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DATE: December 13, 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 2023 were $602,000 and $495,000, respectively. Albourne serves as the SBI's private markets consultant and the annual contract fee for fiscal year 2023 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, 2022 through June 30, 2023, 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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REPORT

AON Market Environment Report

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Market Environment

Second Quarter 2023

Investment advice and consulting services provided by Aon Investments USA Inc., an Aon company. Nothing in this document should be construed as legal, tax, or investment advice. Please consult with your independent professional for any such advice. To protect the confidential and proprietary information included in this material, it may not be disclosed or provided to any third parties without the approval of Aon.

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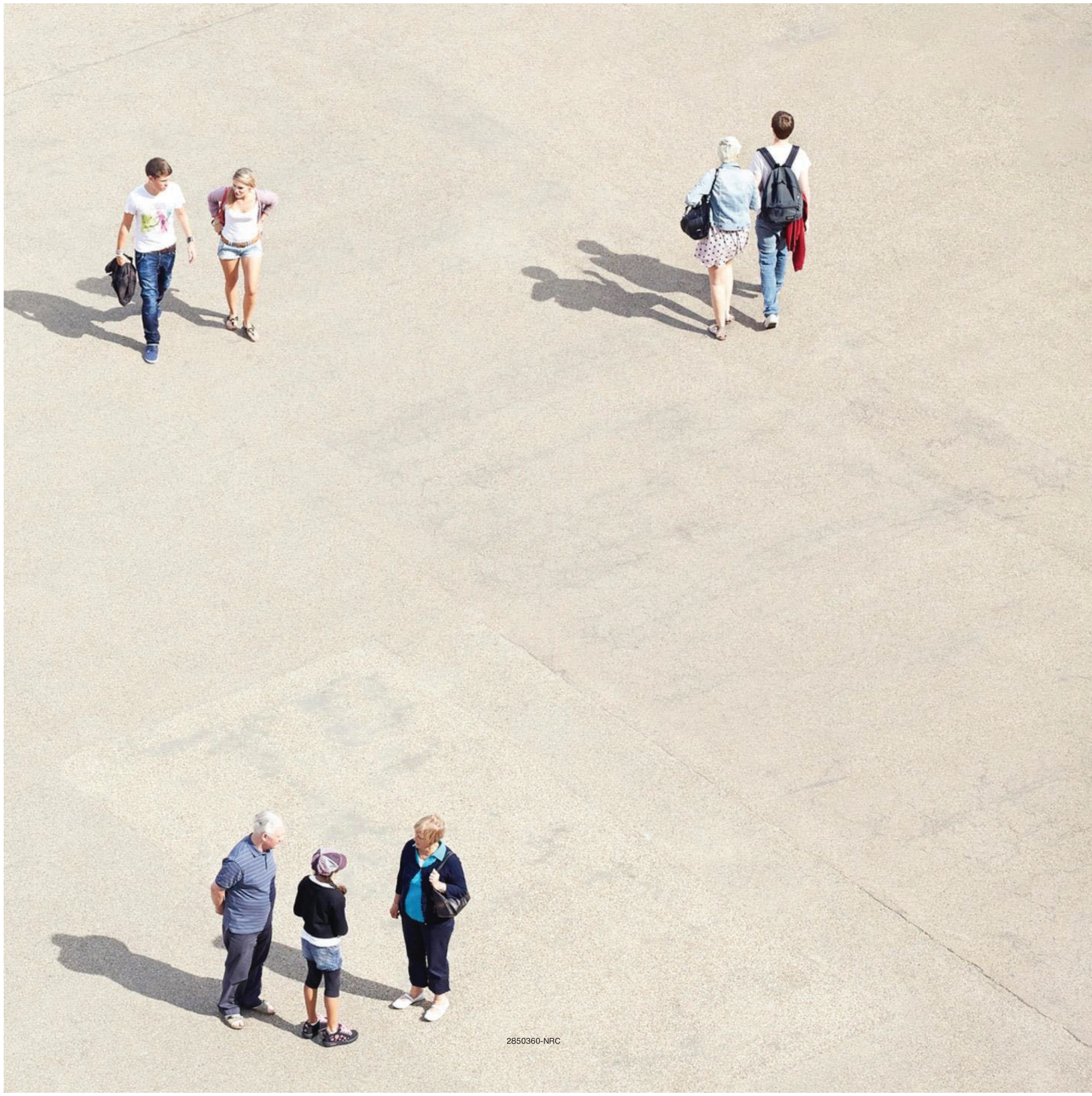

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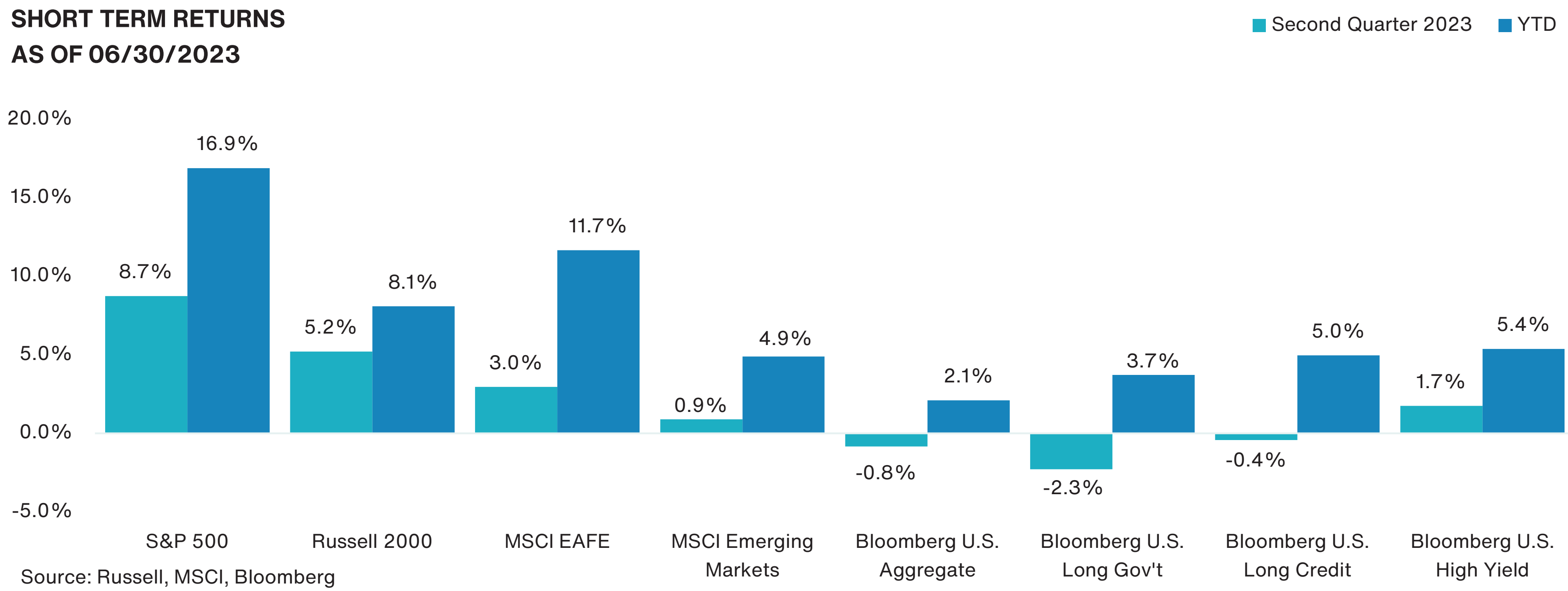
Market Highlights



Source: Russell, MSCI, Bloomberg

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

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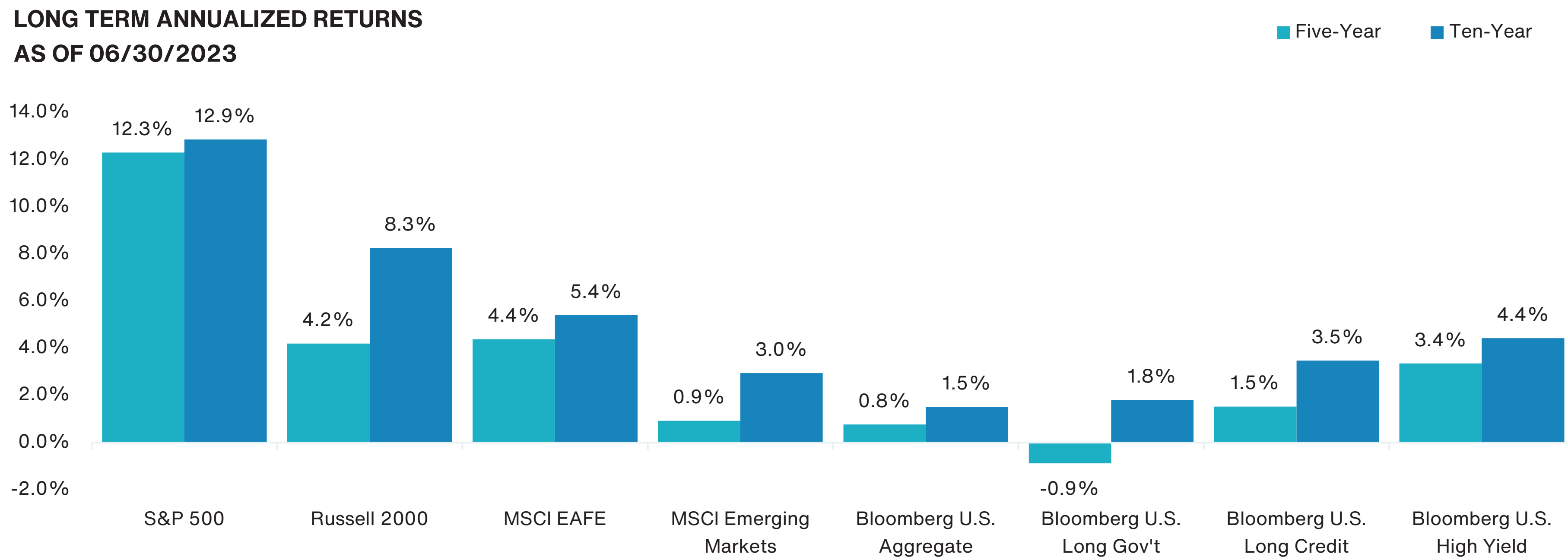
Market Highlights



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Market Highlights

Returns of the Major Capital Markets						Period Ending 06/30/2023
	Second Quarter	YTD	1-Year	3-Year[1]	5-Year[1]	10-Year[1]
Equity						
MSCI All Country World IMI	5.89%	13.25%	16.14%	10.97%	7.65%	8.62%
MSCI All Country World	6.18%	13.93%	16.53%	10.99%	8.10%	8.75%
Dow Jones U.S. Total Stock Market	8.39%	16.24%	18.90%	13.74%	11.26%	12.24%
Russell 3000	8.39%	16.17%	18.95%	13.89%	11.39%	12.34%
S&P 500	8.74%	16.89%	19.59%	14.60%	12.31%	12.86%
Russell 2000	5.21%	8.09%	12.31%	10.82%	4.21%	8.26%
MSCI All Country World ex-U.S. IMI	2.38%	9.10%	12.47%	7.33%	3.38%	4.88%
MSCI All Country World ex-U.S.	2.44%	9.47%	12.72%	7.22%	3.52%	4.75%
MSCI EAFE	2.95%	11.67%	18.77%	8.93%	4.39%	5.41%
MSCI EAFE (Local Currency)	4.28%	12.10%	17.50%	11.73%	6.42%	7.67%
MSCI Emerging Markets	0.90%	4.89%	1.75%	2.32%	0.93%	2.95%
Equity Factors						
MSCI World Minimum Volatility (USD)	1.79%	4.13%	7.44%	6.35%	6.48%	8.41%
MSCI World High Dividend Yield	2.37%	4.35%	9.03%	10.62%	7.13%	7.58%
MSCI World Quality	9.83%	21.58%	24.60%	13.11%	13.19%	12.99%
MSCI World Momentum	4.34%	3.13%	10.14%	6.44%	8.16%	10.96%
MSCI World Enhanced Value	5.21%	11.30%	16.04%	13.07%	4.76%	7.22%
MSCI World Index Growth	10.50%	27.27%	26.66%	11.31%	12.08%	12.29%
MSCI USA Minimum Volatility (USD)	2.65%	3.98%	7.99%	8.92%	9.06%	10.92%
MSCI USA High Dividend Yield	1.46%	0.73%	6.35%	10.70%	7.78%	10.00%
MSCI USA Quality	11.70%	23.40%	24.90%	13.73%	14.31%	14.62%
MSCI USA Momentum	4.35%	-0.06%	8.70%	4.72%	7.29%	12.58%
MSCI USA Enhanced Value	1.95%	4.52%	7.18%	12.27%	5.64%	9.28%
MSCI USA Equal Weighted	4.56%	8.76%	13.66%	13.09%	8.85%	10.70%
MSCI USA Growth	13.87%	33.68%	29.69%	13.56%	15.47%	15.87%

Returns of the Major Capital Markets						Period Ending 06/30/2023
	Second Quarter	YTD	1-Year	3-Year[1]	5-Year[1]	10-Year[1]
Fixed Income						
Bloomberg Global Aggregate	-1.53%	1.43%	-1.32%	-4.96%	-1.09%	0.20%
Bloomberg U.S. Aggregate	-0.84%	2.09%	-0.94%	-3.96%	0.77%	1.52%
Bloomberg U.S. Long Gov't	-2.29%	3.73%	-6.79%	-12.02%	-0.88%	1.81%
Bloomberg U.S. Long Credit	-0.42%	4.97%	1.06%	-6.06%	1.53%	3.48%
Bloomberg U.S. Long Gov't/Credit	-1.29%	4.39%	-2.56%	-8.60%	0.66%	2.86%
Bloomberg U.S. TIPS	-1.42%	1.87%	-1.40%	-0.12%	2.49%	2.08%
Bloomberg U.S. High Yield	1.75%	5.38%	9.06%	3.13%	3.36%	4.43%
Bloomberg Global Treasury ex U.S.	-2.93%	0.09%	-2.77%	-7.04%	-3.23%	-1.13%
JP Morgan EMBI Global (Emerging Market	1.53%	3.81%	6.85%	-2.68%	0.82%	2.60%
Commodities						
Bloomberg Commodity Index	-2.56%	-7.79%	-9.61%	17.82%	4.73%	-0.99%
Goldman Sachs Commodity Index	-2.73%	-7.54%	-14.22%	25.11%	2.76%	-3.52%
Hedge Funds						
HFRI Fund-Weighted Composite[2]	2.24%	3.45%	5.09%	8.16%	4.98%	4.71%
HFRI Fund of Funds[2]	1.52%	2.27%	3.67%	5.04%	3.32%	3.39%
Real Estate						
NAREIT U.S. Equity REITS	2.62%	5.37%	-0.13%	8.91%	4.55%	6.42%
FTSE Global Core Infrastructure Index	0.06%	-0.98%	-1.42%	6.89%	6.36%	7.45%
Private Equity						
Burgiss Private iQ Global Private Equity[3]			-1.81%	19.78%	17.13%	15.20%

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, 2022

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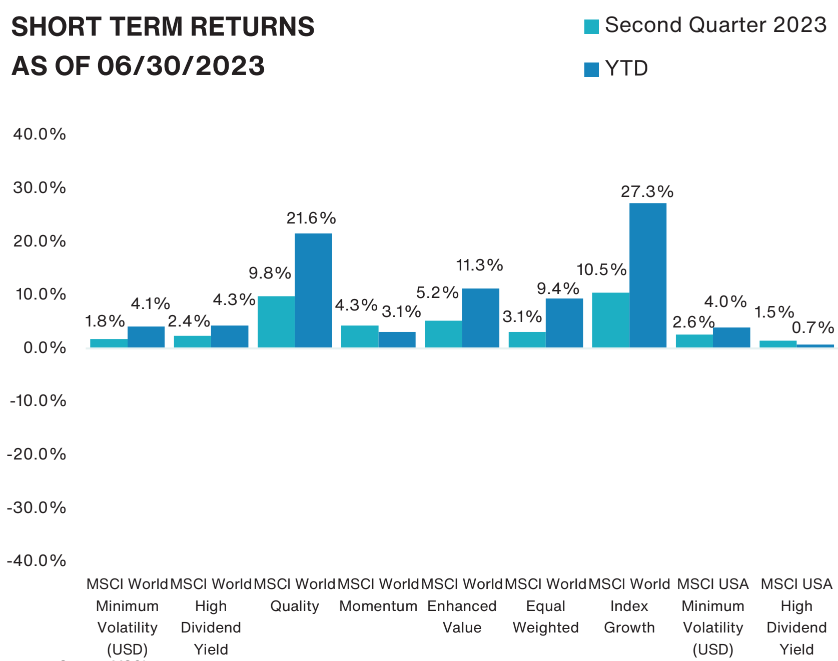
Factor Indices



Source: MSCI
MSCI Indices show net total returns throughout this report.
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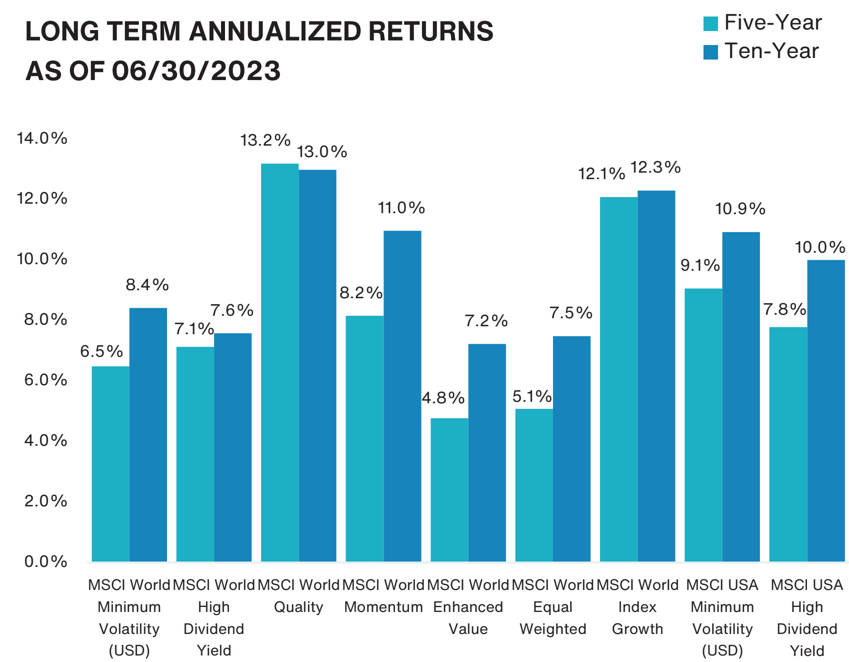

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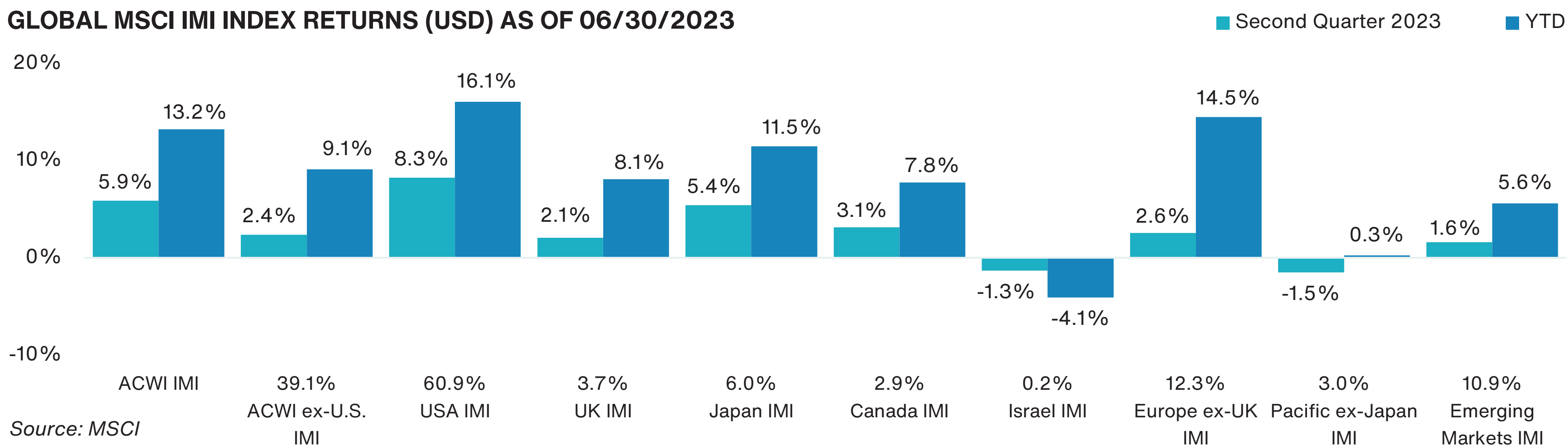
Global Equity Markets



Source: MSCI

- In Q2 2023, equity markets rose as high-interest rate concerns abated, with inflation also cooling down in major economies. Volatility fell throughout the quarter as the CBOE Volatility Index (VIX) fell to 13.6 in June from 18.7 in the previous quarter, staying below its 20-year average of 19.2. Yields trended higher as major central banks indicated higher interest rates to bring inflation down to around a 2% target. The MSCI All Country World Investable Market Index (ACWI IMI) returned 5.9% for the quarter and was also up 13.2% on a YTD basis.
- Across international markets, generally all the regions were strong over the quarter. All regions apart from Israel and Pacific ex-Japan posted positive returns.
- US IMI equities were the best regional performer with a return of 8.3%. Economically sensitive sectors including Information Technology and Consumer Discretionary outperformed.

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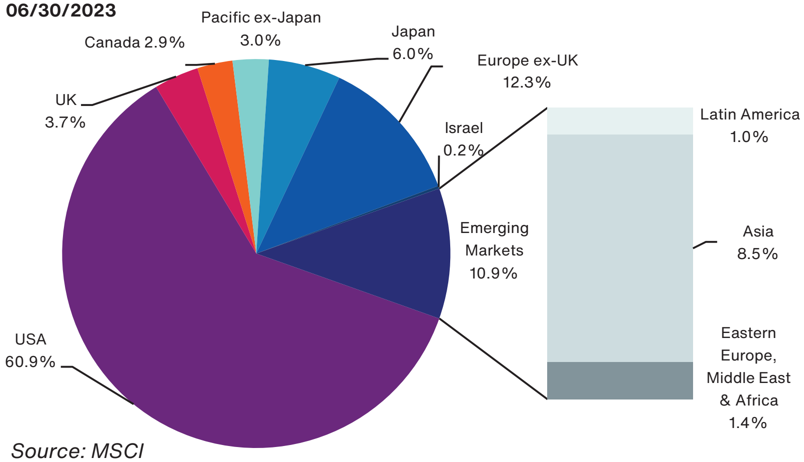
Global Equity Markets

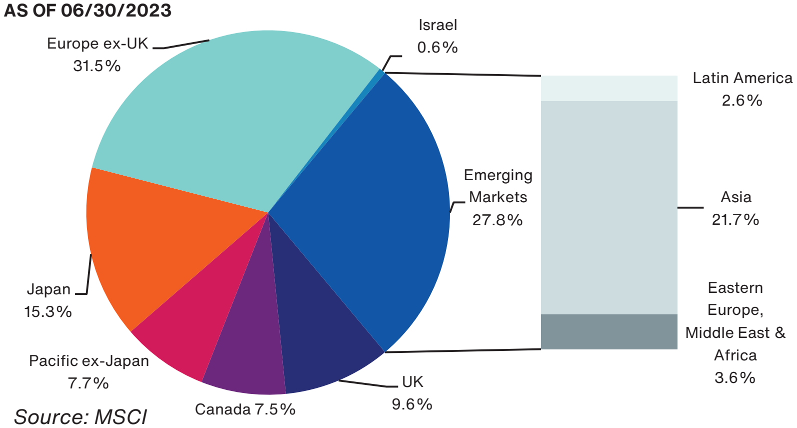
Below is the country/region breakdown of the global and international equity markets as measured by the MSCI All Country World IMI Index and the MSCI All Country World ex-U.S. IMI Index, respectively.

MSCI ALL COUNTRY WORLD IMI INDEX GEOGRAPHIC ALLOCATION AS OF 06/30/2023



Source: MSCI

MSCI ALL COUNTRY WORLD EX-U.S. IMI INDEX GEOGRAPHIC ALLOCATION AS OF 06/30/2023

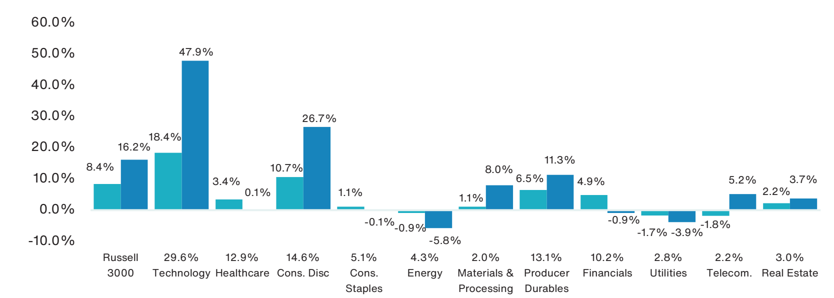


Source: MSCI

U.S. Equity Markets

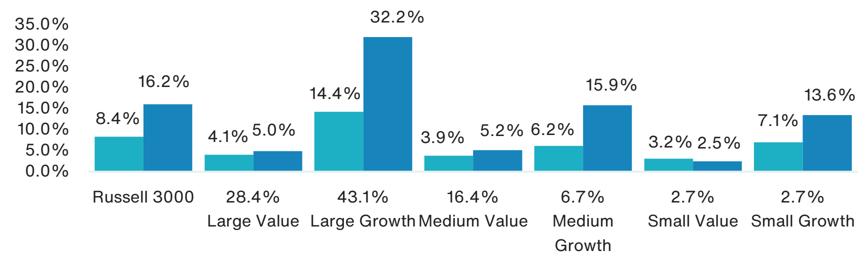
- U.S. equities had a strong quarter with the S&P 500 index rising by 8.7% as high-interest rate concerns abated, with inflation also cooling down in major economies.
- The U.S. Senate passed the debt ceiling bill with strong bipartisan support of 63-36 votes to avoid a default in the world's largest economy. Previously, the bill was passed in the House of Representatives with a margin of 314-117 votes. The agreement imposes restrictions on government spending, introduces new welfare reforms, and reins in perceived government overreach, whilst not including any new taxes.
- The Cyberspace Administration of China banned U.S.-based chipmaker Micron Technology's products, in China's biggest measure against a U.S. semiconductor group, citing "security risks to China's critical information infrastructure supply chain".
- The U.S. economy expanded by 2.0% year-on-year in the first quarter, higher than economists' forecasts of 1.4% but lower than the 2.6% recorded in the previous quarter. Increased consumer spending fueled by a strong labor market and rising wages helped offset business investment and housing declines.
- The Russell 3000 Index rose 8.4% during the second quarter and rose 16.2% on a YTD basis. Technology (18.4%) and Consumer Discretionary (10.7%) were the best performers while Telecommunication Services (-1.8%) and Utilities (-1.7%) were the worst performers.
- Large-cap stocks outperformed both in growth and value. On a style basis, growth outperformed value across market capitalizations over the quarter.

RUSSELL SECTOR RETURNS AS OF 06/30/2023



Source: Russell Indexes

RUSSELL STYLE RETURNS AS OF 06/30/2023



Source: Russell Indexes

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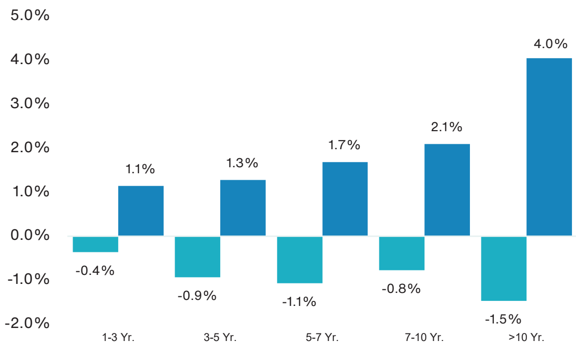
U.S. Fixed Income Markets

BLOOMBERG AGGREGATE RETURNS BY MATURITY AS OF 06/30/2023

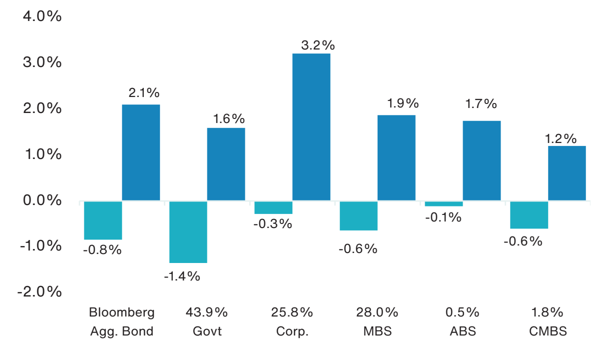


Source: FactSet

BLOOMBERG AGGREGATE RETURNS BY QUALITY AND HIGH YIELD RETURNS AS OF 06/30/2023

Source: FactSet

BLOOMBERG AGGREGATE RETURNS BY SECTOR AS OF 06/30/2023



Source: FactSet

- The U.S. Federal Reserve (Fed) increased its benchmark interest rate by 25bps to a range of 5.0%-5.25% over the quarter, the highest level since 2007. Fed Chair Jerome Powell indicated that the central bank intends to carry out further monetary tightening to bring persistently high inflation under control but defended the current pause citing "potential headwinds" from the banking crisis.
- The Bloomberg U.S. Aggregate Bond Index was down 0.8% over the quarter but was up 2.1% on a YTD basis.
- Across durations, all maturities finished the quarter in negative territory.
- Within investment-grade bonds, lower-credit quality generally outperformed higher-quality issues, with Baa bonds remaining flat. High-yield bonds rose by 1.7%.

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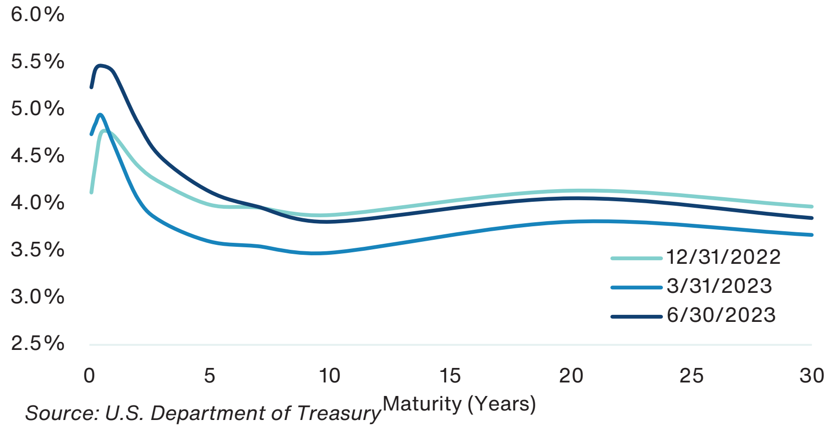
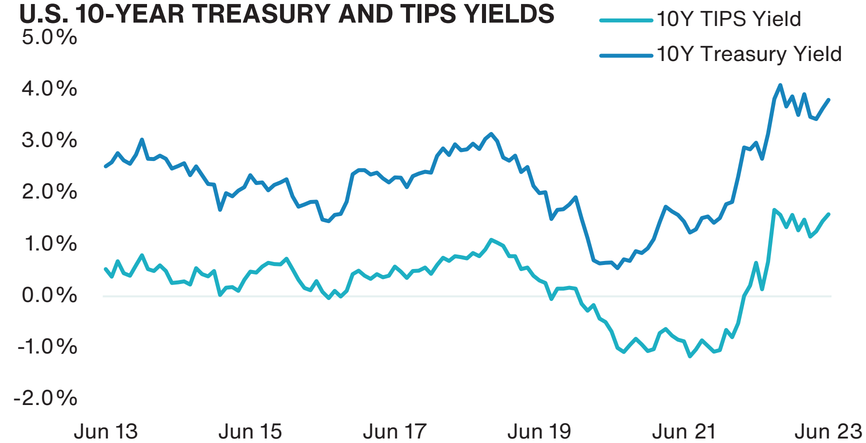
U.S. Fixed Income Markets



Source: U.S. Department of Treasury

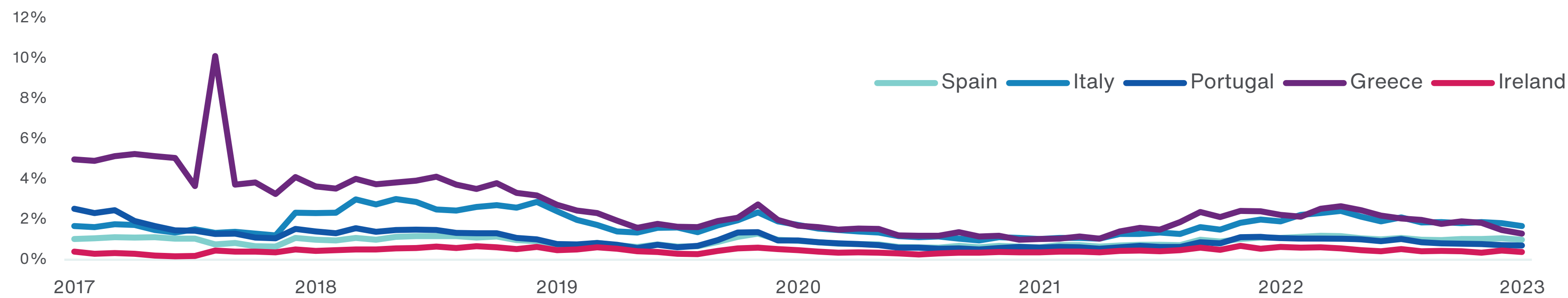


Source: U.S. Department of Treasury

- U.S. Treasury yields rose significantly across maturities as the yield curve shifted upwards over the quarter. The 10-year Treasury yield was up by 33bps to 3.81%, and the 30-year Treasury yield was up by 18bps to 3.85% over the quarter.
- The U.S. annual consumer price index (CPI) eased to its lowest level since March 2021 as it rose by 4.0% in May, sharply down from the 4.9% recorded in April and coming in lower than economists' expectations of a 4.1% increase.
- The 10-year TIPS yield rose by 43bps over the quarter to 1.59%.

European Fixed Income Markets

EUROZONE PERIPHERAL BOND SPREADS (10-YEAR SPREADS OVER GERMAN BUNDS)



- European government bond spreads over 10-year German bunds narrowed across the Euro Area. The European Central Bank (ECB) raised its benchmark interest rates by 50bps to 3.5% over the quarter, its highest level since 2001, and indicated another potential rate increase in July. The ECB president Christine Lagarde indicated that policymakers "still have ground to cover" and that the inflation outlook remains "to remain too high for too long", with inflation not returning to its target level of 2% even by 2025.
- Greek and Italian government bond yields fell by 52bps and 5bps to 3.71% and 4.09% respectively over the quarter whilst Irish and Spanish government bond yields rose by 5bps and 4bps to 2.80% and 3.40% respectively.
- German bund yields rose by 8bps to 2.41% over the quarter.
- Eurozone inflation fell to 5.5% year-on-year in June, the slowest pace since January 2022, decelerating from the 6.1% recorded in May and lower than economists' expectations of a 5.6% increase. Sharp falls in energy prices, along with a slowdown in food, alcohol, tobacco, and industrial goods inflation were the main drivers.

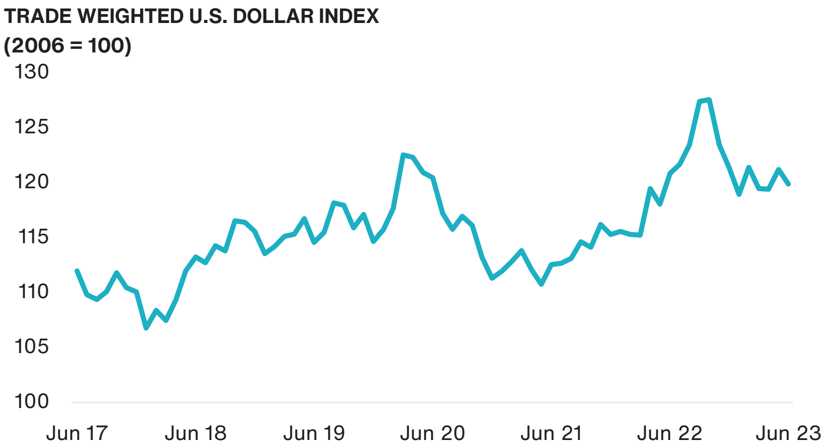
Credit Spreads

Spread (bps)	6/30/2023	3/31/2023	12/31/2022	Quarterly Change (bps)	YTD
U.S. Aggregate	49	57	51	-8	-2
Long Gov't	1	2	2	-1	-1
Long Credit	148	159	157	-11	-9
Long Gov't/Credit	79	86	87	-7	-8
MBS	52	63	51	-11	1
CMBS	134	142	120	-8	14
ABS	68	85	76	-17	-8
Corporate	123	138	130	-15	-7
High Yield	390	455	469	-65	-79
Global Emerging Markets	320	352	332	-32	-12

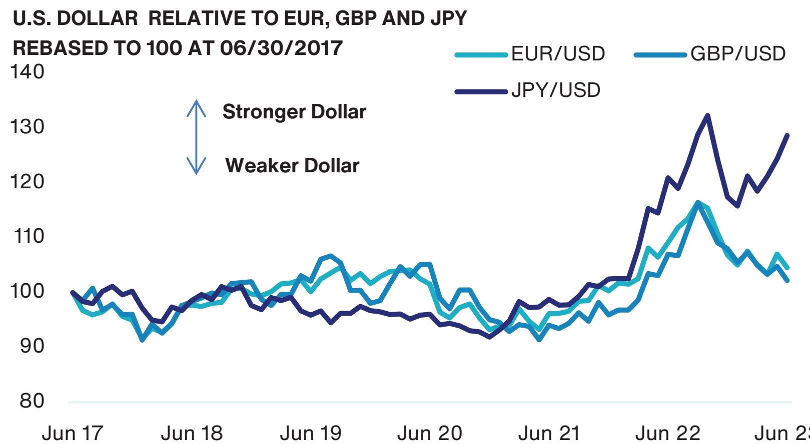
Source: FactSet, Bloomberg

- Credit markets rose amid risk-taking sentiment during the quarter, with spreads narrowing.
- High Yield and Global Emerging Markets spreads narrowed by 65bps and 32bps respectively. Meanwhile, Long Govt/Credit and Long Govt spreads narrowed by 7bps and 1bp respectively.

Currency



Source: Federal Reserve



Source: FactSet

- The U.S. Dollar weakened against all major currencies (except for yen) over the quarter. On a trade-weighted basis, the U.S. dollar appreciated by 0.3% as a sharp appreciation against the yen offset the losses against the sterling and the euro.
- Sterling appreciated by 2.7% against the U.S. dollar. The Bank of England (BoE) raised its benchmark interest rate by 75bps to 5.0% over the quarter, touching its highest level since 2008. Andrew Bailey, the BoE governor, indicated that the central bank is "committed to returning inflation to the 2 percent target and will make the decisions necessary to achieve that."
- The U.S. dollar depreciated by 0.4% against the Euro but appreciated by 8.6% against the yen.

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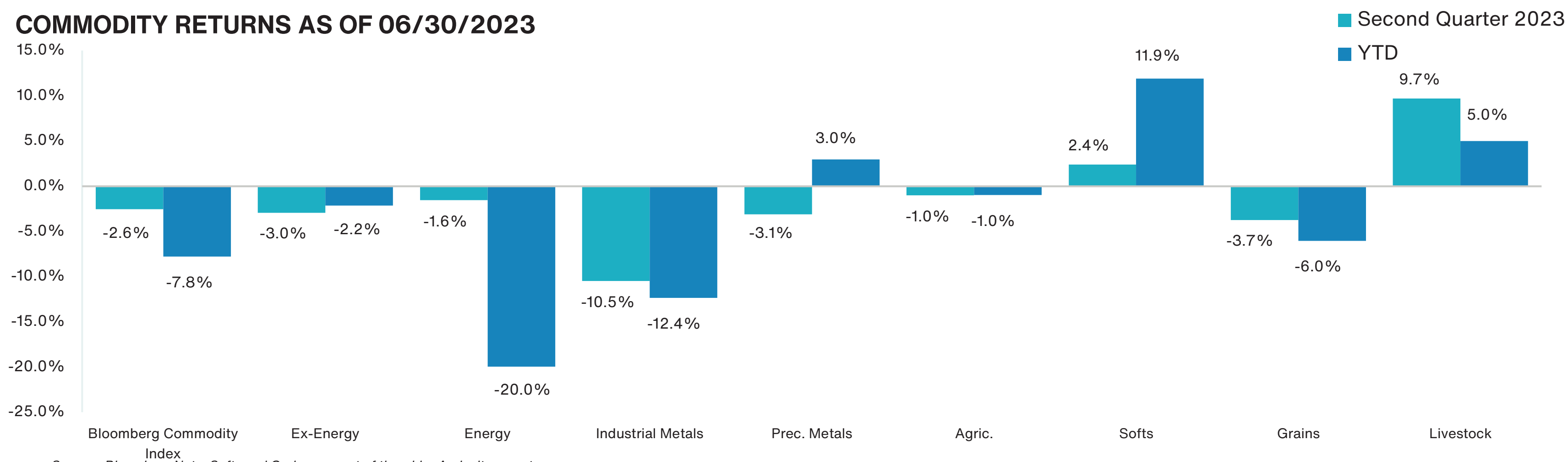
Commodities

COMMODITY RETURNS AS OF 06/30/2023



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

- Commodity prices fell over the quarter with the Bloomberg Commodity Index falling by 2.6% for the quarter.
- The energy sector fell 1.6% over the quarter and 20.0% on a YTD basis. The price of WTI crude oil was down by 6.6% to U.S.$71/BBL. .
- Industrial Metals fell the most over the quarter at -10.5%.
- Meanwhile, Opec+ announced a surprise oil production cut of 1mn barrels a day in July, which could be extended further. Saudi Arabia will lead the entire production cut to boost oil prices as other Opec+ members were spared from making additional cuts this year. The production quotas of several African nations and Russia are set to be lowered from January 2024.

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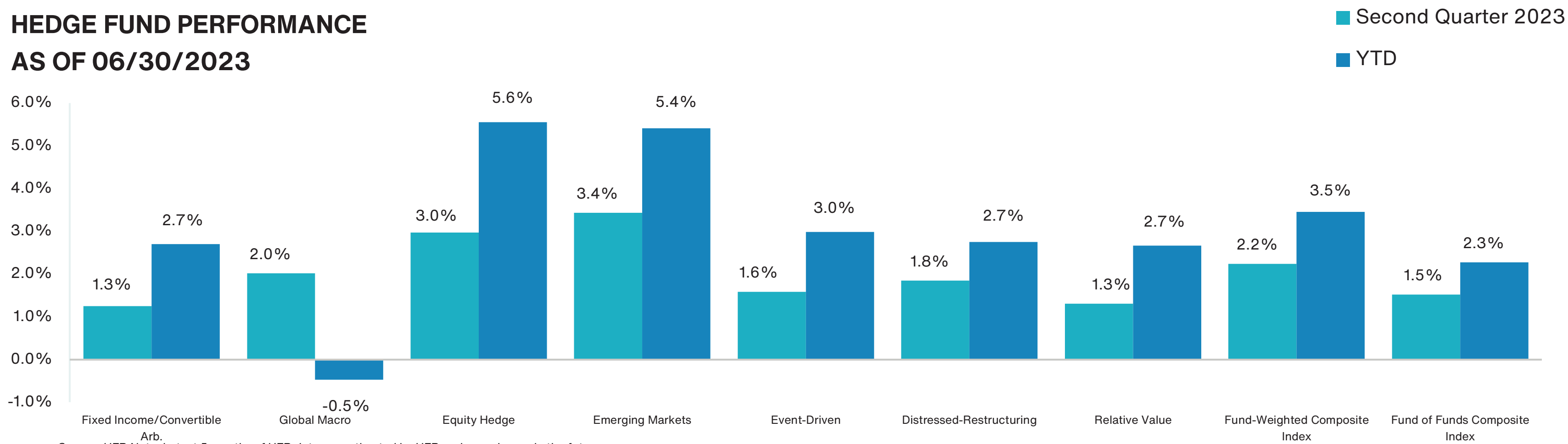
Hedge Funds Market Overview



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

- Hedge fund performance was positive over the quarter.
- The HFRI Fund-Weighted Composite and HFRI Fund of Funds Composite Index produced returns of 2.2% and 1.5% over the quarter, respectively.
- Over the quarter, the Emerging Markets strategy was the best performer with a return of 3.4%.
- Fixed income/ Convertible Arb. was the worst performer with a return of 1.25% over the quarter.
- On a YTD basis, Equity Hedge has outperformed all other strategies whilst Global Macro have performed the worst.

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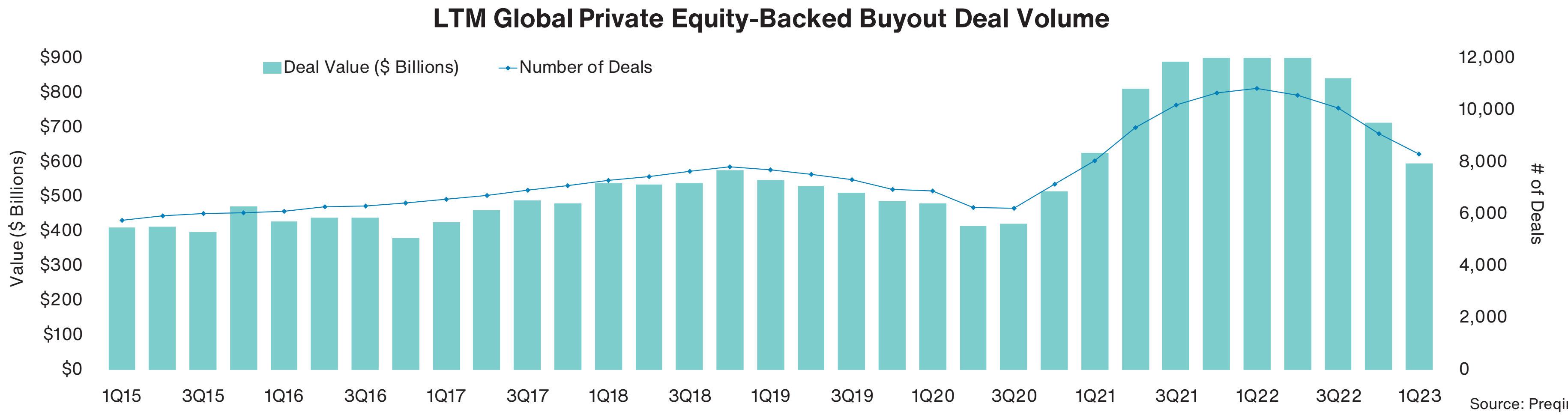
Private Equity Overview – 1Q 2023



Source: Preqin

- **Fundraising:** In Q1 2023, $232.9 billion was raised by 470 funds, which was a decrease of 5.1% on a capital basis and a decrease of 36.9% by number of funds from the prior quarter. Dry powder stood at $3.1 trillion at the end of the quarter, an increase of 1.0% and 27.4% compared to year-end 2022 and the five-year average, respectively.[1]
- **Buyout:** Global private equity-backed buyout deals totaled $126.2 billion in Q1 2023, which was an increase on a capital basis of 9.0% compared to Q4 2022 but a decrease of 21.6% compared to the five-year quarterly average.[1] At the end of the quarter, the average purchase price multiple for all U.S. LBOs was 12.4x EBITDA, up from year-end 2022's average of 11.9x and up from the five-year average (11.3x). Large cap purchase price multiples stood at 12.4x, up compared to the full-year 2022 level of 11.8x. The average purchase price multiple across European transactions greater than €1B averaged 10.7x EBITDA on an LTM basis as of Q1 2023, down from the 11.1x multiple seen at year-end 2022. Purchase prices for transactions of €500M or greater decreased from 10.7x in 2022 to 10.1x on an LTM basis ending Q1 2023.[2] Globally, buyout exit value totaled $27.3 billion across 379 deals during the quarter, significantly lower than the $113.2 billion in value from 460 deals during Q1 2022.[1]
- **Venture:** During the quarter, 2,856 venture-backed transactions totaling $37.0 billion were completed, which was a decrease on both a capital and deal count basis over the prior quarter's total of $41.1 billion across 3,586 deals. This was also a decrease of 30.1% compared to the five-year quarterly average of $53.0 billion. Total U.S. venture-backed exit value continued to slow, totaling approximately $5.8 billion across an estimated 300 completed transactions in Q1 2023, down substantially from $32.2 billion across 397 exits in Q1 2022.[3]

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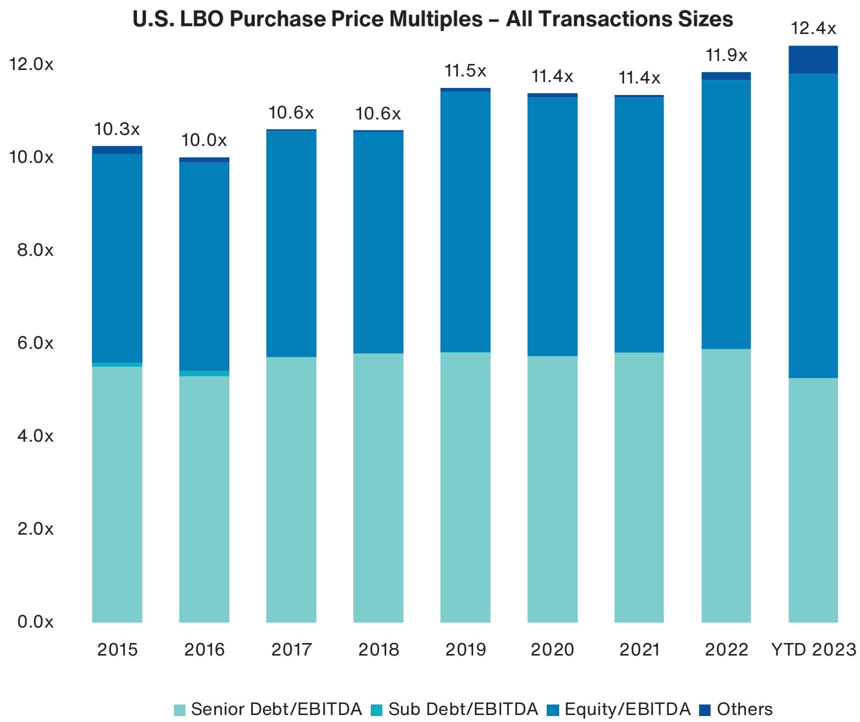
Private Equity Overview (cont.)

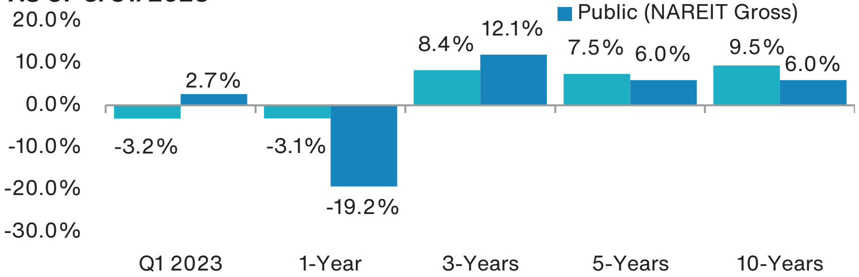


Source: S&P

- **Mezzanine:** 8 funds closed on $25.7 billion during the year. This was an increase from the prior quarter's total of $4.3 billion raised by 10 funds and represented an increase of 285.9% from the five-year quarterly average of $5.4 billion. Estimated dry powder was $63.8 billion at the end of Q1 2023, down from $66.6 billion at the end of the prior quarter.[1]
- **Distressed Debt:** The TTM U.S. high-yield default rate was 1.8% as of March 2023, which was up from December 2022's TTM rate of 1.3%. Fitch expects the high-yield default rate to trend higher through 2023.[4] During the quarter, $9.1 billion was raised by 12 funds, down from the $15.8 billion raised by 21 funds during Q4 2022. Dry powder was estimated at $149.8 billion at the end of Q1 2023, which was up 2.0% from Q4 2022. This remained above the five-year annual average level of $140.2 billion.[1]
- **Secondaries:** 15 funds raised $33.4 billion during Q1 2023, up substantially from the $11.8 billion raised by 22 funds in Q1 2022. This was an increase of 218.6% compared to the five-year average of $10.5 billion.[1] The average discount rate for LP buyout and venture capital portfolios finished the year at 10.0% and 30.0%, respectively. Buyout pricing improved by 200 basis points while venture pricing was flat compared to year-end 2022.[5]
- **Infrastructure:** $2.7 billion of capital was raised by 10 funds in Q1 2023 compared to $33.3 billion of capital raised by 32 partnerships in Q4 2022. At the end of the quarter, dry powder stood at $309.0 billion, down from Q4 2022's total of $325.7 billion. Infrastructure managers completed 453 deals for an aggregate deal value of $71.0 billion in the first quarter compared to 649 deals totaling $110.0 billion in Q4 2022.[1]
- **Natural Resources:** During Q1 2023, 3 funds closed on $1.0 billion compared to 9 funds totaling $2.2 billion in Q1 2022. Energy and utilities industry managers completed 50 deals totaling $3.4 billion in Q1 2023, an increase, on a volume basis, compared to 47 deals totaling $7.8 billion completed in Q4 2022.[1]

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

PRIVATE VS. PUBLIC REAL ESTATE RETURNS AS OF 3/31/2023

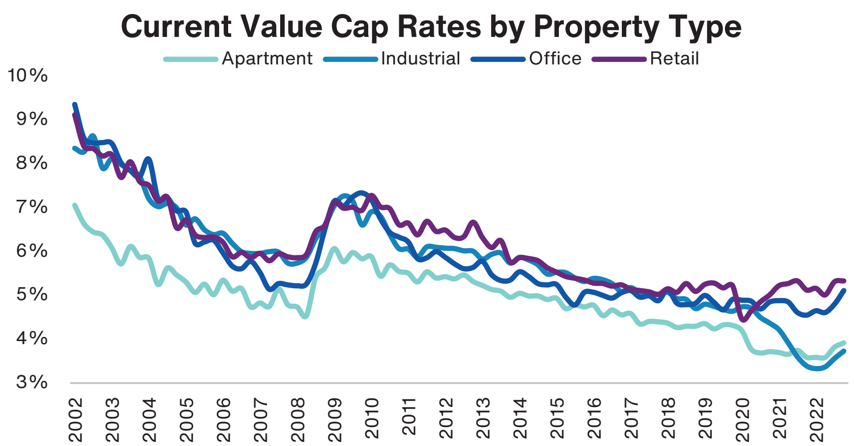


**First quarter returns are final*

Sources: NCREIF, FactSet

- U.S. Core Real Estate returned -3.2%* gross return in the first quarter 2023, resulting in a -3.1% total gross return for the trailing one-year, including a 3.4% income return. Real estate capital markets have been impacted by the higher inflation and interest rate environment and resulting increased cost of capital. During the first quarter of 2023, REITs rebounded as inflationary pressures appeared to settle, and the perceived probability of fed funds rate cuts in 2023 increased.
- Global property markets, as measured by the FTSE EPRA/NAREIT Developed Real Estate Index, returned 1.0% (USD) in aggregate during the first quarter and experienced a cumulative decline of 20.6% over the trailing 1-year period. REIT market performance during the quarter was driven by North America (+2.7% USD), with Europe (-2.8% USD) and Asia Pacific (-2.2% USD) lagging the global Index. The U.S. REIT markets (FTSE NAREIT Equity REITs Index) returned 2.7% in the first quarter.
- In the first quarter of 2023, U.S. private real estate transaction volumes declined 56% from the first quarter of 2022 to $85 billion. This decline is the culmination of rising interest rates, the availability of capital, and a perceived bid-ask spread.

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



- While capital markets have created significant near-term headwinds for nearly every asset class, we believe real estate fundamentals have remained generally promising, but also highly bifurcated. Even in the midst of moderating rent growth, Multifamily properties continue to experience near record-high occupancy and may be a net beneficiary of the eroding affordability of homeownership in this high interest rate environment. Industrial vacancy rates are amongst the lowest which supports continued NOI growth, helping offset pricing pressure as a result of rising cap rates.
- The retail and office sectors are facing significant headwinds over the near term. Retail real estate demand has seen modest recovery from occupiers, but the sector faces declining consumer confidence and purchasing power. Additionally, work-from-home trends and a cooling labor market are impacting office space needs. Weakening demand and increasing sublease inventory have pushed occupancy rates down across the sector—although demand for high-quality assets in well-located markets has been more resilient than commodity product.
- 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.

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Appendix: Index Definitions

MSCI AC World Index - The MSCI ACWI Index, MSCI's flagship global equity index, is designed to represent performance of the full opportunity set of large- and mid-cap stocks across 23 developed and 24 emerging markets. As of May 2022, it covers more than 2,933 constituents across 11 sectors and approximately 85% of the free float-adjusted market capitalization in each market.

S&P 500 - The S&P 500® is widely regarded as the best single gauge of large-cap U.S. equities and serves as the foundation for a wide range of investment products. The index includes 500 leading companies and captures approximately 80% coverage of available market capitalization.

HFRI Fund Weighted Composite - The HFRI Fund Weighted Composite Index is a global, equal-weighted index of single-manager funds that report to HFR Database. Constituent funds report monthly net of all fees performance in US Dollar and have a minimum of $50 Million under management or $10 Million under management and a twelve (12) month track record of active performance. The HFRI Fund Weighted Composite Index does not include Funds of Hedge Funds.

Russell 3000 Index - The Russell 3000 Index is a market-capitalization-weighted equity index that seeks to track 3000 of the largest U.S.-traded stocks.

Russell 2000 Index - The Russell 2000 Index measures the performance of the small-cap segment of the U.S. equity universe. The Russell 2000 Index is a subset of the Russell 3000® Index representing approximately 10% of the total market capitalization of that index. It includes approximately 2000 of the smallest securities based on a combination of their market cap and current index membership.

MSCI All Country World Investable Market Index - A capitalization-weighted index of stocks representing approximately 49 developed and emerging countries, including the U.S. and Canadian markets and covering all investable large-, mid- and small-cap securities.

MSCI Emerging Markets Investable Market Index - A capitalization-weighted index of stocks representing approximately 26 emerging countries, and covering all investable large-, mid- and small-cap securities.

Dow Jones U.S. Total Stock Market Index - A capitalization-weighted index of stocks representing all U.S. equity eligible securities.

MSCI World Index - A free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets, representing 24 developed market country indices.

MSCI USA Value/Growth - The MSCI USA Value/Growth Index captures U.S. large and mid cap securities exhibiting overall value/growth style characteristics. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield. The growth investment style characteristics for index construction are defined using five variables: long-term forward EPS growth rate, short-term forward EPS growth rate, current internal growth rate and long-term historical EPS growth trend and long-term historical sales per share growth trend.

Bank of America Merrill Lynch U.S. Corporate Index - An unmanaged index considered representative of fixed-income obligations issued by U.S. corporates.

Bank of America Merrill Lynch U.S. High Yield Index - An unmanaged index considered representative of sub-investment grade fixed-income obligations issued by U.S. corporates.

Bloomberg U.S. Government Index - An unmanaged index considered representative of fixed-income obligations issued by the U.S. government.

Bloomberg Long Credit Index - An unmanaged index considered representative of long duration fixed-income obligations issued by U.S. corporates.

S&P GSCI – A world-production weighted index that is based on the average quantity of production of each commodity in the index.

MSCI factor indexes - are rules-based indexes that capture the returns of systematic factors that have historically earned a persistent premium over long periods of time—such as Value, Low Size, Low Volatility, High Yield, Quality and Momentum and Growth.

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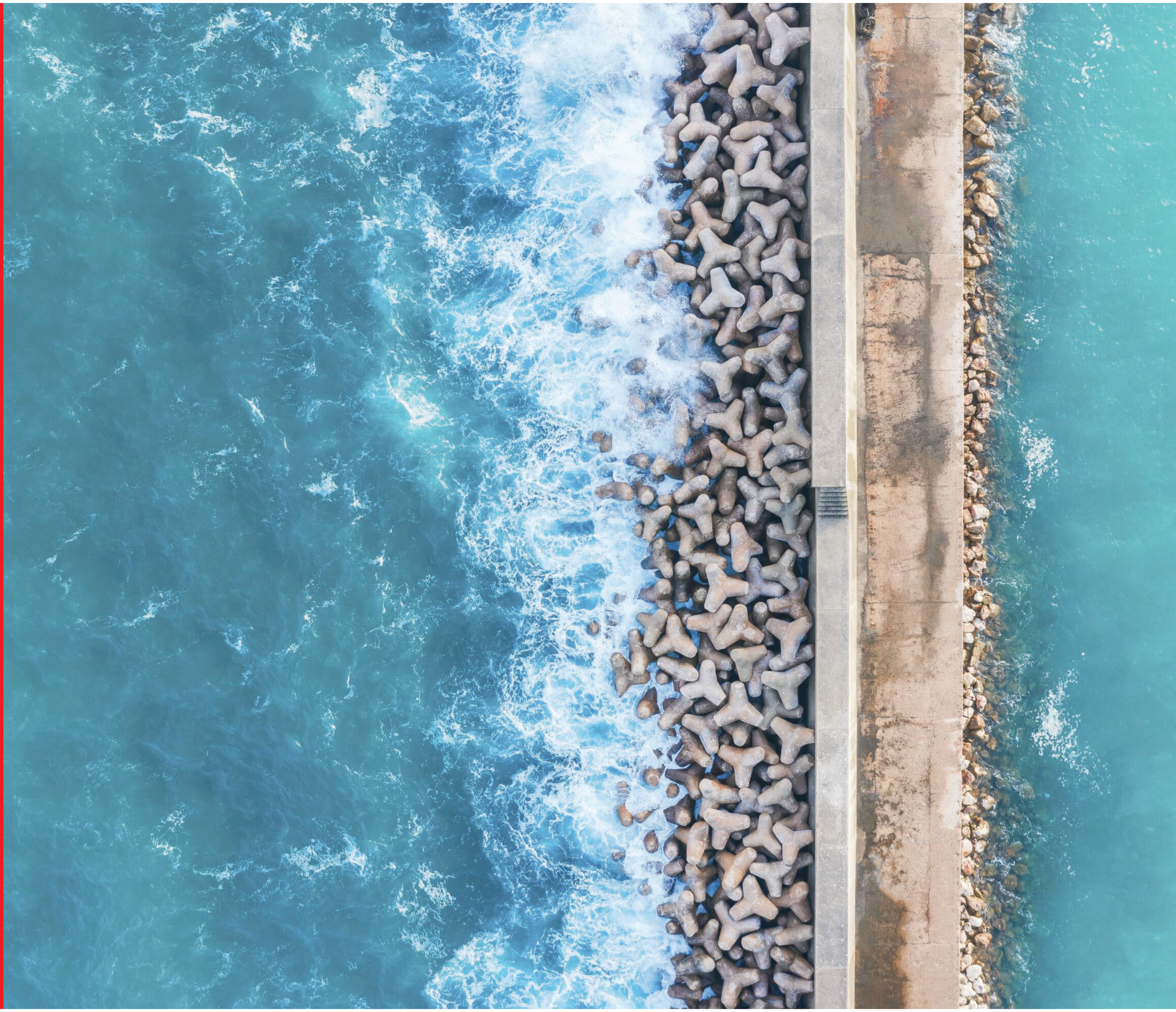
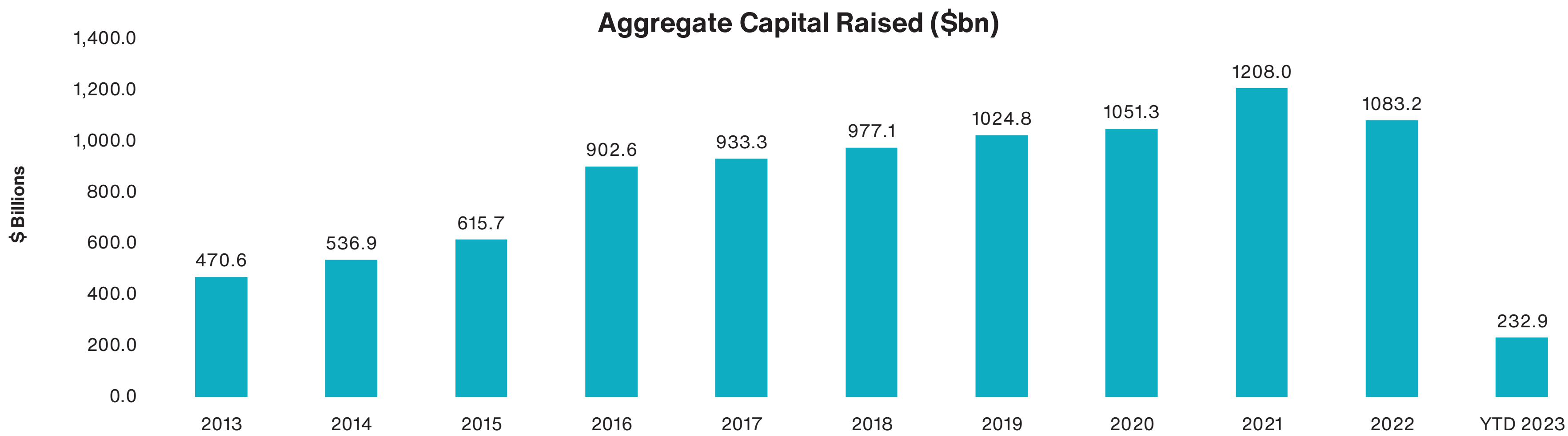
Q1 2023 Global Private Equity Market Overview

July 2023



Private Equity Overview



Fundraising

- In Q1 2023, $232.9 billion was raised by 470 funds, which was a decrease of 5.1% on a capital basis and a decrease of 36.9% by number of funds from the prior quarter. Capital raised through Q1 2023 represented 21.5% of capital raised during calendar year 2022.[1]
  - Q1 2023 fundraising was 21.3% lower, on a capital basis, than capital raised in Q1 2022 and 48.3% lower by number of funds raised.
  - The majority of capital was raised by funds located in North America, comprising 70.7% of the quarter's total. This was up from 67.1% in Q4 2022. Capital targeted for Europe made up 24.2% of the total funds raised during the quarter, an increase from 23.0% in Q4 2022. The remainder was attributable to managers targeting Asia and other parts of the world.
- Dry powder stood at $3.1 trillion at the end of the quarter, an increase of 1.0% and 27.4% compared to year-end 2022 and the five-year average, respectively.[1]

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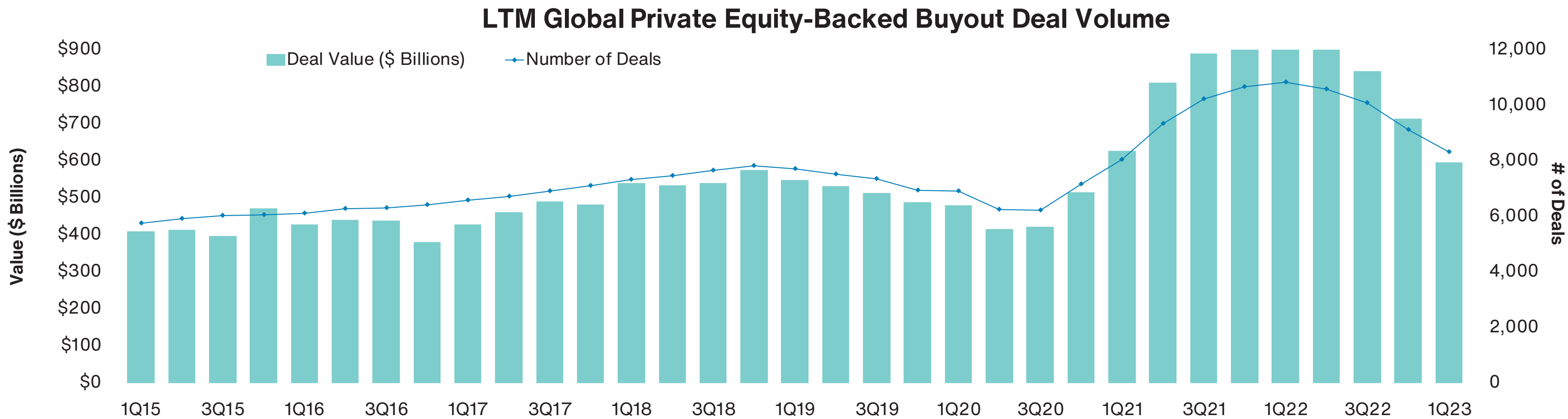
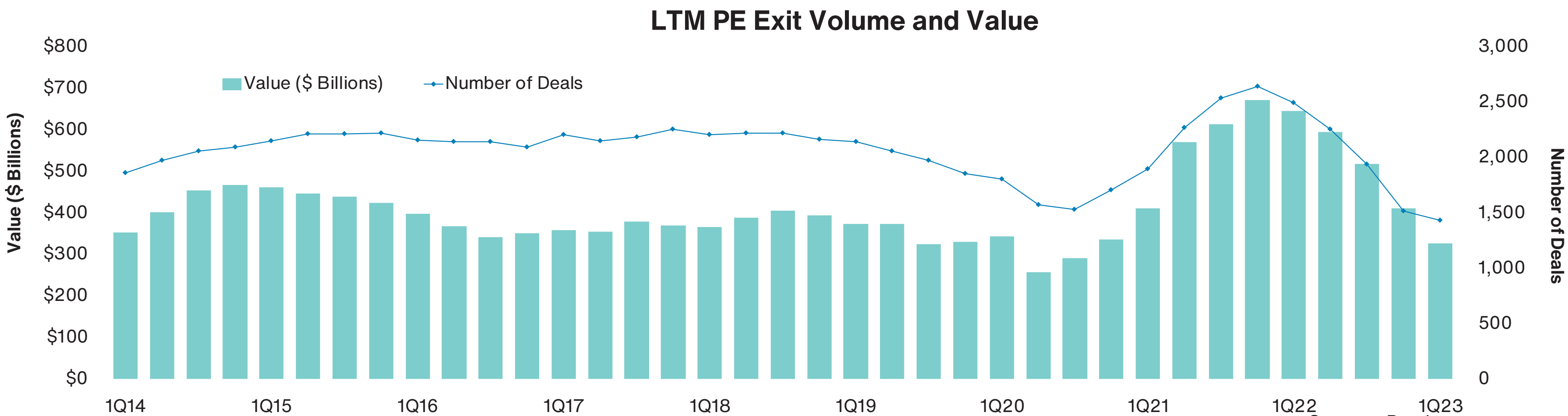
Private Equity Overview (cont.)



Activity

- Global private equity-backed buyout deals totaled $126.2 billion in Q1 2023, which was an increase on a capital basis of 9.0% compared to Q4 2022.[1]
  - This was a decrease of 21.6% compared to the five-year quarterly average.
  - Average deal size was $500.9 million in Q1 2023. This was down 13.7% compared to Q1 2022 but up 7.5% relative to the five-year quarterly average.
- During the quarter, the average purchase price multiple for all U.S. LBOs was 12.4x EBITDA, up from Q4 2022's average of 11.9x and up from the five-year average (11.3x). Large cap purchase price multiples stood at 12.4x during the quarter, up compared to full-year 2022's level of 11.8x.[2]
  - Average purchase price multiples for all U.S. LBOs were 1.1x and 1.8x turns (multiple of EBITDA) above the five- and ten-year average levels, respectively.
- In Europe, the average purchase price multiple across transactions of greater than €500M averaged 10.1x EBITDA on an LTM basis, down from 10.7x at the end of Q4 2022.[3]
- Availability of debt has contracted, but GPs were still able to obtain debt financing for the best deals.
  - The average leverage for U.S. deals through Q1 2023 was 5.3x compared to the five and ten-year averages of 5.8x and 5.7x, respectively.[3]
  - In Europe, the average senior debt/EBITDA on an LTM basis ended Q1 2023 at 5.8x, slightly lower than that observed at the end of Q4 2022 (5.9x).

Buyouts / Corporate Finance



Sources: Preqin

Fundraising

- $120.5 billion was closed on by 124 buyout and growth funds in Q1 2023, compared to $131.0 billion raised by 179 funds in Q4 2022. Capital raised was flat with Q1 2022, but lower by number of funds as 212 funds closed in the first quarter of 2022 .[1]
  - This was higher, on a capital basis, than the five-year quarterly average of $119.7 billon but significantly lower by number of funds (208).
  - Permira VIII was the largest fund raised during the quarter, closing on $17.7 billion of commitments.
- Buyout and growth equity dry powder was estimated at $1.3 trillion, up from Q4 2022.[1]
  - An estimated 58.6% of buyout dry powder was targeted for North America, while European dry powder comprised 22.9% and Asia/Rest of World accounted for the remainder.

Activity

- Globally, buyout exit value totaled $27.3 billion across 379 deals during the quarter, significantly lower than the $113.2 billion in value from 460 deals during Q1 2022.[1]

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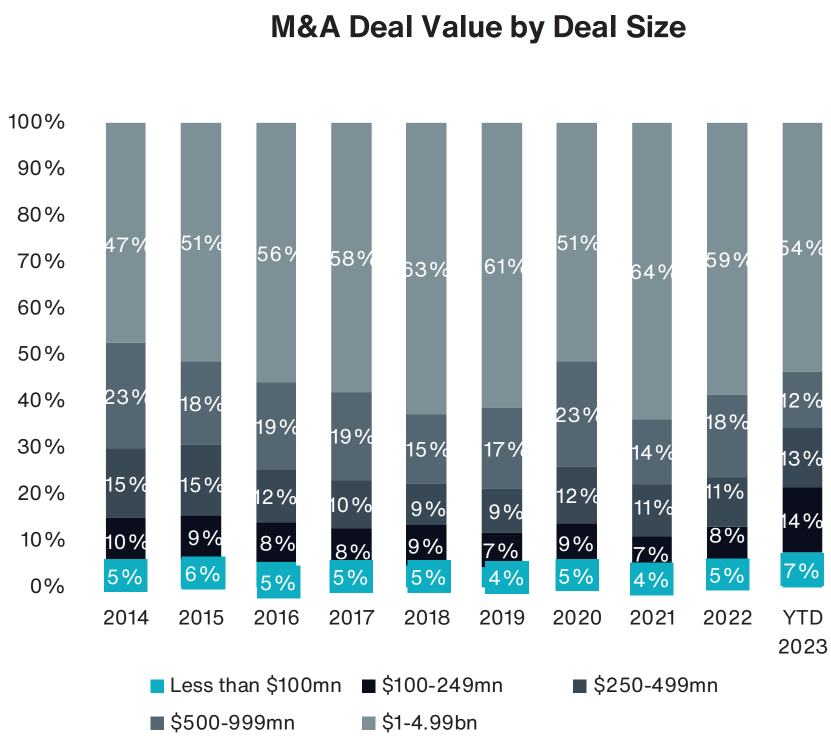
Buyouts / Corporate Finance



Sources: Preqin

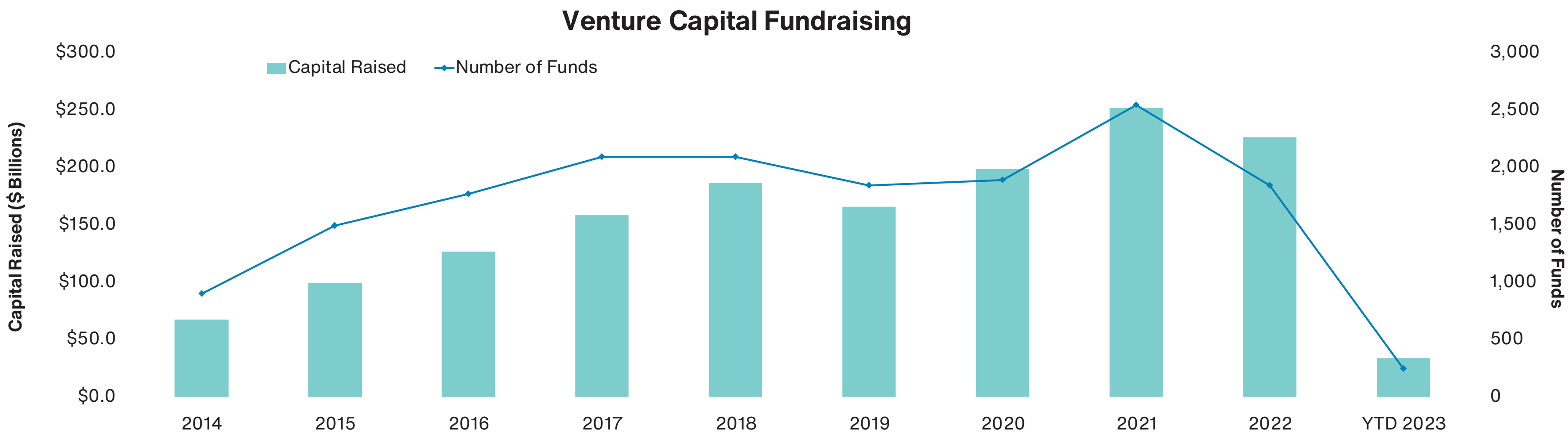
Activity

- Global private equity-backed buyout deals totaled $126.2 billion in Q1 2023, which was an increase on a capital basis of 9.0% compared to Q4 2022 but a decrease of 48.3% compared to Q1 2022.[1]
- Through Q1 2023, total deal value accounted for 17.7% of 2022's total.[1]
  - Of deals less than $5.0 billion in size, Q1 2023 deals valued between $1.0 billion - $4.9 billion accounted for an estimated 53.5% of total deal value compared to 58.5% in 2022. Deals valued between $100.0 million to $249.9 million represented 14.0% of total deal value through the first quarter.
  - By geography, North American deals accounted for the largest percentage of total deal value at an estimated 65.6% in Q1 2023, while Information Technology deals accounted for the largest percentage by industry at 25.8% of total deal value.
- Through Q1 2023, the average purchase price multiple for all U.S. LBOs was 12.4x EBITDA, up from year-end 2022's average of 11.9x and up from the five-year average (11.3x).[3]
  - Large cap purchase price multiples stood at 12.4x, up compared to the full-year 2022 level of 11.8x.
- The average purchase price multiple across European transactions greater than €1B averaged 10.7x EBITDA on an LTM basis as of Q1 2023, down from the 11.1x multiple seen at year-end 2022. Purchase prices for transactions of €500M or greater decreased from 10.7x in 2022 to 10.1x on an LTM basis ending Q1 2023.[3]
- The portion of average purchase prices financed by equity for all deals was 52.7% through Q1 2023, up from 48.9% in Q4 2022. This was above the five- and ten-year average levels of 48.0% and 45.6%, respectively.[3]

Opportunity[4]

- Mid-market managers targeting growing companies operating within large markets with value-creation expertise across business cycles.

Venture Capital

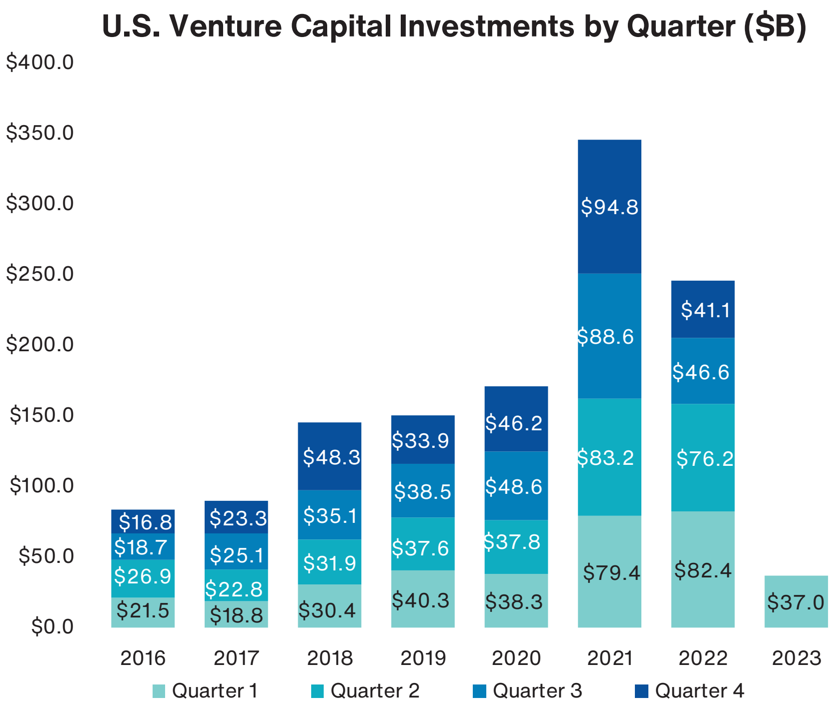


Sources: Preqin

Fundraising

- $33.6 billion of capital was raised by 244 funds in Q1 2023, higher, on a capital basis, from the prior quarter's total of $28.7 billion raised by 409 managers. This was down from Q1 2022's amount of $81.2 billion raised by 556 funds. Through Q1 2023, capital raised represented 14.8% of 2022's total.[1]
  - Q1 2023 fundraising was 34.8% lower, on a capital basis, compared to the five-year quarterly average of $51.5 billion.
  - Primavera Capital Fund IV was the largest fund raised during the quarter, closing on $4.0 billion.
- At the end of Q1 2023, there were an estimated 5,755 funds in market targeting $423.9 billion.[1]
  - G42 Expansion Fund 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 $562.6 billion at the end of Q1 2023, roughly flat with Q4 2022.[1]

Venture Capital



Source: Pitchbook / NVCA

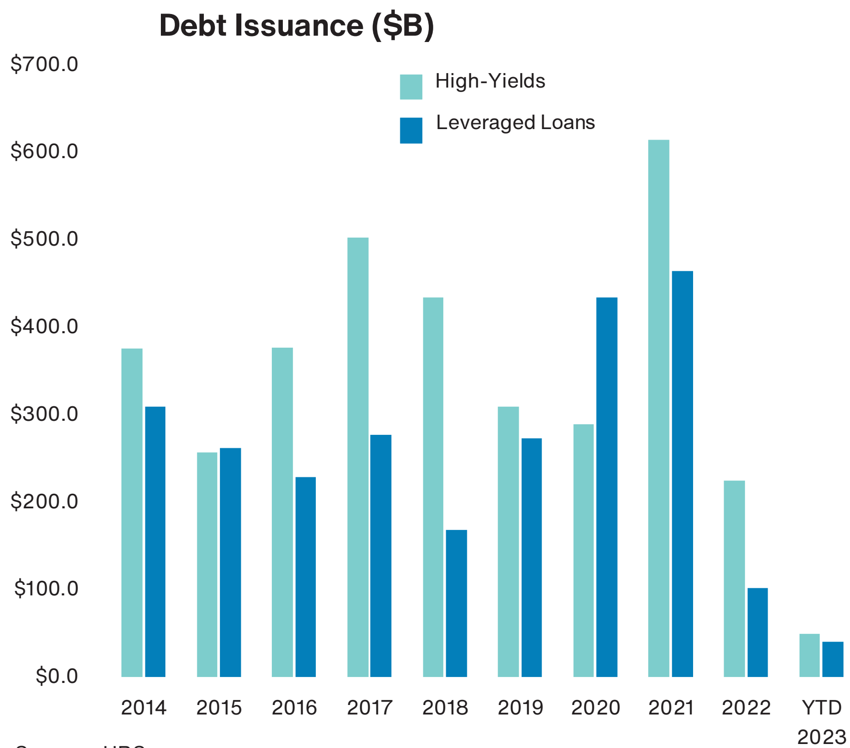
Activity

- During the quarter, 2,856 venture-backed transactions totaling $37.0 billion were completed, which was a decrease on both a capital and deal count basis over the prior quarter's total of $41.1 billion across 3,586 deals. This was also a decrease of 30.1% compared to the five-year quarterly average of $53.0 billion.[7]
  - In Q1 2023, there were 38 U.S.-based deals involving unicorn companies, representing roughly $10.1 billion in deal value. This was up by value compared to Q4 2022, which saw 69 unicorn-related deals close at a deal value of $8.9 billion. However, this was below the five-year quarterly average of $17.6 billion.[7]
- At the end of Q1 2023, median pre-money valuations increased across all series. Compared to Q4 2022, Seed transactions increased from a median pre-money valuation of $14.8 million to $15.4 million, Series A increased from $39.2 million to $40.0 million, Series B increased from $90.0 million to $140.0 million, Series C increased from $228.0 million to $543.5 million, and Series D+ median pre-money valuations increased from $426.6 million to $1.9 billion.[8]
- Total U.S. venture-backed exit value continued to slow, totaling approximately $5.8 billion across an estimated 300 completed transactions in Q1 2023, down substantially from $32.2 billion across 397 exits in Q1 2022. This was the lowest quarterly total since Q1 2013. Through Q1 2023, U.S. exit activity represented only 8.0% of 2022's total.[7]
  - The number of U.S. venture-backed initial public offerings decreased over Q4 2022, with only 20 IPOs completed in Q1 2023 at a value of $2.1 billion. 162 exits occurred by acquisition, marking a decrease over the prior quarter's 167, and accounted for $3.7 billion in exit value.[7]

Opportunity[4]

- Early stage continues to be attractive, although we continue to monitor valuations
- Smaller end of growth equity
- Technology sector, with emerging AI, digital health, and potential for new energy & climate-related innovation

Leveraged Loans & Mezzanine



Sources: UBS

Leveraged Loans
Fundraising

- New CLO issuance totaled $33.5 billion through Q1 2023.[2]
- High-yield debt issuance totaled $40.6 billion in Q1 2023, compared to $43.3 billion during the same period in 2022.[2]
- Through Q1 2023, leveraged loan mutual fund net flows ended at a net outflow of $8.2 billion, compared to $8.5 billion of outflows in all of 2022.[2]

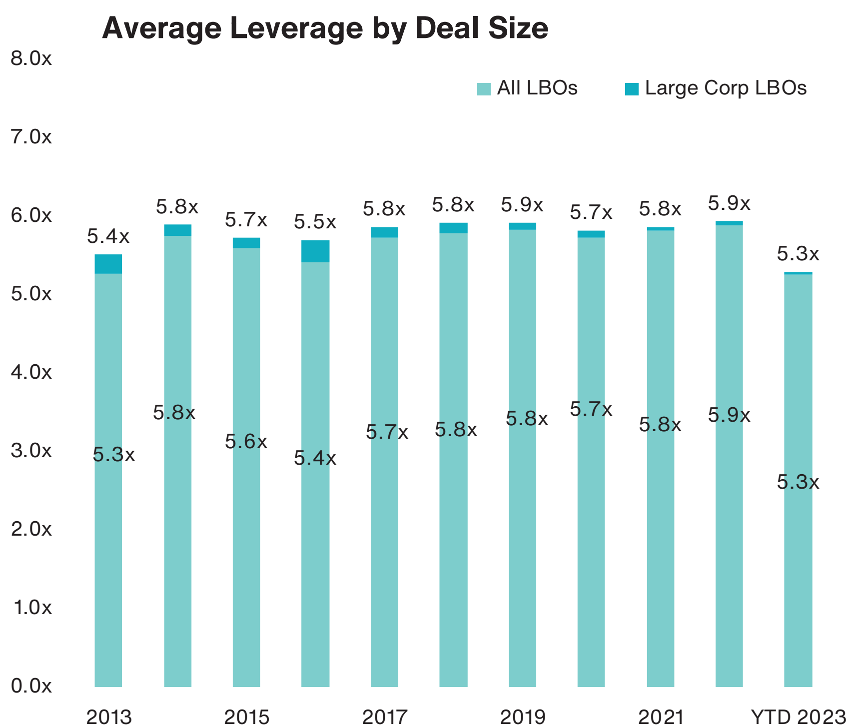
Activity

- In Q1 2023, institutional leveraged loan issuances totaled $49.7 billion, compared to $35.7 billion in Q4 2022. However, this was significantly lower than the $112.3 billion of issuance in Q1 2022.[2]
- European sponsored loan issuance totaled €7.1 billion during Q1 2023 compared to €15.1 billion during Q1 2022. This was 55.6% lower than the five-year quarterly average level of €15.9 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

Leveraged Loans & Mezzanine



Sources: S&P

Activity

- Leverage for all U.S. LBO transactions through Q1 was 5.3x, down from Q4 2022's leverage level of 5.9x. Leverage continues to be comprised almost entirely of senior debt. The average leverage level for large cap LBOs was also 5.3x through the quarter, lower than that seen at year-end 2022 (5.9x).[3]
- The amount of debt issued supporting new transactions decreased substantially compared to the prior quarter, moving from 80.4% to 37.4%, and was lower than the five-year average of 72.3%.[3]

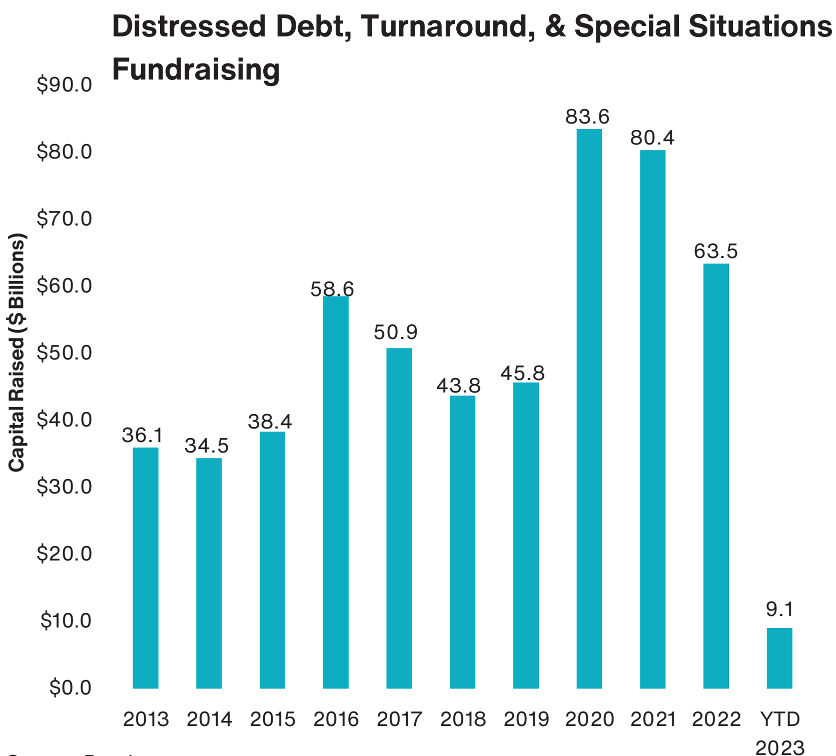
Mezzanine
Fundraising

- 8 funds closed on $21.0 billion during the quarter. This was a significant increase from the prior quarter's total of $4.3 billion raised by 10 funds and also a significant increase from the five-year quarterly average of $5.4 billion.[1]
- Estimated dry powder was $63.8 billion at the end of Q1 2023, down from $66.6 billion at the end of Q4 2022.[1]
- An estimated 117 funds were in market targeting $24.3 billion of commitments. ICG North American Private Debt Fund III is the largest fund in market targeting commitments of $2.0 billion.[1]

Opportunity[4]

- Funds with the capacity to scale for large sponsored deals

Distressed Private Markets

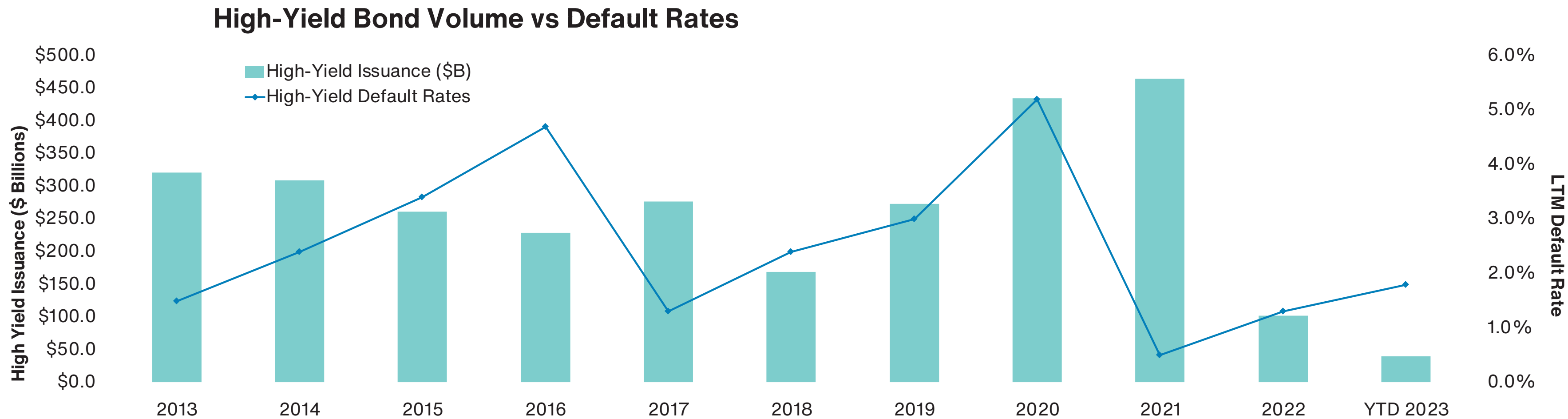


Source: Preqin

Fundraising

- During the quarter, $9.1 billion was raised by 12 funds, down from $15.8 billion raised by 21 funds during Q4 2022. Distressed funds have raised 14.4% of 2022's total through Q1 2023.[1]
  - Q1 2023's fundraising was 42.4% lower than the five-year quarterly average.
  - Capital raised in Q1 2023 represented an increase compared to the $1.3 billion raised in Q1 2022.
  - Arrow Credit Opportunities II was the largest fund closed during the quarter, closing on $2.9 billion.
- Dry powder was estimated at $149.8 billion at the end of Q1 2023, which was up 2.0% from Q4 2022. This remained above the five-year annual average level of $140.2 billion.[1]
- Roughly 226 funds were in the market at the end of Q1 2023 seeking $124.0 billion in capital commitments.[1]
  - Distressed debt managers were targeting the most capital, seeking an aggregate $66.5 billion, followed by special situations managers at $54.1 billion.
  - Oaktree Opportunities Fund XII was the largest fund in market with a target fund size of $18.0 billion.

Distressed Private Markets



Sources: UBS / Fitch Ratings

Activity

- The TTM U.S. high-yield default rate was 1.8% as of March 2023, which was up from December 2022's TTM rate of 1.3%. Fitch expects the high-yield default rate to trend higher through 2023.[6]
- The market dislocation caused by current macroeconomic factors may supply additional distressed opportunities in the next several months.

Opportunity [4]

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

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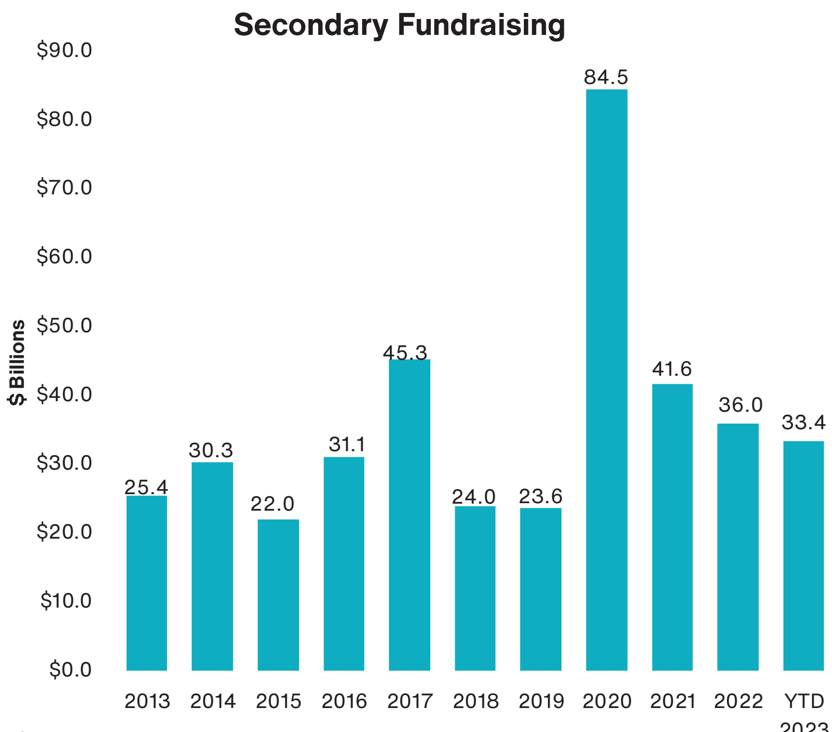
Secondaries



Source: Preqin

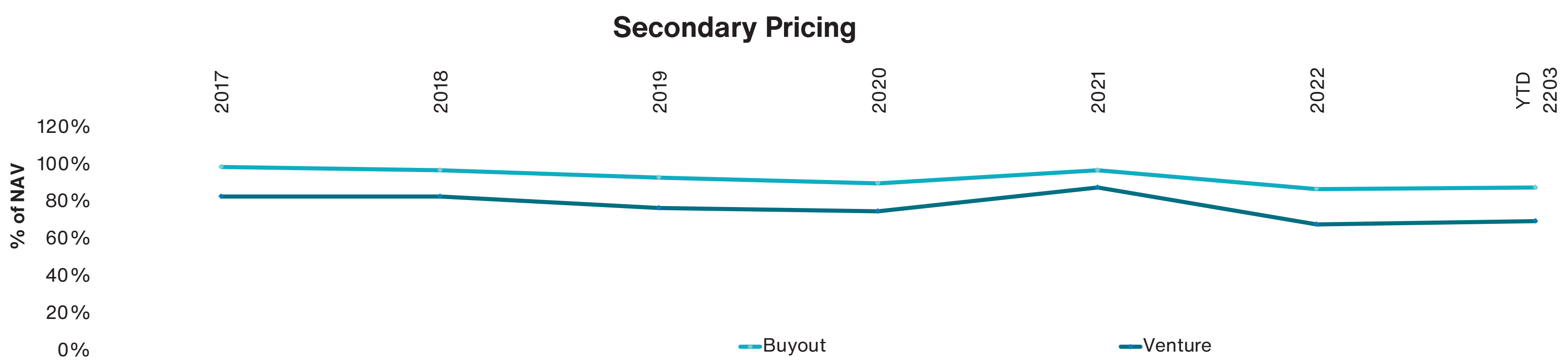
Fundraising

- 15 funds raised $33.4 billion during Q1 2023, up substantially from the $11.8 billion raised by 22 funds in Q1 2022. This was an increase of 218.6% compared to the five-year average of $10.5 billion.[1]
  - Strategic Partners IX was the largest fund raised during the quarter, closing on $22.2 billion.
- At the end of Q1 2023, there were an estimated 127 secondary and direct secondary funds in market targeting roughly $98.8 billion. The majority of secondary funds are targeting North American investments.[1]
  - ASF IX and Lexington Capital Partners X are the largest funds being raised, each seeking $15.0 billion in commitments.

Activity

- The market continues to have participation from a broad base of buyers and sellers with opportunistic selling activity being seen from public and private pensions, financial institutions and insurance companies.[2]
- Jefferies identified several trends in Q1 2023 including increased demand and activity related to secondary transactions, notably within the buyout segment, and peak capital availability given the fundraising environment over the last several quarters.[16]
- PJT Partners noted investors shifting preferences from industries impacted by the public market volatility to less cyclical industries. Investors are now focusing their demand on a select group of managers.[17]
- According to UBS, the number of GP-led situations brought to market continued to increase with varying quality and strategies, along with more household GP names utilizing the secondary market. This is expected to continue throughout 2023.[2]

Secondaries



Source: Jefferies

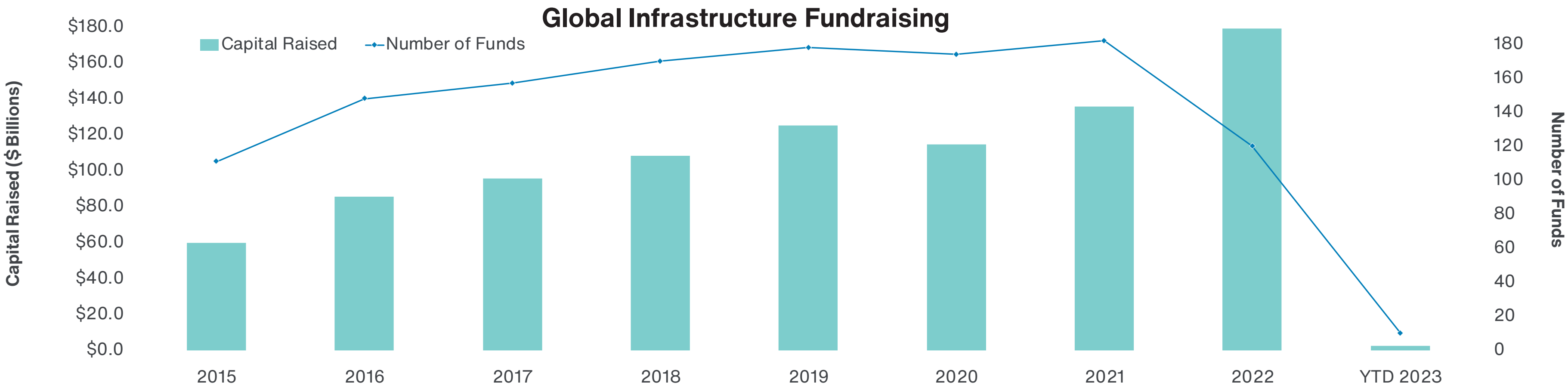
Activity

- Campbell Lutyens expects LP-led secondary sales to continue as more investors use these transactions to crystalize gains, trim their GP rosters, and manage balance sheet risk.[14]
- Payment deferrals and structured equity solutions, notably mosaic structures, continue to be prevalent in the LP portfolio market and are used as a means to improve pricing and deal returns in an increasingly competitive environment.[16]
- Given recent public market conditions, buyers are wanting to purchase assets based off NAVs that reflect the volatility.[2]
- Jefferies expects pricing to improve as demand increases and markets stabilize. This, coupled with secondary dry powder available to invest, is expected to drive strong transaction volume in the second half of 2023.[17]
- The average discount rate for LP buyout and venture capital portfolios finished the year at 12.0% and 30.0%, respectively. Buyout pricing improved by 100 basis points while venture pricing was flat compared to year-end 2022.[17]

Opportunity[4]

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

Infrastructure

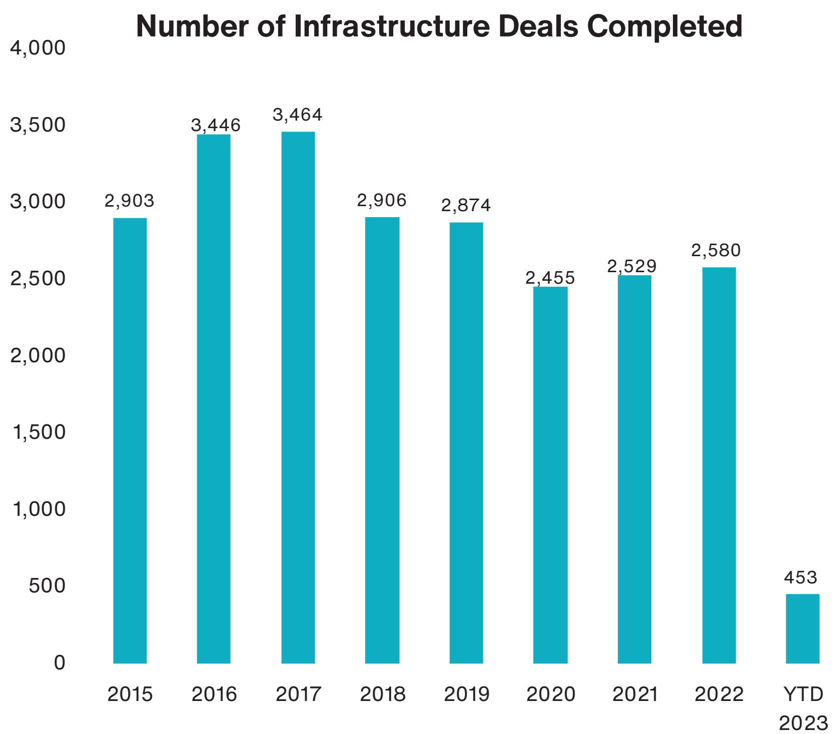


Source: Preqin

Fundraising

- $2.7 billion of capital was raised by 10 funds in Q1 2023 compared to $33.3 billion of capital raised by 32 partnerships in Q4 2022. This was a decline of 91.9% compared to the five-year average of $33.2 billion.[1]
  - SAF Annex Fund was the largest fund raised during the quarter, closing on $700.0 million.
- As of the end of Q1 2023, there were an estimated 482 funds in the market seeking roughly $438.2 billion.[1]
  - Three funds in market have target fund sizes of $25.0 billion, including Brookfield Infrastructure V, Global Infrastructure Partners V, and Stonepeak Infrastructure Partners V.
- At the end of the quarter, dry powder stood at $309.0 billion, down from Q4 2022's total of $325.7 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 strong levels of dry powder and increased investment activity from strategic and corporate buyers as well as institutional investors.

Infrastructure



Source: Preqin

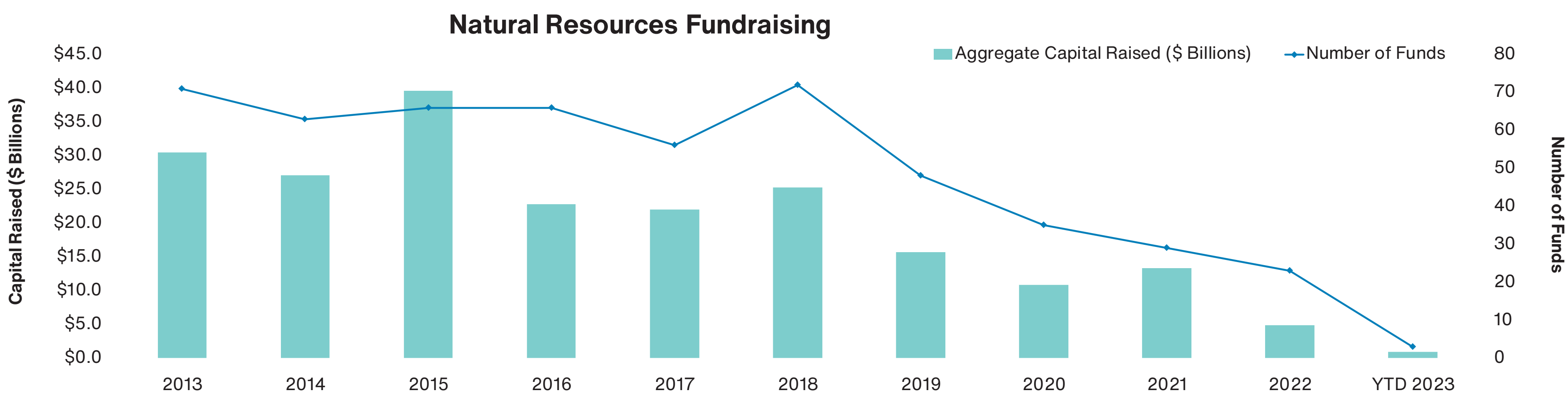
Activity

- Infrastructure managers completed 453 deals for an aggregate deal value of $71.0 billion in the first quarter compared to 649 deals totaling $110.0 billion in Q4 2022.[1]
  - By region, Europe saw the largest number of deals, with 44.9% of deals being completed in the region, followed by North America at 27.0%. Asia amassed 11.8% of activity through the end of Q1 2023.
  - Renewable energy was the dominant industry during the quarter, making up 62.9% of transactions, followed by the conventional energy sector which accounted for 14.0% of deals. The telecom sector accounted for 7.1% of deals in the first quarter.

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



Source: Preqin

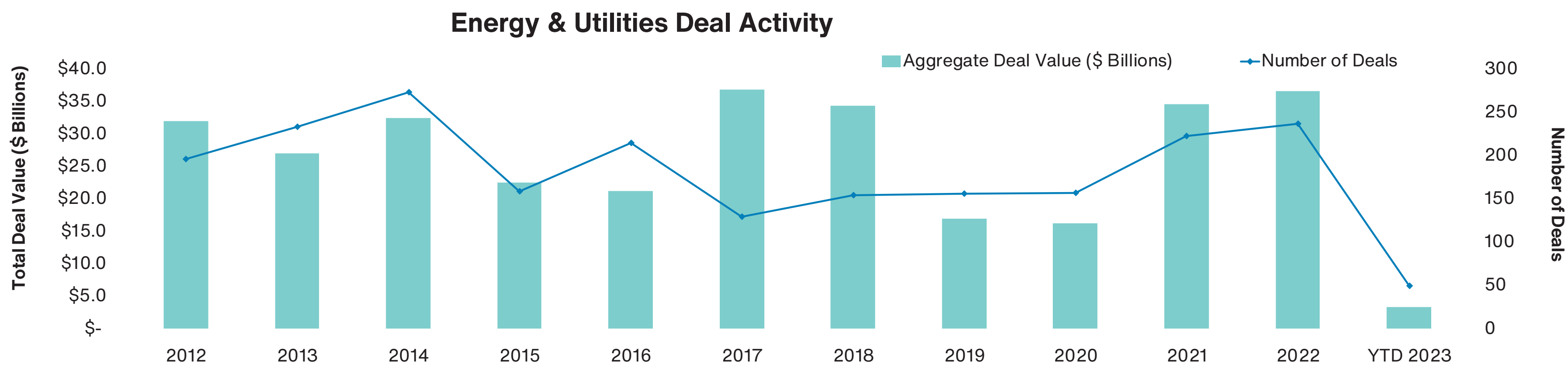
Fundraising

- During Q1 2023, 3 funds closed on $1.0 billion compared to 9 funds totaling $2.2 billion in Q1 2022.[1]
- Dry powder stood at roughly $30.6 billion at the end of Q1 2023, which was 1.0% higher than Q4 2022's level of $30.3 billion but down from the five-year average level by 26.3%.[1]

Activity

- Crude oil prices decreased during the quarter.
  - WTI crude oil prices decreased 4.1% during the quarter to $73.28 per bbl. This was also a decrease of 32.5% compared to Q1 2022.[10]
  - Brent crude oil prices ended the quarter at $78.43/bbl, down 3.1% compared to the prior quarter. This was a decrease of 33.1% from Q1 2022.[10]
  - Natural gas prices (Henry Hub) finished Q1 2023 at $2.31 per MMBtu, which was down 58.2% from the prior quarter and down 52.9% from Q1 2022.[10]

Natural Resources



Source: Preqin

Activity

- Energy and utilities industry managers completed 50 deals totaling $3.4 billion in Q1 2023, an increase, on a volume basis, compared to 47 deals totaling $7.8 billion completed in Q4 2022.[1]
- A total of 755 crude oil and natural gas rotary rigs were in operation in the U.S. at the end of the quarter. This was down by 3.1% from the prior quarter but up 12.2% over Q1 2022.[13]
  - Crude oil rigs represented 78.4% of the total rigs in operation. 58.6% of the 592 active oil rigs were in the Permian basin.
  - At the end of Q1 2023, 41.3% and 25.0% of natural gas rigs were operating in the Haynesville and Marcellus basins, respectively.
- The price of iron ore (Tianjin Port) ended the quarter at $128.37 per dry metric ton, up from $111.84 at the end of Q4 2022.[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
16. PJT Partners
17. Jefferies

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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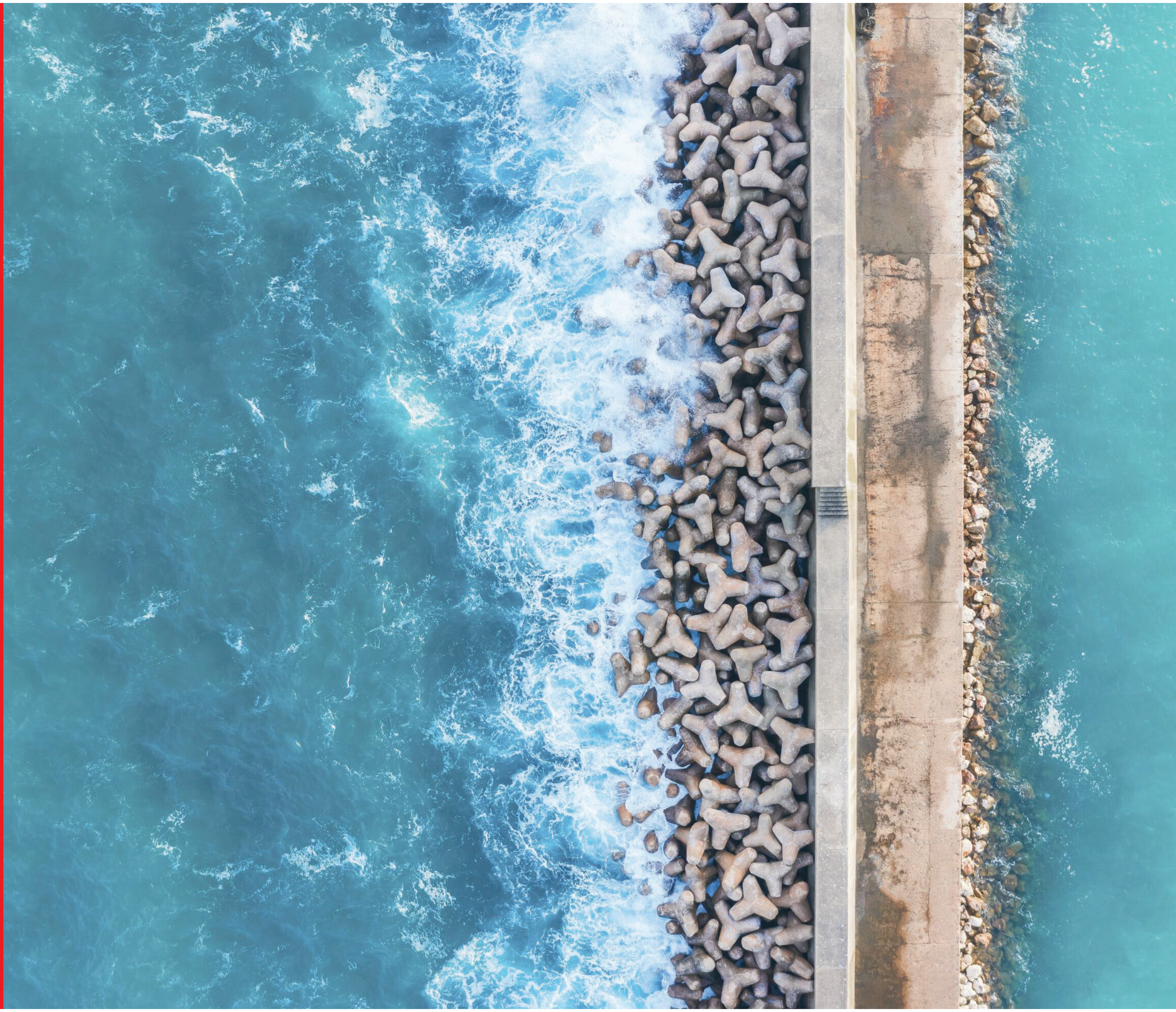
1Q 2023 Real Estate Market Update

August 2023



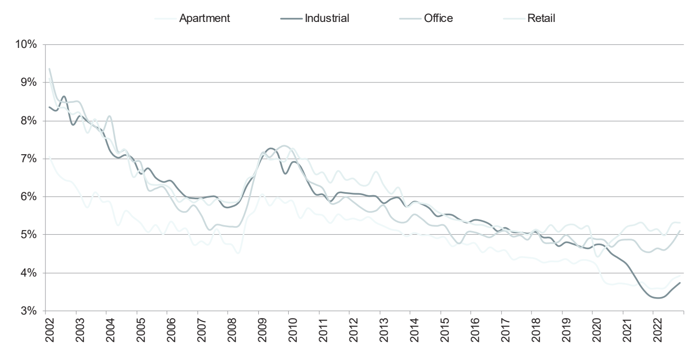
United States Real Estate Market Update (1Q23)

General

- The economy continues to face headwinds stemming from an increasingly aggressive federal funds rate, continuous inflation, and geopolitical events. The S&P 500 has returned a positive quarter coming in at 7.5% despite the underperformance in 2022. The MSCI US REIT index continued its upward trend after a challenging 2022, posting a gross first quarter return of 2.8%.

- During the first quarter, GDP increased at an annualized rate of 1.1%. This positive growth was primarily due to government spending, consumer spending, and strong job market growth. As a result of geopolitical events such as the atrocities of the Russia-Ukraine war, Saudi-Iranian oil concerns, and increased protectionist measures, commodity pricing has remained elevated in tandem with persistent inflation, which may persist throughout 2023. Federal reserve officials remain committed to taming inflation and reducing the central bank's balance sheet for the foreseeable future, approving seven interest rate hikes throughout 2022, and two in the first quarter of 2023 totaling an increase of 500 basis points since March 2022.

Current Value Cap Rates by Property Type



Source: NCREIF

Commercial Real Estate

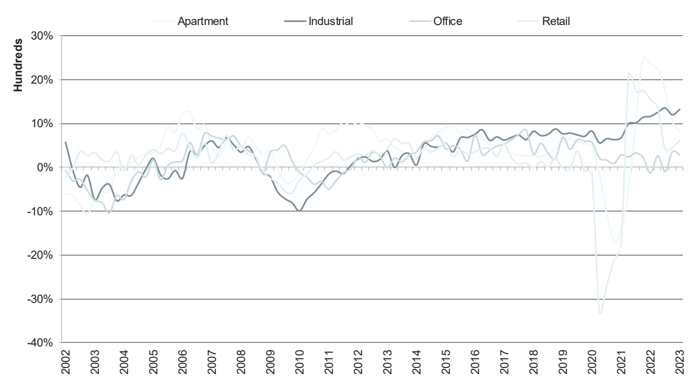
- To start off 2023, total CRE transaction activity for the quarter decreased by -56% YoY, with annual transaction activity down -32% YoY. The office sector transaction volumes in the U.S. have notably not recovered to pre-pandemic levels. Although the office sector has seen minor improvements, transaction volumes for the office sector in the U.S. have continued to fall due to the increase in the cost of debt and loose return to office requirements.

- Transaction cap rates (5.6%) continued to expand, moving out 77 bps during the quarter. This increase comes after historic low cap rates experienced in 4Q21 and 2Q22. Current valuation cap rates expanded for all major property sectors, led by office (+31 bps), and followed by industrial (+17 bps), apartment (+10 bps) and retail (+2 bps).

- NOI growth has continued to diverge between property sectors. Apartment sector fundamentals continue to show strength. With the cost of debt for homes continuing to become more expensive, Apartment NOI expanded (+8%) YoY. Industrial NOI expanded (+13%) YoY on the back of companies' investments in direct-to-customer distribution.

- 10-year treasury bond yields declined slightly, ending the quarter at 3.5%. As economists expected, rates moved significantly higher throughout the first quarter of 2023, with the potential to climb further.

4 Qtr Rolling NOI Growth



Source: NCREIF

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

United States Property Matrix (1Q23)

TOWNSEND® GROUP
an Aon company

INDUSTRIAL

- In 1Q23, industrial properties returned -0.82% and outperformed the NPI by 99 bps.
- Transaction volumes decreased to $18 billion in the first quarter of the year, resulting in an 54% decrease year-over-year. Individual asset sales decreased 65% year-over-year, while portfolio purchases turned in a year-over-year volume decrease of 30%. At $18 billion, the industrial sector decreased by $15 billion quarter-over-quarter.
- The industrial sector turned in NOI growth of 13.3% over the past year. NOI continues to reach all time highs for the sector.
- Vacancy decreased by 30 bps year-over-year to 1.5%. Vacancy in the sector decreased 2 bps from last quarter, reaching all-time historic lows. E-commerce continues to drive demand across the sector.
- Industrial cap rates slightly compressed approximately 18 bps from a year ago, to 3.5%. Industrial overall fundamentals still top all property sectors.

MULTIFAMILY

- The apartment sector delivered a -2.1% return during the quarter, underperforming the NPI by 31 bps.
- Transaction volume in the first quarter of 2023 decreased to $25 billion, resulting in a decrease of 64% year-over-year. Transaction volume for the sector decreased from the fourth quarter by nearly 50%. This volume continues to make multifamily the most actively traded sector for the twentieth straight quarter.
- Cap rates remained steady at 3.7% quarter-over-quarter, increasing 6 bps year-over-year. Multifamily cap rates remain at low levels relative to prior years, driven by continued increases in valuation.
- The multifamily sector saw increasing vacancy rates throughout the entirety of 2020 due to the global pandemic. Throughout 2021 and 2022, the sector appeared to have shaken that trend although vacancy rates remained steady. Vacancy rates increased during fourth quarter of 2022 but have decreased by 12 bps quarter-over-quarter. 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 -4.06% in 1Q23, 225 bps below the NPI return over the period.
- Transaction volumes decreased by 68% year-over-year in the first quarter. Transaction volume equated to $11 billion for the quarter, a decrease of $10 billion quarter-over-quarter. Office transaction levels have regressed since 4Q21 and are now at levels seen during 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 12.68%, slightly decreasing by 10 bps from last quarter.
- NOI growth in the office sector decreased quarter-over-quarter by 75 bps to 2.91% and appears to be in the midst of its recovery to pre-pandemic levels.
- Office cap rates expanded from a year ago, sitting at approximately 4.8%. 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 1Q23, the retail sector delivered a quarterly return of 0.52%, outperforming 129 bps compared to the NPI.
- Transaction volumes totaled $17 billion in the first quarter, decreasing 27% year-over-year. Single asset transactions accounted for just over 53% of all sales volume for the quarter.
- Cap rates have remained fairly steady within the sector over the last year at 5.2%. Current valuation cap rates expanded quarter-over-quarter by 5 bps due to valuation adjustments made across the sector in general.
- NOI growth increased from the prior quarter to 6.17% as of the first quarter. Retail has begun its slow recovery as a large portion of stores nationally have opened and operate safely.
- Retail vacancy rates remained steady over the quarter at 7.85%, down 122 bps over the past year. 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 (1Q23)

TOWNSEND® GROUP an Aon company

- Headwinds related to elevating interest rates, stringent lending standards, and a looming moderate recession remain present entering 2023 . Year over year, deal volumes have contracted by 52% with capital markets activity hampered by uncertainty. These difficulties crystalized in the US, in which two of the largest bank collapses in history were felt throughout the property markets. The resulting $66 B in capital invested in commercial real estate priced at $10M or greater was the lowest since Q3 2020, amid the pandemic.

- US markets endured relative to the EMEA region, whose deal volume fell to its lowest since 2012. YOY Transaction activity in the U.K. was down 60%, in Germany by 76% and in France by 43%. Pockets of encouragement can be seen with large retail warehouse and grocery-anchored properties trading. This further illuminates the resilience and preference for the asset type which emerged during the pandemic.

Global Total Commercial Real Estate Volume - 2022 - 2023

$ US Billions	Q1 2023	Q1 2022	% Change Q1 23 - Q1 22	Full Year Ending 1Q23	Full Year Ending 1Q22	% Change Full Year
Americas	78	186	-58%	579	877	-34%
EMEA	38	105	-64%	266	474	-44%
Asia Pacific	95	148	-36%	795	903	-12%
Total	211	439	-52%	1639	2254	-27%

Source: Real Capital Analytics, Inc., Q1' 23

- Despite strong investment activity in Japan and mainland China, Asia Pacific deal volume fell by 36% YOY in Q1. The tandem accounted for the bulk of office investment in Q1 with investors preferring Tier 1 cities in those countries with higher rates of return to office work. Hospitality is foreseen to have significant growth with the return of Chinese tourism in 2023.Regional tourism should be bolstered by investment in prime retail assets in Hong Kong and Singapore. Logistics leasing demand in the region is expected to recede due to limited availability of prime assets and a slowdown in e-commerce growth. Markets with low vacancy, such as Japan and Australia, likely will attract investor interest throughout the year.

- Consumer demand softened in several major retail markets globally during Q1 as pressure mounts on disposable incomes particularly in Europe and North America. Retail fundamentals have started to pull back because of sustained inflation and banking troubles. Absorption in Q1 was lower but positive in the U.S., leasing was healthy across Asia Pacific, and demand rose in several European cities. Discount and online retailers will increase consumer market share as disposable income wanes.

- In the first quarter, demand for logistics and industrial in the US in Europe had declines in leasing activity. Amid climbing interest rates coupled with an uncertain global economic outlook, the stagnation in decision-making timelines will persist as GP's strategically weigh their options when executing deals. Tenants that are time sensitive to supply chain delays will increase nearshoring operations to have better access to their end-users. E-commerce related demand has continued to rise past peak pandemic levels globally and this will drive additional demand for warehouse space, particularly in emerging Asia where e-commerce levels are still materializing .

- Investment in U.S. multifamily declined 65% since Q1 2022, despite record levels of dry power indicating latent demand pending an interest rate decrease. Across Europe, house price growth eased or began to fall as mortgage rates increased and sentiment declined, while transaction volumes also softened in the region during the first quarter. Bucking the trend, Asia Pacific multifamily investment continues to be encouraging, with China particularly active post-lockdown.

Global Outlook - GDP (Real) Growth % pa, 2023-2025

	2023	2024	2025
Global	**2.6**	**2.7**	**3.2**
Asia Pacific	**4.4**	**4.2**	**4.2**
Australia	1.7	1.6	2.4
China	5.5	4.9	4.7
India	7.0	6.0	6.3
Japan	1.0	1.1	1.1
North America	**1.1**	**0.8**	**2.0**
US	1.1	0.8	2.0
Middle East	**2.9**	**3.5**	**-**
European Union	**0.7**	**1.4**	**1.9**
France	0.6	1.0	1.5
Germany	0.0	1.1	1.6
UK	0.2	0.9	1.7

Source: Bloomberg

42

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

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REPORT

Meketa Capital Markets Outlook & Risk Metrics

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Capital Markets Outlook & Risk Metrics

As of June 30, 2023

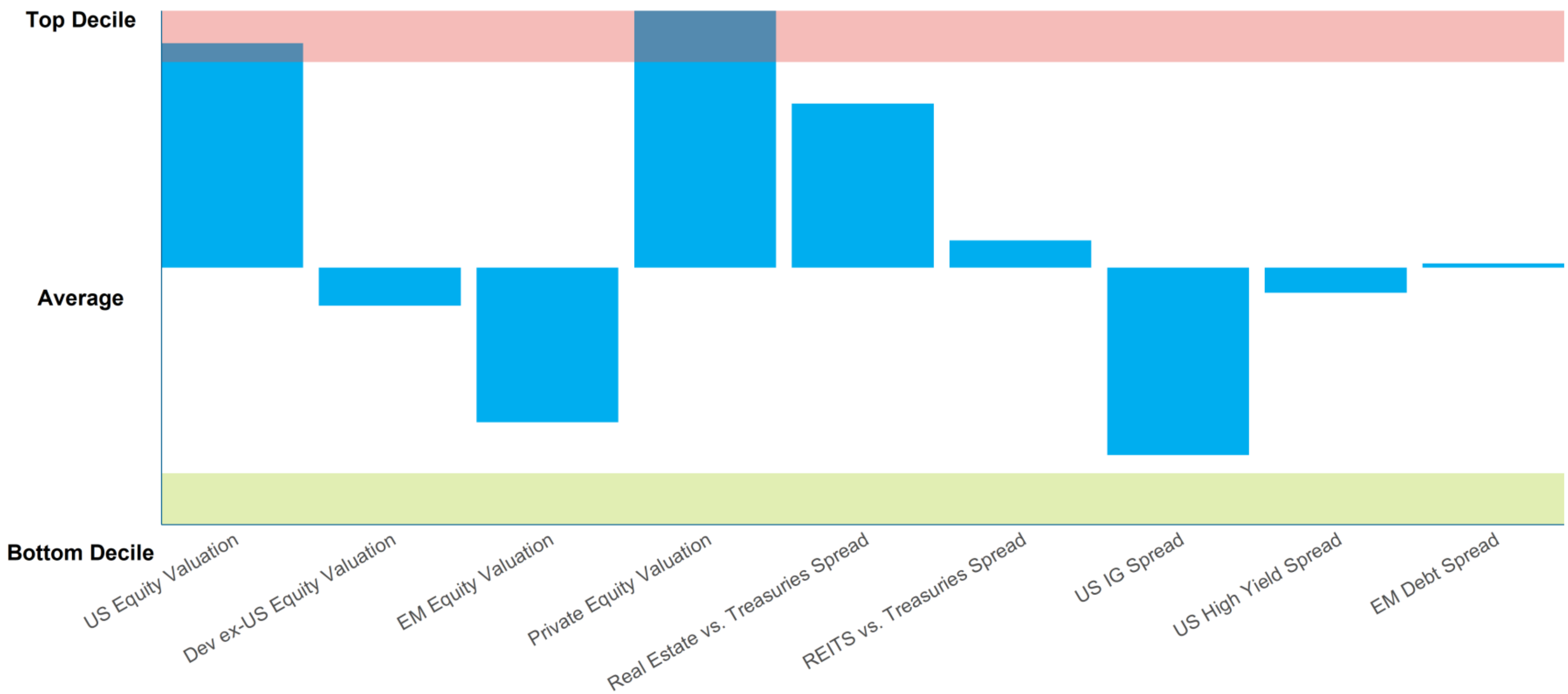
Capital Markets Outlook

- → The Fed kept rates unchanged in June, arguing that the skip was consistent with their moderating pace of policy hikes, but they signaled that further rate increases may be forthcoming. Other central banks continued to raise rates in June. In general, global inflation indicators have continued to fall though they remain above policy targets.
- → Economic data appears to indicate continued strong demand and tight labor markets that may imply the need for still higher rates in the future.
- → Most equity markets posted strong performance in June, with many of these markets delivering strong Q2 returns in aggregate. However, fixed income markets experienced mixed results in June and Q2 due to elevated inflation and expectations for further rate increases.
- → Chinese equities rallied in June, but negative performance for the second quarter reflect investors' shaken confidence in China's reopening.
- → In spite of sputtering Chinese economic growth there were other bright spots in emerging markets. Emerging market equities and emerging market debt posted positive returns in June and year-to-date as dollar weakness earlier in the year and optimism on India's economic prospects boosted returns.
- → US equities rallied in June and delivered one of the strongest starts to a year on modern record with large cap stocks leading the way.
- → While higher quality bonds suffered negative returns in the second quarter, bank loan and high yield markets produced gains.

Capital Markets Outlook

- → Although a deteriorating growth outlook weighed on commodities and natural resource stocks in early 2023, natural resource stock returns turned positive in June. Likewise, public real estate benefited from a reversal in investor sentiment, posting strong returns in June and the second quarter.
- → After a strong retrenchment in share prices in 2023, US stocks are now trading well-above their long-run cyclically adjusted price-to-earnings ratio while non-US stocks continue to trade at a discount.

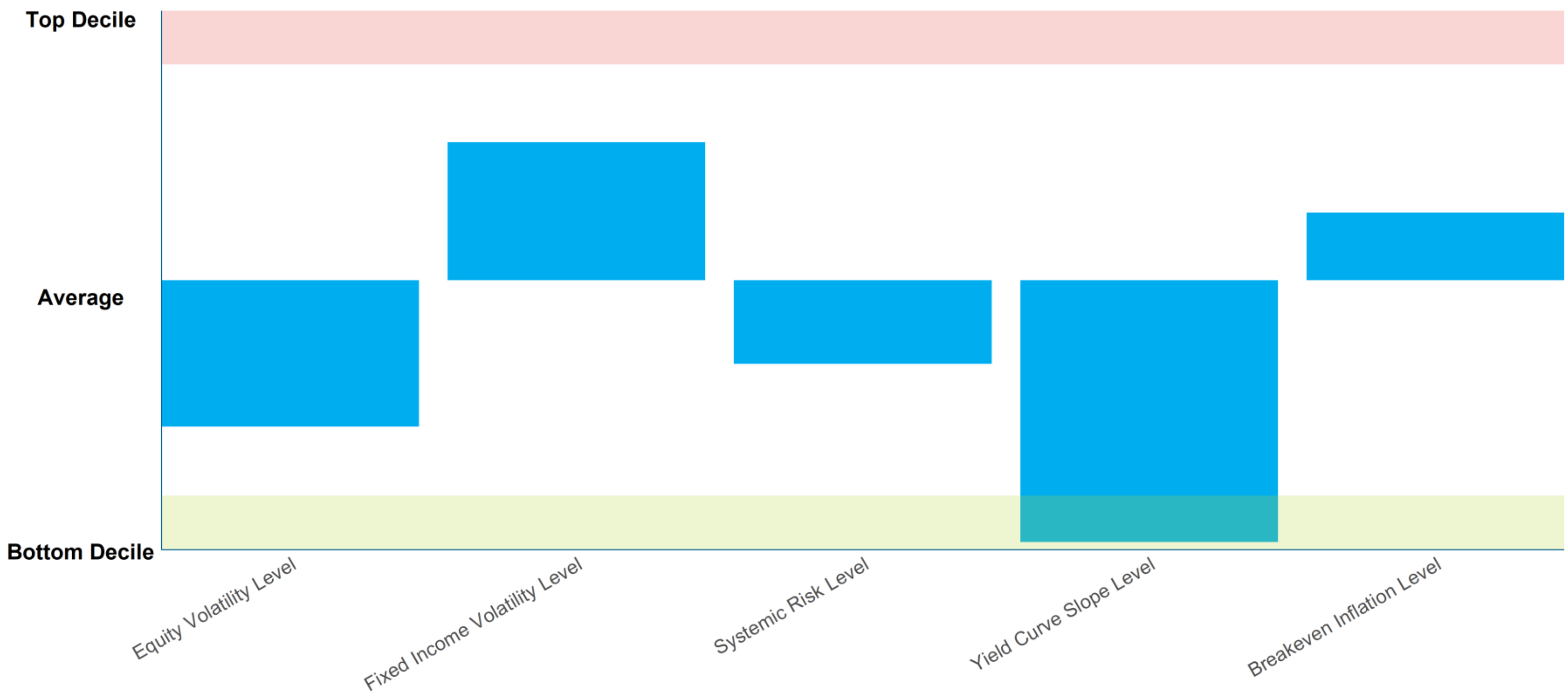
Risk Overview/Dashboard (1)
(As of June 30, 2023)[1]



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

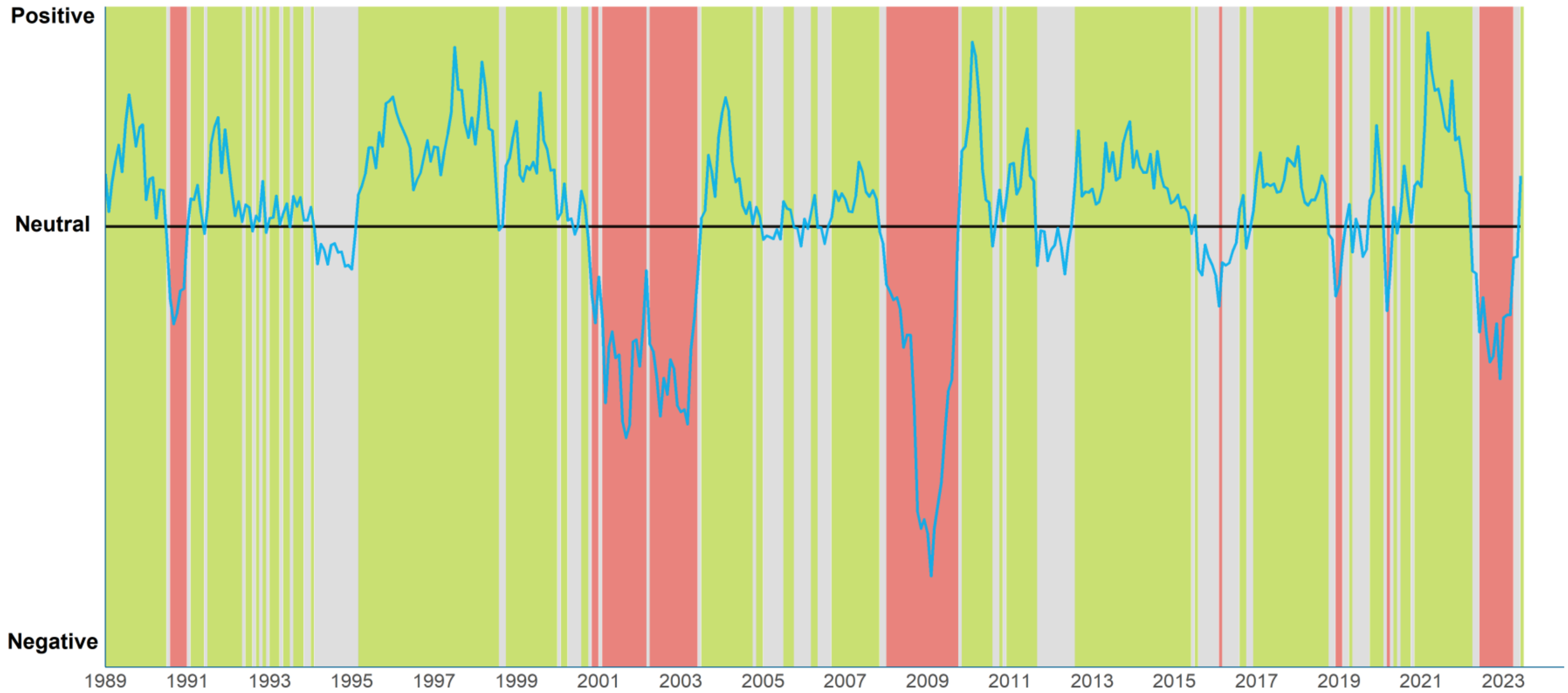
[1] With the exception of Private Equity Valuation, that is YTD as of December 31, 2022.

Risk Overview/Dashboard (2)
(As of June 30, 2023)

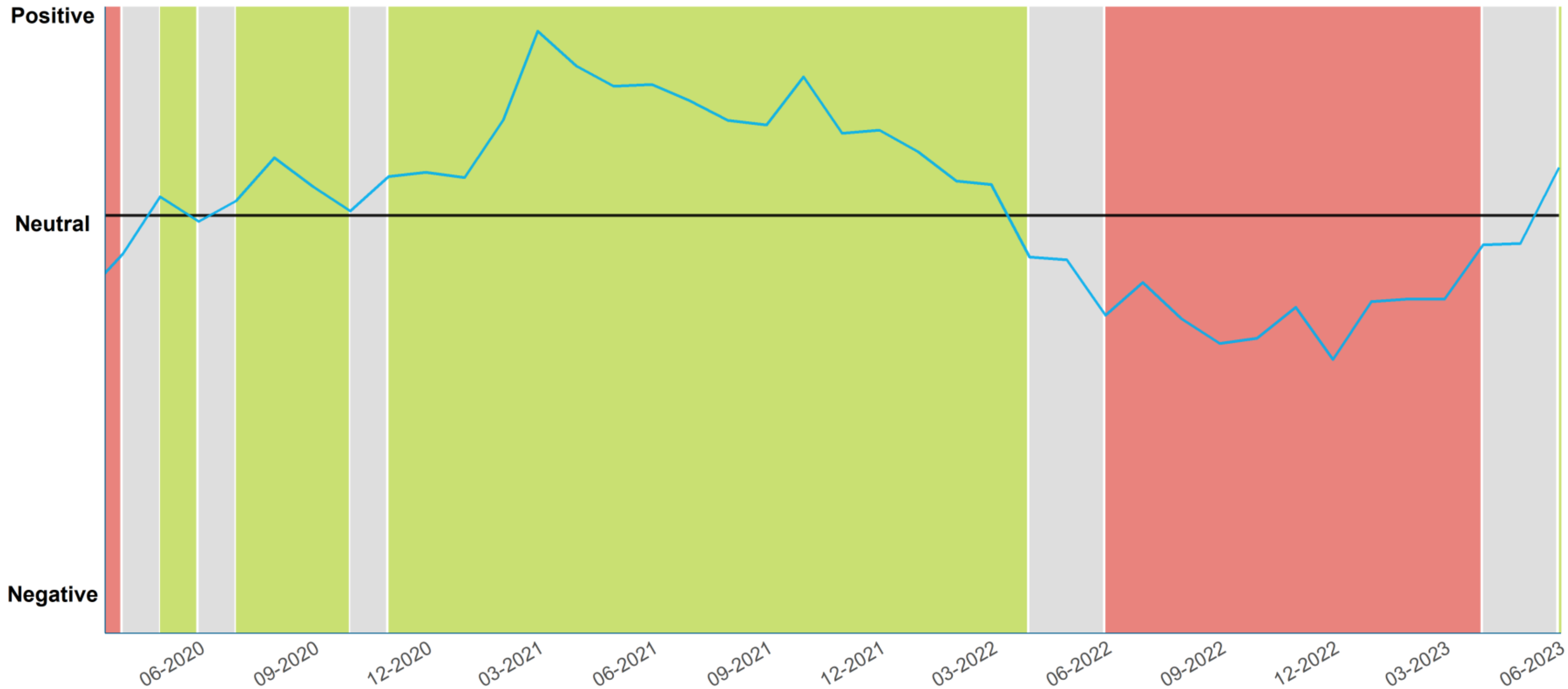


→ Dashboard (2) shows how the current level of each indicator compares to its respective history.

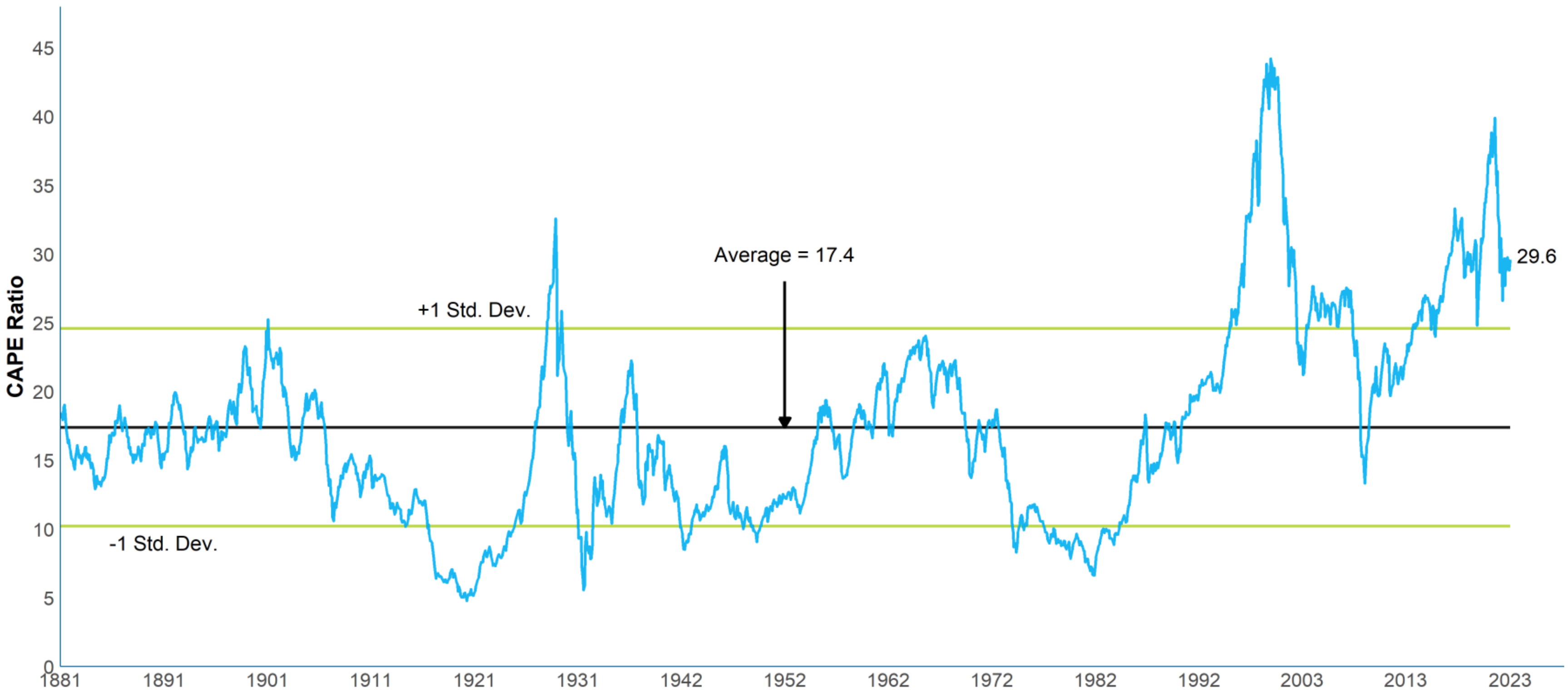
Market Sentiment Indicator (All History)
(As of June 30, 2023)



Market Sentiment Indicator (Last Three Years)
(As of June 30, 2023)



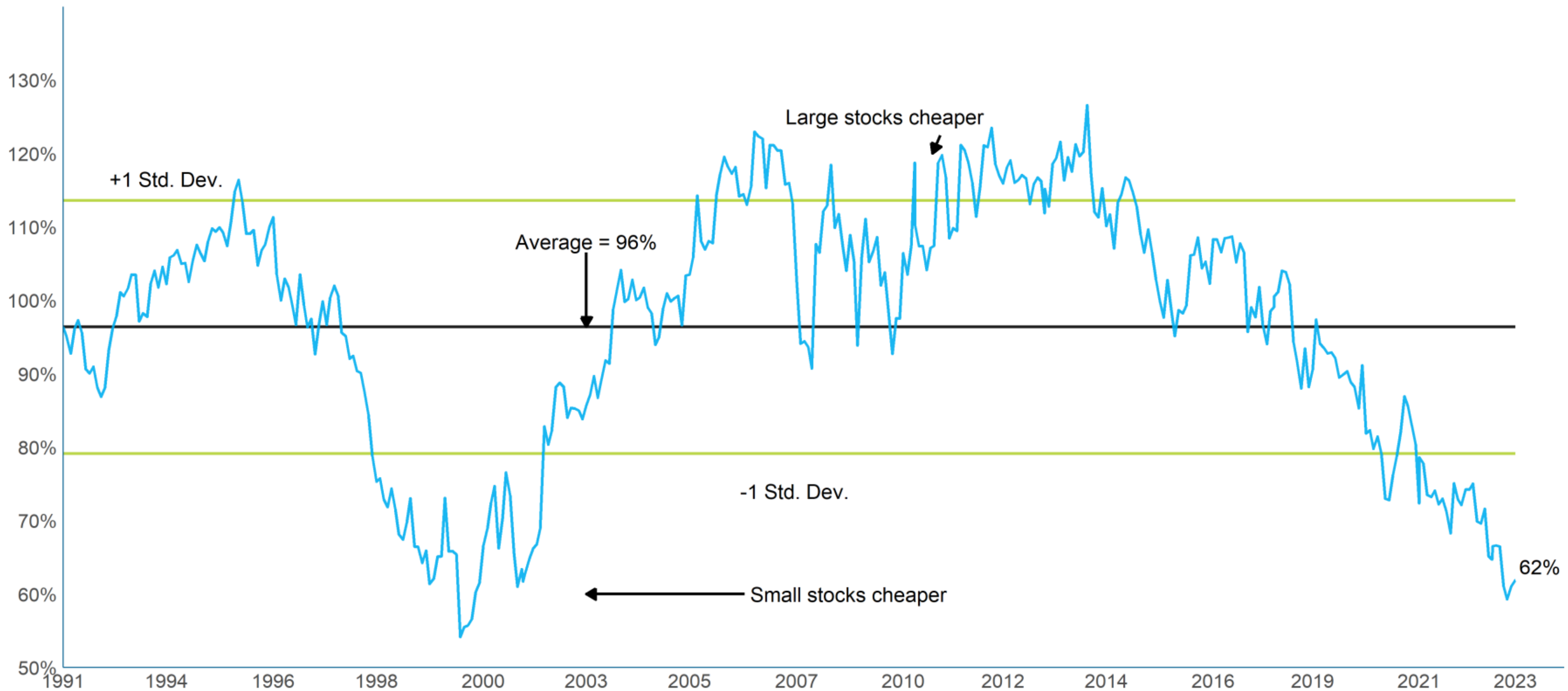
US Equity Cyclically Adjusted P/E[1]
(As of June 30, 2023)



→ 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, 2023)



→ 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 and Bloomberg. Prior months unavailable on Bloomberg are backfilled with last reported earnings. Earnings figures represent 12-month "as reported" earnings.

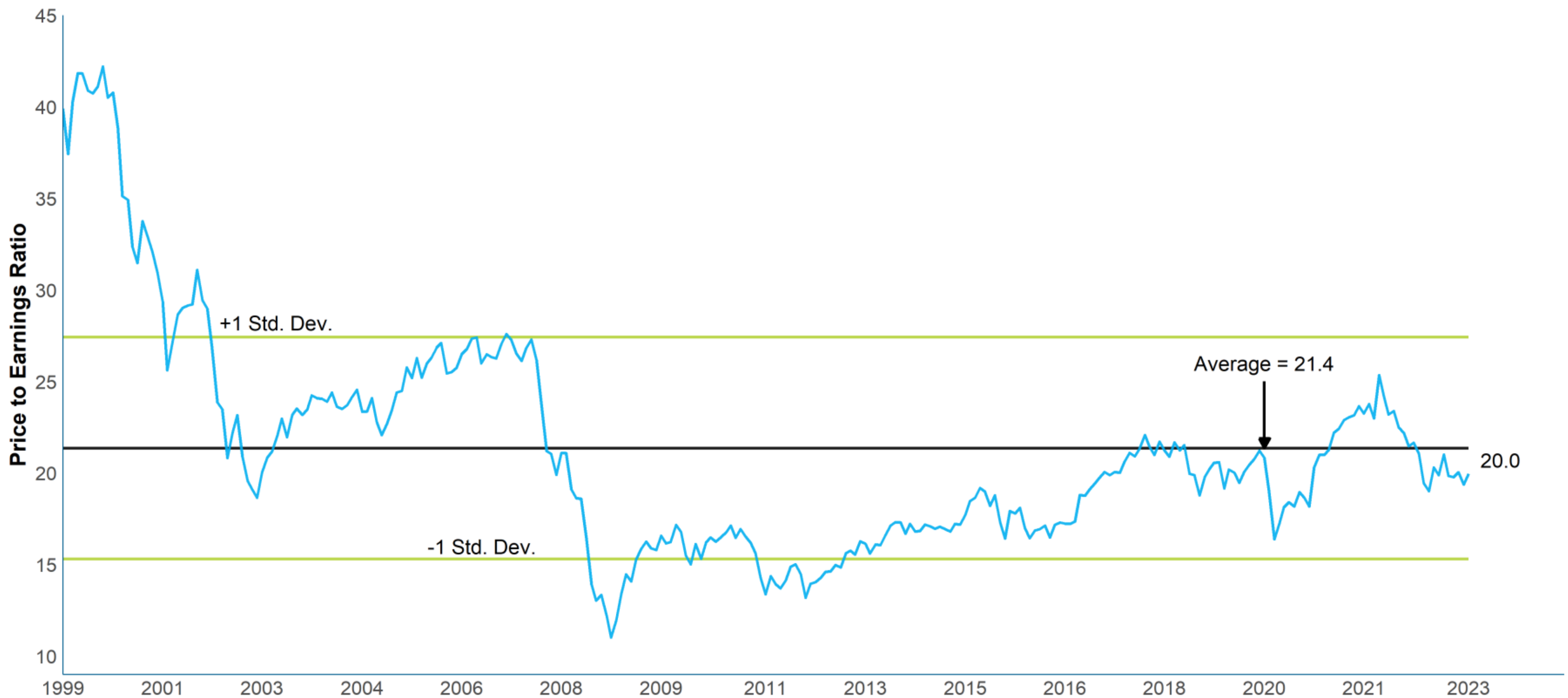
Growth P/E vs. Value P/E[1]
(As of June 30, 2023)

→ 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]

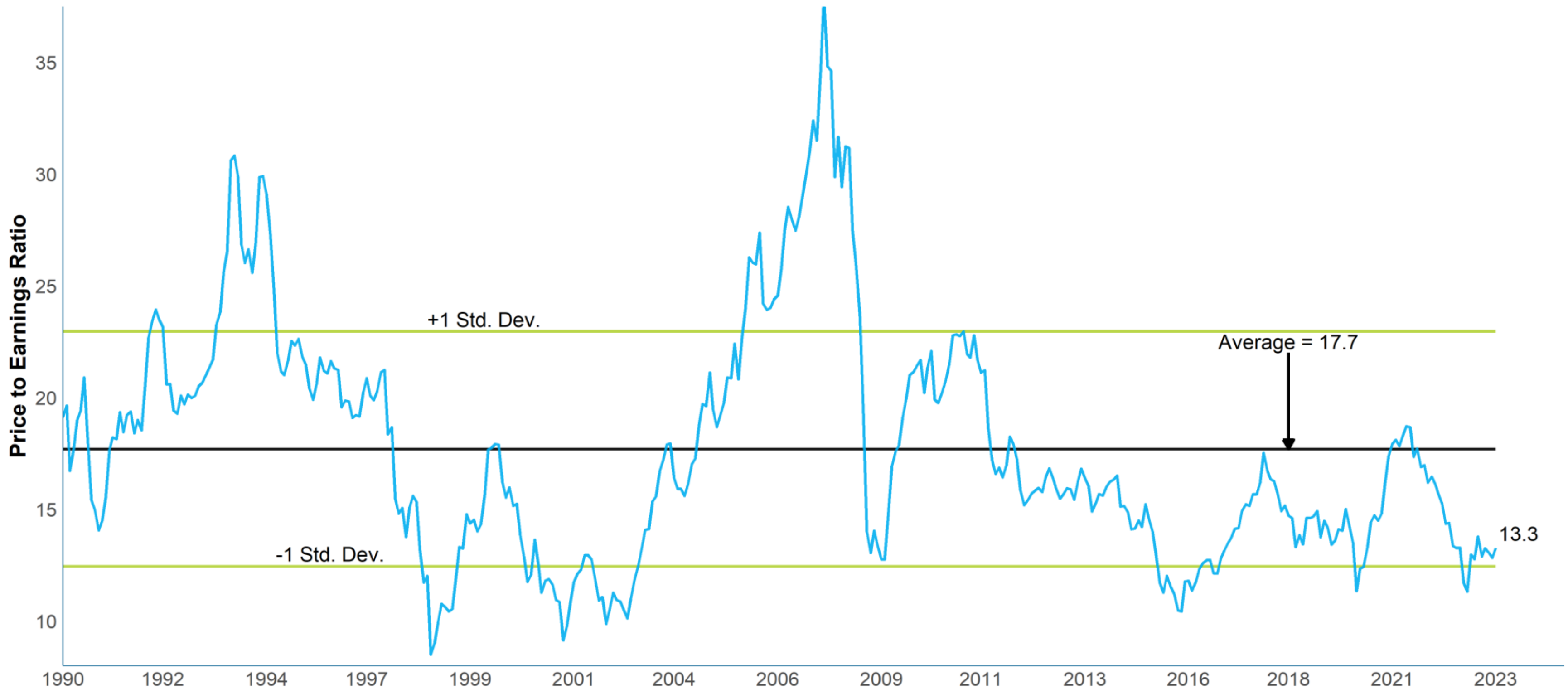
(As of June 30, 2023)



→ 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.

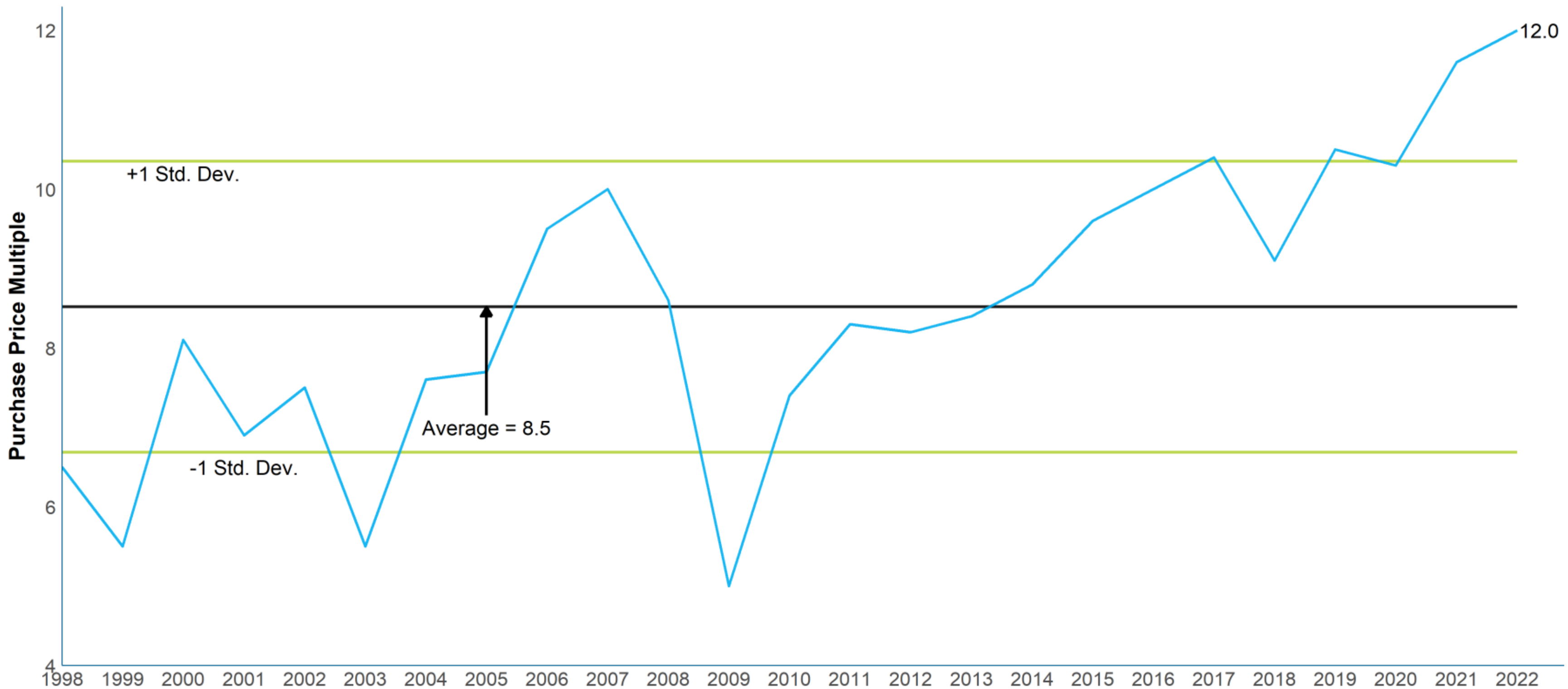
Emerging Market Equity Cyclically Adjusted P/E[1]
(As of June 30, 2023)



→ 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.

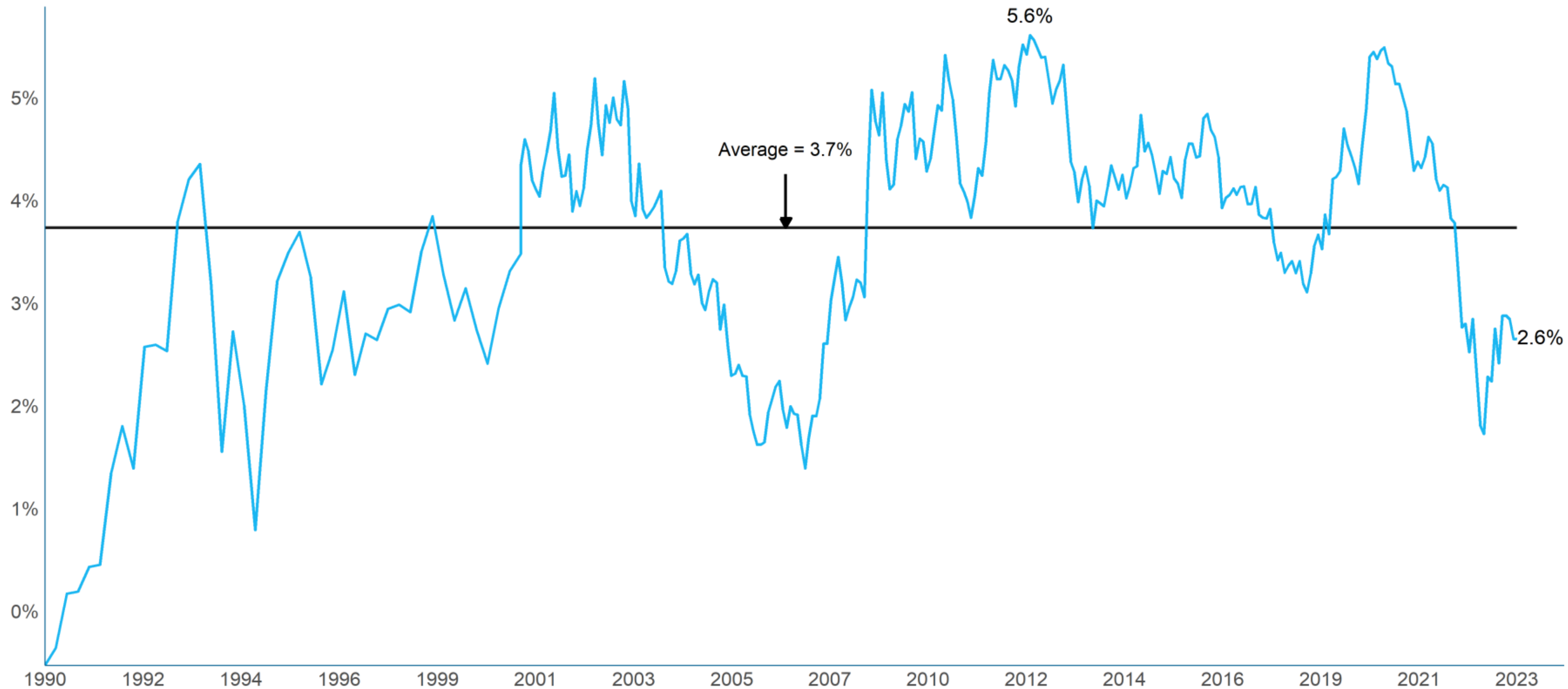
Private Equity Multiples[1]
(As of June 30, 2023)



→ 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: Preqin Median EBITDA Multiples Paid in All LBOs.

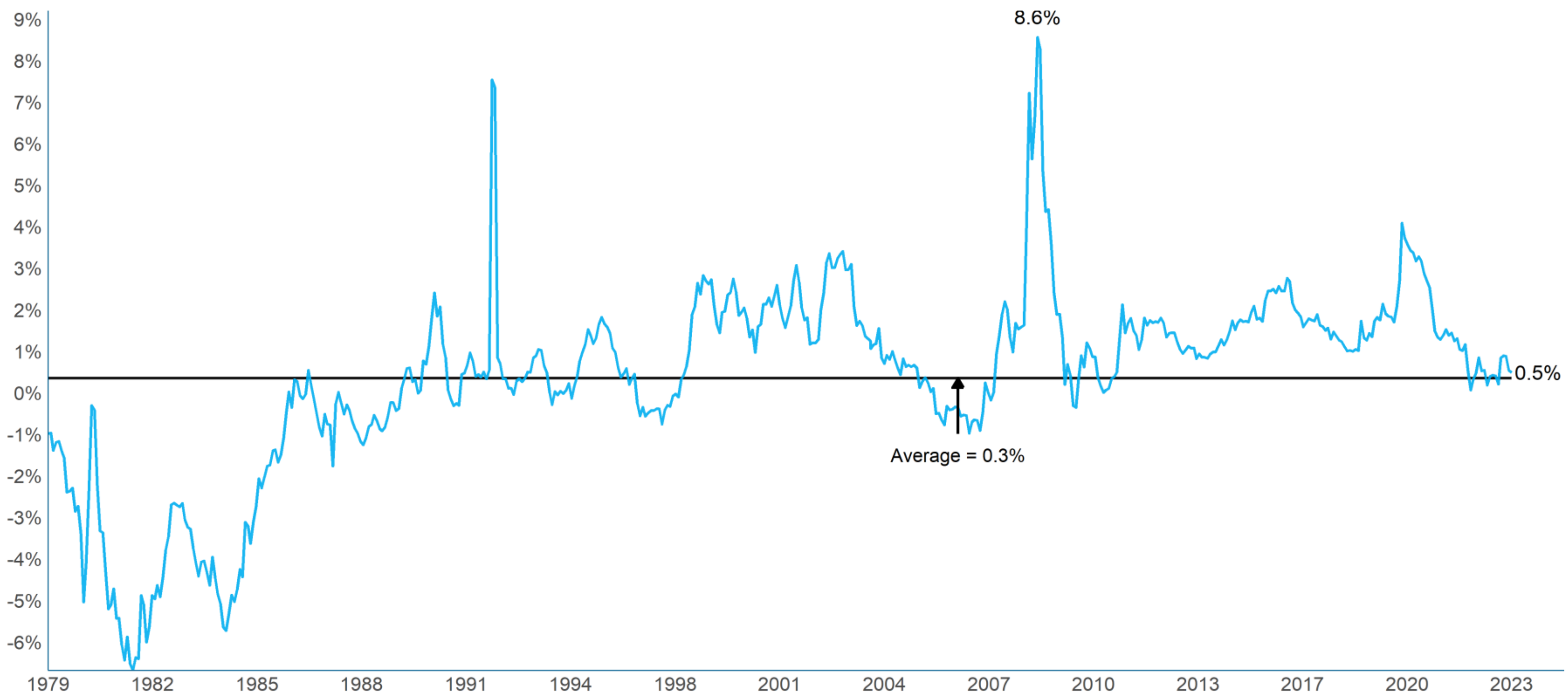
Core Real Estate Spread vs. Ten-Year Treasury[1]
(As of June 30, 2023)



→ 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.

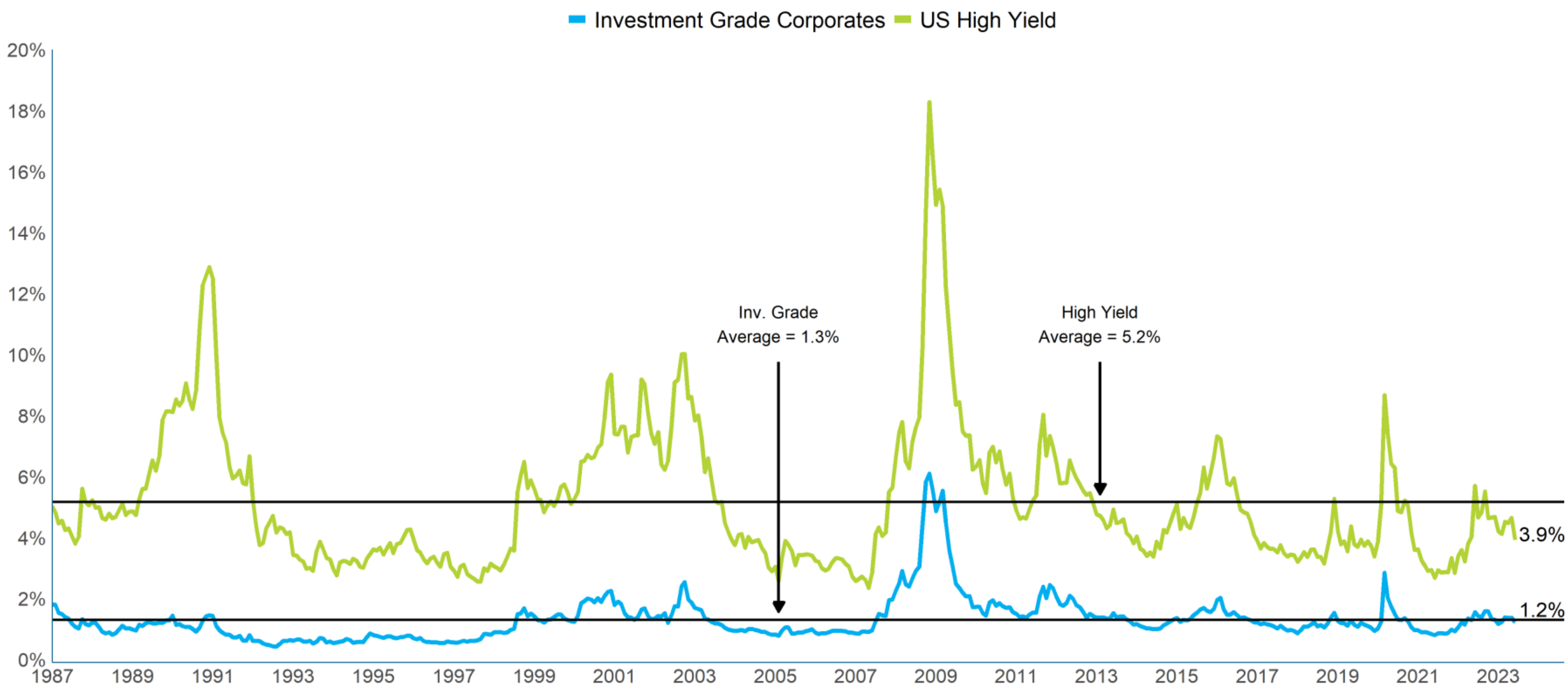
REITs Dividend Yield Spread vs. Ten-Year Treasury[1]
(As of June 30, 2023)



→ 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, 2023)



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

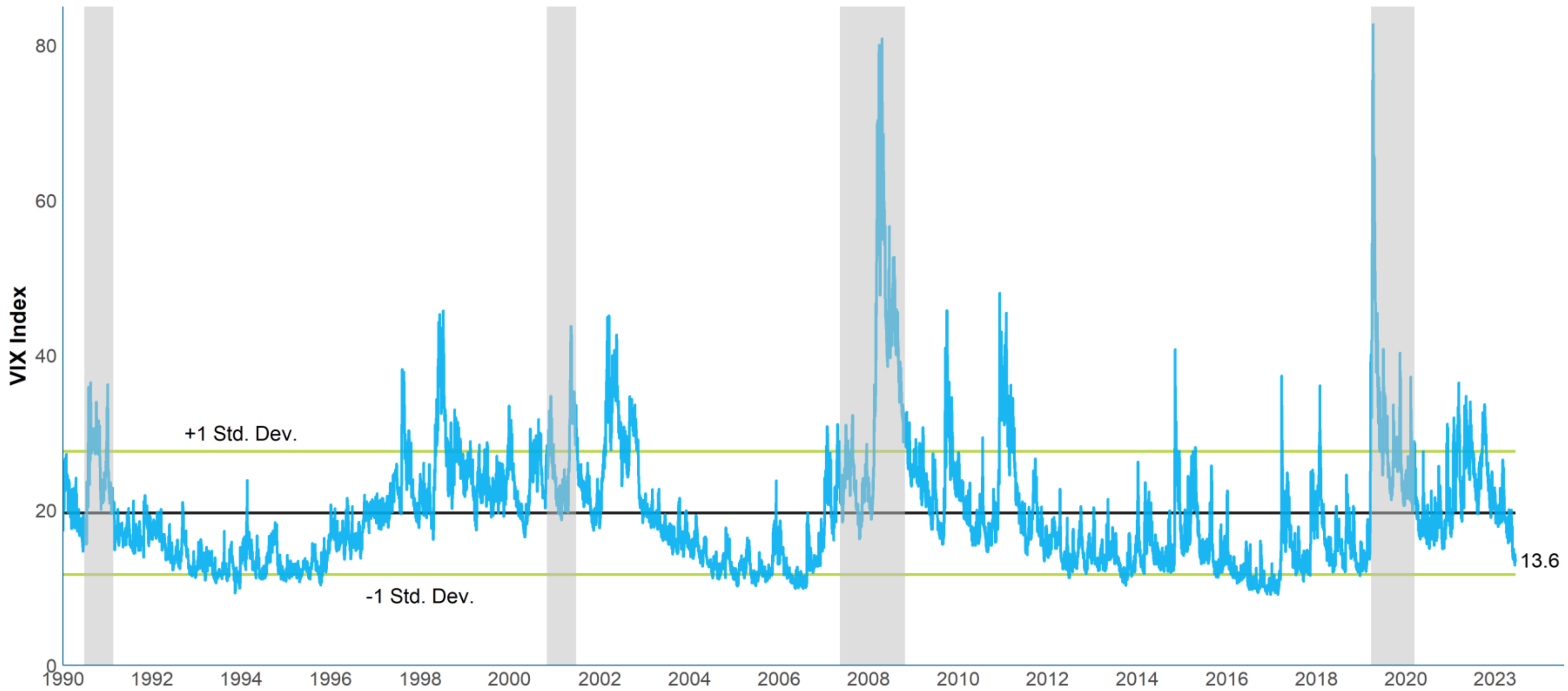
[1] Credit Spreads – Source: Bloomberg. High Yield is proxied by the Bloomberg High Yield Index and Investment Grade Corporates are proxied by the Bloomberg US Corporate Investment Grade Index. Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year US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

Emerging Market Debt Spreads[1]
(As of June 30, 2023)

→ 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.

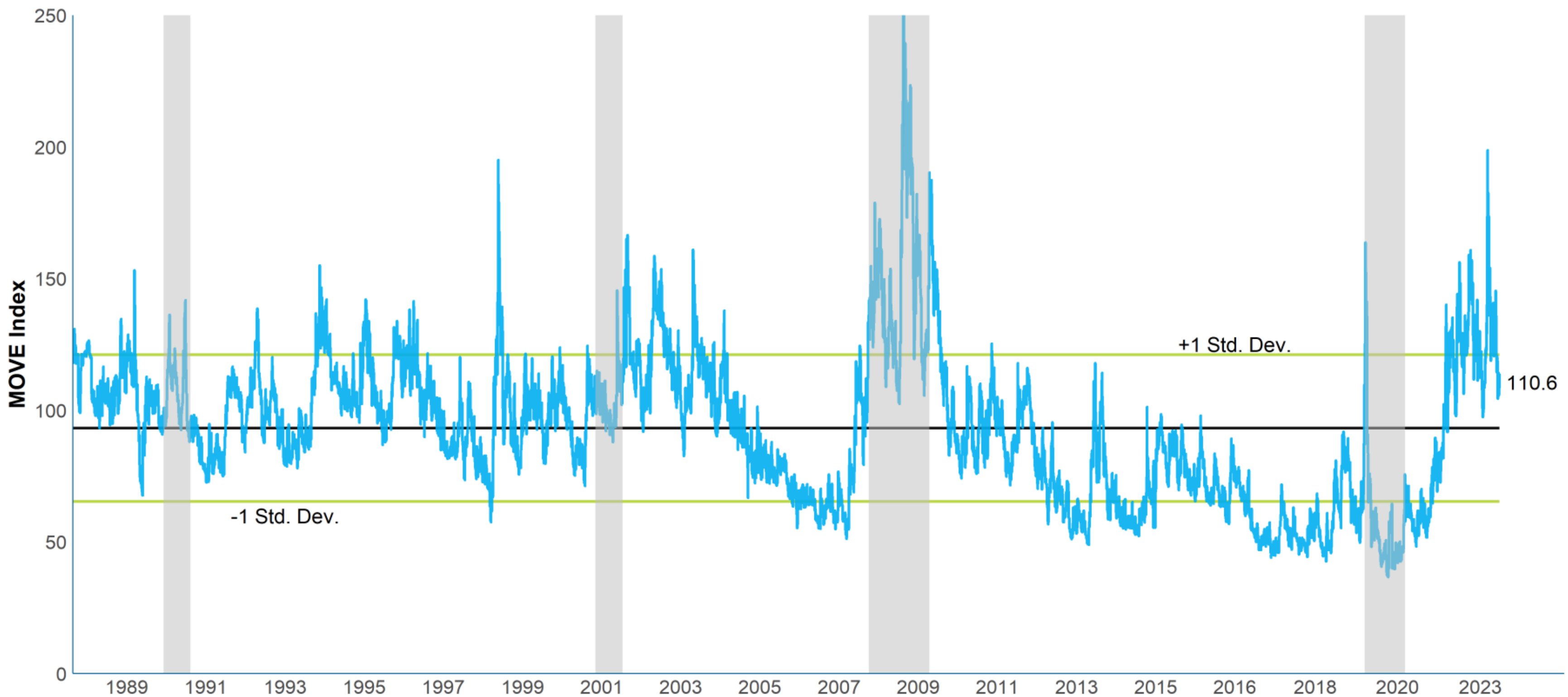
Equity Volatility[1]
(As of June 30, 2023)



→ 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.

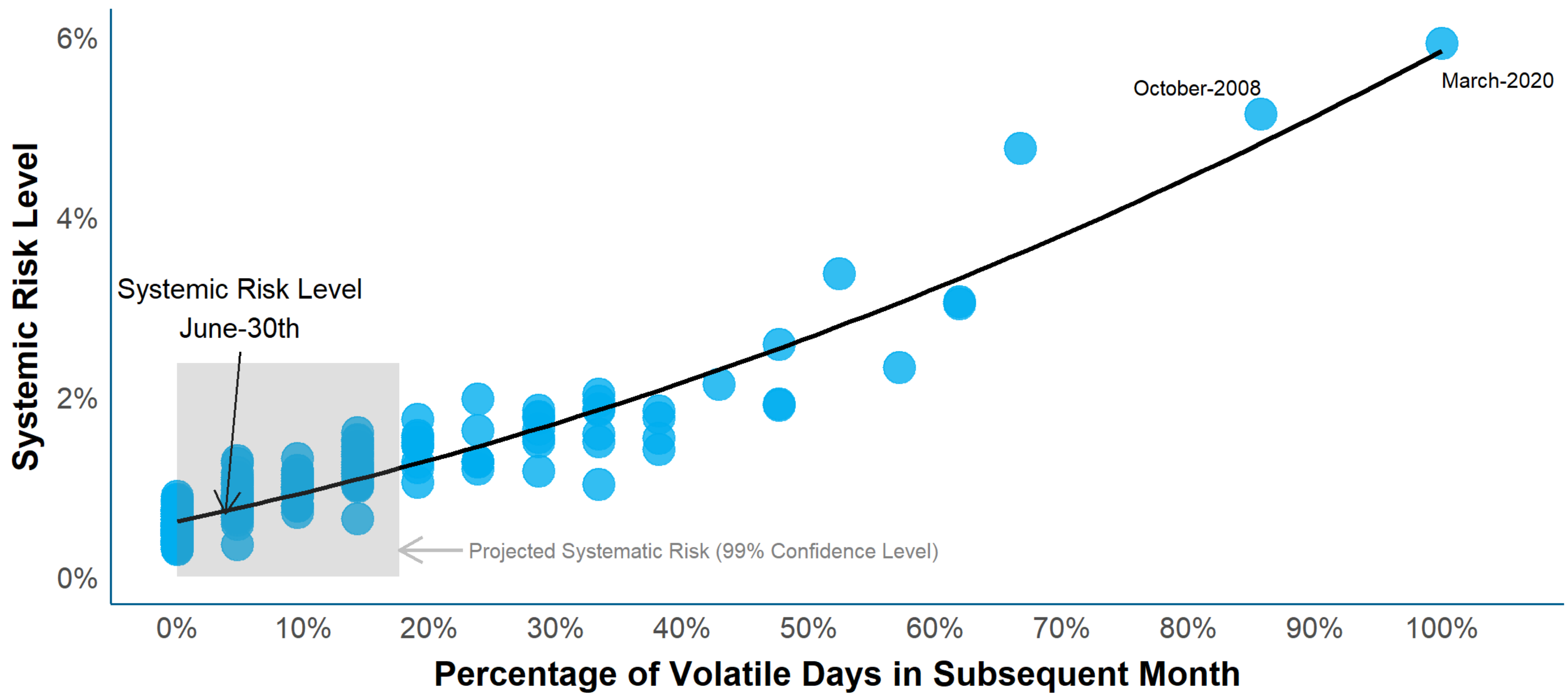
Fixed Income Volatility[1]
(As of June 30, 2023)



→ 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.

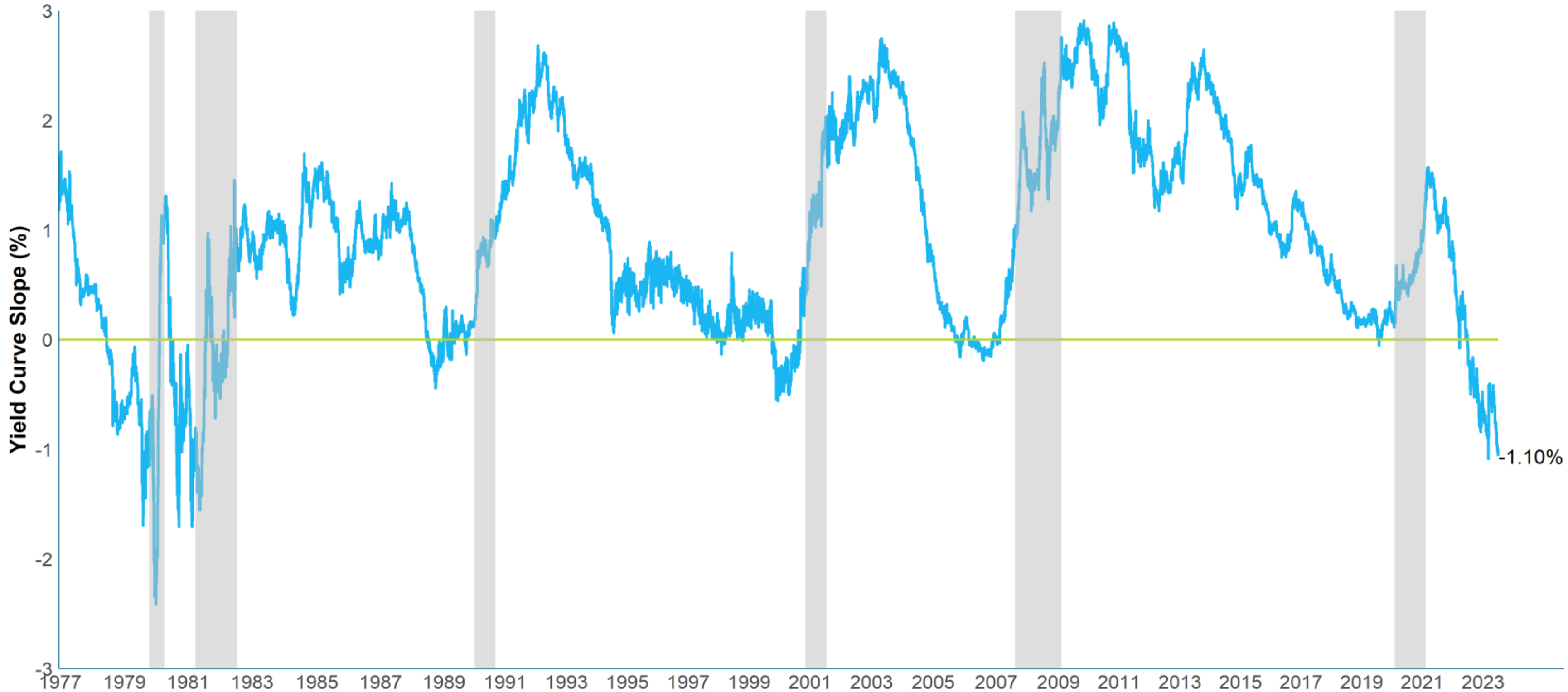
Systemic Risk and Volatile Market Days[1]
(As of June 30, 2023)



→ 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, 2023)



→ 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.

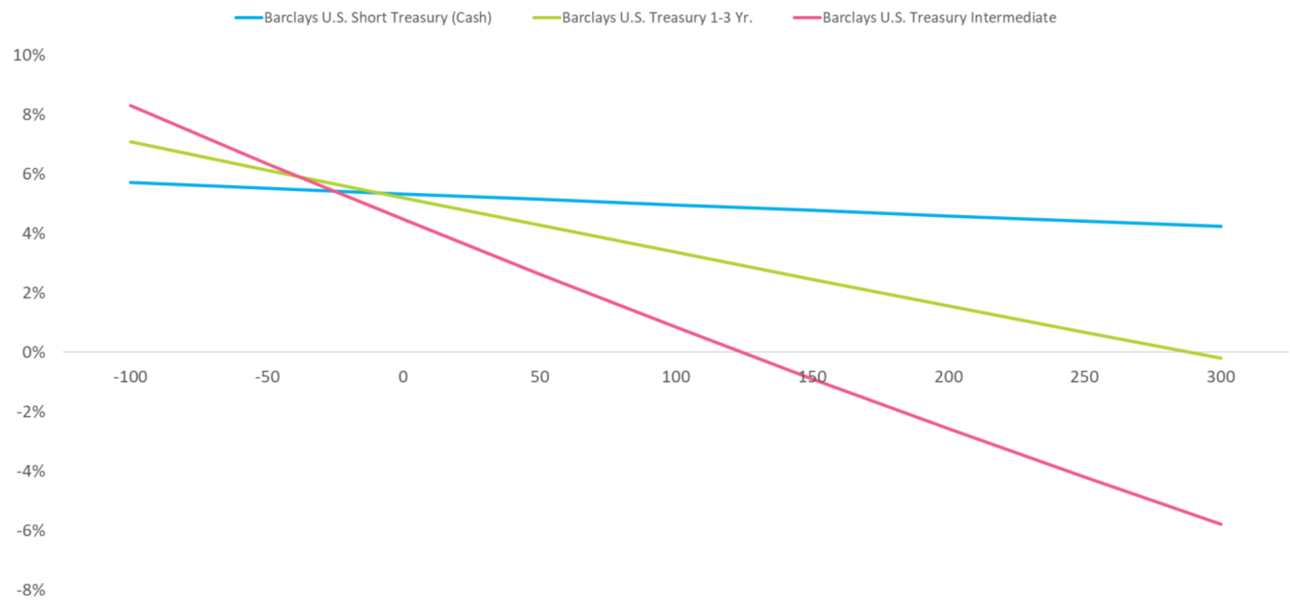
[1] Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

Ten-Year Breakeven Inflation[1]
(As of June 30, 2023)

→ 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).

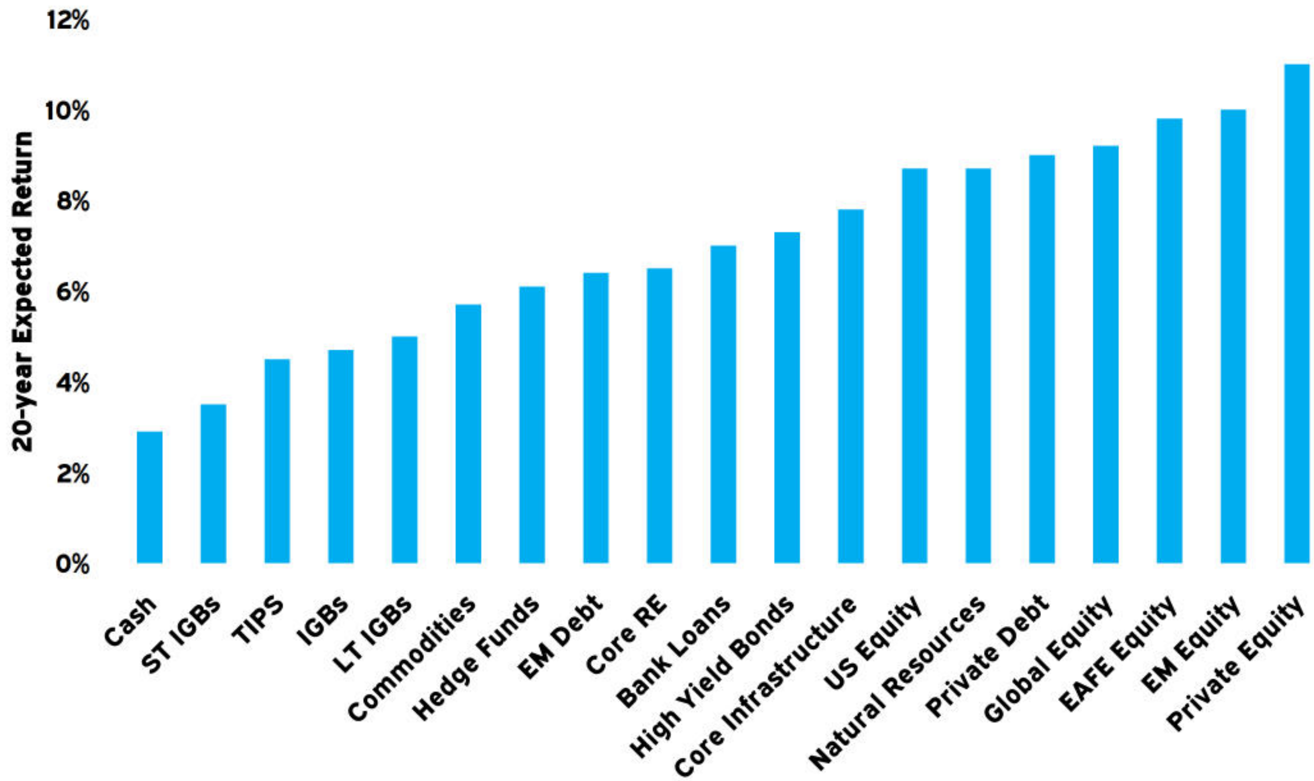
Total Return Given Changes in Interest Rates (bps)[1]
(As of June 30, 2023)



	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)	5.7%	5.5%	5.3%	5.1%	5.0%	4.8%	4.6%	4.4%	4.2%	0.37	5.33%
Barclays US Treasury 1-3 Yr.	7.1%	6.1%	5.2%	4.3%	3.4%	2.5%	1.6%	0.7%	-0.2%	1.86	5.20%
Barclays US Treasury Intermediate	8.3%	6.4%	4.5%	2.6%	0.8%	-0.9%	-2.6%	-4.2%	-5.8%	3.73	4.47%
Barclays US Treasury Long	21.6%	12.4%	4.0%	-3.6%	-10.3%	-16.2%	-21.3%	-25.6%	-29.0%	15.97	3.97%

[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 2023 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 March 31, 2023, 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 March 31, 2023, 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 March 31, 2023, 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:

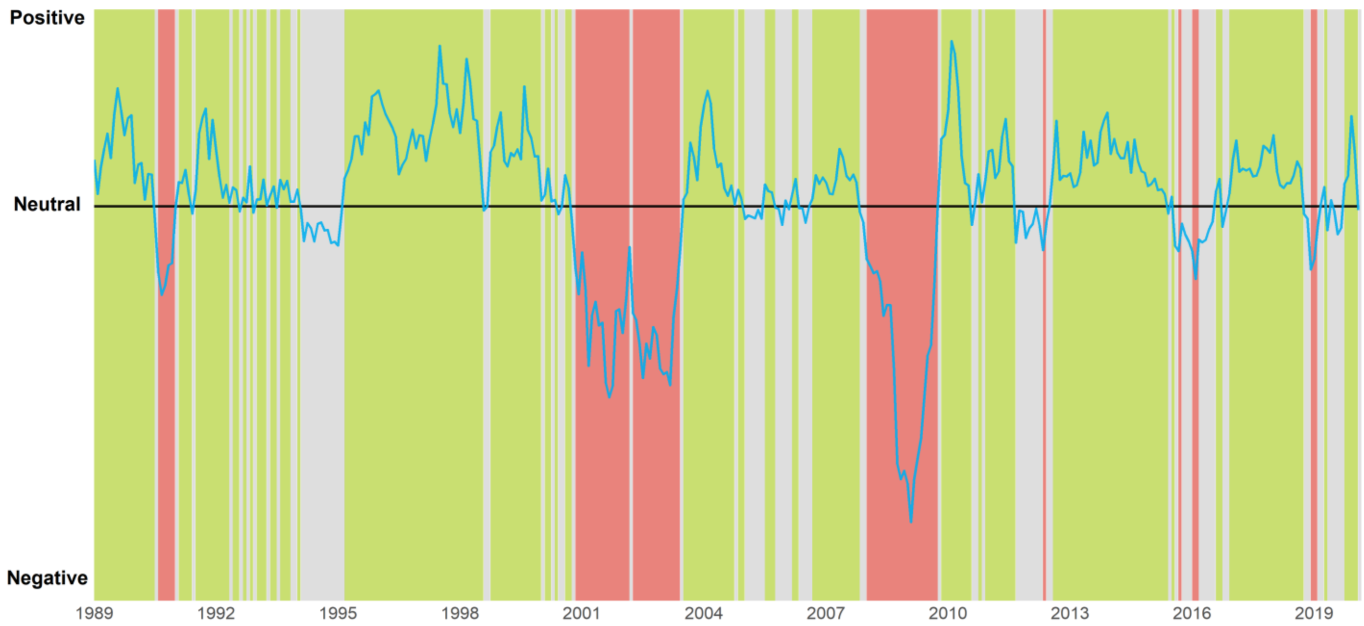
What is the Meketa Market Sentiment Indicator (MIG-MSI)?

→ 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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