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DATE: February 6, 2023

TO: Legislative Reference Library

FROM: Jill E. Schurtz
Executive Director and Chief Investment Officer

SUBJECT: Report on Investment Consultant Activities

The provisions of Minnesota Statutes, Section 11A.27 require the State Board of Investment (SBI) to file with the Legislative Reference Library a report on investment consultant activities.

The SBI contracts with Aon Investments USA Inc. (Aon), Chicago, IL; Meketa Investment Group, LLC (Meketa), Portland, OR; and Albourne America LLC (Albourne), Norwalk, CT. Aon and Meketa serve as the SBI's general consultant and the annual contract fees for fiscal year 2022 were $576,000 and $390,000, respectively. Albourne serves as the SBI's private markets consultant and the annual contract fee for fiscal year 2022 was $1,463,000.

As part of their consultant services, Aon and Meketa are available to the Board, staff and Investment Advisory Council (IAC) to provide perspective, counsel and input on relevant investment related issues. Albourne, who is available to the Board and IAC, works primarily with staff to provide back office support, strategic planning resources, and analysis on private market firms and investments.

During the period July 1, 2021 through June 30, 2022, Aon and Meketa provided the following reports:

- Periodic background information for evaluating SBI investment managers
- Quarterly Capital Market Outlook Reports

Attached is an example of the work product each has provided.

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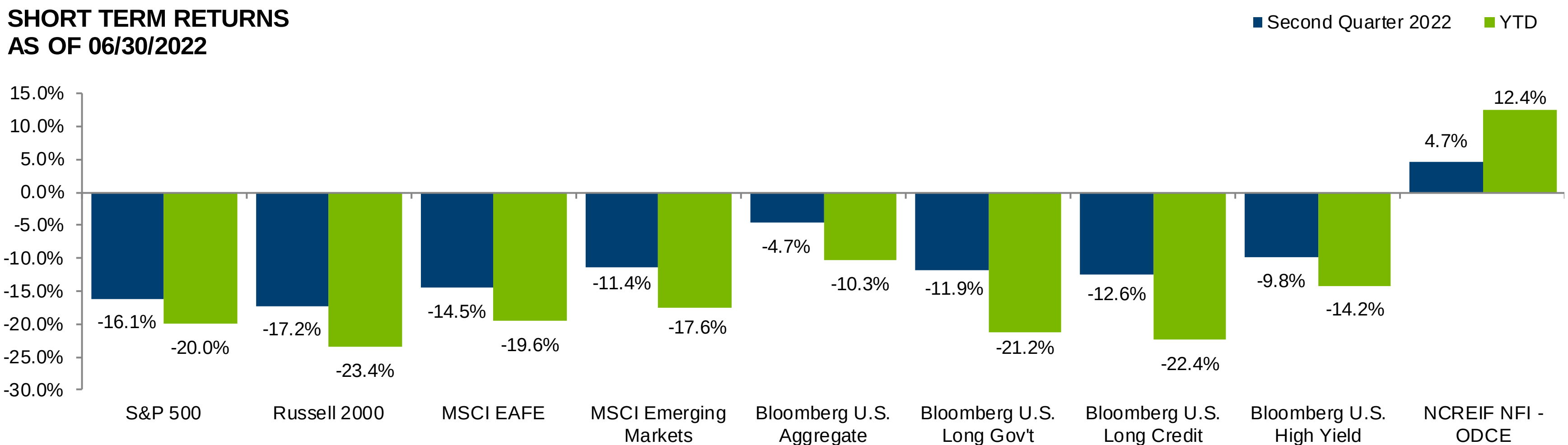
Market Environment

Second Quarter 2022

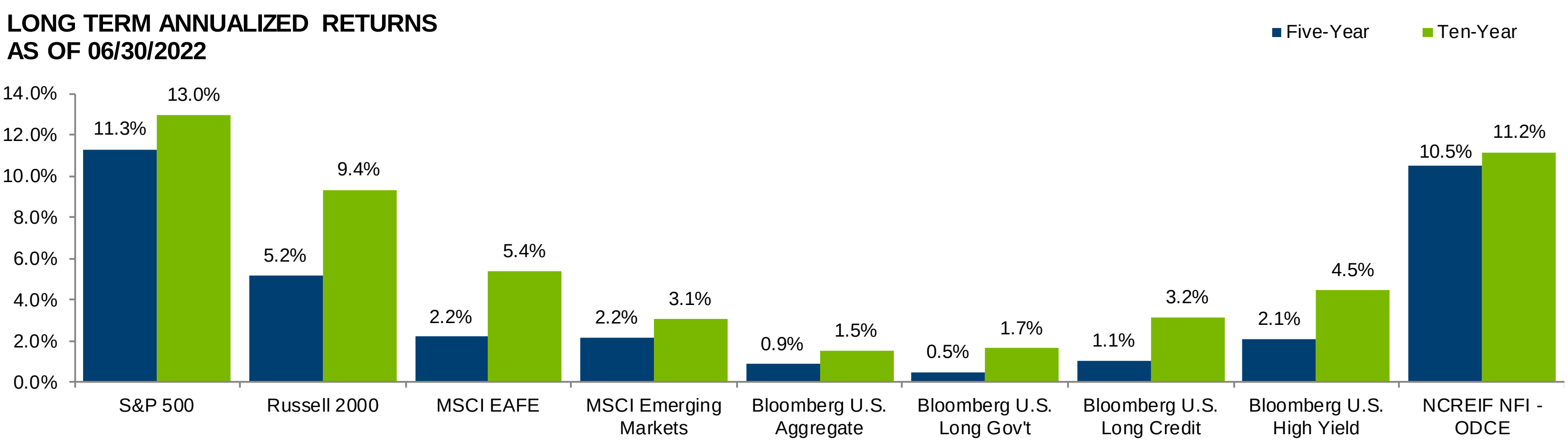
Aon
Investment advice and consulting services provided by Aon Investments USA Inc., an Aon Company.

Empower Results®

Market Highlights



Source: Russell, MSCI, Bloomberg
MSCI Indices show net total returns throughout this report. All other indices show gross total returns.



Source: Russell, MSCI, Bloomberg

Note: MSCI Indices show net total returns throughout this report. All other indices show gross total returns.

Market Highlights

Returns of the Major Capital Markets

Period Ending 06/30/2022

	Second Quarter	YTD	1-Year	3-Year[1]	5-Year[1]	10-Year[1]
Equity						
MSCI All Country World IMI	-15.83%	-20.44%	-16.52%	5.98%	6.70%	8.71%
MSCI All Country World	-15.66%	-20.18%	-15.75%	6.21%	7.00%	8.76%
Dow Jones U.S. Total Stock Market	-16.84%	-21.33%	-14.24%	9.61%	10.48%	12.47%
Russell 3000	-16.70%	-21.10%	-13.87%	9.77%	10.60%	12.57%
S&P 500	-16.10%	-19.96%	-10.62%	10.60%	11.31%	12.96%
Russell 2000	-17.20%	-23.43%	-25.20%	4.21%	5.17%	9.35%
MSCI All Country World ex-U.S. IMI	-14.28%	-19.08%	-19.86%	1.55%	2.50%	5.01%
MSCI All Country World ex-U.S.	-13.73%	-18.42%	-19.42%	1.35%	2.50%	4.83%
MSCI EAFE	-14.51%	-19.57%	-17.77%	1.07%	2.20%	5.40%
MSCI EAFE (Local Currency)	-7.83%	-11.27%	-6.59%	4.37%	4.27%	8.33%
MSCI Emerging Markets	-11.45%	-17.63%	-25.28%	0.57%	2.18%	3.06%
Equity Factors						
MSCI World Minimum Volatility (USD)	-9.54%	-6.01%	-6.01%	3.58%	6.55%	9.01%
MSCI World High Dividend Yield	-8.48%	-8.06%	-3.32%	5.61%	6.40%	8.36%
MSCI World Quality	-16.80%	-23.79%	-15.83%	10.16%	11.43%	12.01%
MSCI World Momentum	-17.98%	-22.60%	-17.21%	6.97%	10.48%	11.72%
MSCI World Enhanced Value	-11.97%	-12.92%	-10.00%	3.69%	3.72%	7.91%
MSCI World Equal Weighted	-15.62%	-19.93%	-17.78%	3.23%	4.29%	8.11%
MSCI World Index Growth	-21.14%	-28.71%	-22.22%	8.67%	10.32%	11.42%
MSCI USA Minimum Volatility (USD)	-9.15%	-12.56%	-3.21%	6.34%	9.64%	11.65%
MSCI USA High Dividend Yield	-7.45%	-8.84%	-0.84%	7.16%	8.44%	11.19%
MSCI USA Quality	-16.19%	-23.60%	-15.21%	11.05%	13.11%	13.86%
MSCI USA Momentum	-18.02%	-24.04%	-20.02%	5.88%	10.32%	13.44%
MSCI USA Enhanced Value	-12.85%	-16.12%	-11.31%	6.67%	7.14%	11.66%
MSCI USA Equal Weighted	-16.45%	-20.57%	-15.25%	7.72%	8.62%	11.84%
MSCI USA Growth	-22.94%	-29.88%	-21.80%	12.43%	14.09%	14.69%
Fixed Income						
Bloomberg Global Aggregate	-8.26%	-13.91%	-15.25%	-3.22%	-0.55%	0.11%
Bloomberg U.S. Aggregate	-4.69%	-10.35%	-10.29%	-0.93%	0.88%	1.54%
Bloomberg U.S. Long Gov't	-11.89%	-21.20%	-18.42%	-2.94%	0.50%	1.65%
Bloomberg U.S. Long Credit	-12.59%	-22.40%	-21.36%	-2.44%	1.05%	3.17%
Bloomberg U.S. Long Gov't/Credit	-12.27%	-21.88%	-20.14%	-2.32%	1.03%	2.63%
Bloomberg U.S. TIPS	-6.08%	-8.92%	-5.14%	3.04%	3.21%	1.73%
Bloomberg U.S. High Yield	-9.83%	-14.19%	-12.81%	0.21%	2.10%	4.47%
Bloomberg Global Treasury ex U.S.	-11.44%	-17.19%	-19.67%	-5.89%	-2.12%	-1.46%
JP Morgan EMBI Global (Emerging Markets)	-10.55%	-18.83%	-19.25%	-4.33%	-1.00%	2.05%
Commodities						
Bloomberg Commodity Index	-5.66%	18.44%	24.27%	14.34%	8.39%	-0.82%
Goldman Sachs Commodity Index	2.01%	35.80%	45.05%	14.69%	11.67%	-1.83%
Hedge Funds						
HFRI Fund-Weighted Composite[2]	-4.94%	-5.86%	-5.82%	6.10%	5.05%	4.96%
HFRI Fund of Funds[2]	-3.61%	-6.28%	-5.19%	4.05%	3.69%	3.78%
Real Estate						
NAREIT U.S. Equity REITS	-17.00%	-20.20%	-6.27%	4.00%	5.30%	7.39%
NCREIF NFI - ODCE	4.70%	12.42%	29.50%	12.66%	10.54%	11.16%
FTSE Global Core Infrastructure Index	-8.64%	-5.37%	2.88%	5.73%	7.78%	9.06%
Private Equity						
Burgiss Private iQ Global Private Equity[3]			35.76%	25.94%	21.26%	16.77%

MSCI Indices show net total returns throughout this report. All other indices show gross total returns.

[1] Periods are annualized.

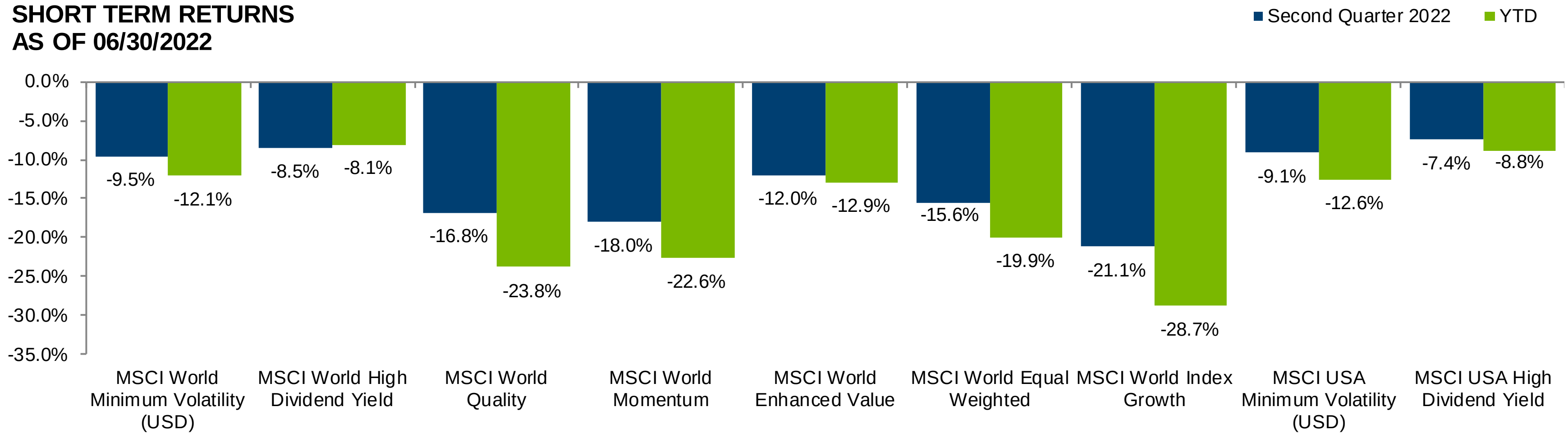
[2] Latest 5 months of HFR data are estimated by HFR and may change in the future.

[3] Burgiss Private iQ Global Private Equity data is as at December 31, 2021

MSCI Indices show net total returns throughout this report. All other indices show gross total returns.
[1] Periods are annualized.
[2] Latest 5 months of HFR data are estimated by HFR and may change in the future.
[3] Burgiss Private iQ Global Private Equity data is as at September 30, 2021

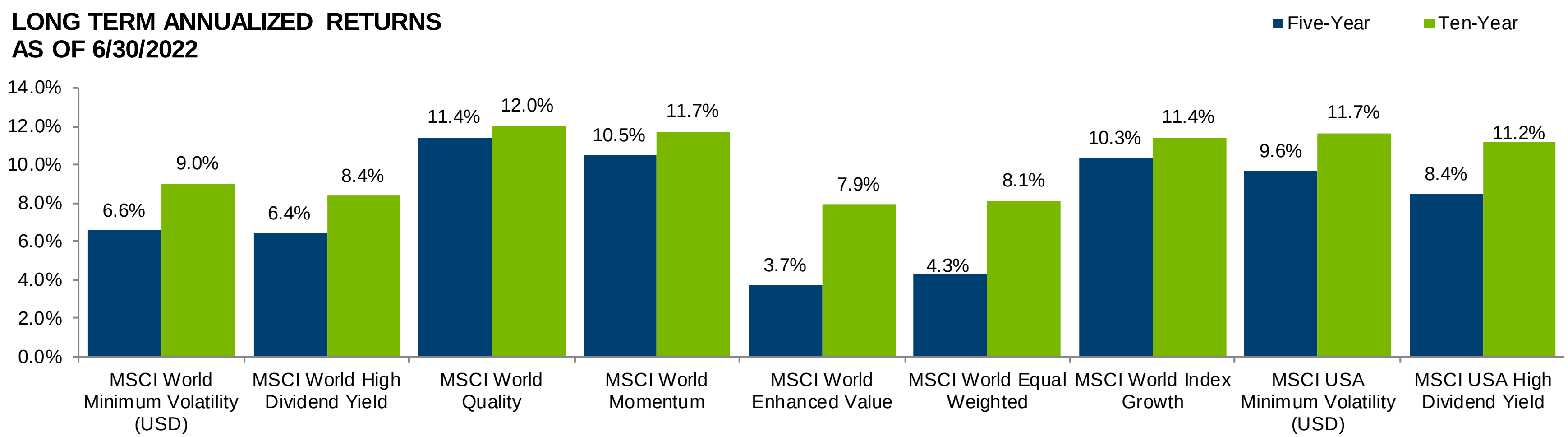
Factor Indices

SHORT TERM RETURNS
AS OF 06/30/2022



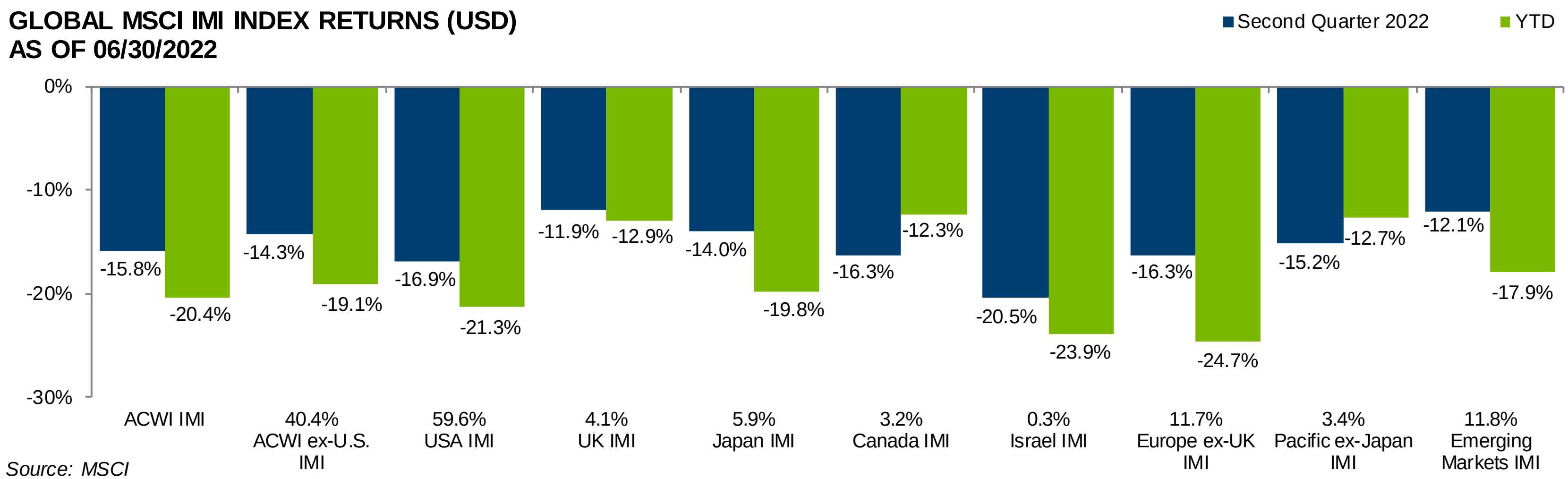
Source: MSCI

LONG TERM ANNUALIZED RETURNS
AS OF 6/30/2022



Source: MSCI

Global Equity Markets



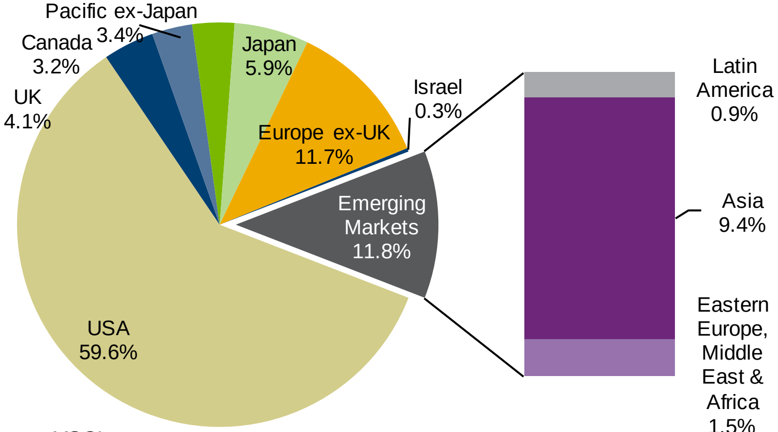
Source: MSCI

- In Q2 2022 capital markets were dominated by geopolitical uncertainty and higher interest rates amidst soaring inflation. Volatility remained elevated throughout the quarter. U.S. equities were sharply down over the quarter with major equity indices entering correction territory. The MSCI All Country World Investable Market Index (ACWI IMI) returned -15.8% for the quarter and was down 20.4% on a year-to-date basis.
- Across international markets, all the regions were weak over the quarter, with almost all major equity regions posting double-digit losses.
- Europe ex-UK equities were the second worst regional performer with a return of -16.3% due to Europe's proximity and exposure to the fallout from the Russia-Ukraine conflict.
- Emerging Markets returned -12.1% for the second quarter with Brazilian and Korean equities weighing on the region. The Biden administration has put five Chinese companies on an export blacklist for supporting Russian military and defence companies. Meanwhile, the US cabinet has not reached a consensus on the issue of removing Trump-era tariffs on Chinese imports.

Global Equity Markets

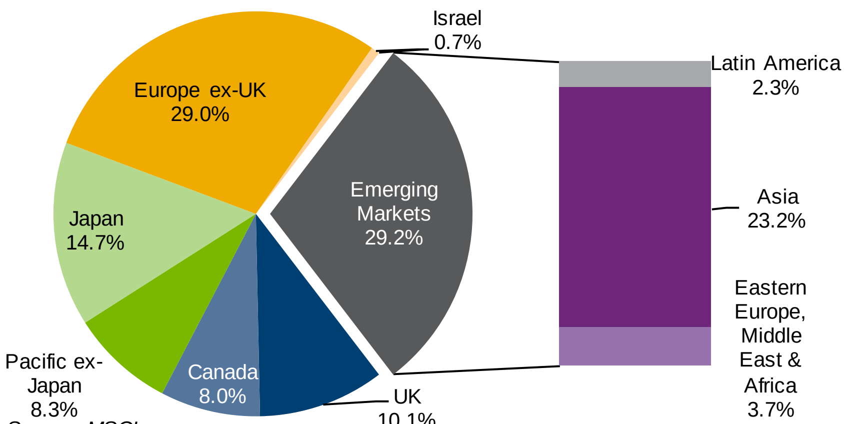
Below is the country/region breakdown of the global and international equity markets as measured by the MSCI All Country World IMI Index and the MSCI All Country World ex-U.S. IMI Index, respectively.

MSCI ALL COUNTRY WORLD IMI INDEX GEOGRAPHIC ALLOCATION AS OF 06/30/2022



Source: MSCI

MSCI ALL COUNTRY WORLD EX-U.S. IMI INDEX GEOGRAPHIC ALLOCATION AS OF 06/30/2022

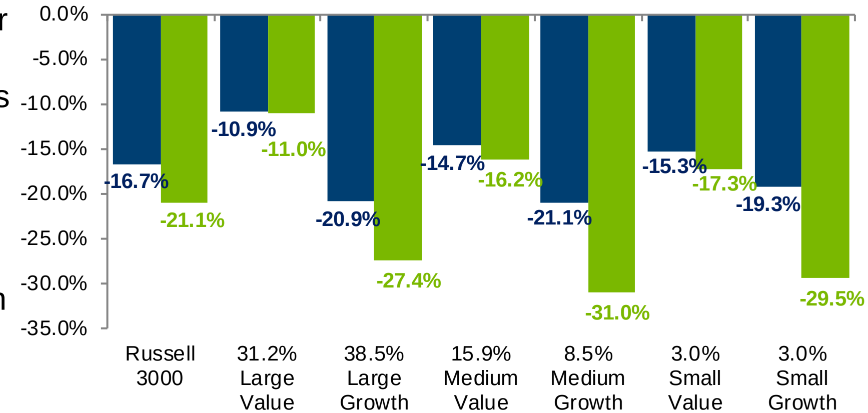


Source: MSCI

U.S. Equity Markets

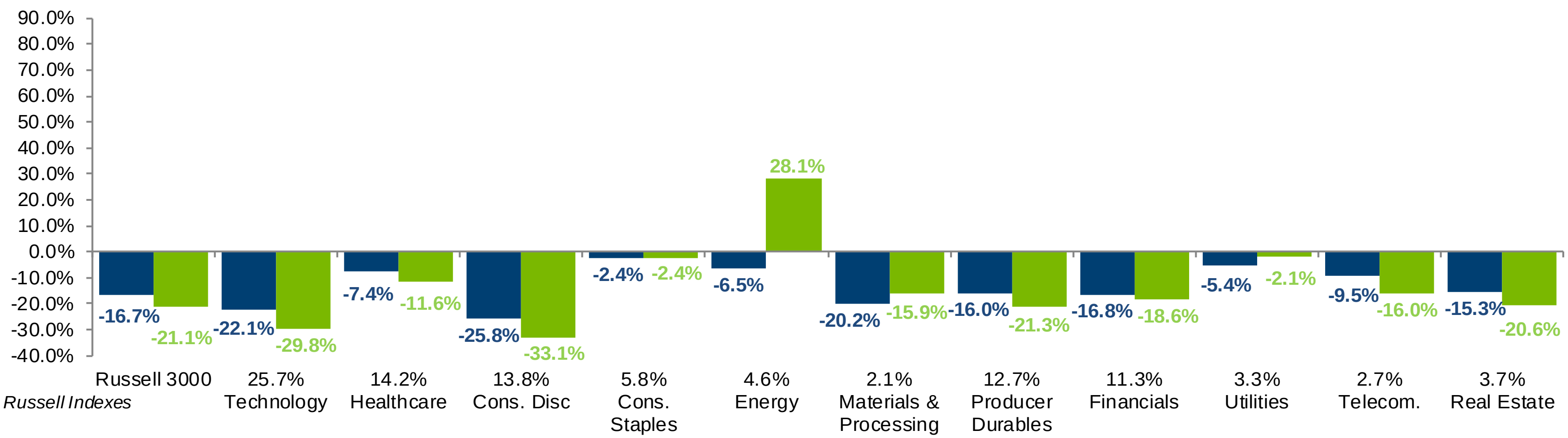
- U.S. equities had a weak quarter with the S&P 500 index falling by 16.1%.
- The Russell 3000 Index fell 16.7% during the second quarter and was down 21.1% on a year-to-date basis. Performance among sectors was negative. Consumer Staples and Utilities were the best performers while the Consumer Discretionary and Technology sectors were the worst performers.
- Large cap stocks have outperformed medium cap stocks over the quarter. On a style basis, value outperformed growth across market capitalizations over the quarter and on a year-to-date basis.

RUSSELL STYLE RETURNS AS OF 06/30/2022



Source: Russell Indexes

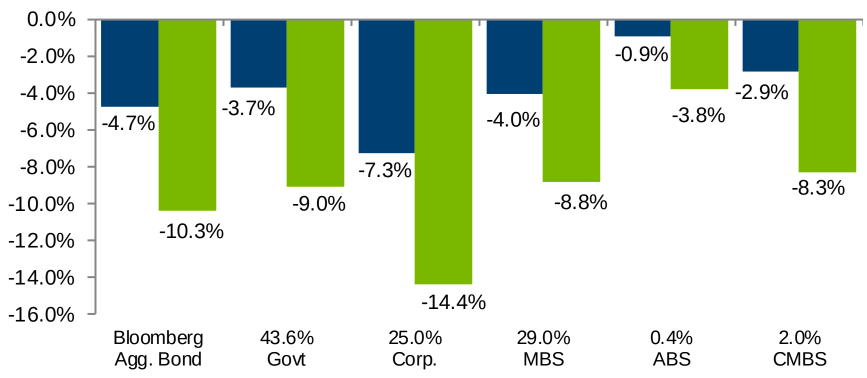
RUSSELL SECTOR RETURNS AS OF 06/30/2022



Source: Russell Indexes

U.S. Fixed Income Markets

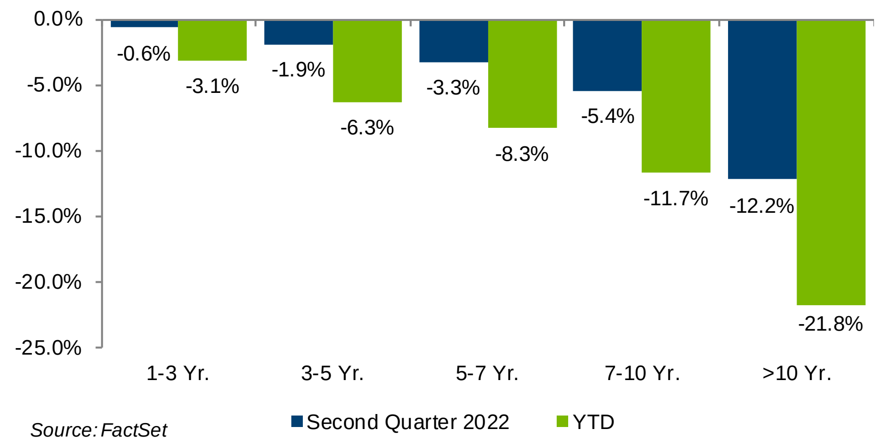
BLOOMBERG AGGREGATE RETURNS BY SECTOR AS OF 06/30/2022



Source: FactSet

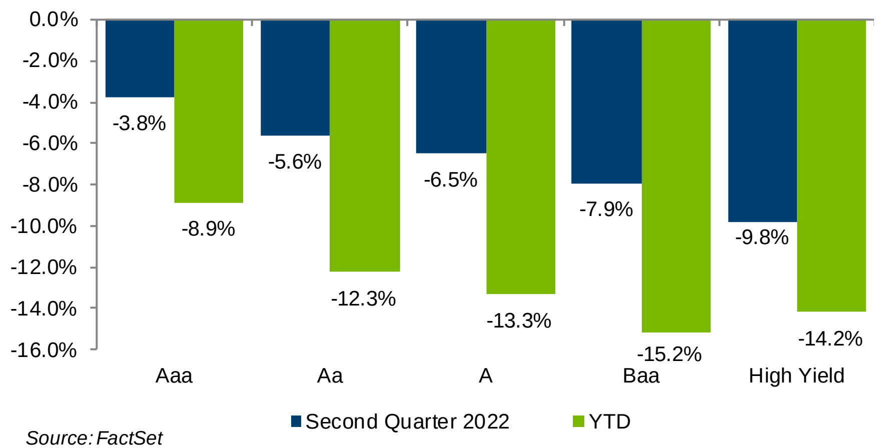
- The Bloomberg U.S. Aggregate Bond Index was down 4.7% over the quarter and 10.3% on a year-to-date basis.
- Across durations, all maturities finished the quarter in negative territory.
- Within investment-grade bonds, lower-credit quality underperformed higher-quality issues, with Baa bonds falling by 7.9%. High-yield bonds fell by 9.8%.

BLOOMBERG AGGREGATE RETURNS BY MATURITY AS OF 06/30/2022



Source: FactSet

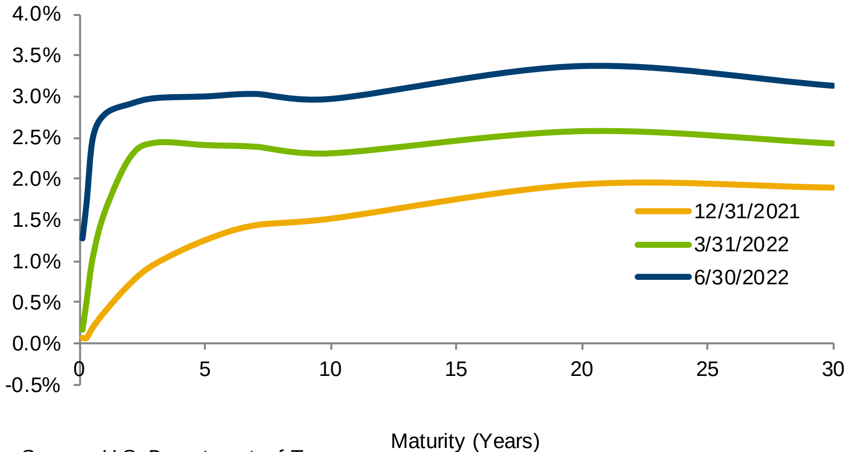
BLOOMBERG AGGREGATE RETURNS BY QUALITY AND HIGH YIELD RETURNS AS OF 06/30/2022



Source: FactSet

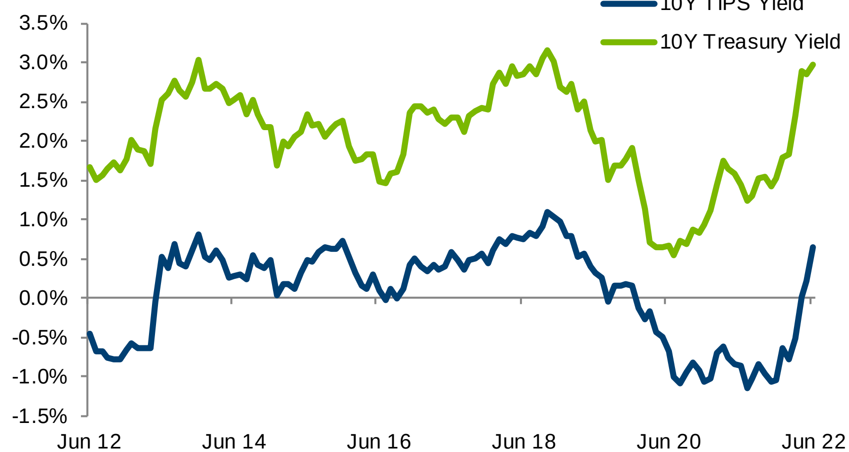
U.S. Fixed Income Markets

U.S. TREASURY YIELD CURVE



Source: U.S. Department of Treasury

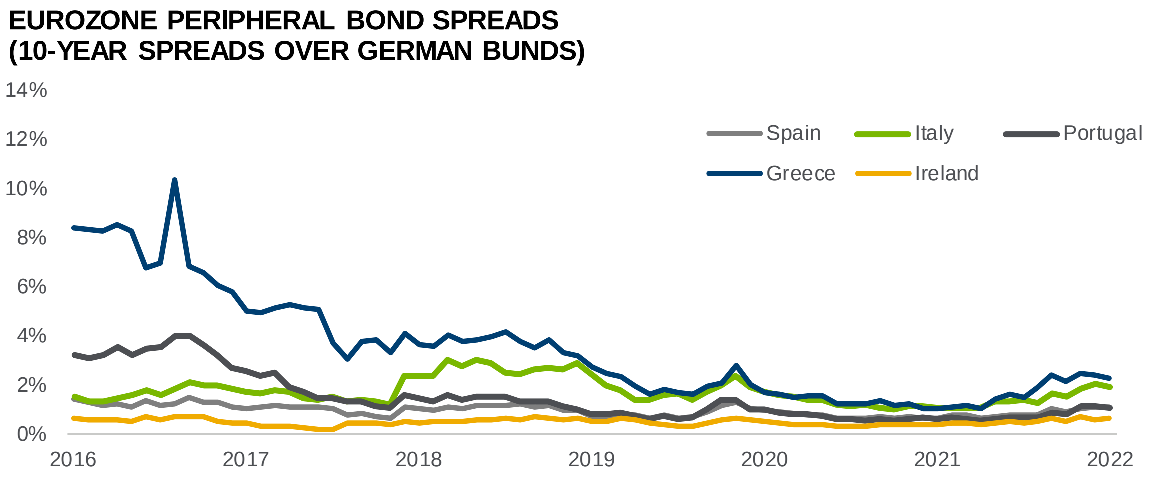
U.S. 10-YEAR TREASURY AND TIPS YIELDS



Source: U.S. Department of Treasury

- U.S. Treasury yields saw notable increases across the maturities which moved the yield curve upwards over the quarter. The 10-year Treasury yield was up 66bps to 2.98%, and the 30-year Treasury yield was up 70bps to 3.14% over the quarter.
- As expected, the U.S. Federal Reserve (Fed) increased its benchmark interest rate by 75bps to a range of 1.50-1.75%, the largest rate increase since 1994. Fed chair Jay Powell indicated that a rate hike of 50bps or 75bps is also imminent at the July meeting. According to the median estimate on the Fed dot plot, officials expect the interest rate to reach 3.4% by the end of the year. The Fed announced its plans to shrink its $9 trillion balance sheet in a phased manner by stopping the reinvestment of proceeds from maturing securities from June. The Fed will allow $30 billion of Treasuries and $17.5 billion of mortgage-backed securities (MBS) to mature every month from June. After three months, this pace will increase to $60 billion in Treasuries and $35 billion in MBS.
- Inflation remained elevated as energy and food prices accelerated sharply due to supply-chain disruptions, which have been exacerbated by Russia's invasion of Ukraine. The U.S. annual consumer price index (CPI) remained at a 40-year high as it rose 8.6% year on year in May.
- The 10-year TIPS yield rose by 117bps over the quarter to 0.65%.

European Fixed Income Markets



Source: FactSet

- European government bond spreads over 10-year German bunds widened across the Euro Area. The European Central Bank (ECB) president Christine Lagarde signaled that the central bank might raise rates by 50bps in September "if the inflation outlook persists or deteriorates", in addition to a planned 25bps hike in July. However, later in the quarter, the ECB held an emergency meeting to tackle the issue of widening spreads between the bond yields of core and peripheral Eurozone countries after the yields of countries like Italy and Spain touched their highest level in eight years. The ECB indicated that it would flexibly invest the proceeds from its €1.7tn asset purchase program to support peripheral countries with wider spreads.
- German government bund yields rose sharply, up 83bps to 1.38% over the quarter.
- Eurozone inflation hit an all-time high of 8.6% over the year to June.

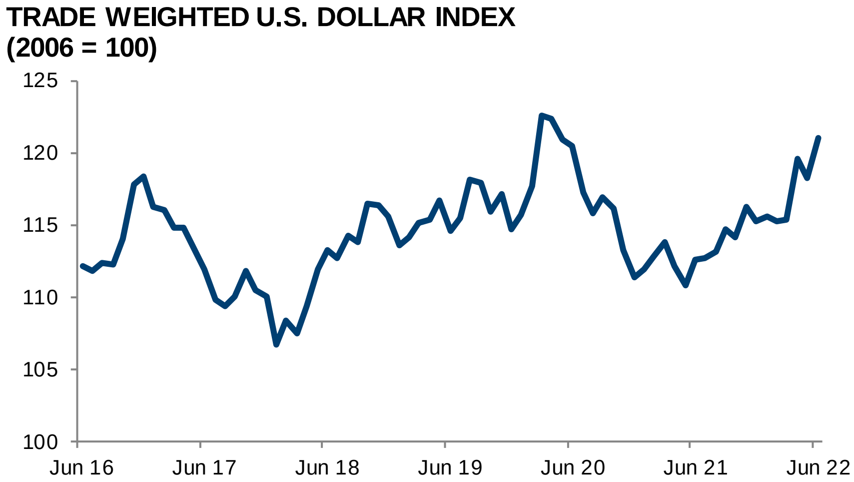
Credit Spreads

Spread (bps)	06/30/2022	03/31/2022	12/31/2021	Quarterly Change (bps)	YTD Change (bps)
U.S. Aggregate	55	41	36	14	19
Long Gov't	-1	3	0	-4	-1
Long Credit	184	155	130	29	54
Long Gov't/Credit	101	88	74	13	27
MBS	46	24	31	22	15
CMBS	101	85	68	16	33
ABS	75	57	38	18	37
Corporate	155	116	92	39	63
High Yield	569	325	283	244	286
Global Emerging Markets	404	313	285	91	119

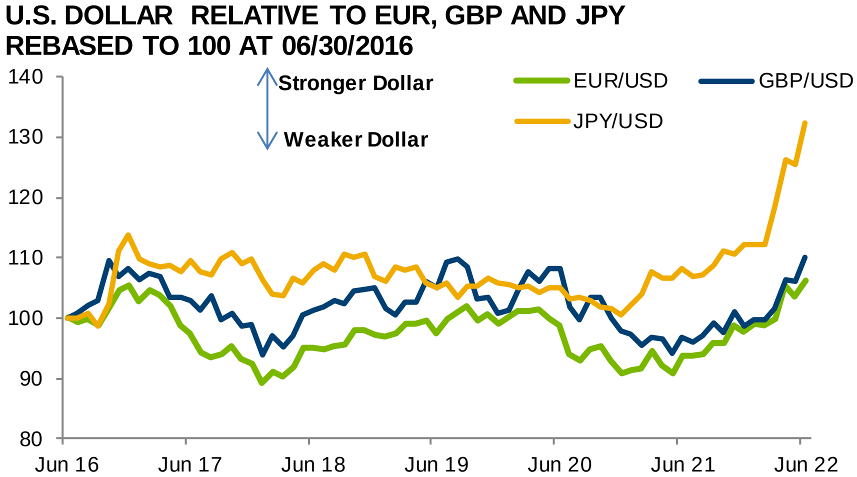
Source: FactSet, Bloomberg

- Credit markets declined from risk-averse sentiment during the quarter, with spreads widening.
- High Yield and Global Emerging Markets spreads increased by 244bps and 91bps, respectively.

Currency



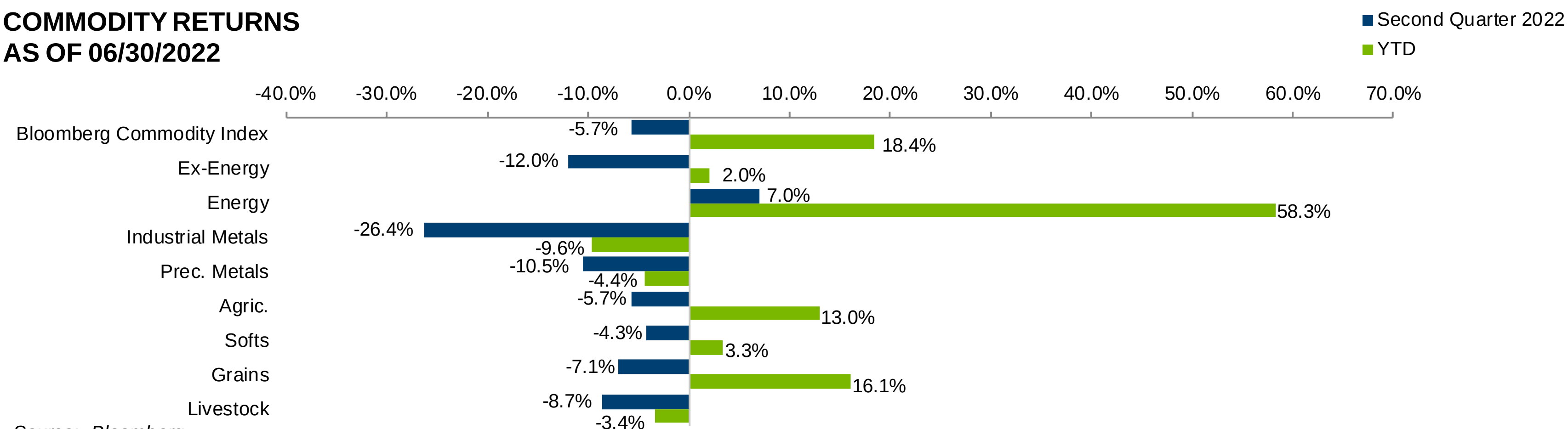
Source: Federal Reserve



Source: FactSet

- The U.S. Dollar strengthened against all major currencies over the quarter. On a trade-weighted basis, the U.S. dollar appreciated by 4.9%.
- The Sterling depreciated by 8.4% against the U.S. dollar. The Bank of England increased its benchmark interest rate for the second time this quarter, with the policy rate sitting at 1.25%, its highest level in 13 years.
- The U.S. dollar appreciated by 6.4% against the Euro.
- The US dollar appreciated by 11.9% against the yen as the Bank of Japan is still maintaining its ultra-loose monetary policy stance as compared to the current monetary tightening stance of other major central banks.

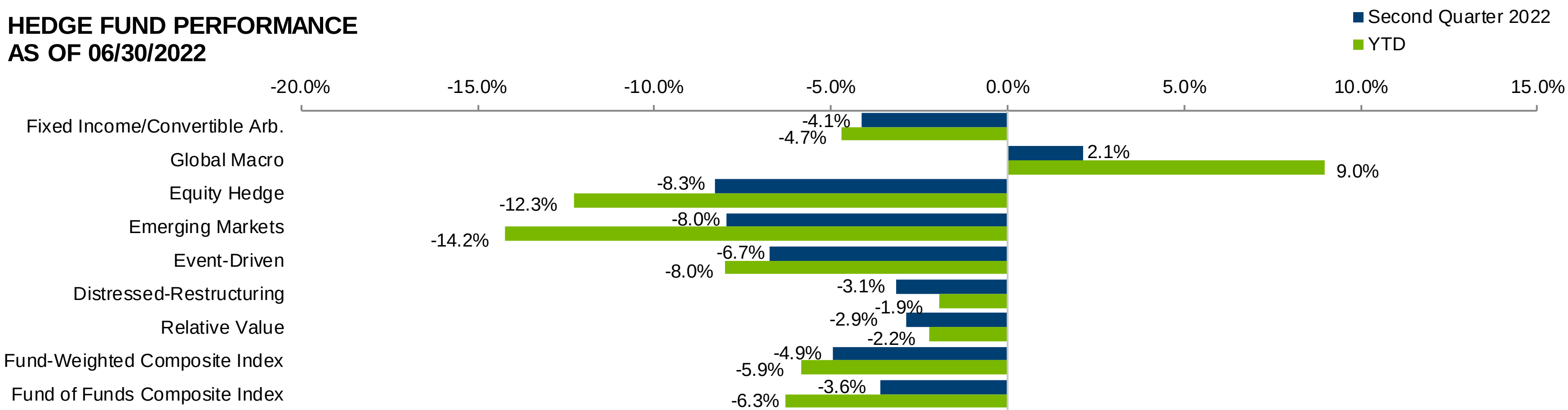
Commodities



Source: Bloomberg
Note: Softs and Grains are part of the wider Agriculture sector

- Commodity prices were pegged back later in the quarter, after rising for two consecutive months, with the Bloomberg Commodity Index falling by 5.7% for the quarter.
- Energy continued to have outsized gains, with the sector up 7.0% over the quarter and 58.3% on a year-to-date basis. The price of Brent crude oil rose by 6.4% to $115/bbl while WTI crude oil spot prices rose by 5.5% to $106/bbl over the quarter.
- Industrial Metals fell the most over the quarter at -26.4%.
- Meanwhile, OPEC+ agreed to a larger than expected oil production increase due to surging energy prices. The group decided to increase production by 648,000 barrels per day for July and August.

Hedge Fund Markets Overview

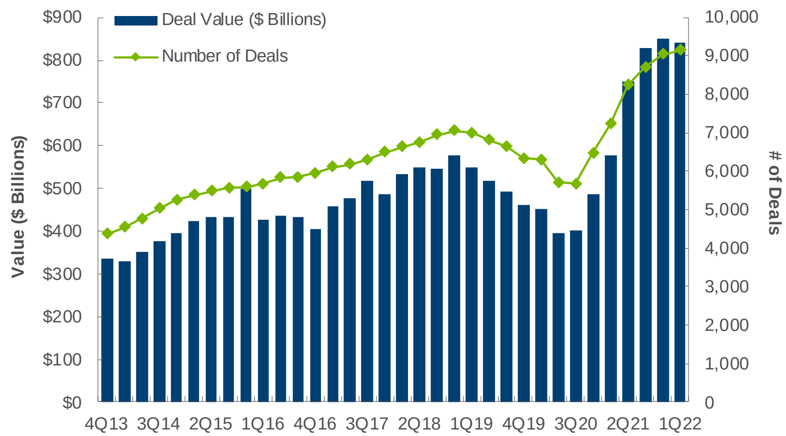


Note: Latest 5 months of HFR data are estimated by HFR and may change in the future.
Source: HFR

- Hedge fund performance was generally negative over the quarter, with only the Global Macro strategy outperforming.
- The HFRI Fund-Weighted Composite and HFRI Fund of Funds Composite Index produced returns of -4.9% and -3.6% over the quarter, respectively.
- Over the quarter, Global Macro was the only one to generate positive returns with returns of 2.1%.
- Equity Hedge and Emerging Markets strategies were the worst performers with returns of -8.3% and -8.0% respectively.
- On a year-to-date basis, all strategies, except for Global Macro, were negative.

Private Equity Market Overview – 1Q 2022

LTM Global Private Equity-Backed Buyout Deal Volume

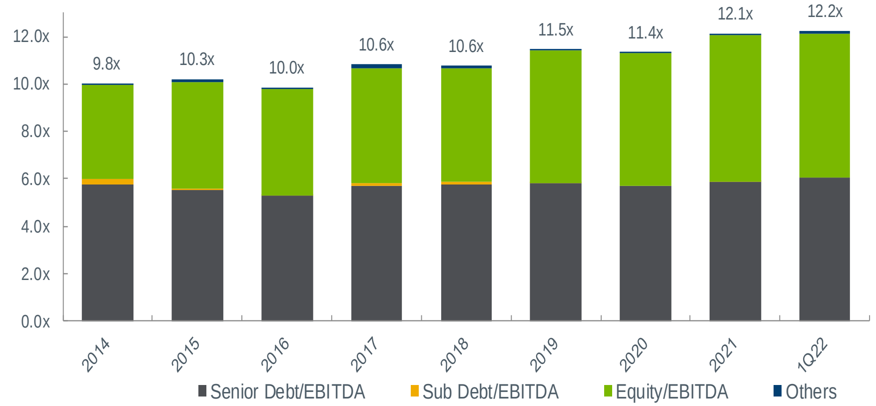


Source: Preqin

- **Fundraising:** During Q1 2022, $270.1 billion was raised by 482 funds, which was roughly equal to capital raised in Q4 2021 but 8.8% lower than capital raised in Q1 2021. Dry powder stood at $2.8 trillion at the end of the quarter, an increase of 0.9% and 28.5% compared to year-end 2021 and the five-year average, respectively.
- **Buyout:** Global private equity-backed buyout deals totaled $191.6 billion in Q1 2022, which was a decrease on a capital basis of 11.3% compared to Q4 2021, but an increase of 33.9% compared to the five-year quarterly average. At the end of Q1 2022, the average purchase price multiple for all U.S. LBOs was 12.2x EBITDA, up from year-end 2021's average of 11.4x and up from the five-year average (11.1x). Large cap purchase price multiples stood at 12.2x, up compared to Q4 2021 level's of 11.2x. The average purchase price multiple across European transactions greater than €1B averaged 11.6x EBITDA at the end of Q1 2022, equal to the multiple seen at year-end 2021. Purchase prices for transactions of €500M million or more remained stable at 11.5x EBITDA, equal to that seen at the end of 2021. Globally, exit value totaled $110.4 billion on 570 deals during the quarter, significantly lower than the $254.3 billion across 839 deals during Q4 2021.
- **Venture:** During the quarter, an estimated 3,723 venture-backed transactions totaling $70.7 billion were completed, which was a decrease on a capital and deal count basis over the prior quarter's total of $95.4 billion across 4,098 deals. This was an increase of 59.6% compared to the five-year quarterly average of $44.3 billion. Total U.S. venture-backed exit value totaled approximately $33.6 billion across an estimated 430 completed transactions in Q1 2022, down substantially from $192.5 billion across 537 exits in Q4 2021.
- **Mezzanine:** 6 funds closed on $10.7 billion during the quarter. This was a significant increase from the prior quarter's total of $1.6 billion raised by 7 funds and represented 80.6% of capital raised in full year 2021. Estimated dry powder was $50.0 billion at the end of Q1 2022, up from $48.3 billion at the end of 2021.

Private Equity Market Overview – 1Q 2022

U.S. LBO Purchase Price Multiples – All Transactions Sizes



Source: S&P

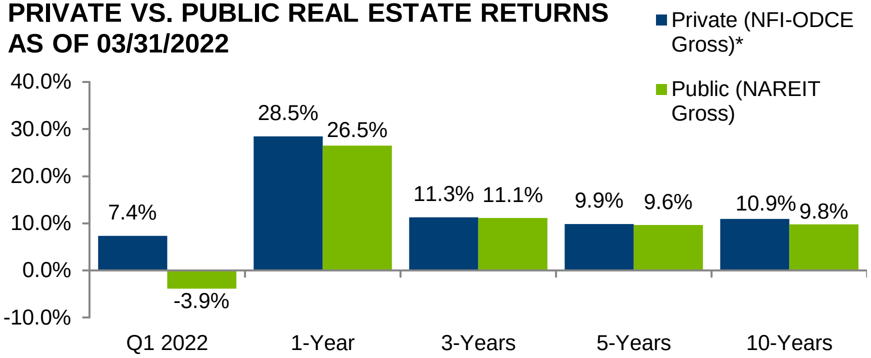
- **Distressed Debt:** The LTM U.S. high-yield default rate was 0.5% as of March 2022, which was in line with December 2021's LTM rate of 0.5%.4 The high-yield default rate is projected to trend higher through 2022. During the quarter, $3.9 billion was raised by 7 funds, down significantly from the $13.2 billion raised by 30 funds during Q4 2021. Dry powder was estimated at $145.3 billion at the end of Q1 2022, which was down 8.3% from year-end 2021. This remained above the five-year annual average level of $130.5 billion.
- **Secondaries:** 14 funds raised $5.3 billion during the quarter, down slightly from the $5.8 billion raised by 14 funds in Q4 2021. This was 50.1% lower than the five-year quarterly average of 10.6 billion.
- **Infrastructure:** $69.7 billion of capital was raised by 20 funds in Q1 2022 compared to $36.7 billion of capital raised by 24 partnerships in Q4 2021. At the end of the quarter, dry powder stood at $330.9 billion, up from last year's record of $313.0 billion. Infrastructure managers completed 566 deals for an aggregate deal value of $72.5 billion in Q1 2022 compared to 733 deals totaling $181.0 billion in Q4 2021.
- **Natural Resources:** During Q1 2022, an estimated 5 funds closed on $0.4 billion compared to 28 funds totaling $14.4 billion in 2021. Energy and utilities industry managers completed 55 deals totaling $33.0 billion in Q1 2022, compared to $34.7 billion across 223 deals in 2021.

Sources: [1] Preqin [2] Standard & Poor's [3] PwC/CB Insights MoneyTree Report [4] PitchBook/NVCA Venture Monitor [5] Fitch Ratings [6] Thomson Reuters [7] UBS

Notes: FY=Fiscal year ended 12/31; YTD=Year to date; LTM=Last 12 months (aka trailing 12 months); PPM=Purchase Price Multiples: Total Purchase Price ÷ EBITDA.

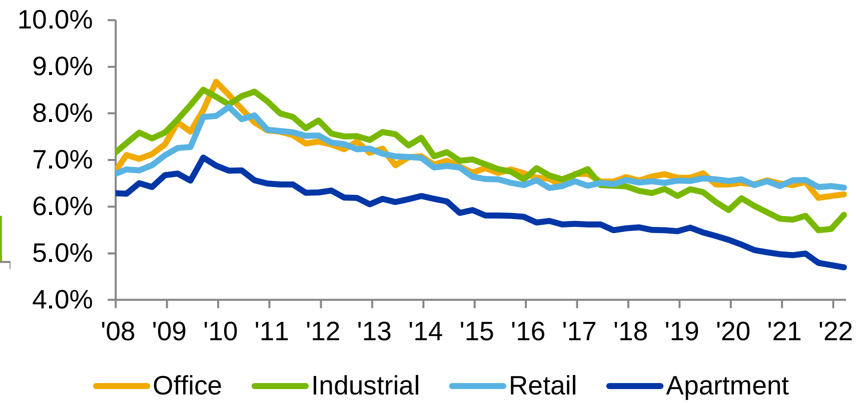
U.S. Commercial Real Estate Markets (TO BE UPDATED)

PRIVATE VS. PUBLIC REAL ESTATE RETURNS AS OF 03/31/2022



**First quarter returns are preliminary*
Sources: NCREIF, FactSet

CAP RATES BY SECTOR



Sources: RCA, AON 3/31/2022

- U.S. Core Real Estate returned 7.4%* in first quarter 2022, equating to a 28.5% total gross return year-over-year. Townsend witnessed a robust recovery across the US economy and US real estate markets in 2021, with a continuation through the first quarter of 2022. Real estate capital markets are highly liquid and competitive for in vogue sectors but have also been surprisingly strong for less favored sectors. Capital raising has exceeded pre-pandemic levels and even exceeded historical highs, resulting in a continued build up of dry powder in the market.
- Global property markets, as measured by the FTSE EPRA/NAREIT Developed Real Estate Index, returned -3.8% (USD) in aggregate during the first quarter and experienced a cumulative increase of 15.4% over the trailing 1-year period. REIT market performance was driven by Asia Pacific (-0.8% USD), North America (-3.9% USD), and Europe (-7.1% USD). The U.S. REIT markets (FTSE NAREIT Equity REITs Index) returned -3.9% in the first quarter. The U.S. 10-year treasury bond yields steepened to 2.3% during the quarter, an increase of 80 basis points over year-end 2021.
- In first quarter 2022, deal volumes across all sectors moderated from a historic high in fourth quarter 2021. The demand for modern logistics networks has outpaced development and now low-single-digit vacancy rates are common across major markets in the US. A mismatch of supply and demand is driving strong rent growth in the industrial sector, as e-commerce still only accounts for approximately 15% of retail sales and is forecasted to grow at close to 10% per annum between 2022-2025. Significant demand combined with an undersupply of modern assets continues to support the development modern logistics properties and refurbishment of well-located older product.
- The strong global economic rebound has stoked inflation beyond economists' expectations and persistent supply chain disruption has been slow to resolve. Commercial real estate construction has been particularly impacted by supply chain disruption and witnessed material prices increases well beyond CPI. Key materials inputs for commercial and residential construction have seen substantial price increases, including Lumber, Copper, and Steel. Real estate provides an inflationary hedge, and the trend is already prevalent in industrial, apartment, and life sciences in terms of rising rent growth. However, not all sectors will benefit from hedge. Office fundamentals likely to remain weak in the near-term
- Townsend has identified high conviction investment themes that are predicated on secular growth trends and strong underlying real estate market fundamentals. These investment themes have commonalities such as anticipated tenant demand growth, natural barriers to supply, and operating complexity that are anticipated to persist medium to long-term.

*Indicates preliminary NFI-ODCE data gross of fees

Notes

1. Preqin
2. Standard & Poors
3. PitchBook/National Venture Capital Association Venture Monitor
4. Fitch Ratings

Notes:

FY: Fiscal year ended 12/31
YTD: Year to date
YE: Year end
LTM: Last twelve months (aka trailing twelve months or TTM)
PPM: Purchase Price Multiples: Total Purchase Price / EBITDA
/bbl: Price per barrel
MMBtu: Price per million British thermal units

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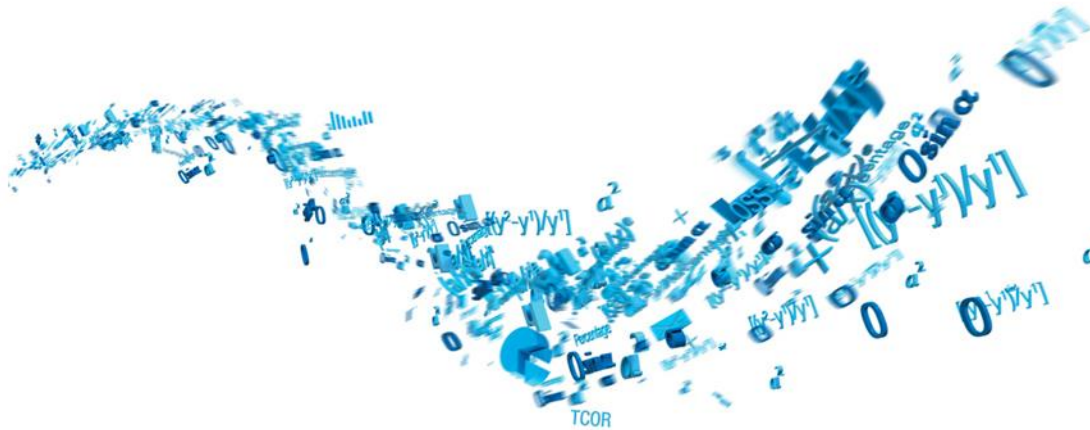
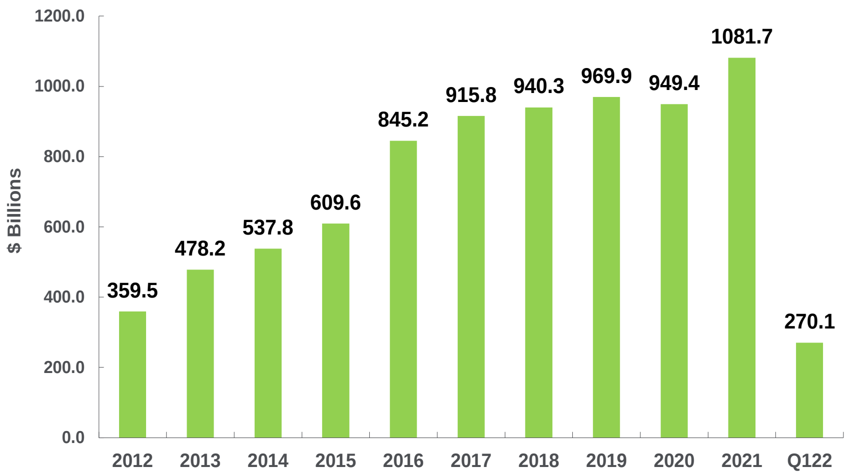


Appendix A:

Global Private Equity Market Overview
1Q 2022

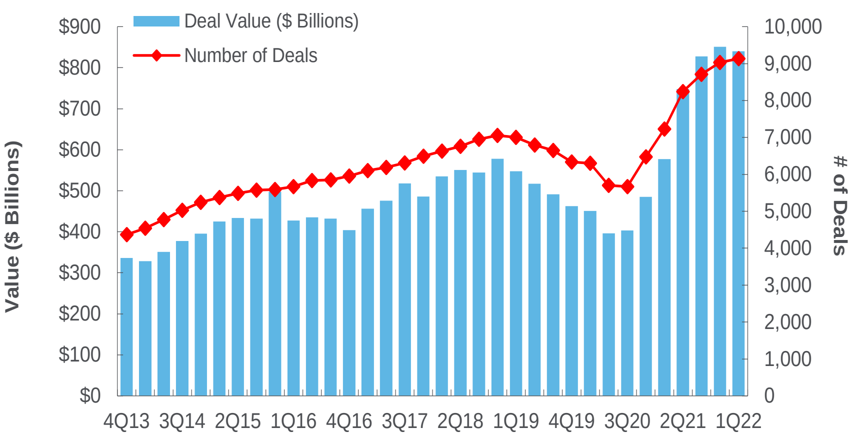
Private Equity Overview

Total Funds Raised



Source: Preqin

LTM Global Private Equity-Backed Buyout Deal Volume



Source: Preqin

Fundraising

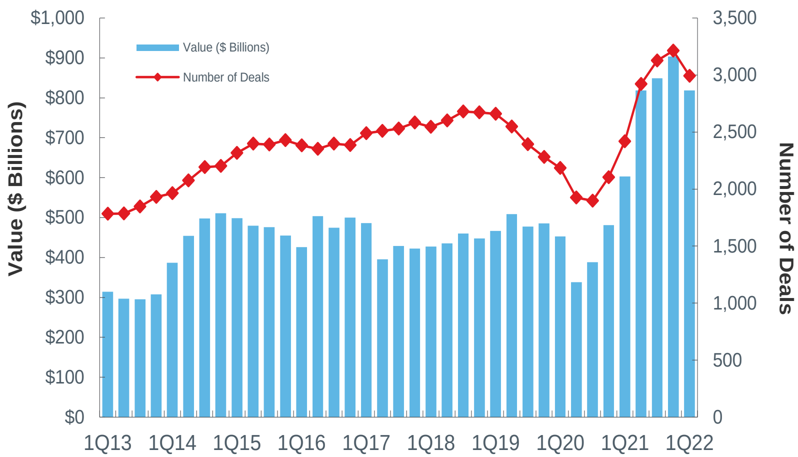
- During Q1 2022, $270.1 billion was raised by 482 funds, which was roughly equal to capital raised in Q4 2021 but 8.8% lower than capital raised in Q1 2021. Capital raised through 1Q 2022 represented 25.0% of capital raised during calendar year 2021.[1]
  - 1Q 2022 fundraising was 8.8% lower, on a capital basis, than capital raised in 1Q 2021 and 41.7% lower by number of funds raised.
  - The majority of capital was raised by funds with target geographies in North America, comprising 72.8% of the quarter's total. This was up from 52.7% in 4Q 2021. Capital targeted for Europe made up 17.6% of the total funds raised during the quarter, a decrease from 28.7% in 4Q 2021. The remainder was attributable to managers targeting Asia and other parts of the world.
- Dry powder stood at nearly $2.8 trillion at the end of the quarter, roughly flat with that seen at year-end 2021.[1]

Activity

- Global private equity-backed buyout deals totaled $191.6 billion in 1Q 2022, which was down 11.3% on a capital basis and down 8.0% by number of deals from 4Q 2021.[1]
  - This was 33.9% higher than the five-year quarterly average deal value of $143.1 billion.
  - Average deal size was $501.6 million in 1Q 2022. This was down 0.5% compared to 4Q 2021 and up 11.3% relative to the five-year quarterly average.
- European sponsored loan issuance decreased to €15.1 during Q1 2022 compared to €32.6 during Q1 2021. This was 16.3% lower than the five-year quarterly average level of €18.0 billion.[3]
- Through 1Q 2022, the average purchase price multiple for all U.S. LBOs was 12.2x EBITDA, an increase of 0.8x over 2021's average.[2] Large cap purchase price multiples stood at 12.2x through 1Q 2022, up compared to 2021's level of 11.2x.[2]
  - Average purchase price multiples for all U.S. LBOs were 1.0x and 1.8x turns (multiple of EBITDA) above the five- and ten-year average levels, respectively.
- In Europe, the average purchase price multiple across European transactions of greater than €500M averaged 11.5x EBITDA as of 1Q 2022, equal to that seen at the end of 4Q 2021. Purchase prices for transactions of greater than €1.0 billion averaged 11.6x EBITDA, also equal to the value seen at the end of Q4 2021.[3]
- Debt remained broadly available in the U.S.
  - The average leverage for U.S. deals through 1Q 2022 was 6.0x compared to the five and ten-year averages of 5.8x and 5.6x, respectively.[3]
  - The amount of debt issued supporting new transactions increased compared to the prior quarter, moving from 61.9% to 78.2%, and was higher than the five-year average of 65.0%.[3]
- In Europe, the average senior debt/EBITDA on an LTM basis ended 1Q 2022 at 5.9x, up from the 5.8x observed at 4Q 2021.

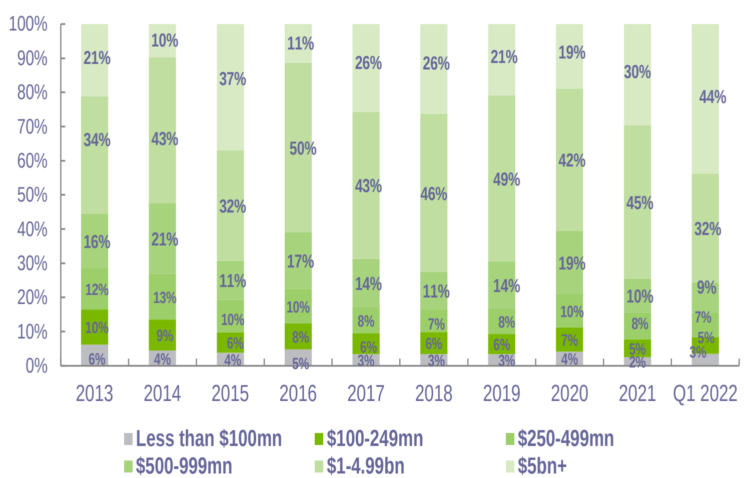
Buyouts / Corporate Finance

LTM PE Exit Volume and Value



Source: Preqin

M&A Deal Value by Deal Size



Source: Preqin

Fundraising

- $105.8 billion was closed on by 121 buyout and growth funds in 1Q 2022, compared to $105.8 billion raised by 197 funds in 4Q 2021, equal in value to the prior quarter. This was lower than the $132.3 billion raised by 204 funds in 1Q 2021.[1]
  - This was also lower than the five-year quarterly average of $112.3 billon and 183 funds.
  - Insight Partners XII was the largest fund raised during the quarter, closing on $17.0 billion of commitments.[1]
- Buyout and growth equity dry powder was estimated at $1.1 trillion, slightly lower than 4Q 2021.[1]
- Small, medium, and large cap buyout funds increased in dry powder compared to 4Q 2021 by 1.0%, 1.0% and 4.0%, respectively. Mega cap buyout funds had amassed $398.4 billion in dry powder at the end of the quarter, down 9.4% compared to 4Q 2021.[1]
  - An estimated 54.4% of buyout dry powder was targeted for North America, while European dry powder comprised 22.4% and Asia/Rest of World accounted for the remainder.[1]

Activity

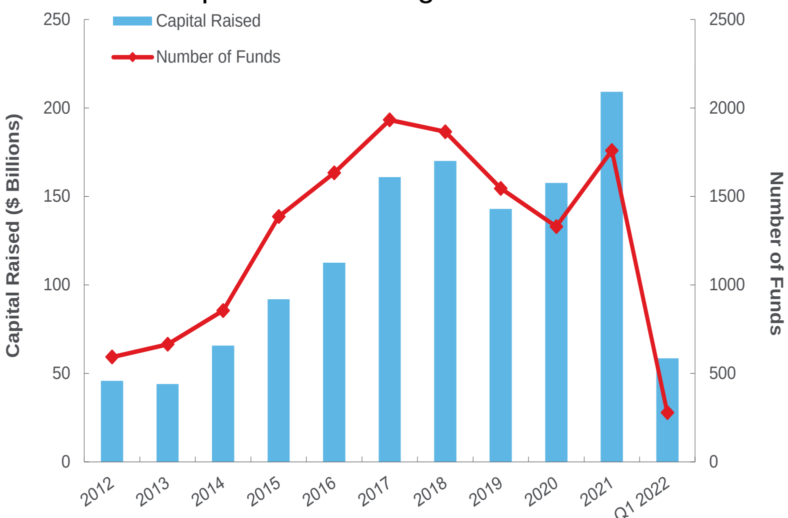
- Global private equity-backed buyout deals totaled $191.6 billion in 1Q 2022, which was a decrease on a capital basis of 11.3% compared to 4Q 2021, but an increase of 33.9% compared to the five-year quarterly average.[1]
- Through 1Q 2022, deal value accounted for 22.5% of 2021's total buyout activity and represented 94.4% of deal value during the same period in 2021.[1]
  - Through 1Q 2022, deals valued at $5.0 billion or greater accounted for an estimated 43.7% of total deal value compared to 18.9% through 1Q 2021 and 29.6% in 2021.[1] Deals valued between $1.0 billion to $4.99 billion represented 31.8% of total deal value through the first quarter.[1]
  - By geography, North American deals accounted for the largest percentage of total deal value at an estimated 68.3% through 1Q 2022, while Information Technology deals accounted for the largest percentage by industry at 23.4% of total deal value. [1]
- At the end of 1Q 2022, the average purchase price multiple for all U.S. LBOs was 12.2x EBITDA, up from year-end 2021's average of 11.4x and up from the five-year average (11.1x). [3]
  - Large cap purchase price multiples stood at 12.2x, up compared to the full-year 2021 level of 11.2x.[3]
  - The average purchase price multiple across European transactions greater than €1B averaged 11.6x EBITDA at the end of 1Q 2022, equal to the multiple seen at year-end 2021. Purchase prices for transactions of €500M million or more remained stable at 11.5x EBITDA, equal to that seen at the end of 2021.[3]
  - The portion of average purchase prices financed by equity for all deals was 50.0% through 1Q 2022, down slightly from 50.8% through 4Q 2021. This remained above the five- and ten-year average levels of 47.9% and 45.1%, respectively.[3]
- Globally, exit value totaled $110.4 billion on 572 deals during the quarter, significantly lower than the $254.3 billion across 839 deals during 4Q 2021. 1Q 2022's totals were also lower than 1Q 2021's totals of $195.5 billion in value across 793 deals.[1]

Opportunity [4]

- Managers targeting the middle and large markets with expertise across business cycles.

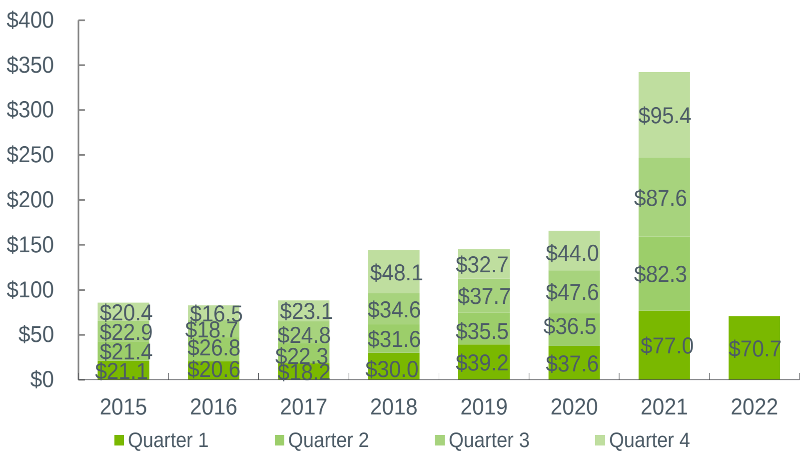
Venture Capital

Venture Capital Fundraising



Source: Preqin

U.S. Venture Capital Investments by Quarter ($B)



Source: Pitchbook / NVCA Venture Monitor

Fundraising

- $58.5 billion of capital was raised by 278 funds in 1Q 2022, up from the prior quarter's total of $52.3 billion raised by 471 managers. However, this was down from 1Q 2021's amount of $64.5 billion raised by 419 funds. 1Q 2022's capital raised represented 28.0% of 2021's total.[1]
  - 1Q 2022 fundraising was 39.3% higher, on a capital basis, compared to the five-year quarterly average of $42.0 billion.
  - Tiger Global Private Investment Partners XV was the largest fund raised during the quarter, closing on $12.7 billion.
- At the end of 1Q 2022, there were an estimated 4,109 funds in market targeting $315.3 billion.[1]
  - Alpha Wave Ventures II was the largest venture fund in market, targeting an estimated $10.0 billion.
  - The majority of funds in market are seeking commitments of $200.0 million or less.
- Dry powder was estimated at $483.2 billion at the end of 1Q 2022, up from 4Q 2021's total of $439.5 billion.[1]

Activity

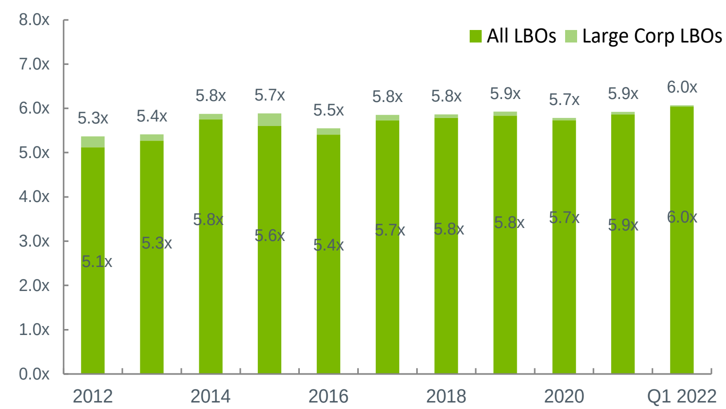
- During the quarter, an estimated 3,723 venture-backed transactions totaling $70.7 billion were completed, which was a decrease on a capital and deal count basis over the prior quarter's total of $95.4 billion across 4,098 deals. This was an increase of 59.6% compared to the five-year quarterly average of $44.3 billion.[7]
  - In 1Q 2022, there were 134 U.S.-based deals involving unicorn companies, representing roughly $27.3 billion in deal value. This was down by value and by number compared to 4Q 2021, which saw 166 unicorn-related deals close at a deal value of $40.4 billion. 1Q 2022 represented the lowest quarter by value and number since 4Q 2020.[7]
- At the end of 1Q 2021, median pre-money valuations increased across Seed, Series A, and Series B. Compared to 4Q 2021, Seed transactions increased to a median pre-money valuation of $21.0 million from $18.7 million, Series A increased from $51.8 million to $78.0 million, and Series B increased from $171.5 million to $285.2 million. Series C and Series D+ median pre-money valuations decreased during the quarter, with Series C dropping from $567.0 million to $528.7 million and Series D+ dropping from $1.9 billion to $1.3 billion.[8]
- Total U.S. venture-backed exit value totaled approximately $33.6 billion across an estimated 430 completed transactions in 1Q 2022, down substantially from $192.5 billion across 537 exits in 4Q 2021. Through 1Q 2022, U.S. exit activity represented only 4.3% of 2021's total.[7]
  - The number of U.S. venture-backed initial public offerings decreased over 4Q 2021, with only 28 IPOs completed in 1Q 2022. 224 exits occurred by acquisition, marking a decrease over the prior quarter's 288, and accounted for only $9.5 billion in exit value. IPOs accounted for $23.8 billion in value compared to $167.8 billion in the prior quarter.[7]

Opportunity[4]

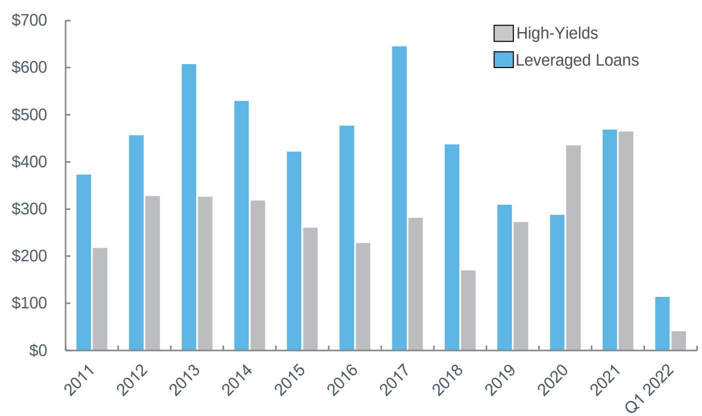
- Early stage continues to be attractive, although we continue to monitor valuations
- Smaller end of growth equity
- Technology sector

Leveraged Loans & Mezzanine

Average Leverage by Deal Size



Debt Issuance ($ Billions)



Sources from top to bottom: S&P, UBS

<u>Leveraged Loans</u>

Fundraising

- New CLO issuance totaled $30.0 billion through 1Q 2022, an increase from the $28.1 billion seen through 1Q 2021.[2]
- High-yield debt issuance totaled $41.1 billion through 1Q 2022. 2022's YTD total is 73.8% less than the same period's total of $156.6 billion in 2021.[2]
- Through 1Q 2022, leveraged loan mutual fund net flows ended at a net inflow of $15.5 billion.[2]

Activity

- Leverage for all U.S. LBO transactions through 1Q was 6.0x, up from 2021's leverage of 5.9x. Leverage continues to be comprised almost entirely of senior debt. The average leverage level for large cap LBOs was 6.0x through the quarter, up from the 5.9x witnessed at year-end 2021.[3]
- Through 1Q 2022, institutional leveraged loan issuances totaled $113.5 billion, 59.2% less than the $228.0 billion issued in the same period during 2021.[2]
- 78.2% of new leveraged loans were used to support M&A and growth activity through 1Q 2022, up from 61.9% in Q4 2021. This was above the five-year average of 65.0%.[3]
- European sponsored loan issuance decreased slightly to €15.1 during the first quarter compared to €20.7 during 4Q 2021. This was 16.3% lower than the five-year quarterly average level of €18.0 billion.[3]

Opportunity [4]

- Funds with the ability to source deals directly and the capacity to scale for large transactions (both sponsored and non-sponsored)
- Funds with an extensive track record, experience through prior credit cycles, and staff with workout experience

<u>Mezzanine</u>

Fundraising

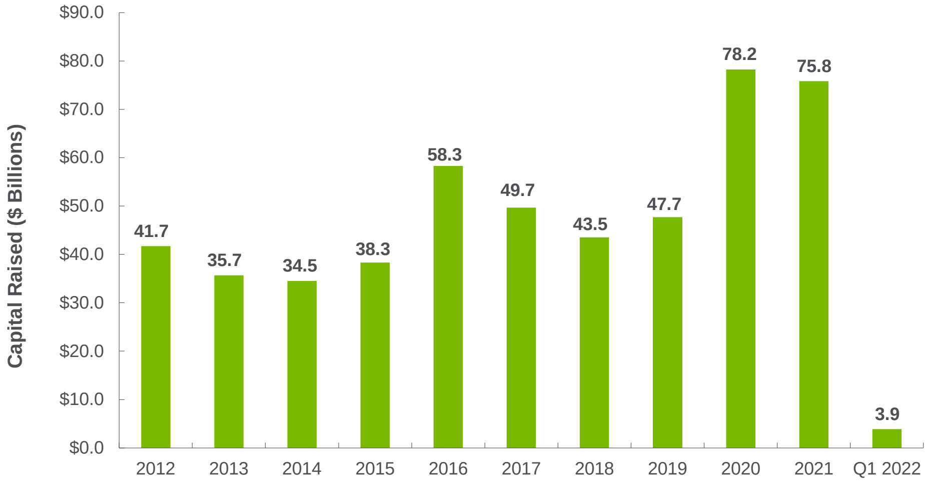
- 6 funds closed on $10.7 billion during the quarter. This was a significant increase from the prior quarter's total of $1.6 billion raised by 7 funds and represented 80.6% of capital raised in full year 2021.[1]
- Estimated dry powder was $50.0 billion at the end of Q1 2022, up from $48.3 billion at the end of 2021.[1]
- An estimated 101 funds are in market targeting $56.0 billion of commitments. GS Mezzanine Partners VIII is the largest fund in market targeting commitments of $12.0 billion.[1]

Opportunity [4]

- Funds with the capacity to scale for large sponsored deals

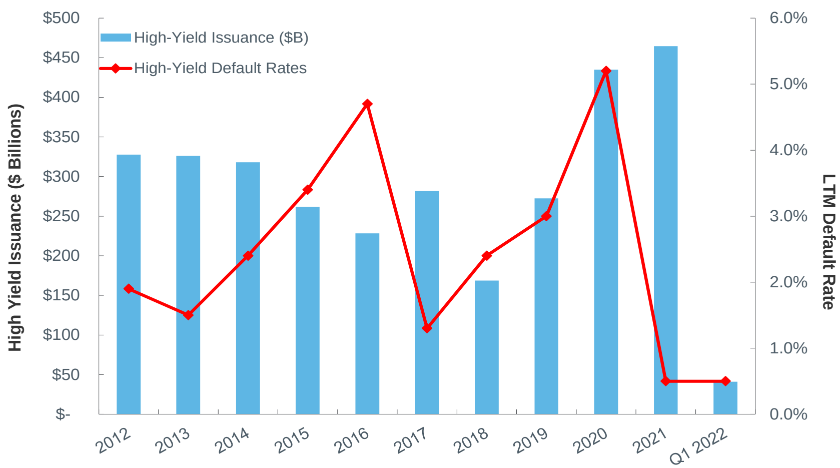
Distressed Private Markets

Distressed Debt, Turnaround, & Special Situations Fundraising



Source: Preqin

High-Yield Bond Volume vs Default Rates



Source: UBS & Fitch Ratings

Fundraising

- During the quarter, $3.9 billion was raised by 7 funds, down significantly from the $13.2 billion raised by 30 funds during 4Q 2021. Distressed funds have raised 5.1% of 2021's total through 1Q 2022.[1]
  - 1Q 2022's fundraising was 73.6% lower than the five-year quarterly average.
  - Capital raised in 1Q 2022 represented a decrease compared to the $19.2 billion raised in 1Q 2021.
  - Crestline Opportunity Fund IV was the largest fund closed during the quarter, closing on $1.6 billion.
- Dry powder was estimated at $145.3 billion at the end of 1Q 2022, which was down 8.3% from year-end 2021. This remained above the five-year annual average level of $130.5 billion.[1]
- Roughly 186 funds were in the market at the end of 1Q 2022 seeking $87.3 billion in capital commitments.[1]
  - Special situations managers were targeting the most capital, seeking an aggregate $56.9 billion, followed by distressed debt managers at $25.8 billion.
  - Clearlake Capital Partners VII was the largest fund in market with a target fund size of $10.0 billion.

Activity

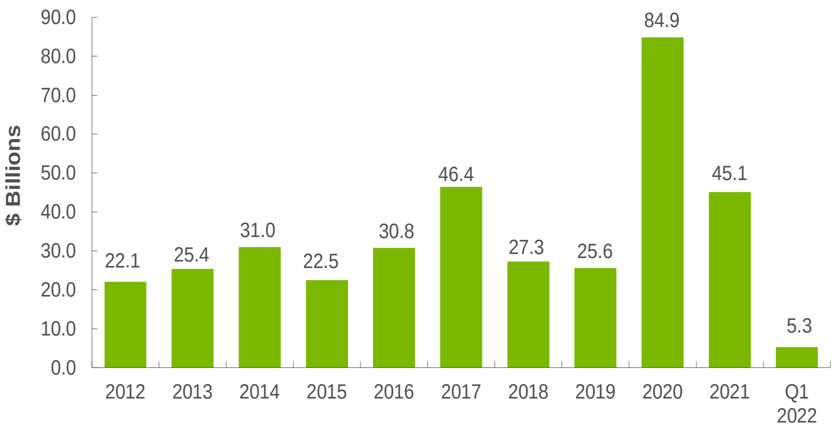
- The LTM U.S. high-yield default rate was 0.5% as of March 2022, which was in line with December 2021's LTM rate of 0.5%. The high-yield default rate is projected to trend higher through 2022.[6]
- The market dislocation caused by COVID-19 is expected to supply additional distressed opportunities in the next several months.

Opportunity [4]

- Funds capable of performing operational turnarounds
- Funds with the flexibility to invest globally

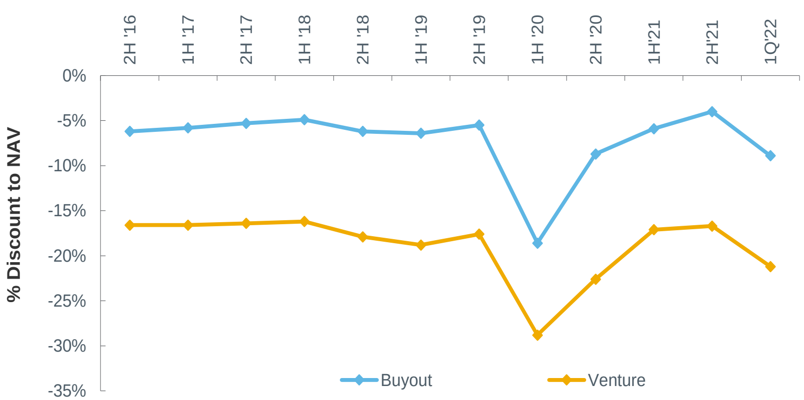
Secondaries

Secondary Fundraising



Source: Preqin

Secondary Pricing



Source: UBS

Fundraising

- 14 funds raised $5.3 billion during the quarter, down slightly from the $5.8 billion raised by 14 funds in 4Q 2021. This was 50.1% lower than the five-year quarterly average of 10.6 billion.[1]
  - Newbury Equity Partners V was the largest fund raised during the quarter, closing on $2.0 billion.
- At the end of 1Q 2022, there were an estimated 111 secondary and direct secondary funds in market targeting roughly $84.8 billion. The majority of secondary funds are targeting North American investments.[1]
  - Lexington Capital Partners X and ASF IX are the largest funds being raised, each seeking $15.0 billion in commitments.[1]

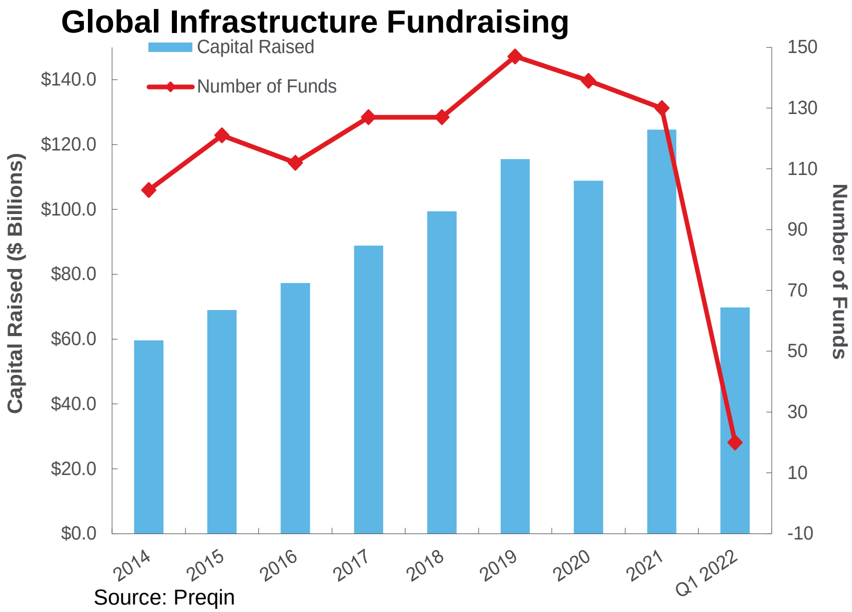
Activity

- The market continues to have participation from a broad base of buyers and sellers with opportunistic selling activity from public and private pensions, financial institutions and insurance companies.
- Transaction fund leverage and deferred payment structures continue to be prevalent and are used as a means to improve pricing and deal returns in an increasingly competitive environment.[2]
- According to UBS, The number of GP-led situations brought to market continued to increase in varying quality and strategies, along with more household GP names utilizing the secondary market. This is expected to continue throughout 2022.[2]
  - GP-led transactions continue to take a greater share of transaction volume and activity.
- Cambell Lutyens expect LP-led secondary sales to grow even stronger as more investors recognize the benefit of using these transactions to crystalize gains, trim their GP rosters, and manage balance sheet risk. [15]
- Recent market volatility may create a widening gap over the course of the year between bid and ask prices for secondary transactions.[15]
- The average discount rate for all private equity sectors finished the quarter at 11.4%, a larger discount compared to the 6.7% discount seen at the end of 2021. The average buyout pricing discount ended the quarter at 8.9%, while the average venture discount increased to 21.2%.[2]

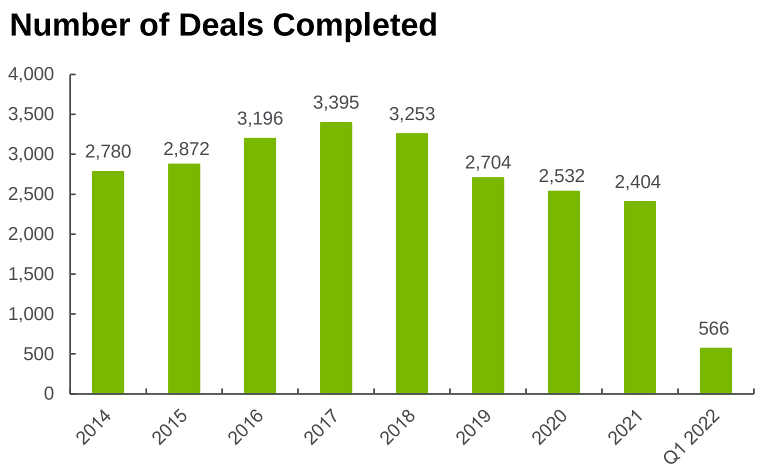
Opportunity [4]

- Funds that are able to execute complex and structured transactions
- Niche strategies

Infrastructure



Source: Preqin



Source: Preqin

Fundraising

- $69.7 billion of capital was raised by 20 funds in 1Q 2022 compared to $36.7 billion of capital raised by 24 partnerships in Q4 2021. Through 1Q 2022, infrastructure funds have raised 56.0% of 2021's total. [1]
  - KKR's Global Infrastructure Investors IV was the largest fund raised during the quarter, closing on $17.0 billion.[1]
- As of the end of 1Q 2022, there were an estimated 357 funds in the market seeking roughly $198.5 billion.[1]
  - Brookfield Global Transition Fund was the largest fund in market and was seeking commitments of $12.5 billion.
- At the end of the quarter, dry powder stood at $330.9 billion, up from last year's record of $313.0 billion.[1]
- Concerns surrounding the relative availability and pricing of assets remain. Fundraising continues to be very competitive given the number of funds and aggregate target level of funds in market. Investor appetite for the asset class persists despite the record levels of dry powder and increased investment activity from strategic and corporate buyers as well as institutional investors.

Activity

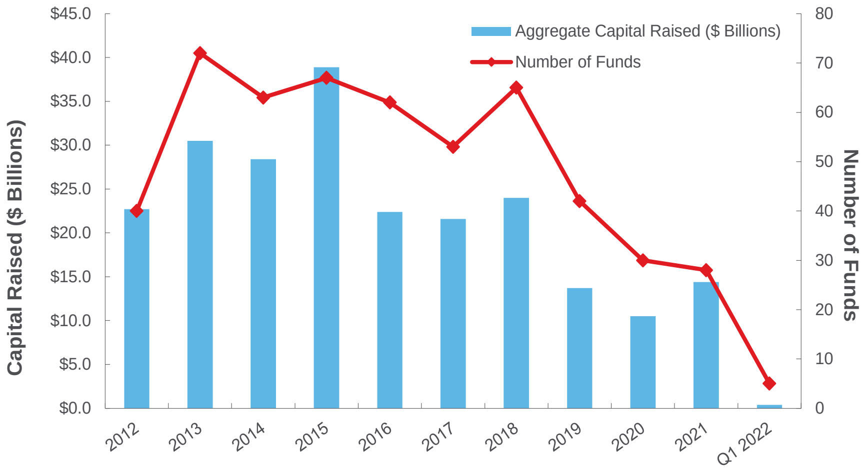
- Infrastructure managers completed 566 deals for an aggregate deal value of $72.5 billion in 1Q 2022 compared to 733 deals totaling $181.0 billion in 4Q 2021.[1]
  - By region, Europe saw the largest number of deals completed, with 44.2% of deals being invested in the region, followed by North America at 26.4%. Asia amassed 9.6% of activity during the quarter.
  - Renewable energy was the dominant industry during the quarter making up 59.5% of transactions, followed by the conventional energy sector which accounted for 11.5% of deals. The telecom sector accounted for 10.4% of deals during the first quarter.[1]

Opportunity [4]

- Mid-market core+ and value-add infrastructure as well as a platform investing approach continue to offer the best relative value
- Assess funds with pre-specified assets with caution due to possible lag in and uncertainty around valuation impact
- Blind-pool funds may be better positioned to take advantage of the market dislocation in certain sub-sectors, however careful review of such strategies is required
- Build-to-core greenfield strategies particularly in the social / PPP infrastructure space offer a premium for investors willing to take on construction / development risk

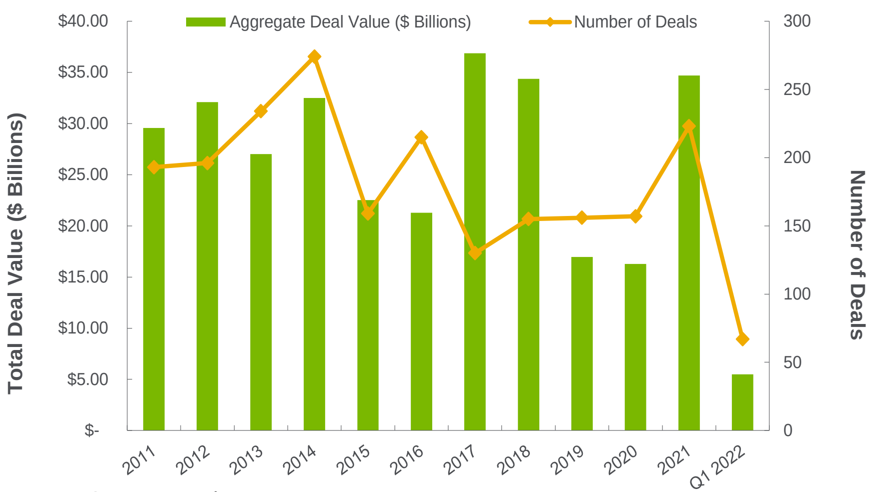
Natural Resources

Natural Resources Fundraising



Source: Preqin

Energy & Utilities Deal Activity



Source: Preqin

Fundraising

- During 1Q 2022, an estimated 5 funds closed on $0.4 billion compared to 28 funds totaling $14.4 billion in 2021.[1]
- Dry powder stood at roughly $38.0 billion at the end of 1Q 2022, which was 4.5% lower than 4Q 2021's level of $39.8 billion and down from the five-year average level by 22.9%.[1]

Activity

- Energy and utilities industry managers completed 67 deals totaling $5.5 billion in Q1 2022, compared to $34.7 billion across 223 deals in 2021.
- Crude oil prices increased during the quarter.
  - WTI crude oil prices increased 51.3% during the quarter to $108.50 per bbl. This was also an increase of 74.1% compared to 1Q 2021.[10]
  - Brent crude oil prices ended the quarter at $117.25/bbl, up 58.1% compared to the prior quarter, and up 79.3% from 1Q 2021.[10]
- Natural gas prices (Henry Hub) finished 1Q 2022 at $4.90 per MMBtu, which was up 30.3% from 4Q 2021 and up 87.0% from 1Q 2022.[10]
- A total of 671 crude oil and natural gas rotary rigs were in operation in the U.S. at the end of the quarter. This was up by 14.5% from the prior quarter and up 56.0% over 1Q 2021.[13]
  - Crude oil rigs represented 79.4% of the total rigs in operation. 60.4% of the 533 active oil rigs were in the Permian basin.
  - 45.6% and 26.8% of natural gas rigs at the end of 1Q 2022 were operating in the Haynesville and Marcellus basins, respectively.
- The price of iron ore (Tianjin Port) ended the quarter at $152.07 per dry metric ton, up from $116.96 at the end of 4Q 2021.[10]

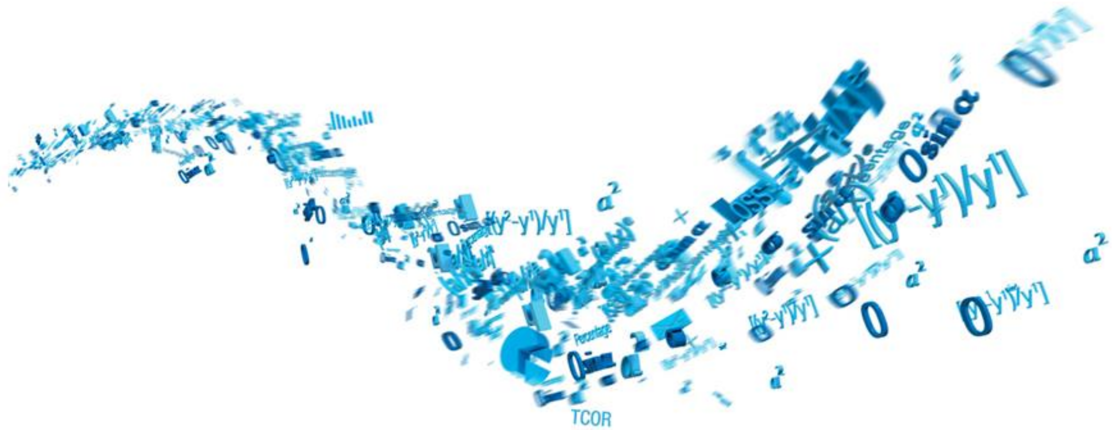
Opportunity [4]

- Acquire and exploit existing oil and gas strategies over early-stage exploration in core U.S. and Canadian basins
- Select midstream opportunities

Notes

1. Preqin
2. UBS
3. Standard & Poor’s
4. Aon Investments USA Inc.
5. Moody’s
6. Fitch Ratings
7. PitchBook/National Venture Capital Association Venture Monitor
8. Cooley Venture Financing Report
9. U.S. Energy Information Administration
10. Bloomberg
11. Setter Capital Volume Report: Secondary Market
12. KPMG and CB Insights
13. Baker Hughes
14. Evercore
15. Campbell Lyutens

Notes:
FY: Fiscal year ended 12/31
YTD: Year to date
YE: Year end
LTM: Last twelve months (aka trailing twelve months or TTM)
PPM: Purchase Price Multiples: Total Purchase Price / EBITDA
/bbl: Price per barrel
MMBtu: Price per million British thermal units



Appendix B:

Real Estate Market Update

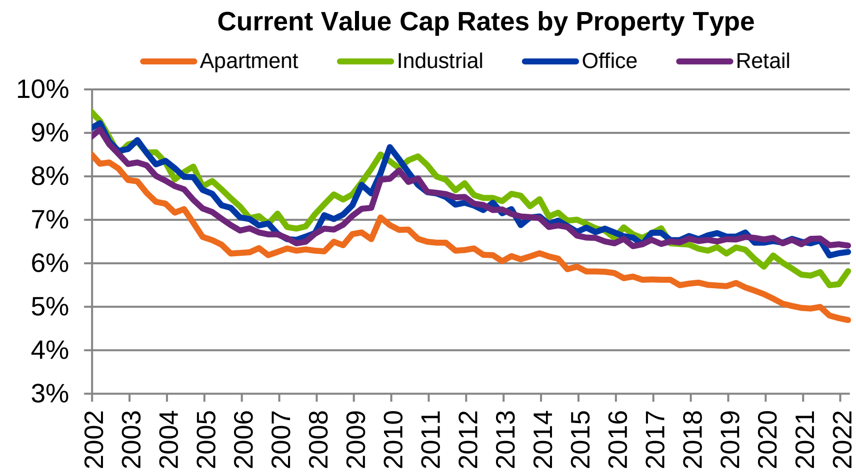
1Q 2022

United States Real Estate Market Update (1Q22)

General

- Townsend witnessed a robust recovery across the U.S. economy and U.S. real estate markets in 2021, with a continuation through the first quarter of 2022. The post-pandemic economic recovery has remained generally on track; however, an array of headwinds have emerged including rising interest rates, persistent inflation, various geopolitical events, and widespread global supply chain struggles. Equity markets retraced from December 2021's all-time highs, as a result of tightening federal reserve policy and market volatility. In 1Q22, The S&P 500 produced a gross total return of -4.6%. The MSCI US REIT index also cooled off following a strong 2021, posting a gross return of -4.1%.

- After multiple quarters of GDP growth, U.S. GDP decreased at an annualized rate of 1.5% in first quarter 2022, attributable to decreased federal, state and local government spending, and decreased exports. As a result of the atrocities of the Russian-Ukraine war, prolonged lockdowns in Shanghai, and a rise in protectionist measures, commodity pricing has skyrocketed, in lockstep with inflation. The Federal Reserve continues to view the overall economy as strong, despite, noting an anticipated slowing of growth in early 2022.



Source: NCREIF

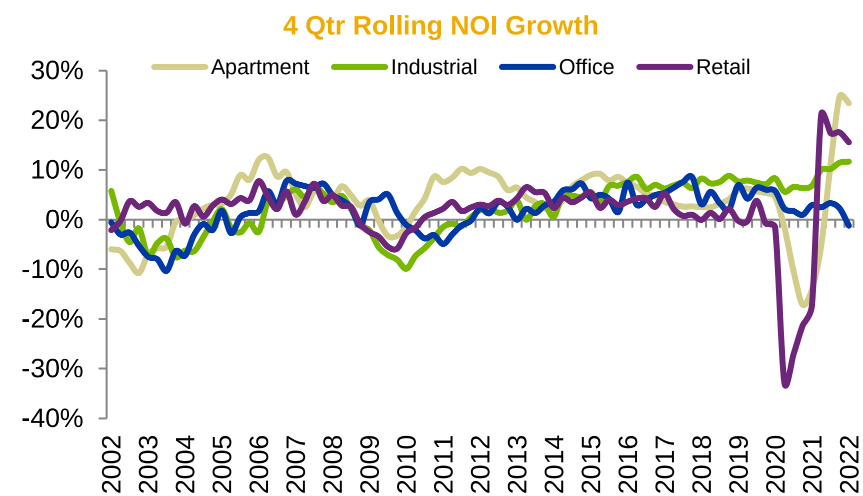
Commercial Real Estate

- Through the first quarter of 2022, total CRE transaction activity for the quarter was up 56% YoY, with annual transaction activity up 125% YoY. In 1Q22, deal volumes across all sectors moderated from a historic high in fourth quarter 2021. Transaction volume has been the strongest in the apartment and industrial sectors.

- Transaction cap rates (5.0%) expanded significantly during the quarter, to the tune of 76 bps. This increase comes after a -81 bps quarter-over-quarter decrease in 4Q21. Current valuation cap rates increased for industrial (+30 bps) and office (+3 bps). While both the apartment (-10 bps) and retail (-3 bps) property sectors experienced slight cap rate compression.

- NOI growth has substantially diverged between property sectors due to the impacts of COVID-19. Retail NOI has expanded substantially (+16%) YoY as the sector continues to recover from decreased rent collections and retailer shutdowns. Apartment sector fundamentals remain strong, as many millennials seek out a more opportune time to purchase their first home. Apartment NOI expanded (+23%) YoY.

- 10-year treasury bond yields steepened to 2.3% during the quarter, an increase of 80 basis points over year-end 2021. Economists expect rates to move modestly higher throughout 2022.



Source: NCREIF

Sources: Bureau of Economic Analysis, U.S. Census Bureau, St. Louis Fed, NCREIF, Real Capital Analytics, Bloomberg LP., Preqin.

United States Property Matrix (1Q22)

TOWNSEND® GROUP
an Aon company

INDUSTRIAL

- In 1Q22, industrial properties were the highest returning sector at 11.0% and outperformed the NPI by 563 bps.
- Transaction volumes decreased to $34 billion in the first quarter of the year, resulting in a 50% increase year-over-year. Individual asset sales increased 18% year-over-year, while portfolio purchases turned in a year-over-year volume increase of 33%. At $34 billion, the industrial sector decreased by $44 billion quarter-over-quarter.
- The industrial sector turned in NOI growth of 11.7% over the past year. NOI continues to reach all time highs for the sector.
- Vacancy decreased by 173 bps year-over-year to 1.8%. Vacancy in the sector decreased 30 bps from last quarter, reaching all-time historic lows. E-commerce continues to drive demand across the sector.
- Industrial cap rates compressed approximately 100 bps from a year ago, to 3.4%. Industrial overall fundamentals still top all property sectors.

MULTIFAMILY

- The apartment sector delivered a 5.3% return during the quarter, underperforming the NPI by 8 bps.
- Transaction volume in the first quarter of 2022 decreased to $63 billion, resulting in an increase of 56% year-over-year. Transaction volume for the sector is near historical levels. This volume continues to make multifamily the most actively traded sector for the eighteenth straight quarter.
- Cap rates remained steady at 3.6% quarter-over-quarter, decreasing 15 bps year-over-year. Multifamily cap rates remain at the lowest level observed in years, driven by continued increases in valuation.
- The multifamily sector saw increasing vacancy rates throughout the entirety of 2020 due to the global pandemic. Through 2021, the sector appears to have shaken that trend although vacancy rates remained steady during the last 3 quarters. Vacancy rates slightly decreased by 7 bps quarter-over-quarter and are back to near pre-pandemic levels. The aging millennials have begun shifting their desires to suburban living, but continued home price appreciation has deterred the full effect of this migratory trend.

OFFICE

- The office sector returned 1.6% in 1Q22, 373 bps below the NPI return over the period.
- Transaction volumes decreased by 59% year-over-year in the first quarter. Transaction volume equated to $35 billion for the quarter, a decrease of $20 billion quarter-over-quarter. Office transaction levels have officially regressed to levels only seen prior to the COVID-19 pandemic.
- Office sector vacancy rates have expanded since the beginning of the pandemic due to work from home orders and uncertainty revolving around the future of office space. Office continues to be the highest vacancy property type at close to 12.9%, increasing 20 bps from last quarter.
- NOI growth in the office sector compressed quarter-over-quarter by 295 bps and appears to be in the midst of its recovery to pre-pandemic levels.
- Office cap rates compressed from a year ago, sitting at approximately 4.5%. Office-using job growth was stunted significantly through out 2020 due to work from home orders. Though we are observing a slow but steady flow back to in-office work, there is still uncertainty in the sector as many companies remain hesitant.

RETAIL

- As of 1Q22, the retail sector delivered a quarterly return of 2.3%, underperforming 307 bps below the NPI.
- Transaction volumes totaled $19 billion in the first quarter, increasing 102% year-over-year. Single asset transactions accounted for just over 79% of all sales volume for the quarter.
- Cap rates have expanded approximately 10 bps within the sector over the last year, to 5.1%. Current valuation cap rates compressed quarter-over-quarter by 20 bps due to valuation adjustments made across the sector in general.
- NOI growth slightly decreased, 2.0% over the last year. Retail has begun its slow recovery as vaccine rollouts have allowed a large portion of store nationally to open and operate safely.
- Retail vacancy rates increased over the quarter by 10 bps, and down 90 bps over the past year to 9.0%. Many big box stores have closed as the need for retail space shrinks, translating to a negative outlook for rent growth. Paired with the global economic crisis, which has had a significant negative impact on this sector.

Sources: Real Capital Analytics, Green Street, NCREIF

Global Real Estate Market Update (1Q22)

TOWNSEND® GROUP
an Aon company

- Diminishing operational uncertainty, robust demand and abundant liquidity led global investment activity to a strong start to 2022. More capital being put into the market than any other first quarter ($280B, 33% increase from 1Q21). Unfortunately, this surge was quelled in relation the geopolitical consequences of war between Russia and Ukraine. The conflict has contributed to rising commodity prices in conjunction with inflation, and lower expectations of economic growth overall.

- That withstanding, the U.S. was at the forefront of this growth in deal volume improving 76% YOY. This was led by its multifamily sector, being the world's largest single property market. The Asia Pacific market had inverse results with deal pipelines dissipating. China's zero-Covid policy, which put some of the country's largest cities into complete lockdown, has played a part.

Global Total Commercial Real Estate Volume - 2021 - 2022

$ US Billions	Q1 2022	Q1 2021	% Change Q1 22 - Q1 21	Full Year Ending Q1 2022	Full Year Ending Q1 2021	% Change Full Year
Americas	169	96	75%	855	356	140%
EMEA	81	78	4%	444	308	44%
Asia Pacific	126	144	-13%	865	824	5%
Total	375	318	18%	2164	1488	45%

Source: Real Capital Analytics, Inc., Q1' 22

- Following a serious downturn during the peak of the pandemic, the hotel industry is trending towards a recovery. The lowering of travel restrictions has seen global air traffic up 116% YOY as of February 2022. This has reflected in transaction activity with purchases totaling $18B 1Q22 and in the last 12 months doubled its volume from the previous year.

- Given the low interest rate environment, the weight of capital targeting real estate will likely continue to increase as investors search for yield. While the industrial, residential and healthcare sectors are taking the lion's share of allocated capital, core offices and niche sectors like student/senior living are beginning to garner more investor interest despite facing occupancy challenges in 2021.

- Buoyant buyer demand boosted by strong investment fundamentals has continued to drive investment activity across the Multifamily asset class globally, continuing its momentum into Q122. Despite a modest decline in quarterly volumes year-over-year in EMEA, activity remained well above historic first quarter norms. While inflationary pressures and rising construction costs suggest some headwinds, the sector remains one of the most favored across the regions.

- Inflation points have reached record levels in the U.S. and Europe prompting a shift in Fed policy. While inflation is forecast to stay high through most of 2022, it is expected to moderate thereafter. In the U.S., the price effects of supply chain disruptions are expected to subside over the coming quarters, with continued higher rents and wages countering these deflationary factors, which is expected to keep overall inflation at higher levels than pre-COVID through 2023.

- The industrial sector continues to exhibit the strongest performance globally, spurred by tenant demand driven by an acceleration in e-commerce and supply chain reconfiguration. Inventory shortages resulting in supply chain reorientation is expected to continue to shift demand to emerging markets(e.g., Vietnam, India, Mexico). Additionally, supply chain bottlenecks have led to shipping and port delays and shifted incremental demand to inland port and more rail- dependent locations.

Global Outlook - GDP (Real) Growth % pa, 2022-2024

	2022	2023	2024
Global	**5.9**	**4.3**	**3.6**
Asia Pacific	**4.4**	**4.6**	**4.4**
Australia	4.1	2.8	2.5
China	4.5	5.2	5.1
India	8.7	7.3	6.5
Japan	1.8	1.8	1.1
North America	**2.7**	**2.0**	**1.9**
US	2.6	2.0	1.9
Middle East	**4.1**	**4.4**	**4.5**
European Union	**3.0**	**2.1**	**2.0**
France	2.7	1.8	1.7
Germany	1.8	2.3	2.0
UK	3.7	1.2	1.7

Source: Bloomberg

Sources: Jones Lang LaSalle Research, Cushman & Wakefield, Real Capital Analytics, Inc., CBRE

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Chicago, IL 60601

ATTN: Aon Investments Compliance Officer

Capital Markets Outlook & Risk Metrics

As of June 30, 2022

Capital Markets Outlook

Markets

→ June capped off the worst first half performance for US equity markets since the 1970s, as markets reassessed future growth expectations in response to the Fed's 75 bp rate hike in June.

→ In the US, small and mid-cap companies lagged large and mega cap stocks in the month of June and value lagged growth stocks.

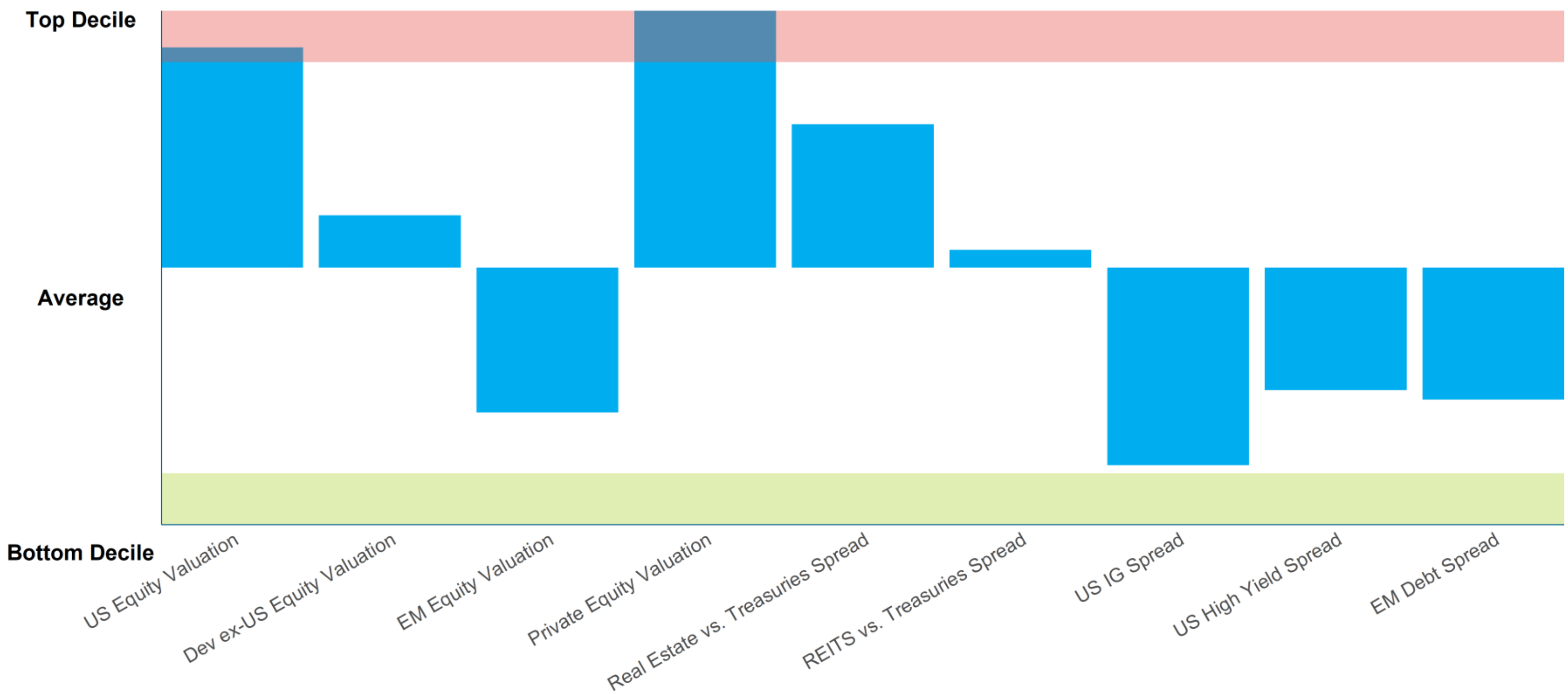
→ While all major equity indices suffered negative returns, emerging markets and China proved to be slightly more resilient than US and non-US developed markets.

→ After a strong performance in early 2022, commodities, infrastructure, and public natural resources also suffered negative returns in June.

→ Inflation re-accelerated in the US and Europe to new highs in June, reigniting concerns that policy officials may prioritize inflation fighting at the expense of economic growth. Markets repriced inflation expectations higher, and bonds suffered losses across all categories.

→ While China continues to ease COVID lockdowns and engage in fiscal and monetary stimulus, concerns persist that China's 2022 GDP will be substantially lower than 2021.

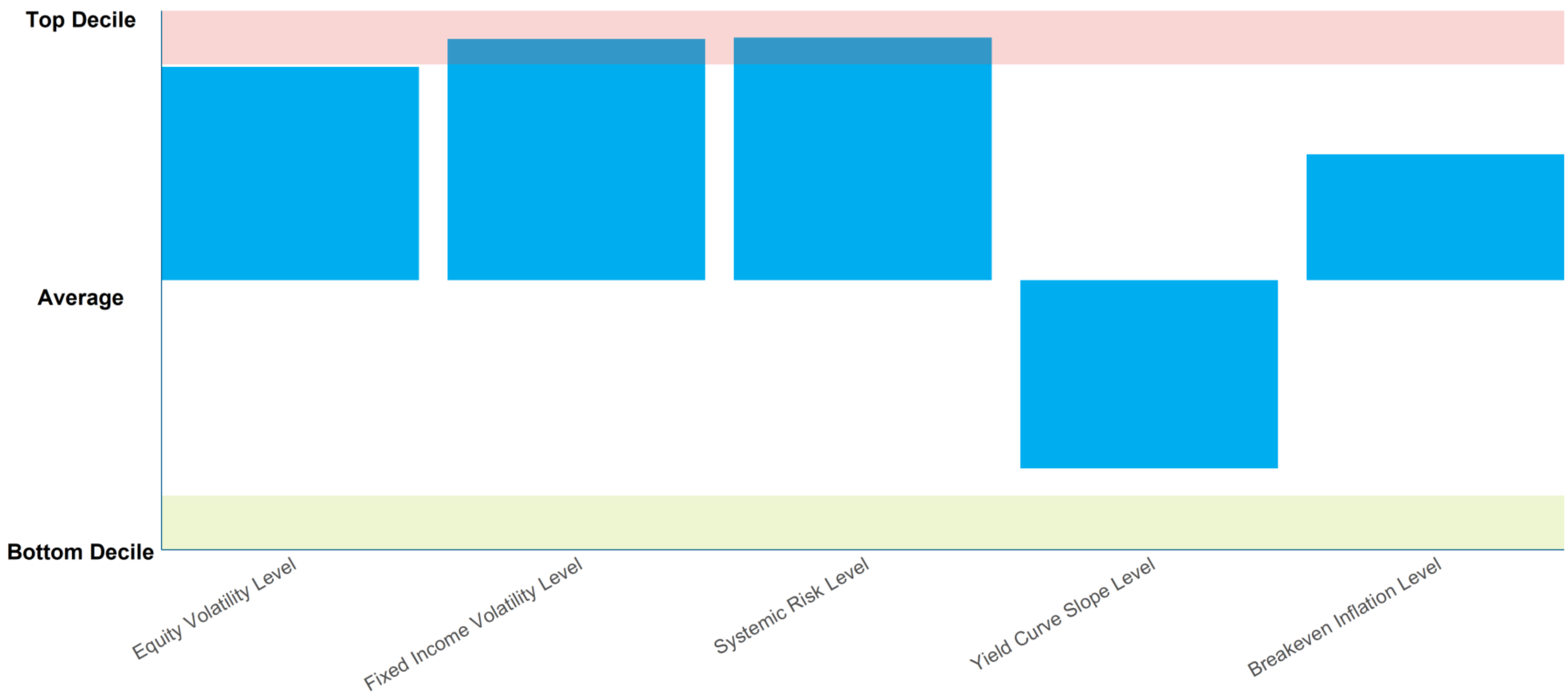
Risk Overview/Dashboard (1)
(As of June 30, 2022)[1]



→ Dashboard (1) summarizes the current state of the different valuation metrics per asset class relative to their own history.

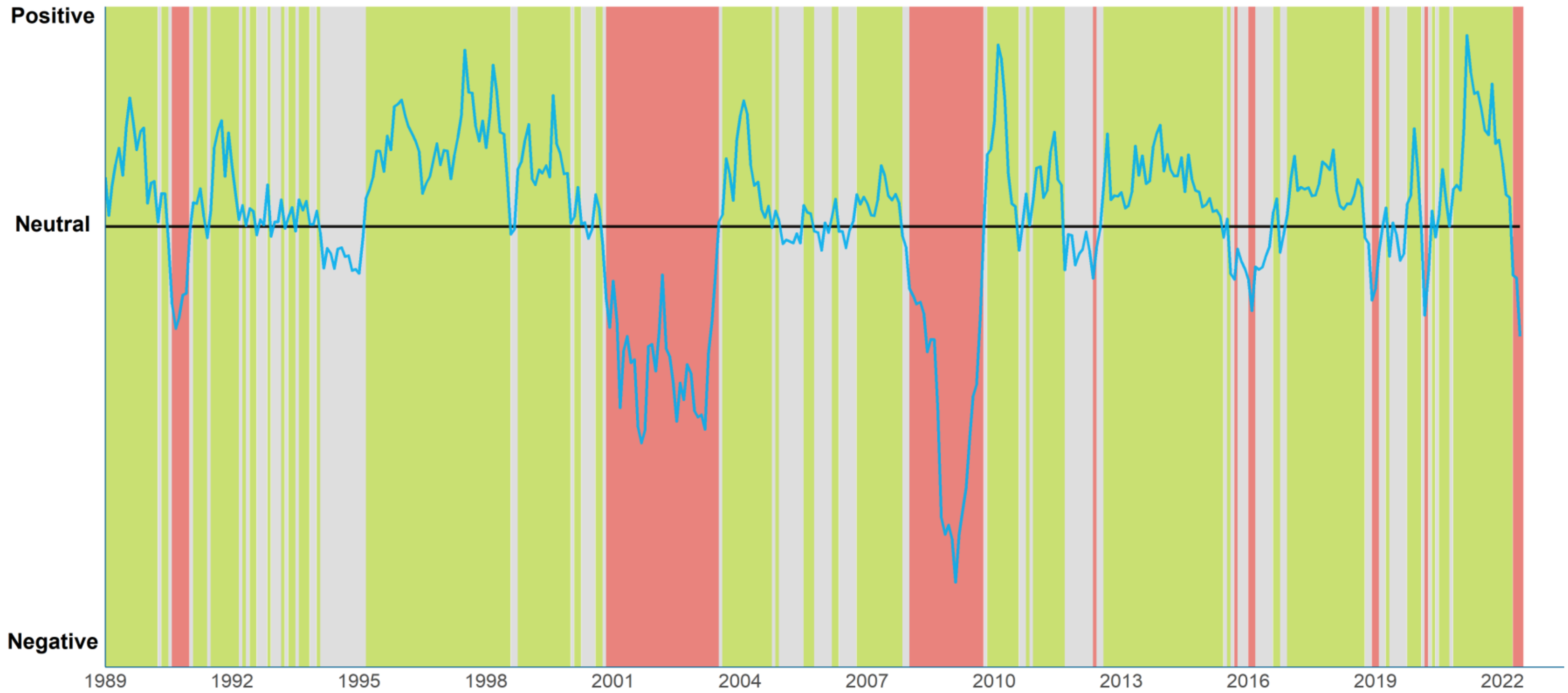
[1] With the exception of Private Equity Valuation, that is YTD as of December 31, 2021.

Risk Overview/Dashboard (2)
(As of June 30, 2022)

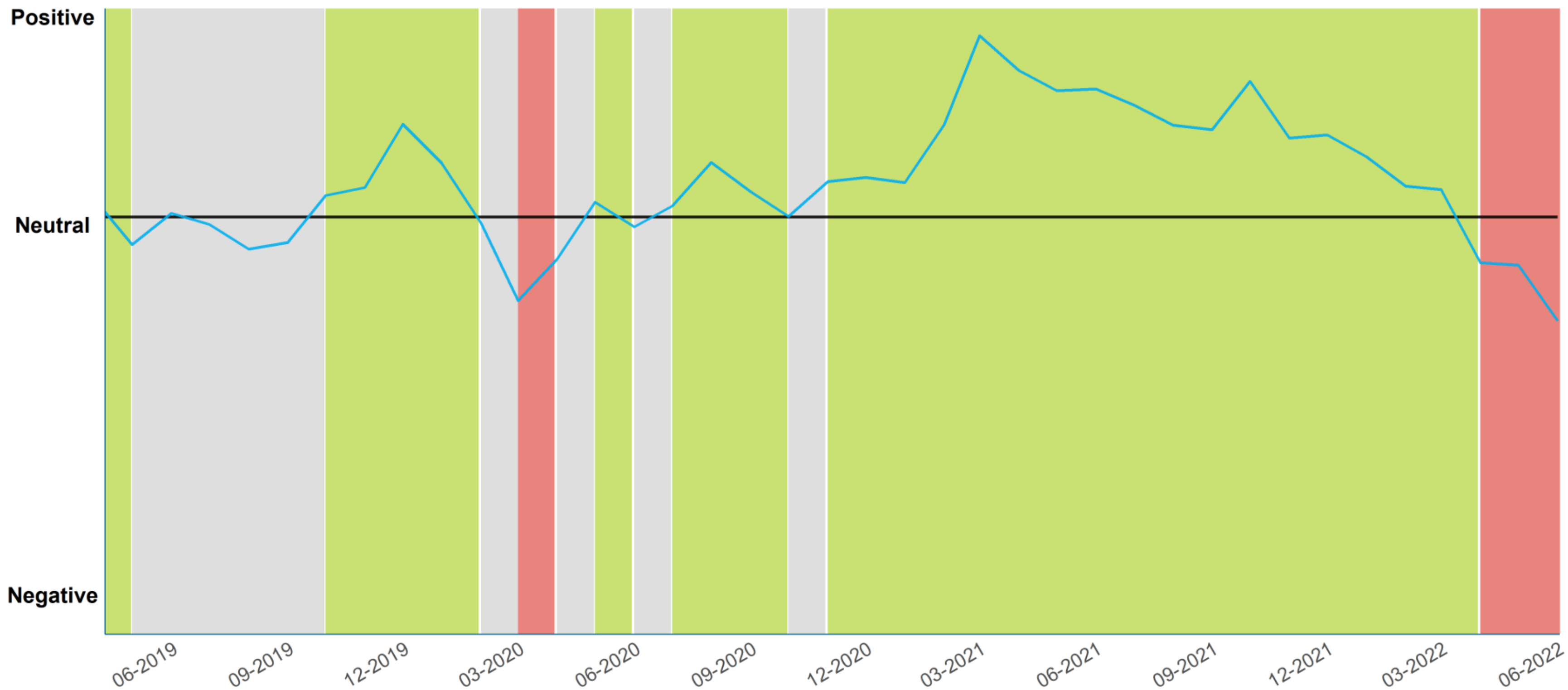


→ Dashboard (2) shows how the current level of each indicator compares to its respective history.

Market Sentiment Indicator (All History)
(As of June 30, 2022)

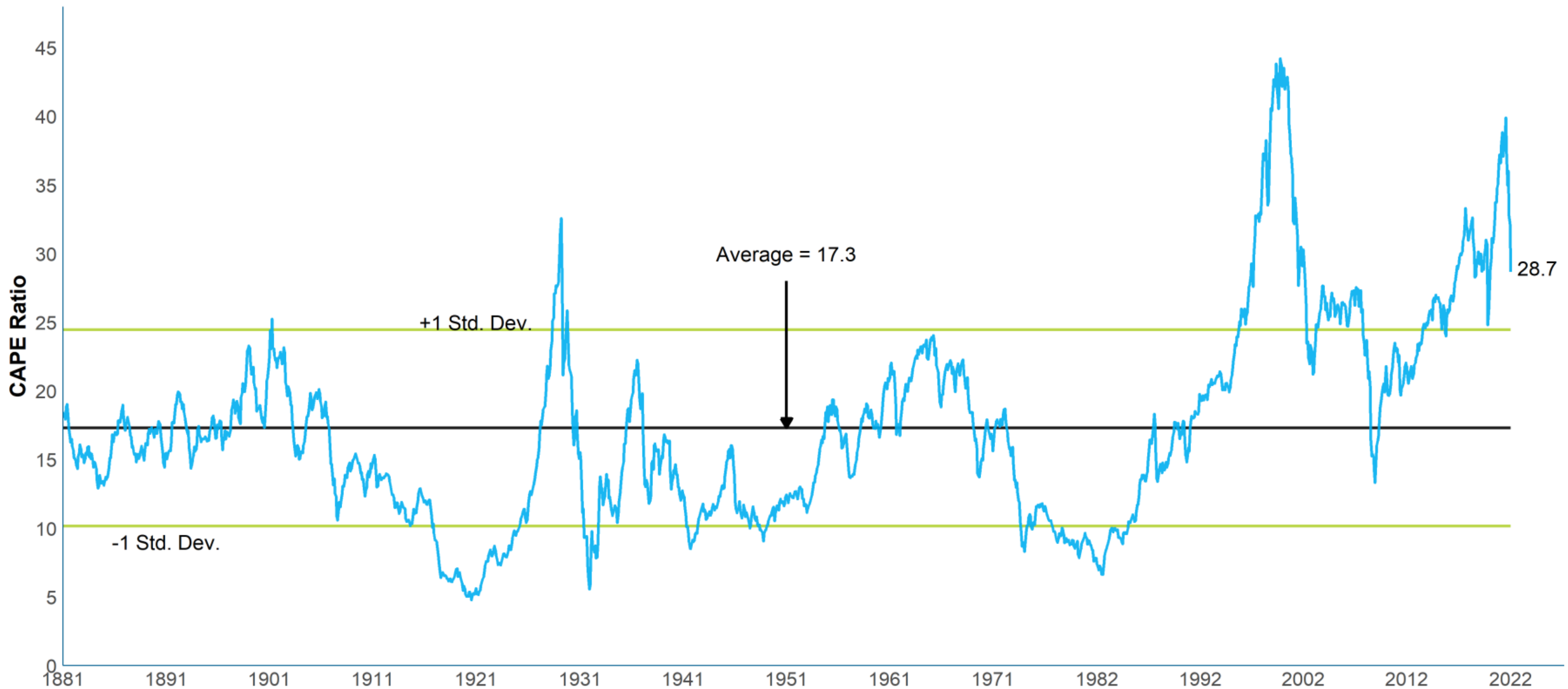


Market Sentiment Indicator (Last Three Years)
(As of June 30, 2022)



US Equity Cyclically Adjusted P/E[1]

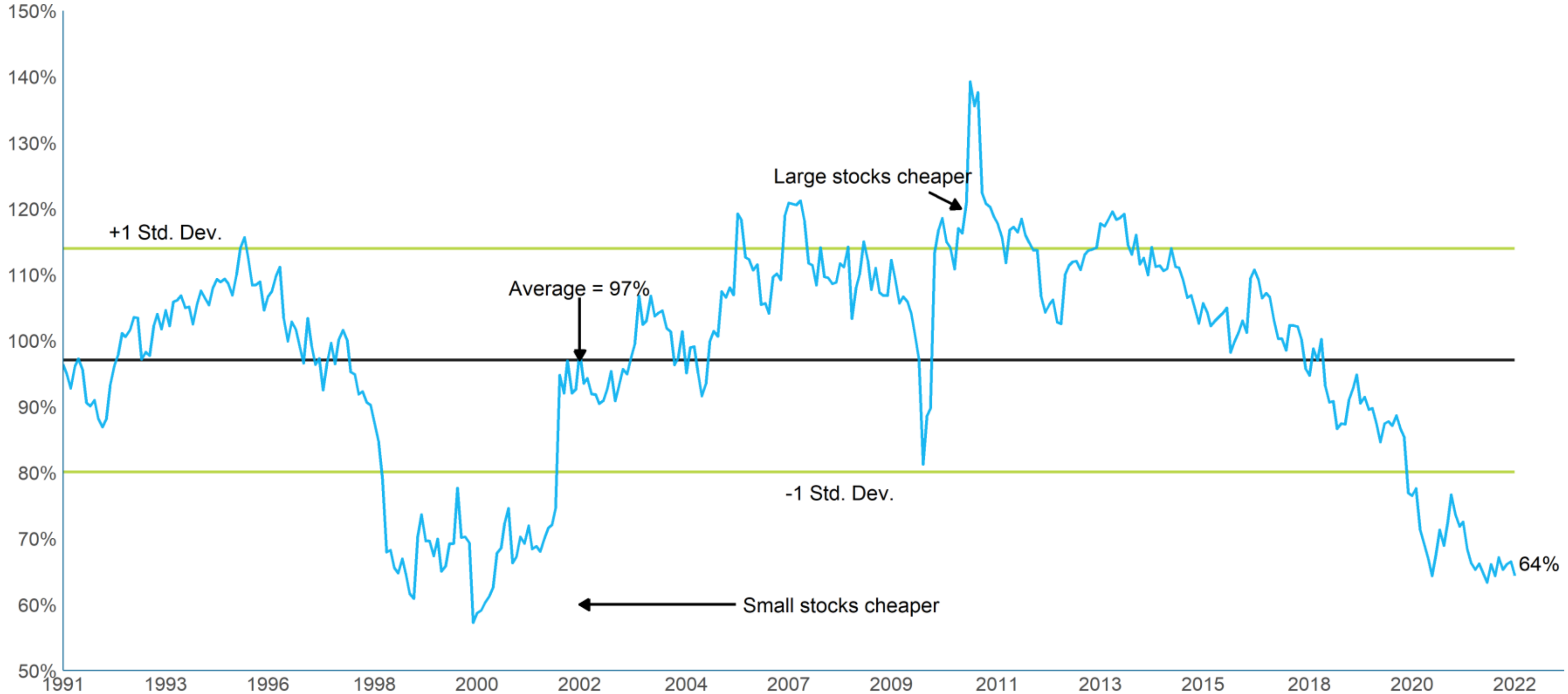
(As of June 30, 2022)



→ This chart details one valuation metric for US equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group.

Small Cap P/E vs. Large Cap P/E[1]
(As of June 30, 2022)



→ This chart compares the relative attractiveness of small cap US equities vs. large cap US equities on a valuation basis. A higher (lower) figure indicates that large cap (small cap) is more attractive.

[1] Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.

Growth P/E vs. Value P/E[1]
(As of June 30, 2022)

→ This chart compares the relative attractiveness of US growth equities vs. US value equities on a valuation basis. A higher (lower) figure indicates that value (growth) is more attractive.

[1] Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.

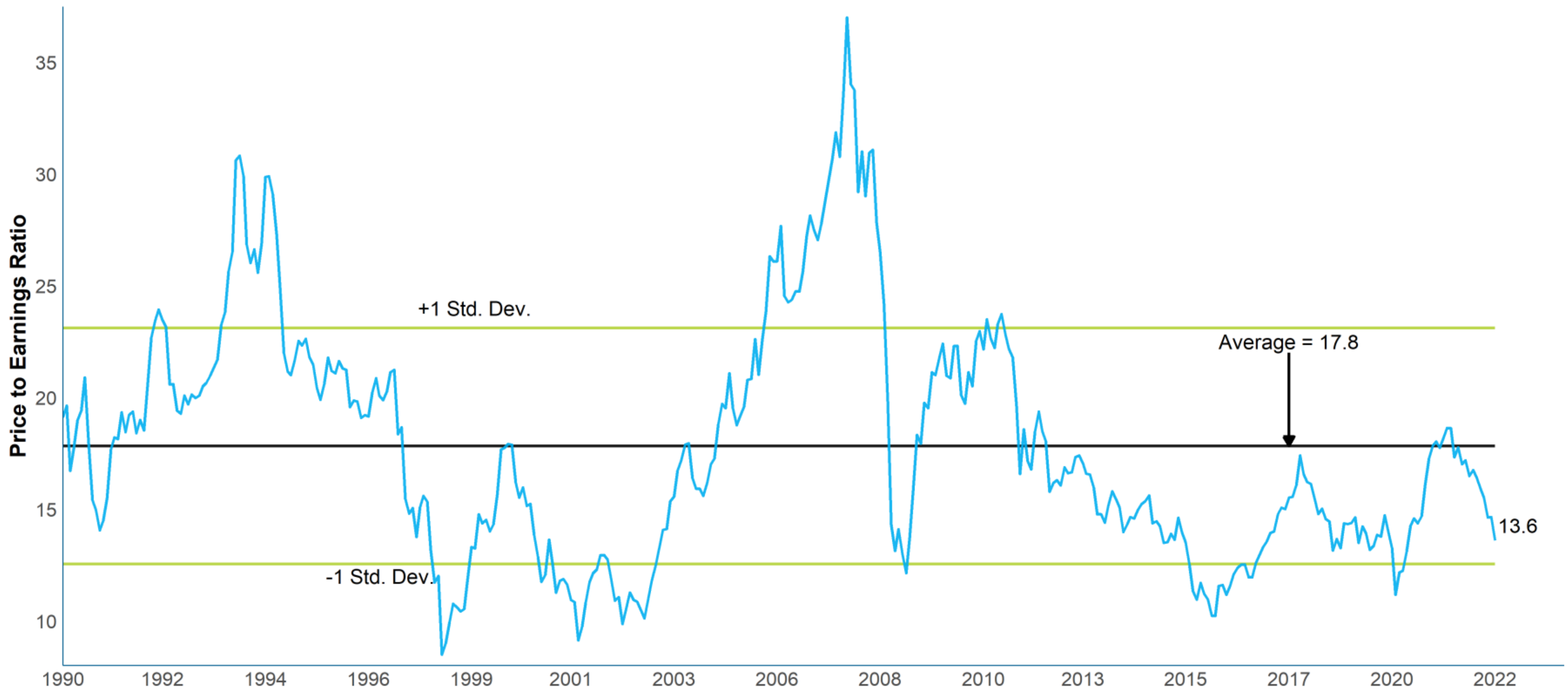
Developed International Equity Cyclically Adjusted P/E[1]
(As of June 30, 2022)

→ This chart details one valuation metric for developed international equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Developed International Equity (MSCI EAFE Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

Emerging Market Equity Cyclically Adjusted P/E[1]

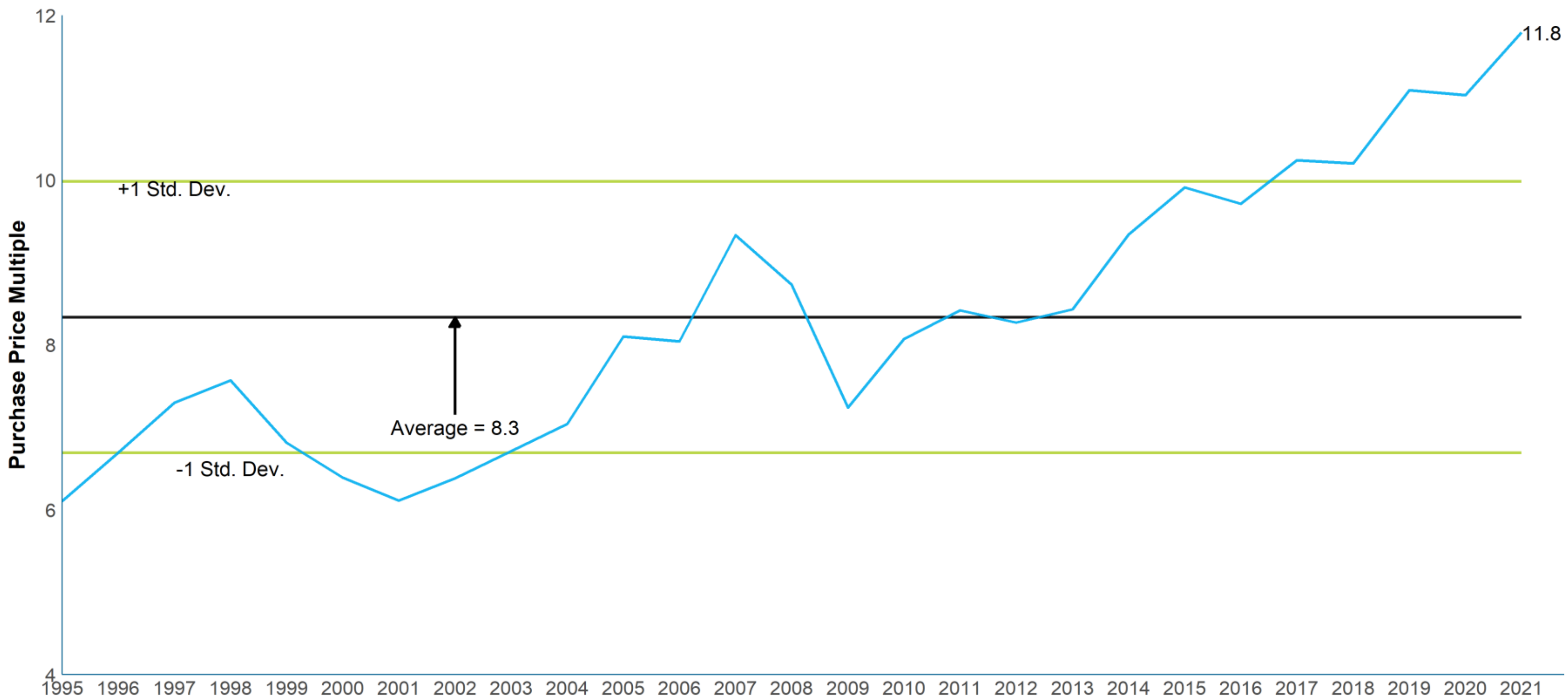
(As of June 30, 2022)



→ This chart details one valuation metric for emerging markets equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

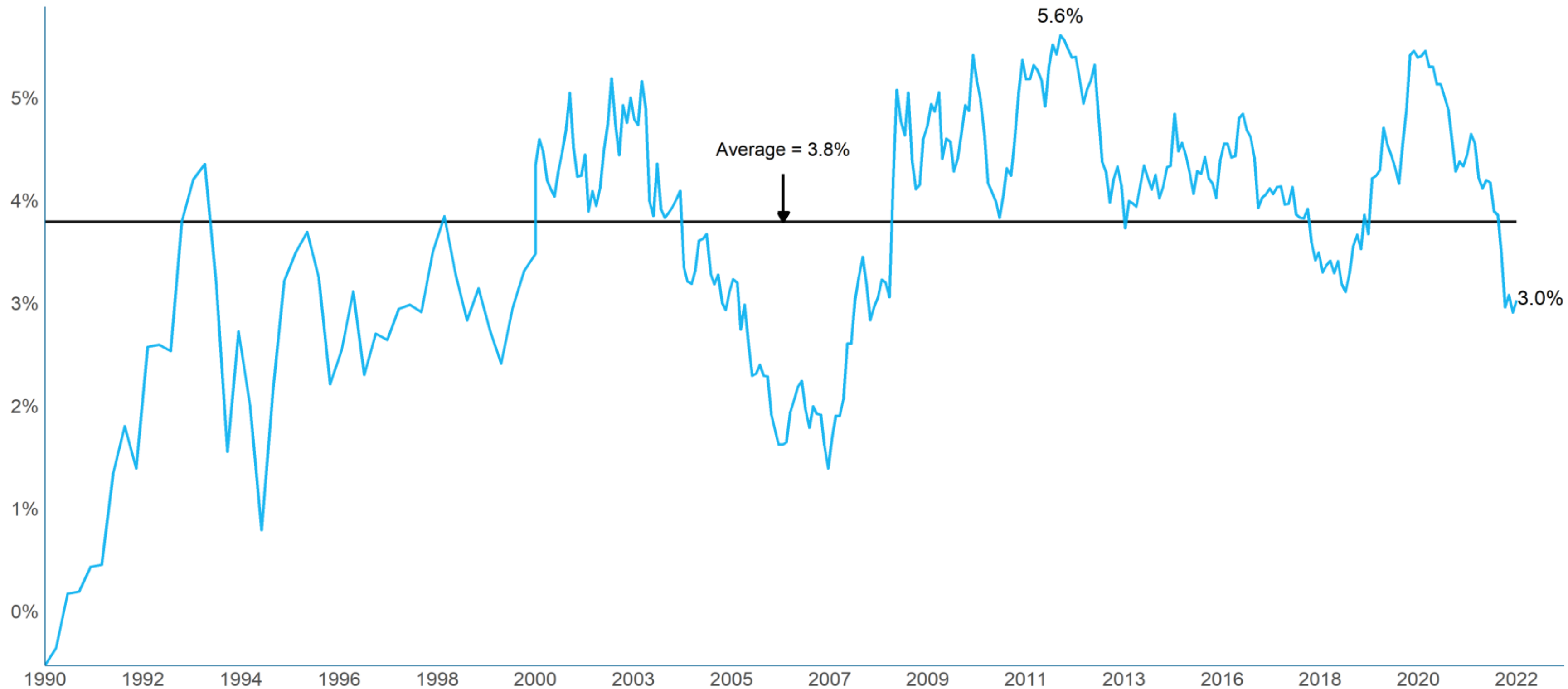
Private Equity Multiples[1]
(As of June 30, 2022)[2]



→ This chart details one valuation metric for the private equity market. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs.
[2] Annual Data, as of December 31, 2021

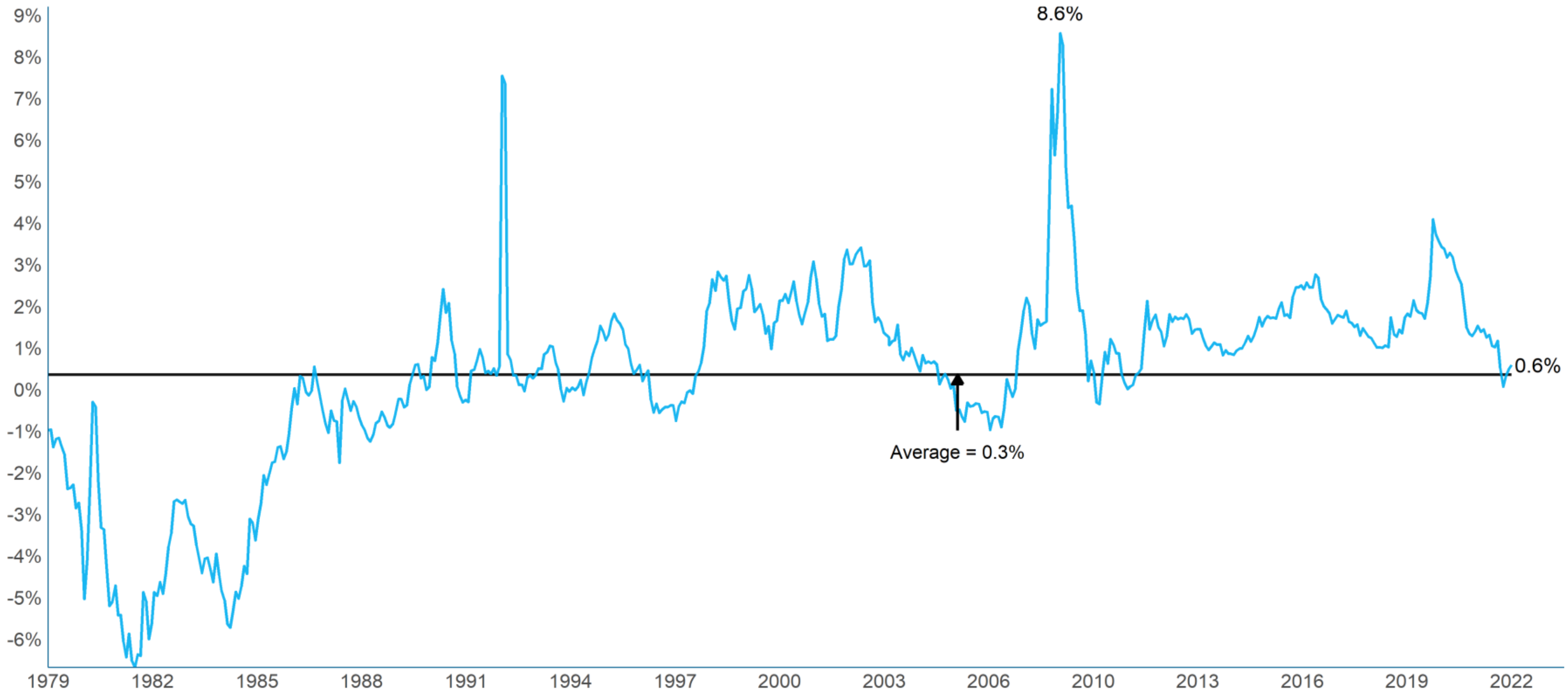
Core Real Estate Spread vs. Ten-Year Treasury[1]
(As of June 30, 2022)



→ This chart details one valuation metric for the private core real estate market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction-based indices from Real Capital Analytics and Meketa Investment Group.

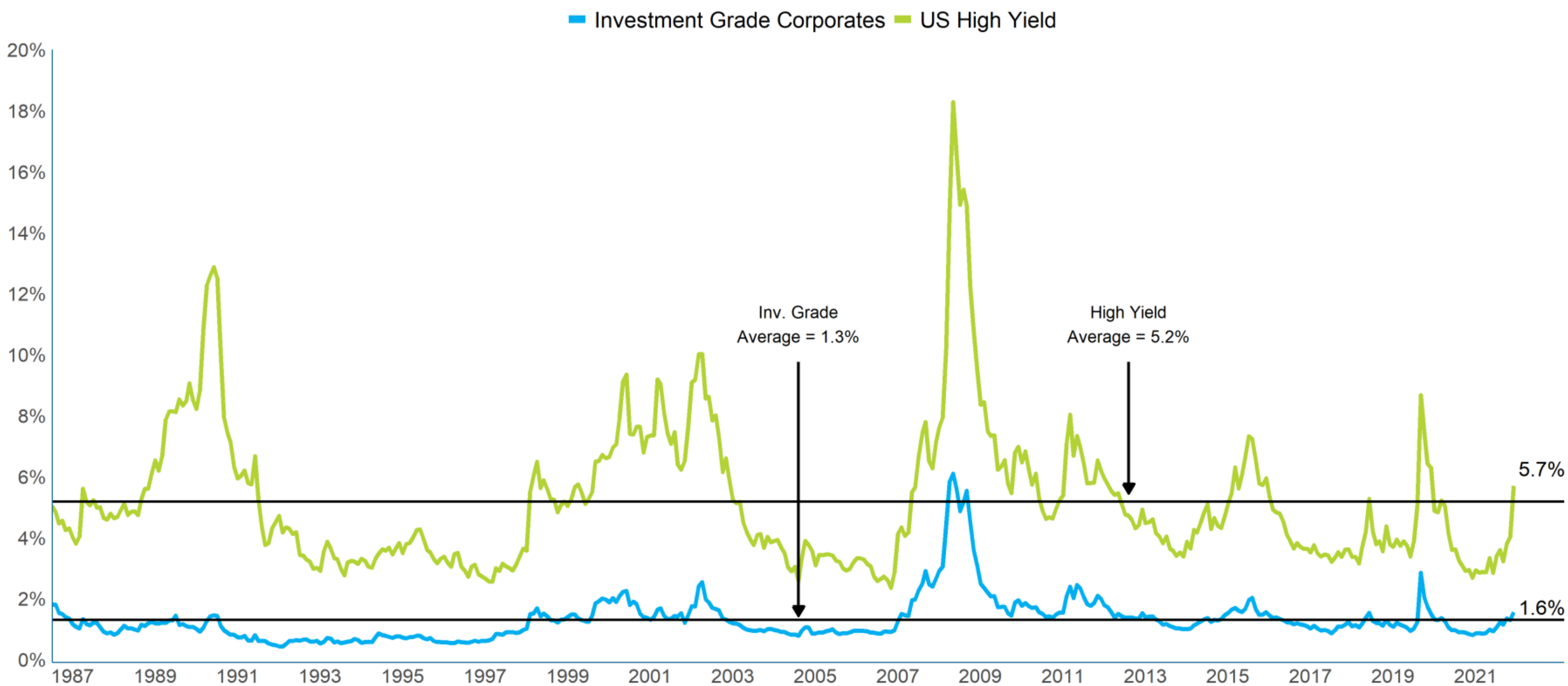
REITs Dividend Yield Spread vs. Ten-Year Treasury[1]
(As of June 30, 2022)



→ This chart details one valuation metric for the public REITs market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity Index.

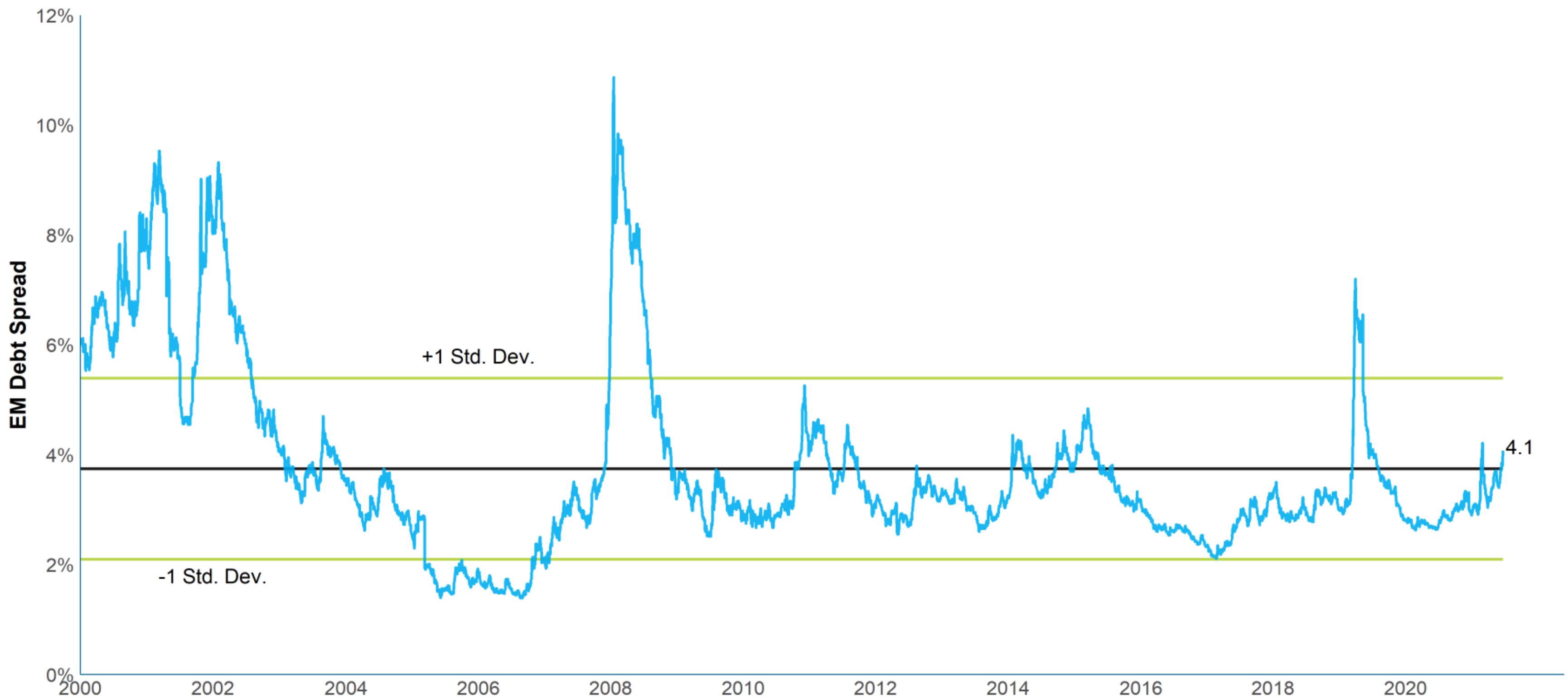
Credit Spreads[1]
(As of June 30, 2022)



→ This chart details one valuation metric for the US credit markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

[1] Credit Spreads – Source: Bloomberg. High Yield is proxied by the Bloomberg High Yield Index and Investment Grade Corporates are proxied by the Bloomberg US Corporate Investment Grade Index. Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year US Treasury yield.

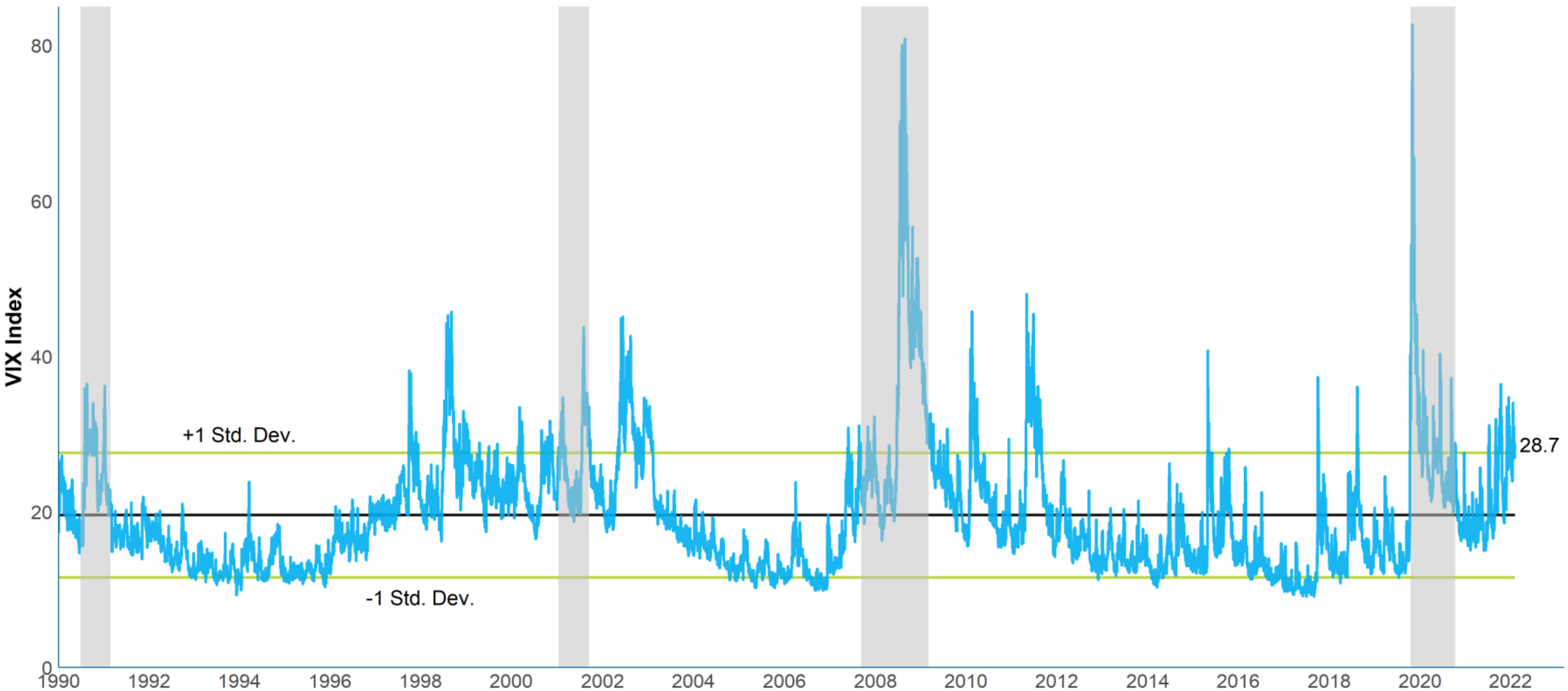
Emerging Market Debt Spreads[1]
(As of June 30, 2022)



→ This chart details one valuation metric for the EM debt markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

[1] EM Spreads – Source: Bloomberg. Option Adjusted Spread (OAS) for the Bloomberg EM USD Aggregate Index.

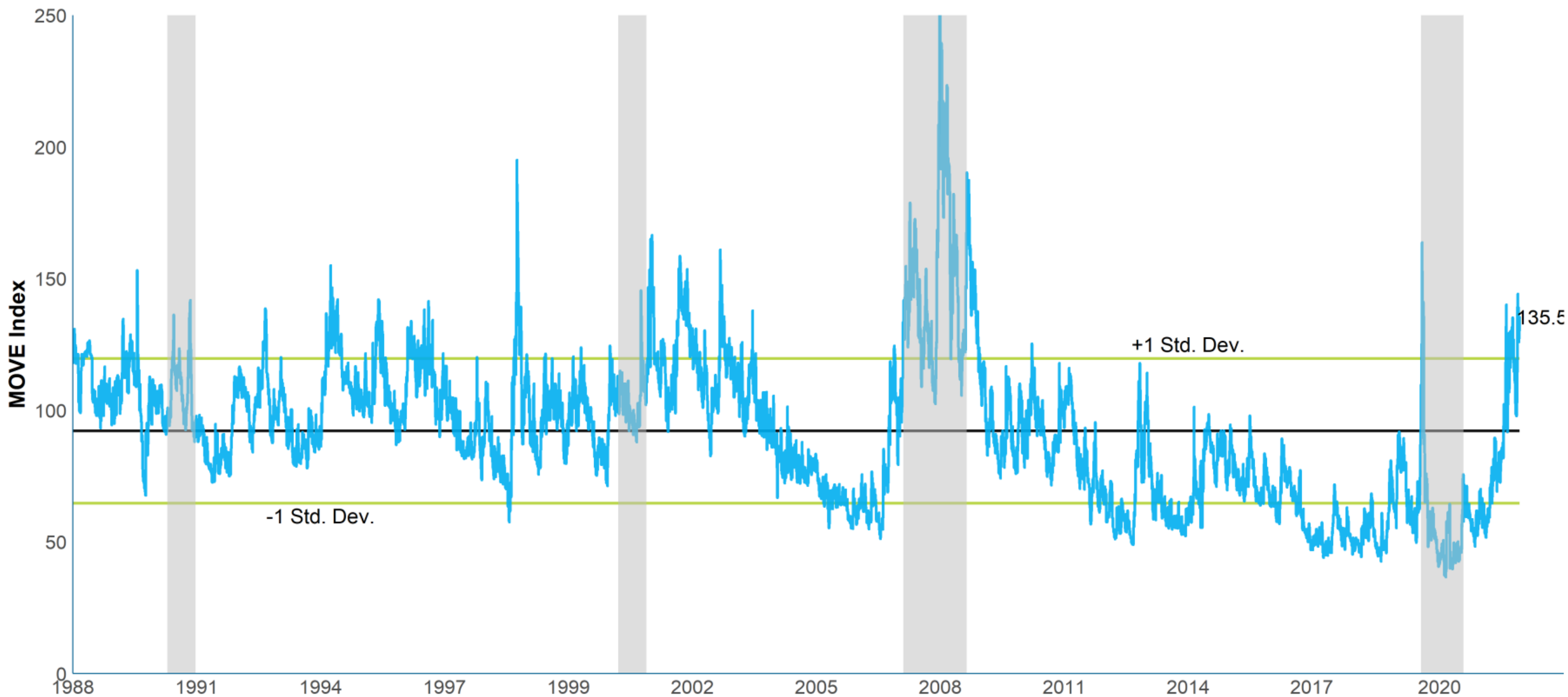
Equity Volatility[1]
(As of June 30, 2022)



→ This chart details historical implied equity market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.

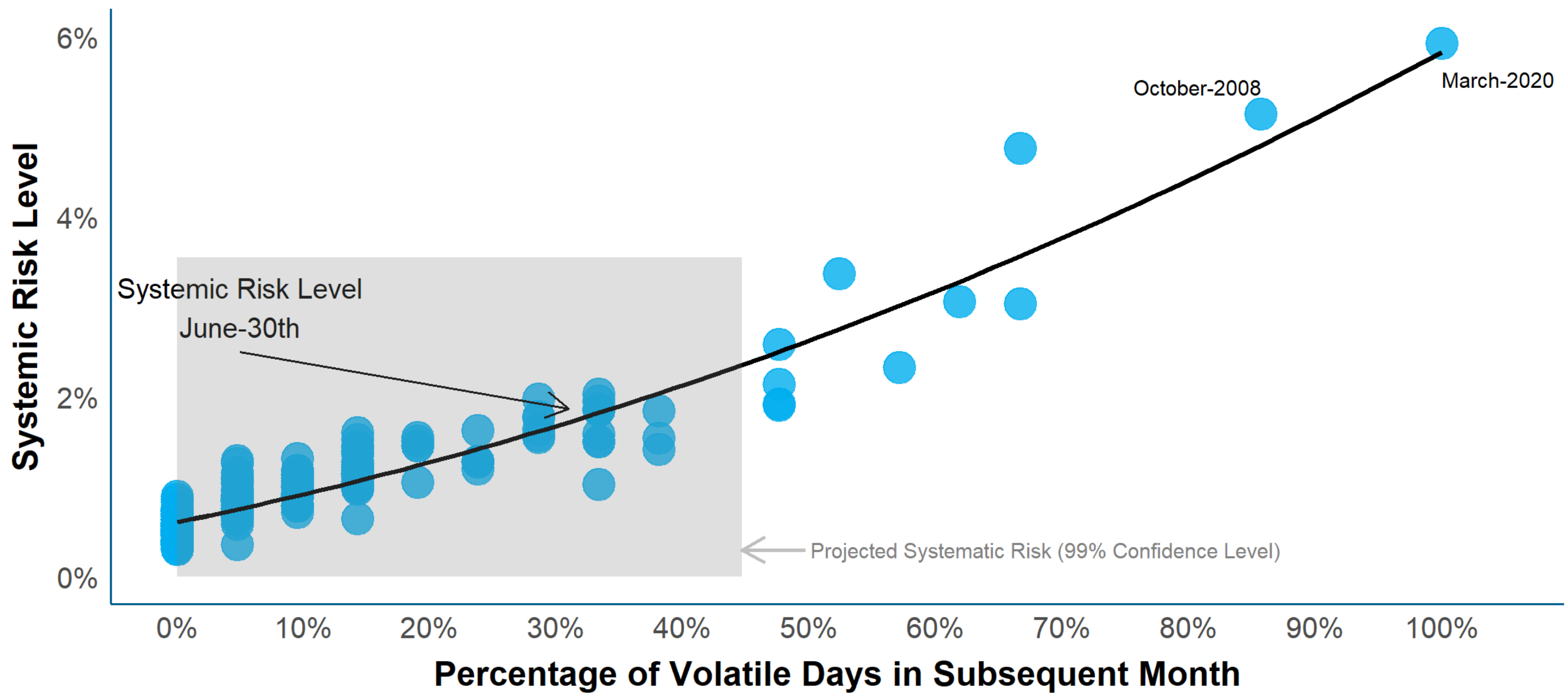
Fixed Income Volatility[1]
(As of June 30, 2022)



→ This chart details historical implied fixed income market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Fixed Income Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.

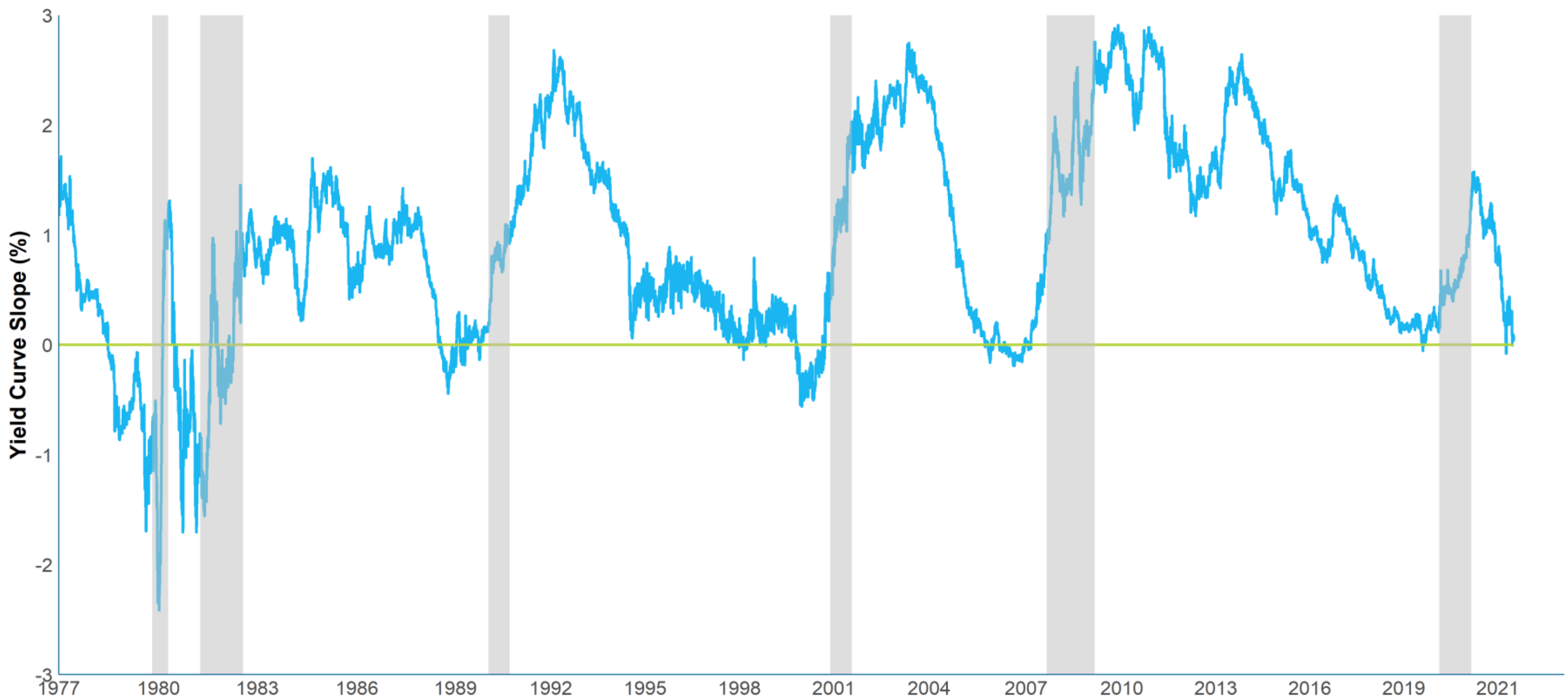
Systemic Risk and Volatile Market Days[1]
(As of June 30, 2022)



→ Systemic Risk is a measure of 'System-wide' risk, which indicates herding type behavior.

[1] Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

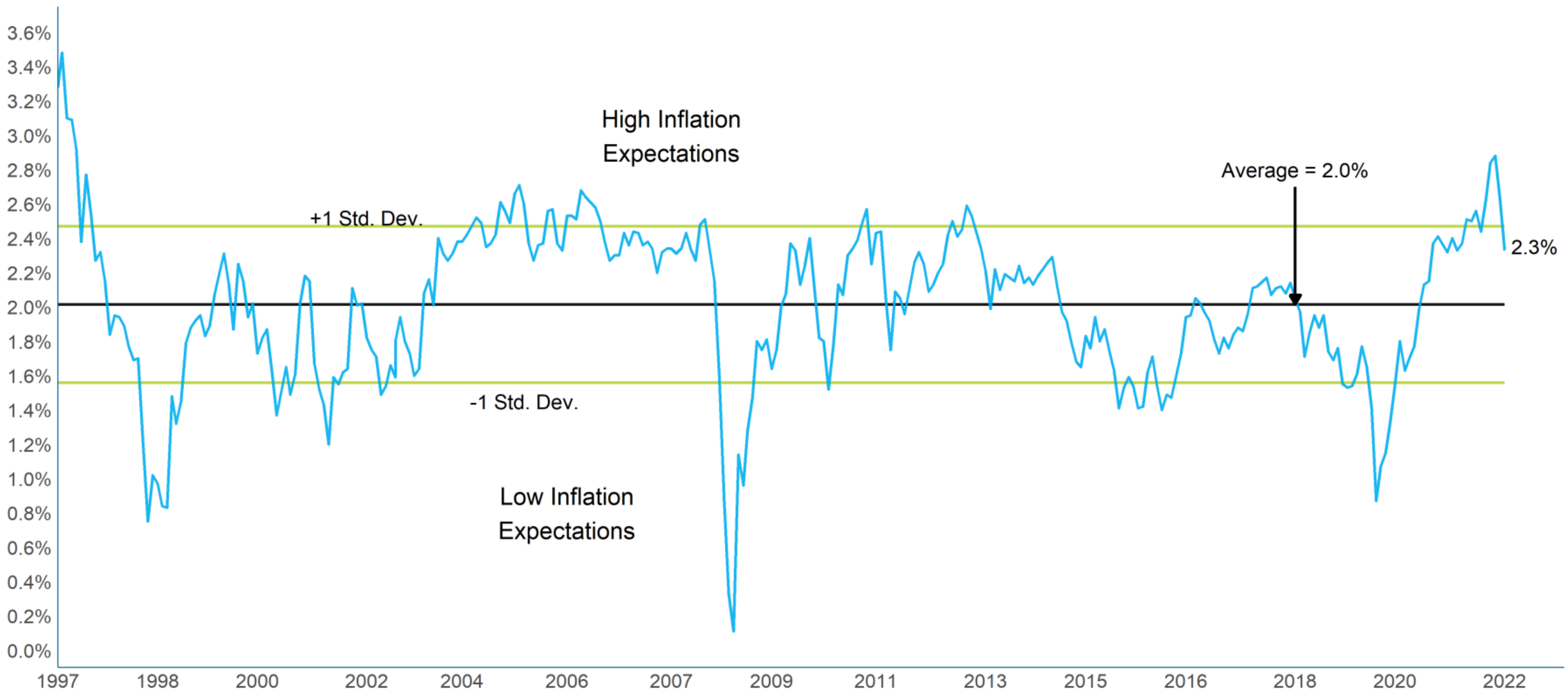
Yield Curve Slope (Ten Minus Two)[1]
(As of June 30, 2022)



→ This chart details the historical difference in yields between ten-year and two-year US Treasury bonds/notes. A higher (lower) figure indicates a steeper (flatter) yield curve slope.

[1] Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

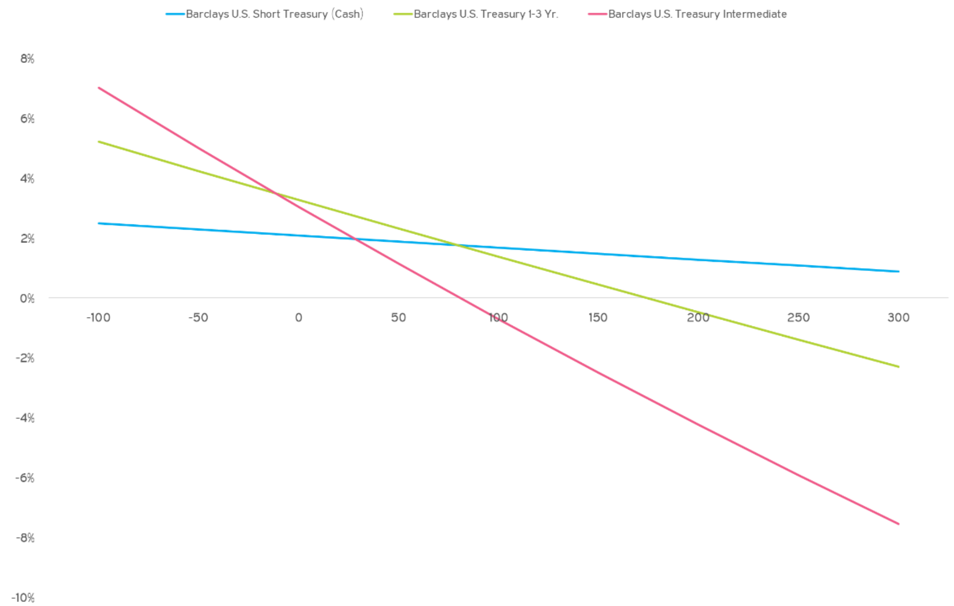
Ten-Year Breakeven Inflation[1]
(As of June 30, 2022)



→ This chart details the difference between nominal and inflation-adjusted US Treasury bonds. A higher (lower) figure indicates higher (lower) inflation expectations.

[1] Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

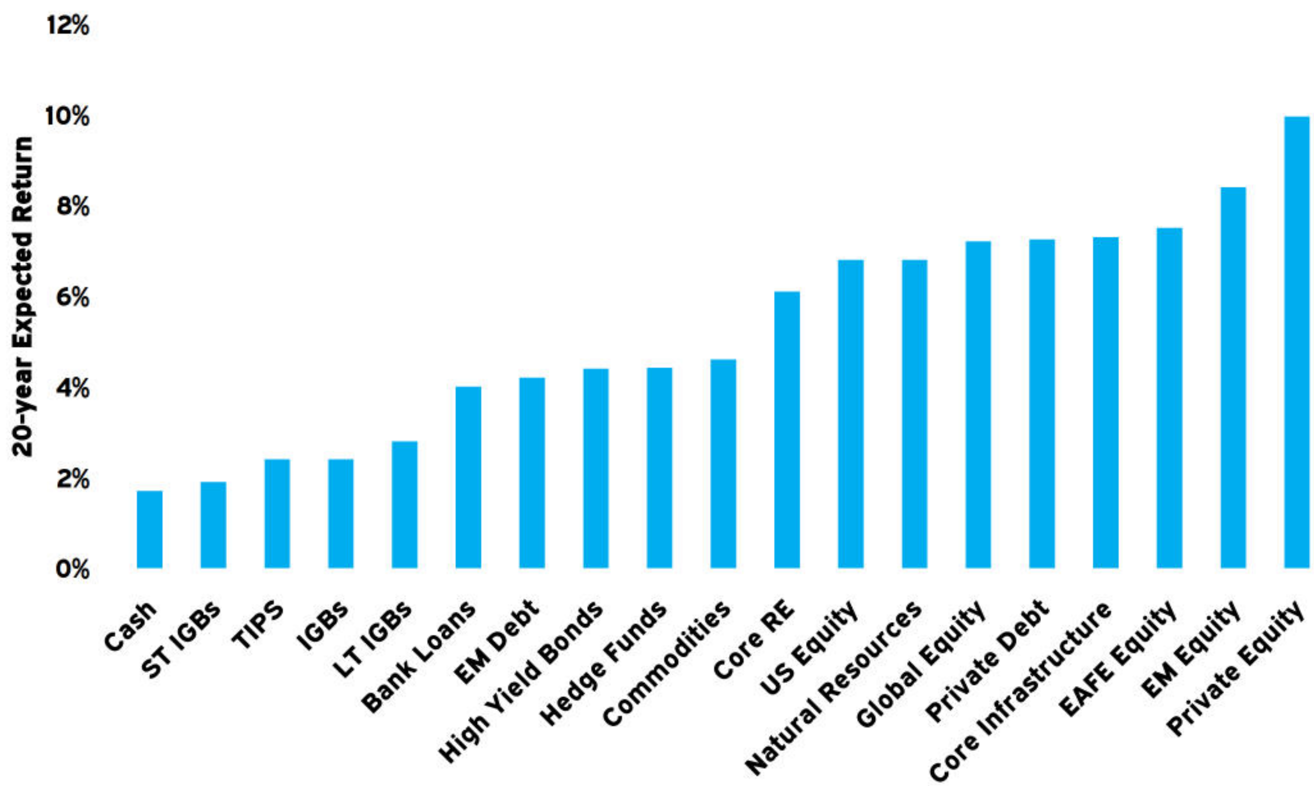
Total Return Given Changes in Interest Rates (bps)[1]
(As of June 30, 2022)



	Total Return for Given Changes in Interest Rates (bps)									Statistics	
	-100	-50	0	50	100	150	200	250	300	Duration	YTW
Barclays US Short Treasury (Cash)	2.5%	2.3%	2.1%	1.9%	1.7%	1.5%	1.3%	1.1%	0.9%	0.41	2.08%
Barclays US Treasury 1-3 Yr.	5.2%	4.2%	3.3%	2.3%	1.4%	0.4%	-0.5%	-1.4%	-2.3%	1.92	3.27%
Barclays US Treasury Intermediate	7.0%	5.0%	3.0%	1.1%	-0.7%	-2.5%	-4.2%	-5.9%	-7.6%	3.86	3.04%
Barclays US Treasury Long	22.4%	12.4%	3.3%	-4.8%	-12.0%	-18.2%	-23.5%	-27.9%	-31.3%	17.17	3.33%

[1] Data represents the expected total return from a given change in interest rates (shown in basis points) over a 12-month period assuming a parallel shift in rates. Source: Bloomberg, and Meketa Investment Group.

Long-Term Outlook – 20-Year Annualized Expected Returns[1]



→ This chart details Meketa's long-term forward-looking expectations for total returns across asset classes.

[1] Source: Meketa Investment Group's 2022 Annual Asset Study.

Appendix

Data Sources and Explanations[1]

→ US Equity Cyclically Adjusted P/E on S&P 500 Index – Source: Robert Shiller and Yale University.

→ Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.

→ Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.

→ Developed International Equity (MSCI EAFE) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

→ Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

→ Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs.

→ Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction-based indices from Real Capital Analytics and Meketa Investment Group.

[1] All Data as of June 30, 2022, unless otherwise noted.

Appendix

Data Sources and Explanations[1]

→ REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity Index.

→ Credit Spreads – Source: Bloomberg High Yield is proxied by the Bloomberg High Yield Index and Investment Grade Corporates are proxied by the Bloomberg US Corporate Investment Grade Index.

- Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year Treasury Yield.

→ EM Debt Spreads – Source: Bloomberg, and Meketa Investment Group. Option Adjusted Spread (OAS) for the Bloomberg EM USD Aggregate Index.

→ Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.

→ Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.

→ Systemic Risk and Volatile Market Days – Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

→ Systemic Risk, which measures risk across markets, is important because the more contagion of risk that exists between assets, the more likely it is that markets will experience volatile periods.

[1] All Data as of June 30, 2022, unless otherwise noted.

Appendix

Data Sources and Explanations[1]

→ Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

→ Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

[1] All Data as of June 30, 2022, unless otherwise noted.

Meketa Market Sentiment Indicator

Explanation, Construction and Q&A

Meketa has created the MIG Market Sentiment Indicator (MIG-MSI) to complement our valuation-focused Risk Metrics. This measure of sentiment is meant to capture significant and persistent shifts in long-lived market trends of economic growth risk, either towards a risk-seeking trend or a risk-aversion trend.

This appendix explores:

→ What is the Meketa Market Sentiment Indicator?

→ How do I read the indicator graph?

→ How is the Meketa Market Sentiment Indicator constructed?

→ What do changes in the indicator mean?

Meketa has created a market sentiment indicator for monthly publication (the MIG-MSI – see below) to complement Meketa's Risk Metrics.

→ Meketa's Risk Metrics, which rely significantly on standard market measures of relative valuation, often provide valid early signals of increasing long-term risk levels in the global investment markets. However, as is the case with numerous valuation measures, the Risk Metrics may convey such risk concerns long before a market correction take place. The MIG-MSI helps to address this early-warning bias by measuring whether the markets are beginning to acknowledge key Risk Metrics trends, and / or indicating non-valuation-based concerns. Once the MIG-MSI indicates that the market sentiment has shifted, it is our belief that investors should consider significant action, particularly if confirmed by the Risk Metrics. Importantly, Meketa believes the Risk Metrics and MIG-MSI should always be used in conjunction with one another and never in isolation. The questions and answers below highlight and discuss the basic underpinnings of the Meketa MIG-MSI:

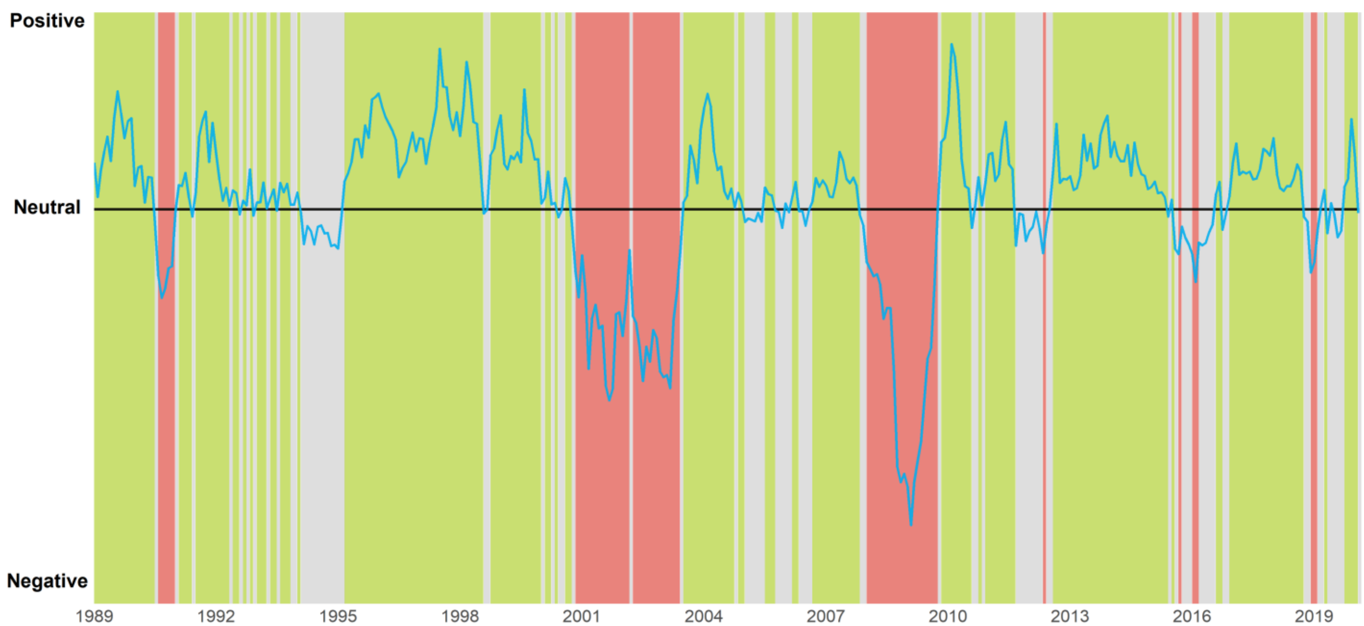
What is the Meketa Market Sentiment Indicator (MIG-MSI)?

→ The MIG-MSI is a measure meant to gauge the market's sentiment regarding economic growth risk. Growth risk cuts across most financial assets and is the largest risk exposure that most portfolios bear. The MIG-MSI takes into account the momentum (trend over time, positive or negative) of the economic growth risk exposure of publicly traded stocks and bonds, as a signal of the future direction of growth risk returns; either positive (risk seeking market sentiment), or negative (risk averse market sentiment).

How do I read the Meketa Market Sentiment Indicator graph?

→ Simply put, the MIG-MSI is a color-coded indicator that signals the market's sentiment regarding economic growth risk. It is read left to right chronologically. A green indicator on the MIG-MSI indicates that the market's sentiment towards growth risk is positive. A gray indicator indicates that the market's sentiment towards growth risk is neutral or inconclusive. A red indicator indicates that the market's sentiment towards growth risk is negative. The black line on the graph is the level of the MIG-MSI. The degree of the signal above or below the neutral reading is an indication the signal's current strength.

→ Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.



How is the Meketa Market Sentiment Indicator (MIG-MSI) Constructed?

→ The MIG-MSI is constructed from two sub-elements representing investor sentiment in stocks and bonds:

- Stock return momentum: Return momentum for the S&P 500 Equity Index (trailing 12-months).
- Bond yield spread momentum: Momentum of bond yield spreads (excess of the measured bond yield over the identical duration US Treasury bond yield) for corporate bonds (trailing 12-months) for both investment grade bonds (75% weight) and high yield bonds (25% weight).
- Both measures are converted to Z-scores and then combined to get an "apples to apples" comparison without the need of re-scaling.

→ The black line reading on the graph is calculated as the average of the stock return momentum measure and the bonds spread momentum measure[1]. The color reading on the graph is determined as follows:

- If both stock return momentum and bond spread momentum are positive = GREEN (positive).
- If one of the momentum indicators is positive, and the other negative = GRAY (inconclusive).
- If both stock return momentum and bond spread momentum are negative = RED (negative).

[1] Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.
"Time Series Momentum" Moskowitz, Ooi, Pedersen, August 2010. *http://pages.stern.nyu.edu/~lpederse/papers/TimeSeriesMomentum.pdf*

What does the Meketa Market Sentiment Indicator (MIG-MSI) mean? Why might it be useful?

→ There is strong evidence that time series momentum is significant and persistent. Across an extensive array of asset classes, the sign of the trailing 12-month return (positive or negative) is indicative of future returns (positive or negative) over the next 12-month period. The MIG-MSI is constructed to measure this momentum in stocks and corporate bond spreads. A reading of green or red is agreement of both the equity and bond measures, indicating that it is likely that this trend (positive or negative) will continue over the next 12 months. When the measures disagree, the indicator turns gray. A gray reading does not necessarily mean a new trend is occurring, as the indicator may move back to green, or into the red from there. The level of the reading (black line) and the number of months at the red or green reading, gives the user additional information on which to form an opinion, and potentially take action.

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