



Market & Portfolio Update

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Chief Investment Officer

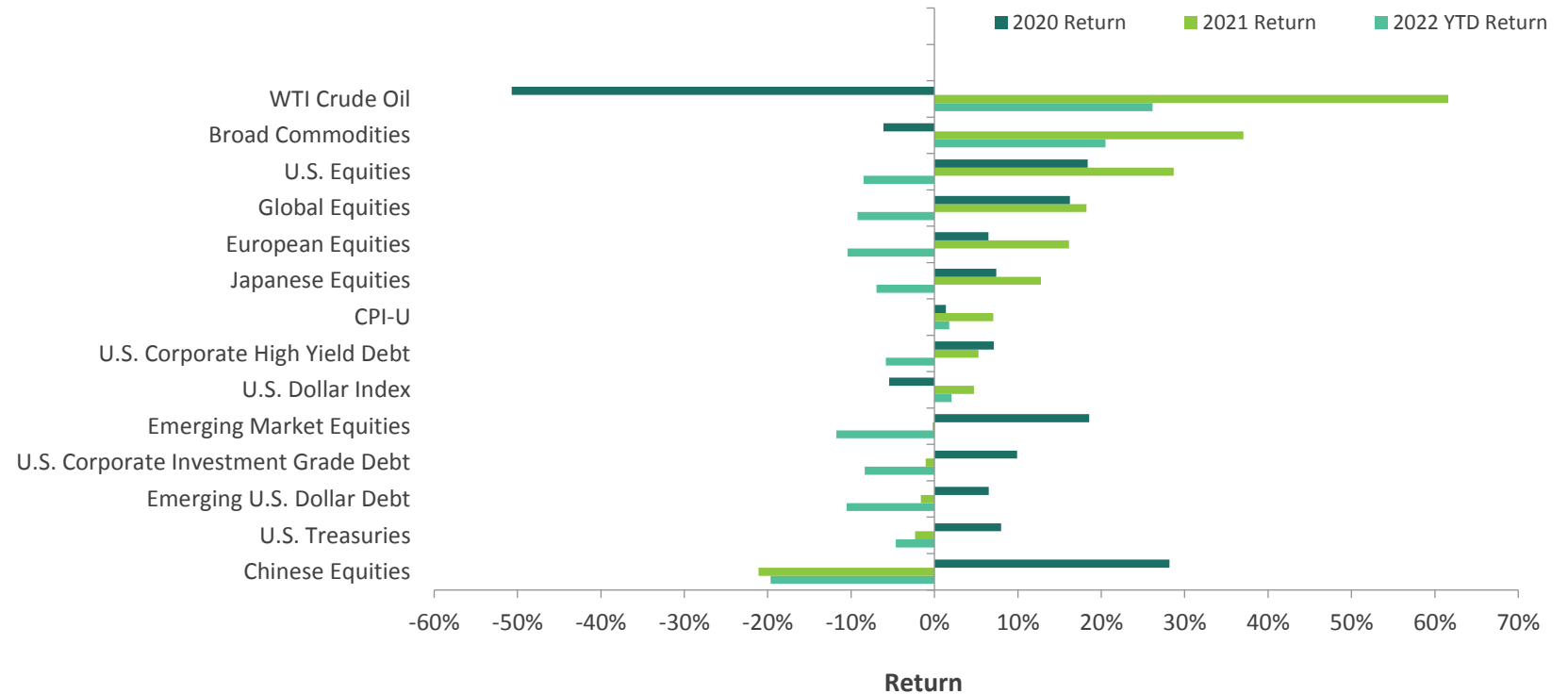
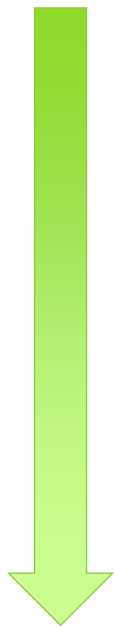
March 18, 2022



Market Performance: 2022 YTD* vs. 2021 and 2020 Calendar Years

“Risk assets” moved higher in 2021 with oil and commodities reversing course from 2020. YTD, only oil and commodities are positive.

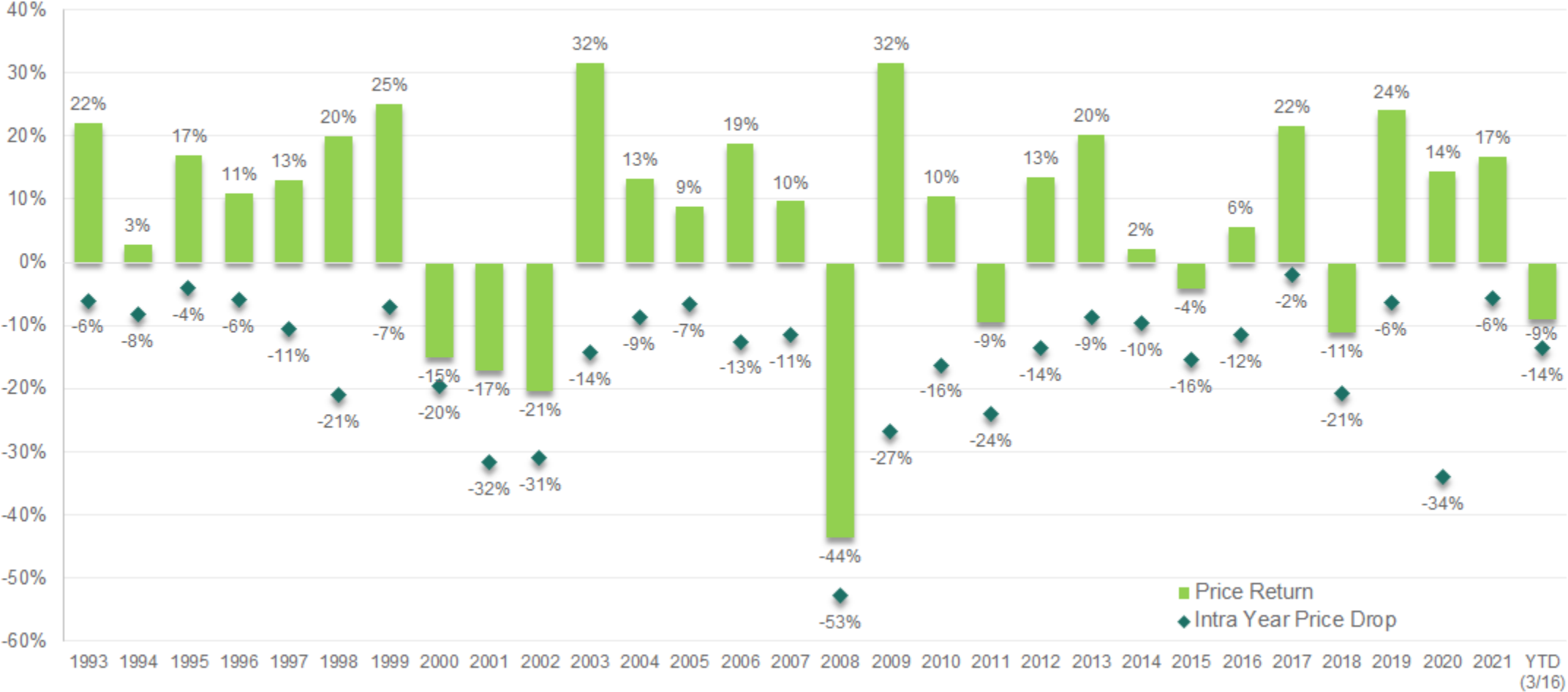
2021 Highest Performers



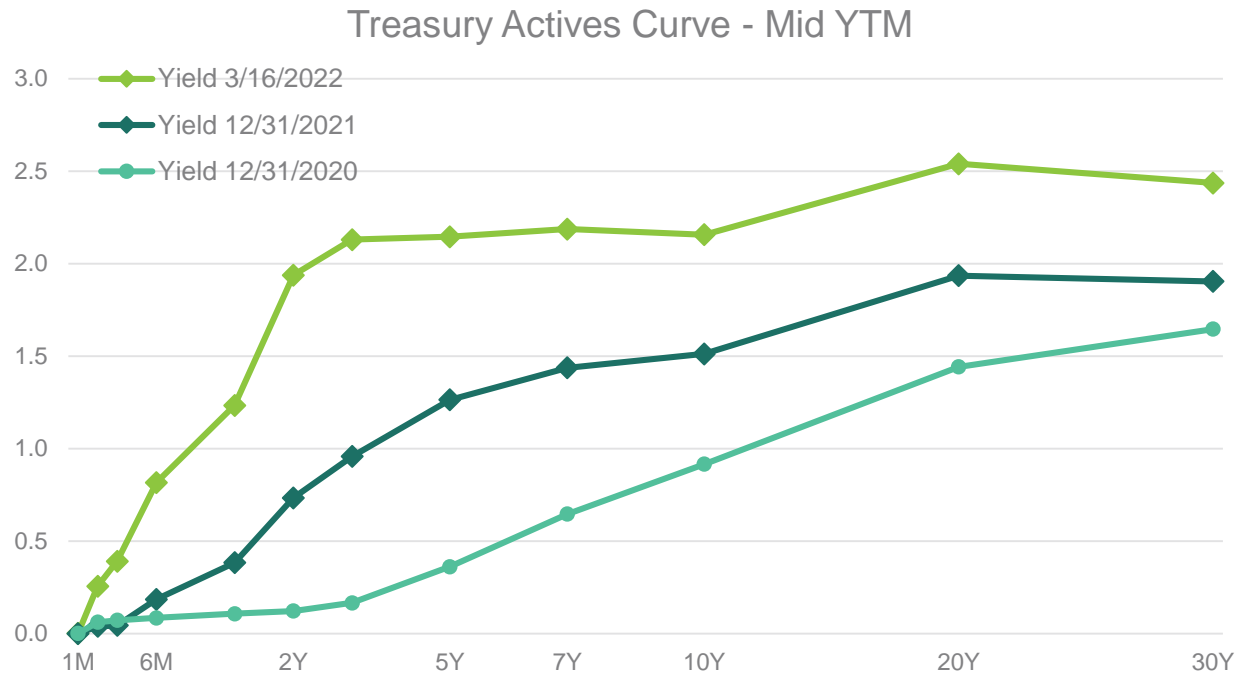
All returns are presented in unhedged USD terms
CPI-U YTD is as of previous month end (2/28/2022)
*YTD as of 3/16/2022

Global Equity Market Volatility

MSCI ACWI Intra-Year Declines vs. Calendar Year Returns
Despite average intra-year decline of 15.3%, annual returns were positive in 22 of 30 years



Treasury Yield Curve

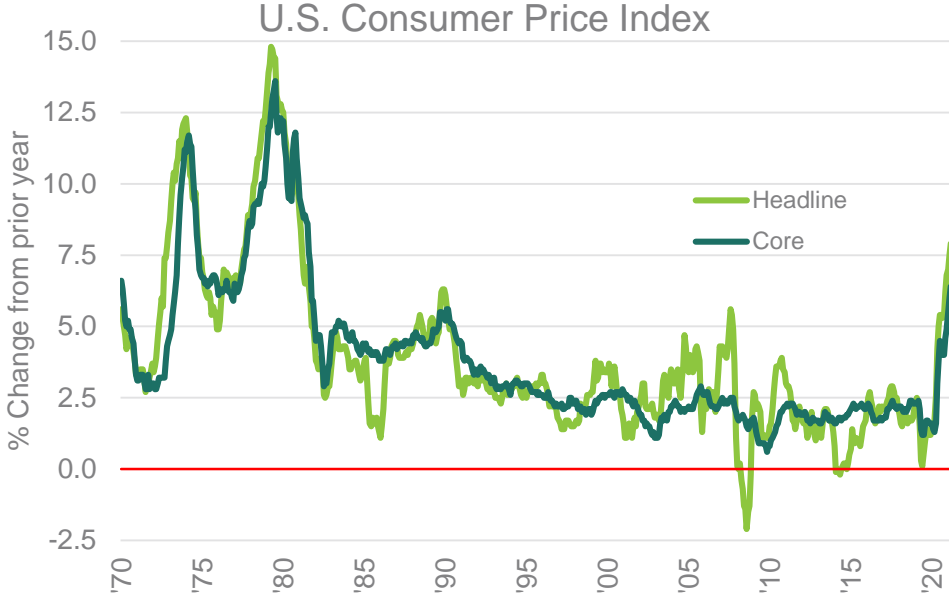
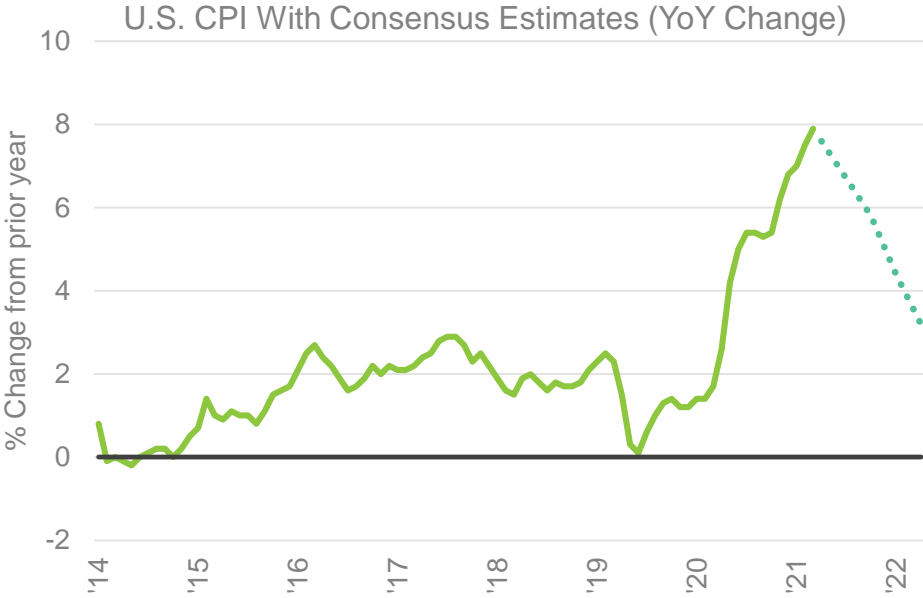


Tenor	Yield 3/16/22	Yield 12/31/21	Yield 12/31/20	Change Dec 20 - Mar 22
1M	0.17%	0.03%	0.04%	0.13%
2M	0.26	0.04	0.06	0.20
3M	0.39	0.04	0.07	0.32
6M	0.82	0.19	0.09	0.73
1Y	1.23	0.38	0.11	1.13
2Y	1.94	0.73	0.12	1.82
3Y	2.13	0.96	0.17	1.96
5Y	2.15	1.26	0.36	1.78
7Y	2.19	1.44	0.65	1.54
10Y	2.16	1.51	0.92	1.24
20Y	2.54	1.94	1.44	1.10
30Y	2.44	1.90	1.65	0.79

- Concerns about potential lasting inflation and the Russian invasion of Ukraine are adding confusion to the economic picture
- Federal Funds rate raised by 25 bps on 3/16/2022; first increase since 2018

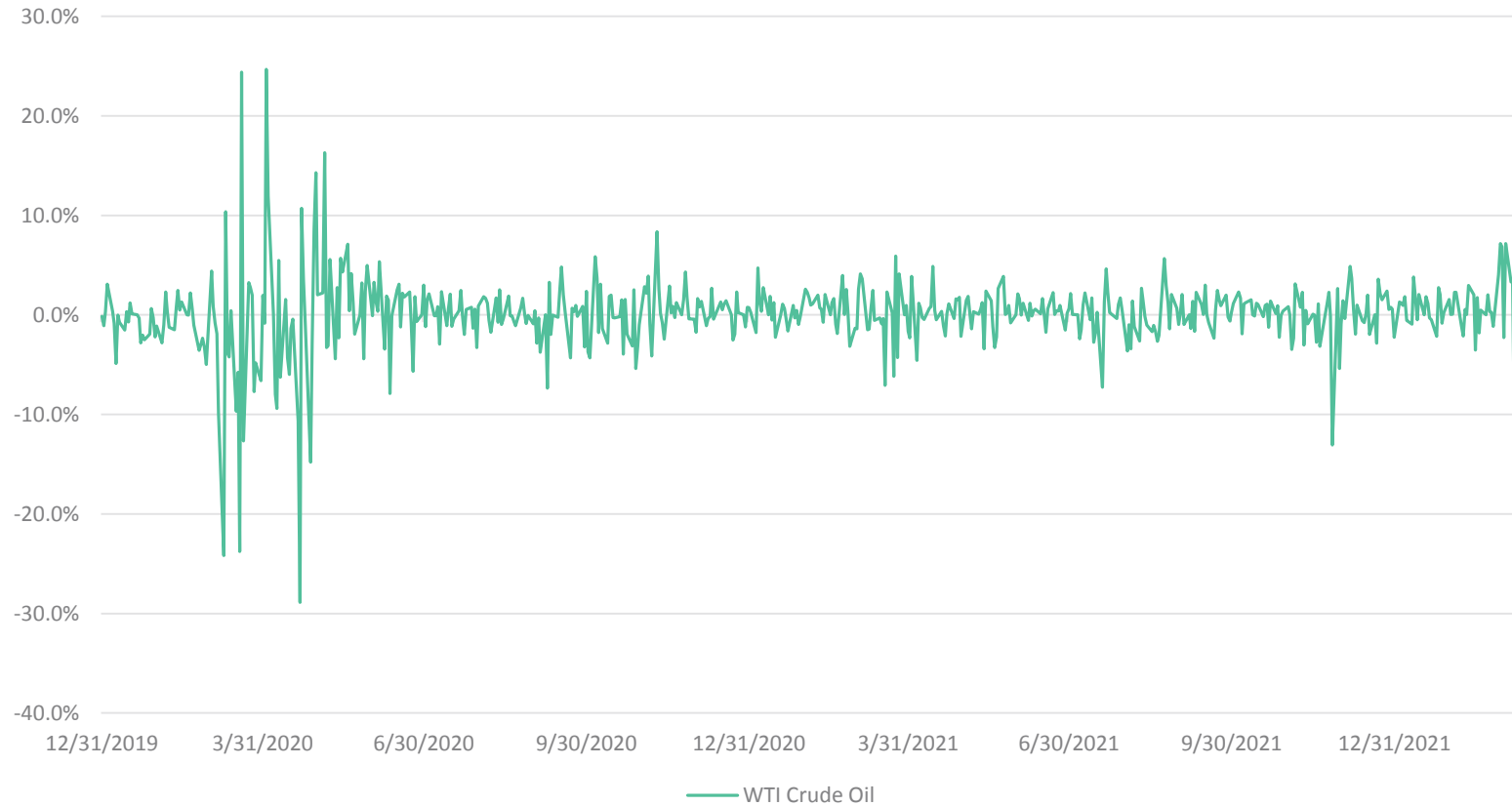
Inflation Estimates

Economist surveys point to a renormalization of inflation trends over the next 18 months



Source: Bureau of Labor Statistics

Oil Price Volatility

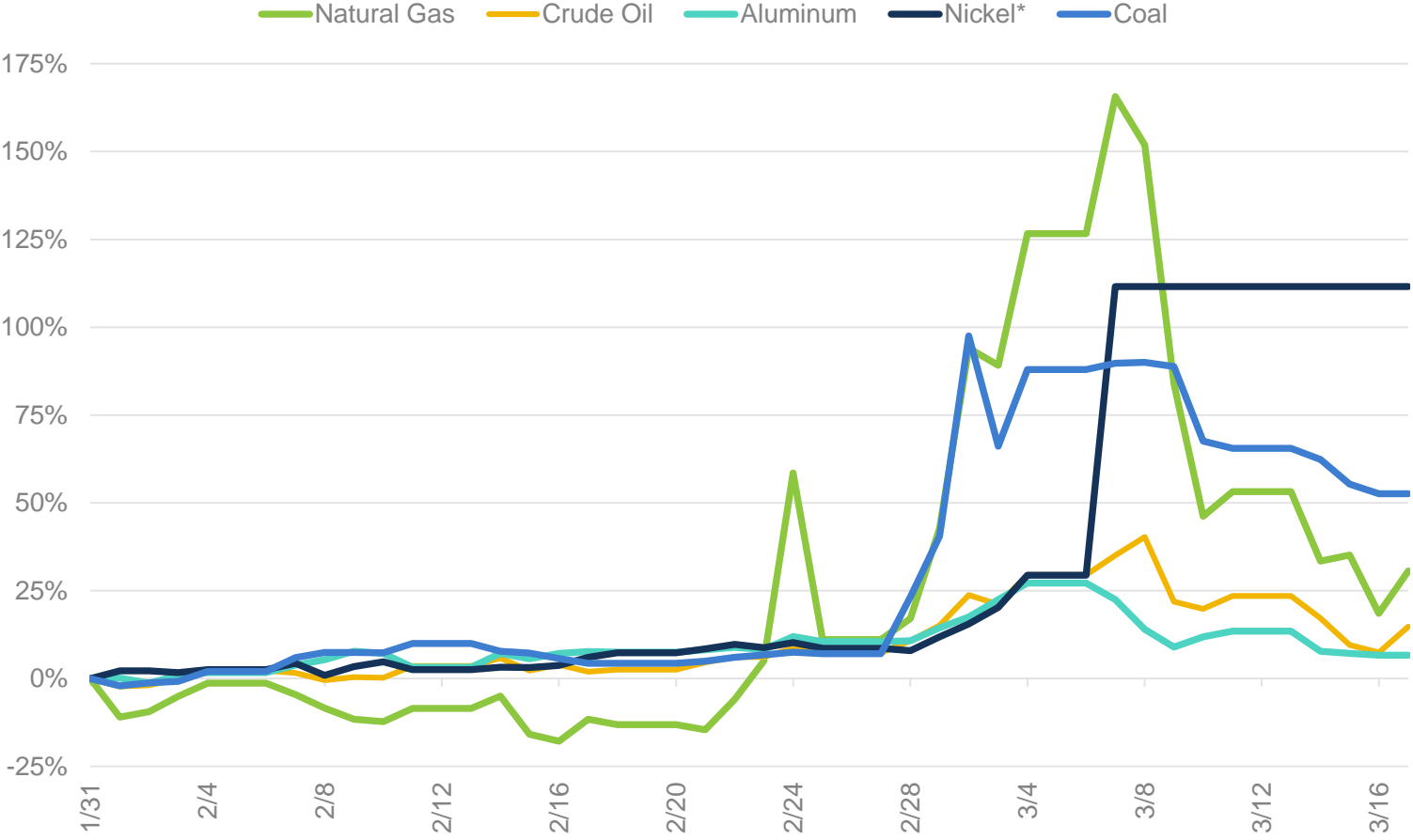


- War in Ukraine and the subsequent sanctions and restrictions on Russian oil have increased volatility in crude oil prices

YTD as of 3/16/2022

Commodity Prices

Commodity Price Increases Since January



Rebound from 2021 Low	
Natural Gas	6.7 X
Crude Oil	2.0 X
Aluminum	1.6 X
Nickel	3.0 X
Coal	4.2 X

as of 3/16/2021

* The London Metals Exchange (LME) halted trading of Nickel March 8th due to price volatility



Global Impact of Ukraine Invasion

Moscow Stock Exchange closed since February 28, 2022

- Foreigners prohibited from selling positions and receiving dividends and interest

NYSE, Nasdaq, and London Stock Exchange have suspended trading in Russian companies; Russia removed from multiple global equity indices

Significant impact to commodities markets; U.S. and Britain have banned Russian oil imports

~ 600 Western companies have temporarily or permanently halted operations in Russia



Sources: Jeffrey Sonnenfeld, Yale University; Bloomberg; The Economist

*At Mar 10th 2022.

Russian Share Of Commodity Production

2021 Estimates

Energy		Metals & Mining							Precious		Agriculture & Fertilizer			
Oil	Nat Gas	Palladium	Platinum	Nickel	Vanadium	Titanium	Alumium	Steel	Diamond	Gold	Potash	Phos.	Wheat	Barley
United States	United States	South Africa	South Africa	Indonesia	China	China	China	China	Russia 29%	China	Canada	China	China	Russia 13%
Saudi Arabia	Russia 17%	Russia 37%	Russia 11%	Philippines	Russia 17%	Japan	Russia 6%	India	Canada	Australia	Russia 20%	Morocco	India	Spain
Russia 11%	Iran	Canada	Zimbabwe	Russia 9%	South Africa	Russia 13%	India	Japan	Botswana	Russia 10%	Belarus	United States	Russia 11%	Germany
Canada	China	United States	Canada	France	Brazil	Kazakhstan	Canada	United States	Angola	United States	China	Russia 6%	United States	Canada
China	Canada	Zimbabwe	United States	Australia	United States	Ukraine	UAE	Russia 4%	South Africa	Canada	Germany	Jordan	Canada	France
Iraq	Qatar			Canada		Saudi Arabia	Australia	Korea	Congo	Ghana	Israel	Saudi Arabia	France	Australia
UAE	Australia			China		India	Bahrain	Germany	Namibia	Mexico	Jordan	Brazil	Pakistan	Turkey

Sources:
 U.S. Energy Information Administration (EIA)
 U.S. Geological Survey (USGS)

Executive Orders and Governor's Request

Current Federal Executive Orders impact one PERA holding (Sberbank)

- Divestment required by May 25, 2022
- Russian markets closed to foreigners (prohibited sales transactions) before PERA could fully divest of position
 - Awaiting further federal guidance
- New investments “in any sector of the Russian Federation economy” are prohibited

Governor Polis requested PERA divest from all Russian-state owned institutions

- ~\$8 million at time of request (\$7.2m was Sberbank)
- Represented less than 1/100th (0.01311) of a percent of the portfolio
- Minimal non state-owned Russian holdings (~\$5m)

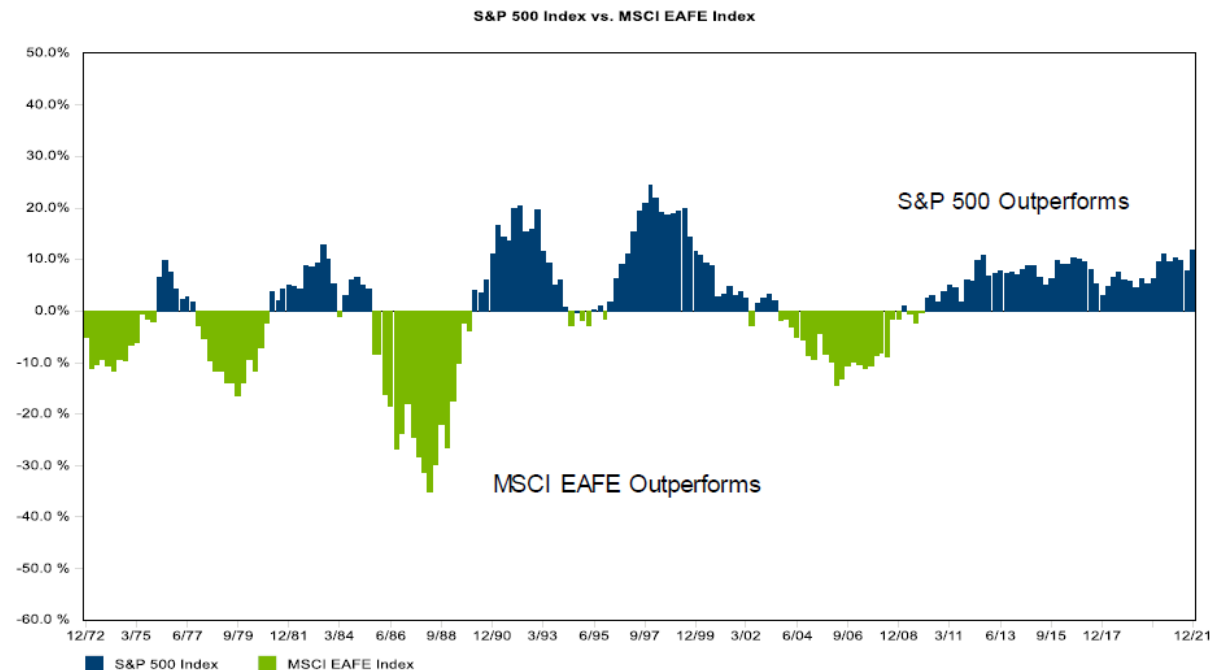
Extremely fluid situation – PERA staff continues to monitor on a daily basis

Why PERA Invests Globally

Global portfolio considerations:

- Most risk/return efficient
- Enhanced diversification should lower volatility
- Reduces portfolio concentration in one (U.S.) market
- May capture growth opportunities in emerging markets (increased risk/reward)
- Subject to additional costs and risks (e.g., currency and geopolitical)

Cyclical nature of domestic vs. international equity outperformance



Anti-BDS Update – Unilever PLC

2016 Anti-BDS legislation – Divestment From Companies With Prohibitions Against Israel

- Prohibits direct investment in publicly traded equities and certain debt securities issued by foreign companies which maintain economic prohibitions against Israel
 - Includes company subsidiaries
- Impacts only Defined Benefit Plan direct holdings

Unilever PLC is placed on Restricted Company List (RCL) today due to statements and actions made by subsidiary Ben & Jerry's

- 180 day engagement period with Unilever 3/18/2022 – 9/14/2022
 - PERA is not subject to divestment or a purchase moratorium
- If company ceases current actions, they will be removed from RCL
- If company continues current actions, PERA must divest
 - Divestment to be completed within one year of placement on RCL (3/18/2023)



2022+ Projects: Investments/Collaborative

Project

Status

Unitization – Fixed Income asset class and entire DB Plan

Project team is pursuing unitization of the Fixed Income asset class with anticipated completion in Summer 2022; will resume research related to feasibility of and process to unitize entire DB plan once Fixed Income is complete

Refreshed Technology Roadmap

Project team focusing in on private asset classes, though ongoing upgrades, custodian bank services, and software evaluations are in process throughout department. Team is focused on efficient use and optimization of current technology

Investment Activities

- Work continues on the Kyriba (cash management/forecasting software) implementation project
- Staff is refreshing investment-related content on the PERA website
- Creating Stewardship and proxy voting content for the Trustee Learning Library
- Beginning stages of evaluation of real estate data provider
- Implementing a software module for improved management of investment transaction data flow

The More Things Change...

The more they stay the same

How it started



How it continued



How it's going





APPENDIX

Asset Allocation Policy

Policy

Asset class weights will be within permissible ranges

Status

All asset class weights within permissible ranges

Asset Class	2021 Policy Benchmark Weight	Actual Weight* (Dec 31, 2021)	Range	Risk Weight (Sept 30, 2021)
Global Equity	55.5%	59.2%	49.5% - 61.5%	70.4%
Fixed Income	23.5%	18.6%	18.5% - 28.5%	0.2%
Private Equity	8.5%	8.9%	4% - 13%	16.9%
Real Estate	8.5%	8.0%	4% - 13%	9.5%
Alternatives	4.0%	4.7%	0% - 12%	2.2%
Cash/Short Term**	0.0%	0.6%	0% - 3%	0.8%
Total	100%	100%		100%

* Transitional cash remains within respective asset classes; 12/31/2021 weights are preliminary and not based on final year-end data

** Includes Cash Overlay

Active Risk Policy

Policy

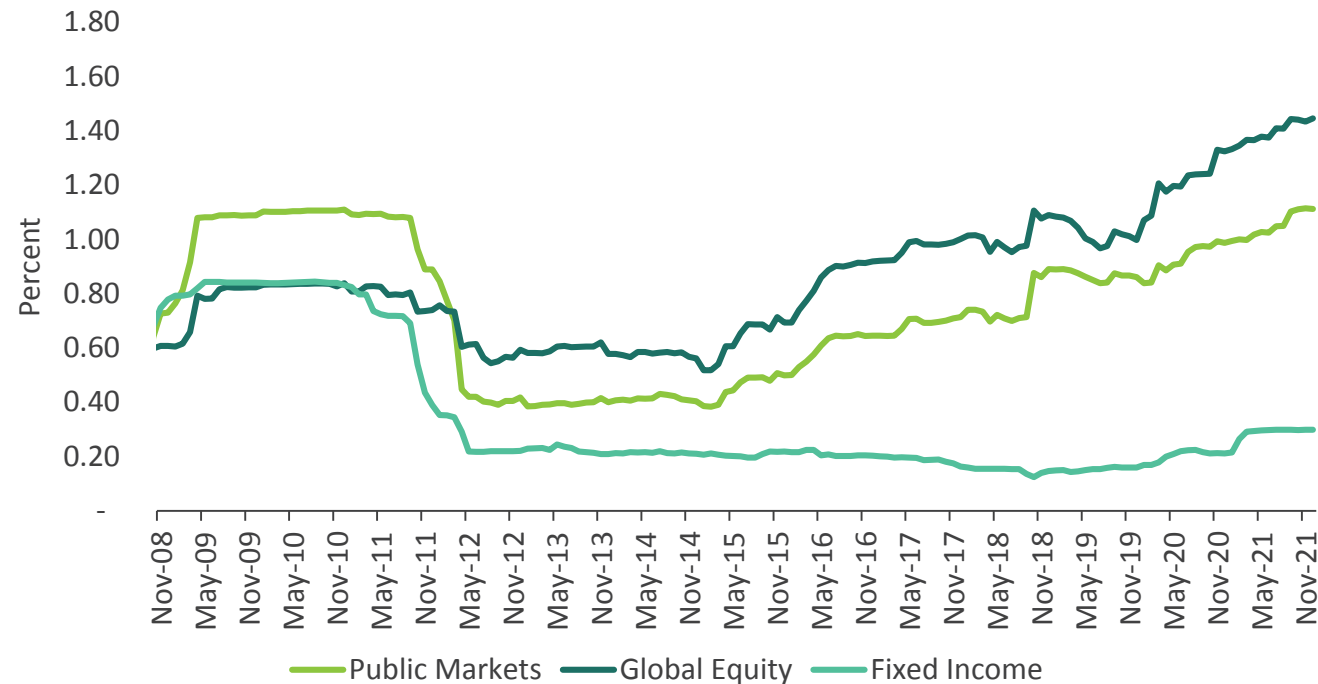
Active risk within marketable securities asset classes (i.e., Global Equity and Fixed Income) and total marketable securities portfolios will not exceed maximums

Status

Active risk levels are within policy limits

Active Risk		
	Five-Year Tracking Error in Basis Points 31-Dec-21	Active Risk Policy Maximum in Basis Points
Global Equity	145	225
Fixed Income	30	100
Total Marketable Securities	111	150

Historical Active Risk - Public Markets



*Active risk measurement was changed from trailing three years to trailing five years as of January 2020



Portfolio Monitor

ASSET CLASS

STRATEGY

Global Equity

Portfolio retains higher quality bias. No material sector or geographic overweights or underweights relative to the benchmark.

Fixed Income

The portfolio is biased to be overweight spread product, take on limited duration risk, and generate the majority of outperformance from security selection and asset allocation. Short term dislocations may cause volatility in performance; however, long term the portfolio is expected to outperform the benchmark

Private Equity

Vintage construction underway with a focus on high quality re-up opportunities, select new managers and unique co-investment possibilities. Reviewing portfolio management options with existing PE sponsors.

Real Estate

The current investment environment continues to improve, but is in the early stages of recovery and investors remain cautious. Transaction activity remains subdued compared to peak levels and only the most desirable property types are trading, while capitalization rates remain largely unchanged. The most negatively impacted sectors are service retail, lodging, and open plan office spaces. Focus remains on selective investment in industrial and multifamily properties in major tech, medical and education driven markets.

Alternatives

Real assets including infrastructure, agriculture and timber offer solid income in a low return environment and may benefit from rising inflation. Also, special situations in Europe and select Emerging Markets are becoming interesting due to rising volatility and macro uncertainty. Existing¹⁹ distressed managers have substantial dry powder available to pursue value transactions in a risk off environment.