MEKETA
INVESTMENT GROUP

City of Quincy Retirement System

January 31, 2022

Interim Update

Agenda

Executive Summary

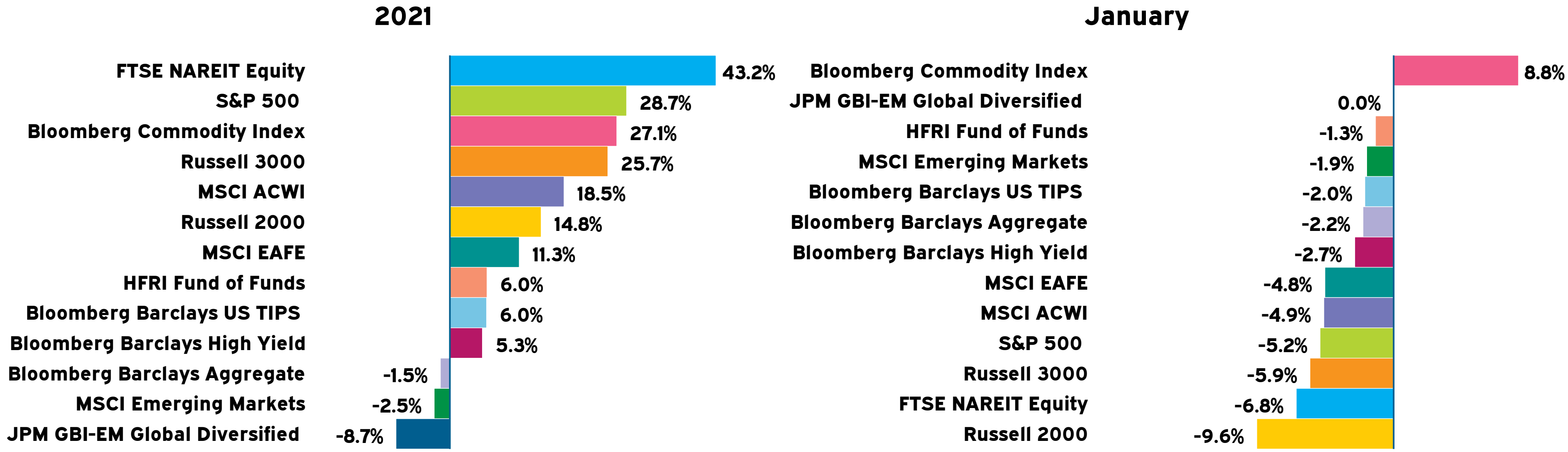
Economic and Market Update

Data as of January 31, 2022

January Commentary

- Expectations for policy tightening to happen faster than previously expected given persistent inflation led to significant volatility to start the year.
  - With a few exceptions most asset classes were down in January.
  - Volatility in equities, as represented by the VIX, spiked.
  - Equity markets led declines with the US down the most.
  - Rates increased across the US yield curve, with flattening continuing.
  - Value once again outpaced growth in the US given higher rates.
  - The dollar strengthened against a broad basket of peers with a few commodity-sensitive currencies outperforming.
  - Inflation expectations fell but remain elevated.
- Looking ahead, the pace of policy tightening, the track of inflation, geopolitical issues, and the path of the virus will all be key.

Index Returns[1]



- Outside of emerging markets and the broad US investment grade bond market (Barclays Aggregate), most asset classes increased in 2021.
- In comparison, 2022 is off to a weak start with all major asset classes declining given expectations for policy tightening.

[1] Data Source: Bloomberg and FactSet. Data is as of January 31, 2022.

Domestic Equity Returns[1]

Domestic Equity	January (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
S&P 500	-5.2	23.3	20.7	16.8	15.4
Russell 3000	-5.9	18.8	19.9	16.1	15.0
Russell 1000	-5.6	20.3	20.5	16.6	15.3
Russell 1000 Growth	-8.6	17.5	26.4	22.3	18.0
Russell 1000 Value	-2.3	23.4	13.8	10.5	12.3
Russell MidCap	-7.4	13.9	16.1	12.8	13.4
Russell MidCap Growth	-12.9	-1.5	17.4	15.8	14.2
Russell MidCap Value	-4.3	23.1	14.1	9.9	12.4
Russell 2000	-9.6	-1.2	12.0	9.7	11.3
Russell 2000 Growth	-13.4	-15.0	11.4	10.9	11.7
Russell 2000 Value	-5.8	14.8	11.7	7.9	10.6

US Equities: Russell 3000 Index -5.9%, and value indices outperformed growth in January.

- All US stock indices posted negative returns in January 2022 as the prospect of a faster tightening of monetary policy was priced in.
- As the economic impact of the virus continued to recede and rates rose, value stocks continued to outpace growth stocks partly driven by strong double-digit results in the energy sector given rising prices and weak results in technology (large cap space) and health care (small cap space).
- Large company stocks (Russell 1000) declined less than small company stocks (Russell 2000).

[1] Source: Bloomberg. Data is as of January 31, 2022.

Foreign Equity Returns[1]

Foreign Equity	January (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)
MSCI ACWI	-4.9	13.2	15.4	12.6	10.7
MSCI ACWI Ex US	-3.7	3.6	9.1	8.0	6.2
MSCI EAFE	-4.8	7.0	9.3	7.9	6.9
MSCI EAFE (Local Currency)	-3.6	14.8	10.0	7.5	9.3
MSCI EAFE Small Cap	-7.3	2.4	9.9	8.6	9.1
MSCI Emerging Markets	-1.9	-7.2	7.2	8.3	4.2
MSCI Emerging Markets (Local Currency)	-1.8	-5.6	8.8	9.3	7.1

International Developed Market Equities: MSCI EAFE -4.8% and MSCI ACWI ex US -3.7%.

- Non-US stocks also posted negative returns in January given the outlook for global interest rates but declined less than US equities.
- Developed markets trailed emerging markets with tensions between Russia and the Ukraine and higher inflation weighing on Europe. The dynamic of value outpacing growth also persisted in Europe and Japan.
- A strong US dollar weighed on developed foreign markets for US investors.

Emerging Markets: MSCI EM -1.9% in January.

- Emerging markets declined the least during the month of January partly due to some oil exporters benefiting from higher energy prices.
- Currency dynamics had less of an impact on results compared to developed markets.

[1] Source: Bloomberg. Data is as of January 31, 2022.

Fixed Income Returns[1]

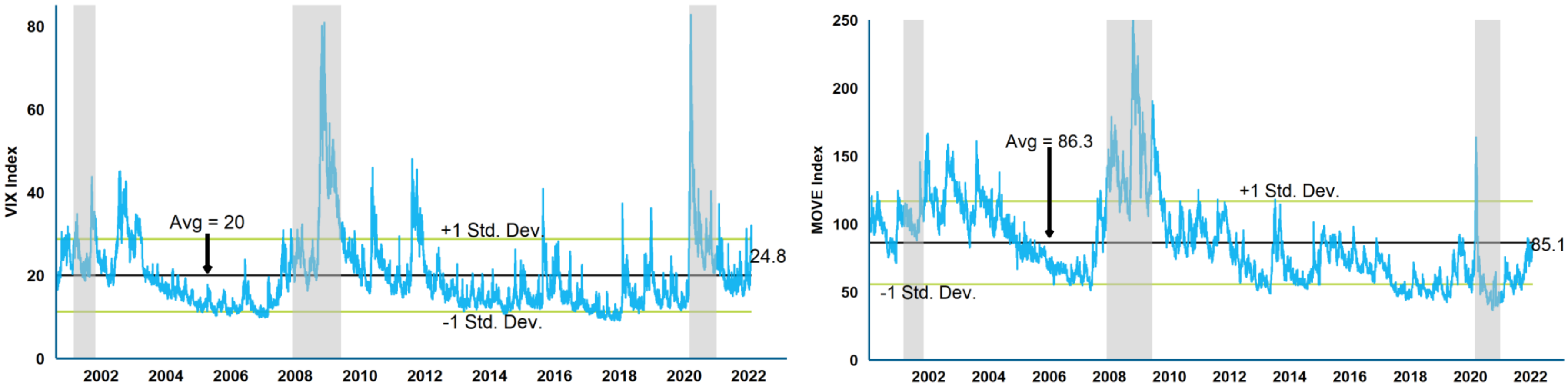
Fixed Income	January (%)	1 YR (%)	3 YR (%)	5 YR (%)	10 YR (%)	Current Yield (%)	Duration (Years)
Bloomberg Universal	-2.2	-2.7	3.9	3.3	3.0	2.5	6.5
Bloomberg Aggregate	-2.2	-3.0	3.7	3.1	2.6	2.1	6.7
Bloomberg US TIPS	-2.0	3.5	7.2	4.7	2.7	1.7	7.6
Bloomberg High Yield	-2.7	2.1	6.3	5.4	6.2	5.3	4.5
JPM GBI-EM Global Diversified	0.0	-7.8	0.3	2.4	0.0	5.7	5.2

Fixed Income: Barclays Universal -2.2% in January.

- Given expectations for a faster than previously expected pace of rate increases and balance sheet reduction by the Federal Reserve to combat persistent inflation, the broad US bond market (Barclays Aggregate) declined in January. The nominal 10-year Treasury yield rose to nearly 2%.
- Yields for TIPS rose given expectations for tighter policy from the Federal Reserve.
- Credit spreads widened but continued to trade at historically tight levels given relatively strong corporate health and high investor demand in the low-rate environment.
- Outside of the US, global sovereign debt yields across developed and emerging economies also generally rose on inflation concerns and expectations for higher policy rates.

[1] Source: Bloomberg. JPM GBI-EM is from InvestorForce, data is as of January 31, 2022.

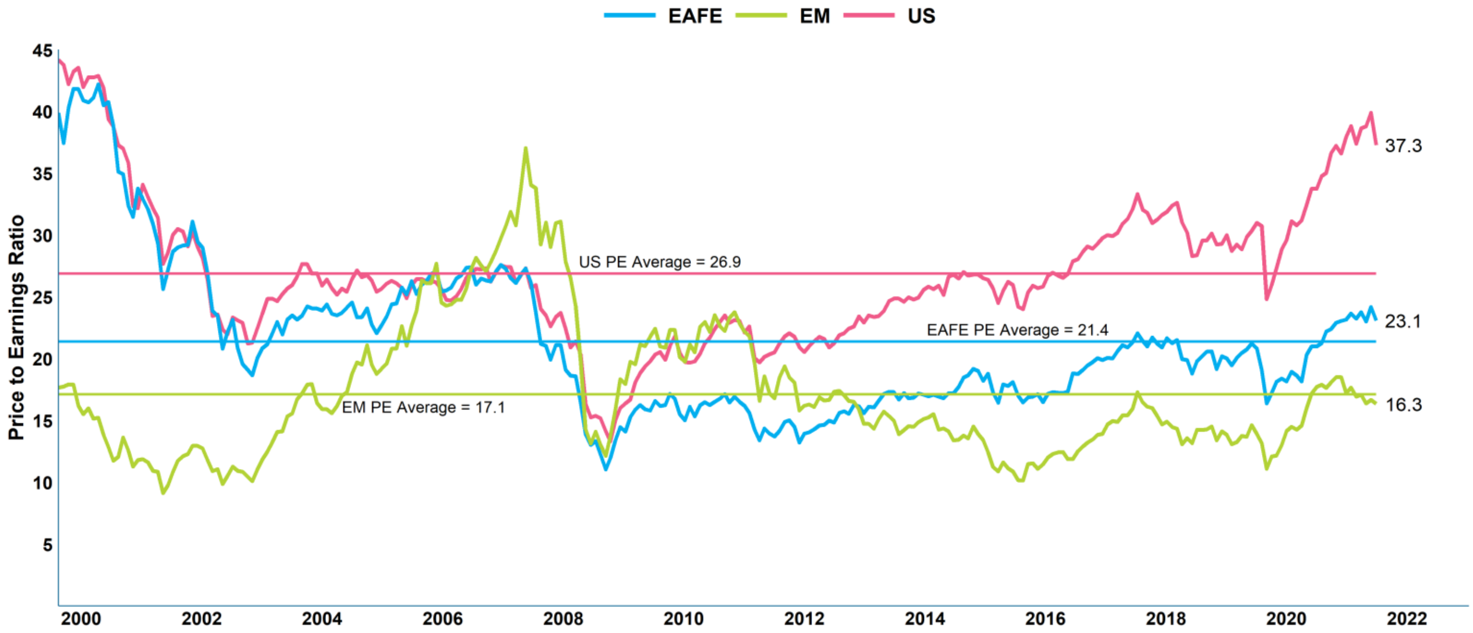
Equity and Fixed Income Volatility[1]



- Volatility in equity (VIX) and fixed income (MOVE) increased at the start of the year, driven largely by expectations that the Federal Reserve would tighten monetary policy faster than previously expected.

[1] Equity and Fixed Income Volatility – Source: Bloomberg. Implied volatility as measured using VIX Index for equity markets and the MOVE Index to measure interest rate volatility for fixed income markets. Data is as of January 31, 2022. The average line indicated is the average of the VIX and MOVE values between January 2000 and the present month-end respectively.

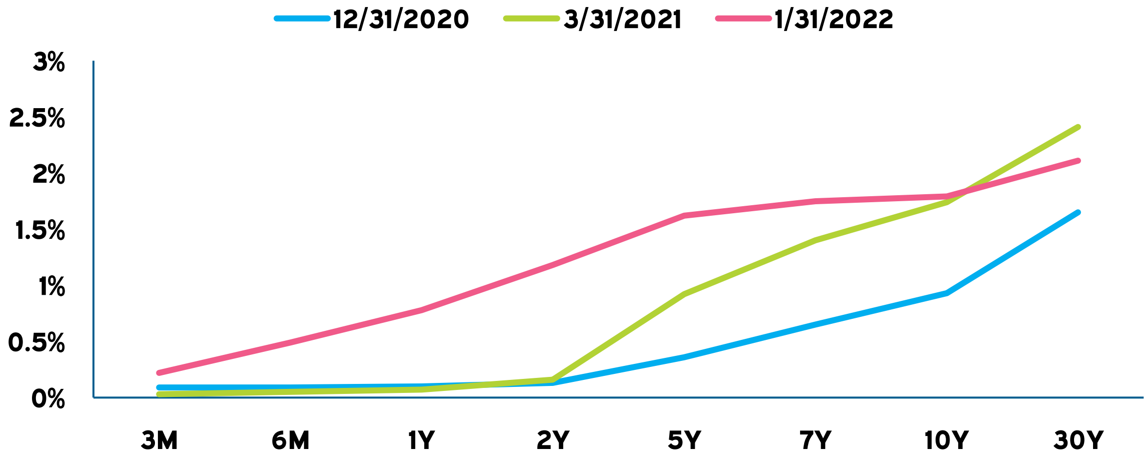
Equity Cyclically Adjusted P/E Ratios[1]



- Valuations in the US equity market declined in January with the market pullback, but they remain well above long-term averages (near +2 standard deviations).
- International devloped market valuations remain below the US with emerging markets under the long-term average.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group. Developed and Emerging Market Equity (MSCI EAFE and EM Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data is as of January 31, 2022. The average line is the long-term average of the US, EM, and EAFE PE values from December 1999 to month-end respectively.

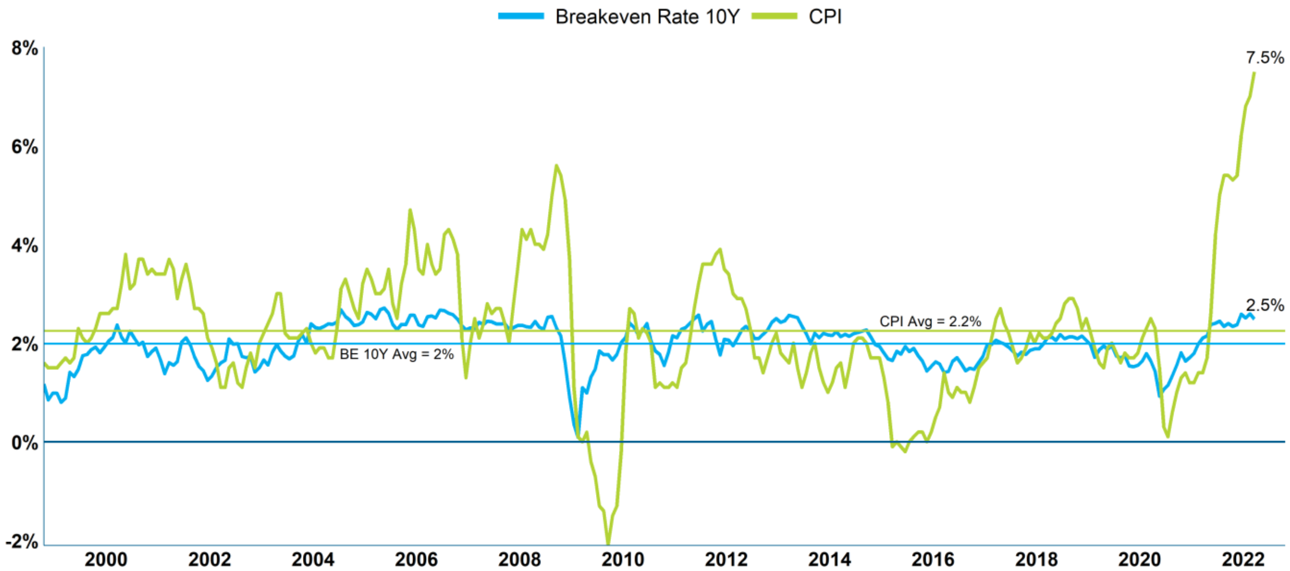
US Yield Curve[1]



- To start the year, interest rates rose across the yield curve with the trend of the curve flattening continuing. The spread between a two-year and ten-year Treasury declined by about 0.18% for the month, ending at 0.60%.
- The main driver of these dynamics was the expectation that the Federal Reserve would accelerate the pace of their policy withdrawal given persistently high inflation and improvements in the labor market.
- After month-end, the release of above expectation January CPI (see next page) furthered the trend of rising rates and curve flattening.

[1] Source: Bloomberg. Data is as of January 31, 2022.

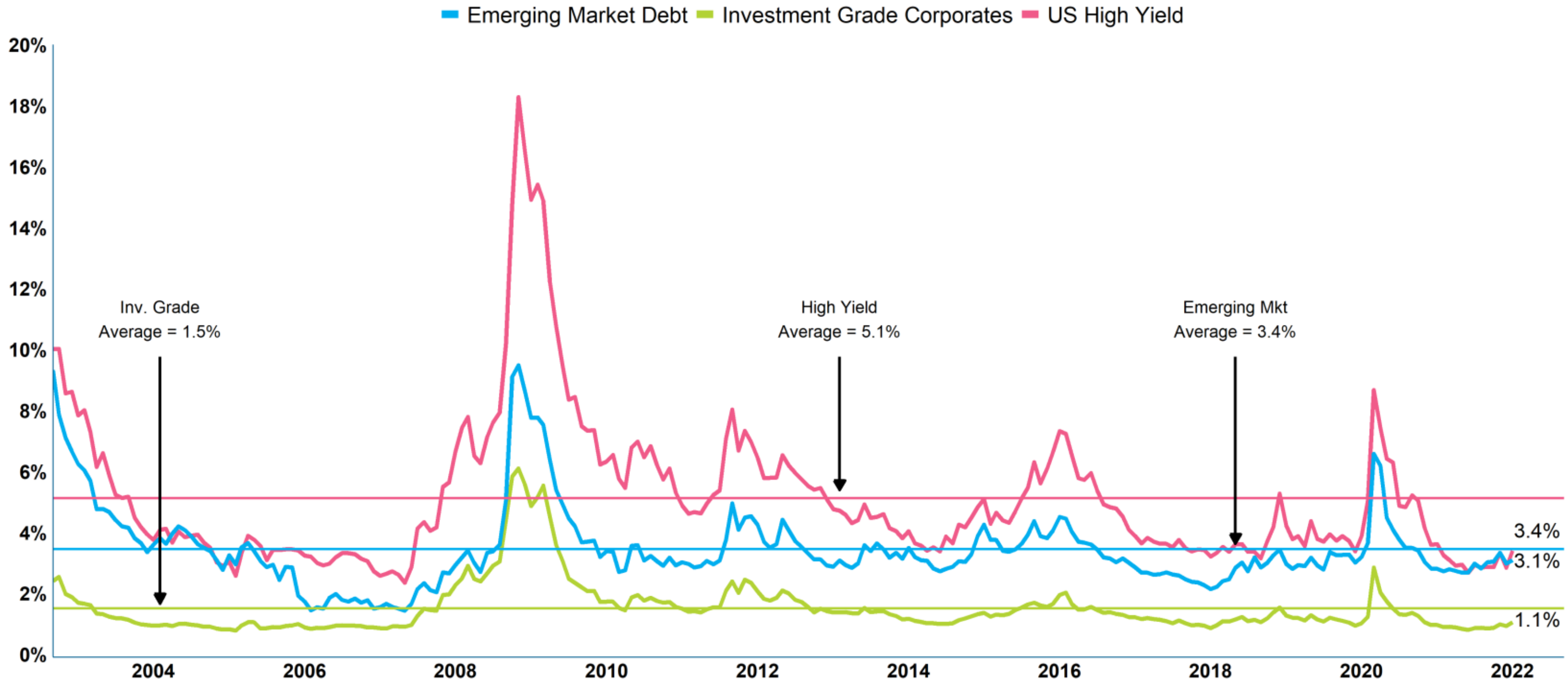
Ten-Year Breakeven Inflation and CPI[1]



- Inflation expectations (breakevens) remain well above long-term averages with the economy reopening and supply chain issues persisting as key drivers.
- In January, trailing twelve-month CPI hit 7.5% for the first time since the early 1980s, a level more than triple the long-term average of 2.2%.
- Rising prices for energy and food, as well as for new and used cars, have been key drivers of higher inflation.
- Real weekly average wages declined 2.7% year over year, as price inflation outpaced rising wages over the past year.

[1] Source: Bloomberg. Data is as of January 31, 2022. The CPI and 10 Year Breakeven average lines denote the average values from August 1998 to the present month-end.

Credit Spreads vs. US Treasury Bonds[1]



- Credit spreads (the spread above a comparable maturity Treasury) for emerging market debt, investment-grade corporates, and high yield corporate debt remain historically narrow despite widening in January.
- The search for yield in a low-rate environment and still strong corporate fundamentals with low default risk have been key drivers in the decline in credit spreads to below long-term averages here in the US.

[1] Sources: Barclays Live and Bloomberg. Data is as of January 31, 2022. Average lines denote the average of the investment grade, high yield, and emerging market spread values from August 2000 to the present month-end.

Global Economic Outlook

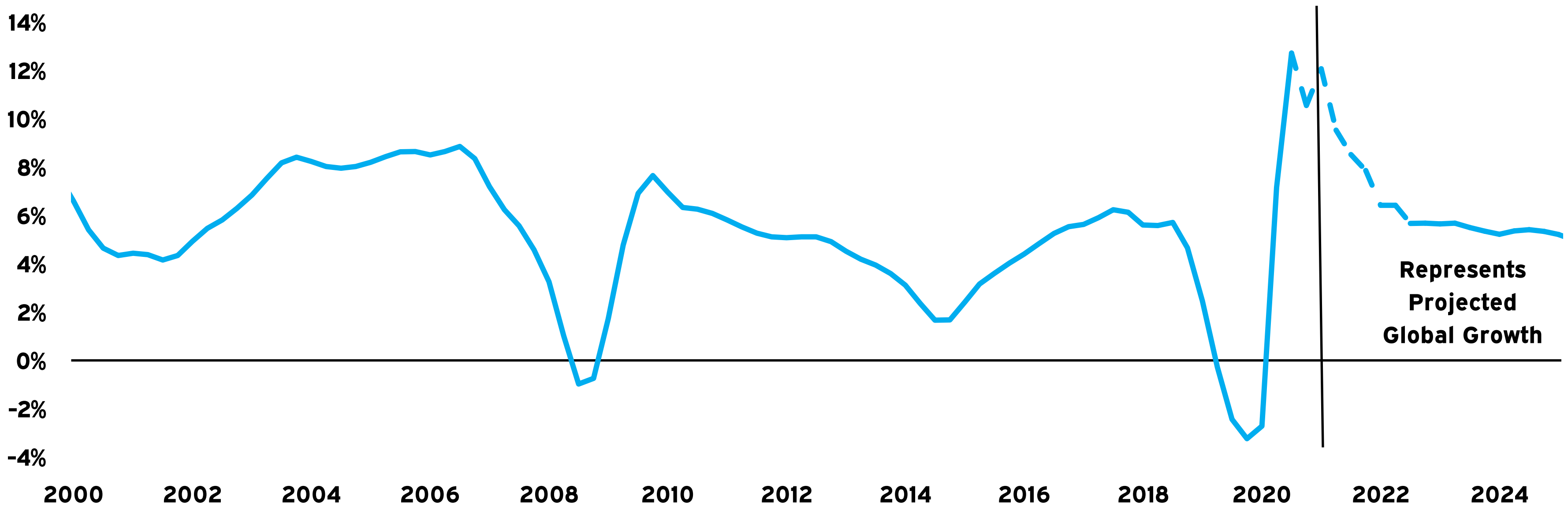
The IMF is forecasting strong growth again this year but continues to downgrade expectations given the lingering pandemic and persistent inflation.

- The IMF forecasts final global GDP to come in at 5.9% in 2021 and 4.4% in 2022 (0.5% below the prior estimate); still well above the past ten-year average of 3.1%.
- In advanced economies, GDP is projected to increase 3.9% in 2022 and 2.6% in 2023. These levels are still above potential as economies re-open and vaccination progress is made. The US forecast experienced a significant reduction in 2022 (4.0% versus 5.2%) given earlier policy reduction than previously expected, high inflation, and struggles in passing fiscal programs. The euro area economy is expected to grow 3.9% in 2022 and 2.5% in 2023, while the Japanese economy is expected to grow 3.3% in 2022 and 1.8% in 2023.
- Growth projections for emerging markets are higher compared to developed markets at 4.8% in 2022 and 4.7% in 2023. China's growth was notably downgraded 0.8% to 4.8% in 2022 given tight COVID-19 restrictions and continued issues in the property sector.
- Globally, inflation is projected to be above long-term averages in 2022 but decline from current levels.

	Real GDP (%)[1]			Inflation (%)[1]		
	IMF 2022 Forecast	IMF 2023 Forecast	Actual 10 Year Average	IMF 2022 Forecast	IMF 2023 Forecast	Actual 10 Year Average
World	4.4	3.8	3.1	3.8	3.3	3.4
Advanced Economies	3.9	2.6	1.6	2.3	1.9	1.4
US	4.0	2.6	2.0	3.5	2.7	1.8
Euro Area	3.9	2.5	1.0	1.7	1.4	1.2
Japan	3.3	1.8	0.5	0.5	0.7	0.5
Emerging Economies	4.8	4.7	4.3	4.9	4.3	5.0
China	4.8	5.2	7.0	1.8	1.9	2.1

[1] Source: IMF World Economic Outlook. Real GDP forecasts from January WEO Update. Inflation as of the October 2021 Update. "Actual 10 Year Average" represents data from 2012 to 2021.

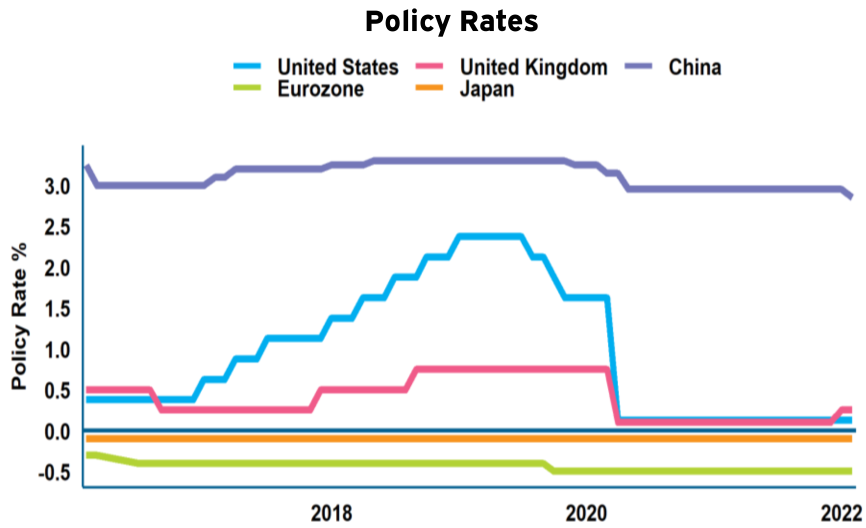
Global Nominal Gross Domestic Product (GDP) Growth[1]

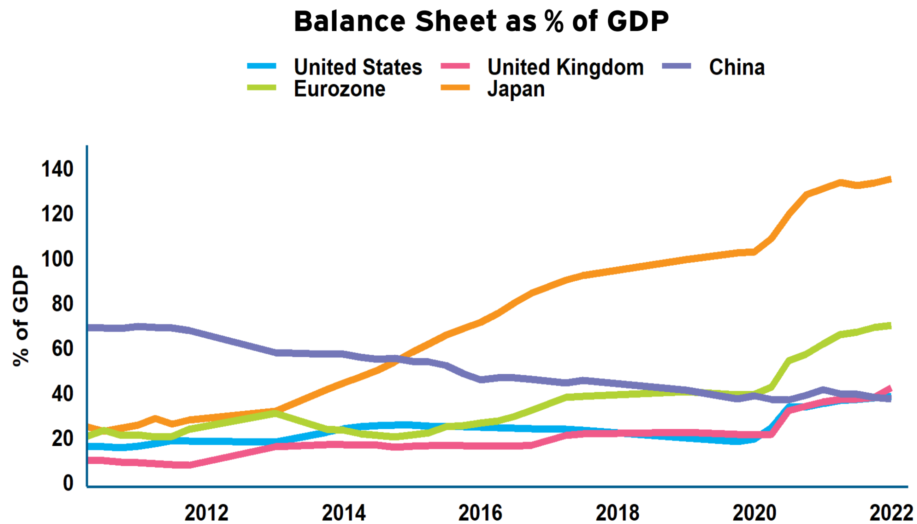


- Global economies are expected to slow in 2022 compared to last year but are forecasted to have another year of largely above-trend growth as economies continue to emerge from the pandemic.
- Looking forward, continued supply chain issues, on-going inflationary pressures, tighter monetary policy, and lingering pandemic problems remain key.

[1] Source: Oxford Economics (World GDP, US$ prices & PPP exchange rate, nominal, % change YoY). Updated January 2022.

Central Bank Response[1]

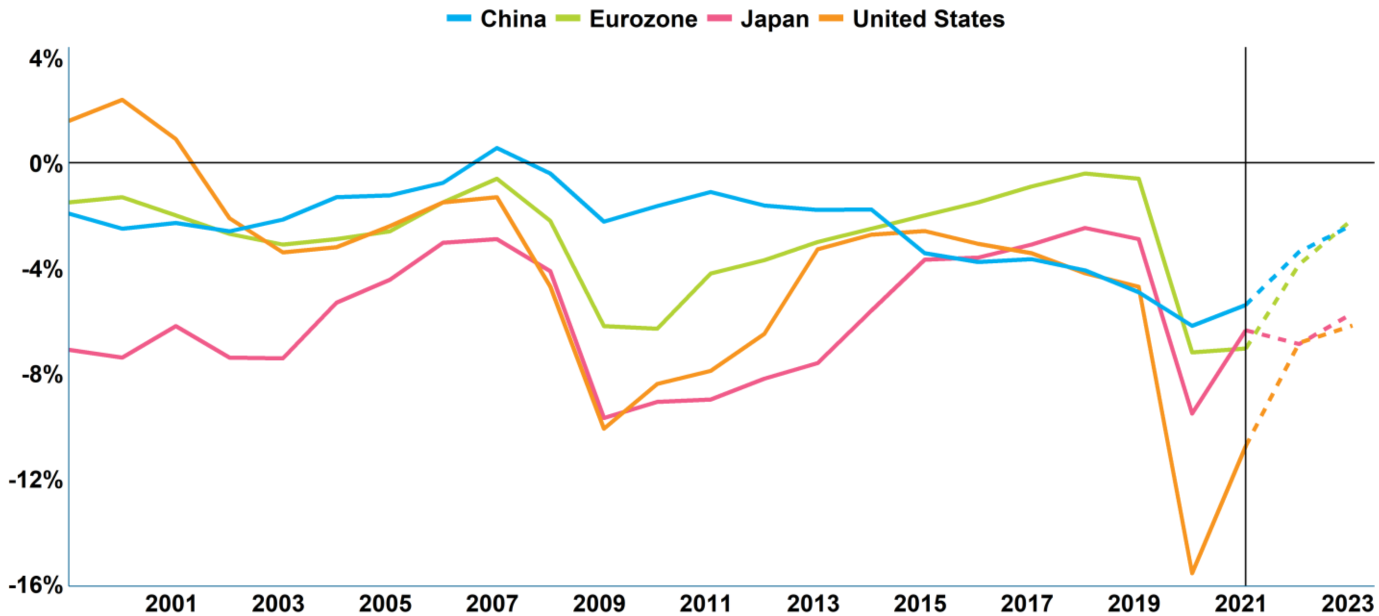




- After global central banks took significant action to support the economy during the pandemic including policy rate cuts and emergency stimulus through quantitative easing (QE), many are now considering reducing support given inflation levels.
- The pace of withdrawing support will likely vary across central banks with the US expected to take one of the more aggressive approaches.
- The one notable exception is China, where they have recently lowered rates and reserve requirements in response to slowing growth.

[1] Source: Bloomberg. Data is as of January 31, 2022. China policy rate is defined as the medium-term lending facility 1 year interest rate. Balance sheet as % of GDP is based on quarterly data.

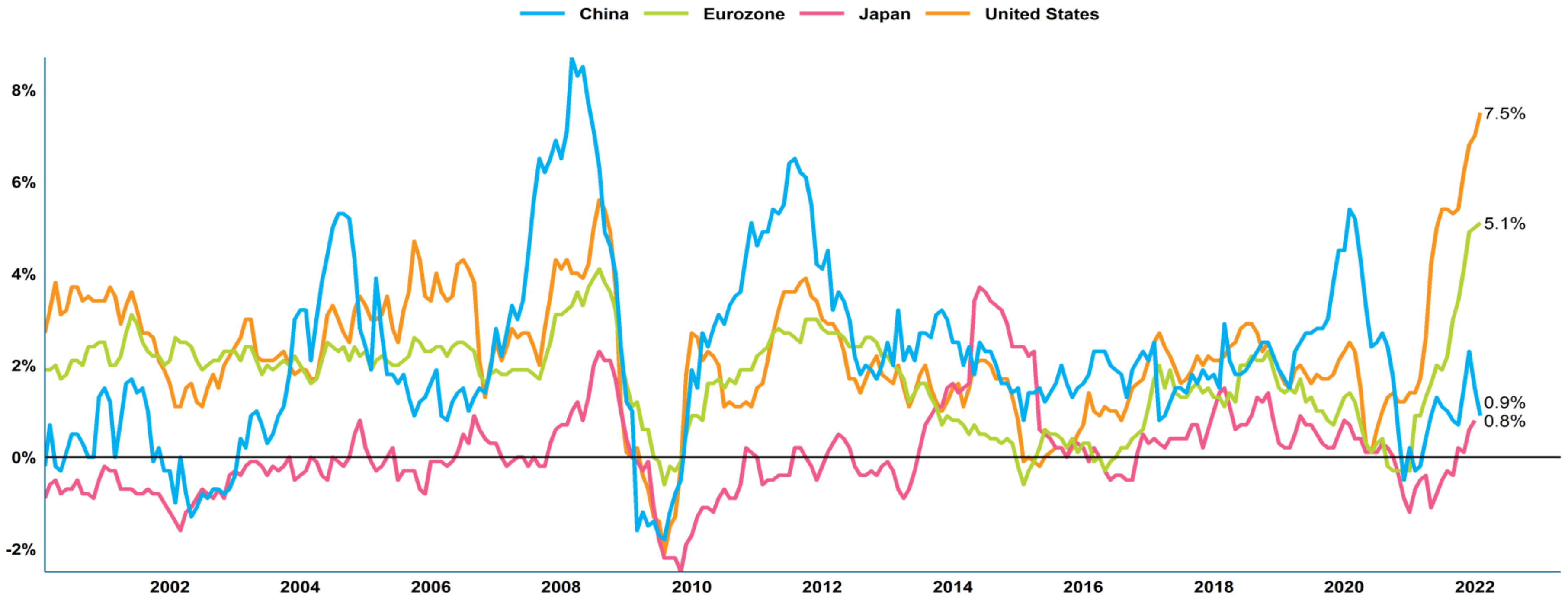
Budget Surplus / Deficit as a Percentage of GDP[1]



- Budget deficits as a percentage of GDP drastically increased for major world economies, particularly the US, due to massive fiscal support and the severe economic contraction's effect on tax revenue in 2020 and 2021.
- As fiscal stimulus programs end, and economic recoveries continue deficits should improve in the coming years.

[1] Source: Bloomberg. Data is as of January 31, 2022. Projections via IMF Forecasts from October 2021 Report. Dotted lines represent 2022 and 2023 forecasts.

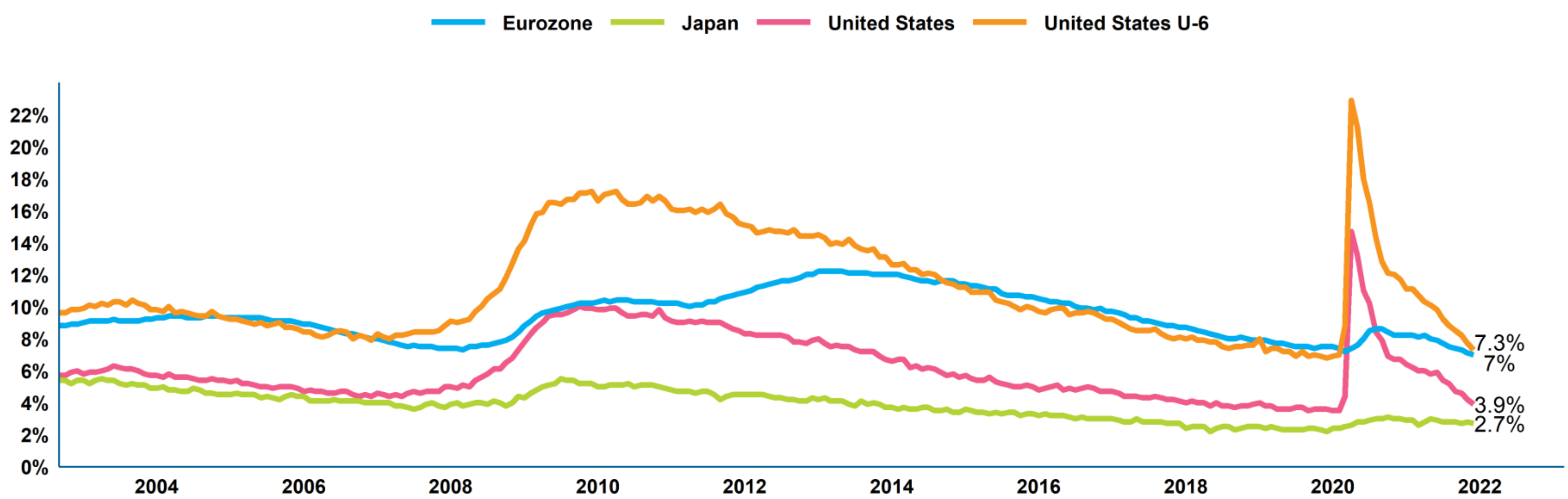
Inflation (CPI Trailing Twelve Months)[1]



- Inflation has increased dramatically from the lows of the pandemic, particularly in the US and Eurozone.

[1] Source: Bloomberg. Data is as of January 31. 2022, except for Japan, where the most recent data available is as of December 31, 2021.

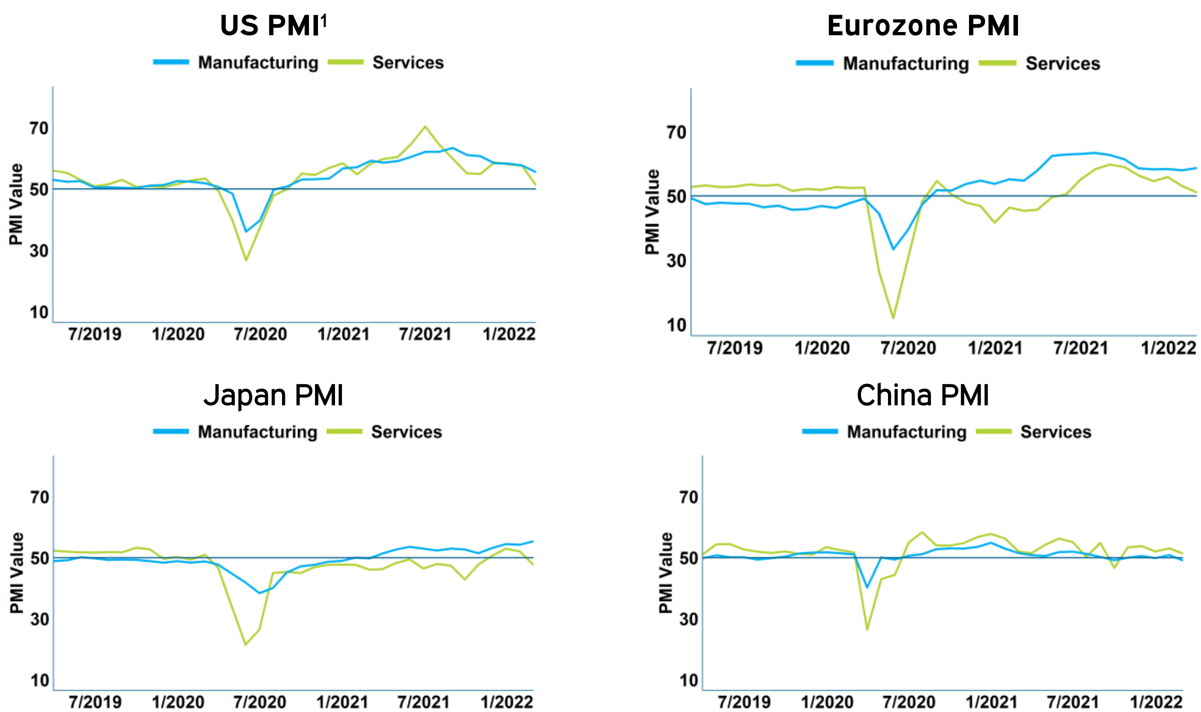
Unemployment[1]



- As economies have largely reopened due to vaccines for the virus, improvements have been seen in the labor market.
- US unemployment, which experienced the steepest rise from the pandemic, declined to under 4% as the economy reopens. The broader measure (U-6) that includes discouraged and underemployed workers has declined but is much higher at 7.0%.

[1] Source: Bloomberg. Data is as of January 31, 2022.

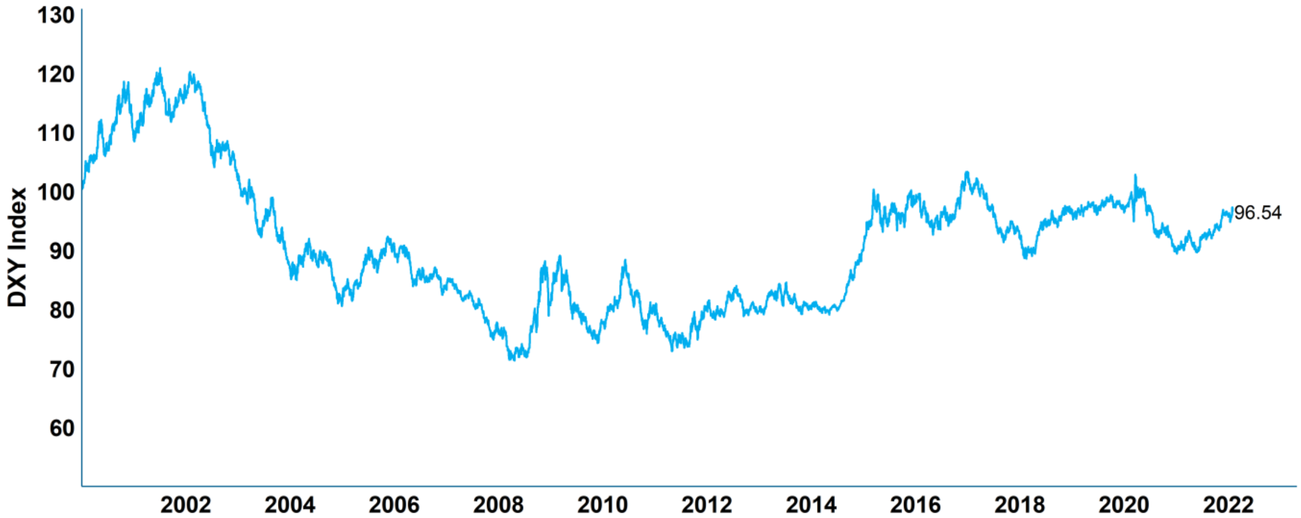
Global PMIs



- After improvements from the lows of the pandemic, Purchasing Managers Indices (PMI), based on surveys of private sector companies, have experienced pressures recently.
- PMIs in the services sector across developed economies have declined to neutral, or in the case of Japan contraction, levels largely due to the impact of the Omicron variant. Notably, China's manufacturing PMI dipped into contraction territory in January given on-going strict COVID-19 related restrictions.

[1] Source: Bloomberg. US Markit Services and Manufacturing PMI, Caixin Services and Manufacturing PMI, Eurozone Markit Services and Manufacturing PMI, Jibun Bank Services and Manufacturing PMI. Data is as of January 2022. Readings below 50 represent economic contractions.

US Dollar versus Broad Currencies[1]



- The US dollar continued its 2021 trend of strengthening against a broad basket of peers in January given expectations for rising rates.
- A few commodity-sensitive currencies like the Brazilian real and South African rand have recently outpaced the dollar though given persistently high commodity prices.

[1] Source: Bloomberg Data as of January 31, 2022.

Summary

Key Trends in 2022:

- Expect growth to slow globally in 2022 but remain above trend. The track of the pandemic will be key.
- Inflationary pressures could linger, particularly if COVID-19 related restrictions persist.
- The end of many fiscal programs will put the burden of continued growth on consumers.
- Monetary policy will likely tighten globally but will remain relatively low.
- Valuations remain high in the US, but low rates and strong margins should be supportive.
- Outside the US, valuations remain lower in both emerging and developed markets, but risks remain.
- Questions remain about the future path of the US yield curve.
- Geopolitical risk in Asia and Eastern Europe could create volatility.

Manager Highlights

Acadian Emerging Markets Small Cap

- Acadian outperformed is benchmark for the month, returning -3.2% vs -4.4% for the MSCI Emerging Markets Small Cap Index.
  - The portfolios underweight position in China and positive stock selection has continued to have a positive impact on relative returns.
- Since inception, the strategy has returned 8.2%, beating the benchmark by 3.0% over that same period.

Brown Small Cap Fundamental Value

- Brown outperformed its benchmark by 1.4% in January, posting a return of -4.4% vs the benchmark's -5.8%.
  - Stock selection in the Health Care and Communication Services sectors provided a positive contribution to relative returns for the month.
- Since inception, Brown has returned 9.7%, trailing the benchmark, which has returned 11.2% over that same period.

Axiom International Small Cap

- Axiom lagged its benchmark in January by 5.5%, returning -13.0% vs. the benchmark return of -7.5%.
  - Stock selection in the Health Care, Information Technology and Industrials sectors were the biggest headwinds to relative performance.
- Since inception, the strategy has returned 27.2%, well above the benchmark's return of 22.8% over that same period.

Driehaus Emerging Markets Growth

- Driehaus underperformed its benchmark in January by 2.1%, returning -4.0% vs the benchmark's -1.9% monthly return.
- Since inception, the strategy has returned 12.7%, well outpacing the benchmark return of 7.3% over that same period.

Interim Update
As of January 31, 2022

Allocation vs. Targets and Policy	Current Balance	Current Allocation	Policy	Policy Range
US Equity	$201,718,682	23%	24%	19% - 29%
Developed Market Equity	$110,389,158	13%	13%	8% - 18%
Emerging Market Equity	$74,027,443	8%	12%	7% - 17%
Private Equity	$127,115,554	14%	10%	5% - 15%
Investment Grade Bonds	$95,653,173	11%	5%	2% - 8%
Emerging Market Bonds	--	--	2%	0% - 4%
High Yield Bonds	$43,933,671	5%	6%	3% - 9%
Bank Loans	$8,108,522	1%	2%	0% - 4%
Real Estate	$78,434,449	9%	10%	5% - 15%
Natural Resources	$18,129,179	2%	3%	0% - 6%
Infrastructure	$8,828,432	1%	2%	0% - 5%
Long-Term Government Bonds	$29,559,105	3%	7%	2% - 12%
TIPS	$17,312,881	2%	4%	1% - 7%
Opportunistic	$39,974,417	5%	0%	0% - 5%
Balanced Assets	$26,461,331	3%	--	--
Cash	$2,837,875	0%	0%	0% - 5%
Total	**$882,483,874**	**100%**	**100%**	

Asset Class Performance Summary

	Market Value ($)	% of Portfolio	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System (gross)	**882,483,874**	**100.0**	**-2.8**	**13.5**	**13.1**	**10.7**	**8.9**	**7.2**	**8.6**	**Jan-89**
Total Retirement System			**-2.8**	**13.3**	**12.9**	**10.4**	**8.6**	**6.8**	**8.2**	
Domestic Equity Assets	**201,718,682**	**22.9**	**-5.7**	**21.7**	**18.6**	**15.1**	**14.5**	**9.2**	**10.5**	**Jul-93**
Russell 3000			*-5.9*	*18.8*	*19.9*	*16.1*	*15.0*	*9.5*	*10.5*	*Jul-93*
International Developed Market Equity Assets	**110,389,158**	**12.5**	**-6.3**	**5.4**	**8.8**	**7.3**	**6.4**	**6.1**	**5.2**	**Feb-98**
MSCI EAFE			*-4.8*	*7.0*	*9.3*	*7.8*	*6.9*	*6.4*	*5.0*	*Feb-98*
International Emerging Market Equity Assets	**74,027,443**	**8.4**	**-3.2**	**-3.1**	**13.6**	**11.0**	**6.0**	**--**	**7.4**	**Sep-08**
MSCI Emerging Markets			*-1.9*	*-7.2*	*7.2*	*8.3*	*4.2*	*9.3*	*4.2*	*Sep-08*
Investment Grade Bond Assets	**95,653,173**	**10.8**	**-2.4**	**-3.1**	**3.6**	**3.0**	**2.6**	**4.2**	**4.8**	**Jul-93**
Bloomberg US Aggregate TR			*-2.2*	*-3.0*	*3.7*	*3.1*	*2.6*	*4.2*	*5.0*	*Jul-93*
Long-Term Government Bond Assets	**29,559,105**	**3.3**	**-2.5**	**-1.1**	**6.3**	**4.8**	**--**	**--**	**4.5**	**Dec-15**
PRIT Core Fixed Income			*-2.5*	*-1.1*	*6.3*	*4.8*	*4.2*	*5.1*	*4.5*	*Dec-15*
TIPS Assets	**17,312,881**	**2.0**	**-2.0**	**3.4**	**7.2**	**4.7**	**2.6**	**--**	**4.4**	**Mar-07**
Bloomberg US TIPS TR			*-2.0*	*3.5*	*7.2*	*4.7*	*2.6*	*5.2*	*4.4*	*Mar-07*
High Yield Bond Assets	**43,933,671**	**5.0**	**-1.9**	**2.6**	**6.5**	**5.4**	**5.8**	**--**	**6.4**	**Apr-07**
Bloomberg US High Yield TR			*-2.7*	*2.1*	*6.3*	*5.4*	*6.2*	*7.6*	*6.8*	*Apr-07*
Bank Loan Assets	**8,108,522**	**0.9**	**0.5**	**4.0**	**4.4**	**3.6**	**--**	**--**	**3.6**	**Aug-14**
Credit Suisse Leveraged Loans			*0.4*	*4.5*	*4.8*	*4.3*	*4.7*	*4.8*	*4.1*	*Aug-14*
Real Estate Assets	**78,434,449**	**8.9**	**0.3**	**15.9**	**6.5**	**6.6**	**9.1**	**7.5**	**7.7**	**Jan-89**
NCREIF-ODCE			*0.0*	*22.2*	*9.2*	*8.7*	*10.4*	*8.3*	*7.5*	*Jan-89*

Total Retirement System | As of January 31, 2022

	Market Value ($)	% of Portfolio	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Real Estate Assets	**78,434,449**	**8.9**	**0.3**	**15.9**	**6.5**	**6.6**	**9.1**	**7.5**	**7.7**	**Jan-89**
NCREIF-ODCE			*0.0*	*22.2*	*9.2*	*8.7*	*10.4*	*8.3*	*7.5*	*Jan-89*
Private Equity Assets	**127,115,554**	**14.4**								
Natural Resources Assets	**18,129,179**	**2.1**								
Infrastructure Assets	**8,828,432**	**1.0**								
Opportunistic Assets	**39,974,417**	**4.5**								
Balanced Assets	**26,461,331**	**3.0**	**13.0**	**35.6**	**19.4**	**14.8**	**11.6**	**8.9**	**9.2**	**Apr-90**
60% Wilshire 5000 & 40% Barclays Aggregate			*-4.3*	*10.3*	*13.8*	*11.2*	*10.2*	*7.8*	*9.0*	*Apr-90*
Cash	**2,837,875**	**0.3**								

Trailing Net Performance	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Total Retirement System (gross)	**882,483,874**	**100.0**	**--**	**-2.8**	**13.5**	**13.1**	**10.7**	**8.9**	**7.2**	**8.6**	**Jan-89**
Total Retirement System				**-2.8**	**13.3**	**12.9**	**10.4**	**8.6**	**6.8**	**8.2**	
Domestic Equity Assets	**201,718,682**	**22.9**	**22.9**	**-5.7**	**21.7**	**18.6**	**15.1**	**14.5**	**9.2**	**10.5**	**Jul-93**
Russell 3000				*-5.9*	*18.8*	*19.9*	*16.1*	*15.0*	*9.5*	*10.5*	*Jul-93*
RhumbLine Russell 1000 Growth Index	26,049,766	3.0	12.9	-8.6	17.5	26.5	22.3	18.0	--	12.6	Jun-05
Russell 1000 Growth				*-8.6*	*17.5*	*26.4*	*22.3*	*18.0*	*10.5*	*12.7*	*Jun-05*
Large Growth MStar MF Median				*-9.2*	*12.5*	*22.1*	*19.7*	*16.3*	*9.8*	*11.5*	*Jun-05*
Large Growth MStar MF Rank				*36*	*25*	*7*	*14*	*12*	*--*	*19*	*Jun-05*
RhumbLine Russell 1000 Value Index	27,767,193	3.1	13.8	-2.3	23.3	13.8	10.5	12.2	--	8.2	Jun-05
Russell 1000 Value				*-2.3*	*23.4*	*13.8*	*10.5*	*12.3*	*8.2*	*8.3*	*Jun-05*
Large Value MStar MF Median				*-1.4*	*25.4*	*14.7*	*11.5*	*12.2*	*8.1*	*8.6*	*Jun-05*
Large Value MStar MF Rank				*71*	*73*	*67*	*68*	*52*	*--*	*65*	*Jun-05*
Rhumbline QSI Index	32,400,380	3.7	16.1	-6.2	22.6	17.6	14.9	--	--	13.4	Aug-13
QSI Index				*-6.3*	*22.7*	*17.7*	*15.0*	*14.3*	*9.9*	*13.5*	*Aug-13*
Russell 3000				*-5.9*	*18.8*	*19.9*	*16.1*	*15.0*	*9.5*	*14.0*	*Aug-13*
Large Cap MStar MF Median				*-5.2*	*21.2*	*18.9*	*15.5*	*14.2*	*9.1*	*13.1*	*Aug-13*
Large Cap MStar MF Rank				*63*	*42*	*60*	*55*	*--*	*--*	*48*	*Aug-13*
Brown Small Cap Fundamental Value	16,996,620	1.9	8.4	-4.4	24.4	11.3	7.8	--	--	9.7	Jul-16
Russell 2000 Value				*-5.8*	*14.8*	*11.7*	*7.9*	*10.6*	*8.8*	*11.2*	*Jul-16*
Small Value MStar MF Median				*-4.0*	*22.5*	*13.0*	*8.6*	*10.7*	*9.3*	*11.2*	*Jul-16*
Small Value MStar MF Rank				*62*	*42*	*77*	*62*	*--*	*--*	*74*	*Jul-16*
PRIT General Allocation Domestic Equity	98,504,723	11.2	48.8	-5.9	--	--	--	--	--	-5.9	Jan-22
PRIT Domestic Equity Benchmark				*-5.9*	*--*	*--*	*--*	*--*	*--*	*-5.9*	*Jan-22*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
International Developed Market Equity Assets	**110,389,158**	**12.5**	**12.5**	**-6.3**	**5.4**	**8.8**	**7.3**	**6.4**	**6.1**	**5.2**	**Feb-98**
MSCI EAFE				*-4.8*	*7.0*	*9.3*	*7.8*	*6.9*	*6.4*	*5.0*	*Feb-98*
SSgA MSCI EAFE Index	41,463,465	4.7	37.6	-4.8	7.3	9.7	8.2	7.2	--	6.0	Oct-09
MSCI EAFE				*-4.8*	*7.0*	*9.3*	*7.8*	*6.9*	*6.4*	*5.8*	*Oct-09*
Foreign MStar MF Median				*-4.0*	*6.8*	*10.3*	*8.4*	*7.5*	*6.9*	*6.6*	*Oct-09*
Foreign MStar MF Rank				*57*	*45*	*62*	*55*	*58*	*--*	*65*	*Oct-09*
Axiom International Small Cap Equity	13,365,688	1.5	12.1	-13.0	-3.1	--	--	--	--	27.2	May-20
S&P Developed Ex-U.S. SmallCap				*-7.5*	*1.0*	*9.7*	*8.3*	*8.5*	*9.5*	*22.8*	*May-20*
MSCI EAFE Small Cap				*-7.3*	*2.4*	*9.9*	*8.6*	*9.1*	*9.6*	*22.8*	*May-20*
PRIT General Allocation Int. Equity	55,560,004	6.3	50.3	-5.7	--	--	--	--	--	-5.7	Jan-22
Custom MSCI World Ex-US IMI Net Divs				*-4.8*	*--*	*--*	*--*	*--*	*--*	*-4.8*	*Jan-22*
International Emerging Market Equity Assets	**74,027,443**	**8.4**	**8.4**	**-3.2**	**-3.1**	**13.6**	**11.0**	**6.0**	**--**	**7.4**	**Sep-08**
MSCI Emerging Markets				*-1.9*	*-7.2*	*7.2*	*8.3*	*4.2*	*9.3*	*4.2*	*Sep-08*
Driehaus Emerging Markets Growth	42,473,988	4.8	57.4	-4.0	-8.1	--	--	--	--	12.7	Mar-19
MSCI Emerging Markets				*-1.9*	*-7.2*	*7.2*	*8.3*	*4.2*	*9.3*	*7.3*	*Mar-19*
Diversified Emerging Mkts MStar MF Median				*-1.4*	*-6.1*	*8.6*	*8.4*	*4.9*	*9.5*	*8.6*	*Mar-19*
Diversified Emerging Mkts MStar MF Rank				*75*	*63*	*--*	*--*	*--*	*--*	*14*	*Mar-19*
Acadian Emerging Markets Small Cap	9,795,384	1.1	13.2	-3.2	21.8	13.9	12.2	--	--	8.2	Jun-14
MSCI Emerging Markets Small Cap				*-4.4*	*13.4*	*12.7*	*9.5*	*5.8*	*10.5*	*5.2*	*Jun-14*
Diversified Emerging Mkts MStar MF Median				*-1.4*	*-6.1*	*8.6*	*8.4*	*4.9*	*9.5*	*4.8*	*Jun-14*
Diversified Emerging Mkts MStar MF Rank				*67*	*1*	*12*	*12*	*--*	*--*	*5*	*Jun-14*
PRIT General Allocation EME	21,758,071	2.5	29.4	-1.7	--	--	--	--	--	-1.7	Jan-22
Custom ACWI Ex-US IMI Net Divs				*-2.2*	*--*	*--*	*--*	*--*	*--*	*-2.2*	*Jan-22*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Investment Grade Bond Assets	**95,653,173**	**10.8**	**10.8**	**-2.4**	**-3.1**	**3.6**	**3.0**	**2.6**	**4.2**	**4.8**	**Jul-93**
Bloomberg US Aggregate TR				*-2.2*	*-3.0*	*3.7*	*3.1*	*2.6*	*4.2*	*5.0*	*Jul-93*
SSgA U.S. Aggregate Bond Index-NL	28,005,351	3.2	29.3	-2.1	-2.9	3.7	3.1	2.6	--	3.8	Apr-04
Bloomberg US Aggregate TR				*-2.2*	*-3.0*	*3.7*	*3.1*	*2.6*	*4.2*	*3.8*	*Apr-04*
Intermediate Core Bond MStar MF Median				*-2.0*	*-2.8*	*4.0*	*3.3*	*2.9*	*4.3*	*3.9*	*Apr-04*
Intermediate Core Bond MStar MF Rank				*75*	*53*	*66*	*64*	*74*	*--*	*63*	*Apr-04*
PRIT General Allocation Core FI	67,647,822	7.7	70.7	-2.5	--	--	--	--	--	-2.5	Jan-22
PRIT Core Fixed Income				*-2.5*	*-1.1*	*6.3*	*4.8*	*4.2*	*5.1*	*-2.5*	*Jan-22*
Long-Term Government Bond Assets	**29,559,105**	**3.3**	**3.3**	**-2.5**	**-1.1**	**6.3**	**4.8**	**--**	**--**	**4.5**	**Dec-15**
PRIT Core Fixed Income				*-2.5*	*-1.1*	*6.3*	*4.8*	*4.2*	*5.1*	*4.5*	*Dec-15*
PRIT Core Fixed Income	29,559,105	3.3	100.0	-2.5	-1.1	6.3	4.8	--	--	4.5	Dec-15
PRIT Core Fixed Income				*-2.5*	*-1.1*	*6.3*	*4.8*	*4.2*	*5.1*	*4.5*	*Dec-15*
TIPS Assets	**17,312,881**	**2.0**	**2.0**	**-2.0**	**3.4**	**7.2**	**4.7**	**2.6**	**--**	**4.4**	**Mar-07**
Bloomberg US TIPS TR				*-2.0*	*3.5*	*7.2*	*4.7*	*2.6*	*5.2*	*4.4*	*Mar-07*
SSgA TIPS Index	17,312,881	2.0	100.0	-2.0	3.4	7.2	4.7	2.6	--	4.4	Mar-07
Bloomberg US TIPS TR				*-2.0*	*3.5*	*7.2*	*4.7*	*2.6*	*5.2*	*4.4*	*Mar-07*
Inflation-Protected Bond MStar MF Median				*-1.9*	*3.2*	*6.7*	*4.4*	*2.3*	*4.9*	*4.1*	*Mar-07*
Inflation-Protected Bond MStar MF Rank				*55*	*39*	*17*	*18*	*19*	*--*	*23*	*Mar-07*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
High Yield Bond Assets	**43,933,671**	**5.0**	**5.0**	**-1.9**	**2.6**	**6.5**	**5.4**	**5.8**	**--**	**6.4**	**Apr-07**
Bloomberg US High Yield TR				*-2.7*	*2.1*	*6.3*	*5.4*	*6.2*	*7.6*	*6.8*	*Apr-07*
Loomis Sayles High Yield Conservative	12,613,135	1.4	28.7	-3.1	1.0	5.8	5.1	5.9	--	5.9	Feb-12
Bloomberg US High Yield TR				*-2.7*	*2.1*	*6.3*	*5.4*	*6.2*	*7.6*	*6.2*	*Feb-12*
High Yield Bond MStar MF Median				*-2.3*	*2.6*	*5.7*	*4.9*	*5.6*	*6.7*	*5.6*	*Feb-12*
High Yield Bond MStar MF Rank				*99*	*86*	*45*	*37*	*35*	*--*	*35*	*Feb-12*
Columbia High Yield	12,199,807	1.4	27.8	-2.9	2.1	6.4	5.2	--	--	5.6	Dec-16
Bloomberg US High Yield TR				*-2.7*	*2.1*	*6.3*	*5.4*	*6.2*	*7.6*	*5.9*	*Dec-16*
High Yield Bond MStar MF Median				*-2.3*	*2.6*	*5.7*	*4.9*	*5.6*	*6.7*	*5.3*	*Dec-16*
High Yield Bond MStar MF Rank				*92*	*60*	*24*	*28*	*--*	*--*	*36*	*Dec-16*
PRIT General Allocation Value Added FI	19,120,729	2.2	43.5	-0.6	--	--	--	--	--	-0.6	Jan-22
PRIT Value Added FI Benchmark				*-0.8*	*--*	*--*	*--*	*--*	*--*	*-0.8*	*Jan-22*
Bank Loan Assets	**8,108,522**	**0.9**	**0.9**	**0.5**	**4.0**	**4.4**	**3.6**	**--**	**--**	**3.6**	**Aug-14**
Credit Suisse Leveraged Loans				*0.4*	*4.5*	*4.8*	*4.3*	*4.7*	*4.8*	*4.1*	*Aug-14*
Beach Point Loan Fund	8,108,522	0.9	100.0	0.5	4.0	4.4	3.6	--	--	3.6	Aug-14
Credit Suisse Leveraged Loans				*0.4*	*4.5*	*4.8*	*4.3*	*4.7*	*4.8*	*4.1*	*Aug-14*
Bank Loan MStar MF Median				*0.2*	*3.7*	*3.9*	*3.6*	*4.0*	*4.3*	*3.5*	*Aug-14*
Bank Loan MStar MF Rank				*1*	*39*	*29*	*52*	*--*	*--*	*39*	*Aug-14*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Real Estate Assets	**78,434,449**	**8.9**	**8.9**	**0.0**	**15.6**	**6.4**	**6.5**	**9.0**	**7.5**	**7.7**	**Jan-89**
NCREIF-ODCE				*0.0*	*22.2*	*9.2*	*8.7*	*10.4*	*8.3*	*7.5*	*Jan-89*
UBS Trumbull Property Income Fund	10,751,299	1.2	13.7	0.0	14.6	6.4	6.1	7.7	7.5	7.4	Jan-89
NCREIF ODCE (net)				*0.0*	*21.0*	*8.2*	*7.7*	*9.4*	*7.3*	*6.5*	*Jan-89*
UBS Trumbull Property Fund	3,504,027	0.4	4.5	0.0	15.7	2.2	3.6	6.3	6.5	6.6	Jan-89
NCREIF ODCE (net)				*0.0*	*21.0*	*8.2*	*7.7*	*9.4*	*7.3*	*6.5*	*Jan-89*
JPMCB Strategic Property Fund	6,255,327	0.7	8.0	0.0	20.1	8.2	--	--	--	8.2	Jan-19
NCREIF ODCE (net)				*0.0*	*21.0*	*8.2*	*7.7*	*9.4*	*7.3*	*8.0*	*Jan-19*
AEW Partners VII	1,020,238	0.1	1.3								
Rockwood X	6,644,419	0.8	8.5								
Torchlight Debt Opportunity Fund VI	3,967,621	0.4	5.1								
TerraCap Partners IV (Institutional), L.P.	4,200,068	0.5	5.4								
Rockwood Capital Real Estate Partners Fund XI, L.P.	4,245,593	0.5	5.4								
PRIT General Allocation Real Estate	37,845,857	4.3	48.3	-0.4	--	--	--	--	--	-0.4	Jan-22
PRIT Real Estate Benchmark				*-1.0*	*--*	*--*	*--*	*--*	*--*	*-1.0*	*Jan-22*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Private Equity Assets	**127,115,554**	**14.4**	**14.4**								
Adams Street Partners 2010	8,441,187	1.0	6.6								
Goldman Sachs Private Equity Partners 2005	824,068	0.1	0.6								
North American Strategic Partners 2006	58,769	0.0	0.0								
Brookfield Capital Partners IV	3,946,752	0.4	3.1								
PRIT Vintage Year 2001	64,195	0.0	0.1								
PRIT Vintage Year 2002	15,695	0.0	0.0								
Ridgemont Equity Partners II	4,059,525	0.5	3.2								
TA XII	3,528,857	0.4	2.8								
LLR Equity Partners V	5,211,161	0.6	4.1								
Wellspring Capital Partners VI	5,621,398	0.6	4.4								
Trilantic Capital Partners VI	5,536,688	0.6	4.4								
Brookfield Capital Partners V, L.P.	3,378,308	0.4	2.7								
FS Equity Partners VIII L.P.	3,439,550	0.4	2.7								
Ridgemont Equity Partners III	4,830,815	0.5	3.8								
Searchlight Capital III	3,641,330	0.4	2.9								
Charlesbank Technology Opportunities Fund	3,262,472	0.4	2.6								
LLR Equity Partners VI, L.P	1,585,000	0.2	1.2								
PRIT General Allocation Private Equity	69,669,784	7.9	54.8	-0.1	--	--	--	--	--	-0.1	Jan-22
State Street PE Index (SSPEI) All PE Excluding PD				*0.0*	*--*	*--*	*--*	*--*	*--*	*0.0*	*Jan-22*

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	20 Yrs (%)	Inception (%)	Inception Date
Natural Resources Assets	**18,129,179**	**2.1**	**2.1**								
Hancock Timberland IX	3,130,700	0.4	17.3								
PRIT General Allocation Timberland	13,054,843	1.5	72.0	-0.4	--	--	--	--	--	-0.4	Jan-22
NCREIF Timberland				*0.0*	*9.2*	*3.7*	*3.6*	*5.3*	*6.4*	*0.0*	*Jan-22*
Oppenheimer Natural Resources	1,943,636	0.2	10.7								
Infrastructure Assets	**8,828,432**	**1.0**	**1.0**								
IFM Global Infrastructure (U.S.), L.P.	7,729,612	0.9	87.6	-0.2	16.3	11.0	--	--	--	10.8	Oct-18
CPI+5%				*1.0*	*12.5*	*8.8*	*8.0*	*7.2*	*7.3*	*8.5*	*Oct-18*
Global Infrastructure Partners IV	1,098,820	0.1	12.4								
Opportunistic Assets	**39,974,417**	**4.5**	**4.5**								
HarbourVest Co-Investment Fund V, L.P.	4,957,110	0.6	12.4								
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	5,083,476	0.6	12.7								
PRIT General Allocation Hedge Funds	29,933,831	3.4	74.9	-0.1	--	--	--	--	--	-0.1	Jan-22
HFRI FOF Composite Index				*-2.8*	*3.5*	*6.4*	*4.8*	*4.0*	*3.7*	*-2.8*	*Jan-22*
Balanced Assets	**26,461,331**	**3.0**	**3.0**	**-2.9**	**16.6**	**13.5**	**11.4**	**9.9**	**8.1**	**8.7**	**Apr-90**
60% Wilshire 5000 & 40% Barclays Aggregate				*-4.3*	*10.3*	*13.8*	*11.2*	*10.2*	*7.8*	*9.0*	*Apr-90*
PRIT General Allocation	26,461,331	3.0	100.0	-2.9	16.6	13.5	11.4	9.9	8.1	8.7	Apr-90
60% Wilshire 5000 & 40% Barclays Aggregate				*-4.3*	*10.3*	*13.8*	*11.2*	*10.2*	*7.8*	*9.0*	*Apr-90*
Cash	**2,837,875**	**0.3**	**0.3**								
Cash Account	2,837,875	0.3	100.0								
91 Day T-Bills				*0.0*	*0.0*	*0.8*	*1.1*	*0.6*	*1.2*	*1.2*	*Jan-02*

Cash Flow Summary						
	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Acadian Emerging Markets Small Cap	$10,103,693	$0	-$10,204	-$298,106	$9,795,384	-3.15%
Adams Street Partners 2010	$8,441,187	$0	$0	$0	$8,441,187	0.00%
AEW Partners VII	$1,020,238	$0	$0	$0	$1,020,238	0.00%
Axiom International Small Cap Equity	$15,359,264	$0	-$8,910	-$1,984,665	$13,365,688	-12.98%
Beach Point Loan Fund	$8,070,199	$0	-$3,379	$41,702	$8,108,522	0.47%
Brookfield Capital Partners IV	$4,024,989	$0	-$78,237	$0	$3,946,752	0.00%
Brookfield Capital Partners V, L.P.	$3,378,308	$0	$0	$0	$3,378,308	0.00%
Brown Small Cap Fundamental Value	$17,760,683	$0	-$14,164	-$749,899	$16,996,620	-4.38%
Cash Account	$15,101,696	$0	-$12,263,820	$0	$2,837,875	0.00%
Charlesbank Technology Opportunities Fund	$3,262,472	$0	$0	$0	$3,262,472	0.00%
Columbia High Yield	$11,065,170	$1,500,000	-$4,168	-$361,195	$12,199,807	-2.93%
Driehaus Emerging Markets Growth	$44,239,973	$0	$0	-$1,765,985	$42,473,988	-3.99%
EnTrustPermal Special Opportunities Evergreen Fund, Ltd.	$4,612,047	$471,429	$0	$0	$5,083,476	0.00%
FS Equity Partners VIII L.P.	$3,439,550	$0	$0	$0	$3,439,550	0.00%
Global Infrastructure Partners IV	$865,966	$232,854	$0	$0	$1,098,820	0.00%
Goldman Sachs Private Equity Partners 2005	$824,068	$0	$0	$0	$824,068	0.00%
Hancock Timberland IX	$3,130,700	$0	$0	$0	$3,130,700	0.00%
HarbourVest Co-Investment Fund V, L.P.	$4,957,110	$0	$0	$0	$4,957,110	0.00%
IFM Global Infrastructure (U.S.), L.P.	$7,747,871	$0	$0	-$18,259	$7,729,612	-0.24%
JPMCB Strategic Property Fund	$6,269,858	$0	-$14,531	$0	$6,255,327	0.00%
LLR Equity Partners V	$5,211,161	$0	$0	$0	$5,211,161	0.00%
LLR Equity Partners VI, L.P	$1,585,000	$0	$0	$0	$1,585,000	0.00%
Loomis Sayles High Yield Conservative	$11,507,154	$1,500,000	-$4,730	-$389,289	$12,613,135	-3.07%

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
North American Strategic Partners 2006	$58,769	$0	$0	$0	$58,769	0.00%
Oppenheimer Natural Resources	$2,225,657	$0	-$282,021	$0	$1,943,636	0.00%
PRIT Core Fixed Income	$25,317,792	$5,000,000	-$2,710	-$755,977	$29,559,105	-2.50%
PRIT General Allocation	$7,084,714	$23,058,279	-$6,723,394	$3,041,732	$26,461,331	12.99%
PRIT General Allocation Core FI	$0	$69,807,809	$0	-$2,159,987	$67,647,822	-3.09%
PRIT General Allocation Domestic Equity	$0	$105,389,898	$0	-$6,885,175	$98,504,723	-6.53%
PRIT General Allocation EME	$0	$22,289,670	$0	-$531,598	$21,758,071	-2.38%
PRIT General Allocation Hedge Funds	$0	$29,794,913	$0	$138,918	$29,933,831	0.47%
PRIT General Allocation Int. Equity	$0	$58,595,156	$0	-$3,035,151	$55,560,004	-5.73%
PRIT General Allocation Private Equity	$0	$72,791,821	$0	-$3,122,038	$69,669,784	-4.29%
PRIT General Allocation Real Estate	$0	$37,616,643	$0	$229,214	$37,845,857	0.61%
PRIT General Allocation Timberland	$0	$13,292,420	$0	-$237,577	$13,054,843	-1.79%
PRIT General Allocation Value Added FI	$0	$19,486,506	$0	-$365,777	$19,120,729	-1.88%
PRIT Vintage Year 2001	$80,856	$0	-$16,387	-$274	$64,195	-0.34%
PRIT Vintage Year 2002	$15,705	$1	$0	-$12	$15,695	-0.08%
Rhumbline QSI Index	$34,558,536	$0	-$1,890	-$2,156,267	$32,400,380	-6.24%
RhumbLine Russell 1000 Growth Index	$28,491,703	$0	-$1,465	-$2,440,471	$26,049,766	-8.57%
RhumbLine Russell 1000 Value Index	$28,426,770	$0	-$1,562	-$658,015	$27,767,193	-2.32%
Ridgemont Equity Partners II	$4,059,525	$0	$0	$0	$4,059,525	0.00%
Ridgemont Equity Partners III	$4,830,815	$0	$0	$0	$4,830,815	0.00%
Rockwood Capital Real Estate Partners Fund XI, L.P.	$4,245,593	$0	$0	$0	$4,245,593	0.00%

	Beginning Market Value	Contributions	Withdrawals	Net Investment Change	Ending Market Value	Month Return
Rockwood X	$6,644,419	$0	$0	$0	$6,644,419	0.00%
Searchlight Capital III	$3,479,604	$161,726	$0	$0	$3,641,330	0.00%
SSgA MSCI EAFE Index	$43,553,030	$0	-$3,455	-$2,086,109	$41,463,465	-4.80%
SSgA TIPS Index	$17,667,197	$0	-$866	-$353,450	$17,312,881	-2.01%
SSgA U.S. Aggregate Bond Index-NL	$28,613,948	$0	-$1,400	-$607,196	$28,005,351	-2.13%
TA XII	$3,528,857	$0	$0	$0	$3,528,857	0.00%
TerraCap Partners IV (Institutional), L.P.	$4,200,068	$0	$0	$0	$4,200,068	0.00%
Torchlight Debt Opportunity Fund VI	$3,967,621	$0	$0	$0	$3,967,621	0.00%
Trilantic Capital Partners VI	$5,536,688	$0	$0	$0	$5,536,688	0.00%
UBS Trumbull Property Fund	$3,504,027	$0	$0	$0	$3,504,027	0.00%
UBS Trumbull Property Income Fund	$10,751,299	$0	$0	$0	$10,751,299	0.00%
Wellspring Capital Partners VI	$5,621,398	$0	$0	$0	$5,621,398	0.00%
Total	**$468,442,947**	**$460,989,125**	**-$19,437,292**	**-$27,510,905**	**$882,483,874**	**-3.01%**

Private Market Managers' Performance Overview[1]

Managers	Strategy	Vintage Year	Commitment Amount ($mm)	% called	Median Peer IRR	Quartile Rank	Net IRR	Net Multiple
Real Estate Managers								
AEW Partners VII	Opportunistic	2014	5.0	91%	9.9	2	11.1%	1.4x
Rockwood X	Value-Added	2016	10.0	85%	11.9	4	7.6%	1.2x
Torchlight Debt Opportunity Fund VI	Opportunistic	2019	5.0	100%	NM[2]	NM	NM	NM
TerraCap Partners IV	Value-Added	2019	5.0	100%	NM	NM	NM	NM
Rockwood XI	Value-Added	2019	8.0	47%	NM	NM	NM	NM
Private Equity Managers								
Adams Street Partners	Fund of Funds	2010	10.0	89%	13.0	3	12.9%	1.8x
Goldman Sachs PE Partners	Fund of Funds	2005	10.0	100%	8.0	3	4.6%	1.4x
North American Strategic Partners[3]	Fund of Funds	2006	9.1	88%	7.2	3	6.4%	1.4x
PRIT Vintage Year 2001	Fund of Funds	2001	2.5	NA	8.5	NA	NA	NA
PRIT Vintage Year 2002	Fund of Funds	2002	0.5	NA	8.1	NA	NA	NA
Brookfield Capital Partners IV	Buyout	2015	4.0	80%	21.1	1	46.9%	2.6x
LLR Equity Partners V	Buyout	2017	5.0	80%	29.5	3	19.1%	1.4x
Ridgemont Equity Partners II	Buyout	2015	6.0	70%	21.1	2	16.1%	1.6x

[1] As of 06/30/2021.

[2] NM" indicates that a fund is early in its investment period; therefore, the return is not yet meaningful. A not meaningful return is generated by funds with less than 24 months of activity.

[3] IRR and multiple are as of 12/31/2020.

Private Market Managers' Performance Overview (continued)[1]

Managers	Strategy	Vintage Year	Commitment Amount ($mm)	% called	Median Peer IRR	Quartile Rank	Net IRR	Net Multiple
TA XII	Growth Equity	2016	4.0	100%	23.0	1	41.7%	2.8x
Wellspring VI	Buyout	2017	5.0	77%	29.5	3	21.3%	1.3x
Trilantic Capital Partners VI	Buyout	2018	5.0	36%	29.7	4	6.2%	1.1x
Brookfield Capital Partners V	Buyout	2019	4.0	54%	NM[2]	NM	NM	NM
FS Equity Partners VIII	Buyout	2019	5.0	52%	NM	NM	NM	NM
Ridgemont Equity Partners III	Buyout	2019	6.0	60%	NM	NM	NM	NM
Searchlight Capital III	Special Situations	2020	5.0	45%	NM	NM	NM	NM
Charlesbank Technology Opportunities	Buyout	2019	5.0	31%	NM	NM	NM	NM
LLR Equity Partners VI	Buyout	2020	4.0	24%	NM	NM	NM	NM
Opportunistic Managers								
HarbourVest Co-Investment Fund IV	Opportunistic	2019	4.0	48%	NM	NM	NM	NM
EnTrustPermal Spec. Opps. Evergreen Fund	Opportunistic	2020	6.0	55%	NM	NM	NM	NM
Infrastructure Managers								
Global Infrastructure Partners IV	Value-Added	2019	5.0	11%	NM	NM	NM	NM
Natural Resources Managers								
Hancock Timberland	Timber	2008	8.0	100%	--	--	-0.3%	1.0x
Oppenheimer Natural Resources	Natural Resources	2010	7.0	100%	--	--	-4.3%	0.7x

[1] As of 06/30/2021.

[2] NM" indicates that a fund is early in its investment period; therefore, the return is not yet meaningful. A not meaningful return is generated by funds with less than 24 months of activity.

Asset Allocation Review and Risk Analysis

Introduction

- Meketa Investment Group recently completed our 2022 capital markets expectations, which updates each of our asset class assumptions.
- Annually, we review asset allocation with the Board, and periodically we recommend modest changes to the asset allocation policy.
  - We try to avoid tinkering too frequently with the Retirement System's long-term strategic asset allocation.
- However, when material changes to the Retirement System occur it is important to reassess the System's asset allocation policy.
  - The recent contribution of the proceeds from the pension obligation bond is a material development for the Retirement System.
  - It warrants revisiting asset allocation to determine if the Board's risk tolerances or return objectives have changed in light of the contribution on the System's behalf in PRIM.
- The following document outlines the System's asset allocation policy, PRIM's current asset allocation, the combined impact of the aggregate Retirement System's assets. In addition, since the February meeting we have also added two alternative policies for the Board's consideration.

Asset Allocation Policy Options[1]

	Quincy (%)	PRIM (%)	Combined (%)	Proposed Quincy 7.5 (%)	Proposed Quincy 7.25 (%)
Growth/Equity	59	59	59	66	60
US Equity	24	24[2]	24	26	25
Developed Market Equity (non-US)	13	13	13	16	13
Emerging Market Equity	12	5	8	14	12
Private Equity	10	16	13	10	10
Credit	10	7	8	4	6
High Yield Bonds	6	5	6	2	4
Bank Loans	2	0	1	2	2
Private Debt	0	1	1	0	0
Emerging Market Bonds	2	0	1	0	0
Rate Sensitive	16	16	16	13	17
Investment Grade Bonds	5	13[3]	9	4	6
Long-term Government Bonds	7	3	5	6	7
TIPS	4	0	2	3	4
Real Assets	15	12	14	14	14
Real Estate	10	8	9	10	10
Natural Resources/Timberland	3	3	3	0	0
Infrastructure	2	1	2	4	4
Opportunistic (Hedge Funds, CTAs)	0	7	3	3	3
Expected Return (20 years)	7.23	7.14	7.19	7.47	7.22
Standard Deviation	14.1	13.6	13.8	14.6	13.7
Probability of Achieving 7% over 20 Years	52.4	51.3	51.9	55.2	52.4

[1] Expected return and standard deviation are based upon Meketa Investment Group's 2022 Annual Asset Study. Throughout this document, returns for periods longer than one year are annualized. Asset Allocations may not sum due to rounding.

[2] Includes long/short equities.

[3] Includes cash

Impact of Pension Obligation Bond ("POB")

- The POB was invested in PRIM, which has an expected return of 6.1% over the next 10 years and 7.14% over the next 20 years, based on Meketa's 2022 capital markets assumptions.
  - This is reasonably consistent with the projections from PRIM's investment consultant of 5.7% for 10 years and 6.9% for 30 years.
- With the influx of assets form the POB, the System's overall expected return decreased to 7.19% over the next 20 years.
  - The System's probability of meeting the assumed rate of return likewise declined, from 49.1% to 48.6%.
  - These assumptions do not include alpha from active management. However, alpha expectations for both policies are expected to be approximately 0% in aggregate, if the Fund's choose slightly above average managers (40th percentile) in all asset classes.

Comparison to Peers – Tracking Error

- The System's current asset allocation policy is different than PRIM.
- The System can expect long-term tracking error (i.e., over a 20-year period) relative to PRIM to be as follows:

Policy	Tracking Error per Annum (%)
Current Policy	1.5
Proposed Quincy 7.5%	1.9
Proposed Quincy 7.25%	1.4

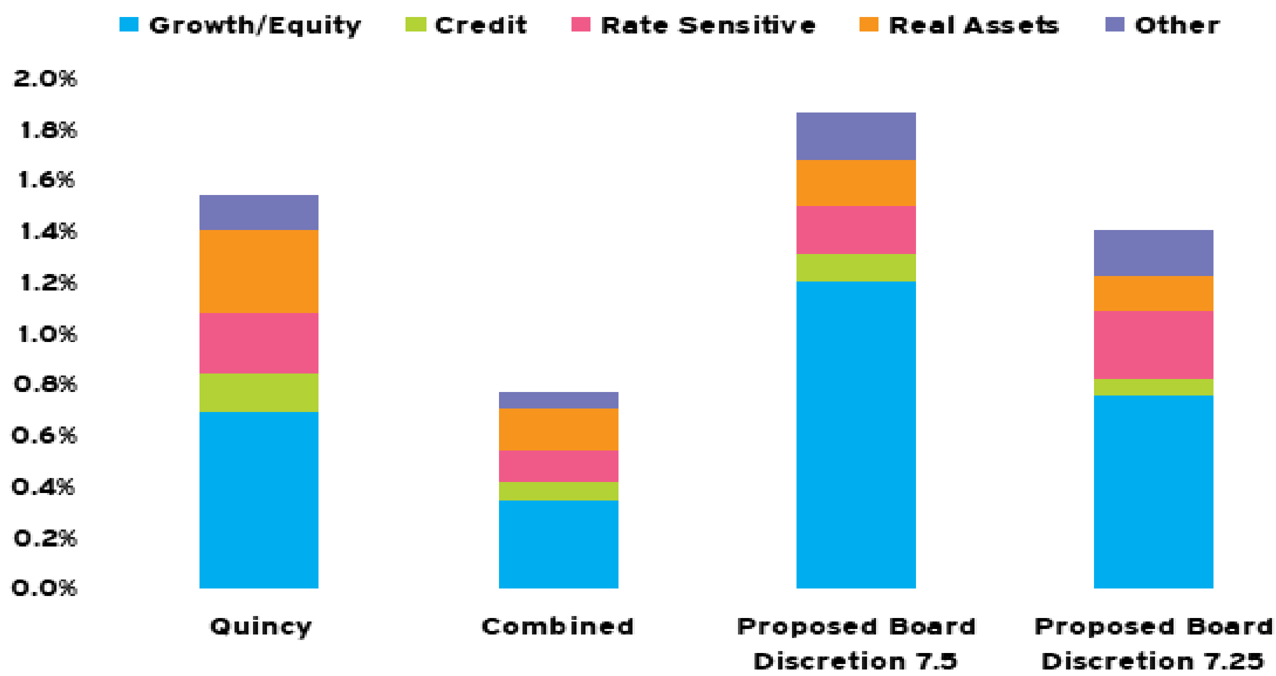
- While we would expect higher tracking error over shorter periods of time, over the long-term, tracking error relative to PRIM would be approximately 1.5% per annum.[1]

[1] Assuming a one standard deviation event.

Decomposition of Tracking Error

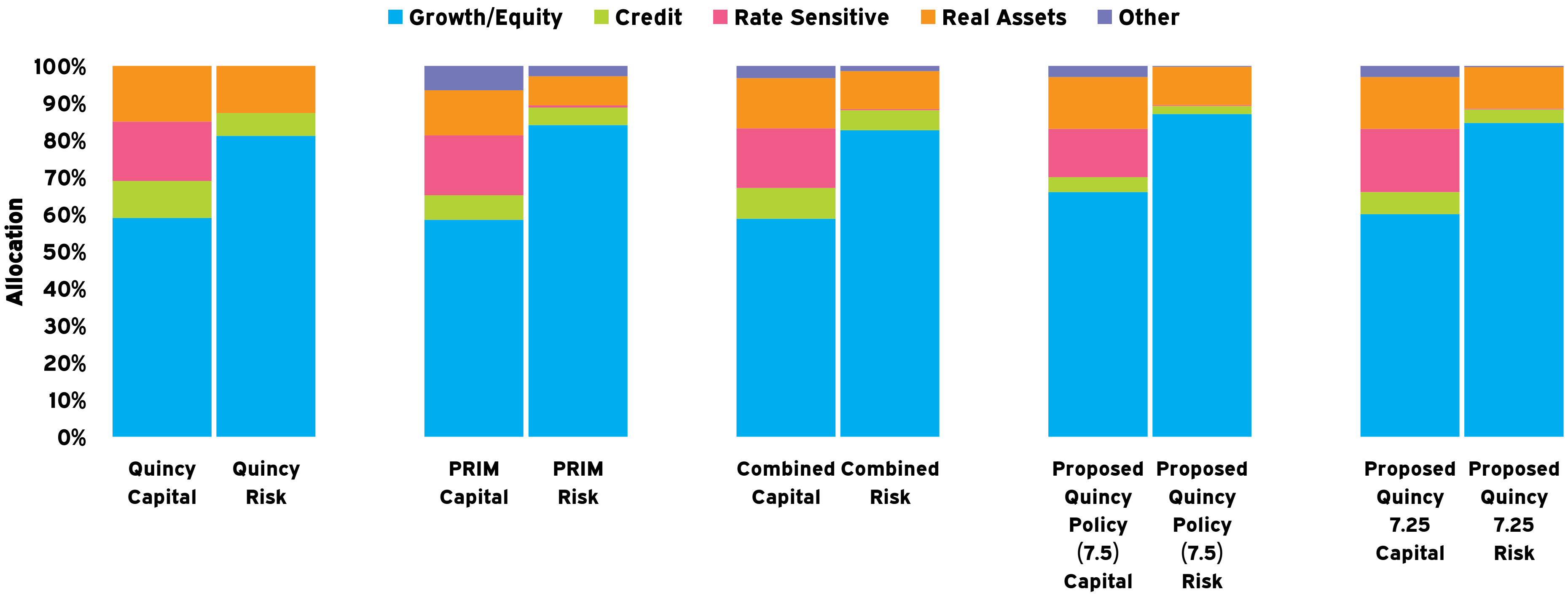
- The current asset allocation policy’s tracking error relative to PRIM comes from many different sources.
- The chart below examines the sources of tracking error due to differences in asset allocation.
- Note that additional tracking error can be expected due to variances resulting from active management.

Sources of Tracking Error



Risk Budgeting Analysis[1]

(Capital Allocation vs. Risk Allocation)



- PRIM has more growth/equity risk and hedge fund risk, while Quincy's asset allocation policy has more risk allocated within the real assets and credit.

[1] Risk allocation is calculated by multiplying the weight of the asset class by its standard deviation and its correlation with the total portfolio and then dividing this by the standard deviation of the total portfolio.

MVO-Based Risk Analysis[1]

Scenario	Quincy (%)	PRIM (%)	Combined (%)	Proposed Quincy 7.5 (%)	Proposed Quincy 7.25 (%)
Worst Case Returns[1]					
One Year	-20.7	-20.1	-20.4	-21.4	-20.1
Three Years (annualized)	-10.0	-9.6	-9.7	-10.3	-9.5
Five Years (annualized)	-6.4	-6.0	-6.2	-6.6	-6.0
Ten Years (annualized)	-2.6	-2.4	-2.5	-2.7	-2.3
Twenty Years (annualized)	0.2	0.3	0.3	0.2	0.4
Probability of Experiencing Negative Returns					
One Year	29.7	29.3	29.4	29.7	29.1
Three Years	17.7	17.3	17.5	17.8	17.1
Five Years	11.6	11.2	11.3	11.7	11.0
Ten Years	4.6	4.2	4.4	4.6	4.1
Twenty Years	0.8	0.7	0.8	0.9	0.7
Probability of Achieving at least a 7.25% Return					
One Year	50.5	50.3	50.4	51.2	50.5
Three Years	50.9	50.5	50.7	52.0	50.9
Five Years	51.2	50.6	50.9	52.6	51.2
Ten Years	51.6	50.9	51.3	53.7	51.7
Twenty Years	52.3	51.2	51.8	55.2	52.3

[1] "Worst Case" Return Projections assume a negative three standard deviation event (i.e., it encompasses >99% of possible outcomes).

Value at Risk[1]

Scenario	Quincy	PRIM	Combined	Proposed Quincy 7.5	Proposed Quincy 7.25
VaR (%):					
1 month	-8.8	-8.5	-8.7	-9.2	-8.6
3 months	-14.4	-14.0	-14.2	-15.0	-14.0
6 months	-19.2	-18.6	-18.9	-20.0	-18.6
VaR ($ mm):					
1 month	-9	-9	-9	-9	-9
3 months	-14	-14	-14	-15	-14
6 months	-19	-19	-19	-20	-19

Conditional Value at Risk[1]

Scenario	Quincy	PRIM	Combined	Proposed Quincy 7.5	Proposed Quincy 7.25
CVaR (%):					
1 month	-10.2	-9.8	-10.0	-10.6	-9.9
3 months	-16.7	-16.2	-16.4	-17.4	-16.2
6 months	-22.5	-21.7	-22.1	-23.4	-21.8
CVaR ($ mm):					
1 month	-10	-10	-10	-11	-10
3 months	-17	-16	-16	-17	-16
6 months	-23	-22	-22	-23	-22

[1] Calculated with a 99% confidence level and based upon Meketa Investment Group's Annual Asset Study. cVaR represents the average loss past the 99th percentile.

Historical Negative Scenario Analysis[1]
(*Cumulative* Return)

Scenario	Quincy (%)	PRIM (%)	Combined (%)	Proposed Quincy 7.5 (%)	Proposed Quincy 7.25 (%)
COVID-19 Market Shock (Feb 2020-Mar 2020)	-18.9	-16.6	-17.8	-19.5	-17.9
Taper Tantrum (May - Aug 2013)	-1.6	0.0	-0.8	-1.4	-1.5
Global Financial Crisis (Oct 2007 - Mar 2009)	-30.0	-27.2	-28.6	-31.5	-28.4
Popping of TMT Bubble (Apr 2000 - Sep 2002)	-15.9	-15.9	-15.9	-18.7	-14.8
LTCM (Jul - Aug 1998)	-9.9	-7.6	-8.8	-9.6	-8.6
Asian Financial Crisis (Aug 97 - Jan 98)	0.3	4.3	2.3	-0.4	0.7
Rate spike (1994 Calendar Year)	1.4	3.8	2.6	1.5	1.2
Early 1990s Recession (Jun - Oct 1990)	-7.2	-5.4	-6.3	-7.1	-6.5
Crash of 1987 (Sep - Nov 1987)	-12.5	-10.3	-11.4	-13.2	-11.9
Strong dollar (Jan 1981 - Sep 1982)	2.0	4.0	3.0	2.2	4.2
Volcker Recession (Jan - Mar 1980)	-4.7	-4.4	-4.6	-3.3	-3.3
Stagflation (Jan 1973 - Sep 1974)	-23.8	-22.0	-22.9	-24.8	-22.5

[1] See the Appendix for our scenario inputs. In periods where the ideal benchmark was not yet available we used the next closest benchmark(s) as a proxy.

Historical Positive Scenario Analysis[1]
(*Cumulative* Return)

Scenario	Quincy (%)	PRIM (%)	Combined (%)	Proposed Quincy 7.5 (%)	Proposed Quincy 7.25 (%)
GFC Recovery (Mar 2009 - Nov 2009)	40.5	32.9	36.7	40.9	38.0
Best of Great Moderation (Apr 2003 - Feb 2004)	33.8	29.3	31.6	35.8	32.8
Peak of the TMT Bubble (Oct 1998 - Mar 2000)	44.5	45.2	44.9	47.8	43.8
Plummeting Dollar (Jan 1986 - Aug 1987)	60.4	52.1	56.3	65.1	58.8
Volcker Recovery (Aug 1982 - Apr 1983)	34.4	31.9	33.1	34.9	33.8
Bretton Wood Recovery (Oct 1974 - Jun 1975)	31.0	28.5	29.7	32.3	30.4

[1] See the Appendix for our scenario inputs. In periods where the ideal benchmark was not yet available we used the next closest benchmark(s) as a proxy.

Stress Testing: Impact of Market Movements (Expected Return under Stressed Conditions)[1]

Scenario	Quincy (%)	PRIM (%)	Combined (%)	Proposed Quincy 7.5 (%)	Proposed Quincy 7.25 (%)
10-year Treasury Bond rates rise 100 bps	4.6	4.2	4.4	4.9	4.2
10-year Treasury Bond rates rise 200 bps	-0.9	-0.9	-0.9	-0.2	-0.9
10-year Treasury Bond rates rise 300 bps	-3.3	-3.9	-3.6	-2.5	-3.1
Baa Spreads widen by 50 bps, High Yield by 200 bps	0.5	0.8	0.6	0.5	0.7
Baa Spreads widen by 300 bps, High Yield by 1000 bps	-24.0	-21.2	-22.6	-24.4	-22.6
Trade Weighted Dollar gains 10%	-4.6	-3.3	-3.9	-5.0	-4.3
Trade Weighted Dollar gains 20%	-2.2	-0.6	-1.4	-1.7	-0.9
U.S. Equities decline 10%	-6.5	-6.2	-6.4	-6.8	-6.2
U.S. Equities decline 25%	-19.0	-17.4	-18.2	-19.4	-18.1
U.S. Equities decline 40%	-29.7	-26.2	-27.9	-30.3	-28.3

[1] Assumes that assets not directly exposed to the factor are affected nonetheless. See the Appendix for further details.

Stress Testing: Impact of Positive Market Movements (Expected Return under Stressed Conditions)[1]

Scenario	Quincy (%)	PRIM (%)	Combined (%)	Proposed Quincy 7.5 (%)	Proposed Quincy 7.25 (%)
10-year Treasury Bond rates drop 100 bps	2.5	2.8	2.7	2.2	2.5
10-year Treasury Bond rates drop 200 bps	12.8	11.3	12.0	12.7	12.5
Baa Spreads narrow by 30bps, High Yield by 100 bps	7.9	7.8	7.8	7.9	7.5
Baa Spreads narrow by 100bps, High Yield by 300 bps	15.4	12.6	14.0	14.7	14.0
Trade Weighted Dollar drops 10%	8.6	7.4	8.0	8.8	8.2
Trade Weighted Dollar drops 20%	24.7	22.1	23.4	26.7	24.7
U.S. Equities rise 10%	7.2	7.4	7.3	7.3	7.0
U.S. Equities rise 30%	18.0	16.7	17.3	18.6	17.5

[1] Assumes that assets not directly exposed to the factor are effected nonetheless. See the Appendix for further details.

Summary

- The assets invested in PRIM have a slightly lower expected return than the legacy Retirement System assets over which the Board has discretion.
- The combined portfolio has just below a 50% probability of achieving the System's 7.25% target return over the next 20 years.
- If the Board wishes to increase the expected return of the assets they control (and hence the combined portfolio), we suggest they consider the "7.5" option presented in this document.
  - The 7.5 option would increase both the expected return and the expected risk of the portfolio.
  - It does this primarily by shifting assets from credit into equities.
    - This includes the elimination of the target to emerging market bonds.
  - It also shifts some assets from bonds into CTA strategies.
- If the Board is comfortable with the current risk and return level, we suggest they consider the "7.25" option presented in this document.
  - The 7.25 option would likewise reduce the credit allocation.
    - This includes the elimination of the target to emerging market bonds.
  - It does this primarily by shifting assets from credit into equities.
  - It would slightly increase the US equity allocation, and it shifts assets from natural resources to infrastructure.
  - It also shifts some assets into CTA strategies.

Appendices

Horizon Study

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.
  - In the 2021 survey there were 39 respondents.
- The Horizon survey is a useful tool for Board members to determine whether their consultant's expectations for returns (and risk) are reasonable.

Asset Class	10-Year Average (%)	Meketa 10-Year (%)	20-Year Average (%)	Meketa 20-Year (%)
Cash Equivalents	1.2	0.7	1.9	1.1
TIPS	1.6	1.2	2.4	1.8
US Core Bonds	2.1	1.2	3.2	1.8
US High Yield Bonds	3.8	3.3	5.0	4.2
Emerging Market Debt	4.2	3.9	5.3	3.8
Private Debt	6.5	6.6	6.9	6.8
US Equity (large cap)	5.8	5.2	6.7	6.8
Developed Non-US Equity	6.4	6.7	7.1	7.1
Emerging Non-US Equity	7.2	7.5	7.8	8.1
Private Equity	8.8	8.0	9.6	9.1
Real Estate	5.5	6.5	6.2	6.9
Infrastructure	6.2	7.1	6.8	7.0
Commodities	3.1	3.4	4.0	3.7
Hedge Funds	4.5	3.4	5.3	4.3
Inflation	2.1	2.3	2.2	2.1

Notes and Disclaimers

[1] The returns shown in the Policy Options and Risk Analysis sections rely on estimates of expected return, standard deviation, and correlation developed by Meketa Investment Group. To the extent that actual return patterns to the asset classes differ from our expectations, the results in the table will be incorrect. However, our inputs represent our best unbiased estimates of these simple parameters.

[2] The returns shown in the Policy Options and Risk Analysis sections use a lognormal distribution, which may or may not be an accurate representation of each asset classes' future return distribution. To the extent that it is not accurate in whole or in part, the probabilities listed in the table will be incorrect. As an example, if some asset classes' actual distributions are even more right-skewed than the lognormal distribution (i.e., more frequent low returns and less frequent high returns), then the probability of the portfolio hitting a given annual return will be lower than that stated in the table.

[3] The standard deviation bars in the chart in the Risk Analysis section do not indicate the likelihood of a 1, 2, or 3 standard deviation event—they simply indicate the return we expect if such an event occurs. Since the likelihood of such an event is the same across allocations regardless of the underlying distribution, a relative comparison across policy choices remains valid.

Scenario Return Inputs

Asset Class	Benchmark Used
Investment Grade Bonds	Barclays Aggregate
TIPS	Barclays US TIPS
Intermediate-term Government Bonds	Barclays Treasury Intermediate
Long-term Government Bonds	Barclays Long US Treasury
EM Bonds (local)	JPM GBI-EM Global Diversified Composite
Bank Loans	CSFB Leveraged Loan
High Yield Bonds	Barclays High Yield
Direct Lending	Cliffwater Direct Lending Index
Mezzanine Debt	Preqin Associates Mezzanine
Distressed Debt	Preqin Distressed Debt Index
Core Real Estate	NCREIF Property
Value-Added RE	NCREIF Townsend Value Added
Opportunistic RE	NCREIF Townsend Opportunistic
REITs	NAREIT Equity
Infrastructure (private)	S&P Global Infrastructure
Natural Resources (private)	S&P Global Natural Resources
Timber	NCREIF Timberland
Commodities	Bloomberg Commodity Index
US Equity	Russell 3000
Public Foreign Equity (Developed)	MSCI EAFE
Public Foreign Equity (Emerging)	MSCI Emerging Markets
Private Equity	Preqin Private Equity Composite
Long-short Equity	HFRI Equity Hedge
Global Macro	HFRI Macro
Hedge Funds	HFRI Fund Weighted Composite
Private Debt	Weighted average of Distressed Debt, Mezzanine Debt and Direct Lending (2nd Lien)

Negative Historical Scenario Returns - Sample Inputs

	Covid-19 Market Shock (Feb 2020-Mar 2020)	Taper Tantrum (May Aug 2013)	Global Financial Crisis (Oct 2007 - Mar 2009)	Popping of the TMT Bubble (Apr 2000 Sep 2002)	LTCM (Jul - Aug 1998)
Cash Equivalents	0.4	0.0	2.6	9.9	0.8
Short-term Investment Grade Bonds	0.4	-0.1	7.9	21.9	1.6
Investment Grade Bonds	-0.9	-3.7	8.5	28.6	1.8
Long-term Corporate Bonds	-18.4	-9.3	-10.3	26.9	-0.6
Long-term Government Bonds	12.7	-11.6	24.2	35.5	4.1
TIPS	-0.4	-8.5	8.2	37.4	0.7
Global ILBs	-6.5	-7.4	-3.9	39.7	0.7
High Yield Bonds	-20.8	-2.0	-22.8	-6.3	-5.0
Bank Loans	-20.3	0.8	-23.7	6.3	0.7
Direct Lending	-4.8	2.6	-3.3	-2.6	-2.3
Foreign Bonds	-4.5	-3.2	2.1	8.5	3.5
Mezzanine Debt	-4.8	4.6	-26.4	-2.0	-2.6
Distressed Debt	-12.2	4.6	-26.4	-2.0	-2.6
Emerging Market Bonds (major)	-15.3	-11.5	-5.0	6.3	-28.2
Emerging Market Bonds (local)	-13.9	-14.3	-7.9	7.2	-34.1
US Equity	-35.0	3.0	-45.8	-43.8	-15.4
Developed Market Equity (non-US)	-32.7	-2.2	-52.1	-46.7	-11.5
Emerging Market Equity	-31.2	-9.4	-51.2	-43.9	-26.7
Global Equity	-33.6	-0.7	-49.3	-46.7	-14.0
Private Equity/Debt	-7.8	5.7	-27.7	-23.4	-3.2
Private Equity	-7.4	5.8	-28.2	-26.0	-3.3
Private Debt Composite	-10.1	4.6	-22.3	-1.7	-2.3
REITs	-41.0	-13.3	-63.0	45.4	-15.3
Core Private Real Estate	0.7	3.6	-10.6	23.6	2.3
Value-Added Real Estate	-3.5	3.8	-20.2	177.0	1.8
Opportunistic Real Estate	-8.6	4.0	-25.7	21.4	1.5
Natural Resources (Private)	-22.1	2.5	-31.2	-3.9	-16.9
Timberland	0.1	1.3	20.7	-1.5	0.5
Farmland	-0.1	3.3	26.7	11.4	0.8
Commodities (naïve)	-18.9	-2.4	-36.9	18.5	-12.0
Core Infrastructure	-1.3	3.7	-0.8	24.8	-0.3
Hedge Funds	-9.1	-0.4	-17.8	-2.1	-9.4
Long-Short	-10.9	1.0	-26.4	-8.8	-8.3
Hedge Fund of Funds	-7.6	-0.5	-19.5	-0.4	-7.7

Negative Historical Scenario Returns - Sample Inputs (continued)

	Rate spike (1994 Calendar Year)	Crash of 1987 (Sep - Nov 1987)	Strong dollar (Jan 1981 - Sep 1982)	Volcker Recession (Jan - Mar 1980)	Stagflation (Jan 1973 - Sep 1974)
Cash Equivalents	3.9	1.4	24.4	2.9	13.5
Short-term Investment Grade Bonds	0.5	2.3	29.9	-2.6	4.3
Investment Grade Bonds	-2.9	2.2	29.9	-8.7	7.9
Long-term Corporate Bonds	-5.8	1.5	29.6	-14.1	-12.0
Long-term Government Bonds	-7.6	2.6	28.4	-13.6	-1.8
TIPS	-7.5	2.8	15.6	-7.8	4.3
Global ILBs	-7.9	2.9	16.5	-8.3	4.5
High Yield Bonds	-1.0	-3.6	6.9	-2.3	-15.5
Bank Loans	10.3	-1.7	3.3	-1.1	-7.5
Direct Lending	7.6	-2.3	3.2	-1.0	-7.2
Foreign Bonds	5.3	-0.3	34.8	-6.5	-1.4
Mezzanine Debt	7.6	-2.3	3.2	-1.0	-7.2
Distressed Debt	7.6	-2.3	3.2	-1.0	-7.2
Emerging Market Bonds (major)	-18.9	-9.2	-1.6	-2.6	-20.2
Emerging Market Bonds (local)	-22.8	-11.0	-2.0	-3.2	-23.9
US Equity	1.3	-29.5	-2.3	-4.1	-42.6
Developed Market Equity (non-US)	7.8	-14.5	-18.0	-7.0	-36.3
Emerging Market Equity	-7.3	-25.3	-12.1	-6.6	-44.2
Global Equity	5.0	-21.5	-11.2	-5.8	-39.3
Private Equity/Debt	13.2	-0.7	-2.7	-2.5	-18.2
Private Equity	14.2	-0.5	-3.9	-2.7	-20.1
Private Debt Composite	6.2	-1.8	3.0	-1.0	-6.9
REITs	-3.5	-19.5	2.5	-3.6	-33.9
Core Private Real Estate	6.4	2.5	23.9	5.5	-4.4
Value-Added Real Estate	11.2	4.3	44.2	9.6	-7.6
Opportunistic Real Estate	18.8	3.1	30.7	7.0	-5.6
Natural Resources (Private)	12.6	-9.9	-9.5	-9.1	19.3
Timberland	15.4	9.2	23.6	-7.4	5.5
Farmland	9.4	5.3	13.3	-4.2	3.1
Commodities (naïve)	16.6	1.8	-16.0	-9.6	139.5
Core Infrastructure	-11.5	-0.1	-0.2	-0.1	-0.5
Hedge Funds	4.1	-7.8	-3.8	-1.9	-15.7
Long-Short	2.6	-10.0	-4.9	-2.5	-19.8
Hedge Fund of Funds	-3.5	-5.7	-2.7	-1.4	-11.5

Positive Historical Scenario Returns - Sample Inputs

	Global Financial Crisis Recovery (Mar 2009 - Nov 2009)	Best of Great Moderation (Apr 2003 - Feb 2004)	Peak of the TMT Bubble (Oct 1998 - Mar 2000)	Plummeting Dollar (Jan 1986 - Aug 1987)	Volcker Recovery (Aug 1982 - Apr 1983)	Bretton Wood Recovery (Oct 1974 - Jun 1975)
Cash Equivalents	0.1	0.9	6.7	10.0	6.0	4.5
Short-term Investment Grade Bonds	4.3	2.8	5.3	13.2	15.4	5.0
Investment Grade Bonds	9.0	4.6	1.7	14.4	26.4	9.2
Long-term Corporate Bonds	28.8	11.3	-3.1	15.9	42.1	17.5
Long-term Government Bonds	2.0	4.9	-2.3	15.4	33.6	11.8
TIPS	14.3	9.1	6.3	10.2	11.5	4.1
Global ILBs	24.7	9.6	6.6	10.8	12.1	4.3
High Yield Bonds	49.1	21.8	2.1	24.9	23.3	19.3
Bank Loans	32.9	10.1	6.1	11.1	10.4	8.7
Direct Lending	-0.2	26.8	8.2	8.3	23.7	-0.2
Foreign Bonds	23.4	15.2	-7.0	44.5	32.3	17.9
Mezzanine Debt	30.8	23.7	26.8	5.4	8.2	8.3
Distressed Debt	30.8	23.7	26.8	5.4	8.2	8.3
Emerging Market Bonds (major)	27.0	20.6	49.0	38.9	21.6	21.0
Emerging Market Bonds (local)	37.5	25.2	61.0	48.4	26.5	25.7
US Equity	51.6	37.2	50.2	64.8	59.3	55.1
Developed Market Equity (non-US)	60.5	56.7	53.0	140.0	29.6	34.6
Emerging Market Equity	94.6	79.4	101.3	126.5	52.1	53.4
Global Equity	59.9	46.2	54.8	108.4	43.0	44.6
Private Equity/Debt	15.4	23.3	84.6	19.1	13.7	18.4
Private Equity	13.0	23.7	92.1	21.7	14.8	20.2
Private Debt Composite	27.5	20.4	21.4	5.9	7.9	8.0
REITs	82.5	44.6	-5.2	51.8	47.4	42.5
Core Private Real Estate	-16.4	9.0	18.1	13.1	6.8	4.5
Value-Added Real Estate	-32.7	11.4	19.6	23.6	11.9	7.8
Opportunistic Real Estate	-19.0	13.6	27.9	16.7	8.6	5.7
Natural Resources (Private)	57.8	36.1	22.2	78.3	30.2	14.8
Timberland	-3.3	8.5	20.5	28.6	20.0	8.7
Farmland	5.4	9.6	10.4	15.9	11.3	5.0
Commodities (naïve)	28.9	30.6	17.1	27.6	6.2	-20.2
Core Infrastructure	2.1	8.5	33.0	1.4	0.6	0.6
Hedge Funds	20.1	22.4	52.8	30.6	13.8	14.5
Long-Short	25.9	25.3	81.4	40.8	18.0	18.9
Hedge Fund of Funds	10.3	13.3	36.8	21.3	9.7	10.3

'Anti' Stress Test Return Assumptions - Sample Inputs[1]

	10-year Treasury Bond rates drop 100 bps	10-year Treasury Bond rates drop 200 bps	Baa Spreads narrow by 30bps, High Yield by 100 bps	Baa Spreads narrow by 100bps, High Yield by 300 bps	Trade Weighted Dollar drops 10%	Trade Weighted Dollar drops 20%	US Equities rise 10%	US Equities rise 30%
Cash Equivalents	1.8	2.1	0.7	0.2	2.1	4.5	2.3	3.5
Short-term Investment Grade Bonds	3.6	5.5	0.5	2.0	1.5	3.3	0.8	1.8
Investment Grade Bonds	8.5	14.6	1.3	3.9	2.6	9.4	1.8	4.2
Long-term Corporate Bonds	18.1	32.8	3.9	14.5	5.5	15.6	3.5	7.8
Long-term Government Bonds	20.2	38.2	0.7	-0.6	1.9	22.2	3.6	6.8
TIPS	9.4	16.9	1.1	5.9	3.7	7.8	1.5	1.8
Global ILBs	3.1	6.4	2.0	7.4	5.8	8.4	1.7	2.8
High Yield Bonds	2.9	8.9	7.0	25.7	7.5	8.6	4.8	10.7
Bank Loans	-0.1	2.1	4.0	16.3	4.0	0.8	2.1	4.0
Direct Lending	-0.3	-0.2	4.8	5.7	1.5	3.0	1.6	2.5
Foreign Bonds	5.8	11.3	1.7	7.4	9.9	21.3	2.3	7.4
Mezzanine Debt	1.4	2.1	8.9	16.7	6.5	5.9	5.9	6.9
Distressed Debt	1.0	2.7	9.1	17.0	6.4	7.5	6.1	8.1
Emerging Market Bonds (major)	3.2	7.3	5.5	15.5	7.1	15.1	5.4	11.3
Emerging Market Bonds (local)	3.8	10.0	5.6	17.6	10.7	19.7	6.2	14.9
US Equity	3.6	15.2	11.0	18.7	7.3	24.4	10.0	30.0
Developed Market Equity (non-US)	-2.3	16.4	9.0	18.3	12.9	47.6	6.4	18.3
Emerging Market Equity	0.6	17.8	9.5	34.3	19.5	47.9	9.3	29.8
Global Equity	0.8	15.1	9.3	19.6	10.7	35.6	8.3	25.0
Private Equity/Debt	2.1	4.3	10.1	9.5	6.9	16.3	10.3	11.9
Private Equity	2.2	4.3	10.1	8.3	6.7	16.9	11.0	12.5
Private Debt Composite	0.8	1.7	7.6	12.8	4.7	5.6	4.5	5.8
REITs	2.8	14.5	9.3	27.1	5.9	25.5	10.0	22.7
Core Private Real Estate	0.9	1.5	4.6	-3.5	1.3	5.2	3.0	3.3
Value-Added Real Estate	2.7	6.3	5.4	-9.3	0.9	12.0	6.0	7.0
Opportunistic Real Estate	0.1	3.8	5.7	-5.4	-0.3	10.8	4.6	5.7
Natural Resources (Private)	-1.0	11.1	9.4	31.0	16.2	26.5	8.5	16.8
Timberland	6.5	9.1	4.9	-0.6	3.9	12.5	6.2	5.9
Farmland	3.2	4.2	6.7	3.8	3.5	7.8	5.2	4.3
Commodities (naïve)	-2.5	-3.2	2.5	9.8	13.1	-2.5	3.1	1.8
Core Infrastructure	0.8	-4.3	7.1	4.8	3.5	-2.3	2.0	2.9
Hedge Funds	3.4	4.8	5.7	11.3	5.6	9.2	5.5	9.2
Long-Short	3.4	5.7	6.6	12.3	7.2	14.7	6.8	12.2
Hedge Fund of Funds	2.5	3.9	4.8	10.2	4.7	8.1	4.7	8.2

[1] Assumptions are based on performance for each asset class during historical periods that resembled these situations.

Stress Test Return Assumptions – Sample Inputs[1]

	10-year Treasury Bond rates rise 100 bps	10-year Treasury Bond rates rise 200 bps	10-year Treasury Bond rates rise 300 bps	Baa Spreads widen by 50 bps, High Yield by 200 bps	Baa Spreads widen by 300 bps, High Yield by 1000 bps	Trade Weighted Dollar gains 10%	Trade Weighted Dollar gains 20%	US Equities decline 10%	US Equities decline 25%	US Equities decline 40%
Cash Equivalents	1.3	1.0	0.7	2.8	1.1	4.0	1.3	3.1	2.3	0.4
Short-term Investment Grade Bonds	-0.2	-2.1	-4.0	2.2	1.5	1.2	1.4	1.3	0.7	0.8
Investment Grade Bonds	-3.9	-10.0	-16.2	3.9	-0.4	1.7	4.2	2.4	0.7	-1.0
Long-term Corporate Bonds	-10.8	-25.1	-39.4	2.6	-13.1	1.0	7.8	0.5	-8.0	-11.7
Long-term Government Bonds	-15.5	-33.2	-50.9	7.8	7.3	3.7	12.8	3.0	2.6	2.4
TIPS	-5.4	-12.9	-20.3	2.8	-6.1	-2.1	-0.2	2.6	-2.3	-8.7
Global ILBs	-2.0	-7.9	-11.9	2.4	-11.1	-3.1	-4.8	2.8	-5.4	-16.3
High Yield Bonds	2.2	-3.4	-3.6	-1.8	-23.0	-3.5	-0.6	-4.9	-15.5	-21.2
Bank Loans	1.0	-0.7	-5.2	-2.7	-20.3	-3.1	-0.5	-3.6	-12.8	-16.9
Direct Lending	-0.3	-3.5	-6.2	-1.6	-7.8	-3.9	0.1	-3.8	-6.8	-5.1
Foreign Bonds	-4.6	-9.8	-15.7	6.6	-2.9	-3.3	-8.8	1.8	-4.6	-9.2
Mezzanine Debt	3.2	-0.9	-6.1	-1.9	-19.0	-2.7	-5.9	-4.7	-15.3	-20.1
Distressed Debt	3.0	-1.1	-6.3	-2.2	-21.0	-3.4	-8.5	-5.3	-16.9	-21.5
Emerging Market Bonds (major)	0.8	-4.8	-3.6	-0.1	-14.3	-1.1	-3.8	-3.2	-12.0	-14.7
Emerging Market Bonds (local)	1.6	-5.2	-3.0	0.0	-13.2	-1.7	-12.7	-3.0	-13.8	-21.2
US Equity	5.7	0.9	2.8	-1.1	-31.6	-2.4	1.9	-10.0	-25.0	-40.0
Developed Market Equity (non-US)	8.0	3.1	-5.6	0.3	-35.1	-12.9	-9.0	-8.7	-23.4	-41.4
Emerging Market Equity	9.3	5.5	0.1	-1.1	-42.8	-15.1	-15.7	-11.9	-30.8	-46.9
Global Equity	6.5	2.1	-0.6	-0.6	-33.3	-8.2	-5.7	-9.5	-24.6	-40.3
Private Equity/Debt	4.8	0.9	-5.5	-0.1	-22.1	-4.1	-6.8	-10.0	-22.1	-25.0
Private Equity	5.1	1.1	-5.3	0.0	-22.3	-3.9	-6.0	-10.8	-22.9	-25.3
Private Debt Composite	1.9	-2.0	-6.2	-1.7	-15.4	-3.3	-3.9	-4.5	-12.5	-14.7
REITs	3.1	-3.5	1.2	-3.8	-37.3	-1.0	12.4	-6.5	-32.8	-55.7
Core Private Real Estate	2.4	2.7	4.8	2.0	-6.7	1.3	9.4	-0.1	-8.2	-13.5
Value-Added Real Estate	4.5	7.3	13.7	7.2	-12.8	14.1	6.8	1.5	-13.1	-22.1
Opportunistic Real Estate	3.7	6.5	9.6	1.1	-19.9	1.1	15.1	-1.4	-16.6	-25.5
Natural Resources (Private)	12.2	6.0	-3.7	-0.8	-26.6	-6.0	-19.7	-5.1	-20.0	-34.4
Timberland	1.4	1.6	-9.8	5.0	6.8	2.5	8.3	0.0	2.6	3.9
Farmland	2.4	-0.1	-9.2	3.9	10.1	0.8	8.0	0.6	4.9	10.3
Commodities (naïve)	27.4	13.8	-0.8	-5.7	-57.0	-15.5	-31.2	-4.3	-34.1	-58.0
Core Infrastructure	0.2	-6.4	-6.1	1.2	0.1	-1.8	3.6	-1.1	-5.0	-7.8
Hedge Funds	2.1	-1.4	-5.2	-0.5	-14.2	-1.9	-1.3	-4.2	-11.9	-15.3
Long-Short	4.2	-0.6	-4.2	-0.1	-20.5	-2.8	-3.8	-7.1	-17.2	-22.8
Hedge Fund of Funds	1.3	-2.1	-5.7	-1.3	-14.5	-2.6	-2.0	-4.8	-12.3	-15.6

[1] Assumptions are based on performance for each asset class during historical periods that resembled these situations.

Trend Following Primer

What is Trend Following?

- Trend following strategies attempt to profit by identifying global market trends and taking long or short positions based on the direction of those trends.
  - Buy what is going up; sell what is going down.
  - Trades based on market price movement, not market fundamentals

- Strategy summary:
  - Systematic rules-based implementation
  - Scalable at the institutional level
  - Strategy volatilities range from ~8-20% (equity volatility is ~15-20%)
  - Trades futures and forwards across; equities, fixed income, currencies, and commodities
  - May also be referred to as managed futures or CTAs (commodity trading advisors)
  - Positive expected return
  - No structural long- or short-bias
  - Historically provide positive returns during large equity drawdowns
  - Uncorrelated to equity risk and other major market risks (correlation based hedge)
  - Highly liquid and low fee options are available
  - Live track records of 20+ years for some managers

History of Trend Following

- Trend following strategies have been utilized for decades
  - *"Cut short your losses, let your profits run on" – David Ricardo, The Great Metropolis, 1838*
  - Dow Theory, originated by Charles Dow through a series of articles from 1899 to 1902
  - *"big money was not in the individual fluctuations but in … sizing up the entire market and its trend" – Jesse Livermore, Lefevre, 1923*

- Example Manager Live Track Records
  - Millburn Diversified = 1977
  - Chesapeake Diversified = 1988
  - Transtrend = 1992
  - FORT Global Trend = 1993
  - Winton Diversified = 1997
  - AHL Alpha = 1995
  - Aspect Diversified = 1998
  - SG Trend Index = 2000
  - Systematica BlueTrend = 2004
  - Graham Tactical Trend = 2006
  - AQR Managed Futures = 2009

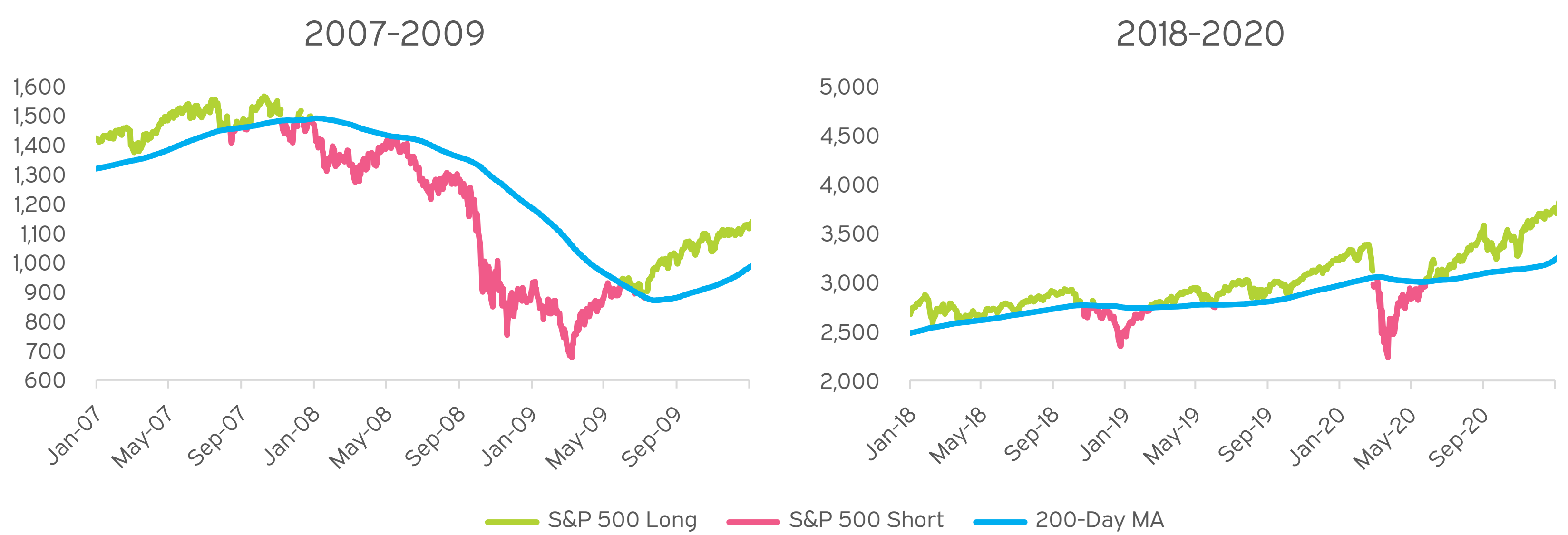
Why do Markets Trend?

- Behavioral Perspective:
  - Informational access or processing differences
  - Confirmation bias
  - Under / over reaction to news
  - Feedback loops
  - Herding
- Economic Perspective:
  - Companies hedging price risks
  - Government and central bank policies used to influence economic growth
  - Time varying risk premia
- Institutional Perspective:
  - Hedge fund risk systems (e.g., stop-losses) may exacerbate price declines
  - Delta hedging (buying more of assets as the price goes up and selling more as prices decline)
  - Flows or rebalancing driven triggers

How are trends identified?

- Moving average crossovers are the most common basic example of trend following
- Loses money when trends reverse and makes money as they continue

Moving Average Crossover Example: S&P 500



Characteristics of Trend Following

- Trend following strategies are managed using a systematic repeatable process with no structural long or short-bias to equities, fixed income, currencies, or commodities.

- Time series data
- Volatility estimates
- Correlation estimates
- Signal lookback length
- Markets traded

- Target volatility
- Market and sector constraints
- Stop losses & position modifiers

- Final Portfolio / Positions

MEKETA

History of Trend Following

- There has been a significant amount of academic research completed which reviews and assesses the efficacy of trend following strategies across 100+ years
  - "*...time-series momentum has been consistently profitable throughout the past 137 years.*" – A Century of Evidence on Trend-Following Investing, Hurst, Brian and Ooi, Yao Hua and Pedersen, Lasse Heje,
  - "*...time series momentum profits are positive, not just on average across these assets, but for every asset contract we examine...*" – Time series momentum, Tobias J. Moskowitz, Yao Hua Ooi, Lasse Heje Pedersen, Journal of Financial Economics 2012

- Historically were only available through a traditional 2% / 20% hedge fund structure
  - What was once thought to be "alpha" can now be obtained as "beta"
  - Managers are primarily hired due to strategy design and implementation

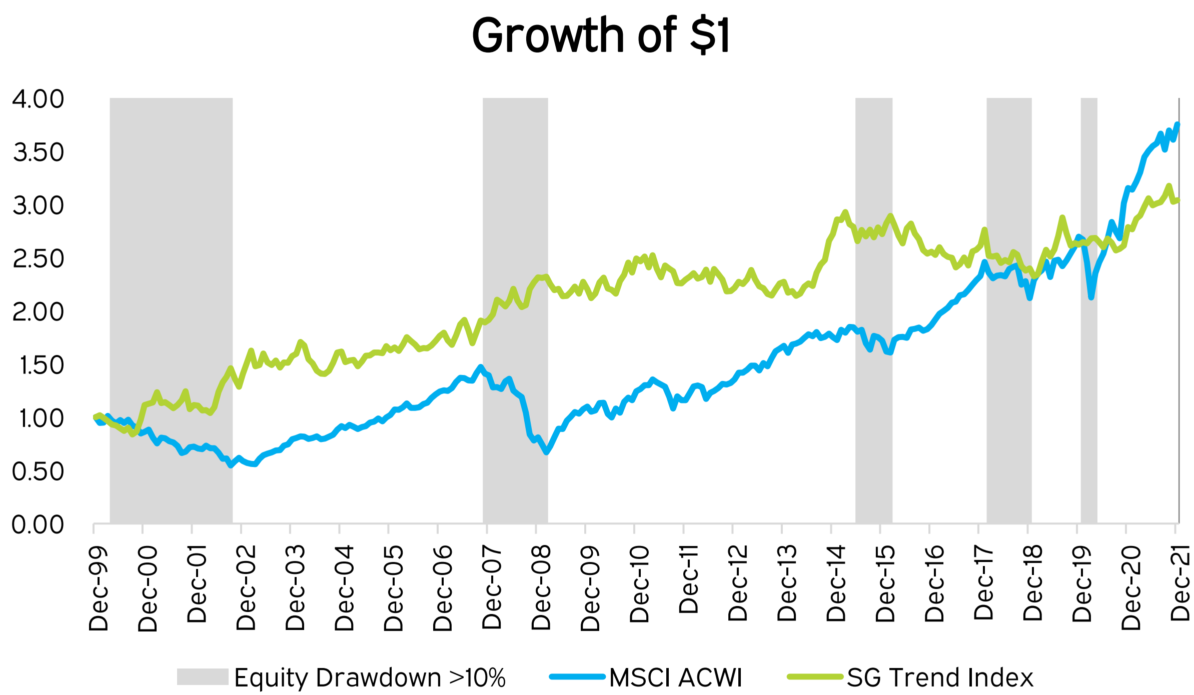
- A wide array of implementation is now available through liquid low fee structures

- Large scale institutions have been investing in trend following for over two decades

- US Pension Plans have invested billions of dollars into trend following strategies as a part of Risk Mitigating Strategies portfolios

Performance Characteristics: Full Cycle Returns

- SG Trend Index = Manager index / composite of 10 largest trend followers
- Trend Following has historically provided diversification to equities



Year	MSCI ACWI	SG Trend Index
2000	-14%	12%
2001	-16%	0%
2002	-19%	26%
2003	35%	12%
2004	16%	3%
2005	11%	1%
2006	22%	8%
2007	12%	9%
2008	-42%	21%
2009	35%	-5%
2010	13%	13%
2011	-7%	-8%
2012	17%	-4%
2013	23%	3%
2014	5%	20%
2015	-2%	0%
2016	9%	-6%
2017	25%	2%
2018	-9%	-8%
2019	27%	9%
2020	17%	6%
2021	19%	9%
Ann. Return	6.2%	5.2%
Monthly StDev	15.6%	13.5%
Return / Risk	0.40	0.38

Source: Societie Générale, MSCI

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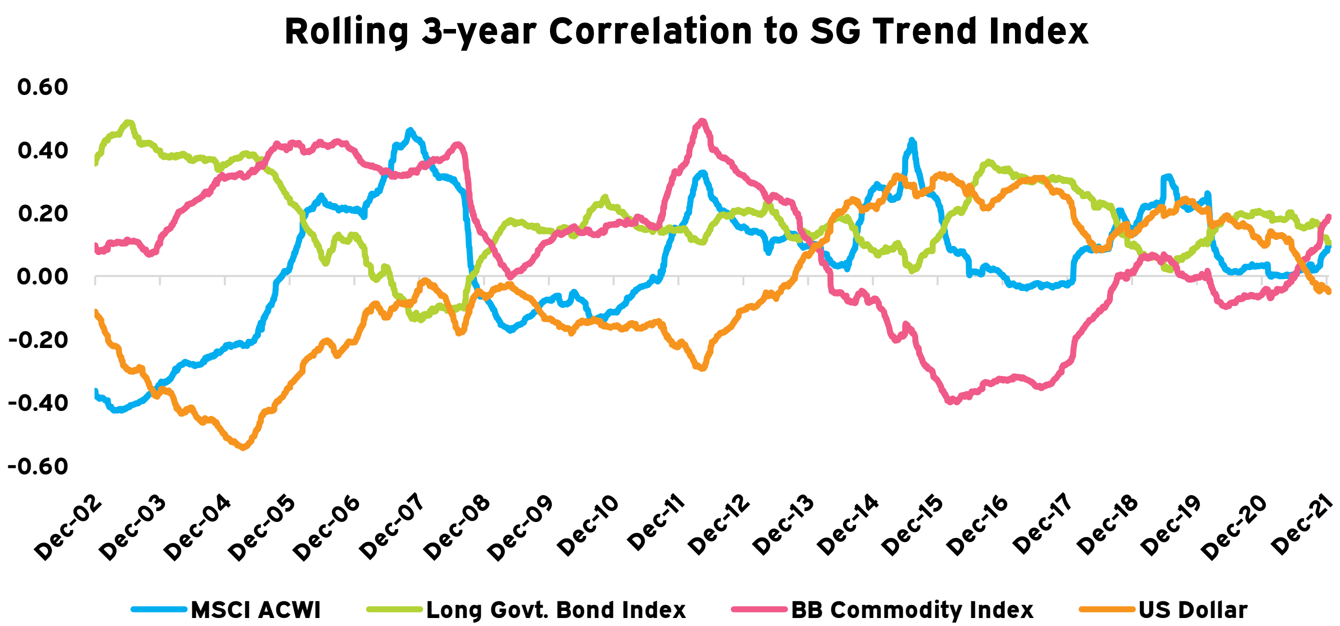
Performance Characteristics: Correlations

- With no structural long or short bias, trend following in aggregate exhibits low to no correlation on average to major market risks.

- Correlations to equities are also commonly negative during periods of equity drawdowns

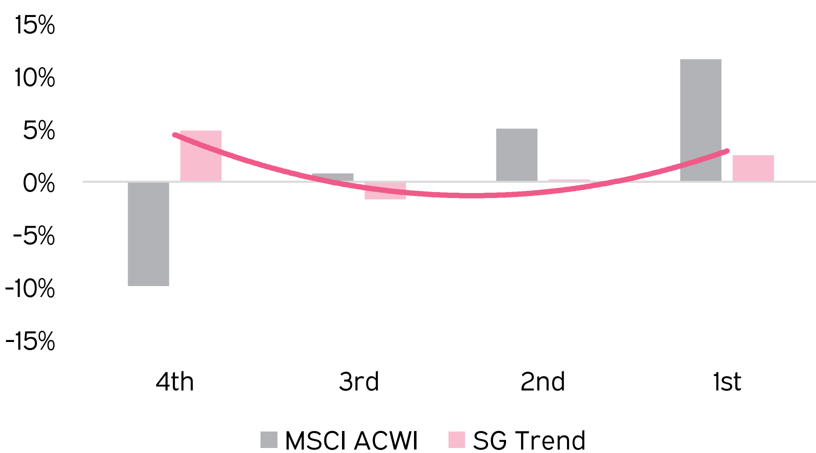


Source: Societie Générale, MSCI, Bloomberg

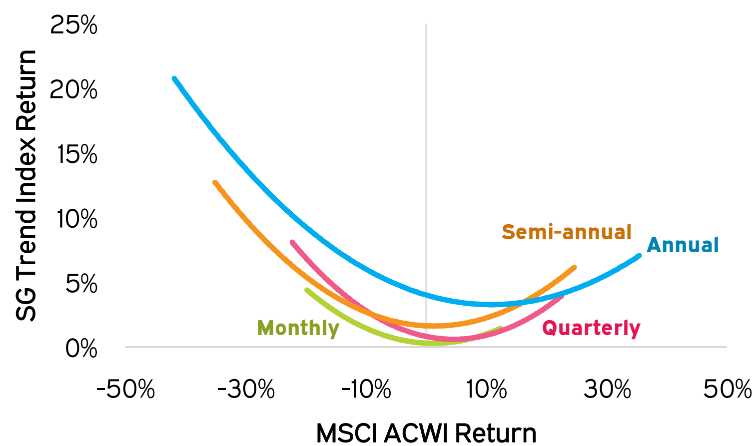
Performance Characteristics: Crisis Alpha

- Trend following has exhibited a negative conditional correlation to equity markets during drawdown periods resulting in a convex return profile.
- The best returns for trend following strategies have typically occurred during the best and worst periods for equities.
- Given trend following focuses on medium-to-long-term trends (6- to 12-months) the convexity profile of trend following is more attractive at longer time horizons, during trends that are more sustained than 1- to 3-month oscillations

Average Quarterly Return by Equity Quartile 2000-2021



Convexity by Time Horizon 2000-2021



Source: Societie Générale, MSCI

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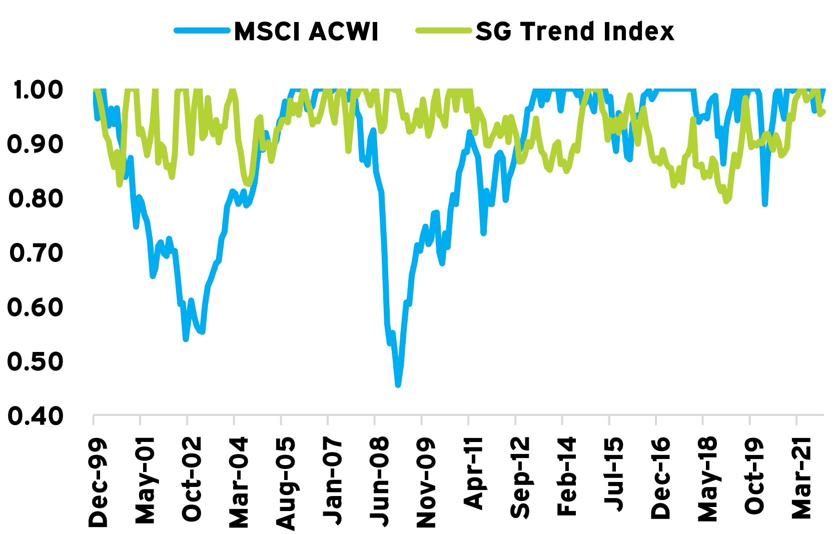
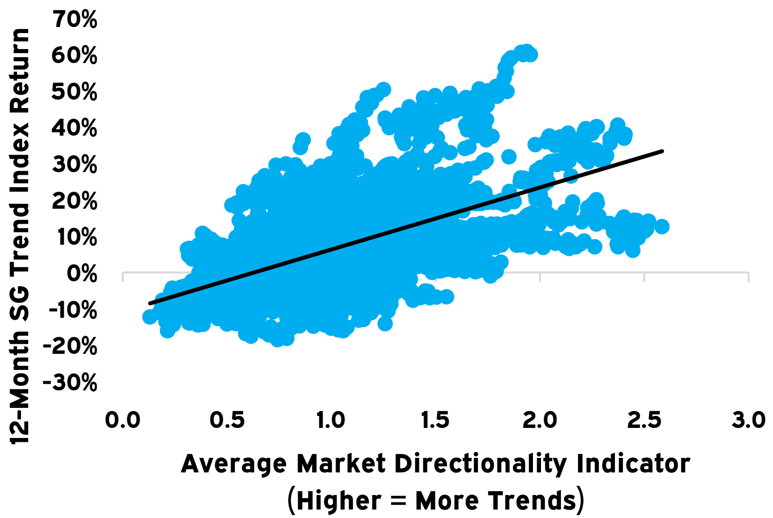
When does trend underperform?

- Trend following typically underperforms in sideways markets or at fulcrum points when markets reverse up (or down) after a sustained trend, creating a drawdown profile that is complimentary to equities
- When volatility is high and returns are range-bound, trend following strategies struggle
  - This is observed by plotting an average directional market indicator (average across equities, fixed income, and currencies and commodities) versus trend following returns where a higher value is the result of larger market moves (long or short) and / or low volatility during the move.

Historical Drawdown Profile



Directional Indicator



Source: Societie Générale, MSCI, Bloomberg, Graham Capital

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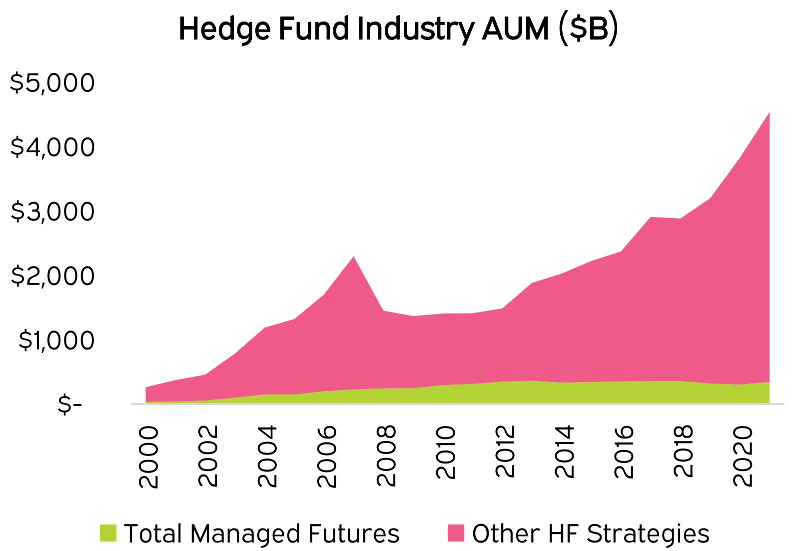
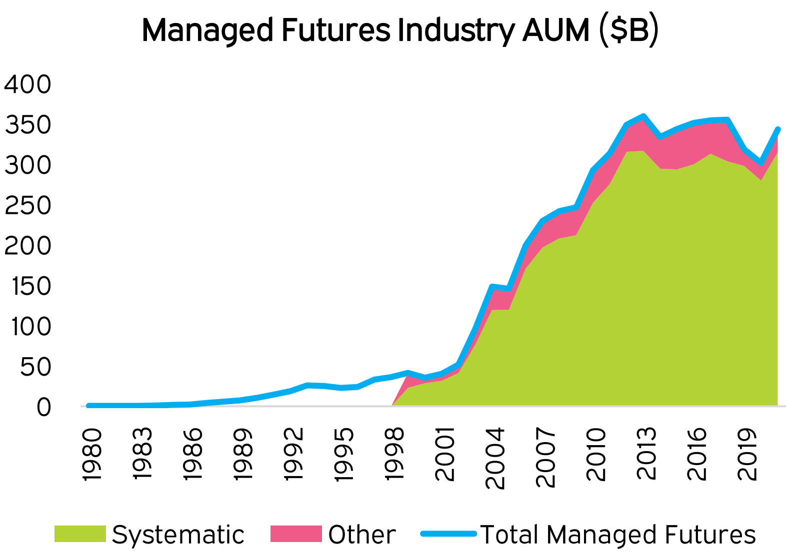
Types of Trend Followers

- By lookback:
  - Short-term (<1-month, or at most <3-months)
  - Medium-term (3- to 6-months) to long-term (6- to 12-months)
- By markets:
  - Traditional = ~60 futures and forwards across equities, fixed income, currencies, and commodities
  - Alternative = ~200 markets including emerging markets, OTC contracts, esoteric commodities, etc.
- By Fee:
  - Replication = ~25-50bps
  - Basic Trend = ~50-100bps
  - "Alpha" Trend = ~100-200bps and incentive fee
- By volatility targeting method:
  - Constant notional or volatility target
  - Range bound depending on market dynamics
- Other common alterations:
  - Capping equity beta
  - Limiting long equity exposure
  - Excluding equities or commodities (due to regulatory constraints)

Size of Managed Futures Market

- The universe of trend following strategies can be proxied by the managed futures industry in total which grew significantly between 2001 and 2013
- However, managed futures (or trend following) still only makes up a small proportion of the total hedge fund industry
- There are approximately 20-30 institutional managers which offer trend following solutions





Source: Barclay Hedge

Trend and Momentum

- Many consider trend and momentum to be interchangeable terms
- However, when describing and reviewing investment strategies trend usually refers to time-series momentum, while momentum refers to cross-sectional momentum
- While highly correlated, there are important distinctions to draw between the two strategies

Trend	Momentum
Time-series momentum	Cross-sectional momentum
Looks at own history to find trends	Relative to other assets
Directional Portfolio	Market Neutral Portfolio
Varying market exposure	No market exposure
Multi-asset class index factor	Single stock risk premia or style factor

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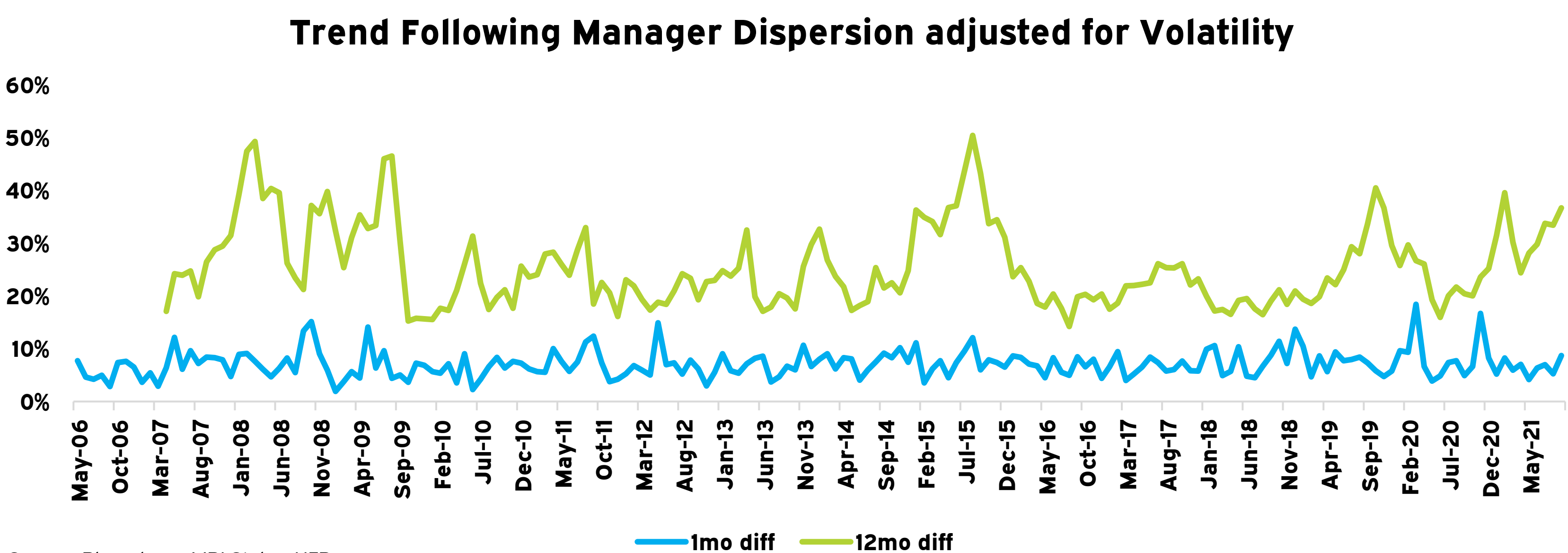
Manager Dispersion

- There is a significant amount of dispersion in returns across trend following strategies
- Accurate ranked manager selection is difficult in this space but are usually clear tiers of managers that can be identified (e.g. high quality, average, low quality)
- Dispersion can be heavily influence by signal lookbacks, markets traded, and volatility targets.
- Dispersion is across 25 CTA Trend Following Strategies selected by Meketa as peers



Source: Bloomberg, MPI Stylus, HFR

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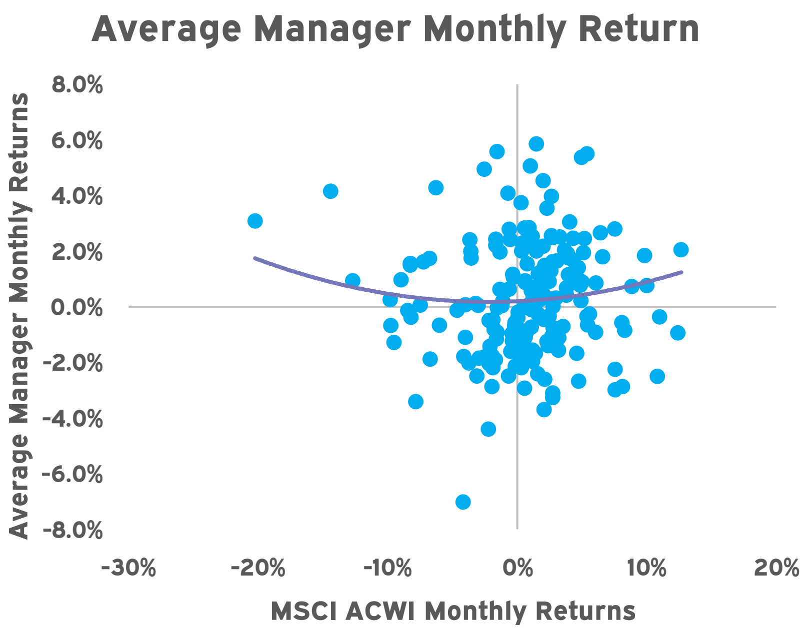
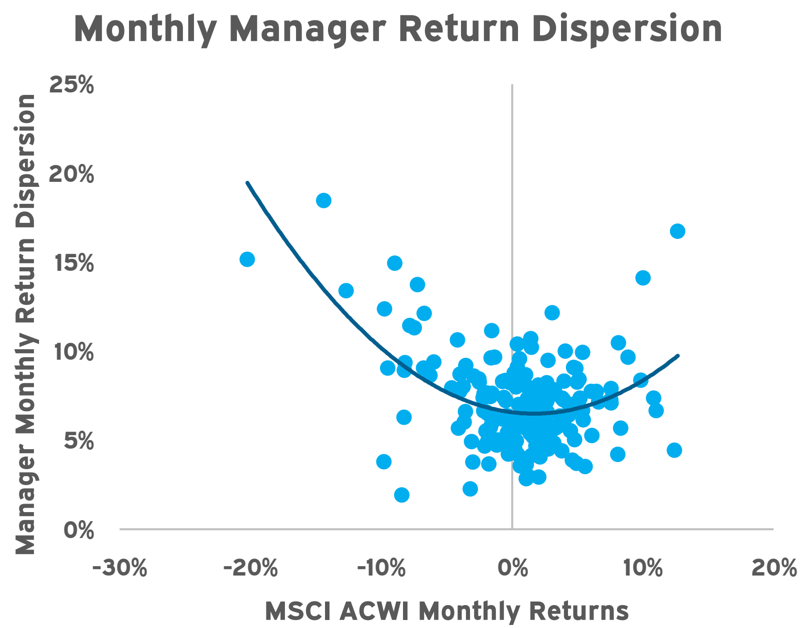
Manager Dispersion

- As we know, trend following managers typically present a convex profile compared to equity performance [left graph].
- The common narrative is that all manager will capture negative equity events similarly
- However, the highest dispersion across strategies typically occurs during the largest market moves [right graph].





Source: Bloomberg, MPI Stylus, HFR

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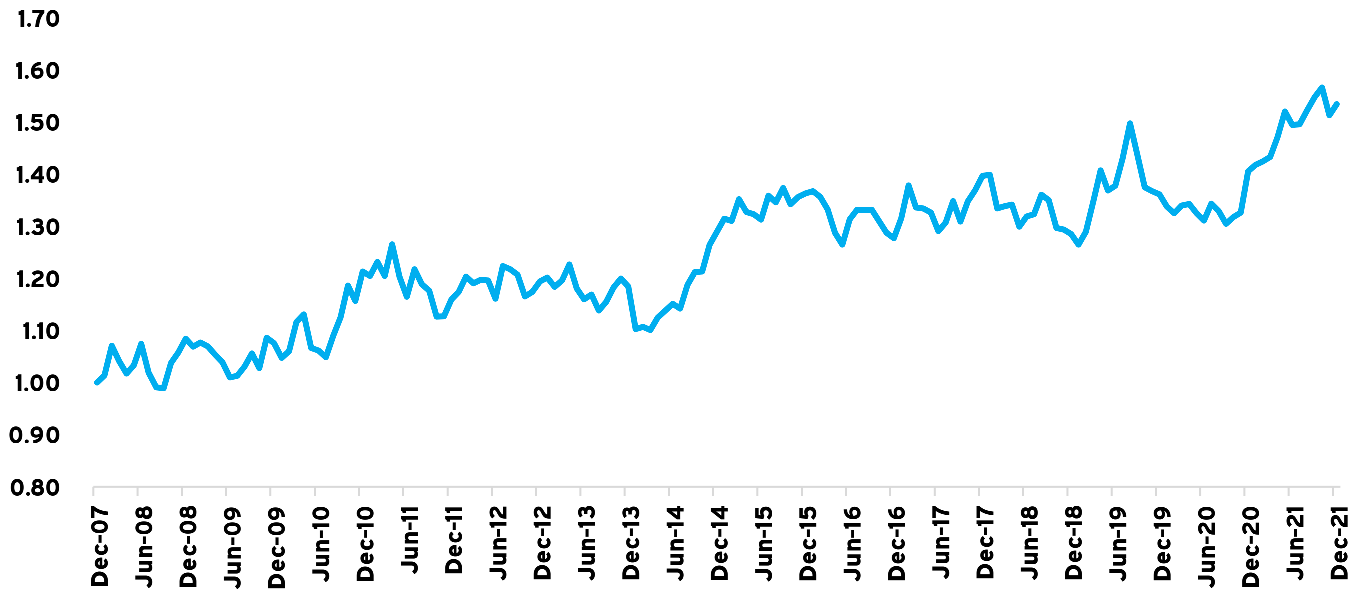
Signal Speed & Dispersion

- We expect that longer trend lookbacks will outperform on average over extended time horizons given their higher Sharpe Ratio, but there can be significant periods of dispersion across managers on the basis of how fast or slow the underlying models are.
- Shorter term signals often outperform during periods where there are significant changes in market volatility but underperform over the long-term

Long-Term minus Short-Term CTA Performance Growth of $1
(SG Trend Index minus SG Short Term Traders Index)



Source: Societie Générale

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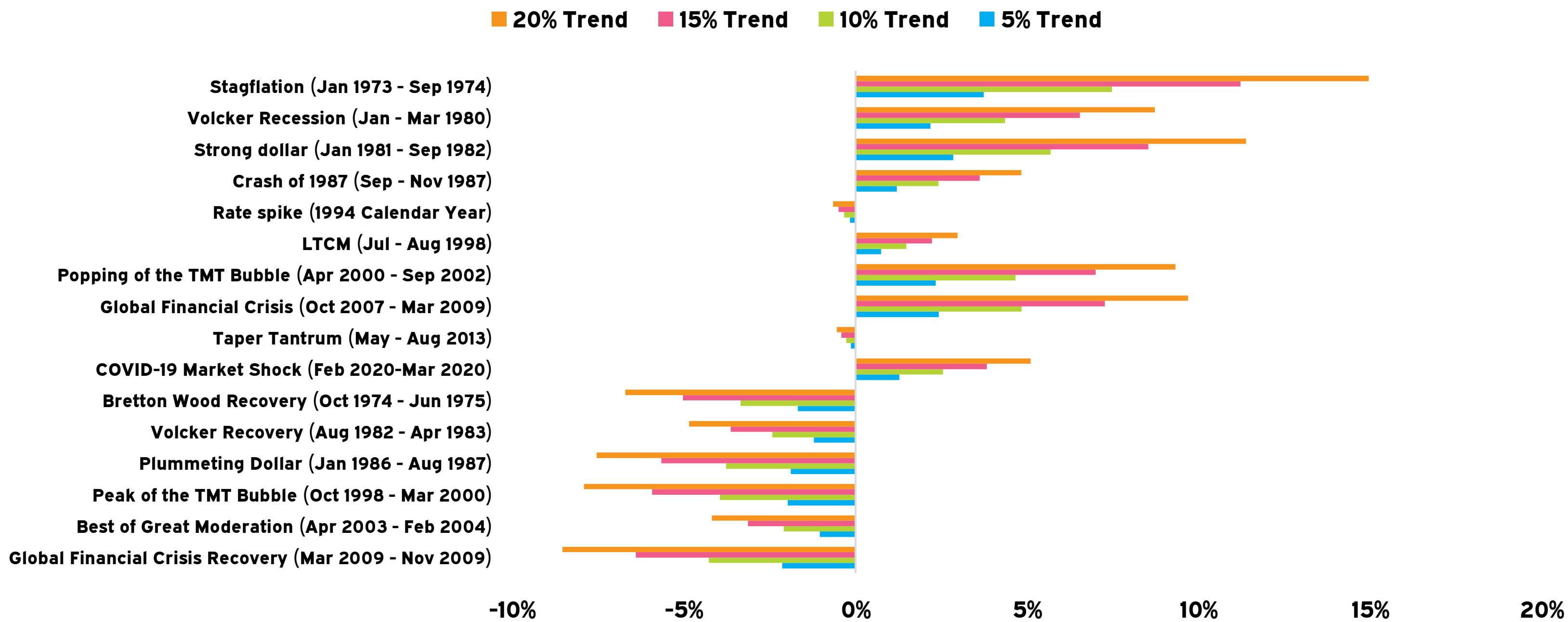
Trend Following Role In Asset Allocation

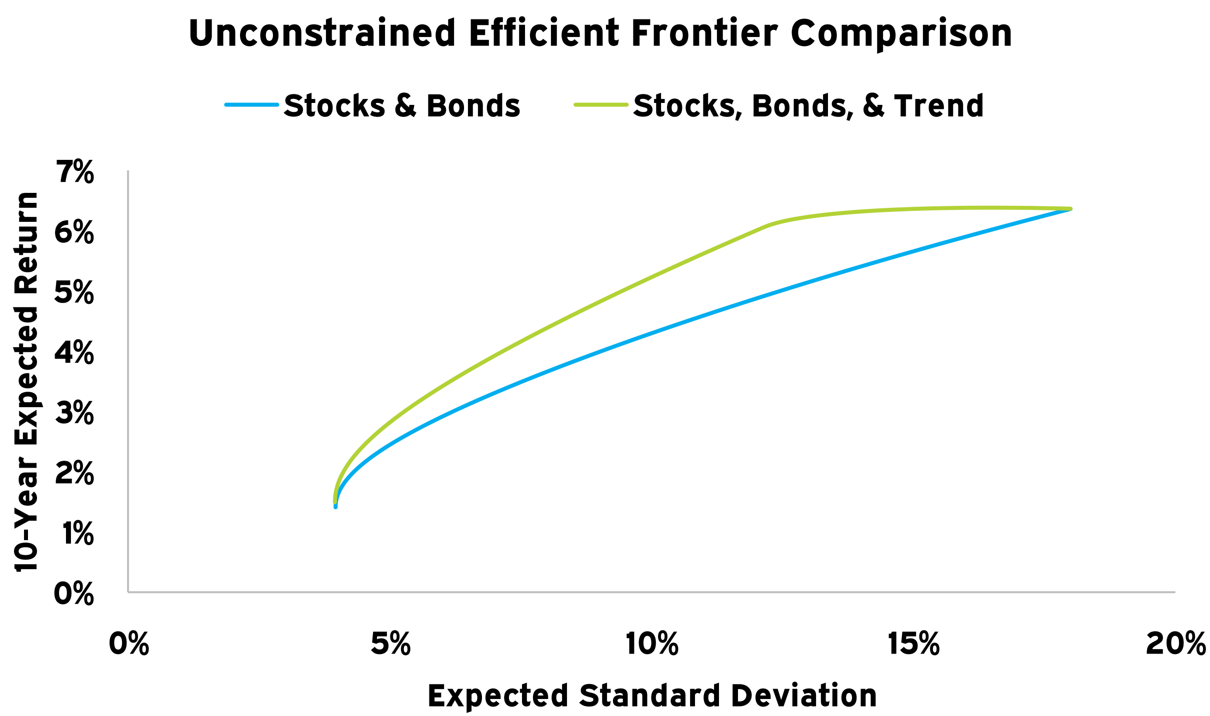
- Using Meketa's 2021 Capital Market Assumptions, the inclusion of trend following in a traditional 70% Global Equity, 30% Investment Grade Bonds portfolio is expected to improve the worst case scenarios and reduce the best case scenarios, reducing the tails of both sides of the distribution.

Historical Scenario Analysis:
Impact of Including Trend to a 70/30 Portfolio



Trend Following Role In Asset Allocation

- By reducing both the left and right tails of the distribution, the inclusion of trend following is expected to provide a more efficient set of portfolio for investors consider when compared to the traditional equity and fixed income opportunity set.



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Credit Risk: Refers to the risk that the issuer of a fixed income security may default (i.e., the issuer will be unable to make timely principal and/or interest payments on the security.)

Duration: Measure of the sensitivity of the price of a bond to a change in its yield to maturity. Duration summarizes, in a single number, the characteristics that cause bond prices to change in response to a change in interest rates. For example, the price of a bond with a duration of three years will rise by approximately 3% for each 1% decrease in its yield to maturity. Conversely, the price will decrease 3% for each 1% increase in the bond's yield. Price changes for two different bonds can be compared using duration. A bond with a duration of six years will exhibit twice the percentage price change of a bond with a three-year duration. The actual calculation of a bond's duration is somewhat complicated, but the idea behind the calculation is straightforward. The first step is to measure the time interval until receipt for each cash flow (coupon and principal payments) from a bond. The second step is to compute a weighted average of these time intervals. Each time interval is measured by the present value of that cash flow. This weighted average is the duration of the bond measured in years.

Information Ratio: This statistic is a measure of the consistency of a portfolio's performance relative to a benchmark. It is calculated by subtracting the benchmark return from the portfolio return (excess return), and dividing the resulting excess return by the standard deviation (volatility) of this excess return. A positive information ratio indicates outperformance versus the benchmark, and the higher the information ratio, the more consistent the outperformance.

Jensen's Alpha: A measure of the average return of a portfolio or investment in excess of what is predicted by its beta or "market" risk. Portfolio Return- [Risk Free Rate+Beta*(market return-Risk Free Rate)].

Market Capitalization: For a firm, market capitalization is the total market value of outstanding common stock. For a portfolio, market capitalization is the sum of the capitalization of each company weighted by the ratio of holdings in that company to total portfolio holdings; thus it is a weighted-average capitalization. Meketa Investment Group considers the largest 65% of the broad domestic equity market as large capitalization, the next 25% of the market as medium capitalization, and the smallest 10% of stocks as small capitalization.

Market Weighted: Stocks in many indices are weighted based on the total market capitalization of the issue. Thus, the individual returns of higher market-capitalization issues will more heavily influence an index's return than the returns of the smaller market-capitalization issues in the index.

Maturity: The date on which a loan, bond, mortgage, or other debt/security becomes due and is to be paid off.

Prepayment Risk: The risk that prepayments will increase (homeowners will prepay all or part of their mortgage) when mortgage interest rates decline; hence, investors' monies will be returned to them in a lower interest rate environment. Also, the risk that prepayments will slow down when mortgage interest rates rise; hence, investors will not have as much money as previously anticipated in a higher interest rate environment. A prepayment is any payment in excess of the scheduled mortgage payment.

Price-Book Value (P/B) Ratio: The current market price of a stock divided by its book value per share. Meketa Investment Group calculates P/B as the current price divided by Compustat's quarterly common equity. Common equity includes common stock, capital surplus, retained earnings, and treasury stock adjusted for both common and nonredeemable preferred stock. Similar to high P/E stocks, stocks with high P/B's tend to be riskier investments.

Price-Earnings (P/E) Ratio: A stock's market price divided by its current or estimated future earnings. Lower P/E ratios often characterize stocks in low growth or mature industries, stocks in groups that have fallen out of favor, or stocks of established blue chip companies with long records of stable earnings and regular dividends. Sometimes a company that has good fundamentals may be viewed unfavorably by the market if it is an industry that is temporarily out of favor. Or a business may have experienced financial problems causing investors to be skeptical about is future. Either of these situations would result in lower relative P/E ratios. Some stocks exhibit above-average sales and earnings growth or expectations for above average growth. Consequently, investors are willing to pay more for these companies' earnings, which results in elevated P/E ratios. In other words, investors will pay more for shares of companies whose profits, in their opinion, are expected to increase faster than average. Because future events are in no way assured, high P/E stocks tend to be riskier and more volatile investments. Meketa Investment Group calculates P/E as the current price divided by the I/B/E/S consensus of twelve-month forecast earnings per share.

Quality Rating: The rank assigned a security by such rating services as Fitch, Moody's, and Standard & Poor's. The rating may be determined by such factors as (1) the likelihood of fulfillment of dividend, income, and principal payment of obligations; (2) the nature and provisions of the issue; and (3) the security's relative position in the event of liquidation of the company. Bonds assigned the top four grades (AAA, AA, A, BBB) are considered investment grade because they are eligible bank investments as determined by the controller of the currency.

Sharpe Ratio: A commonly used measure of risk-adjusted return. It is calculated by subtracting the risk free return (usually three-month Treasury bill) from the portfolio return and dividing the resulting excess return by the portfolio's total risk level (standard deviation). The result is a measure of return per unit of total risk taken. The higher the Sharpe ratio, the better the fund's historical risk adjusted performance.

STIF Account: Short-term investment fund at a custodian bank that invests in cash-equivalent instruments. It is generally used to safely invest the excess cash held by portfolio managers.

Standard Deviation: A measure of the total risk of an asset or a portfolio. Standard deviation measures the dispersion of a set of numbers around a central point (e.g., the average return). If the standard deviation is small, the distribution is concentrated within a narrow range of values. For a normal distribution, about two thirds of the observations will fall within one standard deviation of the mean, and 95% of the observations will fall within two standard deviations of the mean.

Style: The description of the type of approach and strategy utilized by an investment manager to manage funds. For example, the style for equities is determined by portfolio characteristics such as price-to-book value, price-to-earnings ratio, and dividend yield. Equity styles include growth, value, and core.

Tracking Error: A divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark, as defined by the difference in standard deviation.

Yield to Maturity: The yield, or return, provided by a bond to its maturity date; determined by a mathematical process, usually requiring the use of a "basis book." For example, a 5% bond pays $5 a year interest on each $100 par value. To figure its current yield, divide $5 by $95—the market price of the bond—and you get 5.26%. Assume that the same bond is due to mature in five years. On the maturity date, the issuer is pledged to pay $100 for the bond that can be bought now for $95. In other words, the bond is selling at a discount of 5% below par value. To figure yield to maturity, a simple and approximate method is to divide 5% by the five years to maturity, which equals 1% pro rata yearly. Add that 1% to the 5.26% current yield, and the yield to maturity is roughly 6.26%.

$$\frac{5\%\text{ (discount)}}{5\text{ (yrs. to maturity)}} = \begin{array}{l}1\%\text{ pro rata, plus}\\ 5.26\%\text{ (current yield)}\end{array} = 6.26\%\text{ (yield to maturity)}$$

Yield to Worst: The lowest potential yield that can be received on a bond without the issuer actually defaulting. The yield to worst is calculated by making worst-case scenario assumptions on the issue by calculating the returns that would be received if provisions, including prepayment, call, or sinking fund, are used by the issuer.

NCREIF Property Index (NPI): Measures unleveraged investment performance of a very large pool of individual commercial real estate properties acquired in the private market by tax-exempt institutional investors for investment purposes only. The NPI index is capitalization-weighted for a quarterly time series composite total rate of return.

NCREIF Fund Index - Open End Diversified Core Equity (NFI-ODCE): Measures the investment performance of 28 open-end commingled funds pursuing a core investment strategy that reflects funds' leverage and cash positions. The NFI-ODCE index is equal-weighted and is reported gross and net of fees for a quarterly time series composite total rate of return.

Sources: Investment Terminology, International Foundation of Employee Benefit Plans, 1999.
The Handbook of Fixed Income Securities, Fabozzi, Frank J., 1991

Throughout this report, numbers may not sum due to rounding.

Returns for periods greater than one year are annualized throughout this report.

Values shown are in millions of dollars, unless noted otherwise.