)	3 Yrs(%)	5 Yrs(%)	10 Yrs(%)
Total Fund	29,406,588,242.00	3.9	4.8	14.4	9.3	7.1	7.9
<i>Total Fund Policy Index</i>		4.3	5.3	16.6	8.8	6.9	7.7
<i>Long Term Public Index</i>		6.9	8.5	22.2	10.3	7.2	7.9

- One-year ended December 31, 2019, the Fund underperformed the policy benchmark by 2.2%.
- The Fund's assets increased from \$26.87 billion to \$29.41 billion in the past calendar year which includes an investment gain of \$2.98 billion for the year.



TOTAL FUND PERFORMANCE DETAIL (NET OF FEES)

3 Years Ending December 31, 2019				
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio RF
Total Fund	9.31%	5.13%	1.49	1.55
Total Fund Policy Index	8.76%	6.45%	1.10	1.23

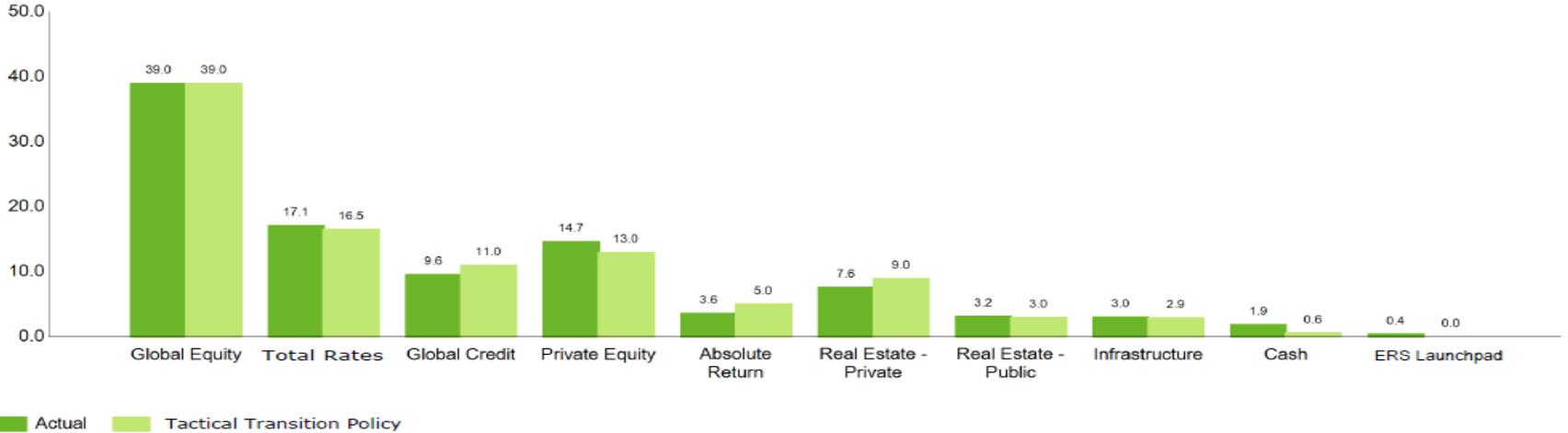
5 Years Ending December 31, 2019				
	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio RF
Total Fund	7.13%	5.54%	1.10	1.46
Total Fund Policy Index	6.91%	6.75%	0.87	1.20

- **Three-year period ended December 31, 2019, the return of 9.31% outperformed the benchmark by 0.55%. On a risk-adjusted basis, the Sharpe and Sortino Ratios over this period indicate active management benefited the Plan.**
- **Five-year period ended December 31, 2019, the Fund returned 7.13% and outperformed the policy benchmark by 0.22%. On a risk-adjusted basis, the Fund's Sharpe Ratio (1.10 vs. 0.87) and Sortino Ratio (1.46 vs. 1.20) indicate strong returns per unit of risk taken and strong returns per unit of downside risk experienced relative to the policy benchmark.**



TOTAL FUND ASSET GROWTH SUMMARY

Actual vs Target Allocation (%)

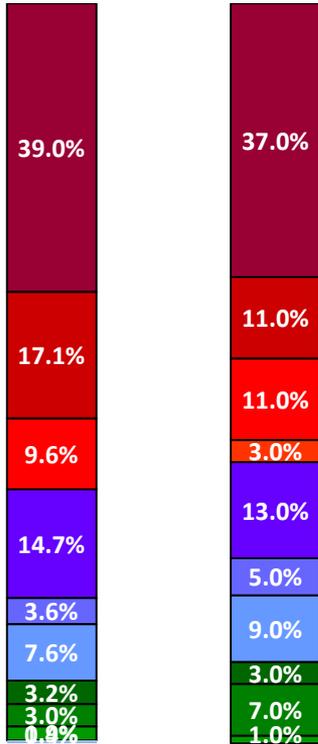


Summary of Cash Flows

	Last Three Months	Fiscal Year-To-Date	One Year	Three Years	Five Years
Beginning Market Value	\$28,644,607,856	\$28,518,729,026	\$26,873,073,745	\$25,538,214,636	\$25,564,100,974
Contributions	\$3,233,941,899	\$6,848,333,358	\$13,208,021,745	\$30,839,349,448	\$46,046,491,784
Withdrawals	-\$3,338,902,855	-\$6,990,505,511	-\$13,697,661,294	-\$33,612,020,275	-\$50,831,497,221
Net Cash Flow	-\$104,960,955	-\$142,172,154	-\$442,905,248	-\$2,725,936,526	-\$4,738,271,136
Net Investment Change	\$866,941,341	\$1,030,031,369	\$2,976,419,744	\$6,594,310,132	\$8,580,758,404
Ending Market Value	\$29,406,588,242	\$29,406,588,242	\$29,406,588,242	\$29,406,588,242	\$29,406,588,242



FUND ASSET ALLOCATION VS. POLICY TARGETS

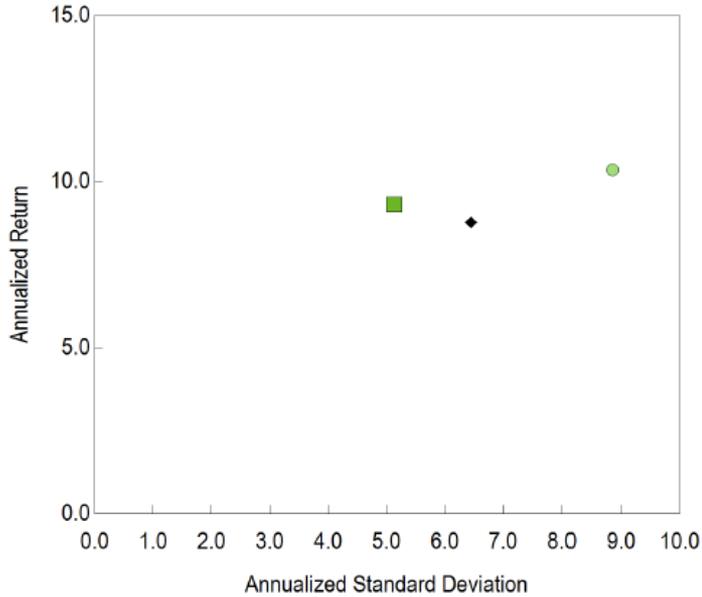


Asset Allocation on December 31, 2019				
	Current	Current	Long-Term Target	Long-Term Target Range
Public Equity	\$11,469,049,044	39.0%	37.0%	27.0% - 47.0%
Total Rates	\$5,031,067,041	17.1%	11.0%	
Global Credit	\$2,813,789,696	9.6%	11.0%	1.0% - 21.0%
Opportunistic Credit	-	-	3.0%	0.0% - 8.0%
Private Equity	\$4,312,337,922	14.7%	13.0%	8.0% - 18.0%
Absolute Return	\$1,049,552,734	3.6%	5.0%	0.0% - 10.0%
Real Estate - Private	\$2,232,727,329	7.6%	9.0%	4.0% - 14.0%
Real Estate - Public	\$937,570,770	3.2%	3.0%	0.0% - 13.0%
Infrastructure	\$886,270,254	3.0%	7.0%	2.0% - 12.0%
Cash	\$552,722,422	1.9%	1.0%	0.0% - 1.0%
ERS Launchpad	\$121,500,931	0.4%		
Total	\$29,406,588,242	100.0%	100.0%	



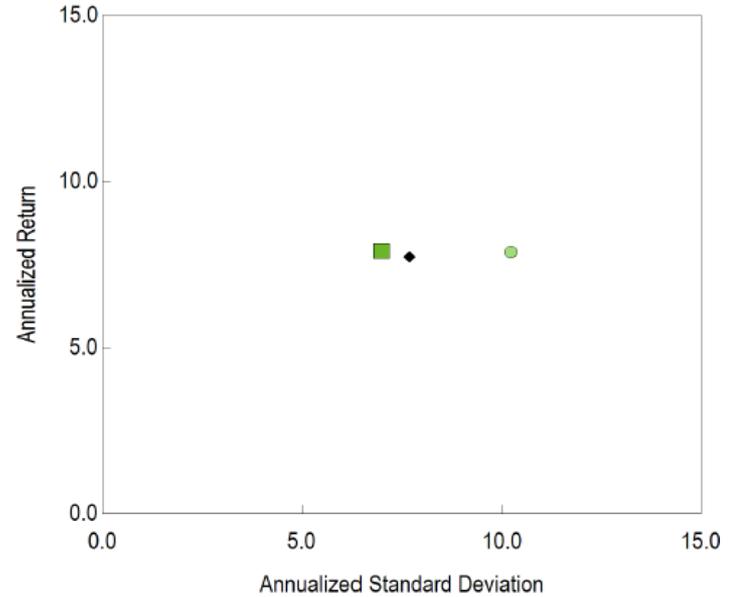
TOTAL FUND RISK/ RETURN

3 Years Ending December 31, 2019



- Total Fund
- ◆ Total Fund Policy Index
- Long Term Public Index

10 Years Ending December 31, 2019



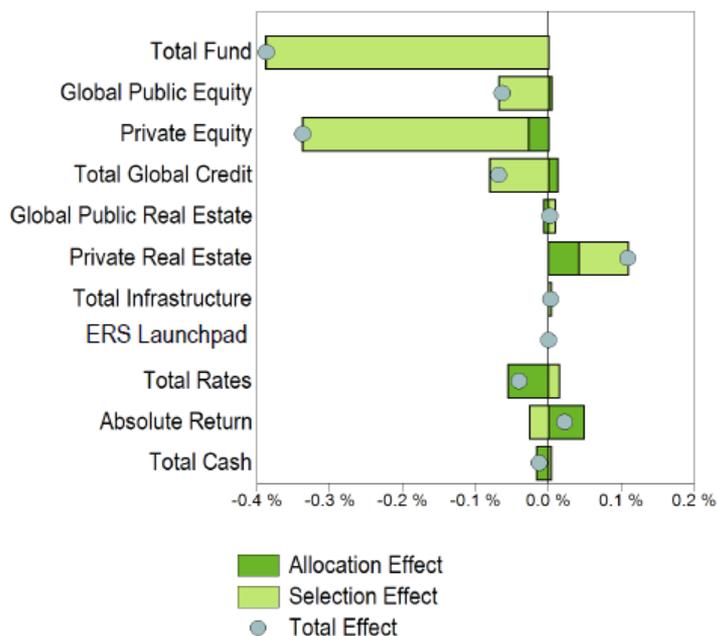
- Total Fund
- ◆ Total Fund Policy Index
- Long Term Public Index



Note: Long Term Public Index is comprised of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index. Index Definitions can be found in the appendix.

TOTAL FUND ATTRIBUTION ANALYSIS

Attribution Effects
3 Months Ending December 31, 2019



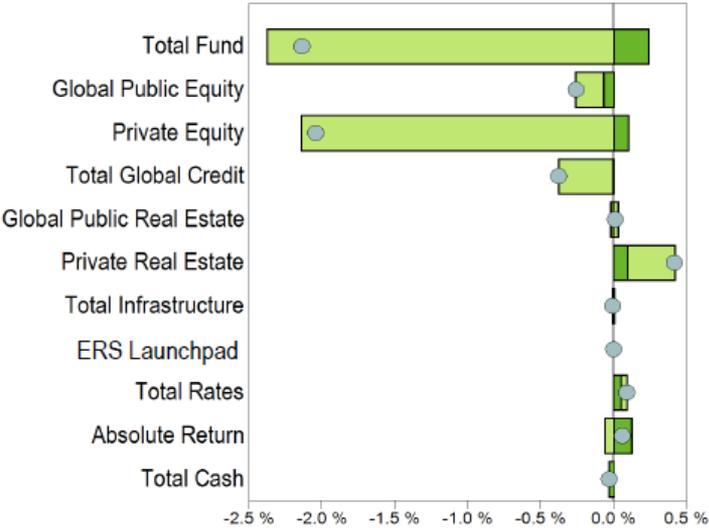
Attribution Summary						
3 Months Ending December 31, 2019						
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Total Effects
Global Public Equity	9.0%	9.1%	-0.2%	-0.1%	0.0%	-0.1%
Private Equity	0.2%	2.3%	-2.1%	-0.3%	0.0%	-0.3%
Total Global Credit	1.8%	2.6%	-0.8%	-0.1%	0.0%	-0.1%
Global Public Real Estate	2.2%	1.9%	0.3%	0.0%	0.0%	0.0%
Private Real Estate	1.9%	1.1%	0.8%	0.1%	0.0%	0.1%
Total Infrastructure	1.3%	1.2%	0.1%	0.0%	0.0%	0.0%
ERS Launchpad	--	--	--	--	--	--
Total Rates	0.1%	0.0%	0.1%	0.0%	-0.1%	0.0%
Absolute Return	0.6%	1.4%	-0.7%	0.0%	0.0%	0.0%
Total Cash	0.6%	0.4%	0.2%	0.0%	0.0%	0.0%
Total	3.9%	4.3%	-0.4%	-0.4%	0.0%	-0.4%

* Total Fund Attribution Analysis uses policy weights.



TOTAL FUND ATTRIBUTION ANALYSIS

Attribution Effects
1 Year Ending December 31, 2019



- Allocation Effect
- Selection Effect
- Total Effect

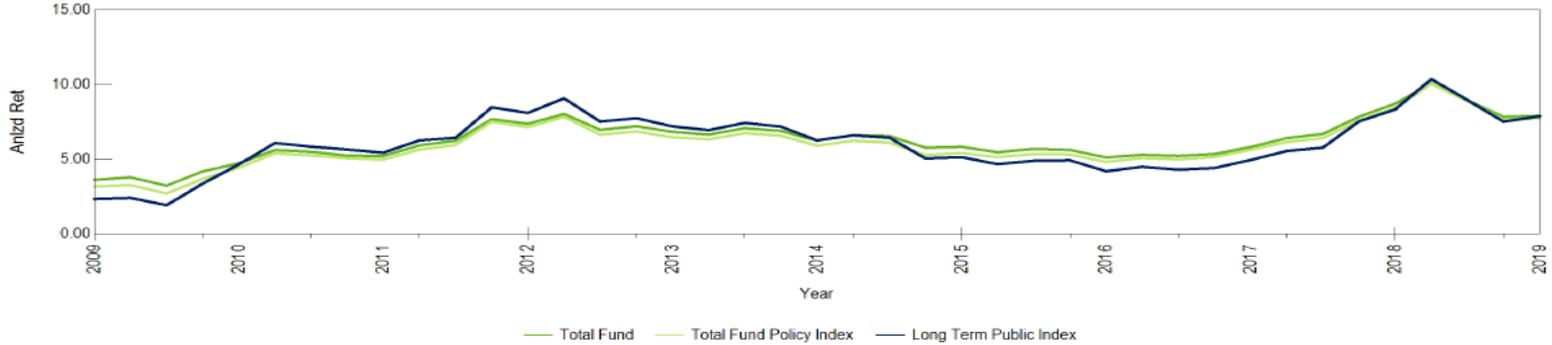
Attribution Summary						
1 Year Ending December 31, 2019						
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Total Effects
Global Public Equity	26.2%	26.8%	-0.6%	-0.2%	-0.1%	-0.3%
Private Equity	3.4%	16.5%	-13.1%	-2.1%	0.1%	-2.0%
Total Global Credit	11.0%	14.3%	-3.3%	-0.4%	0.0%	-0.4%
Global Public Real Estate	23.8%	22.7%	1.1%	0.0%	0.0%	0.0%
Private Real Estate	8.6%	4.6%	3.9%	0.3%	0.1%	0.4%
Total Infrastructure	10.1%	10.4%	-0.2%	0.0%	0.0%	0.0%
ERS Launchpad	--	--	--	--	--	--
Total Rates	5.4%	5.2%	0.2%	0.0%	0.1%	0.1%
Absolute Return	4.6%	6.2%	-1.7%	-0.1%	0.1%	0.1%
Total Cash	2.4%	2.1%	0.3%	0.0%	0.0%	0.0%
Total	14.4%	16.6%	-2.2%	-2.4%	0.2%	-2.1%

* Total Fund Attribution Analysis uses policy weights.

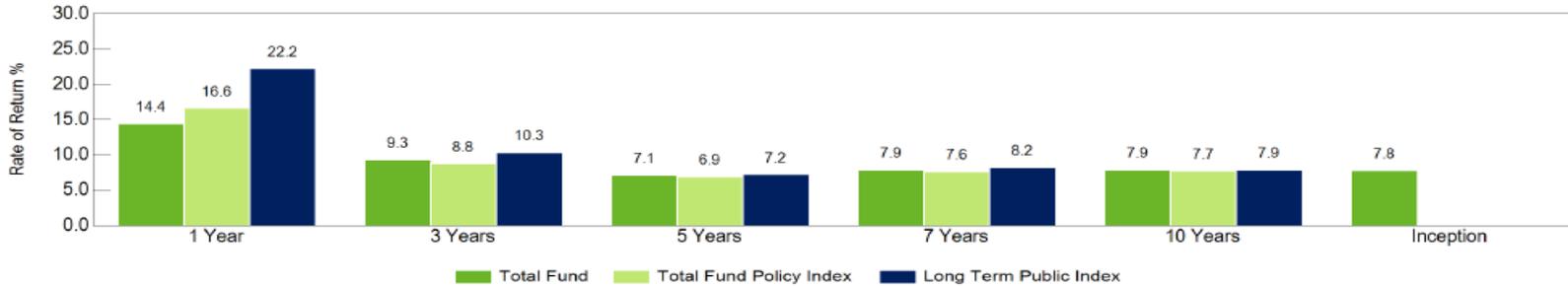


LONG TERM INVESTMENT RESULTS

Rolling 10 Year Annualized Return (%)



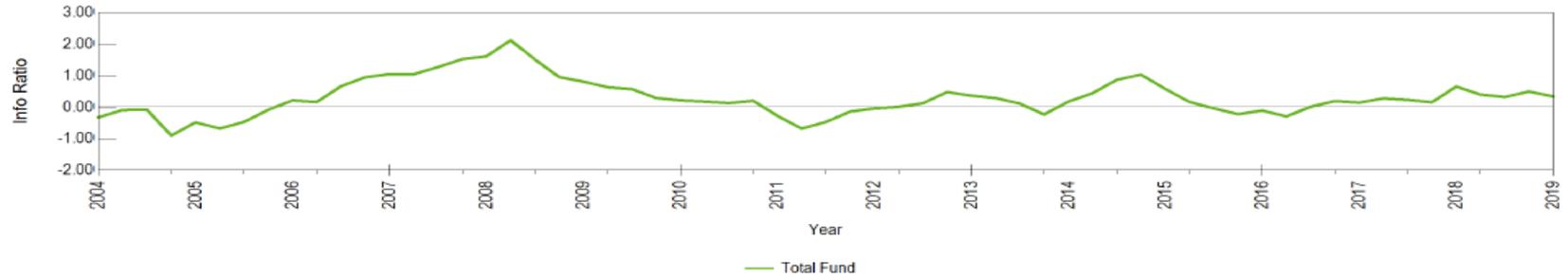
Return Summary
Ending December 31, 2019



Note: Long Term Public Index is comprised of 79% MSCI ACW IMI and 21% Barclays Intermediate Treasury Index. Index Definitions can be found in the appendix.

ROLLING INFORMATION RATIO AND TRACKING ERROR

Rolling 3 Year Information Ratio



Rolling 3 Year Tracking Error



SUMMARY PERFORMANCE COMMENTARY

- **Over the past 10 years, Total Fund returns outperformed the policy benchmark by 0.2% outperforming the Fund's actuarial rate of return.**
- **In the one-year ended December 31, 2019 the Fund underperformed (2.2%) against the policy benchmark.**
 - Private Equity detracted -2.0% and Public Equity detracted -0.4% from Fund returns vs. the policy benchmark
 - Private Real Estate contributed +0.4% to Fund returns vs. the policy benchmark
- **In the past one-year portfolio positioning at the asset class level has had a positive impact (+0.2%) on Total Fund returns vs. policy benchmark.**
 - An under-weight position to Global Public Equity contributed negatively (-0.1%) to total fund returns vs. the policy benchmark.
 - An under-weight position to Absolute Return, Rates and Private Real Estate contributed positively (+0.3%) to total fund returns versus the policy benchmark.



Risk Update

Carlos Chujoy, CFA, Risk Officer, Risk Management and Applied Research

Risk Update

4Q2019



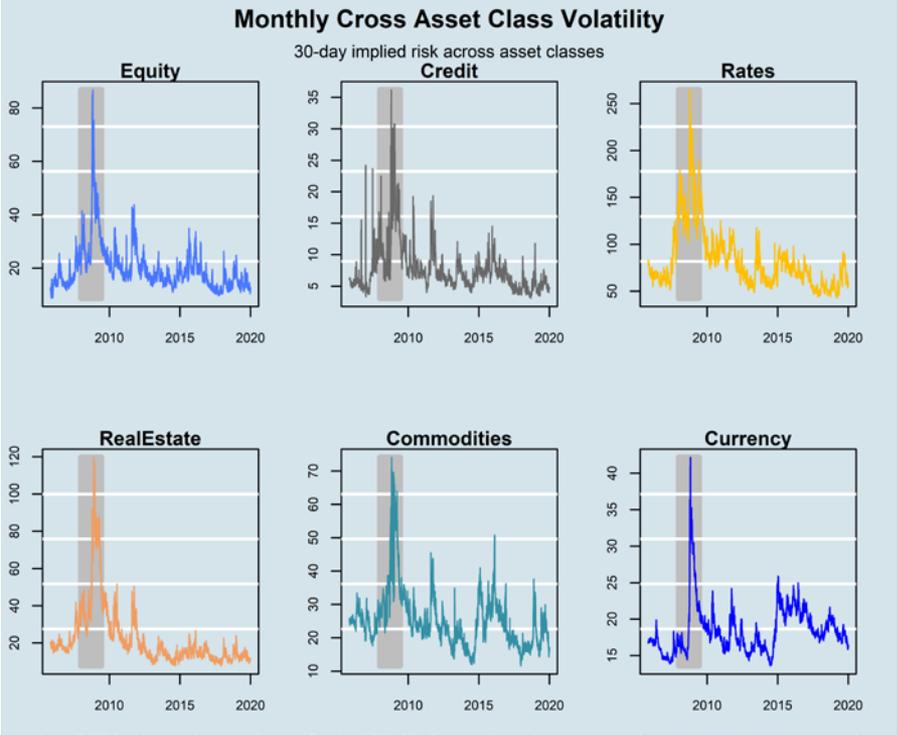
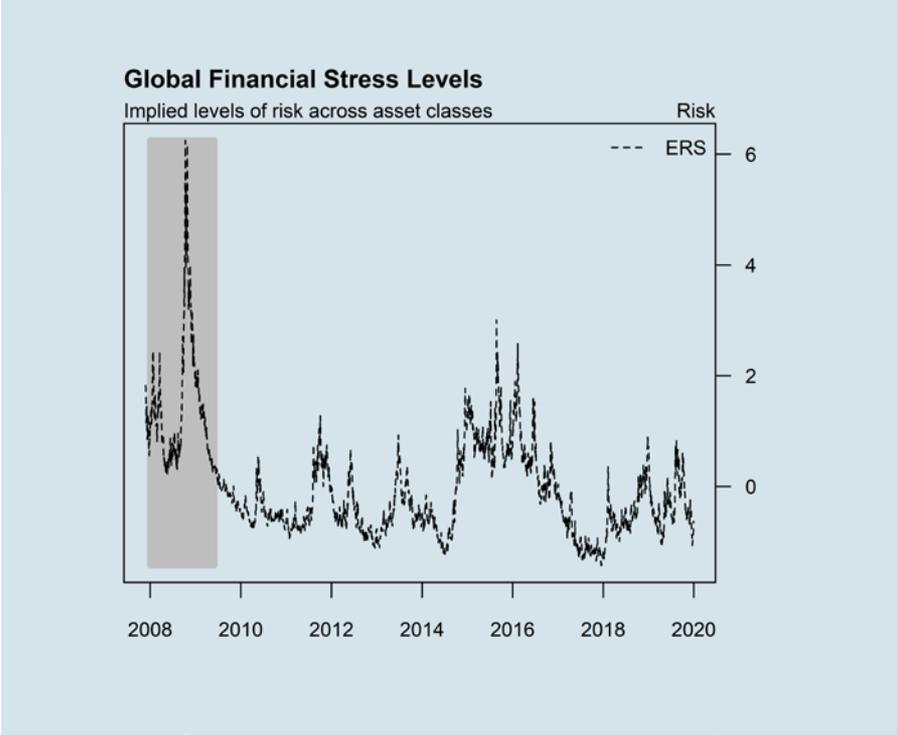
Tailwinds

- Central Bank Intervention
- US-China Phase 1 trade agreement
- UK Brexit resolution
- Seasonality
- Global Trade Rebound
- Strong Earnings Season
- Cross Asset Class implied levels of risk muted

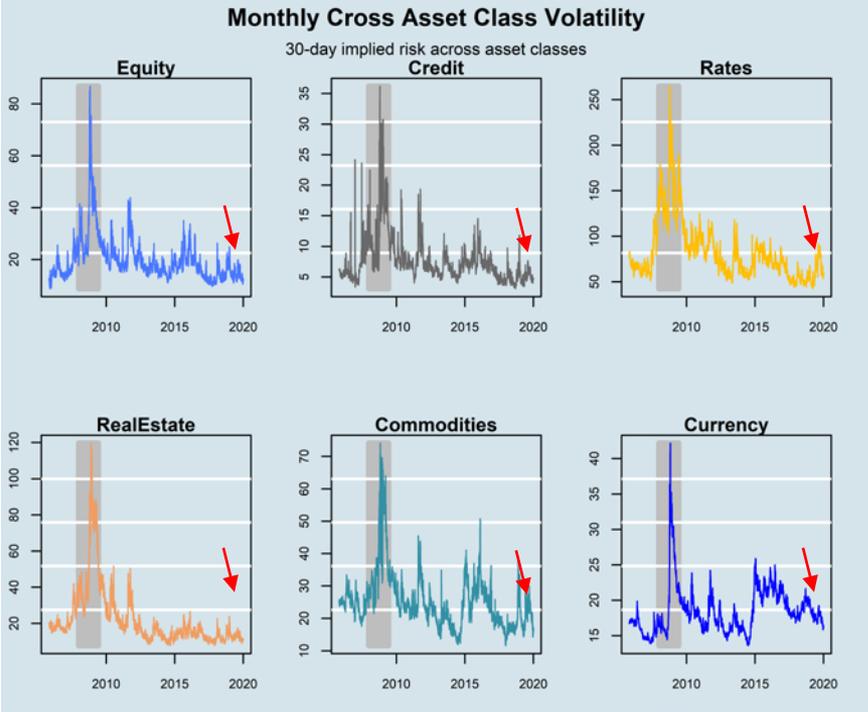
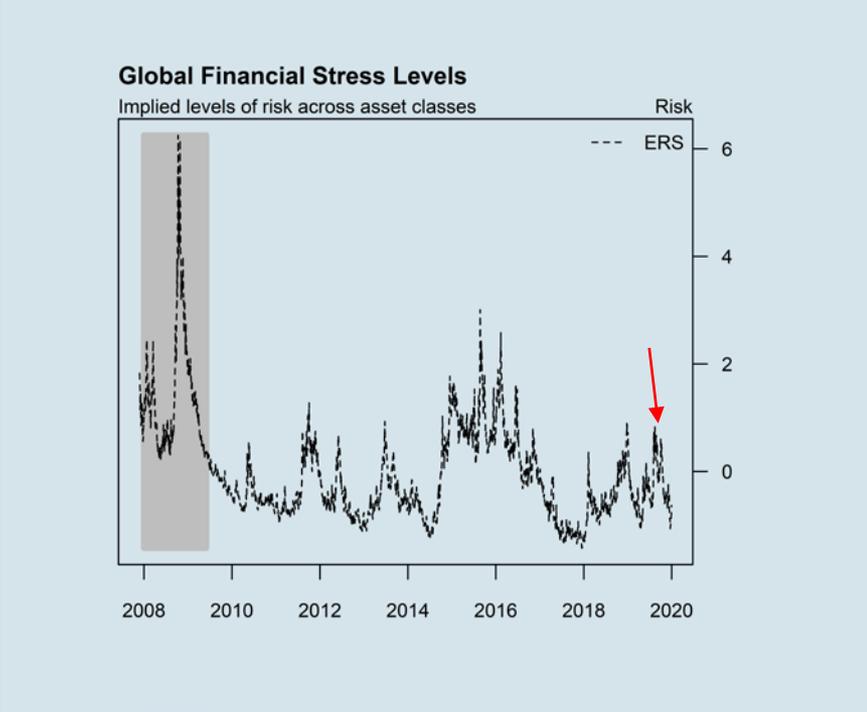
Headwinds

- Global Growth
- Market Valuation At Elevated Levels
- Overbought Market Conditions

Cross Asset Class Risk

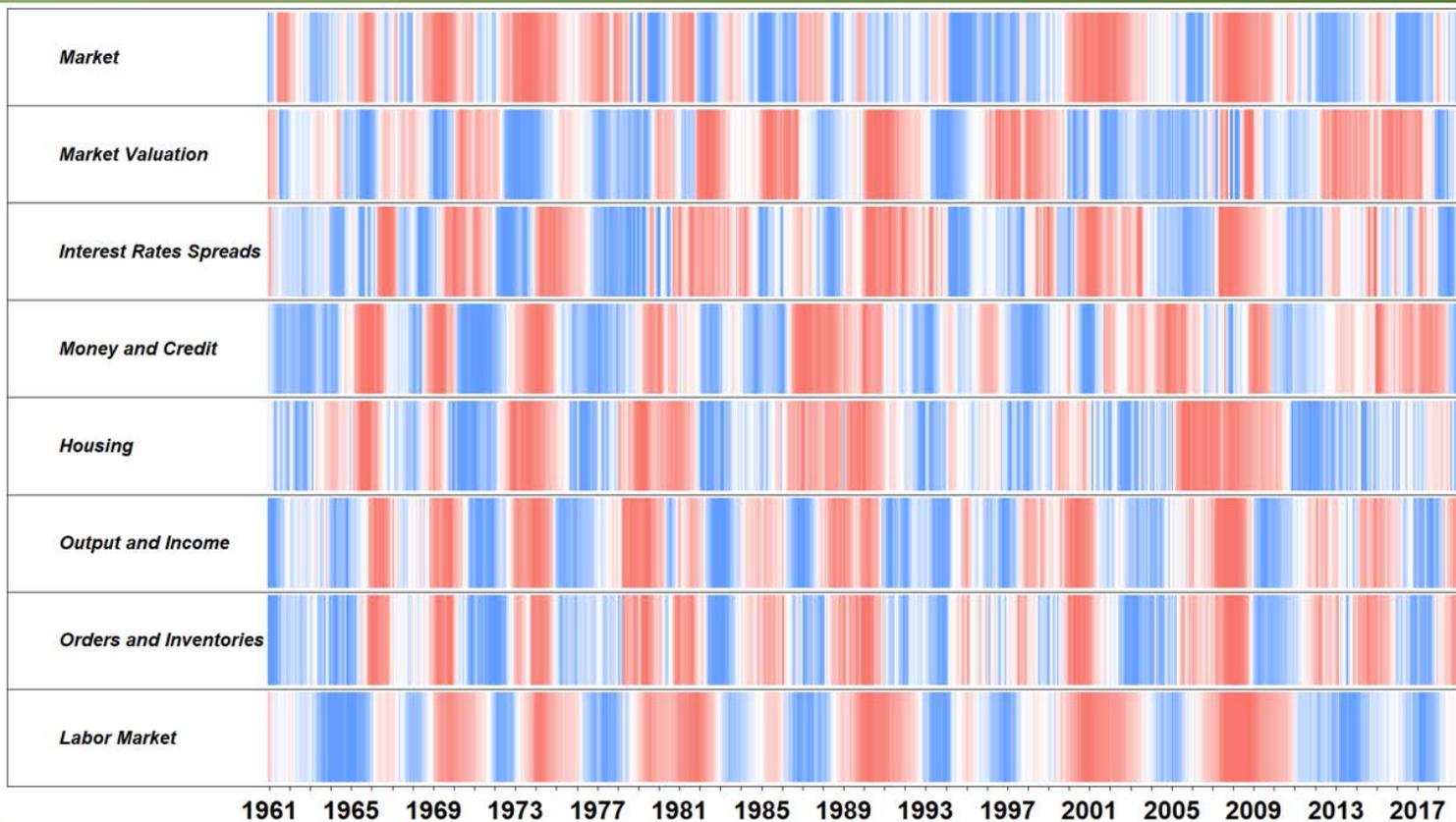


Cross Asset Class Risk



Market HeatMap

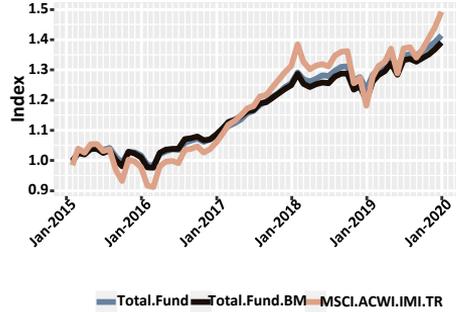
FRED Macro Economic Data Aggregated



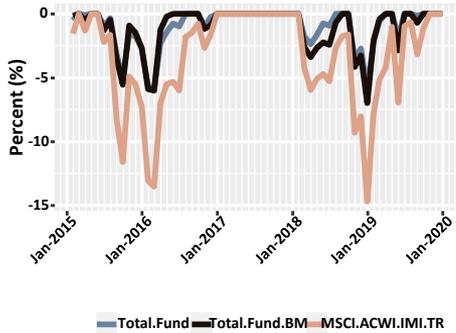
ERS Portfolio



Cumulative Returns



Drawdown



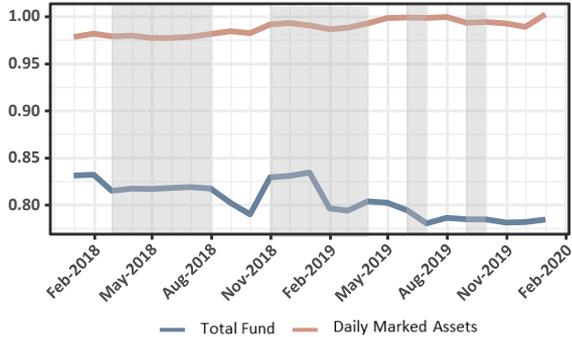
Asset Class	AUM	Weight	Excess Weight	Annualized SD	T12M Return	T12M Excess Return	Annualized Return	Annualized Excess Return	IR	SR	TE	Beta	R^2
Total Fund	\$29,406,588,240	100.00	NA	5.54	14.50	-1.58	7.17	0.37	0.22	1.09	1.67	0.81	96.42
Total Return Seeking Assets	\$22,773,246,044	77.44	0.43	7.25	17.19	-2.87	8.38	0.80	0.33	1.00	2.39	0.79	96.23
Total Risk Reduction	\$6,633,342,196	22.56	-0.43	1.59	5.00	-0.36	2.61	0.02	0.04	0.96	0.49	0.87	92.23

Asset Class	AUM	Weight	Excess Weight	Annualized SD	T12M Return	T12M Excess Return	Annualized Return	Annualized Excess Return	IR	SR	TE	Beta	R^2
Global Public Equity	\$11,469,049,144	39.16	1.16	11.53	26.32	-0.43	8.25	-0.31	-0.26	0.62	1.20	0.97	99.03
Global Private Equity	\$4,312,337,922	14.73	1.73	19.36	3.39	-13.11	11.58	1.34	0.12	2.66	11.36	0.03	0.76
Internal Global Credit	\$2,236,662,323	7.64	NA	5.07	13.55	-0.76	6.18	0.05	0.05	1.00	1.01	0.94	96.36
External Global Credit	\$577,127,372	1.97	NA	5.11	-0.13	-9.81	6.23	0.41	0.09	1.01	4.45	0.61	40.08
Public Real Estate	\$937,570,770	3.20	0.20	10.71	23.74	1.04	5.74	-0.43	-0.42	0.43	1.02	0.98	99.11
Private Real Estate	\$2,232,727,329	7.62	-1.38	17.77	8.58	2.76	12.44	3.33	1.36	4.49	2.45	0.77	10.13
Private Infrastructure	\$886,270,254	3.03	0.01	12.22	10.12	0.12	-1.69	0.02	0.09	-0.20	0.24	1.00	99.97
Total Rates	\$5,031,067,041	17.18	0.19	2.26	5.44	0.22	2.13	0.14	0.86	0.46	0.16	0.96	99.67
Total Cash	\$552,722,422	1.89	0.89	1.10	2.39	0.11	2.11	1.04	0.94	0.94	1.11	-0.69	0.19
Absolute Return	\$1,049,552,734	3.58	-1.42	2.13	4.59	-1.65	4.40	-0.66	-0.31	1.55	2.16	3.64	1.12

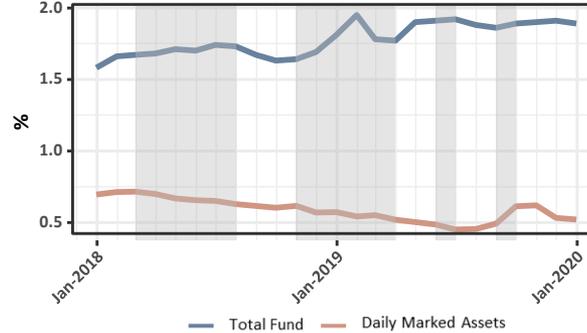
ERS Portfolio



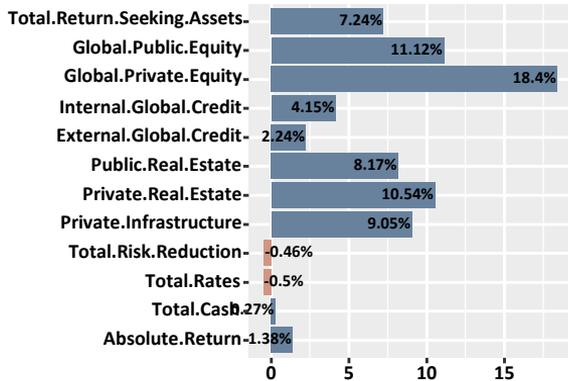
36-Month Rolling Beta



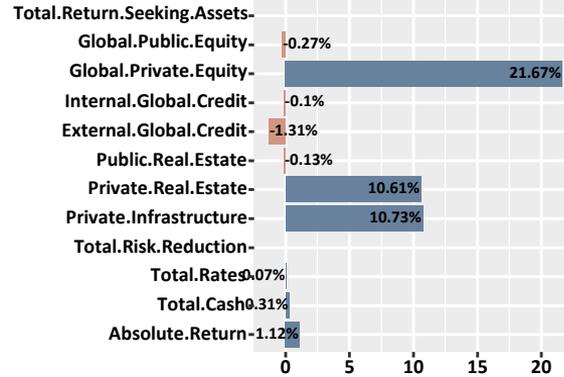
36-Month Rolling TE



Marginal Contribution to Risk



Marginal Contribution to TE



Stress Test

Return/Risk Driver

- MSCI ACWI

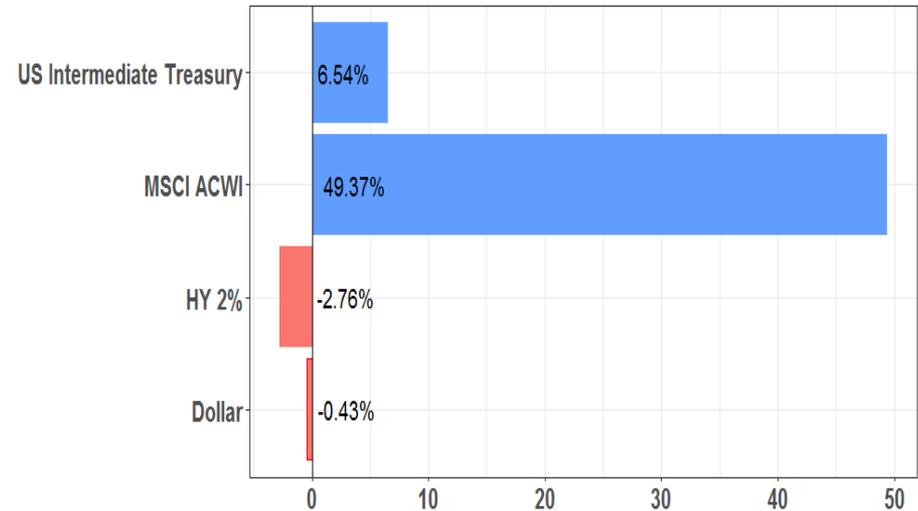
Assumptions

- Modeled both upside risk as well as downside risk. Assume a +/- 5% return change on the MSCI ACWI
- Liquid assets only at asset class level

Impact

- Ex-illiquid assets, public equities exerts the most impact in up/down markets

Total Trust - Beta Sensitivities



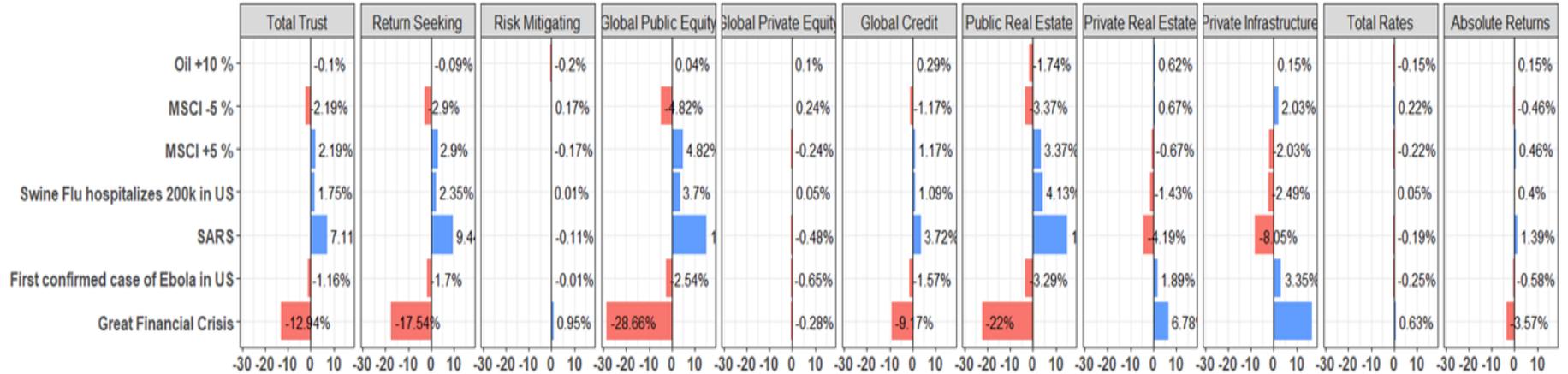
Source: ERS, Bloomberg
Time Period: 1998-12-31 to 2019-02-28
R-Squared = 96.81%

Stress Test



Stress Test

Contribution of factors to stressed returns during corresponding events



Source: ERS, Bloomberg

Time Period: 2012-07-31 to 2019-12-31

Methodology: Stress = Beta Sensitivity x Factor Returns During Event

COVID-19



A Major Uncertainty

- Virus is highly contagious so a global pandemic is likely
- Factories, retail, & other businesses are largely shut down in many areas
 - Initially China, now spreading—especially northern Italy & South Korea
 - Global impact on supply chains, transportation, etc.
- Official data from China must be treated with suspicion
- Chinese central government is now encouraging people to return to work, but is facing resistance, which it may target aggressively
- Economic impact of virus would be greatly reduced if there were effective treatments, which may come in 6-12 months

Questions?

*Public Agenda Item #16

Global Public Equity Program Market Update and Program Overview

March 11, 2020

John Streun, CFA, CPA, Director of Global Public Equity
Lauren Honza, CFA, MBA, External Advisor Portfolio Manager
Michael Clements, CMT, Chief Trader

Global Public Equity Program



Agenda

- Investment Objective and 2019 Performance
- Notable Structural Changes in Global Public Equities
- Global Public Equity Team Update
- Portfolio Structure and Positioning
- External Advisor Program Update
- Trading Update
- 2020 Public Equity Outlook
- Global Public Equity Initiatives for 2020

Global Public Equity Program

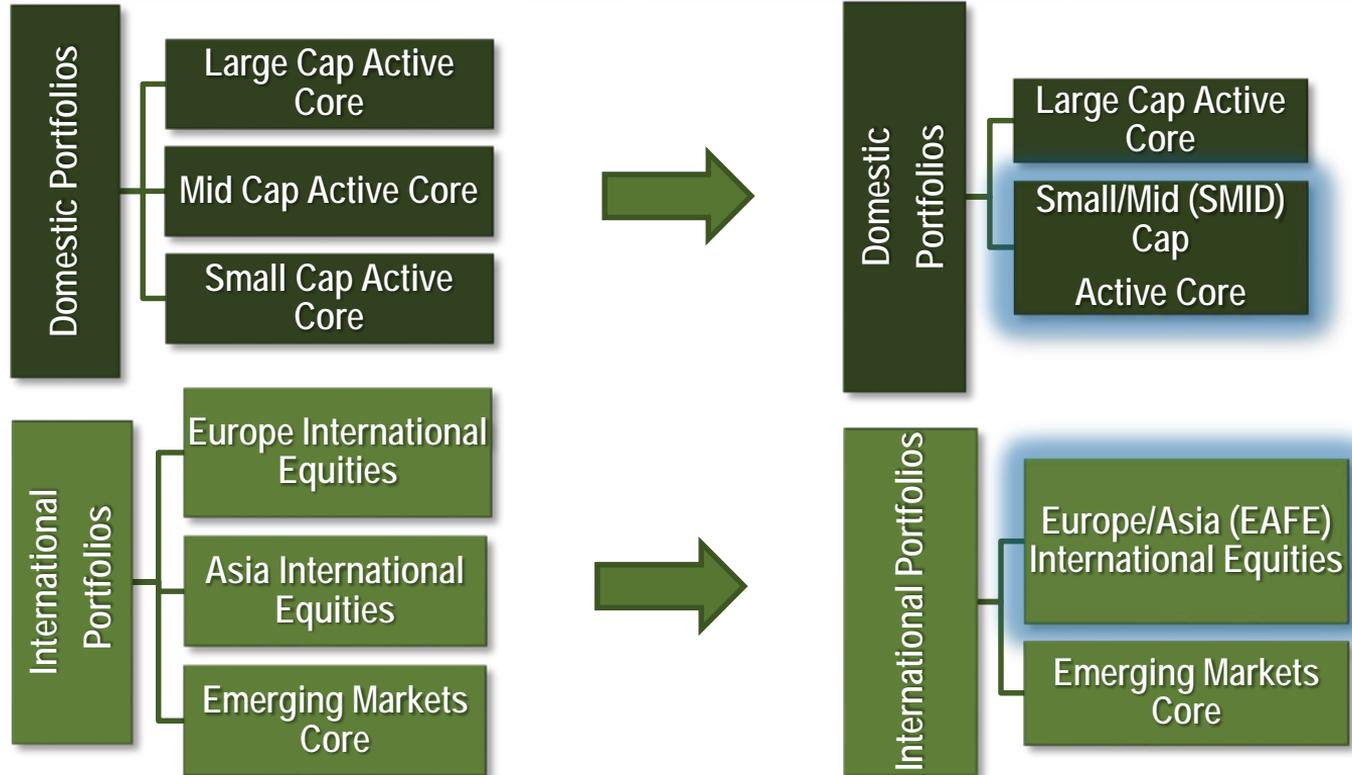


Investment Objective & Strategy

- **Investment Objective** – Outperform the Global Public Equity benchmark over rolling five-year periods, while maintaining compliance with the active risk budget.
- **Investment Strategy** – Combine lower risk internal strategies with higher risk external strategies to produce a stable excess return with a target tracking error of 150 basis points and an excess return ratio of 25 basis points or better.

Global Public Equity Program

Portfolio Structure Changes – Internal Actively Managed Portfolios



Global Public Equity Program

Public Equity Team



Public Equity Team

Leadership: John Streun, Andrew Hodson, Tim Reynolds, Michael Clements, Lauren Honza

Domestic Portfolio Managers:

Large Cap

Kelley Hewell, MBA, CFA (27)

Small and Mid Cap

Andrew Hodson, MBA, CFA (18)

International Portfolio Managers:

International Developed

Keith Lyons, MBA (16)
Nancy McCarthy, MBA, CFA (12)

Emerging Markets

Tim Reynolds, MS, CFA, CAIA (28)

Canada & International Value

Carlos Chujoy, CFA (27)
Yu Tang, CFA (6)

Quantitative

Carlos Chujoy, CFA (27)
Yu Tang, CFA(6)

Trading

Michael Clements, CMT (22)
Rob Newhall, CMT (7)
Travis Olson, CPA (5)

External Advisor Team

John Streun, MS, CFA, CPA (27)
Lauren Honza, MBA, CFA (26)
Michael McCrary, MBA (19)
Mark Long, MBA, CFA (23)
Kelley Hewell, MBA, CFA (27)

Global Public Equity Program

Public Equity Team



Public Equity Structure

International

Emerging Markets

Tim Reynolds, MS, CFA, CAIA (28)

John Taylor, MBA, CFA (13)

June Kim (13)

Ian Smith, MBA, CFA (11)

[Open]

Domestic

Large Cap

Kelley Hewell, MBA, CFA (27)

Bob Wood, MBA, CFA (30)

Michael Yuan, CFA (22)

Paul Knight, CFA (18)

Derek Sadowsky, CFA (21)

International Developed

Keith Lyons, MBA (16)

Nancy McCarthy, MBA, CFA (12)

Teofilo Bacungan, MBA, CFA (19)

T.J. Qatato, MPA, CFA (24)

John McCaffrey, MBA (5)

Small and Mid Cap

Andrew Hodson, MBA, CFA (18)

Ben Schuman, CFA (14)

Jake Tisinger, CFA (11)

Mark Long, MBA, CFA (23)

[Open]

Asset Class Performance Highlights

Calendar Year 2019



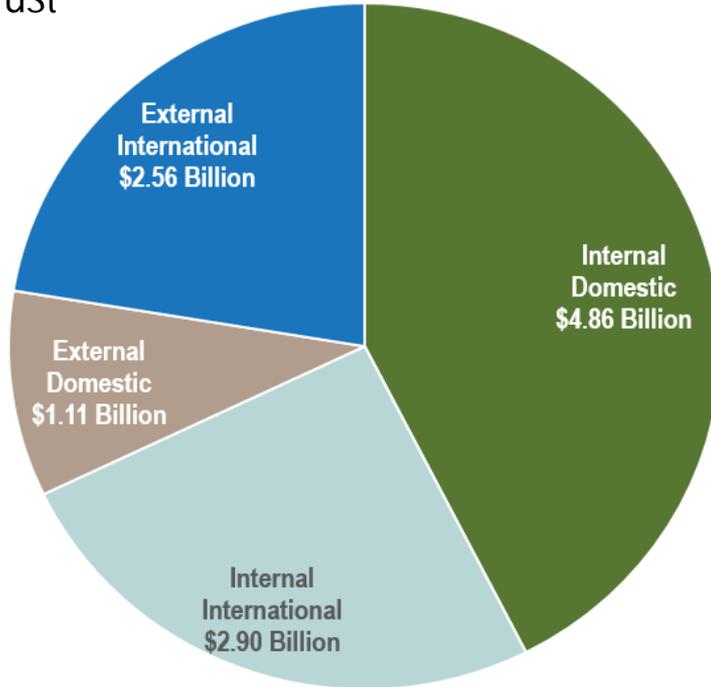
- Strong absolute returns of 26.18% for Calendar Year 2019
- Slight relative under performance of -57 basis points
- 3 out of 4 fundamental internal portfolios outperformed their benchmarks
- 8 out of 10 external portfolios outperformed their benchmarks
- 5 out of 5 new international small cap managers out performed
- Stock selection from both internal and external portfolios was a positive contributor
- The lagged reporting of the Directional Growth Portfolio detracted from performance
- An under weight to U.S. large cap stocks hurt performance
- The small allocation to cash in a strong market environment also detracted from performance

Global Public Equity Program

Global Portfolio Structure – Dollar Allocation (12/31/2019)



39% of Trust



GLOBAL COMPOSITE **\$11,437,303,684**

Internal Domestic **4,862,872,473**

LC ACTIVE CORE 3,385,170,023

SMID CAP CORE 877,240,643

CAPITOL HILL 323,506,812

SPINOFF 276,954,995

Internal International **2,903,672,432**

INTL DEV MARKETS CORE 1,367,763,249

EMERGING MARKETS CORE 785,055,388

INTL DEV MARKETS VALUE 518,886,627

CANADA 231,967,168

External Domestic **1,108,447,832**

BRANDYWINE CLASSIC 518,486,354

BARROW HANLEY LCV 409,830,482

ALLIANZ 180,130,996

External International **2,562,310,947**

MARSHALL WACE 382,543,533

LAZARD ACTIVE INTL 343,168,699

BLACKROCK INTL FOCUS 335,512,429

TEMPLE ACTIVE INTL 308,286,738

LEGATO SC INTL 210,415,671

LEGATO EM 159,887,076

ACADIAN EM 131,141,032

ALGERT JAPAN 147,800,014

KAYNE ANDERSON INTL 121,711,937

AXIOM INTL SMALL CAP 120,805,857

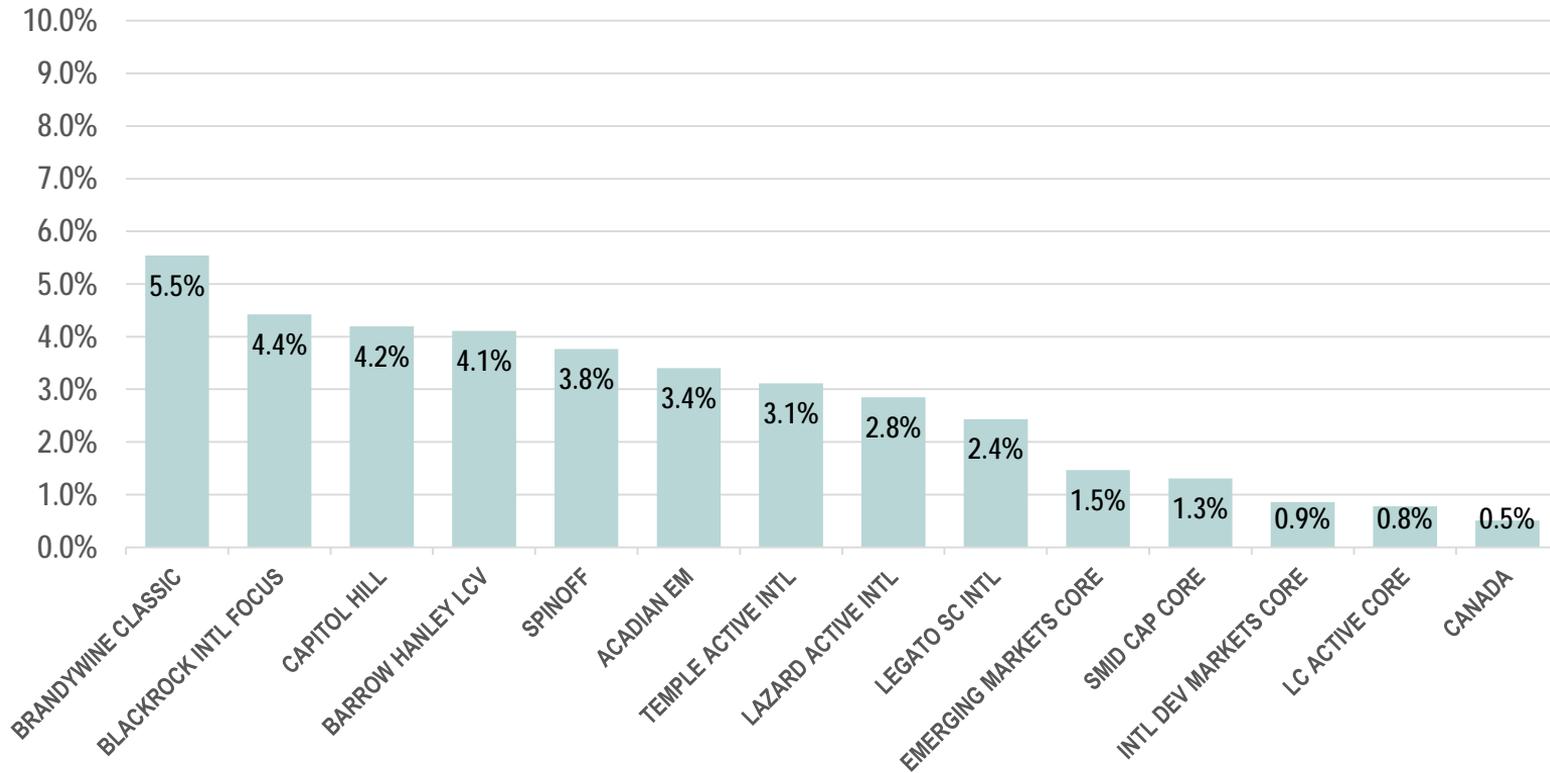
QMA EMERGING MKTS SM 111,665,530

GLOBAL ALPHA INTL SM 96,319,868

EAM INTL SMALL CAP 93,052,563

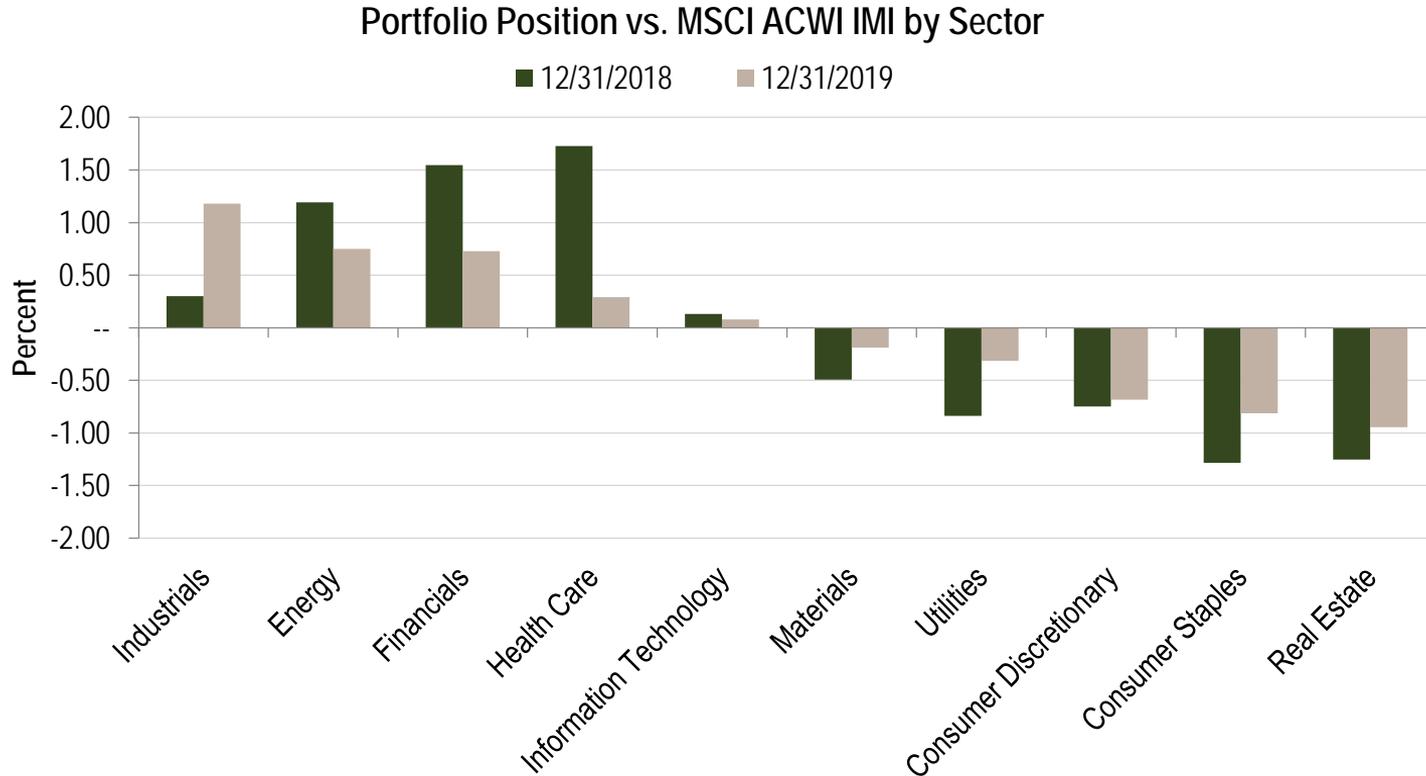
Global Public Equity Program

Tracking Error as of 12/31/2019



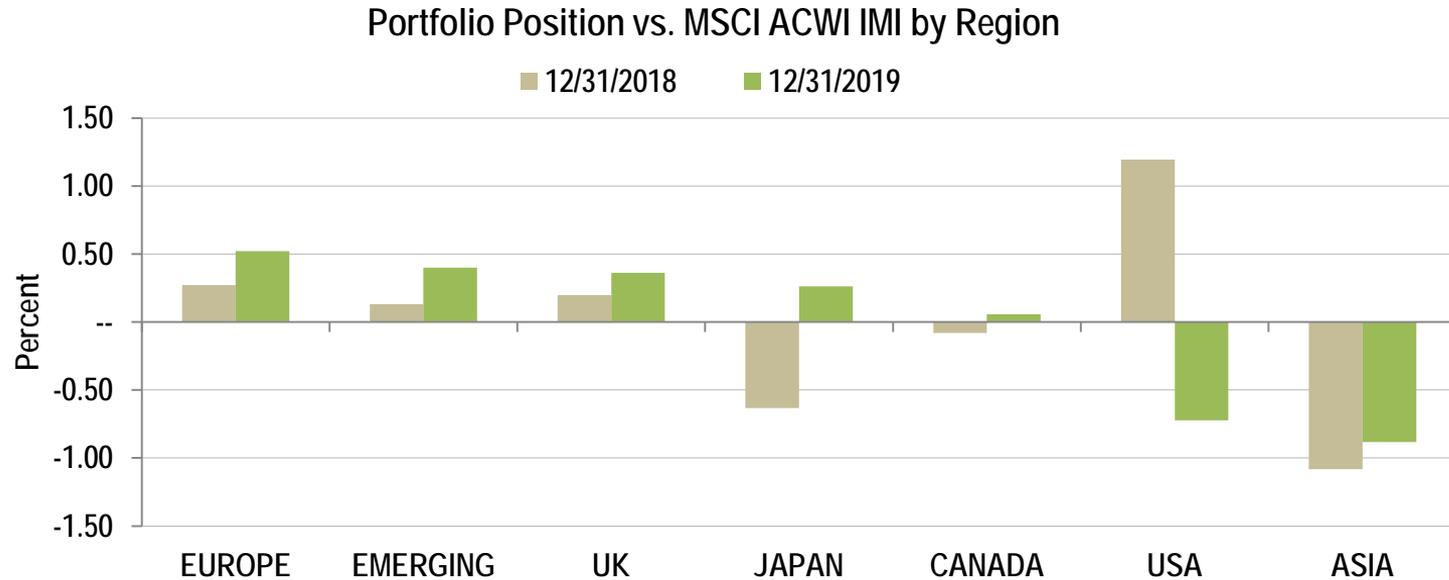
Global Public Equity Program

Portfolio Structure and Positioning – Sector Exposures



Global Public Equity Program

Portfolio Structure and Positioning – Regional Exposures



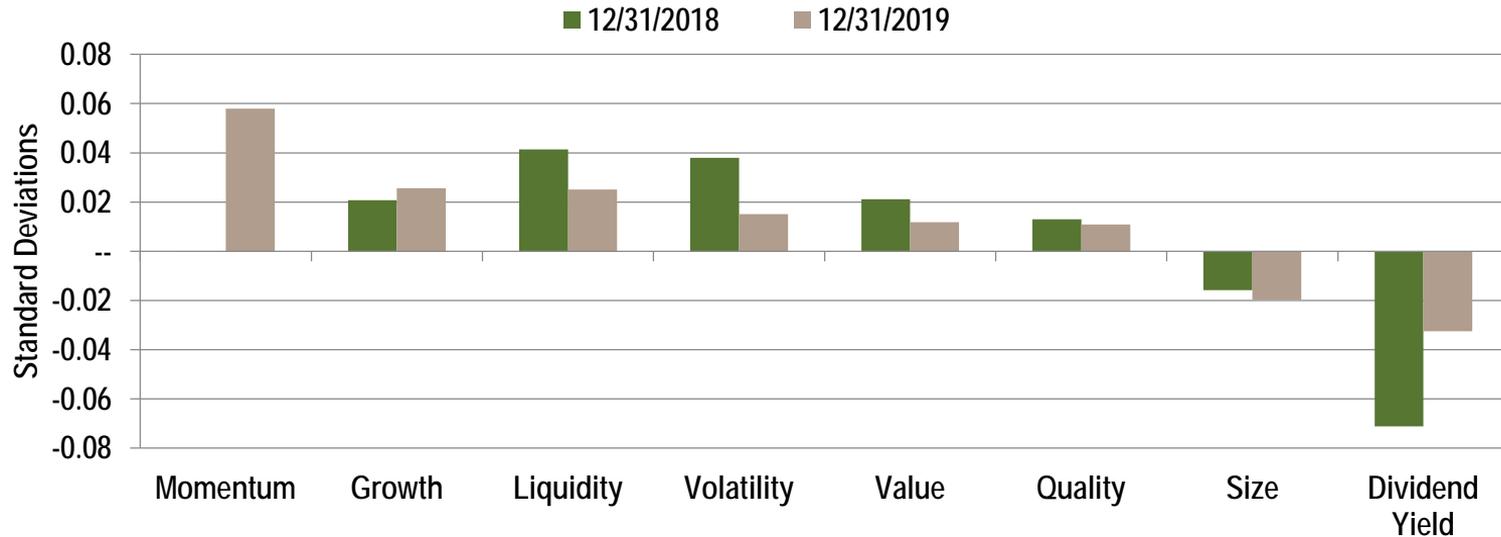
Global Public Equity Program



Factor Exposures (Portfolio Characteristics)

- Factor tilts are modest
- The overall composite does have exposure to momentum and growth

Active Factor Tilts vs. MSCI ACWI IMI by Region



Global Public Equity Program



Active Risk/Tracking Error

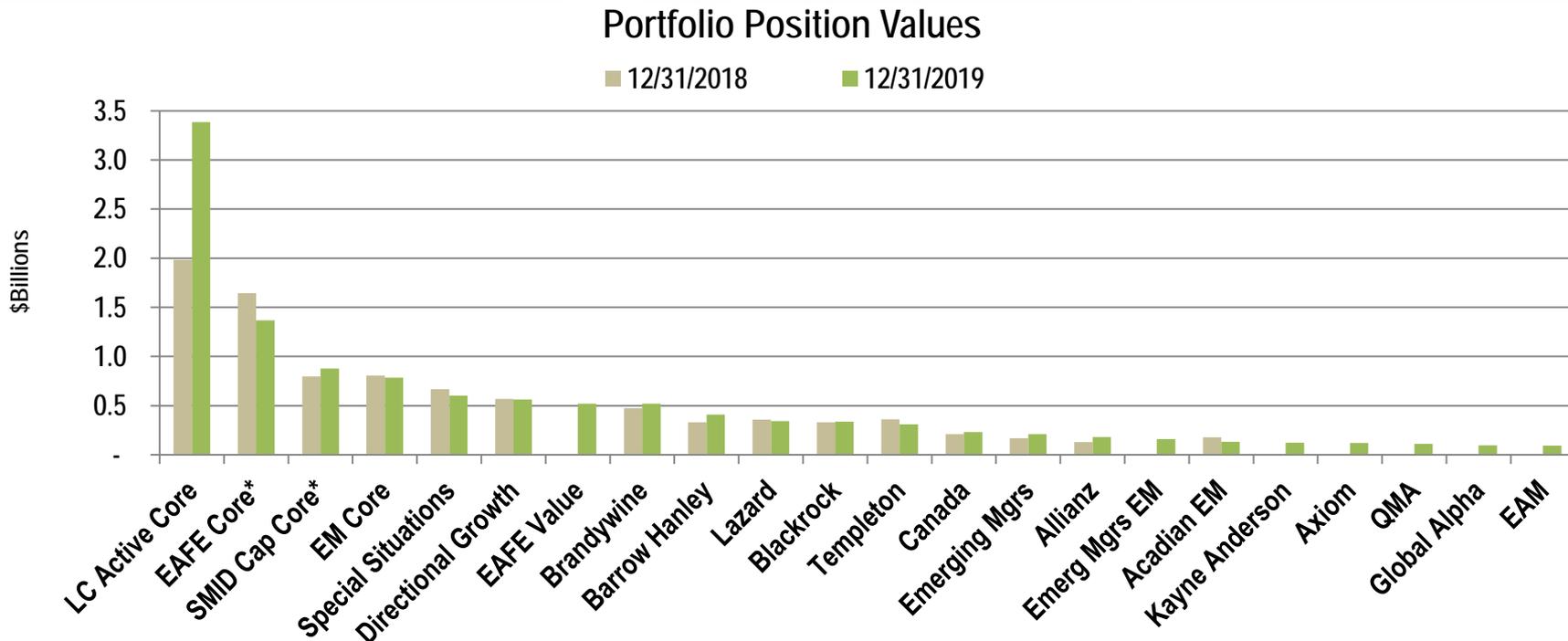
- Forecast risk levels remained within policy limits

Forecast Active Risk of Global Equity Portfolio



Global Public Equity Program

Portfolio Position Values



*EAFE Core combined the former Europe and Asia Intl Portfolios

*SMID Cap Core combined Small and Mid Cap Domestic Portfolios

External Advisor Program

Lauren Honza, MBA, CFA, External Advisor Portfolio Manager

External Advisor Program

Funded External Advisors



Firm	Strategy	Selection Date	Portfolio Inception
Acadian Asset Management	Emerging Markets	12/2/2011	11/1/2017
AllianzGI Strctrd Alpha LC 350	Domestic Large Cap	5/29/2018	8/1/2018
Axiom International Investors	International Small Cap Equity	12/20/2018	3/1/2019
Barrow, Hanley, Mewhinney & Strauss	Large Cap Value	12/2/2010	4/1/2011
BlackRock	International	12/2/2011	3/1/2015
Brandywine GIM	Large Cap Value	12/2/2010	4/1/2017
EAM Investors	International Small Cap	12/20/2018	3/1/2019
Global Alpha Capital Management	International Small Cap	12/20/2018	3/1/2019
Kayne Anderson Rudnick	International Small Cap	12/20/2018	3/1/2019
Lazard Asset Management	International	8/23/2011	12/1/2011
Quantitative Management Associates	Emerging Markets Small Cap	12/20/2018	3/1/2019
Templeton	International	11/19/2002	4/1/2003
Legato Capital Management	International Small Cap	5/25/2010	2/1/2017
Legato Capital Management	Emerging Markets	9/25/2019	11/1/2019

External Advisor Program

Select Pool



Firm	Strategy	Selection Date	Portfolio Inception
Algert Global	International Small Cap	12/20/2018	TBD
Ativo Capital Management	International Small Cap	12/20/2018	TBD
Copper Rock Capital Partners	Emerging Markets Small Cap	12/20/2018	TBD
Fisher Investments	International	1/24/2006	TBD
Strategic Global Advisors	International Small Cap Equity	12/20/2018	TBD
TimesSquare Capital Management	International Small Cap	12/20/2018	TBD

External Advisor Program

Funding: International Small Cap



- Ten strategies approved for placement into Select Pool in December 2018
- Five strategies funded in February 2019
 - Axiom International Small Cap
 - EAM International Small Cap
 - Global Alpha International Small Cap
 - KAR International Small Cap
 - QMA Emerging Markets Small Cap

External Advisor Program



New Mandate: Legato Capital Management Emerging Markets

- Approved by Asset Class Investment Committee in October 2019
- Funding Amount: \$150 Million
- Excess Return Objective: 1.50% - 3.00%
- Tracking Error: Target of 300 basis points
- Four Managers
 - Change Global Investment/Emerging Markets All Cap Value
 - NS Partners/Emerging Markets All Cap Growth
 - Rondure Global Advisors/New World Fund
 - Trinetra Investment Management/Emerging Markets Growth

External Advisor Program

RFP: International Advisory Services



- Published January 24, 2020
- Benchmarks: *MSCI ACWI ex-US* and *MSCI EAFE*
- Process
 - Phase I: Minimum Requirements and Short Form Review
 - Phase II: Investment DDQ Review and Operational DDQ Review
 - Phase III: Onsite Meetings and Reference Checks
 - Phase IV: Committee Approval
 - Phase V: Contract/Fund

Trading Update

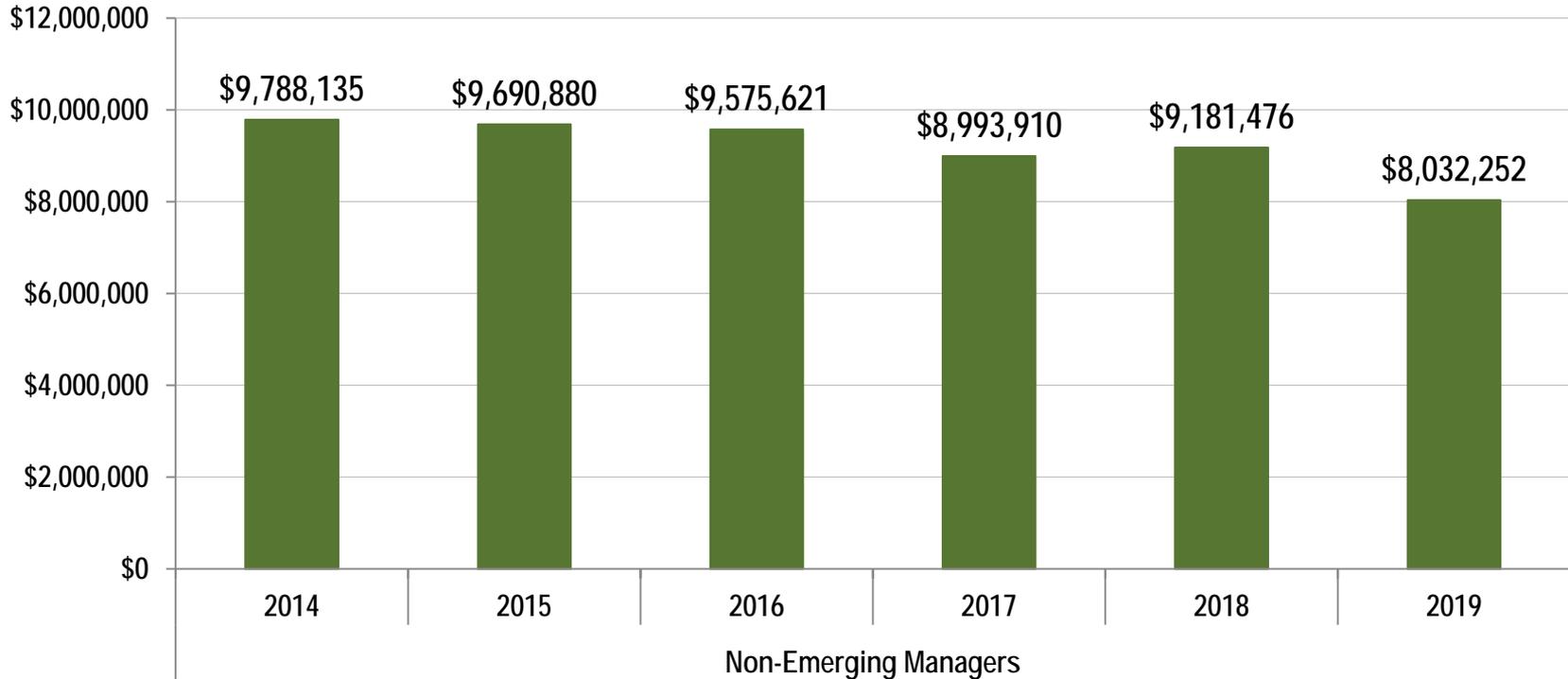
Michael Clements, CMT, Chief Equity Trader

Global Public Equity Program

Total Commissions



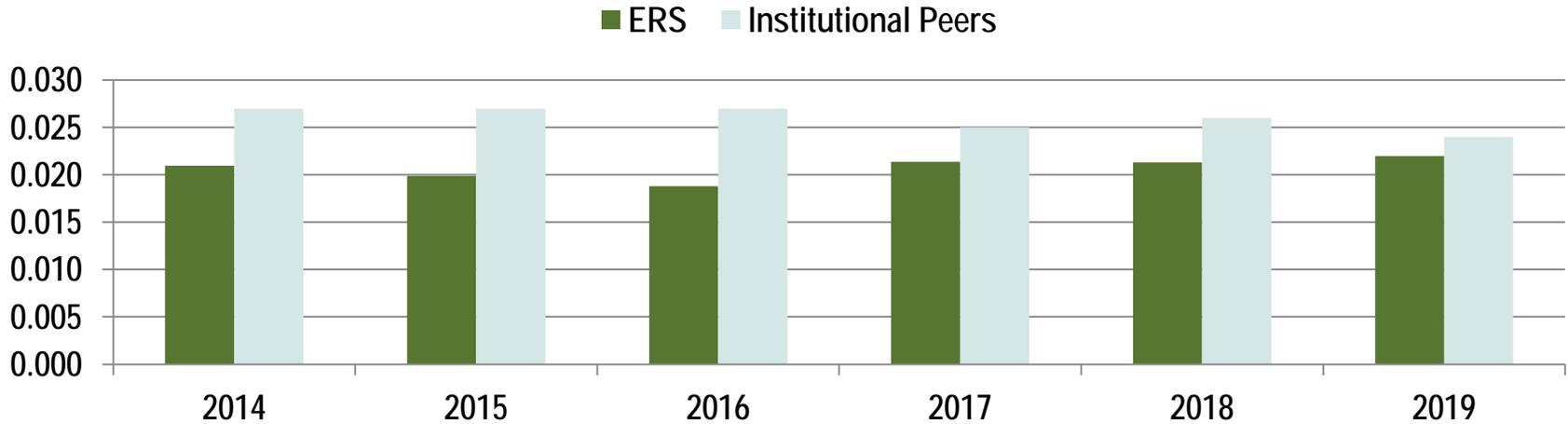
Calendar Year 2019 total commissions were 12.5% less than 2018.



Global Public Equity Program



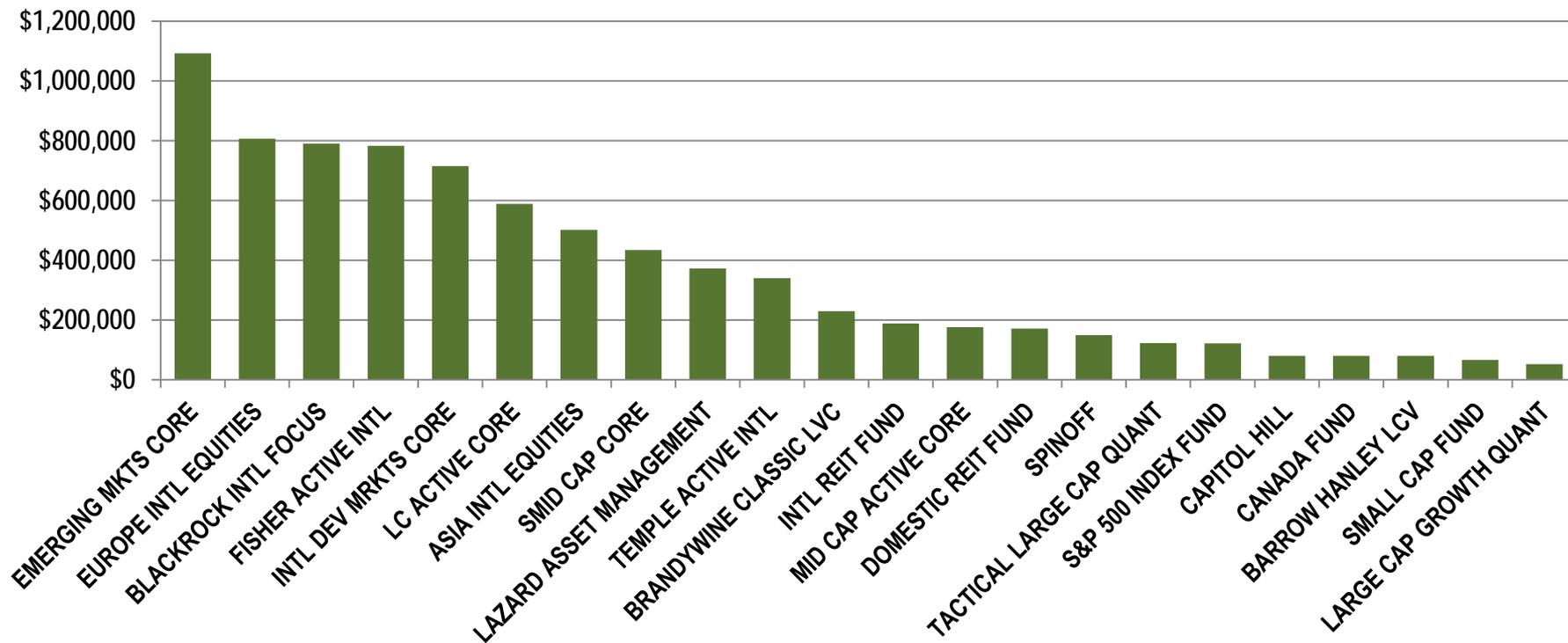
The average “All-In” blended commission rates



- Average “all-in” blended commission rate paid by U.S. institutions to brokers on domestic shares was 2.4 cents-per-share, down from 2.6 cents-per-share in 2018.
 - This average rate takes into account commissions on single-stock, program, and direct-market-access electronic trades.
- ERS’ average commission was 2.2 cents-per-share, up from 2.1 cents-per-share in 2018.

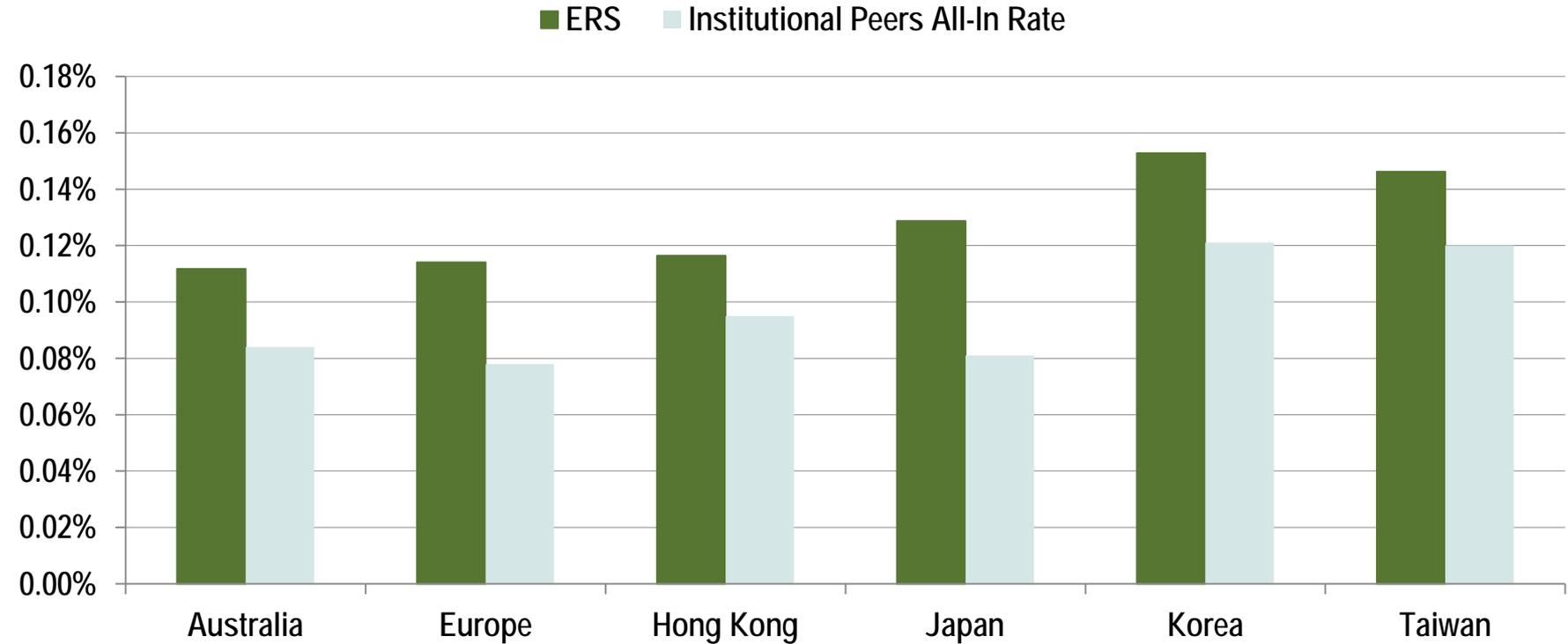
Global Public Equity Program

Commission by Portfolio



Global Public Equity Program

International Commission Rates



ERS Global Public Equity

Outlook for 2020

John Streun, MS, CFA, CPA, Director of Global Public Equity

Global Public Equity Program

Macro



JPMorgan Global Composite PMI SA



Global Public Equity Program

Macro



NY Fed Prob of Recession in US Twelve Months Ahead Predicted by Treasury Spread

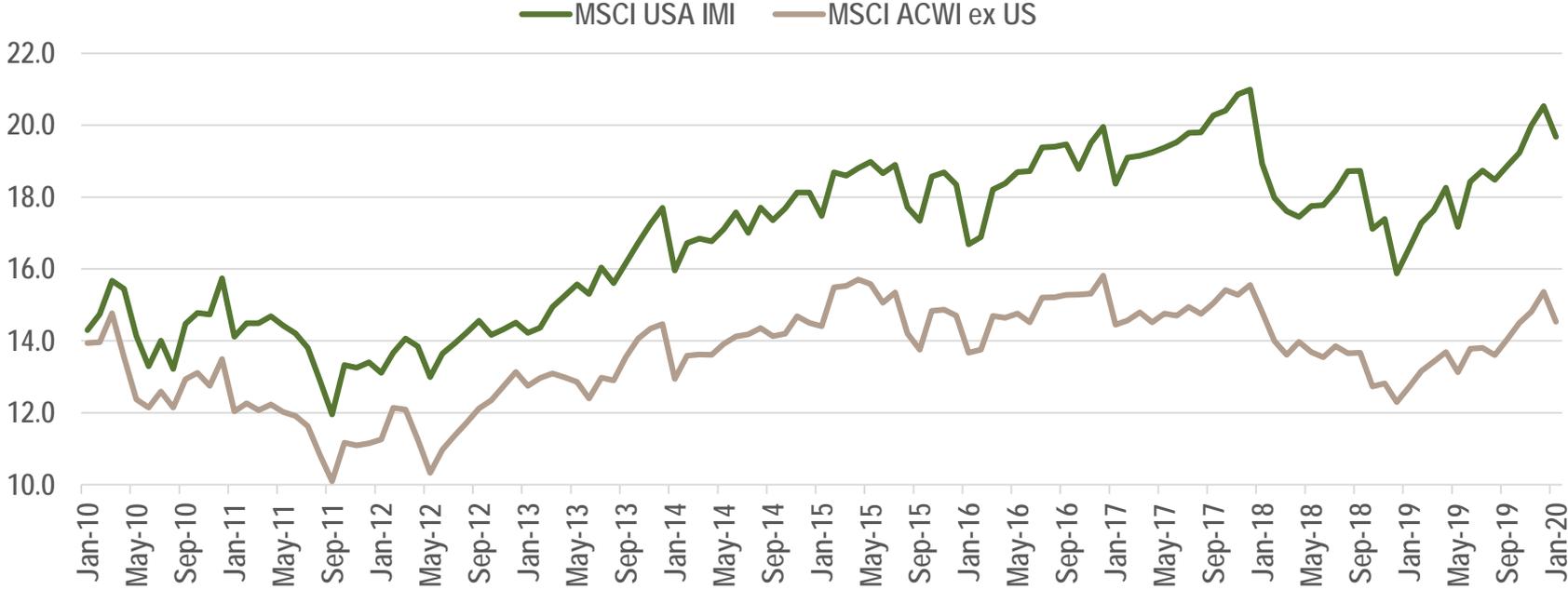


Global Public Equity Program

Macro



Forward P/E Ratios for US vs International Equities



Goals and Objectives for 2020

John Streun, MS, CFA, CPA, Director of Global Public Equity

Global Public Equity Program

Initiatives for 2020



- Select Pool buildout
- External advisor scorecard
- Evaluate target tracking error
- Assess external advisor fees
- Continue to build out and integrate internal team

Questions?

***Public Agenda Item #17**

Opportunistic Credit Program

*Market Update and Consideration of Proposed Opportunistic
Credit Tactical Plan for Fiscal Year 2020 – (Action)*

March 11, 2020

Panayiotis Lambropoulos, CFA, FRM, CAIA, Hedge Funds Portfolio Manager
Nicholas Maffeo, CAIA, Hedge Funds Portfolio Manager
John Claisse and Ta Lohachitkul, Albourne Partners

Opportunistic Credit Program



Purpose & Expectations

- Capture opportunities that do not fit naturally within other more traditional asset classes.
- Opportunities may exist due to structural issues (i.e. banks not lending, Basel III, etc.) or market dislocations.
- Capitalize on various forms of “illiquidity premium”, and maneuver across the spectrum of private credit strategies and sub-strategies such as distressed, private lending, structured product, and real asset or esoteric.
- Primary focus will be on yield-seeking, credit-oriented investments. Total Trust Allocation target is 3% (when fully allocated).

Opportunistic Credit Program



What is it?

- A flexible mandate that gives ERS the ability to identify unique and niche opportunities across the credit spectrum.
- A differentiated approach that allows ERS to invest and generate unique sources of return within the credit markets.
- A portfolio that includes a diverse spectrum of strategies, which can span across traditional asset classes such as income producing, asset backed, and distressed.
- Offers access to private opportunities, which can potentially be more attractive relative to public markets given the current credit cycle (i.e. distressed or stressed).

Opportunistic Credit Program



Investment Approach

- Non-traditional portfolio construction mandate;
 - Will only consider compelling opportunities relative to current Trust credit allocations.
- No minimum exposure ranges, and thus not forced to allocate capital;
 - This allows ERS to invest in an opportunistic fashion.
- Flexible mandate structured through private market investment vehicles;
 - This offers an opportunity for solution-based structures and funds.
- On most occasions, capital will be committed and drawn over a specified period of time.
- Depending on the strategy, cash distributions from investments may be made to ERS over the life of the allocation, effectively de-risking the initial investment.

Current Asset Allocation



Opportunistic Credit: Allocation within the Trust

Asset Class	Final	Credit Investments	Main Focus - Public/Private
Global Equity	37.0%	n/a	Public
Private Equity	13.0%	Yes	Private
Global Credit	11.0%	Yes	Public
Real Estate	12.0%	Limited	Private
Infrastructure	7.0%	Limited	Private
Opportunistic Credit	3.0%	Yes	Private
Total Return-Seeking Assets	83.0%		
Rates	11.0%	Yes	Public
Absolute Return	5.0%	Yes	Both
Cash	1.0%	n/a	
Total Risk-Reducing Assets	17.0%		

Opportunistic Credit Program



Investment Focus

Return Profile

- On an aggregate basis, will target portfolio time-weighted returns of at least 6.5% (net)

J-Curve Mitigation

- Management fees generally paid on invested capital
- Periodic cash distributions

Downside Risk Protection Options

- Self liquidating
- Senior Secured
- Emphasis on strategies with consistent cash flows
- Deals with both covenants and collateral

Opportunistic Credit Program

Investment Strategies & Targeted Ranges



Strategy Class	Target Range	
Distressed/Stressed	0%	40%
Private Lending	0%	75%
Structured Product	0%	25%
Real Asset & Esoteric Credit	0%	25%
Geography	Target Range	
North America	50%	100%
Europe	0%	50%
Asia/Rest of World	0%	25%

Opportunistic Credit Program

Expectations for Initial Focus



- Core-Satellite approach to portfolio construction
- Multi-Strategy/Multi-Asset Manager
 - Serves as a core position within the portfolio
 - Tactical flexibility to invest across different credit strategies
 - Could include a commingled or a “Fund-of-One” fund structure
- Niche Strategy
 - Serves as a satellite (smaller) position within the portfolio
 - May be due to a market dislocation or to a manager’s investment focus and process

Opportunistic Credit Program

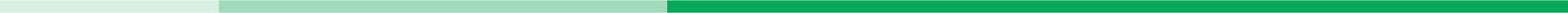


Summary

- Complement existing asset class exposures, not act as an overflow vehicle
- Ideas can be sourced from all ERS investment teams
- Underlying structures will be illiquid while underlying investments will mostly be illiquid
- Primary focus will be on cash flows (yield) with a secondary focus on price appreciation
- Investments may provide equity “kickers” or have characteristics that resemble equity holdings

TX ERS Opportunistic Credit Update

March 11, 2020

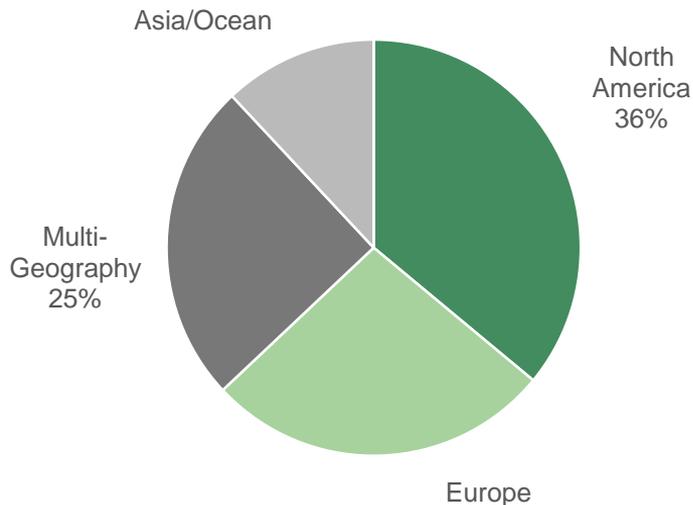


Albourne Coverage

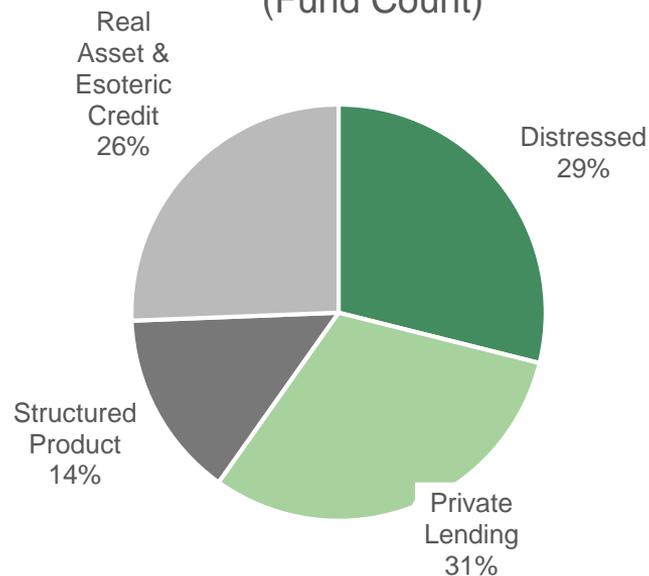
Private Credit Market

\$800bn AUM of Private Credit Funds

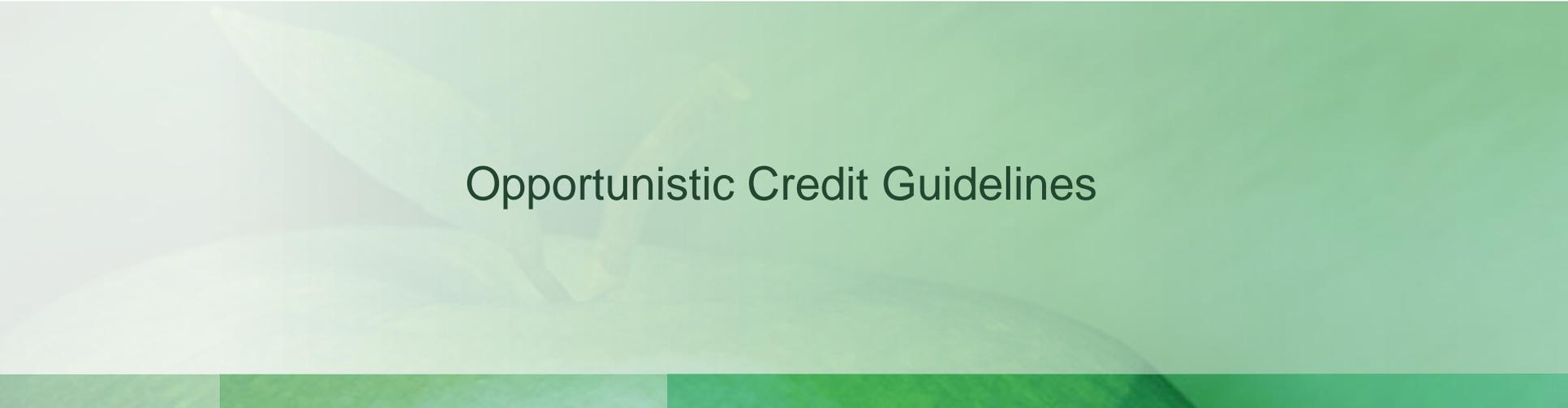
Private Credit Market by Geographical Focus (Fund Count)



Private Credit Market by Strategy (Fund Count)

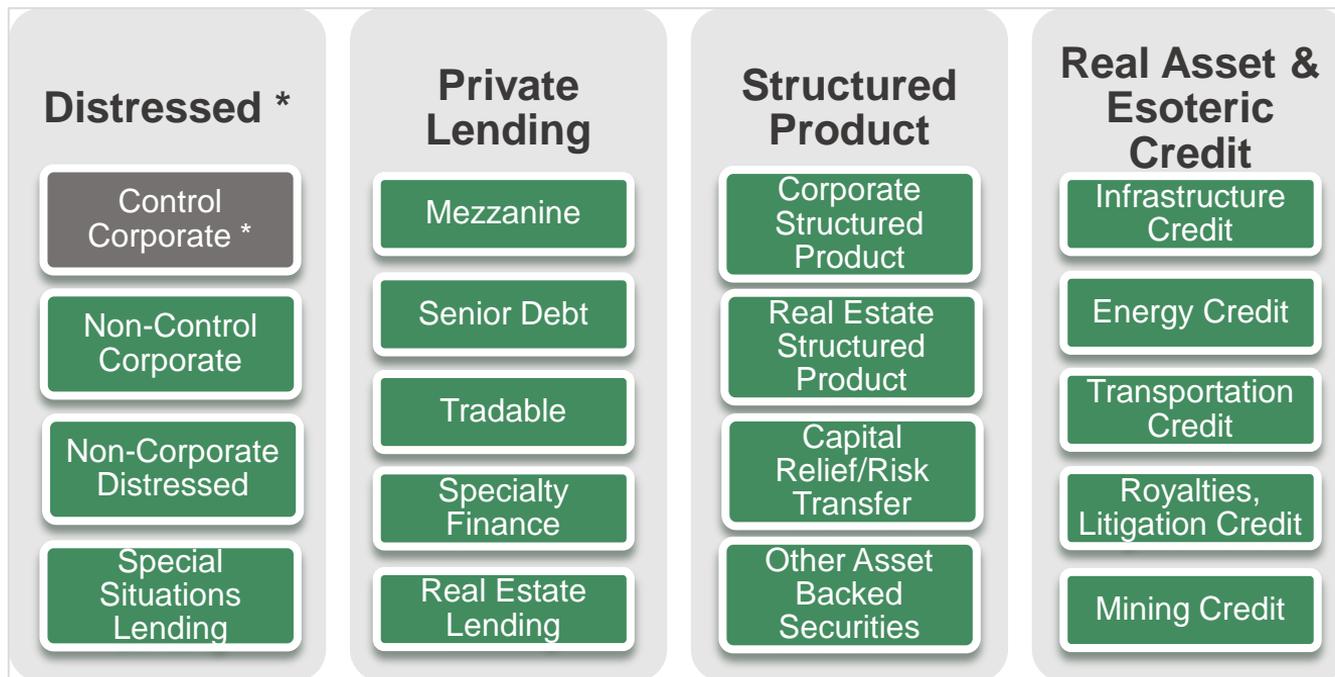


Source: Preqin, matched to Albourne's Strategy and Geography framework (488 funds)



Opportunistic Credit Guidelines

Albourne's Opportunistic Credit Taxonomy



*Distressed can be separated between Illiquid Credit and Private Equity.

Guidelines: New Strategy Classes

Strategy Class	Targeted Range	
	Min	Max
Distressed/Stressed	0%	40%
Private Lending	0%	75%
Structured Products	0%	25%
Real Assets and Esoteric Credit	0%	25%

Strategy Class	Targeted Range	
	Min	Max
North America	50%	100%
Europe	0%	50%
Asia/Rest of World	0%	25%

- **Preference for streamlined Strategy Classes based on similarity across key features:**



- **Program is expected to fall within the min/max ranges after the program matures.**
 - Program may fall outside of these stated ranges during the ramp up phase.
- **Global Exposure:**
 - Long term expectation is for a majority allocation to the US, approximately one-fourth exposure to Europe and the balance to Asia and the rest of the world.

Distressed

Borrower

Mid to large cap corporations, predominately sponsor-backed. Usually secondary markets

Leverage

5-7x EV/EBITDA company creation (the entry value of the company is contingent on the discount to par value of the debt)

Protection

Usually the fulcrum security with equity value as cushion

Return Drivers

Dislocations in markets, cyclical sectors (i.e. O&G, shipping), stressed sellers (i.e. bank regulatory requirements)

Typical Duration of Investment (Years)



Targeted Net Returns (%)



Typical Fees



Management Fee:
1.25%-1.75%

Carry:
20%

Investment Structure

	Open Ended	Closed Ended
Commingled		
Managed		

Private Lending

Borrower

70-90%+ are large cap sponsor backed corporations or real estate projects, small percent are sponsorless. Club deals and syndications

Leverage

Corporate Leverage: 4-7x Debt/EBITDA

Protection

1st liens secured to unsecured with incurrence-based covenants

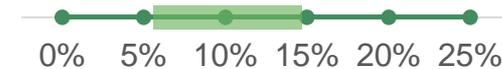
Return Drivers

Amount of dry powder, leveraged loans and high yield markets, LBO dry powder & M&A activity, competition from banks, credit spreads

Typical Duration of Investment (Years)



Targeted Net Returns (%)



Typical Fees



Management Fee:
0.85%-1.5%

Carry:
10%-20%

Investment Structure

	Open Ended	Closed Ended
Commingled		
Managed		



Structured Product

Borrower

Trusts with loans backed by residential and commercial real estate and other assets and credit of consumers, SMEs*, and large corporates. Bilateral synthetic trades with banks' loan portfolio as reference assets

Leverage

Corporate Leverage: 4-7x Debt/EBITDA
Asset-level leverage: 60-80%

Protection

At the collateral level, Loan to Value cushion for asset backed, equity cushion for corporates, while consumer assets are unsecured. At the trust level, credit enhancement for mezzanine and senior tranches.

Return Drivers

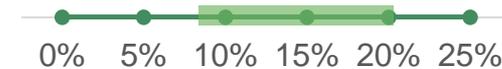
Cashflows from loans, active collateral management, events such as refinancing and restructuring, and recovery in case of distressed credit. Premiums received for writing protection on pool of assets.

Typical Duration of Investment (Years)



Underlying Loans		Originator	CCO
Class A (RMBS)	Class B (RMBS)	Class C (RMBS)	AAA
Class D (RMBS)	Class E (RMBS)	Class F (RMBS)	A
Class G (RMBS)	Class H (RMBS)	Class I (RMBS)	BBB
Class J (RMBS)	Class K (RMBS)	Class L (RMBS)	BBB
Class M (RMBS)	Class N (RMBS)	Class O (RMBS)	BBB
Class P (RMBS)	Class Q (RMBS)	Class R (RMBS)	BBB
Class S (RMBS)	Class T (RMBS)	Class U (RMBS)	BBB
Class V (RMBS)	Class W (RMBS)	Class X (RMBS)	BBB
Class Y (RMBS)	Class Z (RMBS)	Class AA (RMBS)	BBB
Class AB (RMBS)	Class AC (RMBS)	Class AD (RMBS)	BBB

Targeted Net Returns (%)



Typical Fees



Management Fee:
1.5%

Carry:
15%-20%

Investment Structure

	Open Ended	Closed Ended
Commingled	●	●
Managed	●	○

* Small & Medium Sized Enterprises.

Real Asset and Other Credit

Borrower

Project finance loans to infrastructure projects or corporate loans to infrastructure companies. Aviation finance typically approached as a sale-leaseback strategy with carrier. Mine finance loans to public junior mining companies

Leverage

Up to 85% Loan to Value on core operating infrastructure with locked in cash flows. Depending on the stage of development, loans to mining companies may equate to 20-75% Loan to Value

Protection

1st or 2nd lien, typically with strong investor protections including cash flow covenants, restrictions on business activities, contractor controls. Aviation follows a typical lease arrangement

Return Drivers

Banks and insurance companies retrenching from the sub-investment grade infrastructure lending space, also complexity and illiquidity premium. In the case of Aviation, attractive financing strategy for carriers

Typical Duration of Investment (Years)



Targeted Net Returns (%)



Typical Fees



Management Fee:	Carry:
Infra: 75 bps-1.25%	Infra: 10%-15%
Aviation: 2%	Aviation: 20%
Mining: 1.5%-2%	Mining: 17.5%-20%

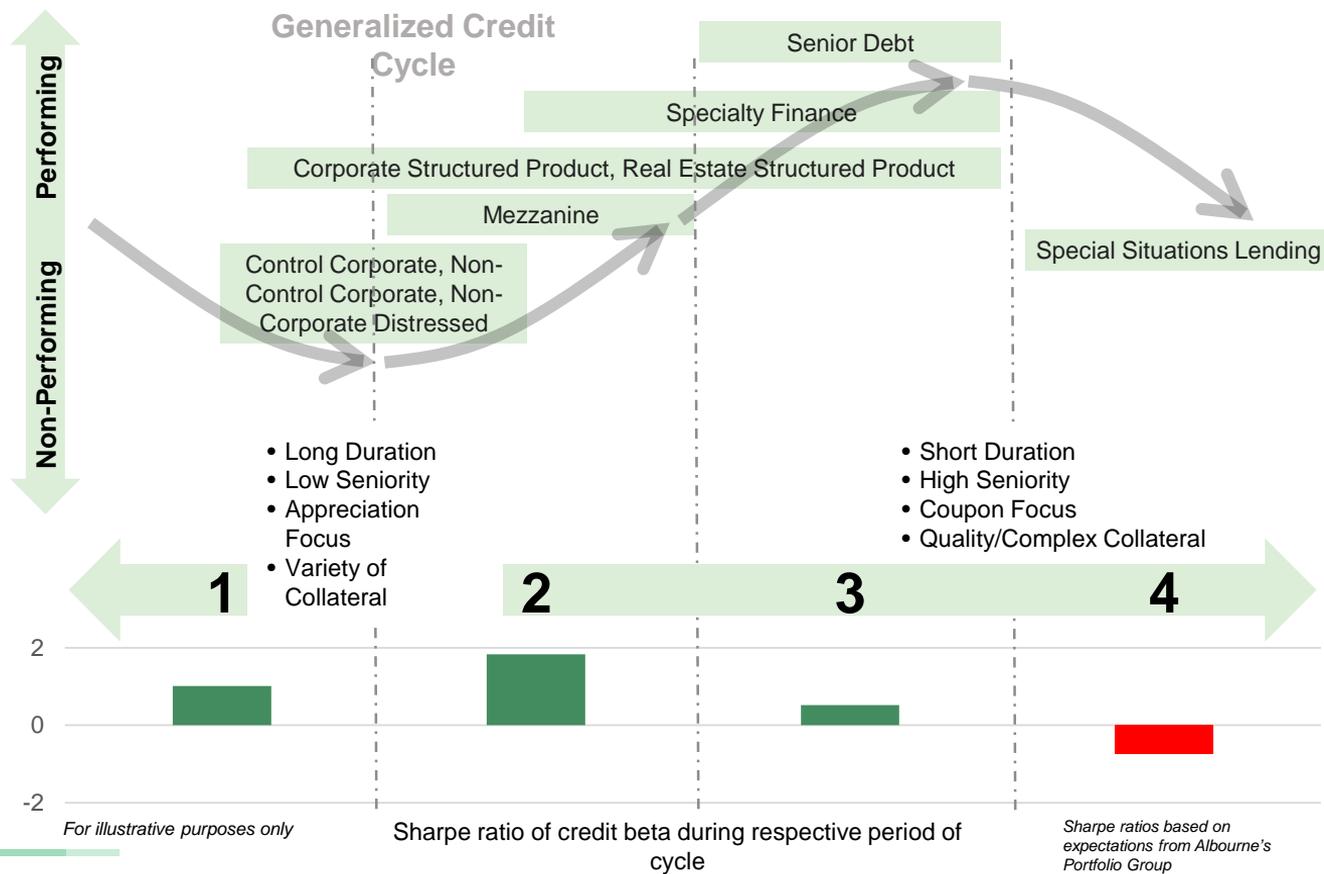
Investment Structure

	Open Ended	Closed Ended
Commingled	<input type="radio"/>	<input checked="" type="radio"/>
Managed	<input type="radio"/>	<input type="radio"/>



Strategy Outlook

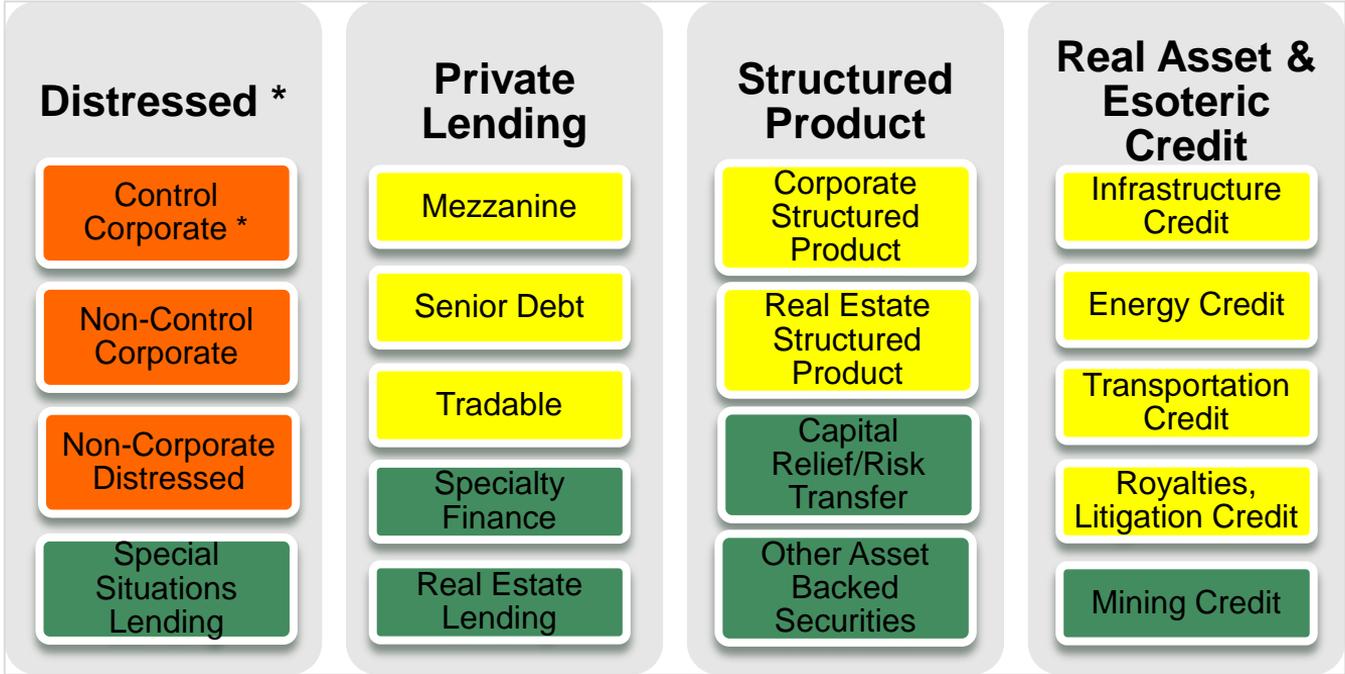
Strategies and the Economic Cycle



For illustrative purposes only

Sharpe ratios based on expectations from Albourne's Portfolio Group

Private Credit Outlook



-  Strategies most favored over the next 12 months
-  Neutral outlook over the next 12 months
-  Strategies least favored over the next 12 months

*Distressed can be separated between Private Credit and Private Equity.

Opportunistic Credit Program

Tactical Plan



- **Initial Targeted Allocation:**
 - Expectations are for 0-3 investments over the next 12 months.
 - Equal to 1% of Trust's allocation target or equivalent of ~\$300 million.
- **Initial Sourcing:**
 - Initial focus will be on a multi-strategy/multi-asset anchor investment
 - Could include a commingled or a "Fund-of-One" fund structure
- **Benchmark:**
 - S&P LTSA Leveraged Loan (SPBDAL) + 150 basis points
- **Primary Consultant:**
 - Albourne Partners

Questions?
Action Item

Public Agenda Item #18

Review, Discussion and Consideration of Contract Award Recommendation for Global Custody Services – (Action)

March 11, 2020

Gabrielle Schreiber, Director of Procurement and Contract Oversight

Betty Martin, Director of Investment Services

Eddie Chan, Assistant Director of Finance

Global Custody Services

Background



ERS is currently contracted with The Bank of New York Mellon (BNY Mellon) to provide global custody services.

Global Custody Services

Request for Proposals (RFP)



- ERS issued a Request for Proposals (RFP) on July 8, 2019.
- Requested Services include:
 - Maintaining and monitoring settlement, safekeeping, delivery, investment accounting (including acting as ERS's book of record);
 - Income collection;
 - Daily securities valuation;
 - Daily investment performance reporting;
 - Compliance monitoring and reporting; and
 - Other services in connection with the assets of the Trust.

Global Custody Services

Request for Proposals (RFP)



- Proposals were due on August 30, 2019.
- The following four entities submitted proposals:
 - BNY Mellon;
 - The Northern Trust Company (Northern Trust);
 - JPMorgan Chase Bank, N.A.; and
 - State Street Bank and Trust Company.

Global Custody Services

Staff Recommendation



Based on the evaluation process we will now discuss, staff recommend that the Board of Trustees of the Employees Retirement System of Texas award the Global Custody Services contract to [_____].

Global Custody Services

Preliminary Review Phase



ERS's Office of Procurement and Contract Oversight (OPCO) evaluated the following criteria on a pass/fail basis:

- Responsiveness
- Compliance with the RFP and
- Certain vendor performance checks required by the Texas Comptroller of Public Accounts.

Global Custody Services

Preliminary Review Phase



OPCO also verified the following Minimum Requirements:

- Each Respondent maintains an office(s) in the United States performing the core business functions (accounting, performance and relationship management functions);
- Each Respondent holds the requisite business and professional licenses and certifications;
- Each Respondent meets certain experience qualifications.

All Respondents passed the Preliminary Review Phase.

Global Custody Services

Proposal Review Phase



Two main categories scored:

- Qualifications and Services: 70%
 - Firm Qualifications
 - Staff Qualifications
 - Core Services
 - Other Required Services
 - Transition-Planning and Implementation Services
 - Technology Requirements
- Price Proposal: 30%



Global Custody Services

Proposal Review Phase



Pass/Fail items:

- Contractibility (initially evaluated);
- Legal Requirements and Regulatory Compliance – Legal Services, Litigation and Regulatory Compliance (initially reviewed);
- Legal Requirements – Standards of Conduct (finally evaluated for all);
- Financial Stability (finally evaluated for all); and
- SOC-2 Requirements (finally evaluated for all).

Global Custody Services

Finalists Review Phase



Based on the Pass/Fail items and the scoring of Price Proposals and Qualifications and Services requirements during the Proposal Review Phase, two Respondents were recommended as Finalists:

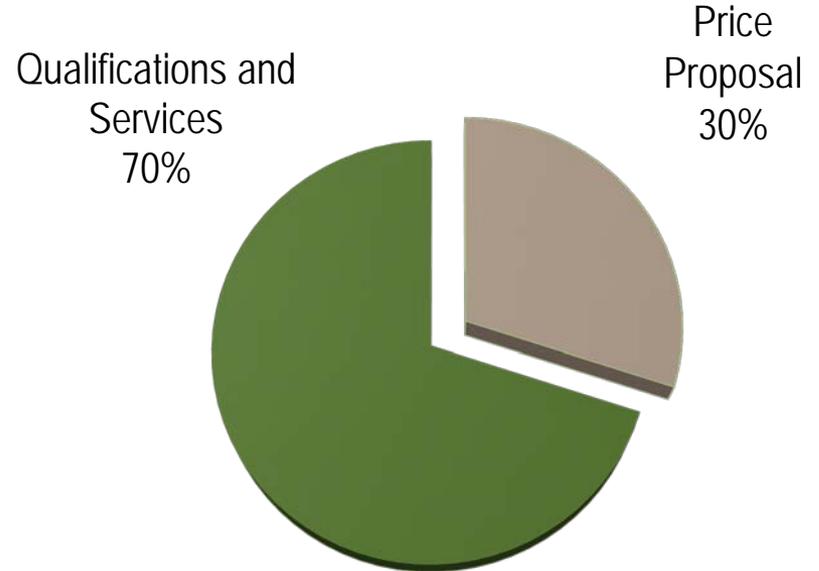
- BNY Mellon and
- Northern Trust.

Global Custody Services

Finalists Review Phase



- Finalists Review Phase:
 - Video Conference Interviews
 - Information Technology Site Visits
 - Operational Site Visits
 - Price Best and Final Offers
 - Past Performance
 - Contractibility and Legal Requirements and Regulatory Compliance



Global Custody Services

Finalists Review Phase



- Staff met with Executive Office and reviewed RFP evaluation team findings.
- A best-value determination was made.

Global Custody Services

Staff Recommendation



Staff recommend that the Board of Trustees of the Employees Retirement System of Texas award the Global Custody Services contract to [_____].

Questions?
Action Item (Board Only)

*Public Agenda Item #19

*Review and Discussion of ERS' Investment Practices and
Performance Relating to Senate Bill 322*

March 11, 2020

Aaron Ismail, Investment Compliance Officer
Sam Austin and Michael Malchenko, NEPC

OVERVIEW OF SB 322 EVALUATION

EMPLOYEES RETIREMENT SYSTEM OF TEXAS

March 11th, 2020

Sam Austin, Partner and Lead Consultant for ERS Texas



BOSTON | ATLANTA | CHARLOTTE | CHICAGO | DETROIT | LAS VEGAS | PORTLAND | SAN FRANCISCO

IMPLEMENTATION OF SB 322

- Senate Bill 322 was introduced in the 86th Session of the Texas Legislature, leading to the adoption of Texas Government Code §802.109 in May 2019
- The new law requires Texas public retirement systems with at least \$100 million in assets to complete an Investment Practices and Performance Evaluation every 3 years
- Impacted systems, including ERS Texas, are required to select an independent firm to prepare an Evaluation Report. Per the legislation, the selected independent firm should have:
 - *substantial experience evaluating the appropriateness, adequacy and effectiveness of institutional investment practices and performance; and*
 - *no conflicts of interest (direct or indirect management of assets) with the retirement system*
- The Pension Review Board (PRB) issued guidance on the scope of evaluations in October 2019
- The first Evaluation Report is due to the PRB 31 days after Board approval, but no later May 31, 2020



PENSION REVIEW BOARD GUIDANCE

The PRB stipulates that a thorough review will:

- 1. Identify and review existing investment policies, procedures, and practices. This should include any formally established policies (e.g. Investment Policy Statement) as well any informal procedures and practices used to carry out the investment activities of the system.**
- 2. Compare the existing policies and procedures to industry best practices.**
- 3. Generally, assess whether the board, internal staff, and external consultants are adhering to the established policies.**
- 4. Identify the strengths and weaknesses of the current policies, procedures, and practices and make recommendations for improvement.**
- 5. Include a detailed description of the criteria considered and methodology used to perform the evaluation, including an explanation of any metrics used and associated calculations.**

SCOPE OF EVALUATION

Texas Gov. Code §802.109 Outlines Five Major Topics for Review:

- 1. Analysis of any investment policy or strategic investment plan adopted by the retirement system and the retirement system 's compliance with that policy or plan**
- 2. A detailed review of the retirement system 's investment asset allocation including:**
 - a) the process for determining target allocations;*
 - b) the expected risk and expected rate of return categorized by asset class;*
 - c) the appropriateness of selection and valuation methodologies of alternative and illiquid assets; and*
 - d) future cash flow and liquidity needs*
- 3. A review of the retirement system 's governance processes related to investment activities, including investment decision-making processes, delegation of investment authority, and board investment expertise and education**
- 4. A review of the retirement system 's investment manager selection and monitoring process**
- 5. A review of the appropriateness of investment fees and commissions paid by the System**

RESOURCES & TIMELINE FOR ERS TEXAS EVALUATION

NEPC Resources Working on the SB 322 Evaluation

Sam Austin, Partner and Lead Consultant for ERS Texas
Bill Bogle, Partner and Chief Compliance Officer
Tim Bruce, Partner and Director of Portfolio Construction
John Krimmel, Partner
Kevin Lau-Hansen, Senior ODD Analyst
Mike Malchenko, Senior Consulting Specialist
Tony Ferrara, Consultant

ERS Texas Resources Working on the SB 322 Evaluation

Porter Wilson
Cathy Terrell
Tom Tull
Betty Martin
Aaron Ismail
Ariana Whaley
Gabrielle Schreiber
John Streun
Leighton Shantz
Ricardo Lyra
Robert Sessa
Pablo de la Sierra Perez
Anthony Curtiss
Michael Clements



SUMMARY OF THE ERS TEXAS SB 322 EVALUATION

- Overall, NEPC finds ERS Texas' policies, procedures and practices to be appropriate, adequate and effective when compared to industry prevailing practice
- NEPC makes one recommendation we characterize as central to the future health of the Retirement System:
 - *NEPC recommends that ERS Texas and its stakeholders develop a comprehensive plan to mitigate the consistent negative cash flow impact to the Trust resulting from underfunding of the Annual Required Contribution from the Plan Sponsor to the Retirement System*

OTHER RECOMMENDATIONS

Additionally, NEPC identified several non-critical areas that ERS Texas and its stakeholders may want to consider for recommended enhancements:

- 1. NEPC recommends an informal annual review of capital market assumptions.**
- 2. NEPC recommends that more flexible procurement options be explored to allow ERS Texas additional operational flexibility when there is a need to quickly replace an investment manager or take prompt advantage of an opportunistic investment.**
- 3. NEPC recommends that ERS Staff regularly review a more formal process of projecting and reporting on liquidity risk. We suggest this process be a collaboration between the Director of Fixed Income and the Risk Committee. This process should monitor liquidity risk using scenario stress testing.**

OTHER RECOMMENDATIONS

4. NEPC suggests that future trade cost analysis should not be limited to the current tracking of explicit commissions, but should also include estimates of market impact, fees and other implicit costs of trading. This more granular analysis will require that ERS Texas maintain a database of time-stamped trade information that is readily accessible by any future third-party firm engaged to conduct the trade cost analysis. A summary of the trade cost analysis should be reported to the Board at least every three years.
5. NEPC recommends an internal review of whether the cost of buying research with hard dollars is lower than the current practice of bundling the cost of research with commissions. We find that, while certainly still permissible in the current regulatory environment, a growing number of Public Funds no longer use a soft dollar program. Instead, many have unbundled trade best execution from payment for research. We acknowledge that ERS Texas has an understandably larger appetite for research given the Trust's relatively high percentage of assets under internal active management in comparison with peers.

OTHER RECOMMENDATIONS

6. NEPC recommends that a comparison of Standard Operating Procedures (“SOPs”) be conducted across asset classes with an objective of formulating a standard format that is more consistent across all asset classes. We acknowledge that some policies and procedures will necessarily be unique to each asset class.
7. In the next annual review of the Investment Policy Statement (“IPS”), NEPC suggests several revisions that could be considered to improve clarity, efficiency and accountability within the document.

SUMMARY AND NEXT STEPS

- **ERS Staff provided NEPC with timely access and guidance regarding all requests for documents, interviews and procedures (formal and informal)**
- **Action on NEPC's primary recommendation to stabilize funding policy is dependent on important factors and stakeholders external to ERS Texas**
- **Implementation of NEPC's non-critical recommendations should be pursued thoughtfully and over time**
- **Following the ERS Board vote on this Evaluation Report, there may be minor formatting changes not impacting content before transmittal to PRB in April**
- **The analysis and recommendations in NEPC's Evaluation Report are intended as helpful resources ERS Texas can use toward accomplishing its mission and objectives**



Questions?

Public Agenda Item #20

Review, Discussion and Consideration of Contract Award Recommendation for Private Equity Consulting Services – (Action)

March 11, 2020

Tom Tull, CFA, Chief Investment Officer
Gabrielle Schreiber, Director of Procurement and Contract Oversight
Ricardo Lyra, Director of Private Equity

Private Equity Consulting Services

Background



ERS is currently contracted with Mercer Alternatives Limited to provide private equity consulting services.

Private Equity Consulting Services

Request for Proposals (RFP)



- ERS issued a Request for Proposals (RFP) on August 29, 2019.
- Requested services include:
 - Assisting ERS on maintaining and monitoring a long-term private equity investment strategy and annual implementation plan; including identification of investment opportunities, screening and partnership due diligence, monitoring, and general assistance related to the program.
 - Providing investment and economic research with respect to the private equity asset class, including domestic and international listed securities and privately held private equity.

Private Equity Consulting Services

Request for Proposals (RFP)



- Proposals were due on October 4, 2019.
- The following 6 entities submitted responses:
 - Albourne America LLC (Albourne);
 - Meketa Investment Group, Inc. (Meketa);
 - NEPC, LLC (NEPC);
 - StepStone Group LP (StepStone);
 - TorreyCove Capital Partners LLC (TorreyCove); and
 - Wilshire Associates Incorporated (Wilshire).

Private Equity Consulting Services

Staff Recommendation



Based on the evaluation process we will now discuss, staff recommend that the Board of Trustees of the Employees Retirement System of Texas award the Private Equity Consulting Services contract to [_____].

Private Equity Consulting Services

Preliminary Review Phase



ERS's Office of Procurement and Contract Oversight (OPCO) evaluated the following criteria on a pass/fail basis:

- Responsiveness;
- Compliance with the RFP; and
- Certain vendor performance checks required by the Texas Comptroller of Public Accounts.

Private Equity Consulting Services

Preliminary Review Phase



- OPCO also verified the following Minimum Requirements:
 - Each Respondent maintains a business location within North America;
 - Each Respondent is a registered investment advisor in good standing under the Investment Advisers Act of 1940;
 - Each Respondent meets certain experience qualifications; and
 - Anticipated revenues from the ERS relationship must not exceed 20% of Respondent's total consulting revenue.

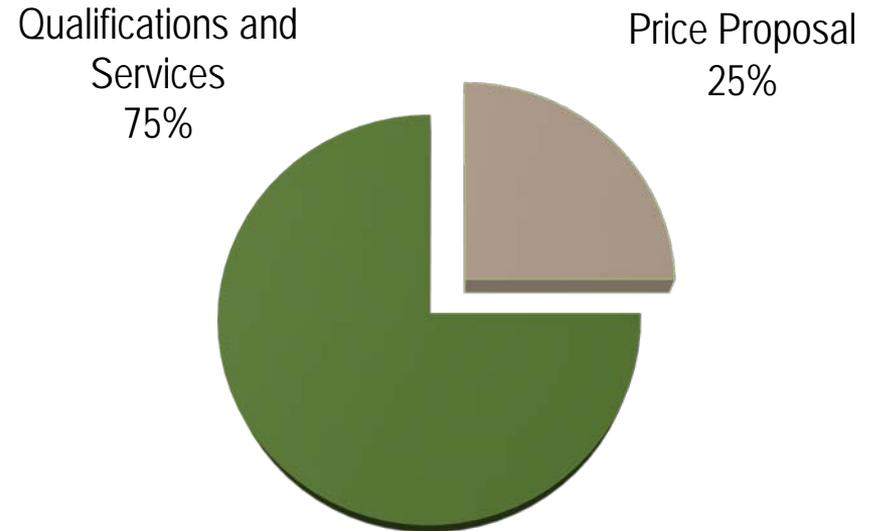
All Respondents passed the Preliminary Review Phase.

Private Equity Consulting Services



Proposal Review Phase

- Two main categories scored:
 - Qualifications and Services: 75%
 - Firm Qualifications
 - Staff Qualifications
 - Methodology and Soundness of Approach
 - Optional Services
 - Price Proposal: 25%



Private Equity Consulting Services

Proposal Review Phase



Pass/Fail items:

- Contractibility (initially evaluated);
- Legal Requirements and Regulatory Compliance (initially evaluated);
and
- Financial Stability (finally evaluated for all).

Private Equity Consulting Services

Finalists Review Phase



Based on the Pass/Fail items and the scoring of Price Proposals and Qualifications and Services requirements during the Proposal Review Phase, three Respondents were recommended as Finalists:

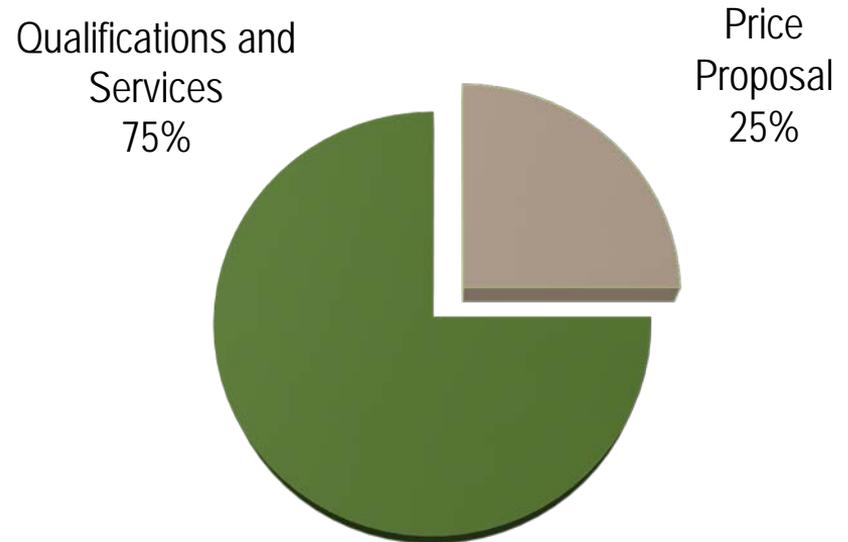
- Albourne;
- Meketa; and
- TorreyCove.

Private Equity Consulting Services



Finalists Review Phase

- Finalists Review Phase:
 - Video Conference Interviews
 - Operational Site Visits
 - Price Best and Final Offers
 - Past Performance
 - Contractibility and Legal Requirements and Regulatory Compliance



Private Equity Consulting Services

Finalists Review Phase



- Staff met with Executive Office and reviewed RFP evaluation team findings.
- A best-value determination was made.

Private Equity Consulting Services

Staff Recommendation



Staff recommend that the Board of Trustees of the Employees Retirement System of Texas award the Private Equity Consulting Services contract to [_____].

Questions?
Action Item (Board Only)

Public Agenda Item #21

Reminder date for the next Joint Meeting of the Board of Trustees and Investment Advisory Committee, the next meeting of the Board of Trustees, and the next meeting of the Audit Committee

March 11, 2020

Next Meeting Dates



2020 Meeting Dates

Wednesday, March 11, 2020

Wednesday, May 20, 2020

Wednesday, August 19, 2020

2-Day Workshop:

Tuesday - Wednesday, December 8 & 9, 2020

Public Agenda Item #22

*Adjournment of the Joint Meeting of the Board of Trustees
and
Investment Advisory Committee*

March 11, 2020

Public Agenda Item #23

Recess of the Board of Trustees

Following a temporary recess, the Board of Trustees will reconvene to take up the Board agenda items

March 11, 2020