ERS

*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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EXECUTIVE SUMMARY

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	

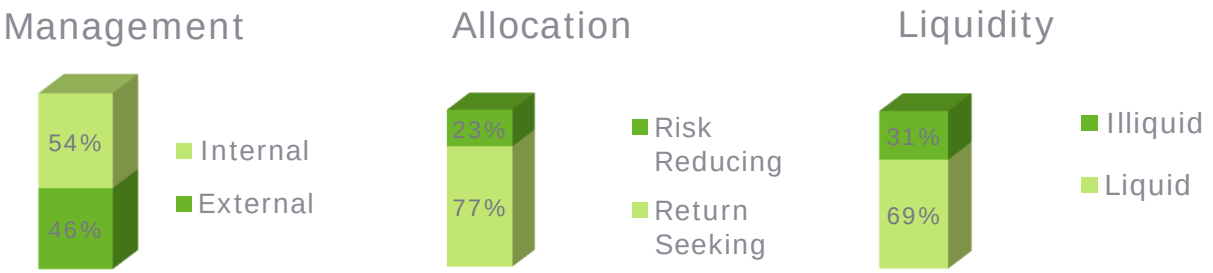
Largest Contributors (Quarter)

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%



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
Total Fund Policy Index		4.3	5.3	16.6	8.8	6.9	7.7
Long Term Public Index		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.**

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 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

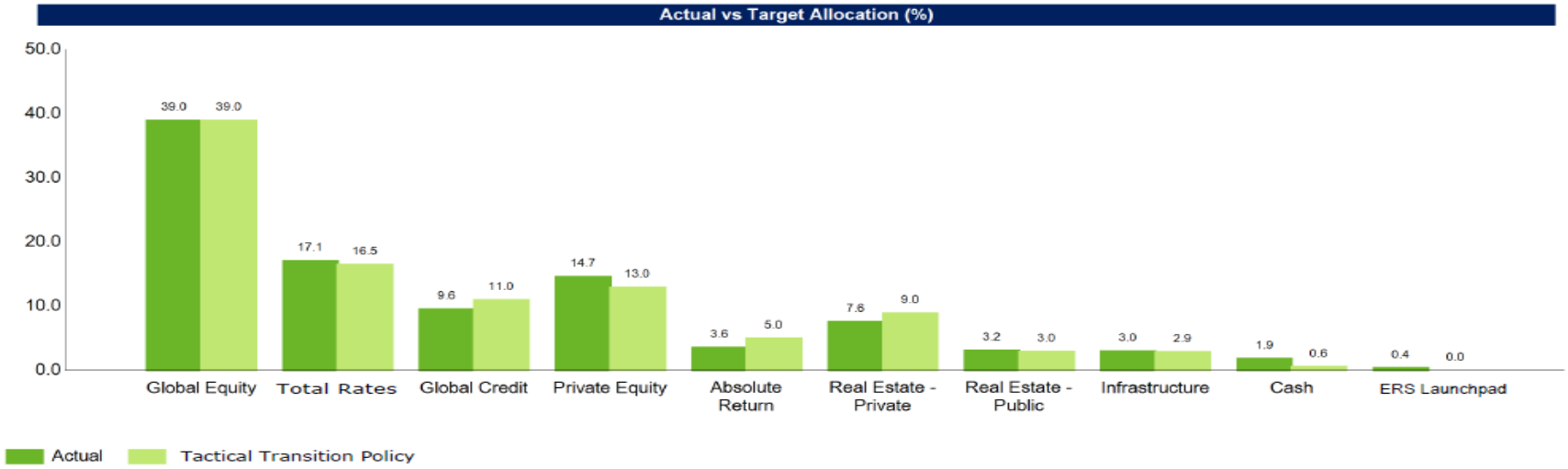
5 Years Ending December 31, 2019	Anlzd Return	Anlzd Standard Deviation	Sharpe Ratio	Sortino Ratio RF
Total Fund	7.13%	5.54%	1.10	1.46
Total Fund Policy Index	6.91%	6.75%	0.87	1.20

- **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.**

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.

Employees Retirement System of Texas

TOTAL FUND ASSET GROWTH SUMMARY

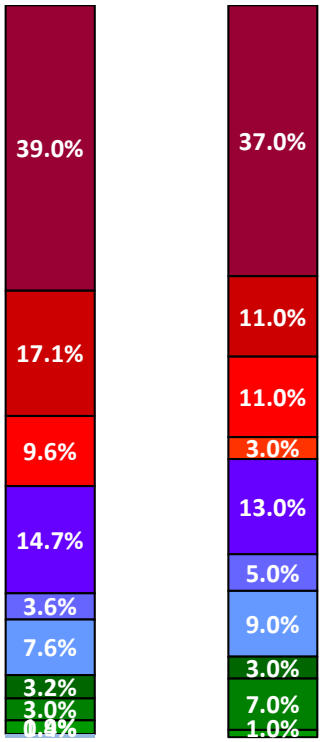


Summary of Cash Flows

	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

Employees Retirement System of Texas

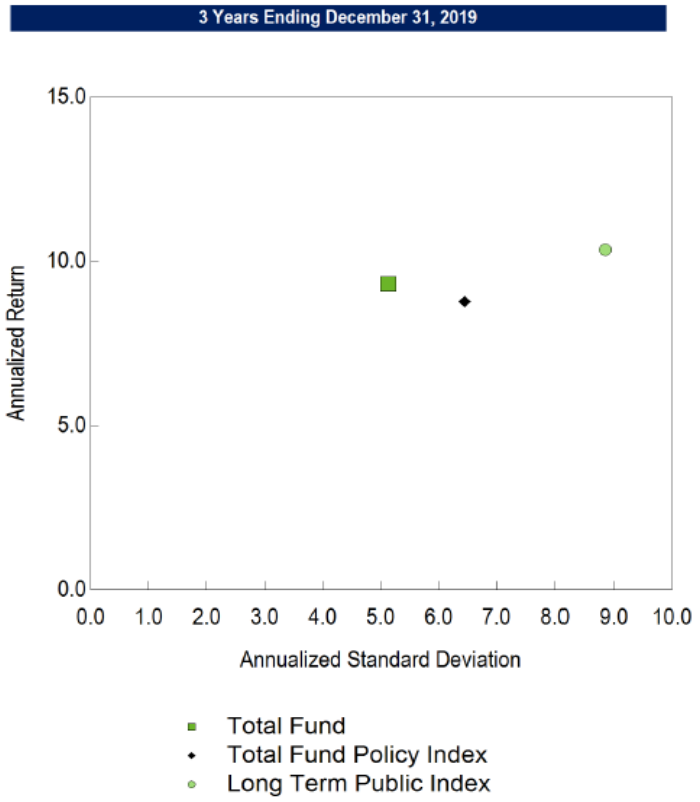
FUND ASSET ALLOCATION VS. POLICY TARGETS

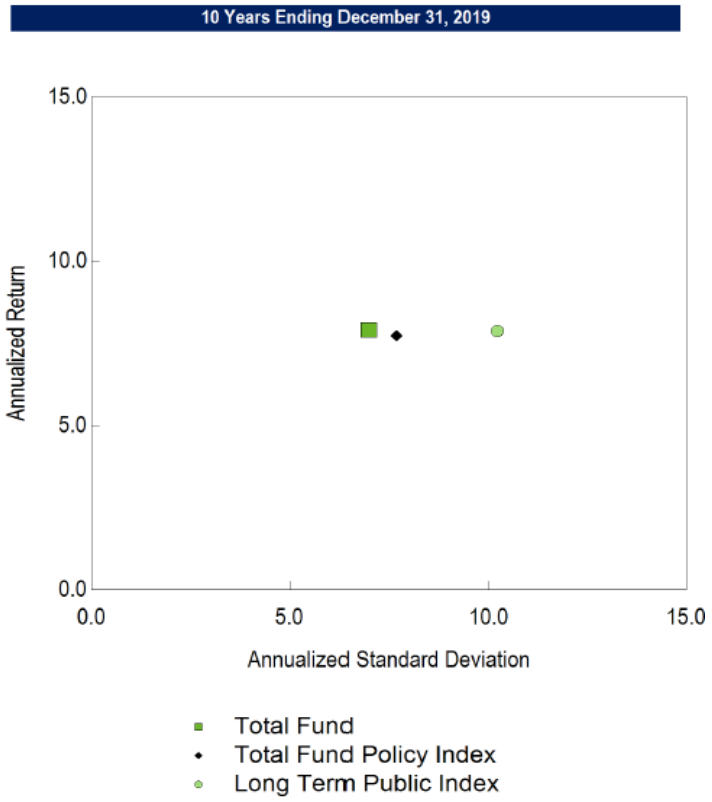


	Asset Allocation on December 31, 2019			
	Current	Current	Long-Term Target	Long-Term Target Range
Public Equity	$11,469,049,044	39.0%	37.0%	27.0% - 47.0%
Total Rates	$5,031,067,041	17.1%	11.0%	
Global Credit	$2,813,789,696	9.6%	11.0%	1.0% - 21.0%
Opportunistic Credit	-	-	3.0%	0.0% - 8.0%
Private Equity	$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%	

Employees Retirement System of Texas

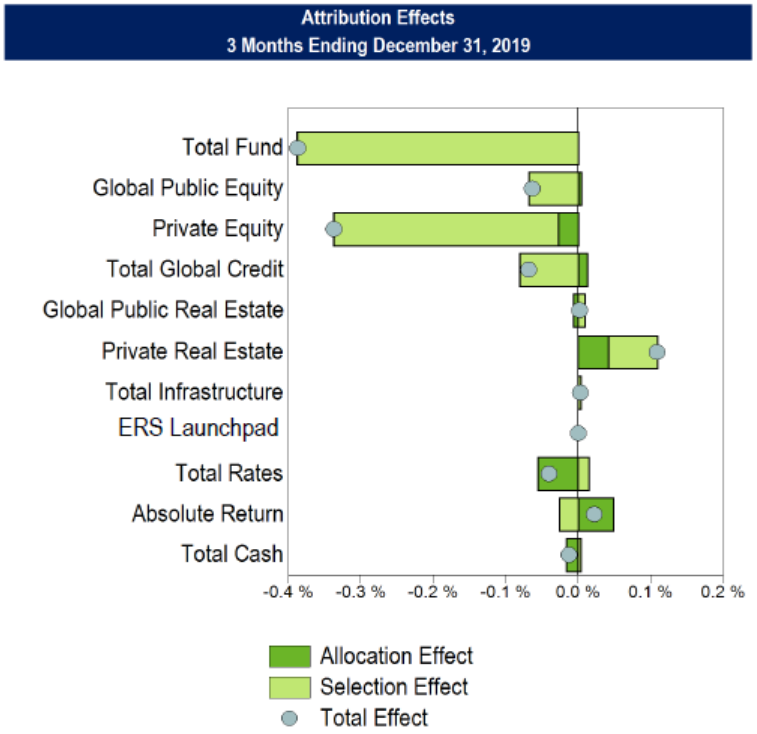
TOTAL FUND RISK/ RETURN





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

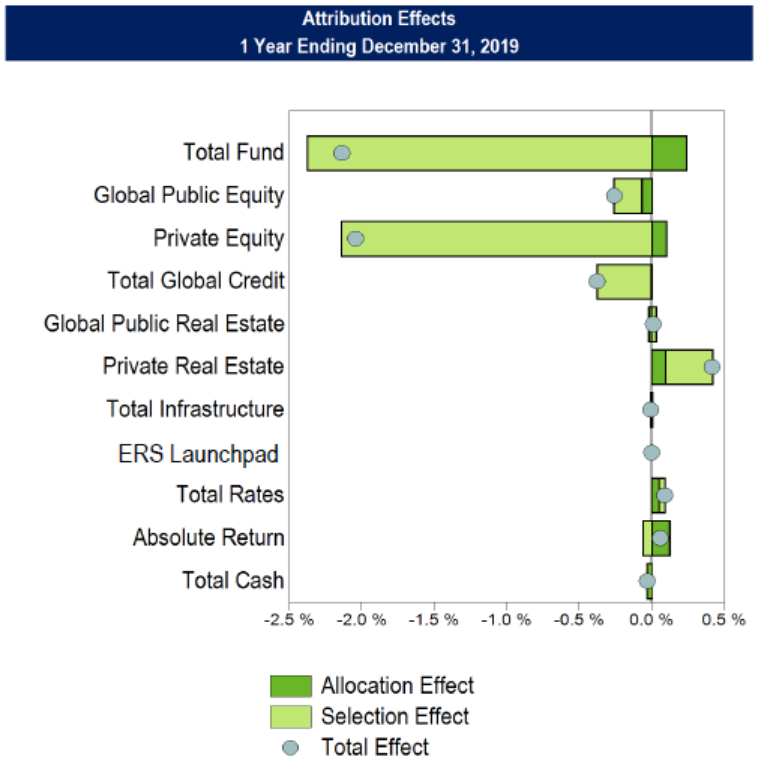


Attribution Summary
3 Months Ending December 31, 2019

	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 Summary
1 Year Ending December 31, 2019

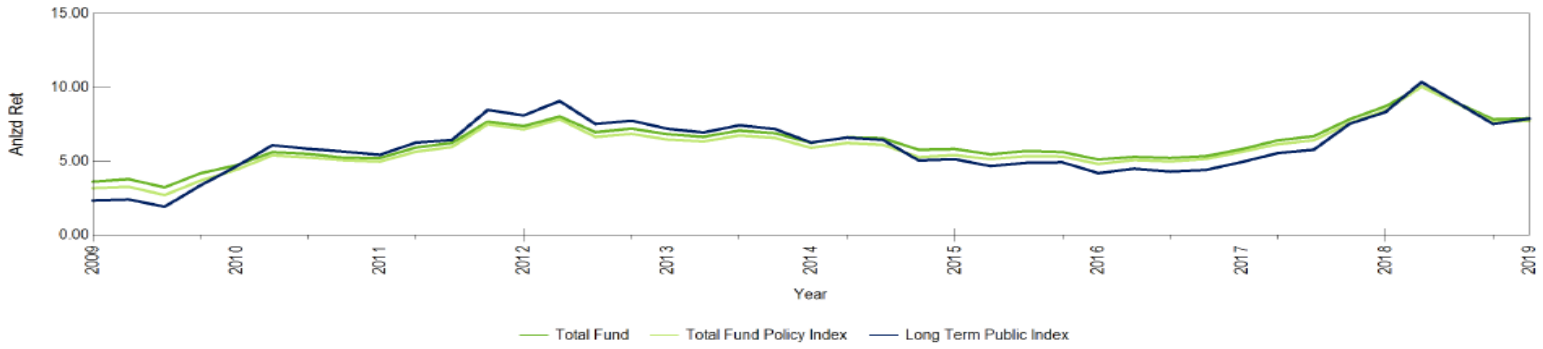
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Total Effects
Global Public Equity	26.2%	26.8%	-0.6%	-0.2%	-0.1%	-0.3%
Private Equity	3.4%	16.5%	-13.1%	-2.1%	0.1%	-2.0%
Total Global Credit	11.0%	14.3%	-3.3%	-0.4%	0.0%	-0.4%
Global Public Real Estate	23.8%	22.7%	1.1%	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.

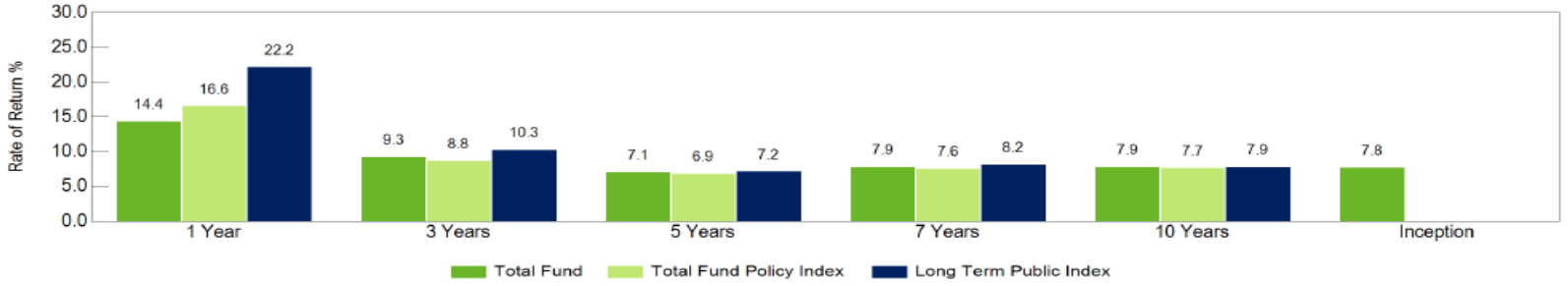
Employees Retirement System of Texas

LONG TERM INVESTMENT RESULTS

Rolling 10 Year Annualized Return (%)



Return Summary
Ending December 31, 2019



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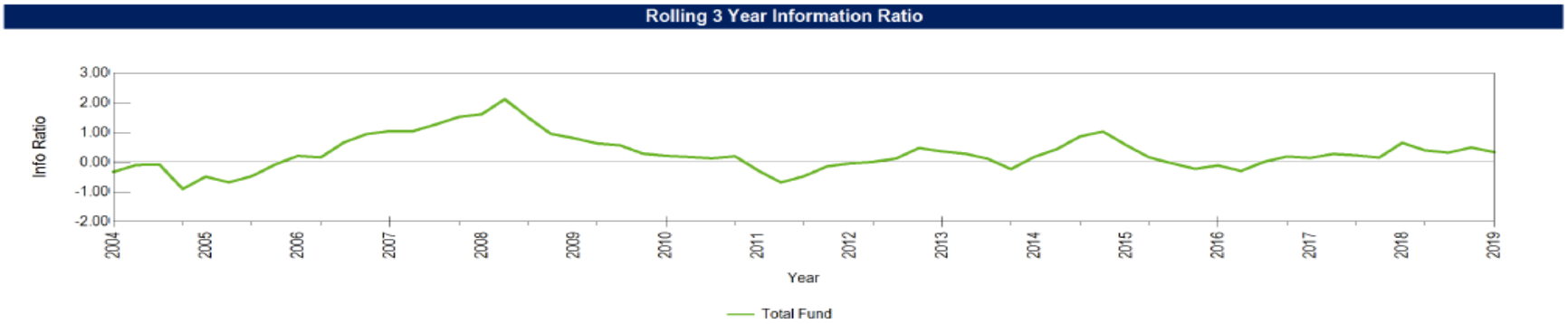
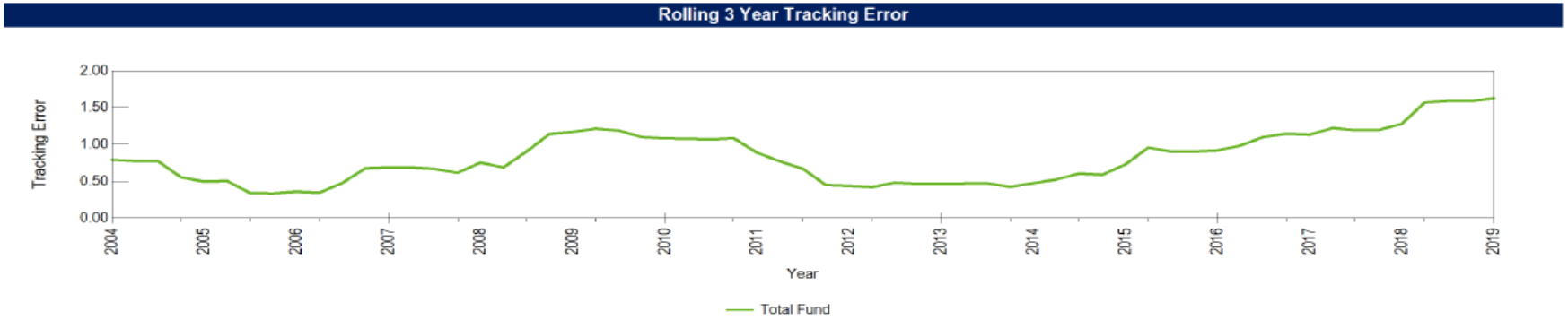
Employees Retirement System of Texas

ROLLING INFORMATION RATIO AND 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

ERS

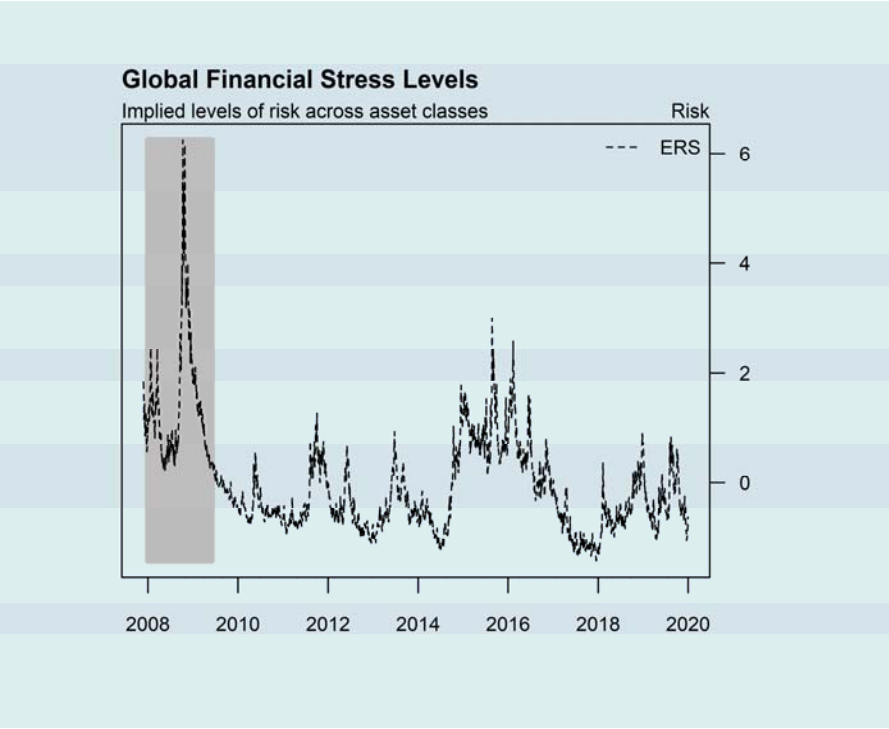
Tailwinds

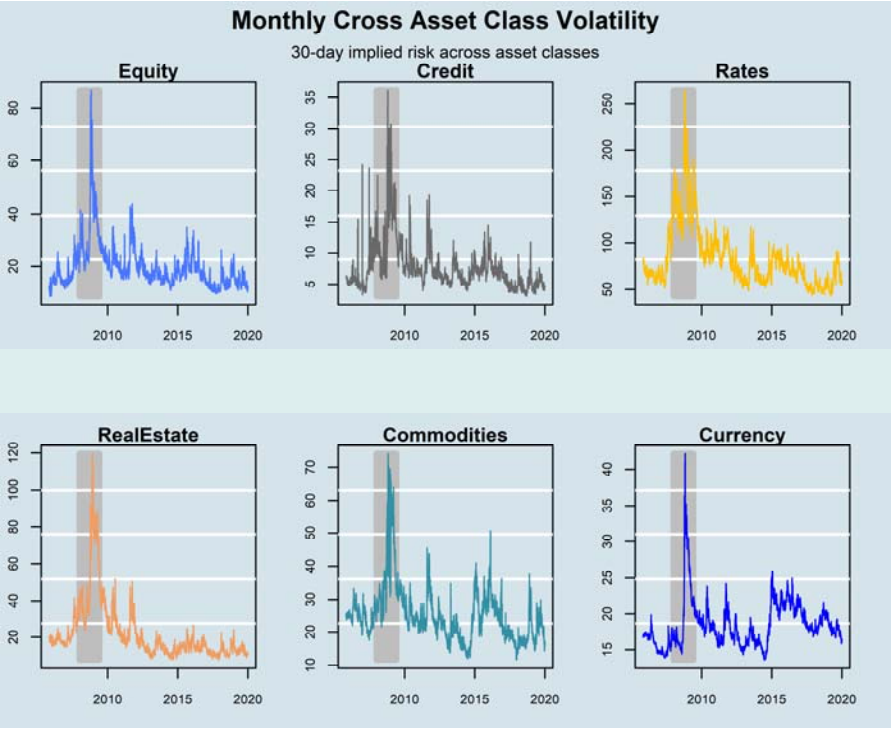
- Central Bank Intervention
- US-China Phase 1 trade agreement
- UK Brexit resolution
- Seasonality
- Global Trade Rebound
- Strong Earnings Season
- Cross Asset Class implied levels of risk muted

Headwinds

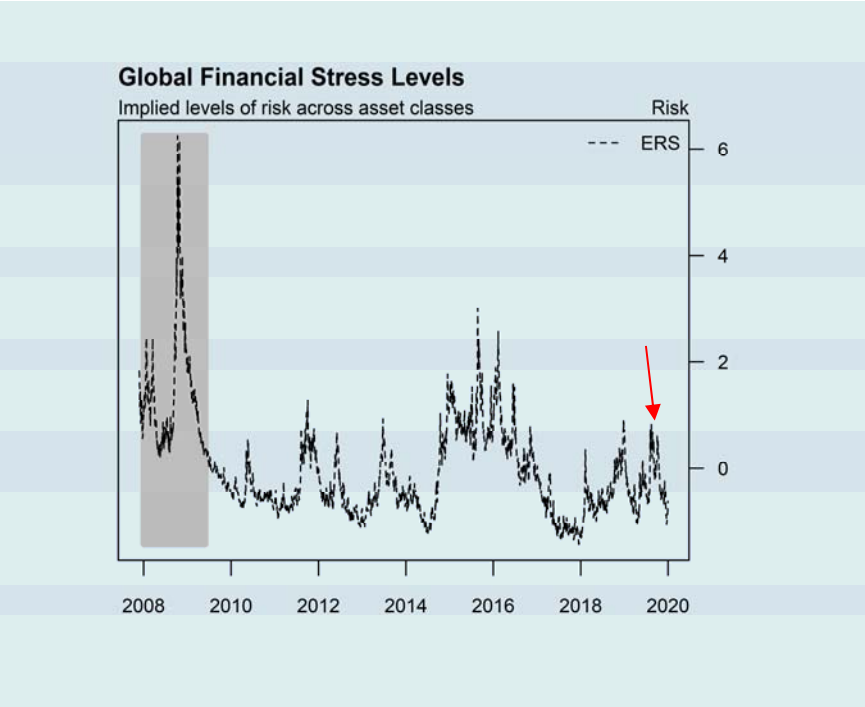
- Global Growth
- Market Valuation At Elevated Levels
- Overbought Market Conditions

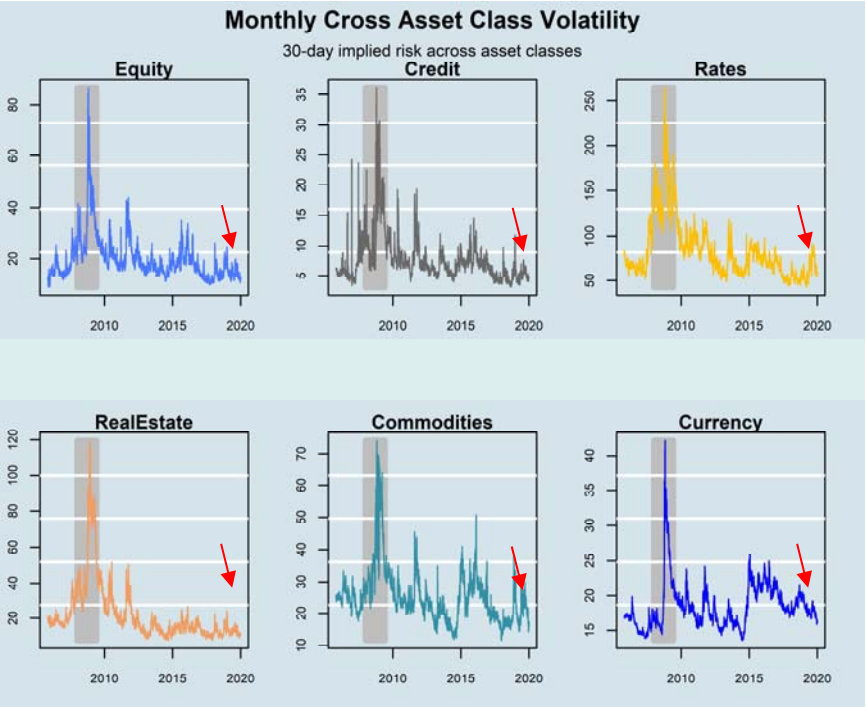
Cross Asset Class Risk





Cross Asset Class Risk

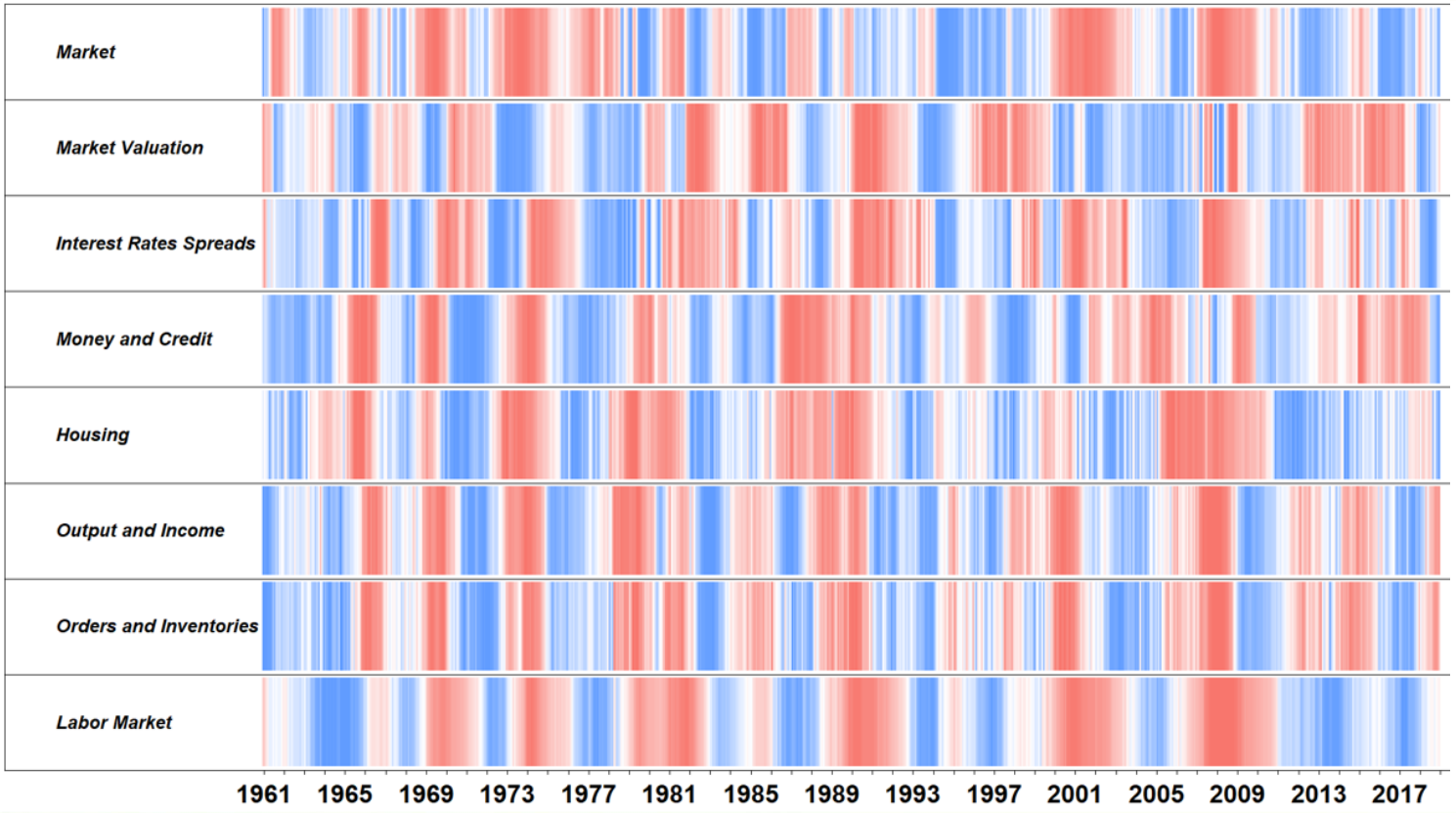




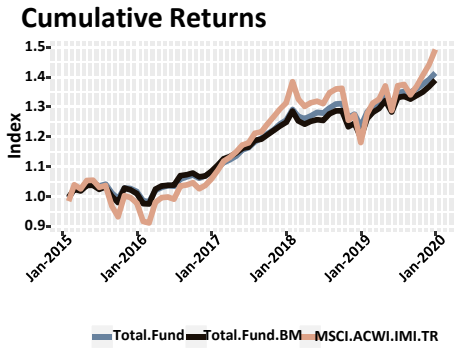
Market HeatMap

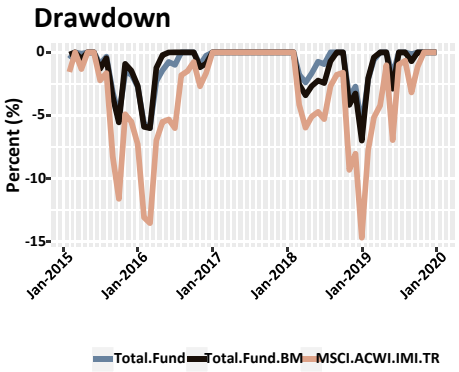
FRED Macro Economic Data Aggregated

ERS®



ERS Portfolio

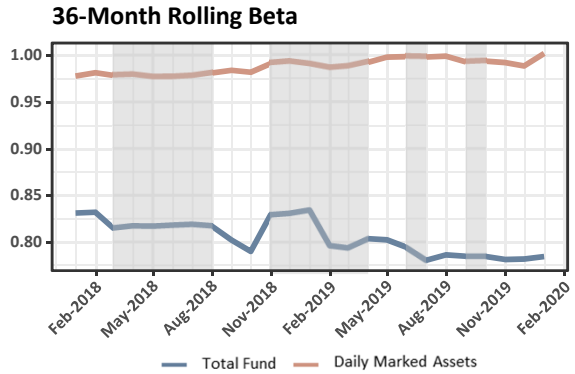


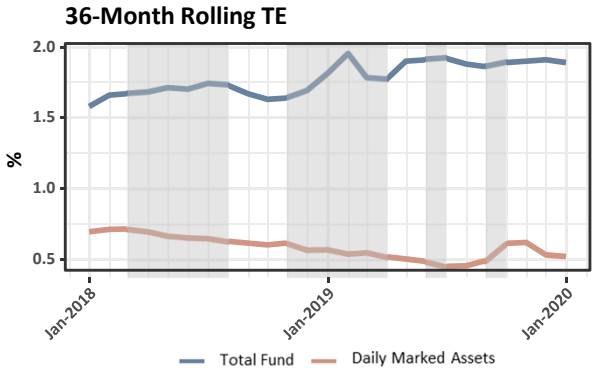


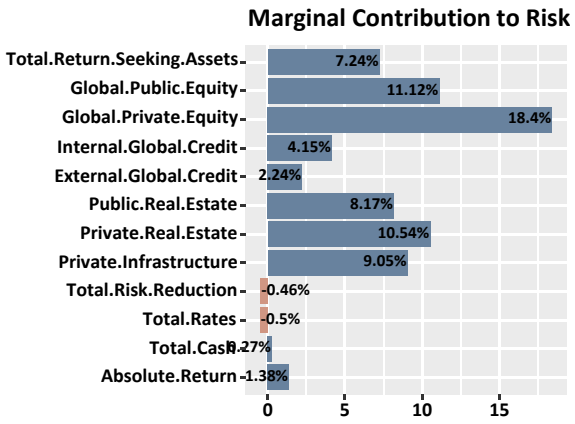
Asset Class	AUM	Weight	Excess Weight	Annualized SD	T12M Return	T12M Excess Return	Annualized Return	Annualized Excess Return	IR	SR	TE	Beta	R^2
Total Fund	$29,406,588,240	100.00	NA	5.54	14.50	-1.58	7.17	0.37	0.22	1.09	1.67	0.81	96.42
Total Return Seeking Assets	$22,773,246,044	77.44	0.43	7.25	17.19	-2.87	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

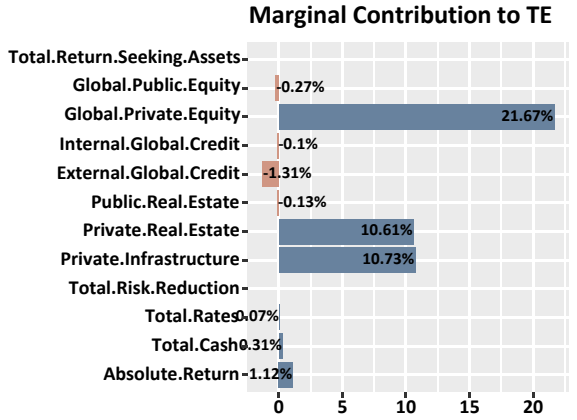
Asset Class	AUM	Weight	Excess Weight	Annualized SD	T12M Return	T12M Excess Return	Annualized Return	Annualized Excess Return	IR	SR	TE	Beta	R^2
Global Public Equity	$11,469,049,144	39.16	1.16	11.53	26.32	-0.43	8.25	-0.31	-0.26	0.62	1.20	0.97	99.03
Global Private Equity	$4,312,337,922	14.73	1.73	19.36	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







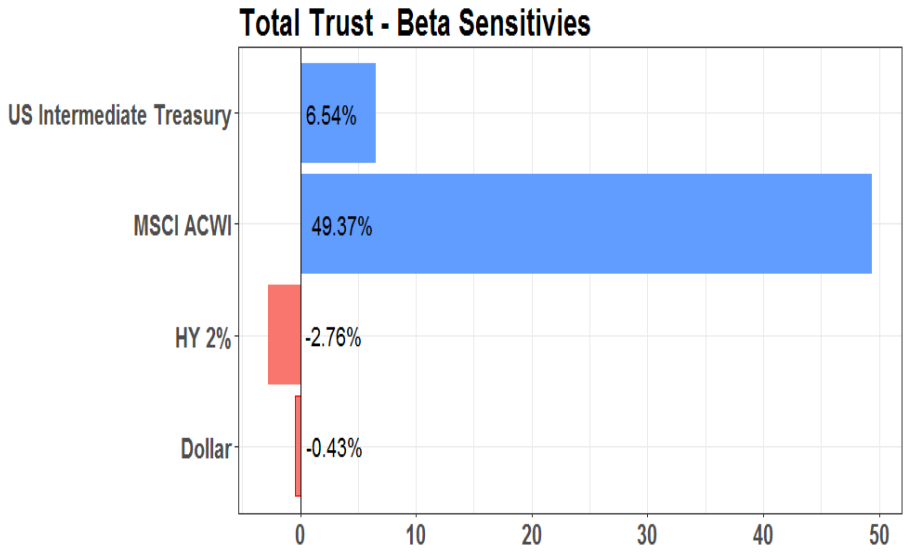


Stress Test

Return/Risk Driver
- MSCI ACWI

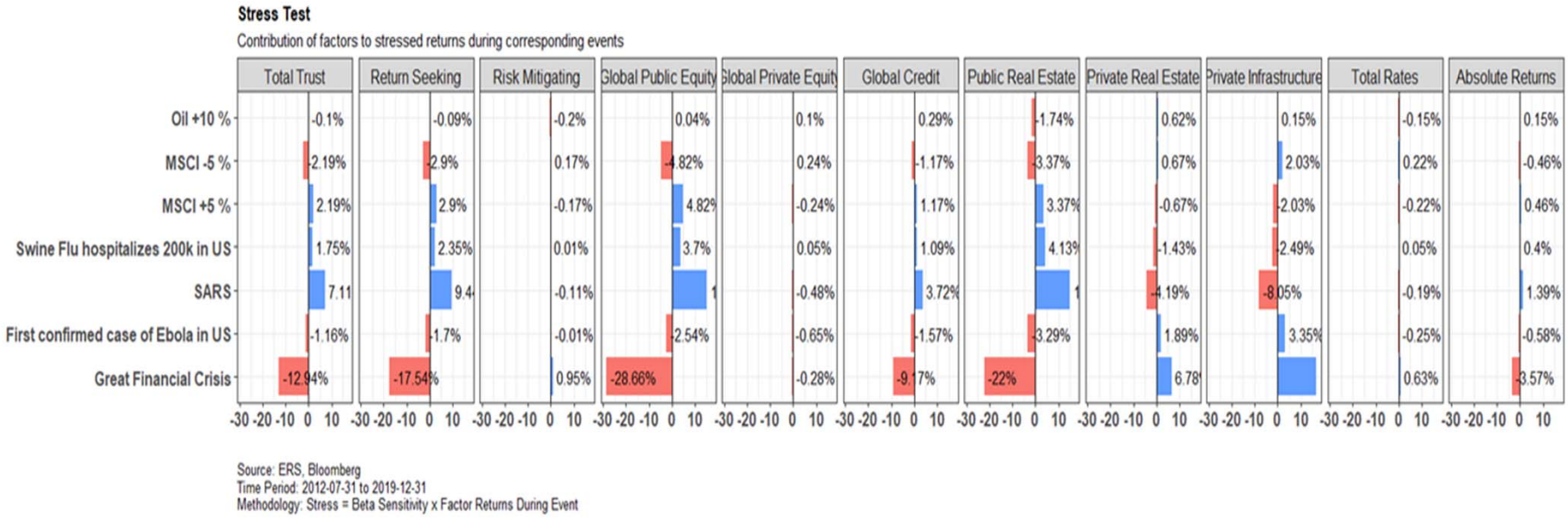
Assumptions
- Modeled both upside risk as well as downside risk. Assume a +/- 5% return change on the MSCI ACWI
- Liquid assets only at asset class level

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



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
Total Trust
Return Seeking
Risk Mitigating
Global Public Equity
Global Private Equity
Global Credit
Public Real Estate
Private Real Estate
Private Infrastructure
Total Rates
Absolute Returns
Oil +10 %
MSCI -5 %
MSCI +5 %
Swine Flu hospitalizes 200k in US
SARS
First confirmed case of Ebola in US
Great Financial Crisis
-30 -20 -10 0 10
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

ERS

- 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?