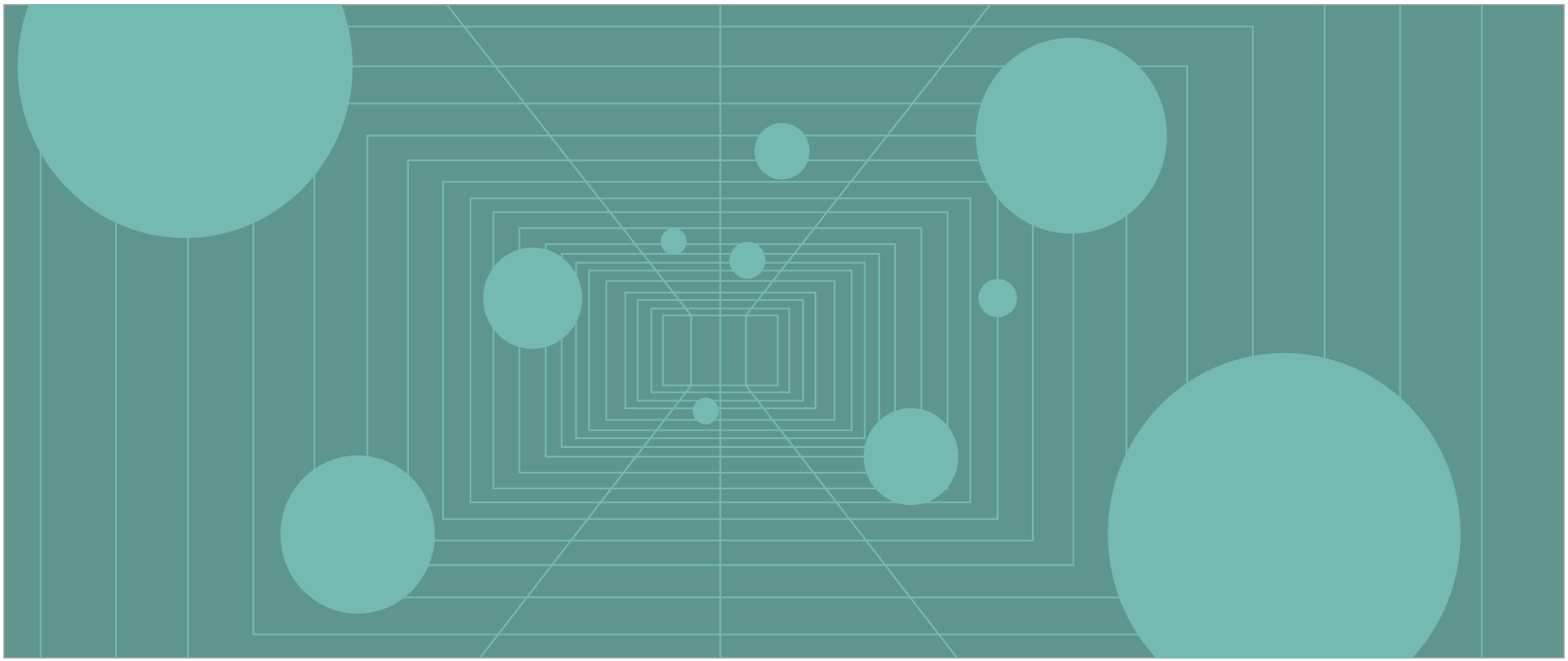
ASSET CLASS FACTS & FIGURES



CAMBRIDGE ASSOCIATES

FIRST QUARTER 2023

Contents

- Facts and Figures
  - Equities
  - Fixed Income
  - Private Equity/Venture Capital
  - Real Assets
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EQUITIES

CAMBRIDGE ASSOCIATES

Developed Markets Equities

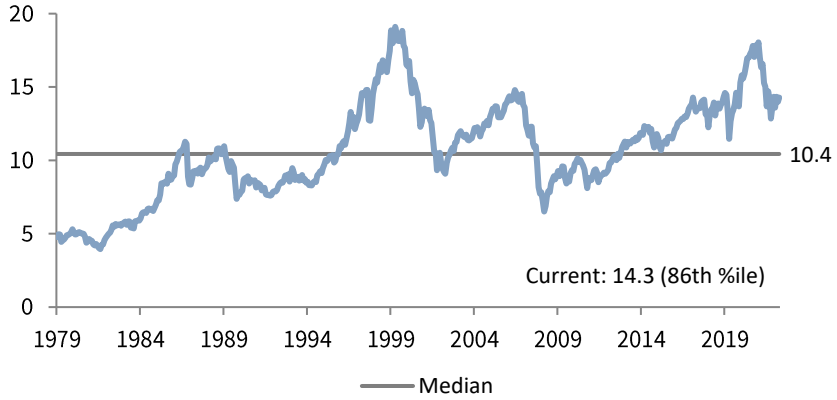
Facts & Figures First Quarter 2023

DM equities returned 7.4% in 1Q and -5.5% across the prior four quarters, in local currency terms. Poor equity performance last year and better-than-expected economic data in 1Q helped equities generate positive returns this quarter. The positive performance came even as two US banks failed and regulators were forced to intervene in multiple markets to shore up financial sector confidence.

- The bloc trades at 14.3x cyclically adjusted cash earnings, which ranks higher than 86% of historical data dating back to 1979. The high valuation level masks dispersion across major DM blocs, with the US trading at levels higher than DM ex US. In particular, the UK's large exposure to cyclical companies has left its equities trading low relative to history.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. This forecast is slightly higher than what analysts expected in December (2.1%), as analysts revised up growth expectations for China from 4.8% to 5.3%. Beyond China, growth expectations are highest for Japan (1.1%), followed by US (1.0%), euro area (0.5%), and the UK (-0.4%), among major markets.
- Corporate earnings are expected to grow by 0.5% in 2023, which is less than the 9.7% pace earnings are expected to have grown in 2022. Last year's growth came as companies dealt with difficult inflation pressures and slowing economic activity. Looking ahead to calendar year 2023, Japan and euro area earnings are expected to grow at levels above DM as a bloc, with the US and the UK below.
- Earnings growth for 2022 is expected to have come primarily from sales growth. Analysts expect sales to grow by 1.2% in 2023, which would be less than the long-term average (2%–3%). To meet earnings growth expectations, DM companies can see their elevated profit margins moderate slightly.
- The impact of monetary policy tightening is a key risk for equities. Major DM central banks increased policy rates by considerable amounts in 2022. While the pace of rate increases is expected to slow in 2023, monetary policy tends to impact economic activity with a lag. If activity falls more than expected, equity prices may have more room to fall.

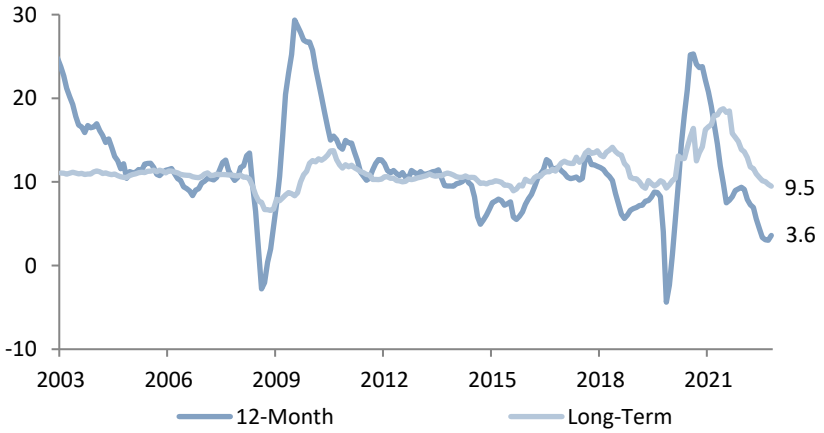
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS

Dec 31, 1979 – Mar 31, 2023



CORPORATE EARNINGS GROWTH EXPECTATIONS

Jun 30, 2003 – Mar 31, 2023 • Percent (%)



Sources: I/B/E/S, MSCI Inc., and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Note: Data are based on the MSCI World Index.

US Equities

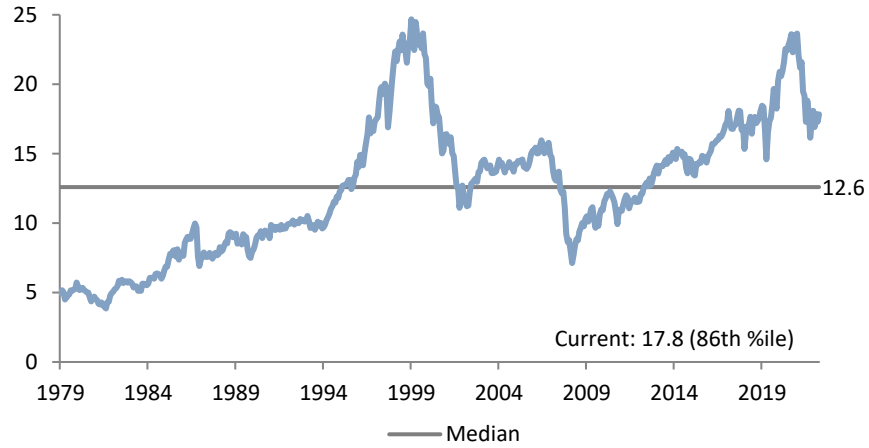
Facts & Figures First Quarter 2023

US equities built on the positive momentum of 4Q 2022 and returned 7.6% in 1Q 2023. US equities mostly led the major economic regions, lagging only Europe ex UK. Investors drove the market up on expectations that a recession would be mild, and rewarded sectors that were badly bruised last year, such as information technology. However, the collapse of two regional banks late in the quarter increased volatility and weighed heavily on the financials and real estate sectors, as fears of contagion and tightening financial conditions gripped the markets.

- US equities trade at 17.8x cyclically adjusted cash earnings, after reaching a recent low in September 2022 (16.1x). The current multiple ranks higher than 86% of historical data dating back to 1979. While the relative valuation with DM ex US (9.7x) is now at 1.8x, the gap has narrowed since it's peak of 2.2x in November 2021. Albeit the gap in equity valuations remains stark even after adjusting for sector differences.
- The US economy is expected to grow by 1.0% in 2023 and 2024, according to analysts surveyed by Bloomberg. These estimates are lower than the real GDP growth of 2.1% in 2022 and reflect expectations of an economic growth slowdown in 2023. The Fed's monetary policy response to inflation, amidst labor market strength and the recent banking turmoil, remains a focal point for influencing expectations.
- Fears of an economic slowdown have driven corporate earnings expectations down as well. Earnings are now expected to grow 0.3% in 2023, which compares to 3.6% expected at the start of the year. However, estimates for earnings growth improves to 11.6% in 2024 and ranks higher than expectations for most major global regions.
- The risk of a recession and the pace of monetary policy tightening are key risks for equities. Higher-than-expected inflation has prompted the Fed to revise rate expectations higher, which has put downward pressure on valuation multiples. According to its March projections, the Fed expects to increase its policy rate to a median of 5.1% for 2023 from the current rate of 4.8%, before cutting rates in 2024 to 4.3%.

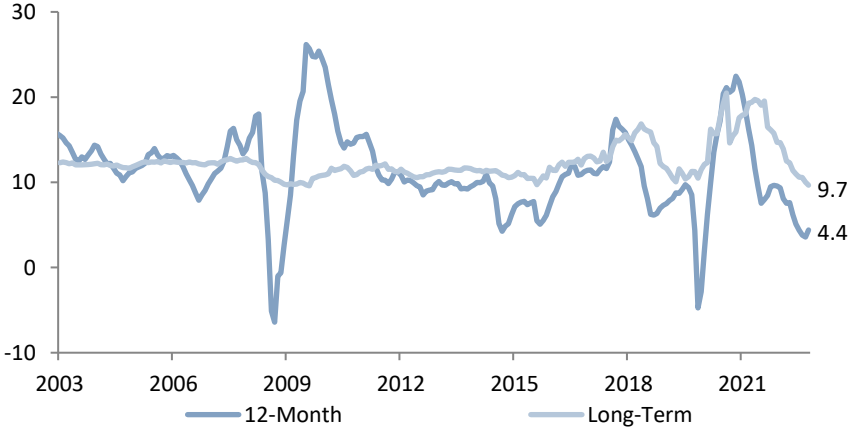
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS

Dec 31, 1979 – Mar 31, 2023



CORPORATE EARNINGS GROWTH EXPECTATIONS

Jun 30, 2003 – Mar 31, 2023 • Percent (%)



Sources: I/B/E/S, MSCI Inc., and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Note: Data are based on the MSCI US Index.

Developed Markets excluding US Equities

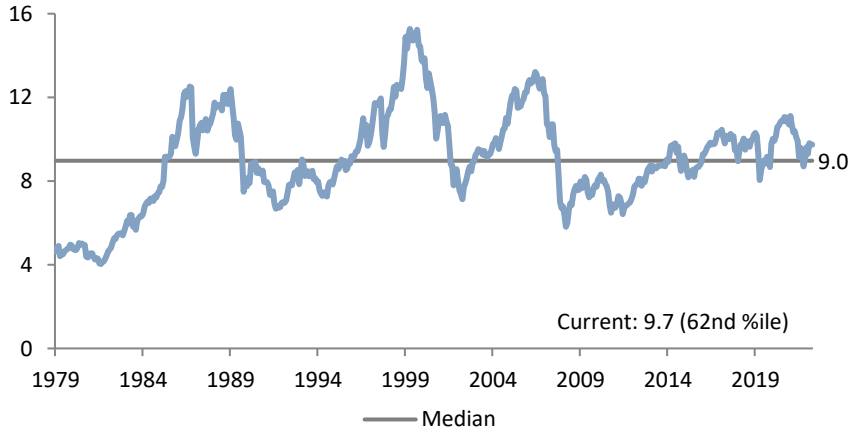
Facts & Figures First Quarter 2023

DM ex US equities returned 7.1% in 1Q 2023 in local currency terms and 8.0% in USD terms. Equities bottomed in September in local currency terms after struggling in the face of high inflation, monetary tightening, and the war in Ukraine. The rebound since then (16.3%) has been aided by signs of slowing inflation, moderating energy prices, and China's post-COVID reopening. EMU returns have been especially strong in the past two quarters, particularly in USD terms, as the energy crisis has subsided.

- The bloc trades at 9.7x cyclically adjusted cash earnings. This is in the 62nd percentile of historical data dating back to 1979, and a little above the long-term median of 9.0x. That valuation multiple remains well below the 17.8x CAPCE of US equities, albeit the gap has moderated substantially from the recent records reached in late 2021. A material valuation gap remains after adjusting for sectoral differences.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg. While this is down substantially from the 3.5% expected this time last year, it is also up three-tenths from the growth rate expected at year end. Moderating inflation, interest rates and energy prices, as well as China's reopening, have all contributed to this recent bounce. Of the major index components, consensus growth for 2023 is highest for Japan (1.1%), followed by the Eurozone (0.5%), while negative growth is still forecast in the UK (-0.4%).
- Analysts expect corporate earnings to grow by 2.3% on a 12-month forward EPS basis. While earnings growth was always likely to moderate after the post-COVID recovery, this would represent a large undershoot of its median long-term EPS growth rate. Within this bloc Switzerland stands out with expected EPS growth of 17.9%, followed by a large gap to Pacific ex Japan at 6.7%. Elsewhere, expected growth is meagre, with Japan at 4.0%, EMU at 3.3%, Canada at 0.9%, and the UK at -5.3%.
- The modest corporate earnings growth of 0.8% for 2023 is expected to be driven by sales growth (1.0%), while profit margins are expected to remain steady. At the end of 1Q, the DM ex US profit margin was 9.9%, just below its record high-level of 10.3% from some months earlier, according to IBES data. But this margin is below the same metric for the US (11.9%).

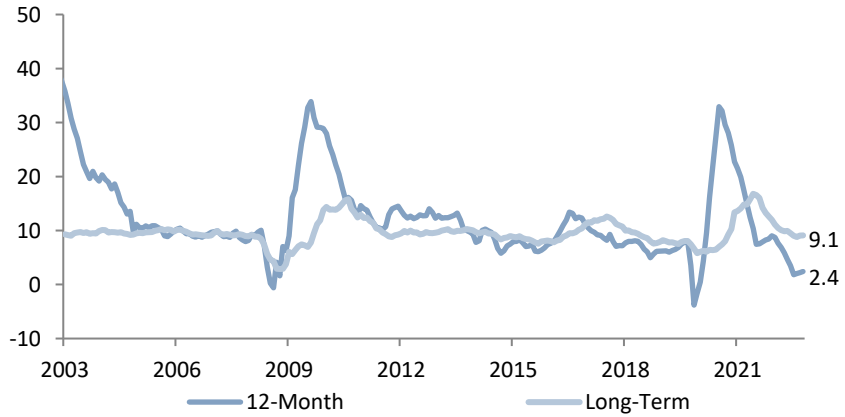
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS

Dec 31, 1979 – Mar 31, 2023



CORPORATE EARNINGS GROWTH EXPECTATIONS

Jun 30, 2003 – Mar 31, 2023 • Percent (%)



Sources: I/B/E/S, MSCI Inc., and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Note: Data are based on the MSCI World ex US Index.

C|A

UK Equities

Facts & Figures First Quarter 2023

UK equities returned 3.2% in 1Q 2023, lagging broader developed markets by 4.2 ppts in local currency terms, though the underperformance in USD terms was more muted at 1.6 ppts. On a trailing one-year horizon, the UK has outperformed DM by 11.1 ppts in LC terms and 6.2 ppts in USD terms. During 2022, outperformance was driven both by sectoral differences between the UK index and the broader DM index, and outright UK outperformance, however its value tilt has proved a headwind in the most recent quarter. The long-term earnings growth of the UK has lagged its peers and is expected to do so again in 2023.

- The UK's cyclically adjusted price-to–cash earnings (CAPCE) ratio rose modestly to 7.2, or the 16th percentile. The ratio of the UK's CAPCE to that of DM declined to 0.50, in the 5th percentile of observations. When adjusting for the substantial sectoral differences between the indexes, the relative CAPCE stands at 0.68. However, when the weaker expected earnings are considered, i.e., by looking at forward PEs, the ratio of sector-neutral forward PEs stands at 0.82. Overall, the valuation of UK equities remains depressed versus peers.

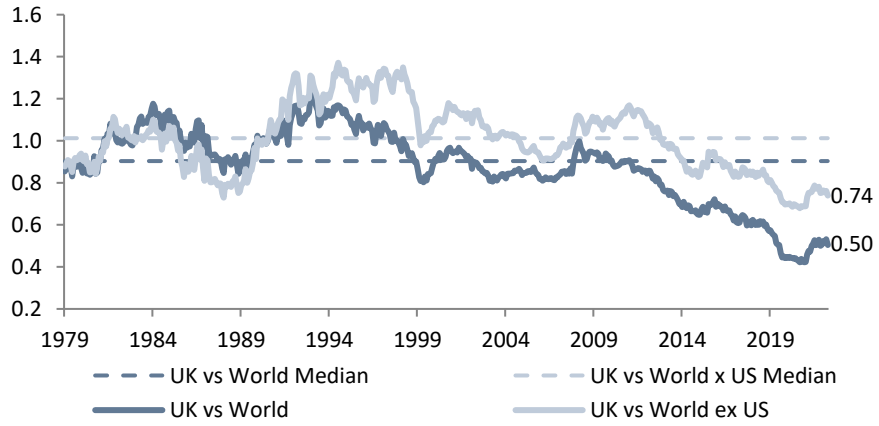
- In general, the UK index has an underweight to growth stocks and an overweight to value stocks. This has been a significant drag on relative performance in recent years, though it was a boon in recent quarters. Last quarter it proved a headwind once more; however, with the three top-performing sectors in DM equities during the period being sectors where the UK has a relative underweight. In general, these tilts may help the UK in periods of accelerating global growth, particularly when the former are partially driven by rising commodity prices.

- UK EPS are forecast to underperform broader DM by more than 8 ppts this year (-7.6% vs 0.5%). Sales growth is currently forecast to be modestly positive (2.5%) but more than offset by margin contraction as inflation persists. This earnings underperformance is also forecast to continue in 2024.

- As with EPS, UK GDP is expected to underperform most peers in 2023, and to experience a decline. The current consensus for real GDP in 2023 is -0.4% vs 2.4% for the world. Supply-side impacts from both the pandemic and Brexit are weighing on growth and contributing to inflationary pressures. Tighter monetary policy to deal with these pressures, and resultant deceleration in credit growth, in addition to tighter fiscal policy, also represent headwinds to UK growth.

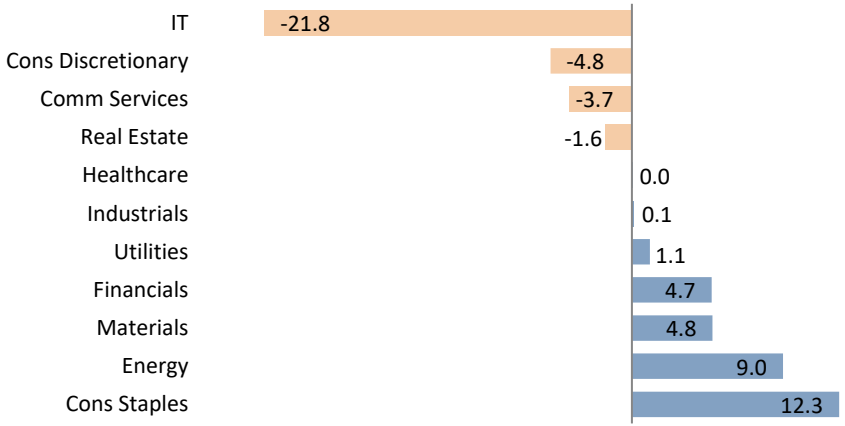
RELATIVE CAPCE: MSCI UK VS WORLD

Dec 31, 1979 – Mar 31, 2023



RELATIVE SECTOR WEIGHTS: UK MINUS WORLD

As of Mar 31, 2023 • Percentage Points



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

C|A

Europe ex UK Equities

Facts & Figures First Quarter 2023

Europe ex UK equities returned 10.3% in 1Q 2023 in local currency terms, outperforming the 7.4% return of DM equities. Since its September 2022 low, the region has returned 24.1% versus 14.3% for DM. The slide in the dollar saw a starker outperformance in USD terms, as Europe ex UK returned 36.6% vs 17.1% for broad DM equities over the same period. While the outperformance of value over growth was a major source of regional outperformance last year, the easing of the European energy crisis has been the major driver more recently. Looking forward, earnings growth is expected to slightly lead that of broad DM in 2023.

- The region's cyclically adjusted PE ratio expanded to 10.6 during the quarter, standing now at the 78th percentile of its history. Its CAPCE relative to DM rose slightly to 0.74, just below the long-term median level of 0.75. A large portion of this relative cheapness is due to the comparative richness of the US market, however. The region's CAPCE relative to that of DM ex US is 1.09, in the 85th percentile.

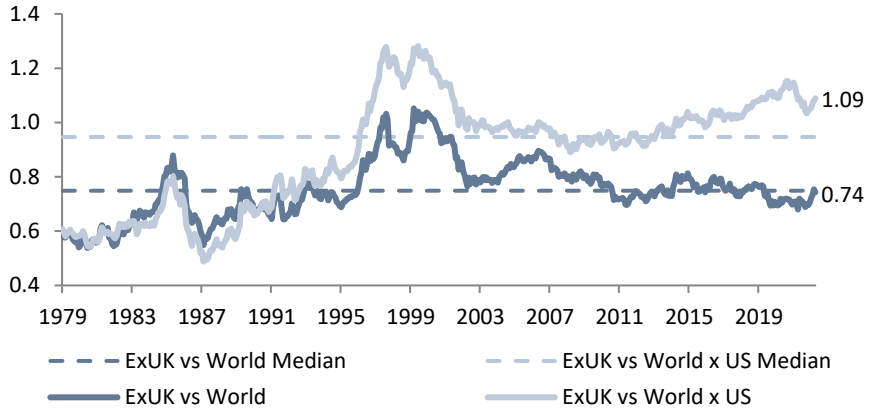
- The longer-term underperformance of the Europe ex UK region versus DM more broadly is down to a lower underlying profitability. The return on equity (ROE) for the region has been below that of broader DM for the last decade and the ratio of their ROEs stands at 0.86, albeit up from a recent low of 0.76 and only just below the long-term median. This is partly due to the region's lower exposures to some of the higher ROE sectors, notably tech. However, sectoral ROEs are lower in eight of the 11 GICS sectors, showing that it's a broader issue. Nevertheless, the region's ROE is slightly greater than that of DM ex US.

- Earnings growth in Europe ex UK is expected to be low but positive in 2023, at 2.8%. With modestly negative sales growth expected this year (-0.6%), this earnings growth is attributable to expectations of marginal profit margin expansion. EPS growth in the region is nevertheless expected to lead that of broader DM (0.5%).

- After being consistently revised down throughout 2022 due to the expected impacts of the war in Ukraine, consensus Eurozone GDP growth for 2023 has been revised up this year to 0.5%, from -0.1% as of year end. However, the positive economic surprises from moderating energy prices may be ending. Contracting credit growth and further monetary tightening from the ECB, in response to sticky core inflation, seem likely to be headwinds in the coming months.

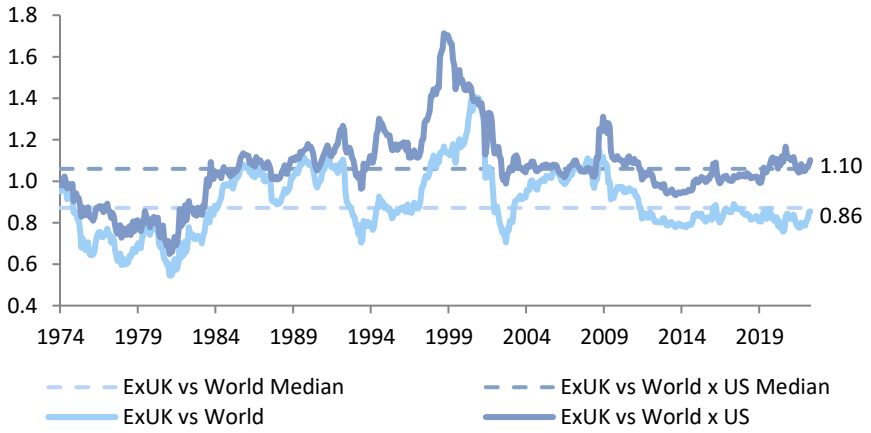
RELATIVE CAPCE: MSCI EUROPE EX UK VS WORLD AND WORLD EX US

Dec 31, 1979 – Mar 31, 2023



ROE: MSCI EUROPE EX UK VS WORLD AND WORLD EX US

Dec 31, 1974 – Mar 31, 2023 • Percent (%)



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Japanese Equities

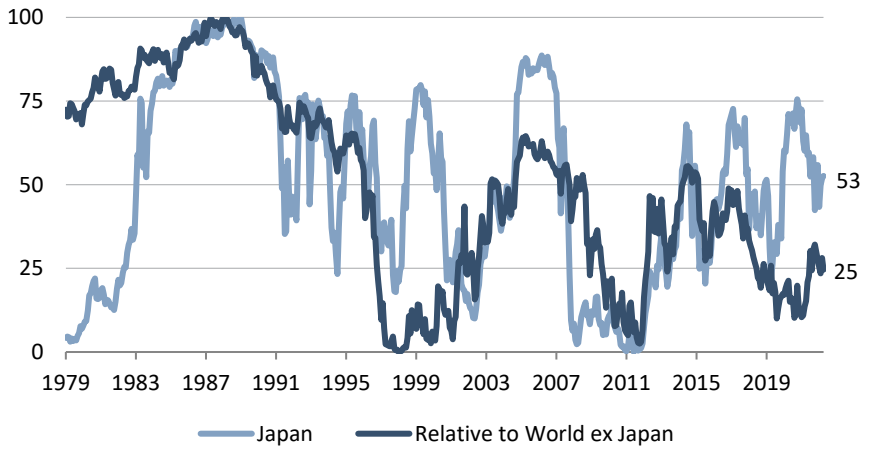
Facts & Figures First Quarter 2023

Japanese equities underperformed their developed markets peers in 1Q 2023. Valuations are near fair value in absolute terms but below historical median relative to other developed markets. Improving corporate earnings and a focus on shareholder returns should help to serve as tailwinds for the market.

- The MSCI Japan Index returned 7.1% and 6.2% in 1Q 2023 in local currency and USD terms, respectively, versus 7.4% and 7.7% for DM equities. Over 2022, Japanese equities (-4.5%) outperformed DM equities by 11.5 ppts in local currency terms and 1.5 ppts in USD terms, supported by accommodative monetary and fiscal policies, as well as a rebound in the yen. The market trades at 9.9x cyclically adjusted cash earnings, which ranks as the 53rd percentile of historical observations since 1979. Relative to other developed markets, Japanese equities are at the 25th percentile of historical observations.
- Analysts estimates of Japanese EPS growth for FY 2022 (ending March 2023) have been revised down to 6.4%. However, corporate earnings in Japan is still expected to hold up in FY 2023 and grow at 4.1%, versus 0.2% for other developed markets (FY 2023 ending December 2023).
- The ROE on Japanese equities currently stands at 8.2%, slightly below the historical median of 8.3%. Although Japan's ROE has historically been lower than that of its DM counterparts, an increased focus on corporate governance and shareholder returns in Japan may see this improve.
- As of end March 2023, the MSCI Japan Index trailing dividend yield was 2.5%, above the 1.7% historical median. Japanese companies retain significant cash balances and have increased shareholder payouts (dividends plus buybacks) in recent years. As a result of their strong balance sheets, dividend payouts have held up relatively well and may continue to serve as a tailwind for Japanese equities.

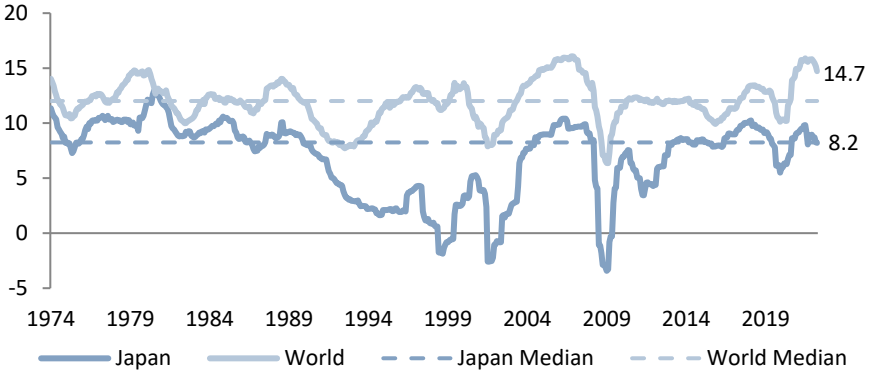
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS

Dec 31, 1979 – Mar 31, 2023 • Percentile (%)



ROE: MSCI JAPAN VS WORLD

Dec 31, 1974 – Mar 31, 2023 • Percent (%)



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

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Emerging Markets Equities

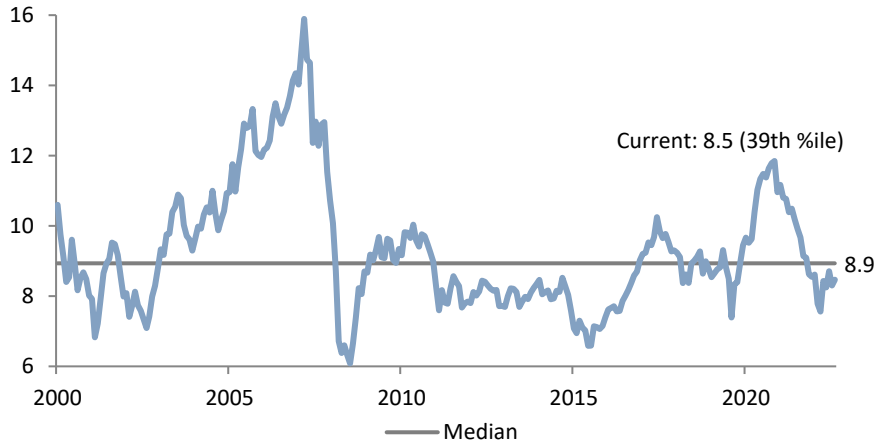
Facts & Figures First Quarter 2023

EM equities gained 4.0% in USD terms in 1Q, bringing TTM performance to -10.7%. EM has lagged DM in recent quarters amid US monetary tightening, USD appreciation, and slowing activity as the economic cycle enters the latter stages. Taiwan, China, and Korea, were the top contributors to return in 1Q, with India and Brazil the largest detractors.

- EM price momentum remains weak in both absolute terms and relative to DM peers. On the latter, EM has generally underperformed DM since 2010, a period that coincided with USD appreciation, highlighting that the USD outlook is key to the EM/DM performance cycle. A stronger USD and tightening US financial conditions have factored into recent EM equity underperformance.
- EM valuations contracted sharply after peaking in mid-2021—which coincided with the height of the Chinese tech crackdown—and remained undemanding at quarter-end. Valuations relative to DM are even lower and sit 11% below median levels (15th percentile).
- EM Asia (4.8%) outperformed in 1Q, driven by rebounding Chinese economic activity and a rally in technology stocks as global bond yields declined. The region faces continued pressure from slowing trade growth and an ongoing supply glut in the semiconductor sector. In addition, Asian central banks (ex China) have raised policy interest rates and drawn down FX reserves to contend with currency depreciation.
- Resource-heavy LatAm (3.9%) and EMEA (-1.1%) lagged in 1Q as energy and industrial metals prices declined. Still, these regions outperformed the broader index in 2022. Notably, LatAm advanced 8.9% on the year, due largely to Brazil, where economic activity exceeded expectations.
- Analysts continued downgrading their EM EPS growth outlook and now expect profits will contract 1.4% in 2023. This compares 9.5% growth expected just 12 months ago. DM EPS growth (albeit essentially flat) is forecast to top EM and has seen milder downward revisions. However, the earnings outlook stands in contrast to the economic outlook. Consensus expects EM GDP growth of 4.2% in 2023, a rate that would exceed DM growth by 3.4 ppts, according to Bloomberg. This would mark the second-widest growth margin in the past decade, suggesting EM EPS may have greater potential for upside surprises.

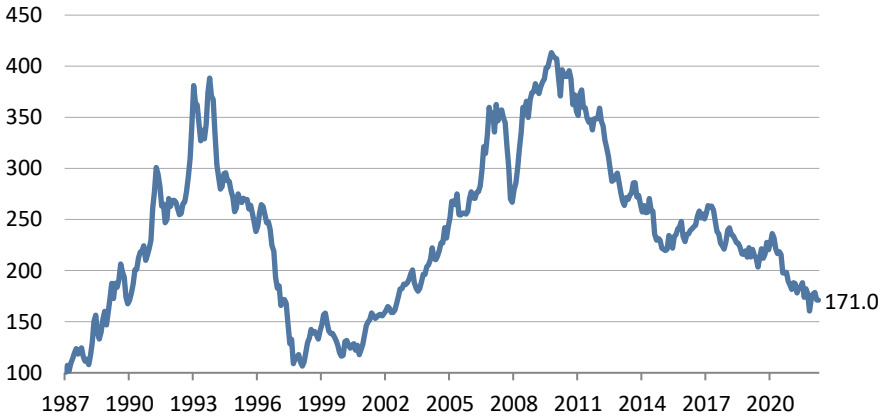
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS: MSCI EM

Aug 31, 2000 – Mar 31, 2023



EM/DM EQUITY RELATIVE CUMULATIVE WEALTH

Dec 31, 1987 – Mar 31, 2023 • US Dollars



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: EM CAPE based on five-year average real cash earnings. Total returns are gross of dividend taxes prior to January 2001 and net thereafter. EM and DM equities based on the MSCI Emerging Markets Index and MSCI World Index, respectively.

Asia ex Japan Equities

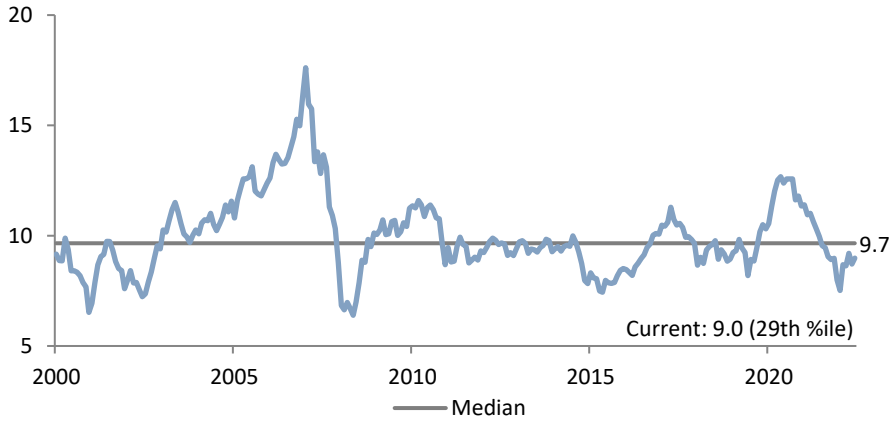
Facts & Figures First Quarter 2023

Asia ex Japan equities returned 4.3% in USD terms in 1Q 2023, with performance mixed across countries and sectors. Over 2022, Asia ex Japan equities returned -19.7% in USD terms. As of March end, the index remains down close to 30% from its February 2021 peak.

- Taiwan (14.8%) and South Korea (9.6%) equities outperformed the broader MSCI AC Asia ex Japan Index in 1Q 2023 due to their overweight to the technology sector that rallied amid a decline in global bond yields. Chinese equities also continued to rally and returned 4.7%. These three countries make up approximately two-thirds of the index.
- Asia ex Japan valuations have risen from their October 2022 lows. The index's CAPCE metric trades at 9.0x, which is the 29th percentile of historical observations. Relative to DM equities, Asia ex Japan trades at the 3rd percentile of historical observations.
- There is wide dispersion among Asia ex Japan country valuations. Most countries currently trade at a discount to historical medians valuations, with the P/B ratio in Malaysia near its lowest levels on record. Taiwan and India are exceptions where valuations are elevated.
- Asia ex Japan equities had been under pressure in 2022 as inflation and a strong USD pushed many Asia ex Japan central banks to tighten monetary policy and draw down FX reserves to support currency values. Higher commodity prices had also weighed on Asia ex Japan as net importers of raw materials. Meanwhile, weakening global growth and trade volume growth, remains a key risk.
- However, the lifting of China's zero-COVID policy in November 2022 and new support measures for China's property sector may continue to boost the region's outlook. GDP growth expectations for 2023 remain stronger at 5.1%, while latest analysts' expectations of forward 12M EPS growth for Asia ex Japan is at 7.9%, which still tops global counterparts.

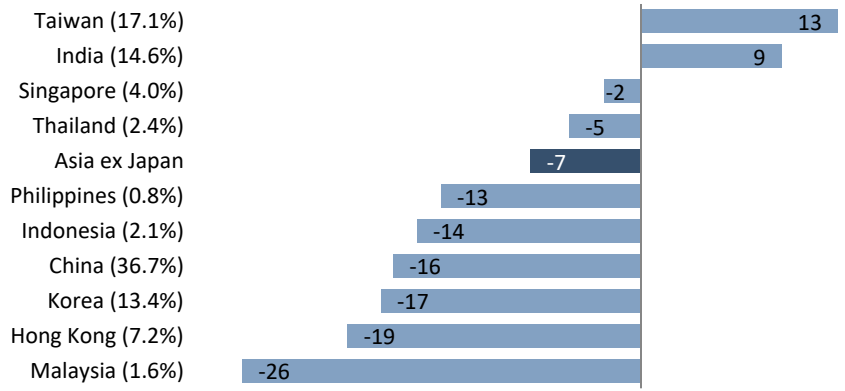
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS: MSCI ALL COUNTRY ASIA EX JAPAN

Oct 31, 2000 – Mar 31, 2023



COUNTRY P/B % DEV FROM HIST MEDIAN: MSCI AC ASIA EX JAPAN

As of March 31, 2023 • Index Weight in Parentheses



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: CAPCE based on five-year average real cash earnings. Totals may not sum to 100% due to rounding.

Chinese Equities

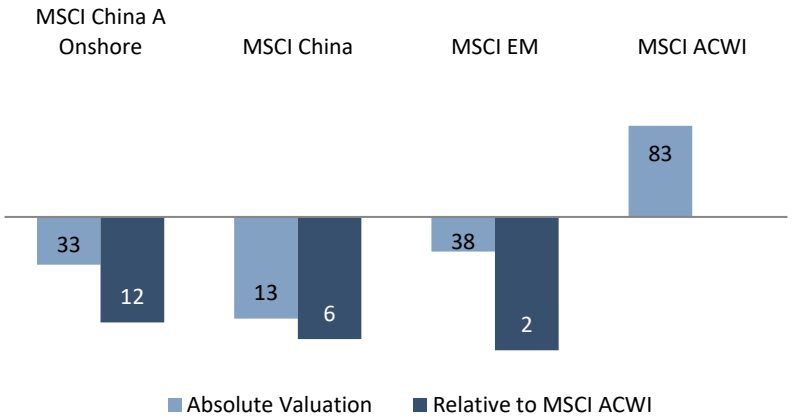
Facts & Figures First Quarter 2023

Chinese equities were volatile in 2022, driven by China's zero-COVID policy and stress in the property sector. While the market has rallied from its October 2022 trough, valuations for Chinese equities remain depressed.

- Chinese A-shares, as measured by the MSCI China A Onshore Index, gained 4.9% in 1Q 2023 in local currency terms, while the MSCI China Index, which consists mostly of offshore Chinese equities, was up 5.1%. Over 2022, A-shares and the MSCI China Index returned -20.6% and -20.7%, respectively, in local currency terms versus -16.0% for global equities.
- Chinese equities bottomed in October 2022 but subsequently rebounded sharply as the government pivoted from its zero-COVID policy and announced new support measures for the real estate sector. Consumer and business confidence are starting to recover, and continued monetary and fiscal policy easing should help to support economic recovery and Chinese corporate earnings growth.
- Valuations for the MSCI China A Onshore Index, which is tilted towards cyclical sectors, are below historical median both in absolute terms and relative to global equities. Valuations for MSCI China—which is overweight the communication services (20%) and consumer discretionary (29%) sectors that have been the hardest hit by 2021's tech reforms—are lower and at the 13th percentile of historical observations in absolute terms and 6th relative to global equities.
- Chinese equities consist of mainland China-listed A-shares, Hong Kong-listed Chinese companies, and US-listed Chinese companies. The MSCI China Index, which is the China equity universe of the MSCI EM Index, is tilted towards Hong Kong-listed (76%) and US-listed (8%) securities, with just a 16% weight to A-Shares.
- Active China-dedicated managers have historically demonstrated an ability to add value over the A-share index, given the retail-driven nature of the market. However, the A-share market is underweight the technology sector, with most Chinese tech companies listed offshore in Hong Kong or the US. Managers with flexible "All China" mandates can offer exposure across the China equity universe.

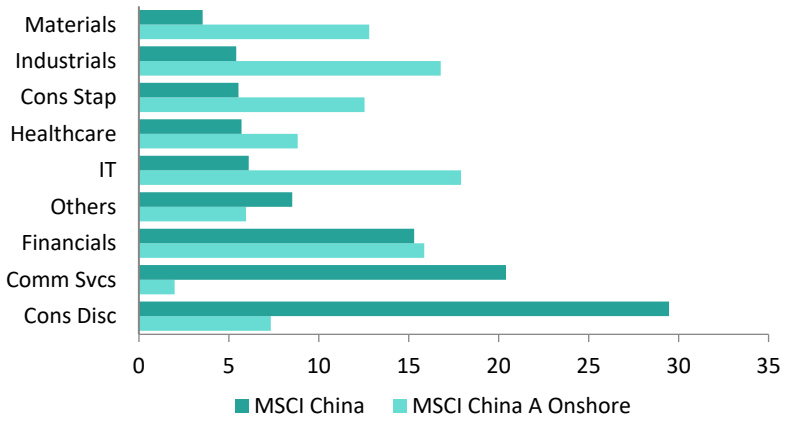
ROE-ADJUSTED P/E: PERCENTILE

Mar 31, 2005 – Mar 31, 2023



SECTOR WEIGHTS

As of Mar 31, 2023 • Percent (%)



Sources: FactSet Research Systems, MSCI Inc., and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: Sector weight for "Others" consists of Real Estate, Utilities, and Energy. Totals may not sum to 100% due to rounding.

C|A

US Small-Cap Equities

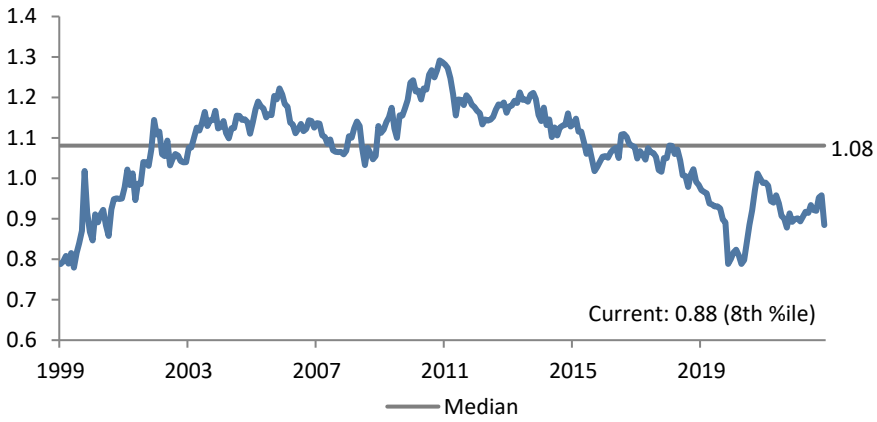
Facts & Figures First Quarter 2023

US small-cap equities gained 3.8% in 1Q, underperforming their mid- and large-cap peers by 382 bps. Banking sector turmoil in March disproportionately impacted small-cap equities, which have a higher weight to the financials sector. Over the past 12 months, small caps and large caps have experienced similar performance, both down around 9%.

- Despite starting the quarter on a high note, small cap stocks had a challenging month in March due to the failures of Silicon Valley Bank and Signature Bank, which sparked concerns that rippled across the banking industry. In March alone, the MSCI US Small Cap Index lost 4.3%, as investors flocked to the relative safety of larger cap stocks.
- Relative valuations between small caps and mid- to large-cap peers now appear more discounted, in the bottom decile of historical observations. Still, measures of relative profitability look reasonable today. The trailing 12-month return on equity of the MSCI US Small Cap Index now stands at 8.9%, compared to a 18.4% figure for the MSCI US Index. This ratio—roughly 2x—is in line with the historical median over the past 20 years.
- The US small-cap segment is overweight cyclical sectors and underweight technology compared to the mid/large cap universe. These dynamics helped explain the underperformance of small caps in 1Q, as information technology (20.9%) and communication services (19.8%) were the best-performing sectors in the broad IMI index, which includes large, mid, and small caps. Financials were the worst-performing sector, down 5.5%.
- Small caps have recently enjoyed robust earnings growth. Over the past five years, MSCI US Small Cap Index earnings have grown at a 17% annualized rate, compared with a 10% rate for the MSCI US Index. Forward earnings estimates are relatively optimistic, with analysts now expecting an 8% earnings increase for small caps in CY 2023.

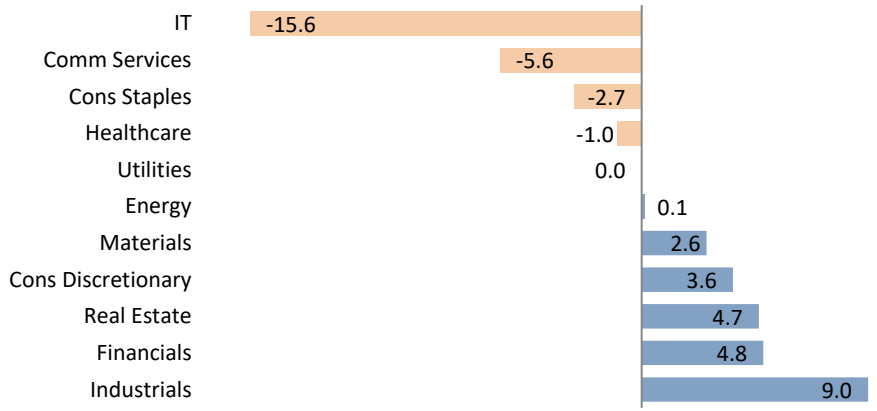
RELATIVE 5-YR CAPCE: MSCI US SC VS US LC/MC

May 31, 1999 – Mar 31, 2023



RELATIVE SECTOR WEIGHTS: US SC MINUS US LC/MC

As of Mar 31, 2023 • Percentage Points



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Note: CAPCE ratios based on five-year average inflation-adjusted earnings.

Developed ex US Small-Cap Equities

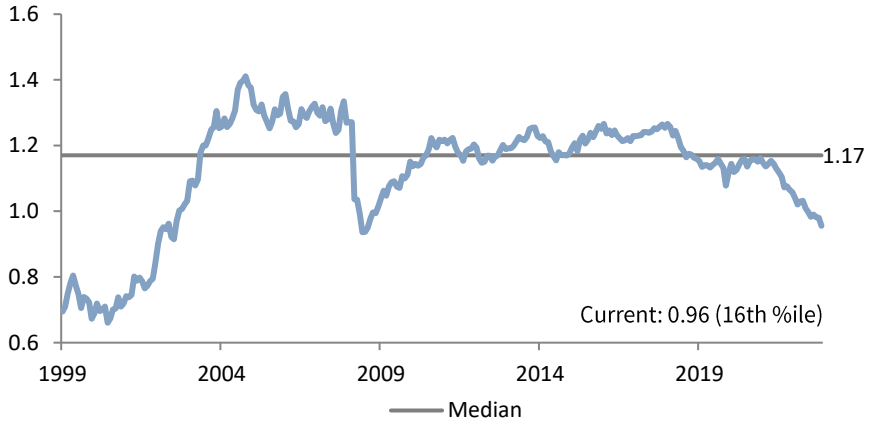
Facts & Figures First Quarter 2023

Developed ex US small caps advanced 4.6% in local currency terms in 1Q, trailing their mid- to large-cap peers by 254 bps. Over the past 12 months, small caps have lagged mid- to large-caps by 644 bps.

- Equities were broadly higher in 1Q, but banking sector turmoil in March weighed more heavily on the small-cap stock universe. Despite being underweight in the small-cap index relative to the large index, financial stocks in the small-cap index fared far worse than their large cap counterparts for the quarter. Moreover, real estate, which was the worst-performing sector for the quarter, holds a much larger position in the small-cap index.
- Developed ex US small-cap valuations ticked higher in 1Q. As of March 31, developed ex US small-cap valuations were trading at a 9.1x cyclically adjusted price-to–cash earnings (CAPCE) ratio, in the 29th percentile of historical observations. On a relative basis, small-cap valuations are in the 16th percentile versus their large-/mid-cap counterparts.
- From a relative sector exposure standpoint, the developed ex US small-cap segment is overweight cyclicals—particularly real estate and industrials—vis-à-vis its large-/mid-cap counterpart, though this is partially offset by a large underweight to financials. However, the defensive and higher-quality consumer staples and healthcare sectors are meaningfully underrepresented in the small-cap universe.
- Superior long-term earnings growth has helped developed ex US small caps outperform their large-/mid-cap counterparts over time. Over the last 15 years, world ex US small caps compounded real cash earnings per share grew by 1.8% per annum, while real EPS for large-/mid-caps has fallen.
- The developed ex US small-cap universe is arguably less efficient than the larger-cap space. Therefore, the former may provide more opportunities for active managers to add value over time.

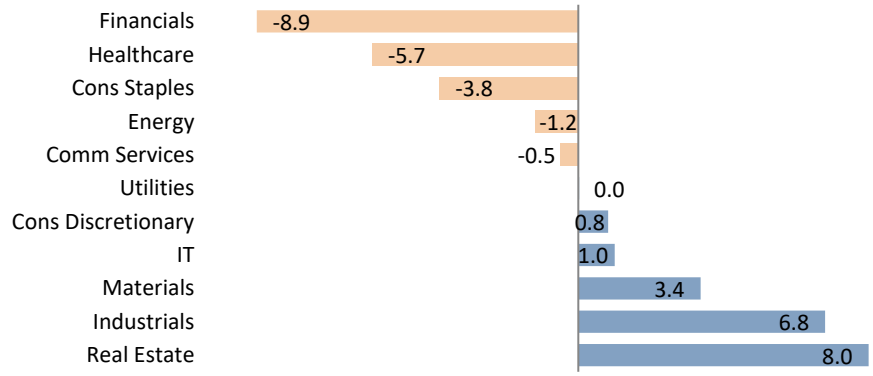
RELATIVE 5-YR CAPCE: MSCI WORLD EX US SC VS LC/MC

May 31, 1999 – Mar 31, 2023



RELATIVE SECTOR WEIGHTS: MSCI WORLD EX US SC MINUS WORLD EX US LC/MC

As of Mar 31, 2023 • Percentage Points



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Note: CAPCE ratios based on five-year average inflation-adjusted cash earnings.

US Growth and Value Equities

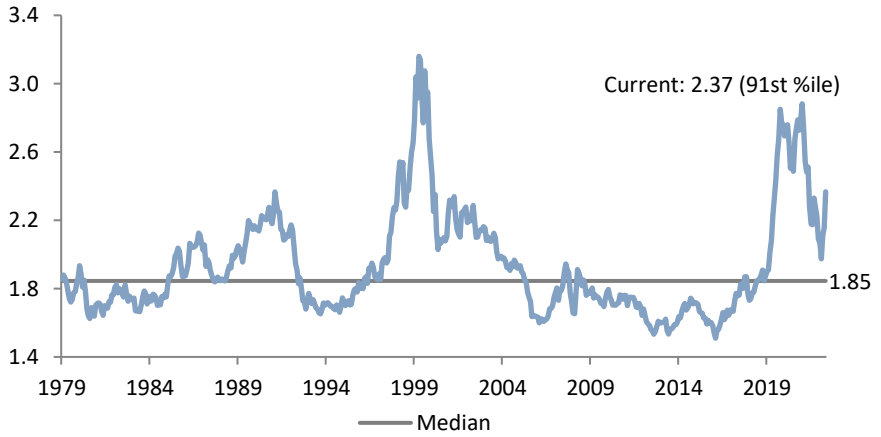
Facts & Figures First Quarter 2023

US growth stocks surged 17.3% in 1Q, trouncing US value stocks (-1.2%) by nearly 19 ppts. The sharp performance reversal comes after value stocks posted a strong year for value stocks. Indeed, even after growth's relative rebound in 1Q, growth has still lagged value by nearly 6 ppts over the past 12 months.

- After a miserable year for growth stocks in 2022, during which the MSCI World Growth Index declined 32.1%, they returned to favor in 1Q 2023. The style tends to have an inverse relationship with interest rate movements. Indeed, rates moved lower during the quarter; banking-sector turbulence fueled a flight to safety amid broader banking turmoil in March.
- Based on the cyclically adjusted price-to–cash earnings (CAPCE) ratio, the MSCI US Growth Index trades at 2.4 times the valuation of the MSCI US Value Index. That relative ratio is in the 91st percentile of historical observations. Growth is also more elevated than value on an absolute basis. It currently sits in the 90th percentile versus its respective history since 1979, compared to 74th percentile for value.
- Growth stocks have traditionally generated higher return on equity (ROE) than value counterparts. Today's wide ROE spread is partly driven by differences in sector exposures—technology and financials most prominently—and helps to explain the current valuation disparity between the growth and value indexes.
- Technology stocks have largely driven the US market's profitability, growth, and price performance over the past decade. Today the IT sector plus just two other stocks (Amazon and Alphabet) make up nearly 60% of the growth index. In comparison, IT is just 12% of the value index. However, the value index has a much higher weighting to the financials sector, which could see an increase in profitability if rates rise and the slope of the yield curve steepens.

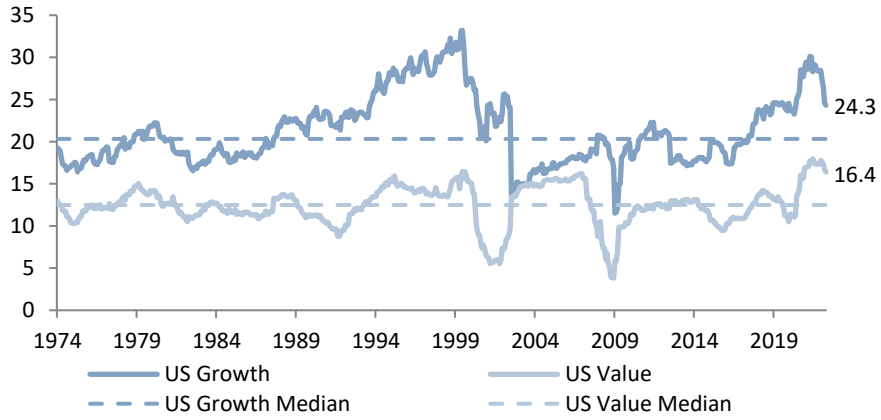
RELATIVE 5-YR CAPCE: MSCI US GROWTH VS US VALUE

Nov 30, 1979 – Mar 31, 2023



ROE: MSCI US GROWTH VS US VALUE

Dec 31, 1974 – Mar 31, 2023 • Percent (%)



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Developed Markets Equity Factors

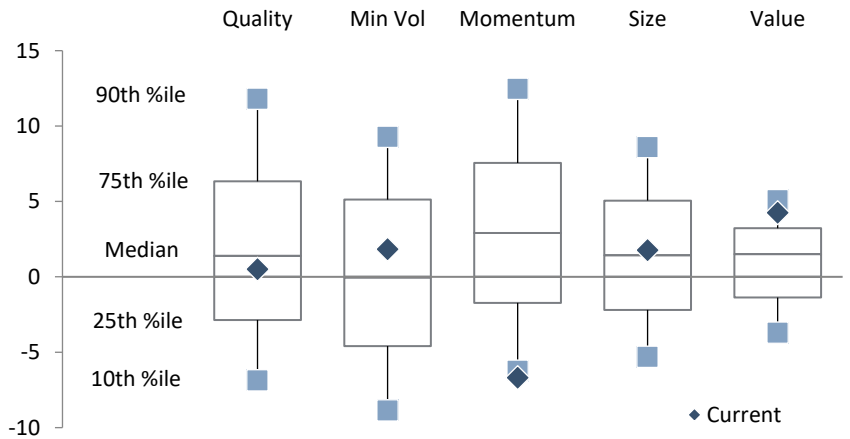
Facts & Figures First Quarter 2023

Quality (10.3%) was the only major factor that bested the MSCI World index in the first quarter. Size (5.6%), value (4.6%), and minimum volatility (2.0%) all lagged broader equities, while momentum (-1.5%) posted a negative return and suffered the widest underperformance.

- After declining the most among major factors in 2022, quality bounced back in 1Q as the information technology sector—which is heavily weighted in the quality index—posted a 21% gain. Central banks continued hiking rates, but in many cases at a slower pace, and banking-sector turbulence later in the quarter fueled a flight to safety that sent government bond yields lower. Technology, which tends to have a higher implied equity duration than other sectors, makes up more than 30% of the MSCI World Quality Index.
- Value stumbled in the latter part of the quarter, due largely to its relatively large exposure to the financials sector. Banking stress weighed heavily on the financial sector, which was down 8.4% in March alone—the worst performance among sectors for that month.
- Valuations crept higher across all factors in first quarter. Minimum volatility and quality command the richest valuations. Momentum trades at the lowest valuations relative to its history, having plunged from the lofty valuations it was commanding in recent years.
- The P/B ratio tends to have the strongest relationship to subsequent five-year returns across factors, but the strength of the relationship varies by factor. For instance, the relationship between starting valuation and subsequent returns is weak for the momentum factor, which overweights recent outperformers and has an exceptionally high turnover ratio (108% as of March).
- Because the excess returns across several strategies have low or negative correlations with each other, combining these factors can add a diversification benefit. For example, value and momentum had strongly negative correlations over the trailing five-year period, suggesting that certain combinations of factors may work together to smooth out the overall pattern of portfolio outperformance over time.
- Quality, minimum volatility, momentum, size, and value are five factors primarily cited in academic research. These factors represent market premiums that have all shown superior risk/return characteristics compared to broad-market benchmarks.

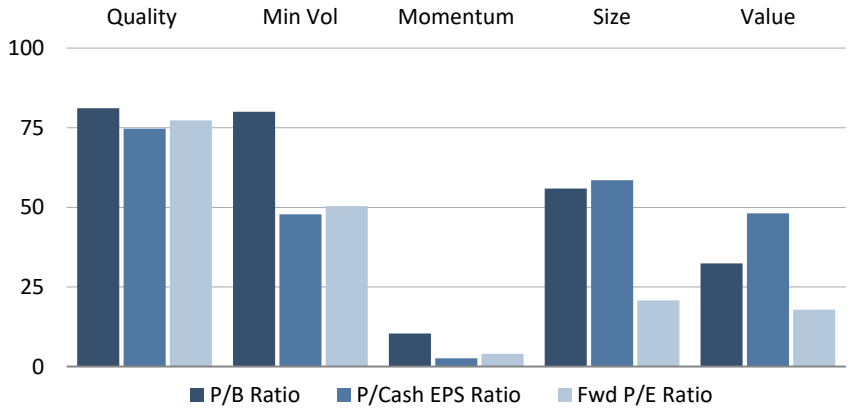
FACTOR RETURNS IN EXCESS OF DEVELOPED MARKETS EQUITIES

As of Mar 31, 2023 • Rolling 12M • Percent (%)



CURRENT VALUATION PERCENTILE RANKING BY FACTOR

As of Mar 31, 2023



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Hedge Funds

Facts & Figures First Quarter 2023

Fundamentally oriented long/short equity and event-driven strategies advanced in volatile but positive global equity and bond markets in 1Q, while March's bond repricing caught CTAs off-guard.

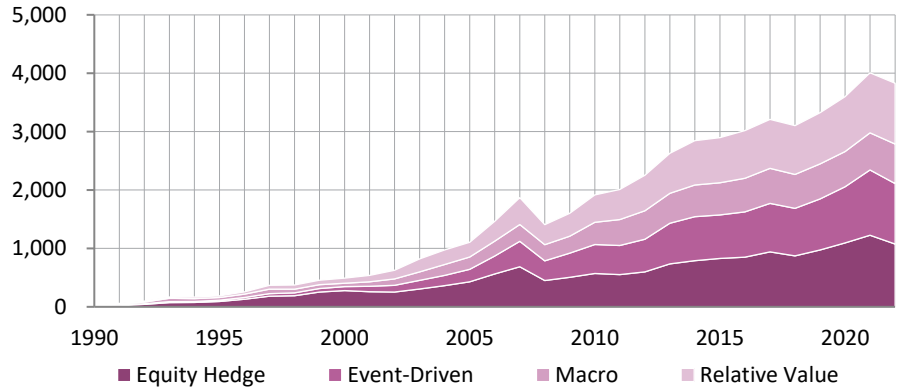
- Macro hedge funds finished the quarter in negative territory with the HFRI Macro (Total) Index down 3.0%. Systematic macro managers, particularly CTAs, were caught wrong-footed by a huge repricing in the bond market precipitated by the Fed's rescue measures implemented in response to the regional banking turmoil. Discretionary managers were less impacted as some had gradually reduced their short-duration bets seeing that the terminal rate was in view. Relative value hedge funds gained 1.4% as proxied by the HFRI Relative Value (Total) Index; volatility in the market caused dislocations along fixed income yield curves, creating opportunities for RV managers that specialize in sovereign fixed income.

- Long/short equity funds posted another strong quarter with the HFRI Equity Hedge (Total) Index gaining 3.4%. Funds with meaningful exposure to growth-oriented sectors—such as information technology, communication services, and consumer discretionary—which all generated robust, double-digit returns and posted strong results, while value managers lagged as the Russell 1000® Value Index underperformed its growth counterpart by more than 1,300 bps. Long/short equity managers emerged largely unscathed by March's mayhem with many benefiting from short exposure to the banking sector. Managers remain constructive on the stock-picking environment as performance dispersion has created an opportunity for alpha generation on both sides of the portfolio.

- The HFRI Event-Driven (Total) Index ended the quarter up 1.4%, underperforming global equity and bond indexes as global bank runs and manic markets made for tricky sledding. Event-driven managers are optimistic about the opportunity set in merger arbitrage and credit. Merger arbitrage, which has historically performed better in higher rate environments, stands to benefit from the widest spreads since the GFC due to rising rates and heightened regulatory scrutiny. Meanwhile, cracks are emerging in credit; although most see traditional distressed as a 2024 event, managers envision a range of opportunities including mispriced performing credit, as well as strategic financings and out-of-court restructurings.

HFRI HISTORICAL ASSET GROWTH BREAKOUT

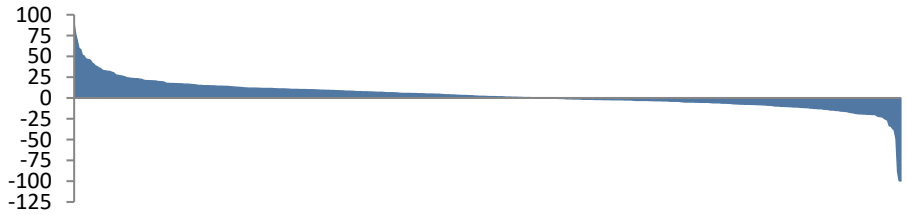
1990–2022 (Dec) • US$B



EQUITY DISPERSION: TOTAL RETURNS FOR THE S&P 500 CONSTITUENTS

As of March 31, 2023

Trailing 3-Month Returns (%)



Trailing 12-Month Returns (%)

Sources: Hedge Fund Research, Inc., FactSet Research Systems, and Standard & Poor's.

Note: 2022 HFRI data are as of December 31.

FIXED INCOME

CAMBRIDGE ASSOCIATES

US Bonds

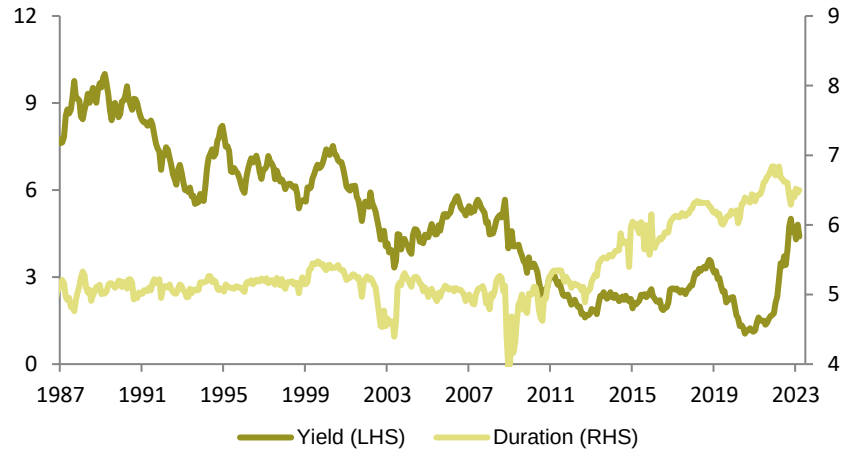
Facts & Figures First Quarter 2023

Core US bonds recovered somewhat in 1Q after posting their worst ever annual performance in 2022. The Fed continues to hike its target Fed Funds rate, but the curve is deeply inverted, mitigating the impact of hikes on longer-duration bonds.

- The Bloomberg US Aggregate Bond Index returned 3.0% in 1Q, recovering somewhat after a -13.0% return in 2022, its worst full-year performance on record. Despite ongoing elevated inflationary pressures, longer-term rates are falling as the market moves to price in the impact of slowing economic growth.
- The Fed has hiked its target rate 475 bps since the start of 2022 and could hike further given Core CPE, at 4.6%, remains over 2x its target. Still, the market thinks the Fed may be forced to cut rates to offset slowing growth by late 2022 and longer-term rates are falling.
- Either way, the Fed is shrinking its balance sheet, and this could push rates higher, though recent bank turmoil may slow the pace and it will take a long time to materially dent the remaining $8.7T of bond holdings.
- The Bloomberg US Aggregate Bond Index yield of 4.4% fell in 1Q but remains almost 2x its ten-year average. Higher yields should improve the ability of traditional 70/30 or 60/40 stock/bond portfolios to cushion equity market volatility and meet investors' spending needs.
- The Bloomberg Aggregate Index has a high-quality asset mix—around 70% of the index carries an AAA rating, and most of this is either a direct or indirect obligation of the federal government. Just 13% of the index consists of corporate bonds carrying a rating of BBB or below.
- The 2022 fixed income sell-off was driven more by rising base (Treasury) rates than fears over weakening higher quality credit fundamentals. The relatively high duration of the index (over 6 years) left it poorly positioned for an unexpected spike in benchmark rates.
- Credit spreads rose slightly in 1Q. The option-adjusted spread on investment-grade corporate bonds (around 24% of the Bloomberg US Aggregate Bond Index) is now 138 bps, up from 130 bps at the end of 4Q.

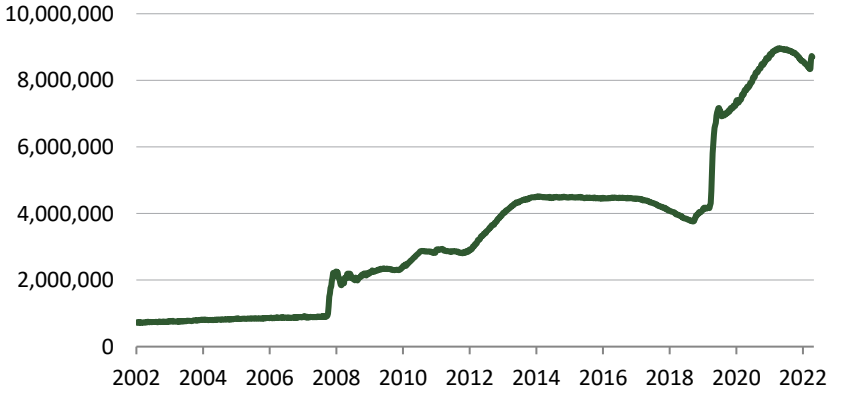
YIELD VS DURATION: BBG US AGGREGATE BOND INDEX

Jan 31, 1987 – Mar 31, 2023



FED BALANCE SHEET TOTAL ASSETS

Dec 18, 2002 – March 31, 2023 • US$M



Sources: Bloomberg Index Services Limited, Federal Reserve Bank of St. Louis, and Thomson Reuters Datastream.

Notes: Fed balance sheet assets are weekly and not seasonally adjusted. Total assets are less eliminations from consolidation.

US Treasuries

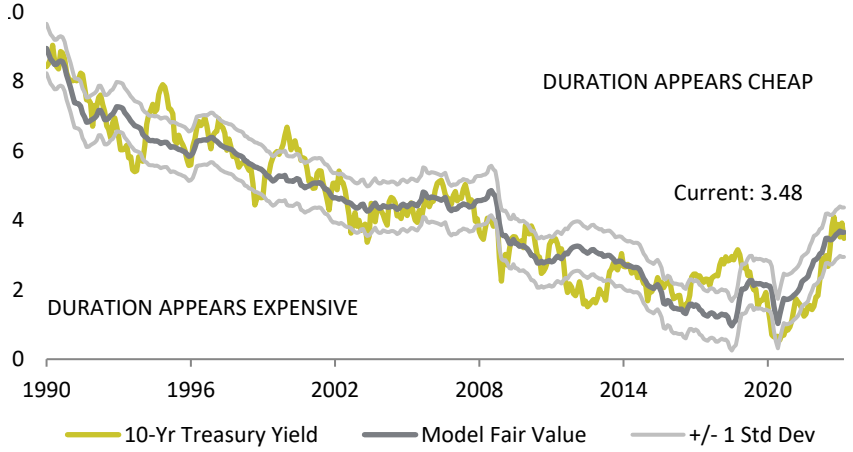
Facts & Figures First Quarter 2023

Sovereign bonds priced in a greater risk of a recession in 1Q amid stress in the US banking sector. US treasury yields fell sharply across the curve and the Bloomberg US Treasury Index returned 3.0% in 1Q, following its worst year on record in 2022 (-12.5%).

- US Treasury yields declined sharply in 1Q. Ten-year yields declined 40 bps in the quarter. Two-year yields fell as much as 100 bps in less than a week in early March—one of sharpest declines ever recorded—with investors pricing in a greater likelihood of a recession and rate cuts later this year amid stress in the banking sector.
- The US yield curve is still inverted, so the opportunity cost of holding shorter-duration bonds in the near-term remains attractive, but long-dated Treasuries still offer value over the long term.
- Ten-year US Treasuries are yielding 3.5%, which is in line with their implied fair value of 3.7%, based on trailing ten-year real GDP and inflation growth. Long-duration Treasuries typically outperform short-duration Treasuries when ten-year yields are above their fair value.
- Ten-year yields could still move higher this cycle. The upper-end of their implied fair value range is 4.4%. However, softer economic data and a likely shift in Fed policy should help limit any further rise in yields.
- Consensus expects US real GDP growth of 1% in 2023 and US headline CPI growth is forecast to decline from 8% in 2022 to 4.3% this year.
- The Fed raised the Fed funds rate a total 475 bps over the past year, from 0.0%–0.25% to 4.75%–5.0%, but future rate hikes appear less likely given weaker economic data and the stress in the banking sector
- Treasuries still face headwinds. Inflation could prove sticker than expected. Also, the Fed continues to reduce its Treasury holdings by $60 billion per month, while demand for Treasuries from some of the largest private holders has also waned more recently.
- Still, valuations have improved, and the macro environment appears to be turning more supportive. Additionally, Treasuries look extremely oversold following last year's sell-off and they could bounce sharply if there is a recession or the Fed cuts rates later this year.

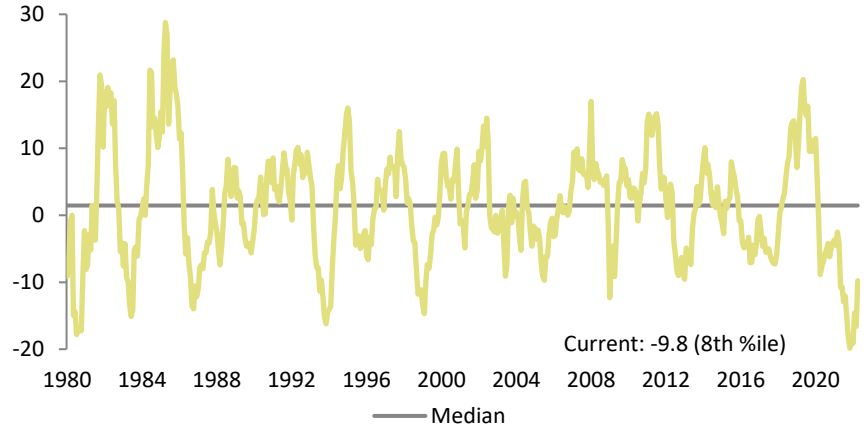
VALUATIONS: 10-YR TREASURY

Jan 31, 1990 – Mar 31, 2023 • Percent (%)



12-MONTH PRICE MOMENTUM: 10-YR TREASURY

Dec 31, 1980 – Mar 31, 2023 • Percent (%)



Sources: Federal Reserve and Thomson Reuters Datastream.

Note: The Model Fair Value is the predicted range of ten-year yields based on a multiple linear regression model that includes trailing ten-year real GDP and CPI change. CPI data are as of February 28, 2023.

US Cash

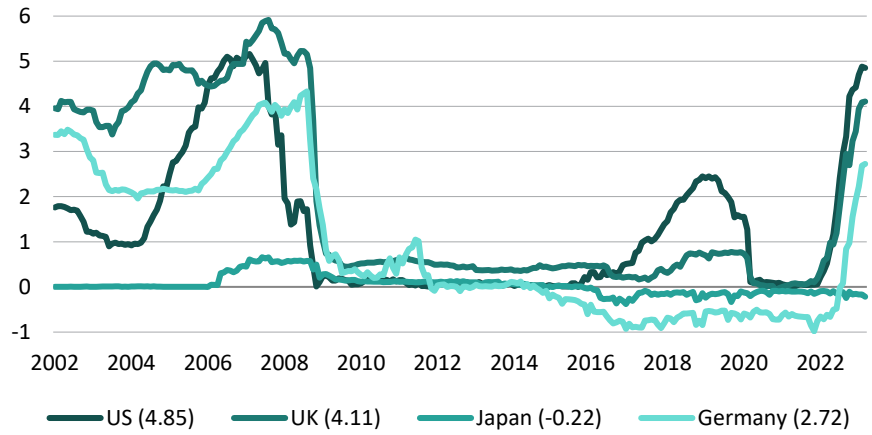
Facts & Figures First Quarter 2023

Cash outperformed most major asset classes last year due to the aggressive tightening by global central bankers. Holding cash may continue to payoff in the near-term given elevated cash yields and inverted yield curves across major regions, but we believe cash will continue to underperform both stocks and bonds over longer periods.

- Most major developed markets central banks, excluding Japan, have aggressively raised interest rates to bring down inflation. The Fed, BOE, and ECB have raised their key policy rates by 450 bps, 350 bps, and 350 bps, respectively, over the past year.
- Cash yields have increased significantly, and treasury yield curves have flattened. US (4.9%), UK (4.1%), and German (2.7%) T-bill rates are at their highest levels in over a decade and the spread between ten-year yields and three-month rates is below zero in all three countries. This has reduced the opportunity cost of holding cash in the near term.
- Cash should be a stable source of returns across several economic environments, and its elevated yields and minimal duration risk should provide downside protection if interest rates continue to rise.
- However, holding cash for an extended period would be challenging, given the risk that inflation erodes the value of cash in real terms and the opportunity costs of not investing in assets with higher expected returns over longer periods. Additionally, reinvestment risk would likely increase quickly in a recession or if central banks cut rates unexpectedly.
- Cash holdings are important for near-term liquidity needs, particularly for investors that have heavy operational spending, significant unfunded commitments, or that have currency and other hedging overlays.
- Investors choosing to hold cash for near-term liquidity purposes should stick to secure instruments such as US T-bills, as recent events have demonstrated. In the eurozone, cash should be kept in a core country bank within prudent limits. For investors that use money market funds, we recommend Treasury and government funds. Prime funds invest in bank commercial paper, corporate notes, and other credits and may have gating and floating-NAV provisions, making them slightly riskier.

T-BILL RATES

Jan 31, 2002 – Mar 31, 2023 • Percent (%)



MARKET EXPECTATIONS FOR FUTURE CENTRAL BANK RATES

As of Mar 31, 2023 • Percent (%)

	CURRENT	3M	6M	1Y	2Y
UK	4.25	4.50	4.60	4.18	3.56
Japan	-0.10	-0.09	-0.03	0.05	0.17
EU	3.00	3.34	3.51	3.26	2.65
US	4.88	4.91	4.63	3.80	2.77

Sources: Bloomberg L.P. and Thomson Reuters Datastream.

Notes: ECB data represented by the ECB overnight deposit rate. Feds funds target range is 4.75%-5.00%. The mid-point of 4.88% is used for future market expectations.

US Corporate Bonds

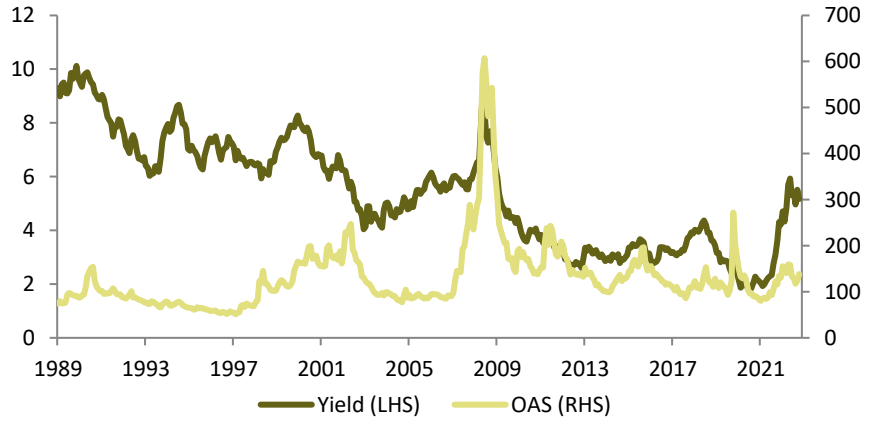
Facts & Figures First Quarter 2023

Investment-grade corporate bonds generated strong performance to start 2023, continuing their recovery after a difficult 2022. The Fed has now hiked rates nine times though the inverted curve dampens the impact on longer-duration corporate bonds. Spreads are elevated relative to historical medians, but rising Treasury yields remain a risk.

- The Bloomberg Corporate Investment-Grade Index returned 3.5% in 1Q, trimming its 12-month loss to -5.6%. The 2022 full-year return (-15.8%) the index's worst performance on record, reflected the market's surprise at the pace of Fed tightening.
- Yields have more than doubled over the last 18 months 5.2%. Most of the rise in yields was driven by the underlying move in benchmark yields. The Fed has hiked rates 475 bps since the start of 2022 and may hike further in 2023.
- The 138 bp option-adjusted spread rose 8 bps in 1Q and is in the 67th percentile of observed values.
- Typically spreads rise further during recessions. While not yet a base case among economists, there are growing signals such as the inverted yield curve and decline in leading economic indicators. Corporate profit growth is also tapering off as margins compress and prospects for stimulative fiscal or monetary seem dim.
- The Fed continues to shrink its balance sheet though it will take time to make a sizable dent given around $8.7T of security holdings remain. The Fed is proceeding cautiously to ensure the combination of rate hikes and asset reduction isn't more disruptive than desired.
- Investment-grade fundamentals are healthy but could decline during a prolonged or severe recession. Morgan Stanley reports interest coverage levels fell slightly to 12.9x in 4Q, though this was still 2.7x higher than pre-COVID levels.
- The pace of new issue supply has been reasonably robust despite looming macro headwinds. In 1Q, IG corporates issued around $285B of debt compared to just $470B for full-year 2022.

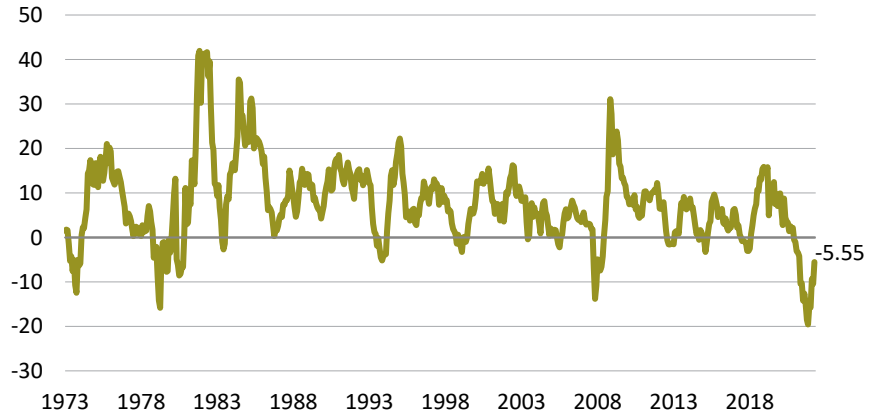
YIELD AND OPTION-ADJUSTED SPREAD: US INVESTMENT-GRADE CORPORATES

Jun 30, 1989 – Mar 31, 2023 • Percent (%)



TRAILING 12-MONTH RETURN: US INVESTMENT-GRADE CORPORATES

Dec 31, 1973 – Mar 31, 2023 • Percent (%)



Sources: Bloomberg Index Services Limited and Thomson Reuters Datastream.

US Tax-Exempt Bonds

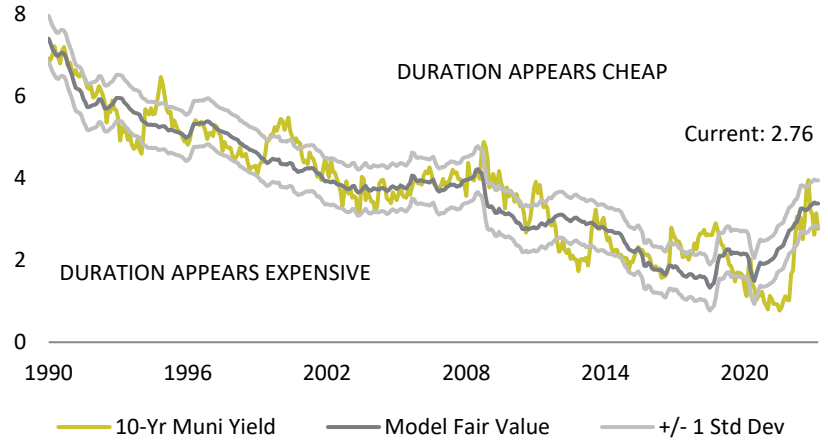
Facts & Figures First Quarter 2023

US municipal bonds benefited in 1Q from sovereign bond markets pricing in a greater risk of a recession. Muni yields declined sharply, and the Bloomberg Municipal Bond Index returned 2.8%, following its worst year since 1981 in 2022 (-8.5%).

- Ten-year muni yields declined 40 bps in 1Q, to 2.76%. Currently, ten-year yields are slightly below the lower-end of their fair-value range of 2.8%–3.9%, but they are still elevated versus recent history. Ten-year yields have a trailing ten-year median of 2.13%.
- The outlook for munis generally has improved. Softer economic data and easier Fed policy should help limit any further rise in sovereign bond yields and the reduced risk of higher yields should stymie the outflow from retail funds, removing a major headwind for the market.
- Retail investors, which hold about 70% of all outstanding muni bonds, have been a headwind recently. According to data from ICI, they pulled a record $120B from municipal bond mutual funds and ETFs in 2022 as the Fed raised rates over this period.
- However, unlike some previous periods of major outflows, munis have held up relatively well versus Treasuries. Therefore, muni/Treasury ratios did not increase like they have historically. The ten-year muni/Treasury ratio is 0.8 times (16th percentile).
- So, while muni yields may look more attractive on an after-tax basis—ten-year Treasuries are yielding 3.5% versus a tax-equivalent ten-year muni yield of 4.7%—there may not be a strong tactical case for munis over Treasuries given rich starting muni/Treasury ratios.
- Banks are the third largest holder of municipal bonds, but any impact from banks potentially selling munis will likely be limited. According to Bloomberg, more than half of banks' exposure to municipal bonds holdings is from direct loans to municipalities. Retail investors will likely continue to be the bigger driver of flows in 2023.
- Meanwhile, technicals remain supportive, as most analysts are not forecasting a material increase in muni issuance this year and they remain constructive on muni fundamentals, which are still benefiting from unspent federal stimulus funds and strong tax collections.

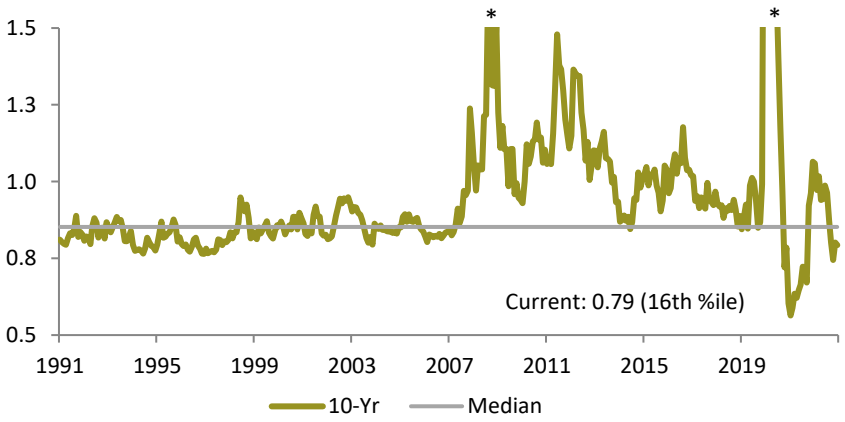
VALUATIONS: 10-YR MUNI

Jan 31, 1990 – Mar 31, 2023 • Percent (%)



RATIO OF 10-YR MUNI YIELDS TO TREASURY YIELDS

Apr 30, 1991 – Mar 31, 2023



* Axis is capped for scaling purposes. Ratio hit a high of 3.16 on 4/30/2020.

Sources: Bloomberg Index Services Limited and Thomson Reuters Datastream.

Note: The Model Fair Value is the predicted range of ten-year yields based on a multiple linear regression model that includes trailing ten-year real GDP and CPI change. CPI data are as of February 28, 2023.

US Inflation-Linked Bonds

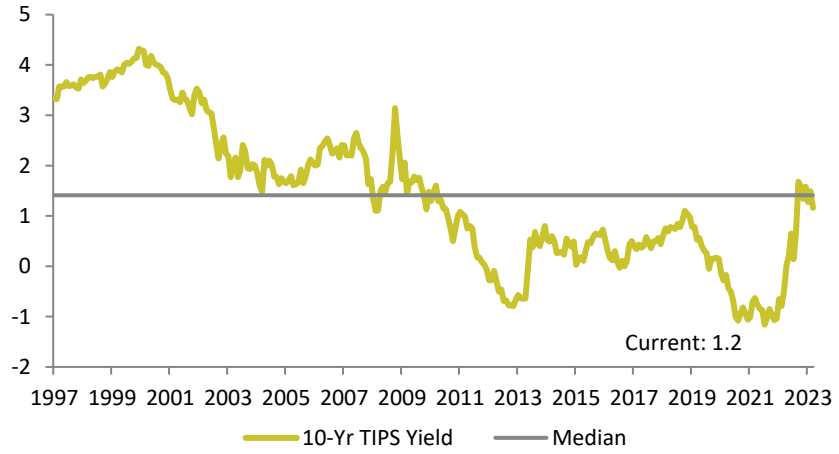
Facts & Figures First Quarter 2023

US TIPS benefited from a broader rally in fixed income in 1Q, as both real and nominal yields fell sharply amid stress in the US banking sector The Bloomberg US TIPS Index returned 3.3%, following its worst year on record in 2022 (-11.8%).

- US ten-year real yields declined 42 bps in 1Q, to 1.16%, after increasing sharply in 2022 (+262 bps). Currently, yields are just slightly below their long-term median of 1.4% but above their implied fair valued of 1.0%, based on trailing ten-year real GDP growth.
- Looking ahead, softer economic data and easier Fed policy should limit any further rise in real yields. Consensus is forecasting US real GDP growth of 1% in 2023, well below the ten-year median rate of growth of 2.3%, and Fed officials projected they will only need to raise rates by another 25 bps, after increasing them by 475 bps over the past year.
- The outlook for TIPS has improved given better valuations, oversold conditions, and the more supportive economic/policy environment. However, the rising risk of a recession and softer inflation are headwinds for TIPS versus Treasuries.
- Several key recession signals (e.g., the yield curve) are flashing red and while inflation remains elevated—US headline CPI accelerated 5.0% in February—it has slowed in recent months and is forecast to continue softening. Consensus is forecasting CPI will average 4.3% this year.
- TIPS are contractually linked to CPI and less liquid than Treasuries, both of which have led to them underperforming Treasuries during previous recessions and other periods of markets stress.
- However, TIPS are one of the few assets that can help support spending and other cash needs in the event of unexpectedly high inflation. If inflation remains high, then TIPS may offer value in both absolute and relative terms, given higher real yields and relatively subdued breakeven inflation rates for the inflation environment.
- The ten-year US breakeven inflation rate (i.e., the difference between nominal and real yields) has declined from a high of over 3% in April 2022 to 2.3%. It is slightly above its post-1997 median, but this may not be the best proxy for the current environment given the short history.

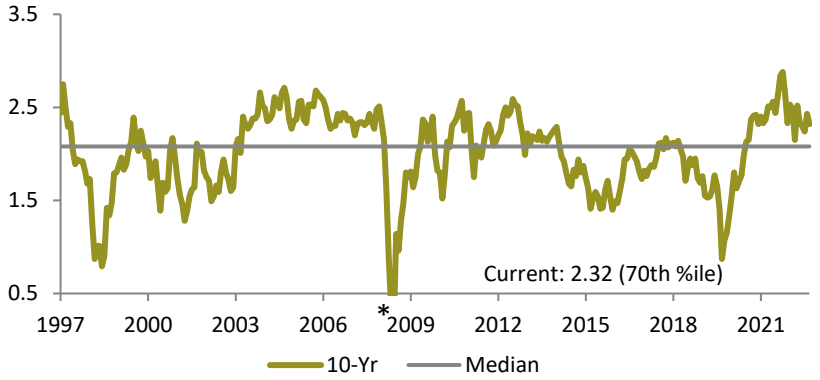
HISTORICAL YIELD: 10-YR TIPS

Jan 31, 1997 – Mar 31, 2023 • Percent (%)



10-YR BREAKEVEN INFLATION

Jul 31, 1997 – Mar 31, 2023 • Percent (%)



* Capped for scale purposes. 10-Yr BE Inflation hit a low of 0.11% on 12/31/2008.

Sources: Bloomberg Index Services Limited, Global Financial Data, Inc., and Thomson Reuters Datastream.

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Global Inflation-Linked Bonds

Facts & Figures First Quarter 2023

Global linkers benefited from a broader rally in fixed income in 1Q, as both real and nominal yields fell sharply amid stress in the US banking sector. The Bloomberg World Inflation-Linked Bond Index returned 4.4%, following its worst year on record in 2022 (-21.9%).

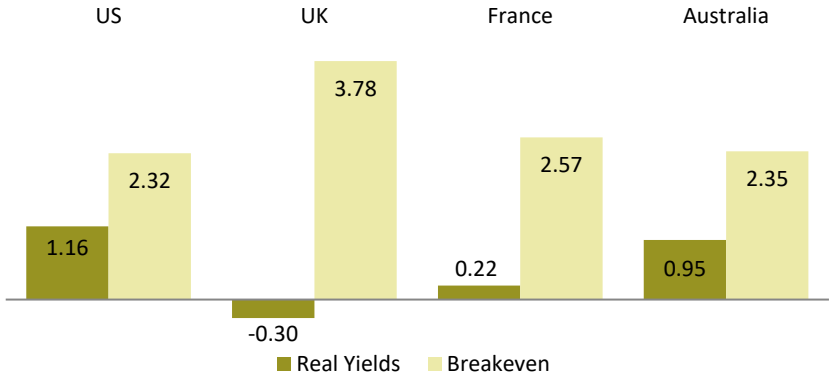
- Global real yields for the Bloomberg index declined 28 bps in 1Q, to 0.76%, after increasing sharply in 2022 (+277 bps). Currently, yields are just slightly below their long-term median of 1.2% but are above their implied fair valued of 0.5%, based on trailing ten-year real GDP growth.
- While the economic/policy outlooks differ to a degree across countries, looking ahead, softer economic data and easier monetary policy should help limit any further rise in real yields.
- Consensus expects global real GDP growth to slow from 3.0% in 2022 to 2.4% in 2023 and most major central banks are considering pausing rate increases after significant rate hikes over the previous year.
- The outlook for linkers has improved given better valuations, oversold conditions, and the more supportive economic/policy environment. However, the rising risk of a recession and softer inflation are headwinds for linkers versus Treasuries.
- Several key recession signals (e.g., yield curves) are flashing red and while inflation remains elevated it has slowed in recent months and is forecast to continue softening. Consensus is forecasting developed markets CPI will average 4.1% this year, down from 6.4% in 2022.
- Linkers are contractually linked to CPI and less liquid than Treasuries, both of which have led to them underperforming Treasuries during previous recessions and other periods of markets stress.
- However, linkers are one of the few assets that can help support spending and other cash needs in the event of unexpectedly high inflation. If inflation remains high, then linkers may offer value in both absolute and relative terms given higher real yields and relatively subdued breakeven inflation rates for the current inflation environment.

HISTORICAL INDEX YIELD: BBG GLOBAL LINKERS

Dec 31, 1996 – Mar 31, 2023 • Percent (%)

10-YR REAL YIELDS AND BREAKEVEN INFLATION

As of Mar 31, 2023 • Percent (%)



Sources: Bloomberg Index Services Limited and Thomson Reuters Datastream.

Notes: France data are based on the underlying securities within the Bloomberg Global Agg Treasuries and Bloomberg World Govt Inflation-Linked indexes. All other data are based on the Bloomberg real yield and breakeven series.

UK Gilts

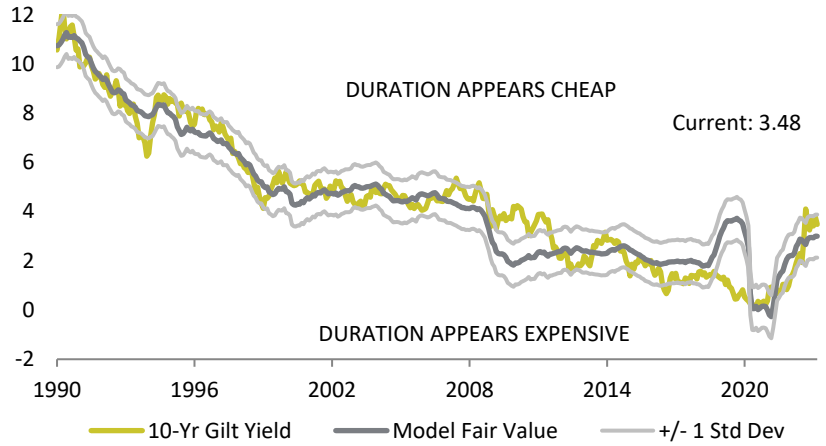
Facts & Figures First Quarter 2023

The Bloomberg Sterling Gilts Index returned 2.2% in 1Q, following its worst year on record (-25.1%). Looking ahead, gilts are oversold and offer better value after last year's sell-off. The policy and economic backdrop will likely be more supportive in 2023.

- The spread between ten- and two-year gilt yields became more negative in 1Q amid fears of contagion from stress in the US banking system. Two-yield yields rose 21 bps, while ten-year yields fell 29 bps.
- The opportunity cost of holding short-dated gilts in the near term is appealing, but ten-year gilt yields are up nearly 180 bps over the trailing 12 months and long-dated gilts offer better value long term.
- Ten-year gilts are yielding 3.5%, which is slightly above their implied fair value of 3.0%, based on trailing ten-year real GDP and inflation growth. Long-duration gilts typically outperform short-duration gilts when ten-year yields are above their fair value.
- Ten-year gilt yields could move higher in the near term. The upper-end of their implied fair value range is 3.9%. However, softer economic data and a likely shift in BOE policy should help limit any further rise in yields.
- Consensus is forecasting a recession in the UK in 2023, and while inflation remains elevated (+10.4% year-over-year), UK headline CPI is forecast to fall to 6.5% this year and to 2.4% in 2024. Yields typically decline as near-term growth moves back to its long-term trend.
- The BOE raised its main bank rate by 400 bps since January 2022, from 0.25% to 4.25%, but future rate hikes appear less likely given weaker data and the recent stress in the US banking sector.
- UK gilts still face headwinds. Inflation could be sticky, and while UK PM Rishi Sunak has UK public finances on a more sustainable trajectory, government spending is forecast to remain elevated this year and the BOE continues to reduce its balance sheet. Barclays estimates net gilt issuance will increase by £180 billion in FY 2022–23.
- Still, valuations have improved, and the macro environment appears to be more supportive. Gilts are also oversold following last year's sell-off and they could bounce sharply if the BOE cuts rates later this year.

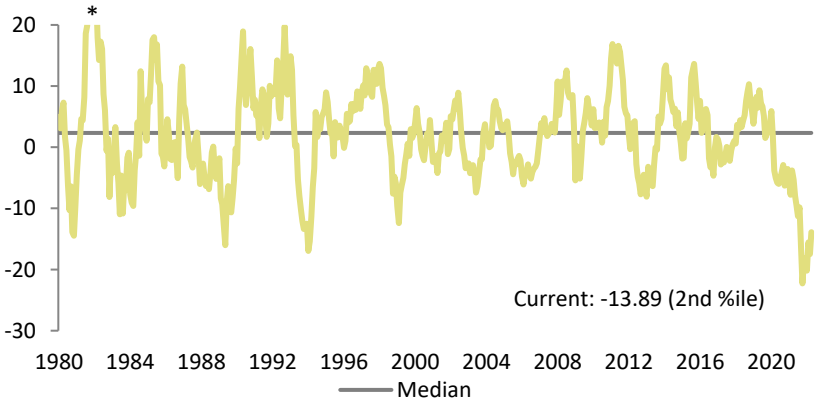
VALUATIONS: 10-YR GILTS

Jan 31, 1990 – Mar 31, 2023 • Percent (%)



12-MONTH PRICE MOMENTUM: 10-YR GILTS

Dec 31, 1980 – Mar 31, 2023 • Percent (%)



* Capped for scale purposes. The rolling 12-M Momentum was 44.5% in October 1982.

Source: Thomson Reuters Datastream.

Note: The Model Fair Value is the predicted range of ten-year yields based on a multiple linear regression model that includes trailing ten-year real GDP and RPI/CPI change. CPI data are as of February 28, 2023.

UK Corporate Bonds

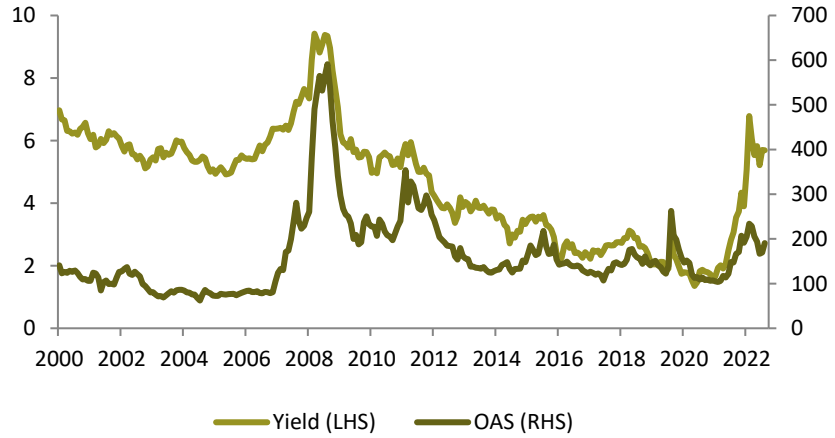
Facts & Figures First Quarter 2023

Sterling-denominated investment-grade corporate bonds had another positive quarter in 1Q, continuing to claw back deep losses suffered in 2022. The LDI-driven volatility has subsided but inflationary pressures, rate hikes, and slowing growth are likely to weigh on sentiment.

- Sterling investment–grade corporate bonds returned 2.5% in 1Q, a second consecutive quarter of positive performance. Still, their full-year loss in 2022 of -19.3% was roughly twice the previous record drawdown (-10.0% in 2008).
- The index yield contracted slightly in 1Q to 5.69% but remains more than twice the level seen at the end of 2021.
- Rising benchmark yields have helped push credit yields higher. The BOE hiked its base rate another 75 bps 1Q (bringing its target rate to 425 bps) in response to elevated inflationary pressures. CPI rose 10.4% YOY in February and is now well above levels seen in the Eurozone or US.
- The option-adjusted index spread fell slightly in 1Q to 191 bps—around the 74th percentile of observed values.
- The macro backdrop for credit in the UK has deteriorated. The IMF now expects its economy to shrink 0.3% in 2023, a 30-bp upgrade from its forecast in January. Stagflation seems likely as broad range of items continue to see price increases and rising debt service costs dampen consumer and business spending.
- Sterling IG net leverage of around 3.3 times EBITDA has fallen back to pre-COVID levels. However, slowing economic growth and rising input costs may put pressure on earnings and in turn, fundamentals.

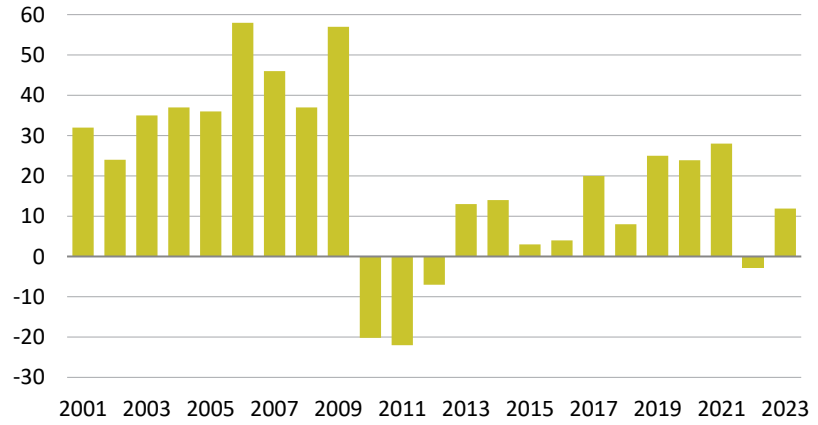
YIELD AND OPTION-ADJUSTED SPREAD: STERLING CORPORATES

Aug 31, 2000 – Mar 31, 2023 • Percent (%)



NET ANNUAL ISSUANCE: STERLING CORPORATES

2001-23 • Sterling (Billions)



Source: Bloomberg Index Services Limited.

Note: Issuance data for 2023 are through March 31.

Euro Area Sovereign Bonds

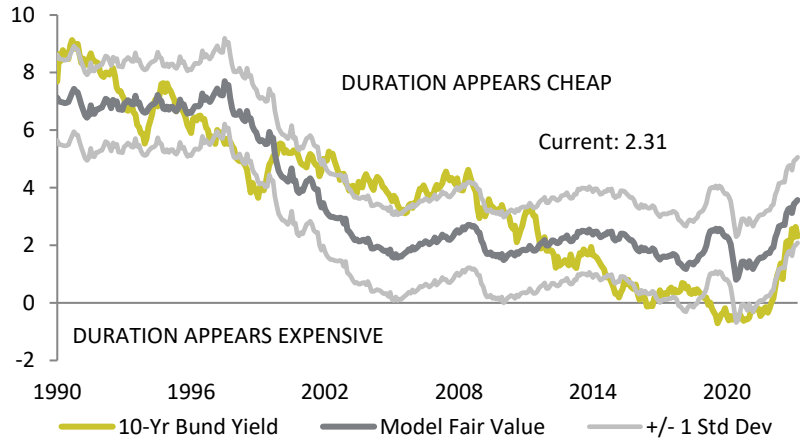
Facts & Figures First Quarter 2023

The Bloomberg Euro-Aggregate Treasury Index returned 2.5% in 1Q, following its worst year on record in 2022 (-17.2%). Looking ahead, core bonds are oversold and offer better value after last year's sell-off, but the ECB's hawkish tilt and quantitative tightening are risks.

- Long-dated core EA sovereign yields fell in 1Q amid fears of contagion from stress in the US banking system. In Germany, ten-year bund yields fell 27 bps for the quarter. Though two-year yields increased 12 bps, the ten-year/two-year yield spread fell further into negative territory.
- The opportunity cost of holding short-dated bunds in the near term is appealing, given the inverted yield curve. However, ten-year bund yields are up nearly 180 bps over the trailing 12-months and long-dated bunds offer some value long-term following last years sell-off.
- Ten-year bunds are yielding 2.3%, within their implied fair value range of 2.1%-5.1%, based on trailing ten-year real GDP and inflation growth.
- Core EA sovereign yields may have more upside in the near term given ten-year bund yields are on the lower-end of their implied fair value range and the ECB has maintained a slightly more hawkish tilt than other major central banks given their concerns about inflation.
- The ECB raised its overnight deposit rate by 350 bps over the past year, from -0.5% to 3.0%. Yet, inflation remains elevated. EA flash headline CPI fell sharply in March as energy prices eased, but core CPI increased to 5.7% year-over-year, from 5.6% in February. The market expects the ECB will need to raise rates by another 50 bps this year.
- The ECB also moved a step closer to starting quantitative tightening by beginning to reduce the size of balance sheet reinvestments in March. QT could be a headwind for EA periphery country bonds, which have grown increasingly dependent on ECB support. The spread between Italian/German ten-year yields is 181 bps, which is well below the levels reached during previous periods of elevated EA sovereign debt risk.
- Weaker growth may eventually cap any further rise in yields—consensus is forecasting real GDP growth of 0.5% in 2023—but risks to core yields and periphery spreads likely remain tilted to the upside in the near-term given the challenging inflation and policy environment.

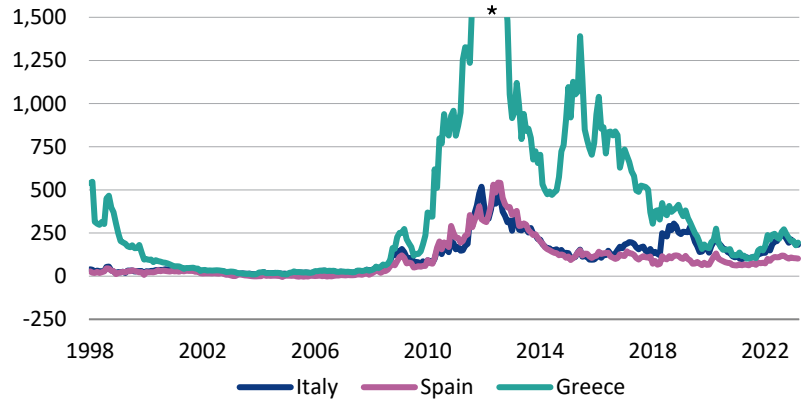
VALUATIONS: 10-YR BUNDS

Jan 31, 1990 – Mar 31, 2023 • Percent (%)



HISTORICAL 10-YR SPREADS OVER BUND YIELDS

Jan 31, 1998 – Mar 31, 2023 • Basis Points (bps)



* Capped for scale purposes. Greece spread hit a high of 3,476 bps on 2/29/2012.

Source: Thomson Reuters Datastream.

Note: The Model Fair Value is the predicted range of ten-year yields based on a multiple linear regression model that includes trailing ten-year real GDP and CPI change.

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Euro Area Corporate Bonds

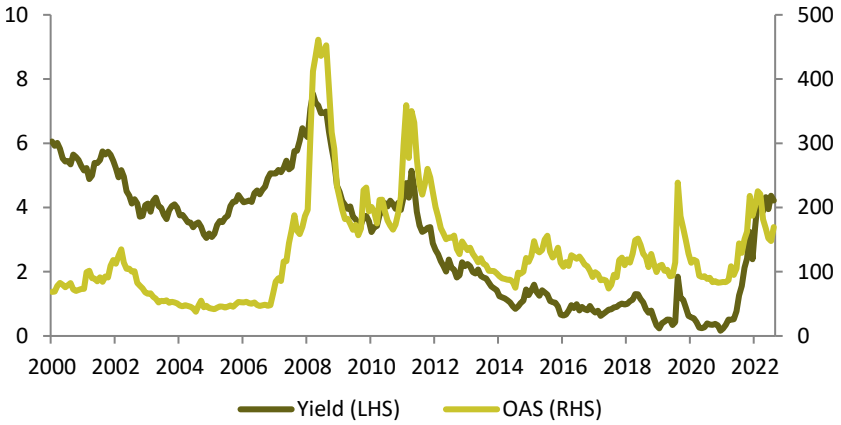
Facts & Figures First Quarter 2023

The Bloomberg Euro-Aggregate Corporate Index returned 1.8% in 1Q, continuing a recent recovery. Despite a positive 4Q, 2022 saw its largest drawdown on record. Growth has stabilized and energy prices have declined but the ECB has embarked on a series of rate hikes to fight inflationary pressures.

- Yields on euro corporate bonds fell slightly in 1Q to 4.22% but remain more than twice the level seen 12 months ago.
- The current 170-bp OAS represents the 79th percentile of observed values and offers investors some cushion if rates rise further and fundamentals weaken from here.
- The macro backdrop is not supportive for corporate earnings although the region seems to have avoided a worst-case scenario in terms of war-related energy shortages and inflationary pressures. The IMF now expects the Eurozone economy to expand 0.8% in 2023, a slight upgrade from its January forecast.
- HICP in March fell to 6.9% year-over-year, a significant cooling off from the 10%+ levels seen early 4Q. Still, even with the rise in nominal yields on corporate bonds, real yields are still deeply negative.
- Central banks have been forced by rising inflation pressures to become more hawkish. The ECB hiked another 100 bps in 1Q, taking its base rate to 3%. The ECB has also announced it will reduce the rate at which it reinvests principal from maturing bond holdings from March onward, another headwind.
- Fundamentals for European corporate credit are mixed. According to J.P. Morgan, European IG issuers grew EBITDA 2.5% year-over-year in 4Q, helping to reduce debt-to-EBITDA to 2.7x. Margins could have some upside from the recent decline in energy costs, but rising interest rates will have the opposite impact.
- Technicals are positive for Eurozone credit. Issuance of euro-denominated investment grade–corporate debt fell to €84B in 2022, down from €139B the prior year.

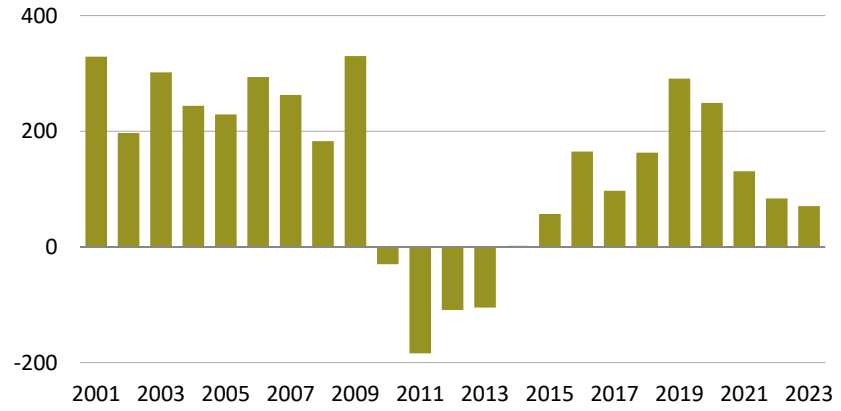
YIELD AND OPTION-ADJUSTED SPREAD: EUROPEAN CORPORATES

Aug 31, 2000 – Mar 31, 2023 • Percent (%)



NET ANNUAL ISSUANCE: EUROPEAN CORPORATES

2001-22 • Billions (EUR)



Source: Bloomberg Index Services Limited.

Note: Issuance data for 2023 are through March 31.

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Structured Finance

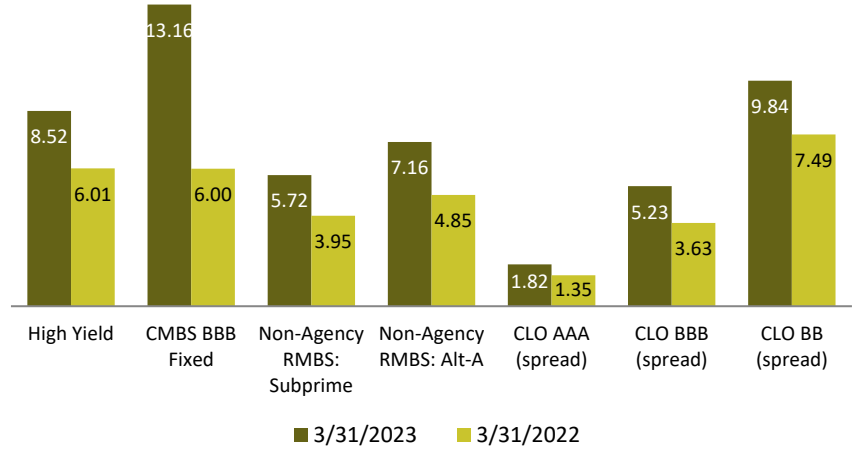
Facts & Figures First Quarter 2023

Structured credit pricing reflects uncertainty over underlying economic conditions and credit fundamentals. However, in general, floating-rate assets have seen smaller drawdowns than the longer-duration fixed-rate equivalents, which have been more impacted by Fed rate hikes.

- Structured credit indexes mostly posted positive returns in 1Q, in line with broader risk markets. Examples include CLO liabilities, with AAA CLO debt returning 1.8%. BBB-rated private label CMBS were an exception, as concerns mounted over commercial real estate fundamentals and bank failures sparked concern over refinancing risks.
- Many structured finance instruments are floating rate, which has proven a tailwind as the Fed continues to hike rates. For example, BB-rated CLO debt returned 3.6% in 1Q, slightly outperforming US leveraged loans (3.1%).
- Fundamentals have held up reasonably well, but market concerns are mounting that slowing economic growth and rising rates will eventually take their toll on underlying assets like real estate and corporate loans..
- Some structured credit assets are less liquid than corporate equivalents and often require specialized data to analyze. Many also have indefinite maturities given amortizing loan pools. The result is a spread premium to similarly rated corporate debt. For example, BB-rated CLO bonds spreads of 984 bps are more than 3x the equivalent spread on BB-rated corporates.
- Fundamentals for structured credit are healthy but will suffer if a recession ensues in 2023. Rating agency downgrades of loans now outpace upgrades, and the large share of B-rated loans in CLOs raises the odds that CCC-rated buckets will increase. Residential property prices, which had been rising strongly, are now ticking downward as higher rates eat into mortgage affordability.
- Overall delinquency rates for loans in CMBS pools declined in 2022 but had started to reverse some of his progress as the year ended. While the recent uptick has been driven by multi-family properties, question marks also remain over office given shifting work patterns post-COVID.
- Investors can access structured credit through several vehicles and mandates, including mutual funds, hedge funds, and closed-end funds.

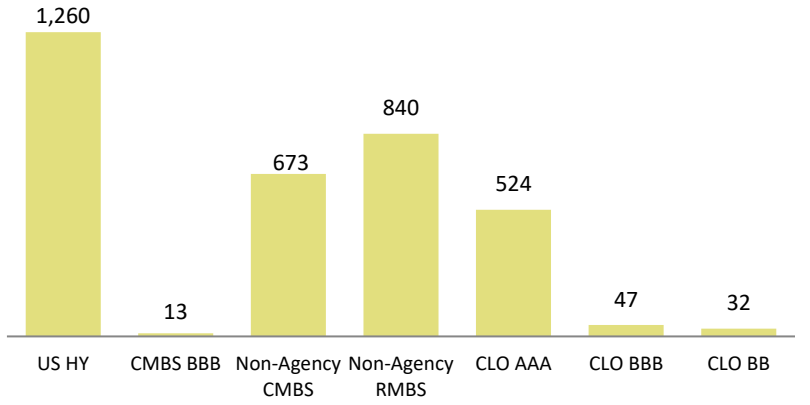
YIELD: SELECT STRUCTURED CREDITS

Percent (%)



MARKET CAP: SELECT STRUCTURED CREDITS

As of March 31, 2023 • US$B



Sources: Bloomberg Index Services Limited, ICE BofA Merrill Lynch, J.P. Morgan Securities, Inc., Securities Industry and Financial Markets Association(SIFMA), and Thomson Reuters Datastream.

Notes: CLOs yield data are represented by discount margins. Non-Agency CMBS and Non-Agency RMBS market-cap data are as of December 31, 2021.

US High-Yield Bonds

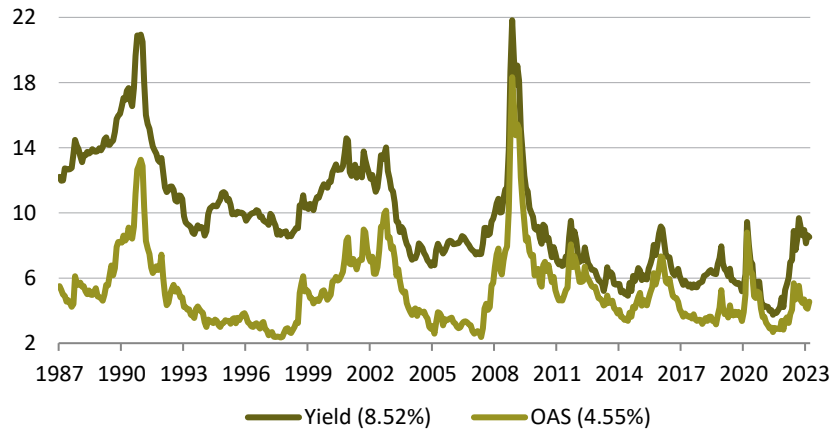
Facts & Figures First Quarter 2023

US high-yield bonds generated strong returns in 1Q, a continuation of their recent recovery that still leaves investors bruised after a rough 2022. Spreads are just below their historical median, offering investors little protection if a recession in 2023 means fundamentals deteriorate.

- The Bloomberg High-Yield Index returned 3.6% in 1Q. Longer-term returns have been less impressive given its 2022 full-year return (-11.2%) was its second-worst year on record (after 2008).
- The high-yield index yield has more than doubled since the start of 2022 to 8.5%. The main driver has been the rise in underlying Treasury yields as the Fed has hiked its target rate 9 times since early 2022.
- Spreads have also risen since early 2022 and the current index spread of 455 bps is slightly below its historical median. Spreads historically have risen to an even greater extent during recessions, a consideration as the US economy is barely expected to grow in 2023.
- Defaults have been limited. Moody's reported a speculative-grade default rate of just 1.3% at the end of February. However, an elevated distressed ratio suggests investors don't expect good times to last. Bank of America calculates around 9.5% of HY bonds have spreads above 1,000 bps.
- Should the US economy enter a recession, credit fundamentals will be starting from a healthy position. Bank of America reports net leverage for high-yield borrowers fell to 3.2x at the end of 4Q, below its long-term average. Interest coverage is elevated (around 5.8x) but may decline as issuers face higher borrowing costs.
- Technicals are mixed for high-yield bonds. Lipper reports that investors have pulled $16B year-to-date from US HY mutual funds but a variety of other sources of liquidity (coupon payments, bond redemptions, etc.) have been more than sufficient to absorb declining issuance.
- The average credit rating for the high-yield index has remained roughly stable at around Ba3/B1. A recession could bring downgrades and threaten this stability. Fourth quarter 2022 may have offered a preview, as rating agency downgrades outnumbered upgrades for the first time all year.

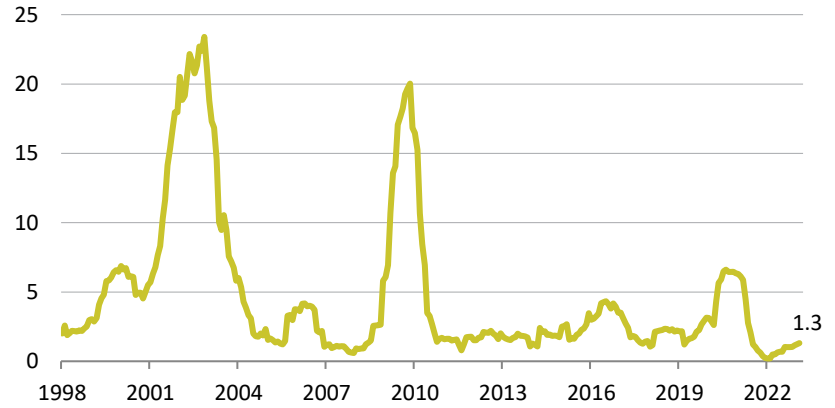
YIELD AND OPTION-ADJUSTED SPREAD: US HIGH-YIELD INDEX

Jan 31, 1987 – Mar 31, 2023 • Percent (%)



PAR DEFAULT RATES: US HIGH-YIELD

Jan 31, 1998 – Feb 28, 2023 • Percent (%)



Sources: Bloomberg Index Services Limited, Deutsche Bank Credit Strategy, and Moody's Investors Service.
Notes: Data prior to June 30, 2017, are represented by Moody's default rates as provided by the Deutsche Bank US Credit Strategy Chartbook. All default rate data on and after June 30, 2017, are sourced from the Moody's Investor Services Default Report.

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Leveraged Loans

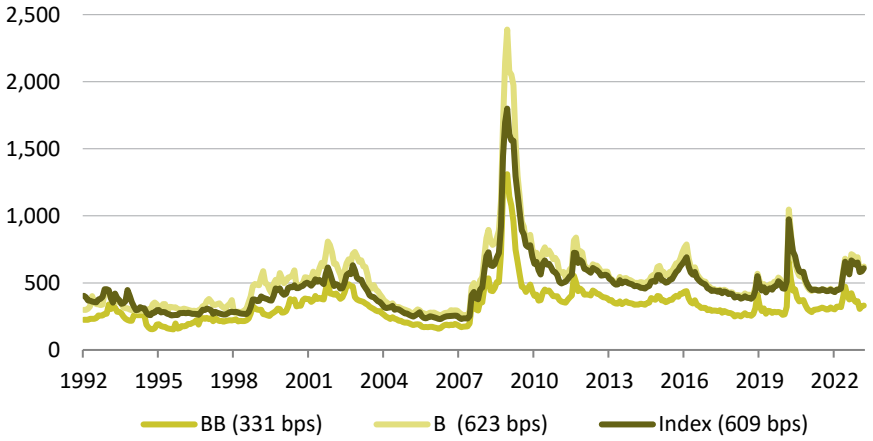
Facts & Figures First Quarter 2023

US leveraged loans have outperformed high-yield bonds over the last 12 months, insulated from rising rates by their floating-rate coupons. While fundamentals are starting from a relatively strong place, rising rates and slowing growth are likely to mean metrics like interest coverage deteriorate and could lead to higher defaults.

- Leveraged loans returned 3.1% in 1Q, bringing their twelve-month return to 2.1%. In contrast, over the last year US high-yield bonds returned -3.3.
- After jumping over 200 bps in 2022, the discount margin for leveraged loans declined in 1Q to 609 bps, which represents the 86th percentile of observed values.
- The current discount margin coupled with the three-month Libor rate (around 5.2%) means the implied yield on leveraged loans is over 11%.
- According to J.P. Morgan, the trailing default rate for leveraged loans rose to 2.2% at the end of 1Q. Defaults may rise further in 2023 as debt service costs increase just as slowing economic growth means revenue may not keep pace. Reflecting this, around 6% of the Morningstar LSTA Leveraged Loan Index now trades below 80 cents.
- The loan index has lower average credit quality than the HY index, leaving it more vulnerable to future downturns. According to Credit Suisse, just 40% of the loan index has at least one BB rating, 10 ppts lower than five years ago.
- Fundamentals are expected to deteriorate if a recession hits but would do so from a position of strength. According to Morgan Stanley, leveraged loan issuers saw EBITDA increase 9.5% year-over-year in 4Q but higher rates meant interest coverage dropped to 4.8x—in line with its 2017–19 average.
- Loan technicals are mixed. While issuance continues to drop and totaled just $33.7B in 1Q, CLO issuance has been steady and recycled cash via paydowns have been more than sufficient to offset declining retail investor demand.

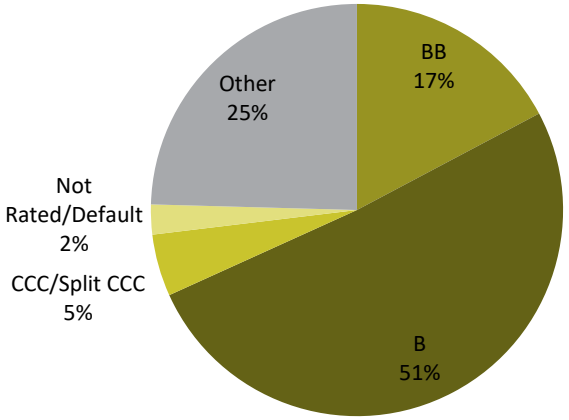
DISCOUNT MARGIN: CS LEVERAGED LOAN INDEX

Jan 31, 1992 – Mar 31, 2023 • Basis Points



RATINGS BREAKDOWN: CS LEVERAGED LOAN INDEX

As of March 31, 2023



Source: Credit Suisse.

Notes: Discount margin assumes a three-year life and represents the yield-to-maturity above and beyond the current LIBOR rate, assuming all loans are paid off at par with no defaults. Other category includes Split BBB, Split BB, and Split B. Not Rated/Default includes CC, C, and Not Rated/Default loans.

Pan-European High-Yield Bonds

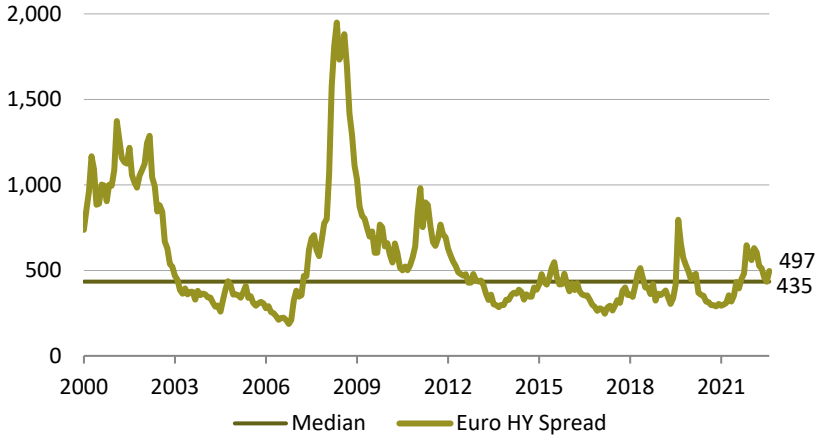
Facts & Figures First Quarter 2023

European high-yield bonds posted a second consecutive strong quarter in 1Q. Spreads fell as risk appetite recovered after a tumultuous 2022 and as the region's economy has persevered despite ongoing impact of the invasion of Ukraine. Still, growth forecasts for 2023 are modest and inflationary pressures are forcing the ECB to become more hawkish.

- The Bloomberg Pan-European High-Yield Index returned 2.9% in 1Q, trimming its 12-month loss to -4.6%.
- Returns are mainly being driven by carry—the yield on the index has more than doubled since the start of 2021 to 8.2%. Yields slightly declined in 1Q.
- The index OAS fell slightly in 1Q but is still 100 bps higher than levels seen 12 months ago. The current 497 bps is above its historical median and in the 60th percentile of observed values. Investors are demanding higher spreads given concerns over weak economic growth and how higher interest rates will impact corporate fundamentals.
- Rising benchmark sovereign yields have also pushed yields higher. The ECB hiked its benchmark rate another 100 bps in 1Q, taking its benchmark rate to 3%. Meanwhile, the BOE also hiked 75 bps in 1Q and its base rate is much higher (4.25%). Both are expected to continue tightening in 2023 but at a slowing pace as inflationary pressures ease.
- Defaults have been contained in recent years as growth rebounded post COVID-19 and low rates boosted interest coverage metrics. Moody's reports the trailing 12-month default rate was just 0.6% at the end of February. Looking ahead, the rising distressed ratio suggests fundamentals are weakening and not all companies are prepared for the expected recession.
- Credit globally has been boosted by central bank asset purchases and investors' thirst for income in a low-yield environment. This tailwind is reversing, with the Bank of England now selling assets and the ECB no longer reinvesting proceeds from maturing bonds purchased under its Asset Purchase Program.
- On a relative basis, European borrowers are less levered than those in the United States. More than 65% of the European HY Index carries at least one BB rating.

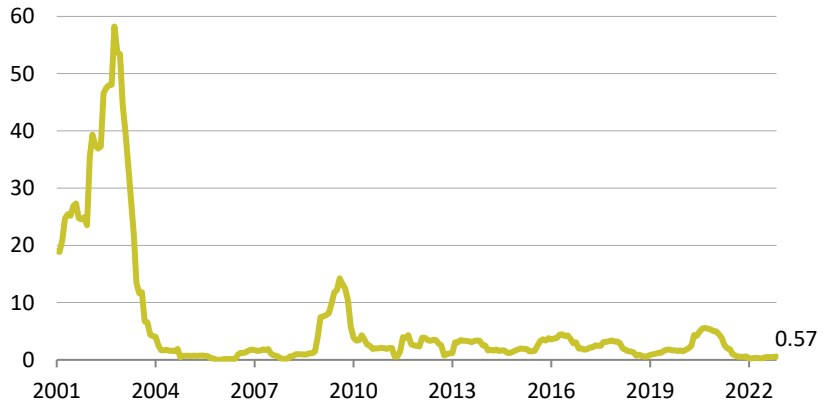
OPTION-ADJUSTED SPREAD: EUROPEAN HIGH YIELD

Aug 31, 2000 – March 31, 2023 • Basis points (bps)



PAR DEFAULT RATES: EUROPEAN HIGH YIELD

Apr 30, 2001 – Feb 28, 2022 • Percent (%)



Sources: Bloomberg Index Services Limited and Moody's Investor Services.

Notes: The European high-yield option-adjusted spread peaked in December 31, 2008, at 1,949 bps. The European high-yield default rate peaked on January 31, 2003, at 58.2%.

Distressed Investing: Non-Control

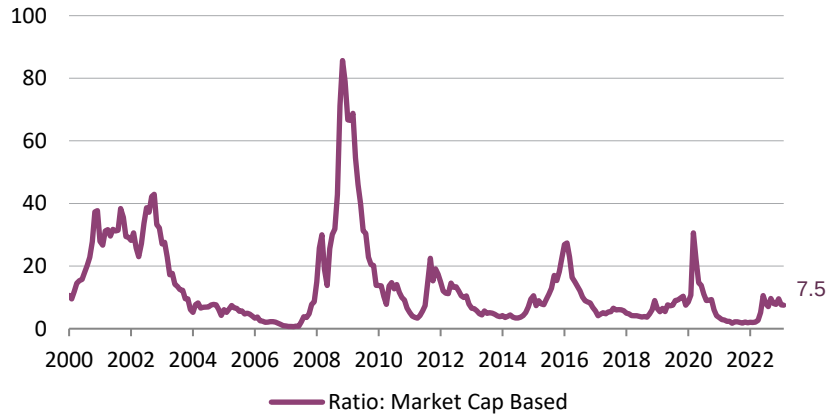
Facts & Figures First Quarter 2023

Distressed hedge funds have generated lackluster returns in recent quarters as softening economic growth and rising corporate stress have weighed on asset prices. The flipside is that current bond and loan prices should create more fertile ground for skilled distressed investors in 2023.

- The HFRI Event Driven: Distressed/Restructuring Index returned 1.2% in 1Q, trimming its twelve-month loss to -4.3%. Distressed hedge funds posted similar returns to the broader fund-of-funds (diversified) HF Index but trailed broader credit indexes like the US High Yield Index (+3.6% in 1Q).
- Distressed funds are seeing a broadening opportunity set, with around 7.5% of the $1.4 trillion face value HY index trading with a spread above 1,000 bps and an elevated share of leveraged loans also trading at distressed prices.
- The average dollar price of B-rated HY bonds (89 cents) and CCC-rated assets (78 cents) suggests funds with deep credit underwriting expertise should be able to earn double-digit returns. Several sectors offer significant volumes of lower-priced/higher-spread assets.
- Metrics like debt/EBITA have declined back down below pre-COVID levels and interest coverages ratios are elevated relative to historical averages. Still, slowing economic growth and rising interest costs will challenge some business models, especially lower-rated credits that are highly levered.
- There are a variety of ways to invest in distressed debt, including hedge funds and lock-up vehicles, which will do everything from trade existing securities to provide rescue finance for troubled companies. Skilled managers may find opportunities beyond traditional focus areas, including structured credit and property-backed credit.

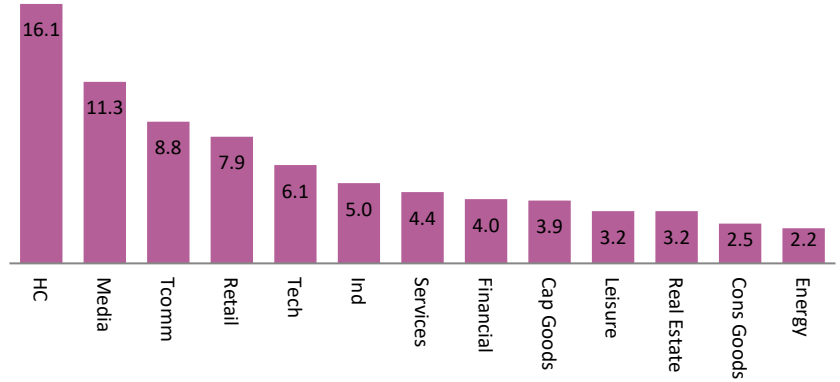
DISTRESSED RATIO: BOFA ML HIGH YIELD MASTER II INDEX

Jan 31, 2000 – Mar 31, 2023 • Percent (%)



MARKET VALUE OF DISTRESSED PAPER FOR SELECT INDUSTRIES

As of March 31, 2023 • US$B



Source: ICE BofA Merrill Lynch.

Notes: Bottom chart represents the ICE BofA Merrill Lynch US High Yield Index universe. Distressed bonds are defined as bonds with option-adjusted spreads greater than 1,000 basis points. Only industries with a market value equal or greater than $2 billion are shown.

USD-Denominated Emerging Markets Debt

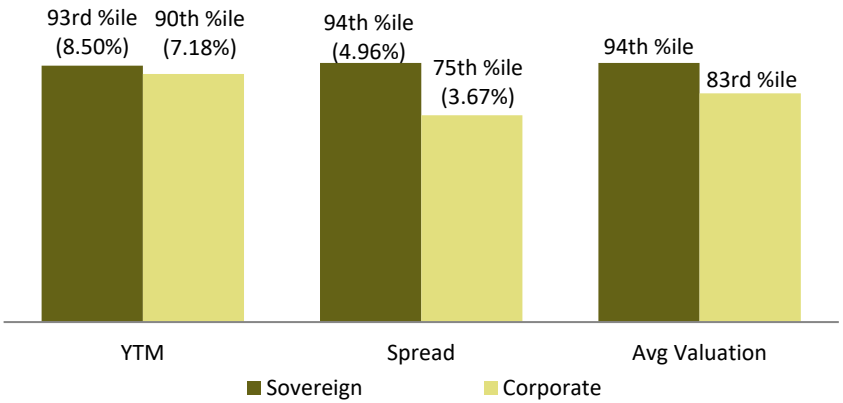
Facts & Figures First Quarter 2023

EM debt indexes plunged in 2022, with the JPM EMBI Global Diversified and (corporate) CEMBI Broad Diversified indexes returning -17.8% and -12.3%, respectively. Central bank tightening, the Russian invasion of Ukraine, and rising default risk all took a toll. Performance has rebounded somewhat in recent quarters as policy tightening slowed and the market's forward rate expectations retreated.

- The JPM EMBI Global Diversified and (corporate) CEMBI Broad Diversified indexes continued rallying in 1Q, up 1.9% and 2.2%, respectively. Returns were supported by falling benchmark yields, although spreads widened due to the sharp repricing of US debt.
- Yields have risen around 320 bps and 270 bps since late-2021, respectively, for sovereign and corporate bonds. EM debt yields have been pushed higher by the underlying move in Treasury yields, which have risen as growth and inflation forced the Fed to hike its target rate by 475 bps and signal that more tightening may be appropriate in 2023.
- Spreads on EM sovereign debt widened in 1Q and remain elevated at the 94th percentile. Corporate spreads have also expanded recently and are at their 75th percentile.
- Sovereign spreads look elevated from a historical perspective but events in 2022 highlight some of the unique risk factors for the asset class. In February, Russia invaded Ukraine, and EM index providers responded to the uninvestible nature of Russian assets by eliminating them from many indexes. The benchmark JPM EMBI GD Index saw its 3% weight for Russian bonds written down to zero, while debt from Ukraine and surrounding countries also plunged.
- More broadly, EM debt index stats disguise wide variation in underlying fiscal health across borrowers. For example, the main EM sovereign index includes a number of CCC/CC-rated borrowers (Argentina, Ukraine, Sri Lanka, etc.) whose optically cheap debt will only prove attractive if coupons and principal payments are repaid.
- About 50% of the sovereign index has an investment-grade rating, which is similar for corporates. The wide dispersion of fundamentals and possible political outcomes suggests an active management approach to these assets may generate more successful outcomes.

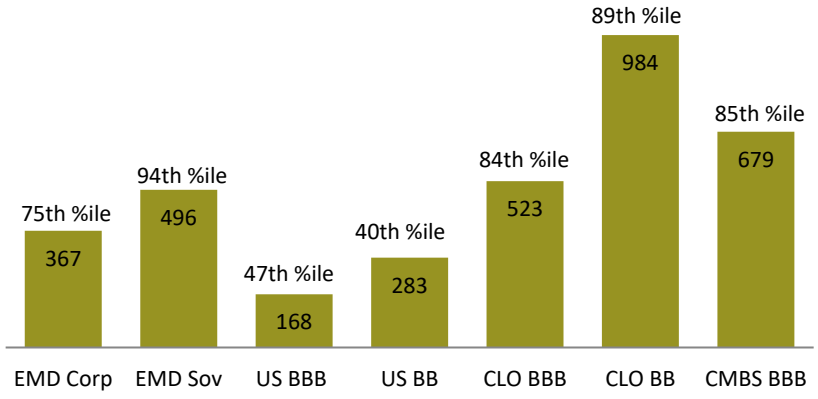
PERCENTILE RANK: USD EM DEBT

As of Mar 31, 2023 (Based on Post-2003 Data)



PERCENTILE RANK: OPTION-ADJUSTED SPREAD

As of Mar 31, 2023



Sources: Bloomberg Index Services Limited, J.P. Morgan Securities, Inc. and Thomson Reuters Datastream.
Notes: Composite Valuation Indicator is the average of YTM percentile and spread percentile. Asset classes represented by J.P. Morgan Emerging Market Bond Index (EMD Sov), J.P. Morgan Corporate Emerging Markets Bond Index (EMD Corp), Bloomberg US Corporate Investment Grade BBB Index (US BBB), Bloomberg US High Yield BB Index (US BB), J.P. Morgan CLOIE BBB Index (CLO BBB), J.P. Morgan CLOIE BB Index (CLO BB), and Bloomberg US CMBS Baa Index (CMBS BBB).

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Local Currency Emerging Markets Debt

Facts & Figures First Quarter 2023

Local currency EM debt returned 2.9% in LC terms in 1Q 2023, with firmer EM currencies delivering a return of 5.2% in USD terms. The asset class has faced several headwinds during 2022 including slowing global growth, elevated domestic inflation, and rising DM bond yields. Each of these factors has moderated to some extent in recent months leading to this bounce in performance. Overall, moderating inflation should see improved LC returns in 2023, while the USD is unlikely to strengthen as it did in 2022.

- EM local currency bond yields rose in 2022 as rising inflation in many emerging markets caused domestic central banks to raise rates aggressively. Additionally, the move higher in core government bond yields lessened the relative attractiveness of EM local bonds yields, resulting in outflows that added to the upward pressure on yields. Inflation now appears to have peaked in EM, and with DM yields declining in recent months, both factors have been more supportive.

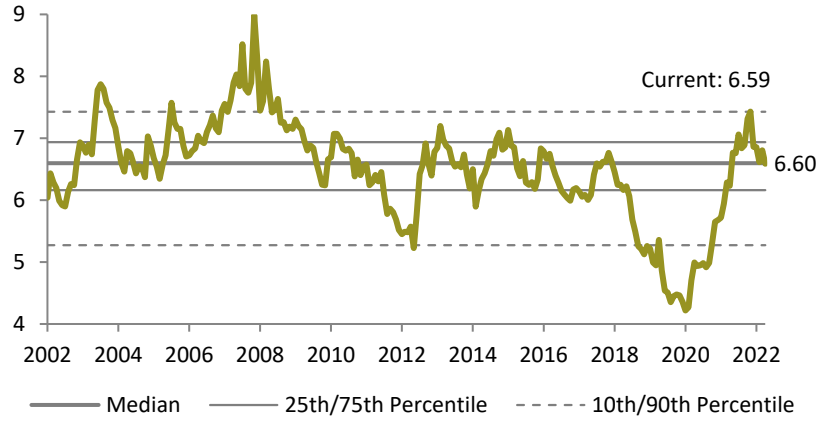
- EM currencies are highly sensitive to global growth prospects. Therefore, impairment of global supply chains and recent fears of an economic slowdown have proved headwinds. Since bottoming toward the end of last year at 2.1%, consensus global growth for this year has since picked up to 2.4%. This process has been aided by the lifting of COVID restrictions in China, which has particularly helped sentiment in emerging markets given the importance of China to the group.

- EM-LC bond yields declined by 27 bps during the quarter, bringing the total decline since the October peak in yields to 84 bps. As a result, yields now sit around the 50th percentile of historical observations. EM currencies are likely to remain the larger driver of returns for unhedged investors. In that regard the asset class remains modestly valued, with the REER of EM fixed-income-weighted currencies having bounced modestly, to the 14th percentile.

- EM currencies will likely remain under pressure in the short term if a steep global economic downturn eventuates. However, with headwinds from domestic inflation, DM bond yields and a steeply appreciating dollar abating, medium-term returns for the asset class look likely to be improved. The level of dispersion between the underlying countries suggests there are opportunities for active managers with broad mandates to add value.

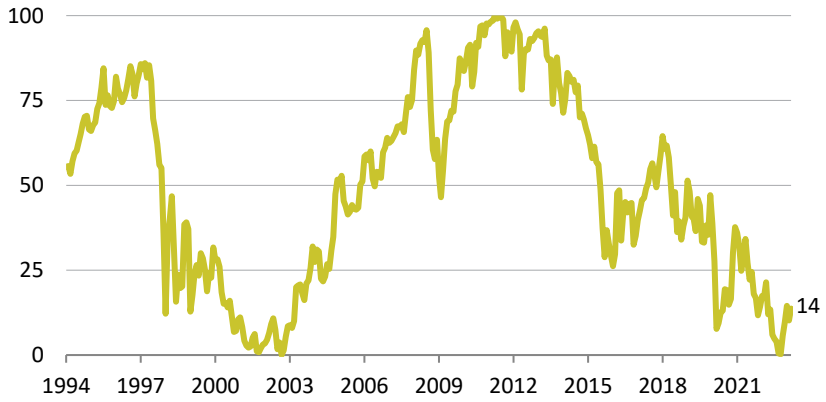
NOMINAL YIELD: JPM GBI-EM GLOBAL DIVERSIFIED INDEX

Dec 31, 2002 – Mar 31, 2023



FI-WEIGHTED EM REAL EXCHANGE RATE VS US: PERCENTILE

Jan 31, 1994 – Mar 31, 2023



Sources: Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Taiwan; INE - National Institute of Statistics, Chile; International Monetary Fund; J.P. Morgan Securities, Inc.; MSCI Inc.; National Bureau of Statistics of China; Thomson Reuters Datastream; and US Department of Labor - Bureau of Labor Statistics. MSCI data provided "as is" without any express or implied warranties.

C|A

PRIVATE EQUITY/VENTURE CAPITAL

CAMBRIDGE ASSOCIATES

US Private Equity

Facts & Figures First Quarter 2023

US PE returns were negative YTD through 3Q 2022 (-5.5%), according to the Cambridge Associates US Private Equity Index, as the public market downturn spilled over to privates. However, US PE handily outperformed public markets over all trailing time periods, with recent outperformance boosted by public market volatility. Fundraising and deal activity were strong in 2022 following a record-setting 2021, whereas exit activity saw a precipitous slowdown in 2H 2022.

- Fundraising remained robust in 2022, bolstered by larger fund sizes as the total number of fund closes declined. The $361B raised during the year marked a new high, exceeding 2021's haul of $355B, according to PitchBook. Median fund size swelled 65% to $140M—the highest in more than a decade—while the number of funds closed (489) was the lowest since 2018. US PE managers secured a hefty 75% of capital raised globally, which is 13 ppts more than their share in 2021. That share was the highest since 1999 and materially higher than during the decade ended in 2021 (57%).

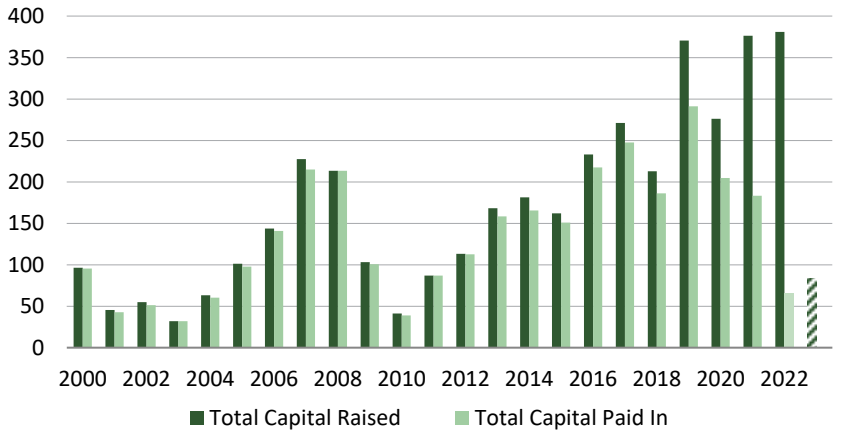
- Deal activity was healthy in 2022 following the prior year's torrid pace. According to PitchBook, capital invested across US buyout and growth equity deals totaled $516B, compared to a near-record $559B deployed in 2021 and a trailing five-year average of around $380B. Notably for LPs, capital calls during 1H 2022 outpaced distributions for only the second time in the past ten years. Information technology companies attracted 43% of investment in 2022, nearly double the trailing five-year average share of 23%. Healthcare accounted for just 10%.

- According to PichBook LCD data, purchase price multiples (PPMs) for buyout transactions have climbed since 2009, hitting a high of 11.9x in 2022. Leverage held steady since 2017 and reached 5.8X EBITDA in 2022. Average equity contributions for large company transactions held steady at 46% in 2022, which remains elevated relative to the longer-term average equity contribution of 37%.

- Exit activity slowed in 2H 2022, with PE-backed IPOs grinding to a halt, according to PitchBook. Overall, the exit environment in 2022 was the weakest in a decade, with total exit value at roughly 75% its pre-2021 five-year average. M&A is the preferred PE-backed exit route; IPOs made up roughly 20% of exit value over the past five years, on average.

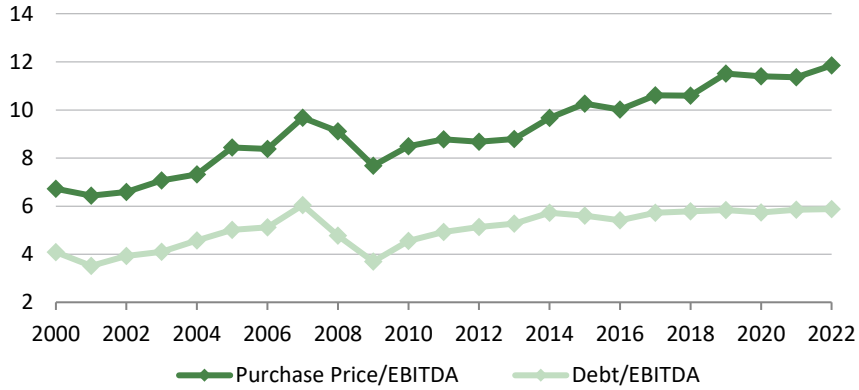
FUNDRAISING AND PAID-IN CAPITAL: US PE

Vintage Years 2000–23 (Mar 31) • US$B



AVERAGE PURCHASE PRICE AND DEBT MULTIPLES: US PE

2000–22 (Dec 31)



Sources: Cambridge Associates LLC, Morningstar, Inc. LCD and PitchBook.

Note: Historical fundraising and paid-in capital data revise.

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US Venture Capital

Facts & Figures First Quarter 2023

US VC returns were negative YTD through 3Q 2022 (-15.0%), according to the Cambridge Associates US Venture Capital Index, as the public market downturn spilled over to privates. However, US VC outperformed public markets over most trailing time periods, save for the 20-year horizon versus the Nasdaq Composite. While the macro environment has weighed on returns, fundraising, deal, and exit activity also slowed precipitously as 2022 progressed.

- US VC funds raised a record amount of capital in 2022, according to PitchBook, driven by increasing fund sizes. The $172B closed during the year surpassed 2021's prior record-setting haul of $158B, although the pace slowed significantly in 2H 2022. Fund sizes in 2022 averaged a record $216M, nearly double the average over the prior ten years. US funds attracted 61% of global VC capital committed in 2022, which was the highest share since 2007. For the decade ended in 2021, US VC accounted for just 32% of global fundraising flows.

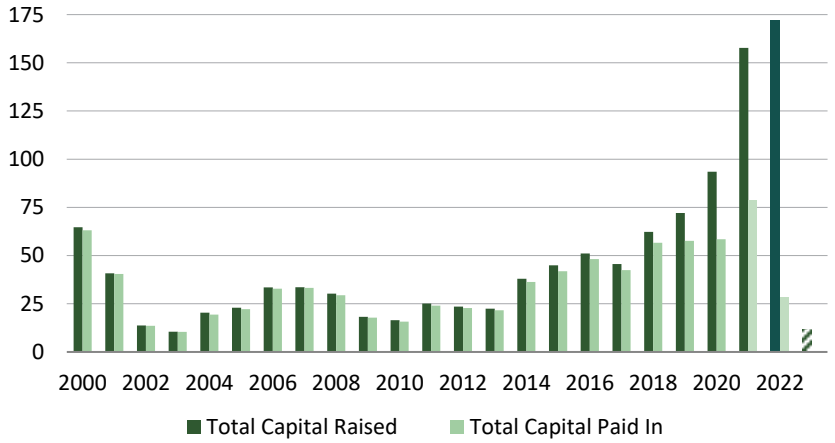
- US VC deal activity reached $250B in 2022, the second-highest pace following 2021's record of $352B. But deal activity slowed in 2H 2022, with the $42B of deployed capital in 4Q 2022 the lowest in three years. Two-thirds of 2022's deal activity was concentrated in the information technology and healthcare sectors, roughly in-line with their trailing five-year average share.

- Later-stage US VC valuations cooled in 2022, but earlier round valuations continued climbing to new highs. Median valuations for series D+ deals declined for the first time since 2016 but remained 2.3x more than 2019's pre-pandemic level. Series C valuations fell for the first time since 2012 but remained historically elevated. Though still early, valuations fell steeply in 1Q 2023. Technology sector deals have been the primary driver of the upswing in valuations in recent years.

- Exit activity slowed sharply, with total exit value of just $71B falling below $100B for the first time since 2016, according to PitchBook. This follows extraordinary IPO activity in 2021 when 300 public listings accounted for $638B in exit value, compared to a prior ten-year average of roughly $80B per year. In contrast, there were only 14 public listings in 4Q 2022. Although M&A and buyouts typically dominate by number of deals, they are historically just a fraction of IPO exit value.

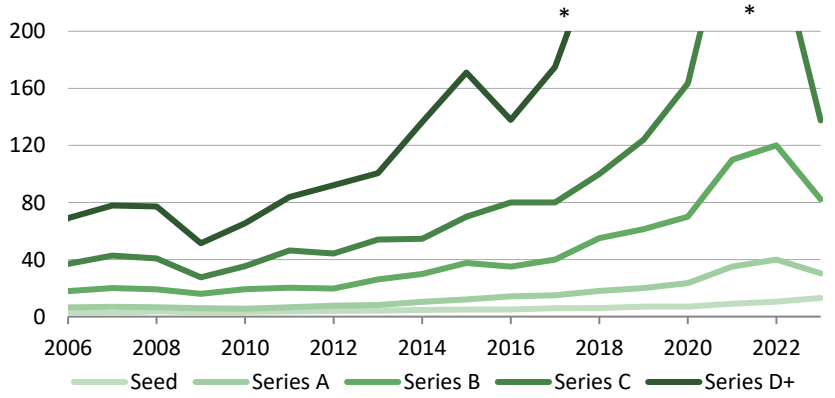
FUNDRAISING AND PAID-IN CAPITAL: US VC

Vintage Years 2000–23 (Mar 31) • U$B



MEDIAN PRE-MONEY VALUATIONS BY SERIES: US VC

2006–23 (Mar 31) • U$M



* Y-axis capped for scale purposes. Latest value for Series D+ is 250.

Sources: Cambridge Associates LLC and PitchBook.

Note: Historical data revise.

European Private Equity

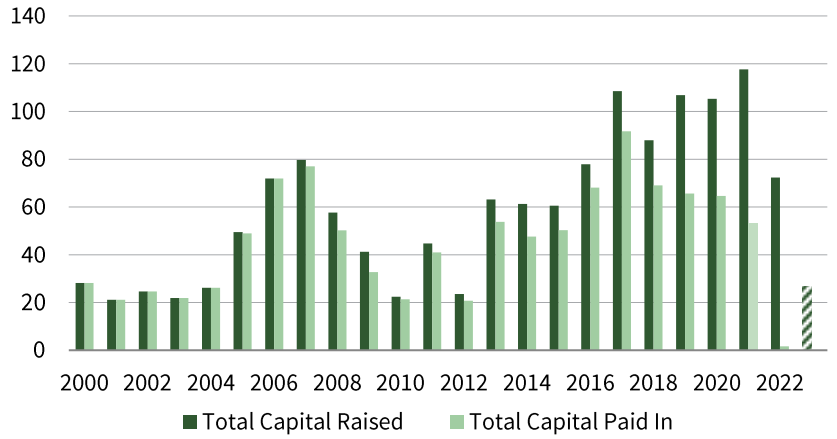
Facts & Figures First Quarter 2023

European PE returns were negative in USD terms YTD through 3Q 2022 (-15.3%), according to Cambridge Associates data, due in large part to the strength of the dollar. Performance held up better in EUR terms (-1.7%) but was still the lowest since early 2020. Longer-horizon European PE returns remain solidly in double-digit territory and have outperformed public markets over all trailing periods. While European PE fundraising and exits slowed in 2022, the pace of deal activity held up amid falling entry valuations.

- European PE fundraising slowed to €63B in 2022, which was the weakest haul since 2015, according to PitchBook. This low level of capital raised was concentrated in fewer funds. Median fund sizes increased more than 30% to a record €250M as the number of funds closed fell to the lowest since 2005. Among all PE funds globally, European funds attracted just 14% of capital raised, which was down roughly 10 ppts from their share in the decade ending 2021 (23%).
- Investment activity directed at European-based targets was healthy in 2022 after soaring in 2021. According to PitchBook, deal value amounted to €595B last year, compared to a record €728B in 2021. Activity in 2022 outpaced the pre-2021 five-year average (€445B.) Among sectors, information technology comprised 20% of deal value in 2022, as activity in the space has steadily risen over the past decade.
- According to PitchBook LCD, purchase price multiples (PPMs) declined in 2022 to 10.7x EBITDA, roughly two turns off their peak in 2020. The PPMs were the lowest since 2017, but in-line with their trailing ten-year average. Leverage multiples have inched up gradually since 2016, holding steady at 5.9x EBITDA in 2022. Leverage continues to trail the high reached in 2007. Equity contributions to leveraged buyouts declined to 44%, their lowest since 2015. This is down from 52% in 2020 and 3 ppts below the trailing ten-year average.
- Exit activity slowed in 2022 as IPOs stalled but M&A persisted. According to PitchBook, total exit value of €200B in 2022 was the lowest since 2013 and down from 2021's record of €390B. Indeed, 2H 2022 marked the weakest two-quarter period for exits since at least 2012. IPOs surged in 2021, but dried up in 2022, with their share of total exit value falling to the lowest level (6%) in the past decade.

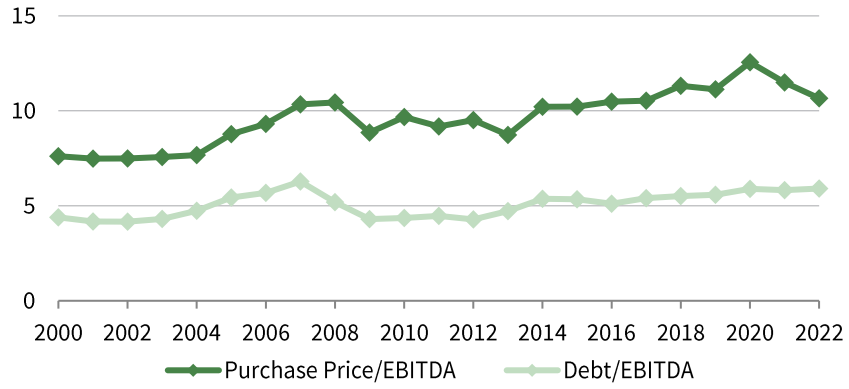
FUNDRAISING AND PAID-IN CAPITAL: EUROPEAN PE

Vintage Years 2000–23 (Mar 31) • Euro (Billions)



AVERAGE PURCHASE PRICE AND DEBT MULTIPLES: EUROPEAN PE

2000–22 (Dec 31)



Sources: Cambridge Associates LLC, Morningstar, Inc. LCD and PitchBook.

Note: Historical fundraising and paid-in capital data revise.

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European Venture Capital

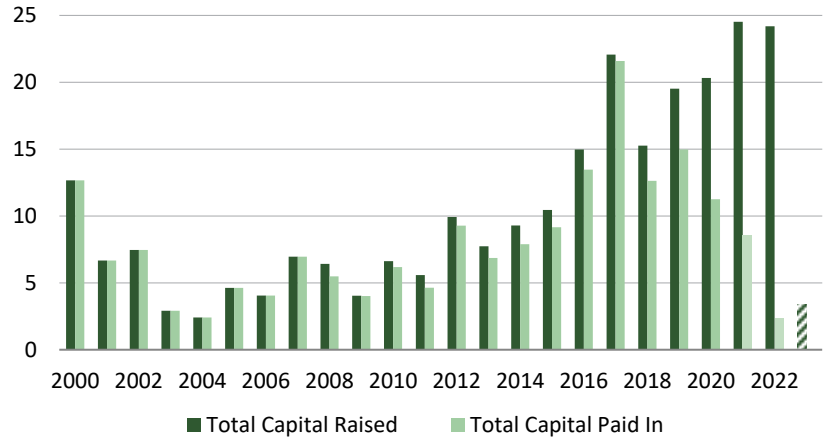
Facts & Figures First Quarter 2023

European VC returns were negative in EUR terms YTD through 3Q 2022 (-6.0%), according to Cambridge Associates data. However, the negative rate was more than 3x worse in USD terms (-19.0%) as the dollar appreciated. Longer-horizon European VC returns remained solidly in double-digit territory, outperforming public markets over all trailing periods. Activity was solid in 2022, though signs of moderation appeared in the second half of the year.

- European VC funds raised €24B of fresh capital in 2022, according to PitchBook. That total nearly matched 2021's record of €25B, and modestly eclipsed 2017's haul. Larger fund sizes drove the increase in activity as the number of fund closes fell to the lowest since 2013. The average fund size of €137M matched the prior record in 2017. Among all VC funds globally, European managers secured 9% of all capital raised in 2022, which is in-line with recent averages.
- Deal activity of €92B in 2022 remained robust after surging to record highs in 2021 (€109B), according to PitchBook. Still, some signs of moderation emerged in 2H. Software accounted for nearly 40% of deal flow in 2022, which marked a new high after steadily trending upwards since the mid-2000s.
- Valuations for seed- and early-stage companies have increased gradually since 2012 and continued doing so in 2022. The increases in median later-stage valuations (Series C and D+) have been more dramatic; they jumped nearly €7M over the past five years, hitting a record in 2022. The drivers were some very large financing rounds (evidenced by the difference between the median of €14M and the average of €118M).
- Exit activity slowed to €38B in 2022 after surging to a record in 2021 (€138B). Still, exit values were elevated compared to the pre-2021 five-year average of €25B. But exit activity has slowed considerably in recent quarters to more normal levels. IPO activity was exceptional in 2021, hitting €107B in value, a ten-fold increase over 2020. IPO activity was solid in 2022 at €13B, in-line with the pre-2021 five-year average. However, the IPO share of total exit value (35%) was tracking lower than pre-2021 five-year average.

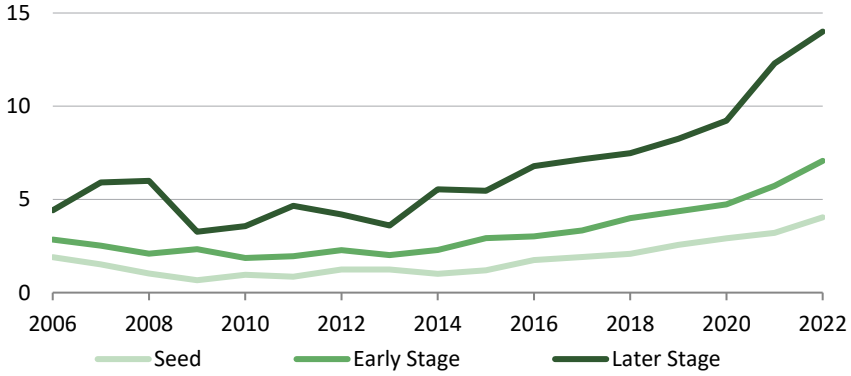
FUNDRAISING AND PAID-IN CAPITAL: EUROPEAN VC

Vintage Years 2000–23 (Mar 31) • Euro (Billions)



MEDIAN PRE-MONEY VALUATIONS BY STAGE: EUROPEAN VC

2006–22 (Dec 31) • Euro (Millions)



Sources: Cambridge Associates LLC and PitchBook.

Notes: Valuations are shown by stage (as defined by PitchBook) rather than by series due to small sample sizes. Historical fundraising and paid-in capital data revise.

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Asian Private Equity

Facts & Figures First Quarter 2023

Asian PE returns were negative in USD terms YTD through 3Q 2022 (-10.6%), according to Cambridge Associates data. However, longer-horizon returns remained solidly in double-digit territory, besting public markets over all trailing periods. More recent outperformance has been particularly strong, magnified by public market volatility. Although activity in 2022 was solid, annual fundraising totals continued falling and investment activity slowed in the second half of the year.

- Asian PE funds raised $39B in 2022, as fundraising totals declined for a fourth straight year, according to PitchBook. Capital raised in 2022 was the lowest since 2017, and well below the ten-year average ($60B.) The number of funds closed in 2022 fell by roughly 60% compared to the ten-year average, meaning that the median fund size ($195M) hit a fresh record. Among all PE funds globally, Asian PE funds secured 8.3% of capital raised in 2022. That share is lower than the region's global share during the decade ending in 2021 (17%).

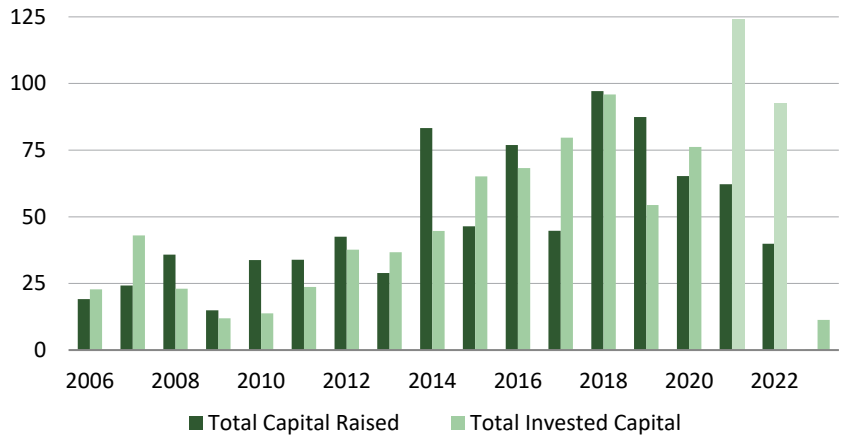
- Deal activity remained solid in 2022, with $141B of capital invested in Asia-based targets, according to PitchBook. This follow's 2021's record of $159B, and was more than the pre-2021 five-year average of around $100B. However, deal activity slowed as the year progressed, with capital invested during 4Q the lowest in more than three years. According to PitchBook, Australian-based targets received 30% of deal flow in 2022, followed by China (26%) and India (10%). In recent years, India and other Asia Pacific countries have been taking investment share from China, Japan, and South Korea.

- Buyout strategies are more prevalent than growth in Australia, Korea, and Japan, while the reverse has been true in China. Regardless of strategy, leverage has historically been modest or low, while valuations, especially in growth sectors, have been as high as those in other regions.

- Exit activity held up well in 2022 after surging nearly four-fold in 2021, according to Dealogic. Although overall exit values were down ($103B vs $130B), they were well above pre-2021 levels. M&A activity accounted for a record 97% of exits in 2022 as IPOs faltered. M&A has been the typical exit path for PE-backed companies in Asia.

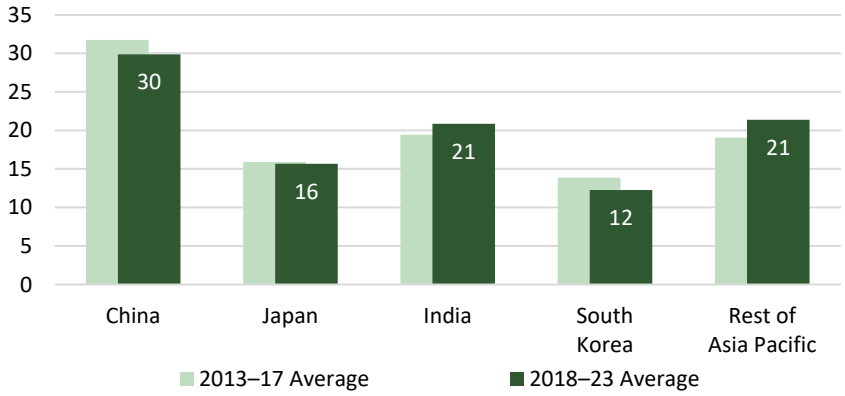
FUNDRAISING AND INVESTED CAPITAL: ASIA PE

2006–23 (Mar 31) • US$B



PERCENT (%) OF INVESTED CAPITAL BY COUNTRY OF TARGET COMPANY

As of December 31, 2022



Source: PitchBook.

Note: Total Capital Raised does not include Softbank Vision funds. For the top chart, invested capital includes deals where the investor is an Asia-based PE fund. For the bottom chart, invested capital includes PE deals where the target company is headquartered in Asia; data may not sum to 100 due to rounding. Historical data revise.

Asian Venture Capital

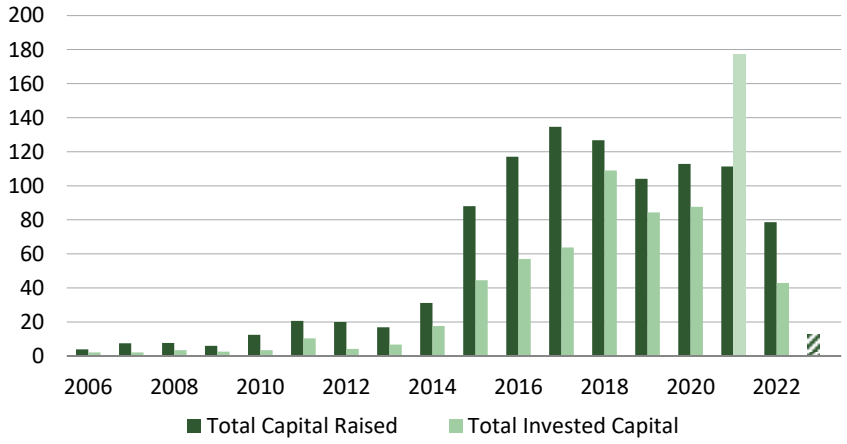
Facts & Figures First Quarter 2023

Asian VC performance turned negative starting in 2H 2021 and returned -11.4% in USD terms in the four quarters ended 3Q 2022, according to Cambridge Associates data. This was the longest quarterly losing streak since the early 2000s. Still, Asia VC returns remained solidly in double-digit territory over longer horizons, handily outperforming public markets in all trailing time periods. Activity showed signs of slowing in in 2022 and valuations for later-stage funding rounds fell sharply.

- Asian VC funds raised $70B in 2022, following $114B of capital raised in 2021. 2022 was the lowest fundraising year since 2014, and roughly 550 funds closed. This pushed average fund size to $130M, which marks an all-time high. Among all VC funds globally, Asian funds secured 25% of all capital raised in 2022. That share is down considerably from the decade ended in 2021 (55%).
- Deal activity was strong in 2022 after 2021's record year. Global investors allocated $135B to Asia-based venture companies in 2022, which is down from $227B in 2021, but well above the pre-2021 five-year average ($117B). Asian VC managers themselves invested just $43B in 2022, which is down from $177B the year prior. Notably, the investment pace by Asian VC managers in 2H 2022 was the lowest second half of a calendar year since 2013. Chinese-based companies received 52% of invested capital in 2022, followed by India, Singapore, and Korea. Information technology accounted for more one-third of deal activity.
- Median pre-money valuations fell in 2022 across later-stage VC deals but continued climbing at the seed and early-stage rounds. Later-stage valuations, which are most impacted by public markets, contracted the most on record (-$21M) and are now back to 2016 levels. Consumer and IT valuations increased in 2022, whereas health care valuations fell. These three sectors have historically dominated the Asia VC landscape.
- Exit activity slowed to $45B 2022. Although this exit value was down from 2021's record of around $105B, activity for the year was in-line with pre-2021 averages. IPO's accounted for almost 90% of all exit value in 2022, which is elevated relative to the five-year average. The exit outlook appears tenuous, however, given weak public market performance and falling valuations among later stage companies.

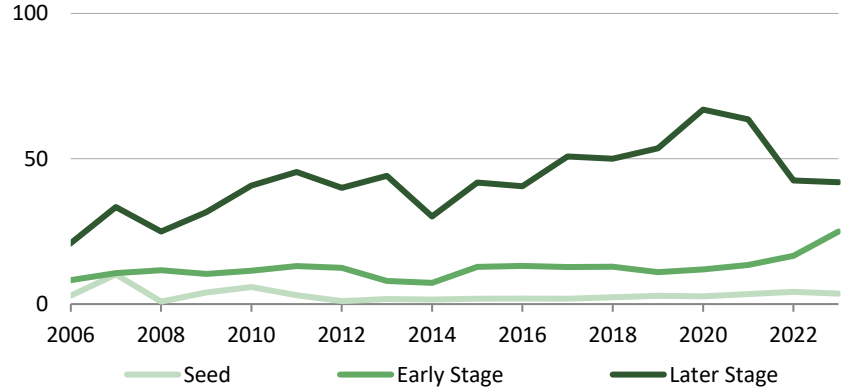
FUNDRAISING AND INVESTED CAPITAL: ASIA VC

2006–23 (Mar 31) • U$B



MEDIAN PRE-MONEY VALUATIONS BY STAGE: ASIA VC

2006–23 (Mar 31) • U$M



Source: PitchBook.

Notes: Total Capital Raised does not include Softbank Vision funds. Invested capital includes deals where the investor is an Asia-based VC fund. Valuations are shown by stage (as defined by PitchBook) rather than by series, due to small sample sizes. Historical data revise.

REAL ASSETS

CAMBRIDGE ASSOCIATES

Developed Markets Property Securities

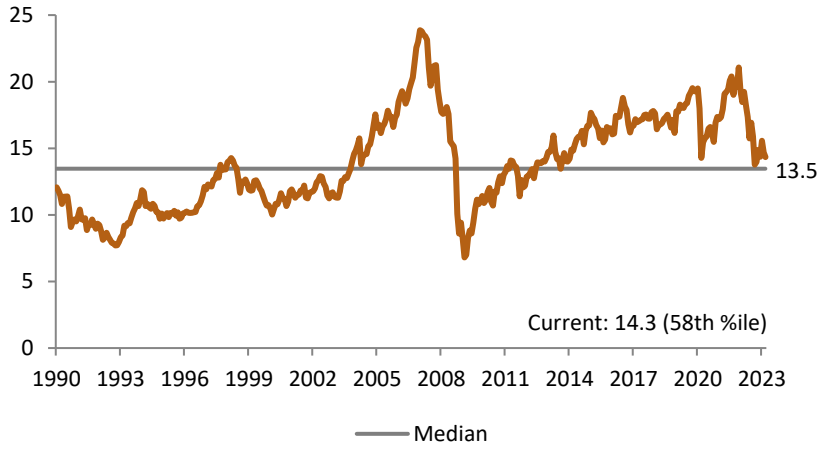
Facts & Figures First Quarter 2023

DM property securities returned 1.0% in 1Q and -20.6% over the past 12-months, in USD terms. The asset class's poor performance over the past year is consistent with the performance of the broader equity market, which has struggled amid tight monetary policy and recession concerns. Property has had to confront changes with consumer and business behaviors resulting from the pandemic. Positive performance in 1Q was aided by an overall increase in risk assets. However, DM property securities underperformed broad DM equities by 669 bps.

- DM property securities trade at 14.3x normalized funds from operations which is higher than 58% of historical data going back to 1990. Furthermore, property securities offer a yield spread over government bonds of 1.6%, close to the long-term median of 1.8%. Although still below the long-term median, spreads did widen notably in March with the backup in government bond yields.
- The global economy is expected to grow by 2.4% in 2023 and 2.8% in 2024, according to analysts surveyed by Bloomberg in March. Developed markets growth expectations for 2023 are highest for Japan (1.1%) and the US (1.0%). However, growth in the Eurozone (0.5%) and the UK (-0.4%) are expected to be more subdued.
- A key concern for property investors is the pandemic's long-term impact on consumer and business preferences. For instance, while operating profit figures of broad DM property securities have recovered from the pandemic, offices are down 34% since 2019. Conversely, other sectors, such as healthcare and diversified REITs, have fared far better growing operating profits double-digits.
- Real estate is a capital-intensive business, which uses debt to finance its growth to a greater degree than other sectors. Still, developed property securities' leverage has fallen since the GFC, with net debt as a percentage of total assets at 39% at the end of 1Q relative to the 42% at the beginning of 2010. The current level of leverage is below the average over the last two decades and reflects more discipline in capital markets.

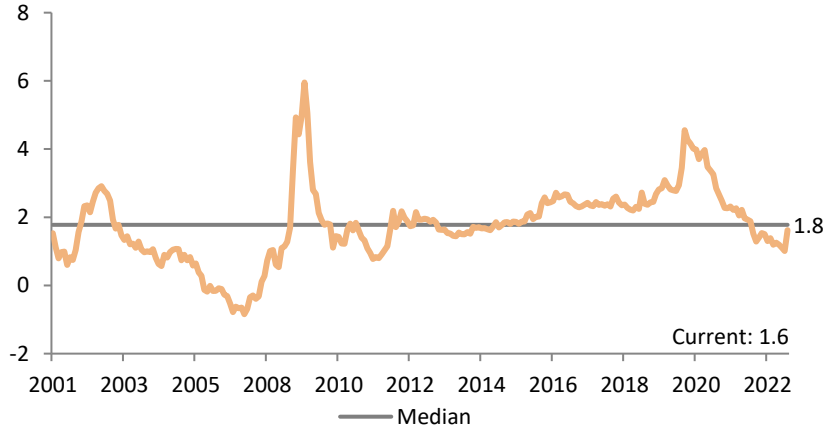
NORMALIZED PRICE-TO–FUNDS FROM OPERATIONS MULTIPLE

Jan 31, 1990 – Mar 31, 2023



SPREAD BETWEEN DY AND GLOBAL GOVT BONDS

Oct 31, 2001 – Mar 31, 2023



Sources: EPRA, FTSE International Limited, J.P. Morgan Securities, Inc., National Association of Real Estate Investment Trusts, and Thomson Reuters Datastream.

C|A

US Private Property

Facts & Figures First Quarter 2023

US property returned 8.1% annualized over the last three-year period at the asset level, according to NCREIF Property Index data as of 4Q. That return masks considerable sector dispersion, with industrial properties returning 22.4% annualized over the same three-year period, while retail and offices returned -0.3% and 1.4%, respectively. Part of that dispersion reflects the pandemic's impact on consumers, which hastened the long-standing shift away from some brick-and-mortar retail to online. Employees also continue to avail themselves of the pandemic era accommodation to work-from-home, resulting in weakening fundamentals for offices.

- Capitalization rates, or cap rates, have steadily fallen since the end of the GFC and are now at low levels relative to history. Across sectors, cap rates are lowest within industrial (3.7%) and apartments (3.4%) and highest within office (4.7%) and retail (5.2%). The recent rise in US rates and the expectation for tightening lending conditions, especially after the recent banking turmoil, has begun to put pressure on property markets in the coming quarters.

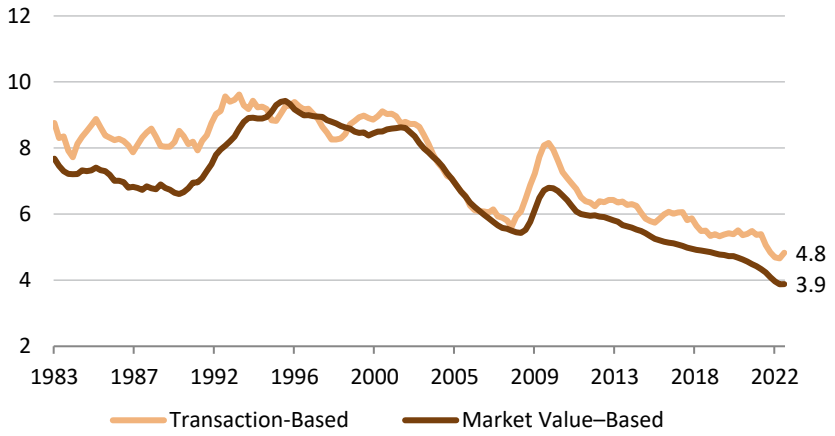
- Macroeconomic uncertainty slowed net operating income growth at an aggregate level, increasing by 7.5% in the last four quarters; a lower growth rate than the prior five periods. Office and retail saw the slowest four-quarter growth at 3.7% and 4.6%, respectively, while secular drivers continued to support industrial property growth at 12.0%.

- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. These forecasts are tepid compared to 2022 (3.4%), due to the ongoing inflationary pressures and tighter monetary policies. Growth expectations for 2023 are highest for China (5.3%), followed by Asia ex Japan (5.1%). Expectations for growth from all other major markets are more moderate, ranging between -0.4%–1.1%.

- New commercial real estate construction collapsed following the GFC, and, while it has been minimal for most of this cycle, construction has picked up in recent years. As of 4Q, commercial construction accounted for 1.24% of US GDP, slightly higher than the average level since 2000 (1.05%). Within sectors, higher-than-normal levels of construction are occurring in industrial, with retail experiencing a lower-than-normal level of construction.

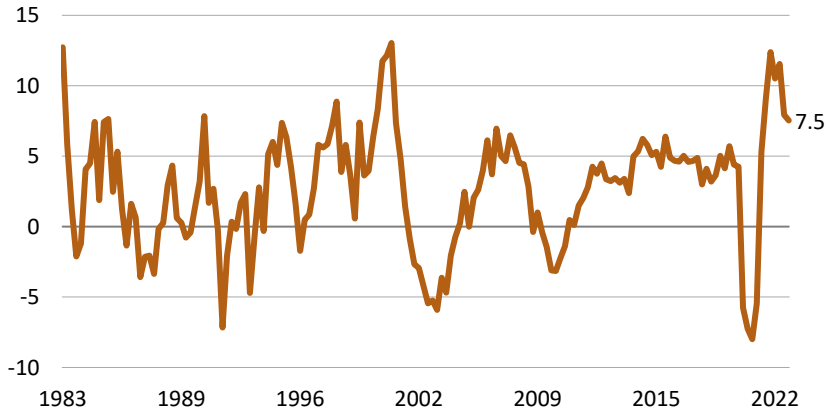
ALL PROPERTY CAP RATES

Second Quarter 1983 – Fourth Quarter 2022 • Percent (%)



FOUR-QUARTER ROLLING NOI GROWTH

First Quarter 1983 – Fourth Quarter 2022 • Percent (%)



Source: National Council of Real Estate Investment Fiduciaries.

UK Private Property

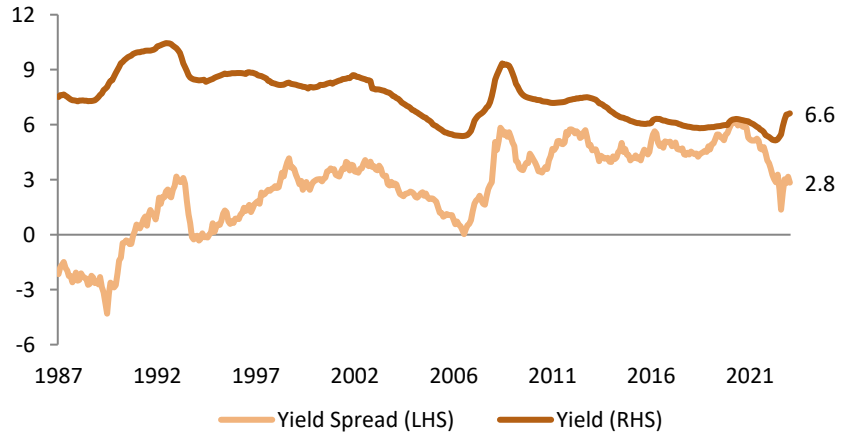
Facts & Figures First Quarter 2023

UK private property returned 1.1% annually over the last three-year period at the asset level, according to the unlevered MSCI UK Quarterly Property Index as of 4Q in GBP terms. Returns are markedly lower as monetary tightening in the economy takes hold. Industrial performance was strong at 8.4% , but nearly half the levels seen in 3Q, and all other sectors posted negative mid single digit returns.

- After dipping to a low of 5.1% in 2022, yields across all UK investment properties increased to 6.6% as the BOE continued hiking rates and the economic outlook softened. According to data from the UK government, non-residential monthly transactions are down 7% YOY on a seasonally adjusted basis, but it should be noted that transactions are up ~20% from 2013. Ongoing economic concerns and higher government yields may mean transaction activity continues to slow in 2023.
- Property yields can be sensitive to changes in government rates. As government rates have increased, property's yield spread over those rates has fallen from 4.5 ppts to 2.8. The current spread is lower than the ten-year average (4.6 ppts), which suggests the asset class's attractiveness relative to gilts has declined in recent quarters.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. These forecasts are tepid compared to 2022 (3.3%), due to the ongoing inflationary pressures and tighter monetary policies. Growth expectations for 2023 are highest for China (5.3%), followed by Asia ex Japan (5.1%). Expectations for growth from all other major markets are more moderate, ranging between -0.4–1.1%.
- As of the end of 2021, the UK commercial real estate market is estimated to be roughly $850B, according to MSCI Real Estate. It is the largest market in Europe and is followed by Germany's roughly $712B market. The UK commercial real estate market is composed primarily of retail, office, and industrial properties, with the industrial sector being the largest sector in the country.

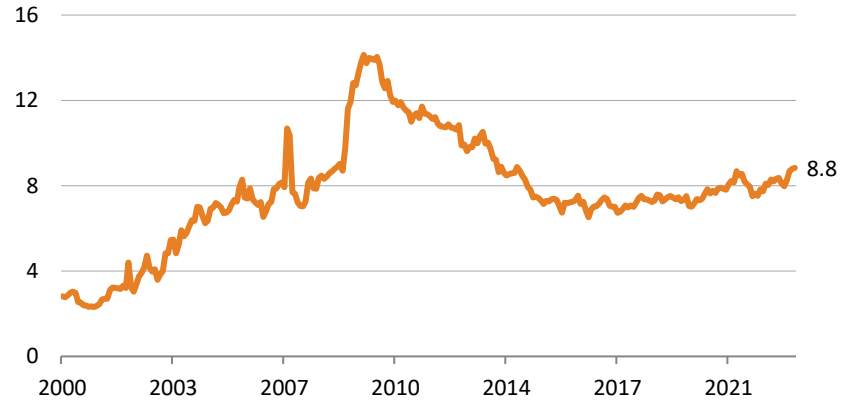
ALL PROPERTY EQUIVALENT YIELDS AND SPREADS

Dec 31, 1987 – Feb 28, 2023 • Percent (%)



VACANCY RATE

Jan 31, 2000 – Feb 28, 2023 • Percent (%)



Sources: MSCI Real Estate and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: The MSCI Real Estate index measures returns to direct investment in commercial property. Initial yield is current net income divided by gross capital value.

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Europe ex UK Private Property

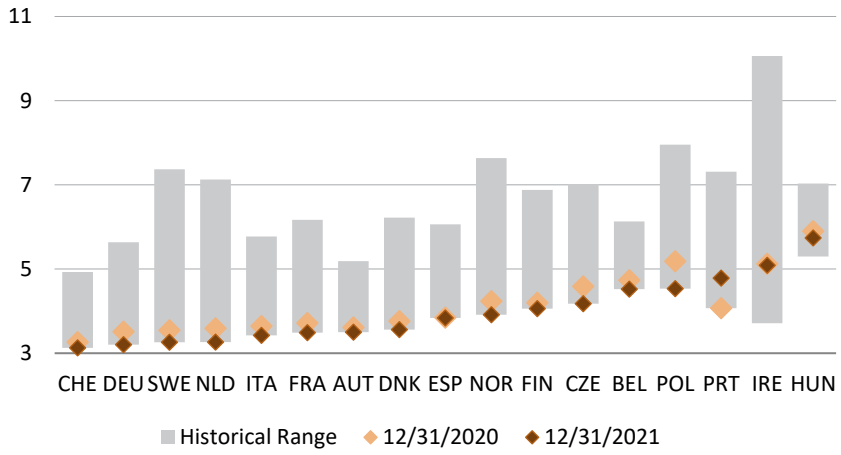
Facts & Figures First Quarter 2023

Continental property returned 3.2% annually over the last three-year period at the asset level, according to the unlevered MSCI Global Property Fund Index data as of 3Q 2022 in LC terms. At a sector level, industrial (6.3%) and residential (2.2%) properties fared well, while the retail sector disappointed (-0.3%). But the sector faces challenges, including the impact of higher interest rates and tighter lending conditions.

- Property yields across most European countries have steadily decreased over the last decade. Top markets, such as Germany and France, have property yields near the lowest level for which data are available, according to MSCI Real Estate. But it seems reasonable to expect property yields to come under some pressure, given the increase in sovereign yields recently.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. These forecasts are tepid compared to 2022 (3.3%), due to the ongoing inflationary pressures and tighter monetary policies. Growth expectations for 2023 are highest for China (5.3%), followed by Asia ex Japan (5.1%). Expectations for growth from all other major markets are more moderate, ranging between -0.4–1.1%.
- Rising interest rates and economic uncertainty drove transaction volumes in Europe down 18% to €305B in 2022, according to CBRE. 4Q volumes decelerated by 58%, compared to down 30% in 3Q. The Office sector saw the largest decline, down by 15% YOY, while retail was the strongest up 20% YOY. Of the top seven countries in the region Sweden and Germany saw the worst declines in investment, down 52% 41% to €15.3B and €65.8B, respectively. Spain posted the highest YOY percentage increase (38%).
- The top two largest commercial real estate investment markets across Europe, excluding the UK, are Germany and France. MSCI estimates the size of all commercial real estate at the end of 2021 in those two markets to be roughly $712B and $513B, respectively. Offices make up a large portion of both Germany and France's commercial real estate markets.

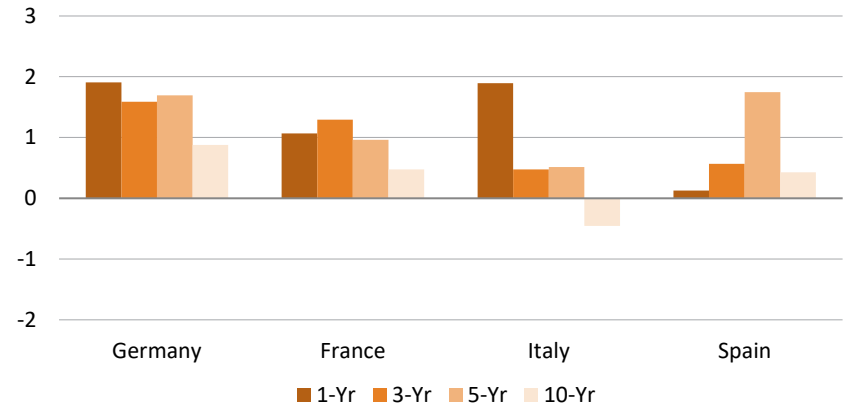
EUROPEAN PROPERTY NET OPERATING INCOME YIELDS

As of Dec 31, 2021 • Percent (%)



ANNUALIZED RENT GROWTH

As of Dec 31, 2021 • Percent (%)



Source: MSCI Real Estate. MSCI data provided "as is" without any express or implied warranties.

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Asian Private Property

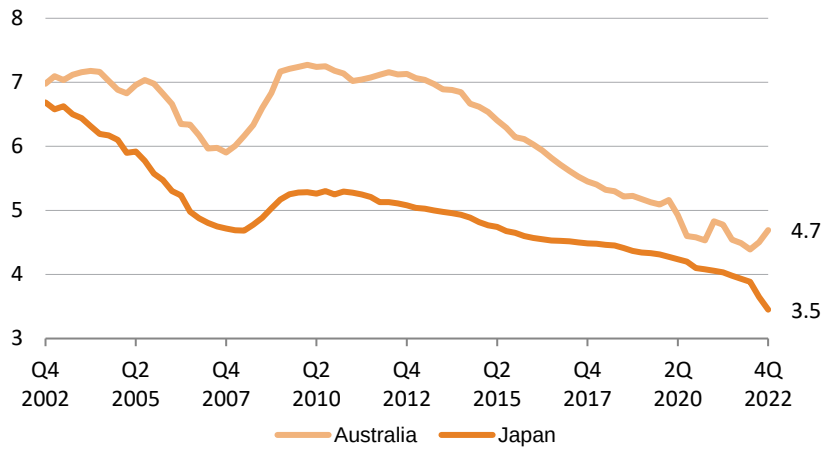
Facts & Figures First Quarter 2023

Asian property returned 5.2% annually over the last three-year period at the asset level, according to MSCI Global Property Fund Index data as of 3Q 2022 in USD terms. At a sector level, industrial and office properties delivered the best results, returning 9.9% and 4.8% annually, respectively, over the same three-year period.

- Property yields in many markets have steadily decreased since the GFC. Two top markets, Australia and Japan, have property yields near or at the lowest level for which data are available, according to MSCI real estate data. Property yields in some countries, such as Australia, may face pressure, given sovereign yields have increased.
- Vacancy rates held mostly steady through the pandemic for many markets. But many properties have multi-year leases, so they make not reflect changed consumer and work life preferences. In some geographies with higher frequency data, higher office and retail vacancy rates have been observed.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. These forecasts are tepid compared to 2022 (3.3%), due to the ongoing inflationary pressures and tighter monetary policies. Growth expectations for 2023 are highest for China (5.3%), followed by Asia ex Japan (5.1%). Expectations for growth from all other major markets are more moderate, ranging between -0.4%–1.1%.
- Asia-Pacific real estate investment volume fell by 19% in 2022 according to CBRE. Tightening liquidity amid higher interest rates resulted in declines of 25% and higher in Australia, Korea and Singapore. Office and Industrial segment saw the strongest growth, while retail lagged.
- Property investors continue to focus on six primary locations in Asia Pacific: China, Japan, Hong Kong, Australia, South Korea, and Singapore, which account for most of the property transactions in the region. The focus as it relates to Asian properties (ex Australia) has been primarily from investors within Asia.

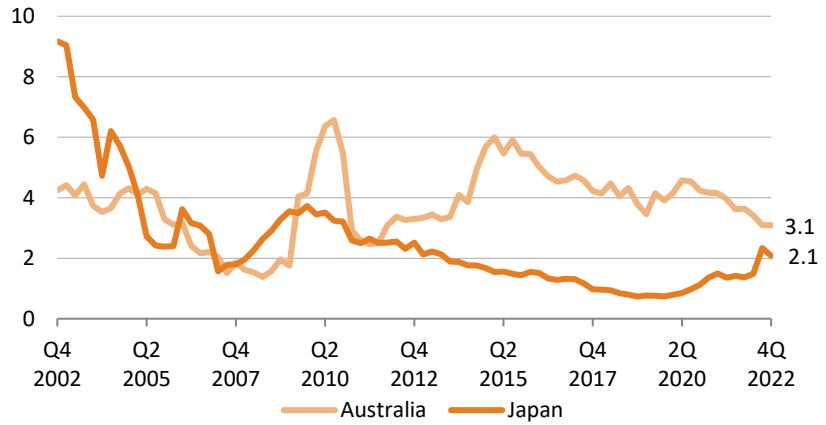
PROPERTY YIELDS

Fourth Quarter 2002 – Fourth Quarter 2022 • Percent (%)



VACANCY RATES

Fourth Quarter 2002 – Fourth Quarter 2022 • Percent (%)



Source: MSCI Real Estate. MSCI data provided "as is" without any express or implied warranties.

Note: Japan third quarter data are as of November 30, 2022.

C|A

Private Infrastructure

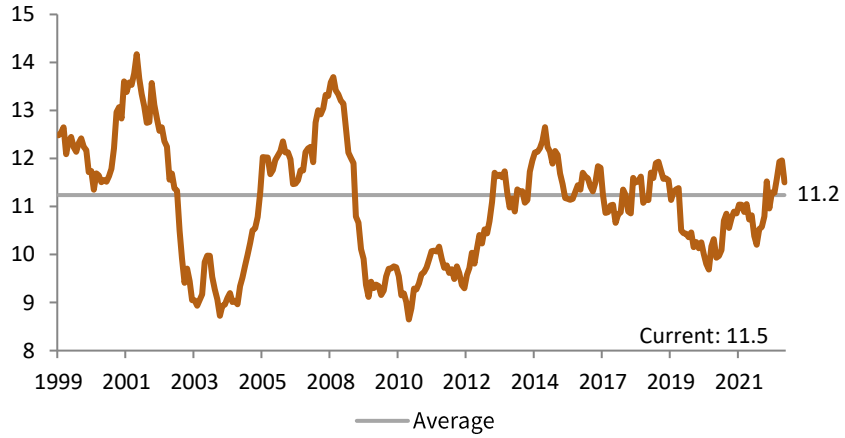
Facts & Figures First Quarter 2023

Private infrastructure returned 10.83% annualized over the last three-year period, according to the Cambridge Associates Infrastructure Index as of 3Q 2022. This index, which calculates horizon internal rates of return, net of fees, expenses, and carried interest, returned 10.68% annualized over the last ten-year period. Developed markets contributed the bulk of the return. The industry benefited from stable demand and increased interest among institutional investors.

- Infrastructure companies transacted at roughly 11.5 times EBITDA over the prior 12-month period on average, which is slightly above the industry's long-term average level. Broadly speaking, institutional investors have been increasingly attracted to brownfield infrastructure investments, as an effort to generate portfolio income and protect against inflation.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. These forecasts are tepid compared to 2022 (3.3%), due to the ongoing inflationary pressures and tighter monetary policies. Growth expectations for 2023 are highest for China (5.3%), followed by Asia ex Japan (5.1%). Expectations for growth from all other major markets are more moderate, ranging between -0.4%–1.1%.
- Global infrastructure transaction value fell by 31% to $194B in 1Q 2023 vs 1Q 2022. Fundraising has also slowed considerably this year. Global refinancing, greenfield, and brownfield deals accounted for 14%, 33%, and 53% of global 1Q deal volume, respectively. Energy and renewables were the top two types of investments, accounting for 43% and 23% of deal volume, respectively.
- Global infrastructure PE fundraising slowed considerably, raising less than $5B in 1Q 2023—following a record year of fundraising ($170B) in 2022. Direct investments by pension funds and sovereign wealth funds in infrastructure assets have increased in recent years. Direct investments can offer attractive return potential, given fees are generally lower, and they allow investors to build custom exposures.

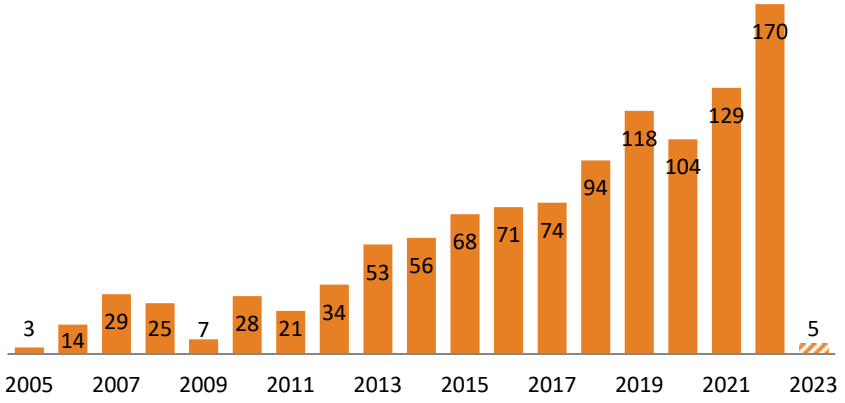
PRICES OF TRANSACTIONS (EV/EBITDA)

Mar 31, 1999 – Mar 31, 2023 • Rolling 12M Average



GLOBAL CAPITAL COMMITMENTS TO INFRASTRUCTURE PE FUNDS

2005–23 • US$B



Sources: Dealogic and InfraDeals.

Notes: Data are monthly and represent the trailing 12-month average EV/EBITDA for all infrastructure transactions. Historical data revise. 2023 capital comitments data are through March 31.

Natural Resources Equities

Facts & Figures First Quarter 2023

Natural resources equities returned -1.8% in 1Q, according to the MSCI World Natural Resources Index in local currency terms. Performance was driven by weakness in the energy sector, which overshadowed the strength seen in precious metals. Concerns of weakening demand due to increasing odds of a recession weighed on energy.

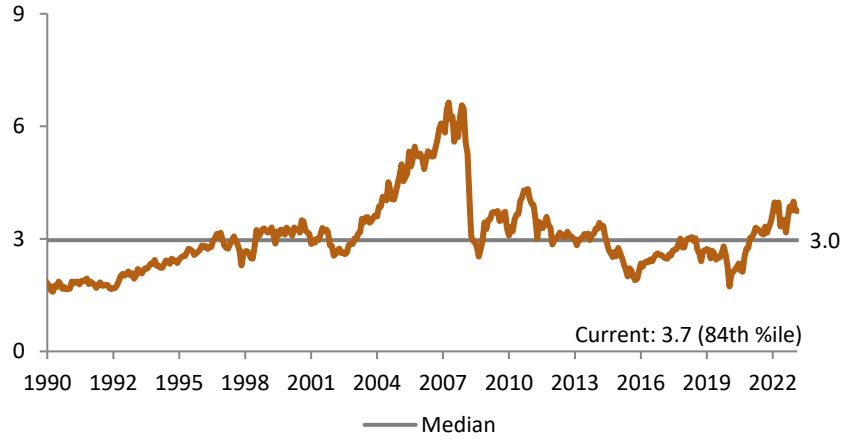
- Natural resources firms trade at 3.7 times cyclically adjusted–cash earnings, which ranks in the 84th percentile of month-end observations dating back to 1990. Markets had to absorb an almost 8% drop in oil prices, driven by softer demand outlook. However, prices remain well above the troughs seen during the beginning of the COVID-19 pandemic. Continued downward pressure on energy prices will likely add risk to earnings expectations for the sector. Gold prices increased by almost 9% during the quarter as investors turned to safe-haven assets as economic uncertainty increased.

- Low investment levels contributed to the rise in oil & gas prices in 2022. Prior to 2017, capital expenditures typically amounted to around 8% of assets, but that level led to a severe glut in energy commodities. Since 2017, capital expenditures at an industry level have fallen to around 5%, which has curtailed available supplies. Although the recent increase in prices has encouraged a return to drilling, Baker Hughes estimates the number of rotary rigs operating in the world is currently 1,921, which is far lower than the ~3,000 rigs that operated on average between 2010 and 2016.

- A key consideration for investors is the extent that renewable energy could undercut future hydrocarbon demand. Some long-term energy analyses, such as the US Energy Information Administration's 2022 Annual Energy Outlook reference case, highlight that oil and natural gas may continue to be the largest global energy sources for decades. Still, long-term energy forecasts have wide confidence intervals, and investors would be wise to carefully consider how different future energy scenarios may impact their portfolios. On the other hand, natural resources equities may attract more investor interest, as weaning off fossil fuels supports demand for certain metals to facilitate the transition to net zero.

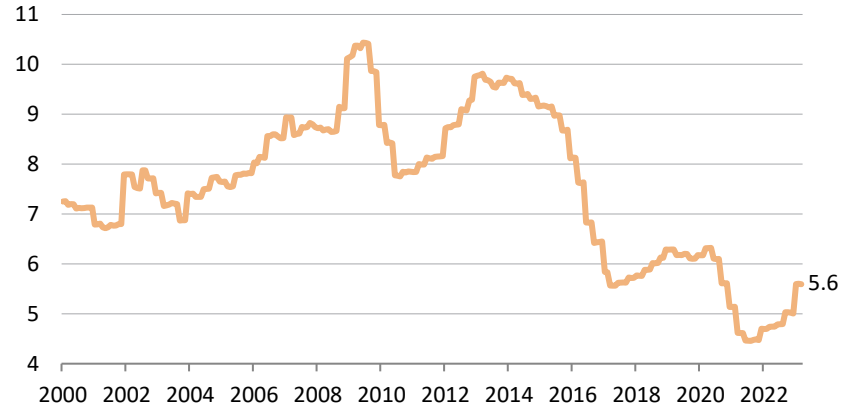
CYCLICALLY ADJUSTED PRICE-TO–CASH EARNINGS

Jan 31, 1990 – Mar 31, 2023



CAPITAL EXPENDITURES

Jan 31, 2000 – Mar 31, 2023 • Percent (%) of Total Assets



Source: Thomson Reuters Datastream.

Notes: Natural resources equities are made up of constituents in the Datastream World Energy Index and the Datastream World Basic Resources Index, weighted on a market-capitalization basis. Historical data revise.

C|A

Commodity Futures

Facts & Figures First Quarter 2023

The Bloomberg Commodity Index returned -5.4% in 1Q in USD terms, driven largely by weakness in energy (-18.7%). Fears of a recession drove lowered demand expectations, driving prices down. Markets are in less backwardation now as concerns of supply constraints, particularly for natural gas in Europe, due to the Russia-Ukraine war have alleviated.

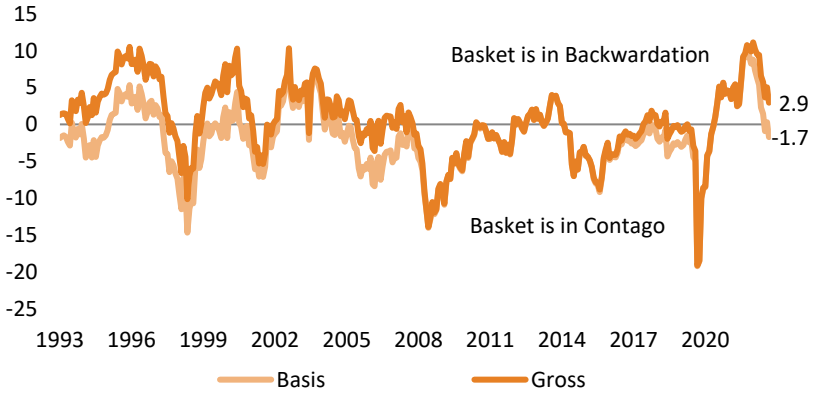
- Commodity spot prices are currently just 0.3 standard deviations above the ten-year inflation-adjusted mean, using the constituents and weights associated with the Bloomberg Commodity Index. Prices reflect supply/demand issues unique to commodities. Lower demand expectations have weighed on prices.
- The global economy is expected to grow by 2.4% in 2023, according to analysts surveyed by Bloomberg in March. These forecasts are tepid compared to 2022 (3.3%), due to the ongoing inflationary pressures and tighter monetary policies. Growth expectations for 2023 are highest for China (5.3%), followed by Asia ex Japan (5.1%). Expectations for growth from all other major markets are more moderate, ranging between -0.4%–1.1%.
- The performance of commodity futures consists of the returns linked to spot price changes, rolling a futures contract forward as it comes due, and the cash used to collateralize the contracts. When the markets are in contango, meaning near-dated contracts are cheaper than contracts dated farther out, the roll return can detract from commodity index returns. After being in backwardation since late 2020 markets are approaching contango again, reflecting expectations of weaker demand in the near term.
- Two frequently referenced commodity benchmarks are the Bloomberg Commodity Index and the S&P GSCI™. The former is a world production- and liquidity-weighted index, with restrictions on individual commodity and commodity subsector sizes to promote diversification. The latter is a world production-weighted index of liquid futures contracts, which has most of its exposure in energy. While both indexes only hold near-month futures contracts, many active managers have the capability to buy contracts all along futures curves.

COMMODITY FUTURES BASKET PRICE DEVIATION

Jun 30, 2003 – Mar 31, 2023 • Z-Score

COMMODITY FUTURES BASKET INDICATIVE ROLL YIELD

Jul 31, 1993 – Mar 31, 2023 • Percent (%)



Sources: Bloomberg L.P. and Thomson Reuters Datastream.

Notes: Exhibits are based on the current futures and weights of the Bloomberg Commodity Index. Price deviation is the weighted z-score of commodity futures using ten years of trailing data. Basis is the roll yield's weighted percentage difference of front month contract relative to contracts one year later. Gross is the roll yield plus cash yield.

C|A

Gold

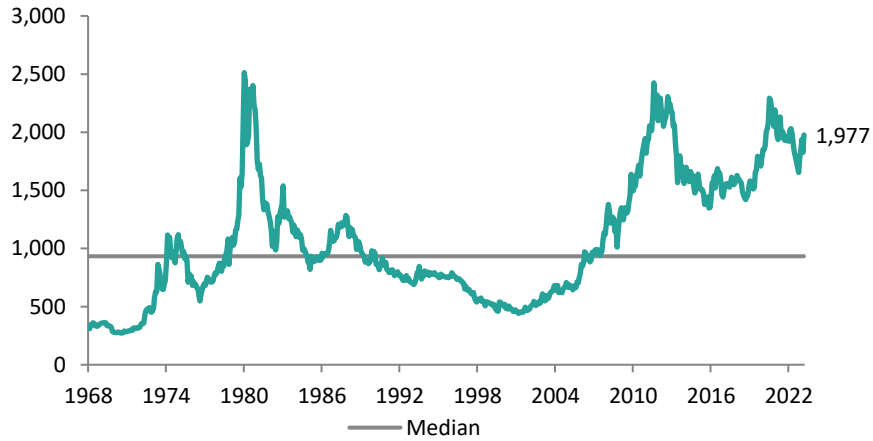
Facts & Figures First Quarter 2023

The price of gold advanced 8.9% in 1Q, ending the quarter at $1,977/troy ounce. Gold's strong performance was driven by increased safe-haven demand as investors fretted about a potential economic slowdown throughout the turbulent quarter. Indeed, gold has historically performed well during recessionary periods.

- Capital markets experienced significant volatility in 1Q amid signs of weakening economic data and turmoil in the banking sector. Real yields declined in 1Q as market participants adjusted their Fed rate hike expectations lower, which helped support gold prices. When real yields fall, so too does the opportunity cost of holding a non-interest-bearing asset like gold.
- The US dollar continued to lose steam in 1Q, which was likely a net benefit to gold prices. The greenback lost 1.0% in nominal trade-weighted terms. Since September 30, the dollar has declined 8.6%, during which time the price of gold has increased 18.1%.
- There are several low-cost, physically backed gold ETFs that track the price of gold without requiring physical storage. While these "paper gold" products offer liquidity, they also carry counterparty risk. Physical gold, which provides investors with a tangible asset, is subject to purchase premiums and storage fees.
- Gold has an expected real return of zero over the long term, which makes it problematic for institutions tasked with meeting a real spending objective. However, it provides a hedge against conditions that are hostile to capital markets.

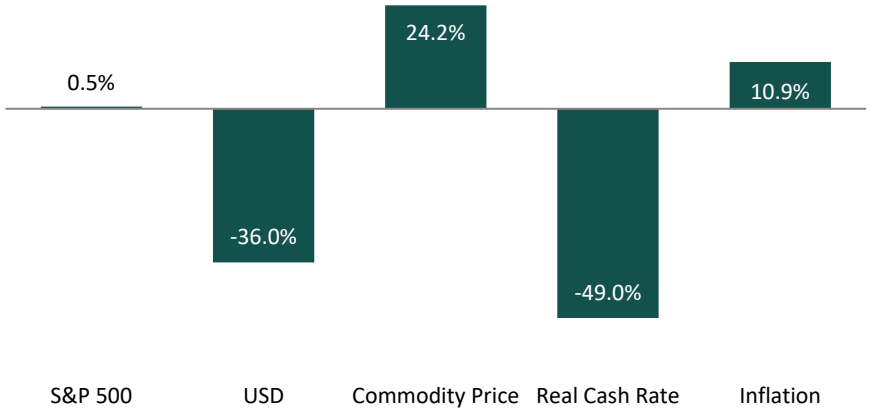
GOLD BULLION REAL PRICE

Jan 31, 1968 – Mar 31, 2023 • US Dollars per Troy Oz



LONG-TERM CORRELATION VS GOLD PRICES

Dec 31, 1970 – Mar 31, 2023



Sources: Intercontinental Exchange, Inc., Standard & Poor's, and Thomson Reuters Datastream.

Notes: Real prices are inflation adjusted to today's dollar. Data for CPI-U are through February 28, 2023.

CURRENCIES

CAMBRIDGE ASSOCIATES

USD vs Developed Markets Currencies

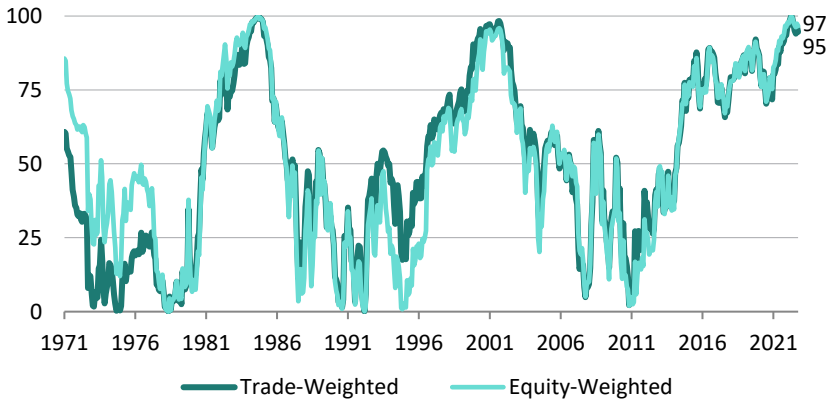
Facts & Figures First Quarter 2023

The US dollar declined by 1.0% in 1Q 2023 in nominal trade-weighted terms, bringing the decline from its September peak to 7%. Interest rate differentials drove the dollar higher in the early part of its recent appreciation before handing off to rising risk aversion and expected growth differentials. These factors have become a headwind for the dollar since then, with reversals seen in several of them. The still-rich real valuation of the dollar suggests the multi-year direction of travel may be lower. Nonetheless, an expected upcoming recessionary environment could yet offer some short-term support.

- A widening in interest-rate differentials between the US and its peers, as a result of an earlier rise in inflation and a more hawkish Fed, was the main plank of dollar strength since this rally began in mid-2021. The bulk of this widening had played out by October 2022 and has broadly reversed against peers in the months since then as other central banks play catch-up with the Fed's hikes. Most notable is the case of the euro area, where core inflation has not yet rolled over, causing the European Central Bank to maintain a hawkish posture.
- Considerable risk aversion was witnessed in 2022. This was initially due to factors, such as COVID-induced inflation and the war in Ukraine, but more latterly has included fears of an economic slowdown. The decline in global equities and widening in credit spreads initially served to benefit the dollar as a safe-haven. However, the moderation of energy prices in Europe and associated bottoming of, and subsequent bounce in, growth forecasts, alongside steadying equity markets, has contributed to the dollar's recent slide.
- The US dollar remains richly valued on a longer horizon. Its real effective exchange rate stands at the 95th and 97th percentiles for the trade- and equity-weighted series. A continued easing of US rate expectations, particularly versus peers if an anticipated growth/inflation slowdown was expected to be US-centered, would be a potential catalyst for further USD weakness. Likewise, any further hawkish pivots by the BOJ. Nonetheless, in the short run there remain potential supports for the greenback. A near-term pivot by the Fed looks unlikely, helping to maintain rates support. If a recession materializes, de-risking could be expected to benefit the dollar, as it has rallied in each of the last seven recessions by a median amount of 4.5%.

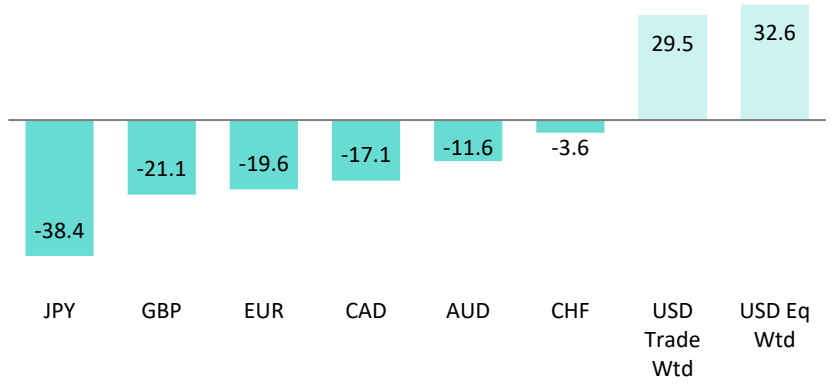
USD BASKET REAL EXCHANGE RATE PERCENTILE

Jun 30, 1971 – Mar 31, 2023



REAL EXCHANGE RATE VS THE USD: % FROM MEDIAN

As of Mar 31, 2023



Sources: Eurostat, MSCI Inc., OECD, Refinitiv, Thomson Reuters Datastream, and US Federal Reserve. MSCI data provided "as is" without any express or implied warranties.

Notes: Australian inflation data are quarterly and as of December 31, 2022. Eurozone inflation data is preliminary as of March 31, 2023. All other inflation data are as of February 28, 2023.

Emerging Markets Currencies

Facts & Figures First Quarter 2023

EM currencies, as measured by an equal-weighted basket, rose by 1.7% in 1Q 2023, bringing the rebound from their October low to 5.9%. Global growth fears, tighter domestic policy due to elevated inflation, and a strong broad dollar have all weighed on EM currencies in the post-COVID period. Each of these headwinds has since moderated, helping to support EM currencies in recent months. The medium horizon outlook may be helped by a weaker dollar; however, recession may be a nearer term headwind.

- EM currencies are highly sensitive to global growth prospects. Therefore, impairment of global supply chains and recent fears of an economic slowdown have proved headwinds. Since bottoming toward the end of last year at 2.1%, consensus global growth for this year has since picked up to 2.4%. This process has been aided by the lifting of COVID restrictions in China, which has particularly helped sentiment in EM given the importance of China to the group.

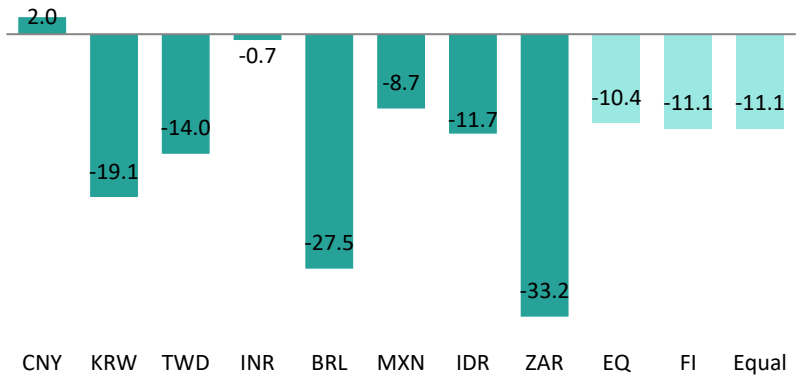
- Emerging markets have been especially impacted by the persistence of inflation given the greater weight of food and energy in their CPI baskets. EM central banks were forced to raise interest rates aggressively to maintain their price stability–targeting credibility, presenting a headwind to growth. Rising DM yields also attracted capital away from emerging markets. Inflation appears to have peaked in emerging markets, and with DM yields declining in recent months, both factors have been more supportive.

- Some of the higher beta EM countries, who typically enjoy larger weights in the EM debt index than in the equity index, featured among the best-performing currencies in the last quarter (e.g., Latin America). As a result, the EMD-weighted index rose by 2.4% as against 0.8% for the equity-weighted index. The fixed income and equity-weighted EM currency baskets are well below their historical medians, with both now 11.1% below median.

- The carry of EM currencies has declined since the end of 2021 as the interest rate differential with DM markets has narrowed, due to the increased number of hikes delivered by the latter. The cost of hedging out the FX exposure of EM equities is now negative for a USD-based investor, around the lowest levels it has been since at least 2003. It costs 2.6% to do likewise for EM local bonds.

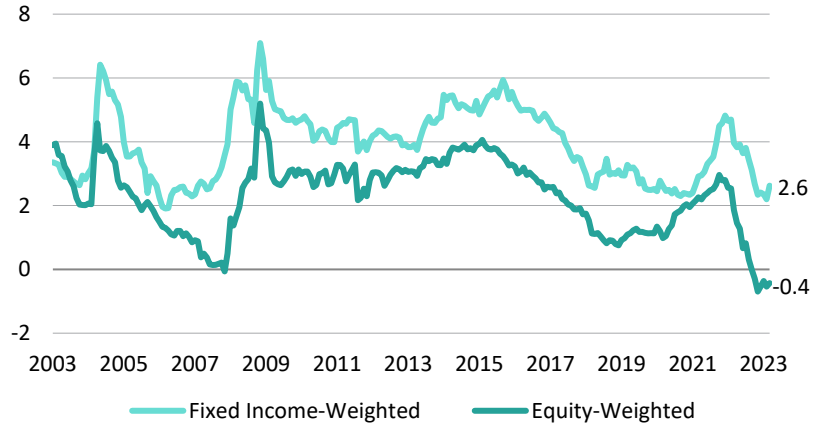
EM REAL EXCHANGE RATE VS USD: % FROM MEDIAN

Jan 31, 1994 – Mar 31, 2023



EMFX IMPLIED CARRY

Jan 31, 2003 – Mar 31, 2023 • Percent (%)



Sources: Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Taiwan; INE - National Institute of Statistics, Chile; International Monetary Fund; J.P. Morgan Securities, Inc.; MSCI Inc.; National Bureau of Statistics of China; Refinitiv; Thomson Reuters Datastream; and US Department of Labor - Bureau of Labor Statistics. MSCI data provided "as is" without any express or implied warranties.

GBP vs Developed Markets Currencies

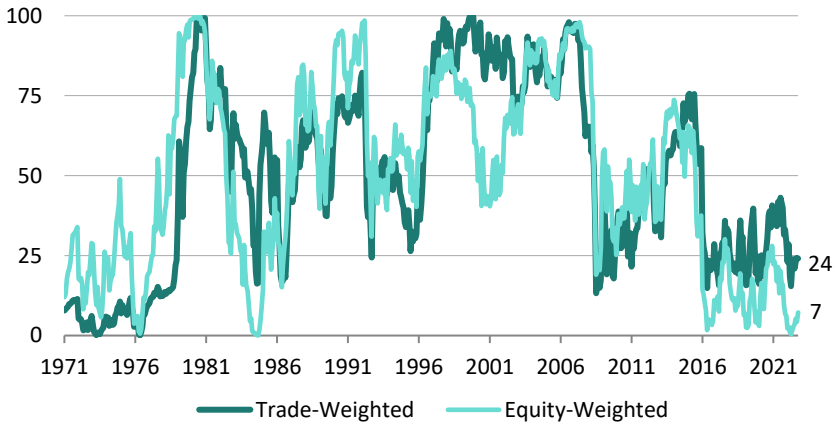
Facts & Figures First Quarter 2023

The pound rose by 1.7% in trade-weighted terms in 1Q 2023, meaning it is now 3.4% above its September 2022 low. The improvement in the European energy landscape has been the biggest driver of sterling's rebound, with its performance against the dollar the dominant contributor. A narrowing rates differential with the US has also acted as a support for the pound in recent months. Though improved, consensus still expects negative growth this year in the UK.

- The BOE raised its policy rate by 75 bps during the quarter to 4.25%. While headline and core inflation may have peaked, inflation is proving persistent, with at least one more hike expected as a result. Though the moderation in gas prices has improved the outlook for this year, the consensus growth estimate for 2023 is still -0.4%, having bottomed last year at -0.95%. There is a high bar for further positive surprises from the energy story, while tightening monetary policy and declining credit growth will be headwinds to economic growth.
- The UK's current account deficit, at 3.8% of GDP, and the greater prevalence of cyclical sectors in the country's asset markets, gives sterling a propensity to behave as a risk-on/risk-off currency. This is in stark contrast to the dollar, which acts as a safe-haven in times of stress. Therefore, with risk assets bottoming in September, the pound is now 10.8% higher versus the dollar since then.
- The USD dominates the equity-weighted index, with a weight of 73%, given its dominance of the MSCI World index. The dollar may stay supported in the near term as recession fears grow, however, in the medium term, improved global growth, further BOJ tightening or an eventual Fed cutting cycle are all potential catalysts for a dollar reversal from its rich valuation The euro dominates the trade-weighted index, at 58%. The REER of the equity-weighted series is now a little above its record low, while the trade-weighted series is at the 24th percentile..
- There remain some fundamental headwinds for the UK to contend with. The supply-side impacts of Brexit mean there is a higher possibility of a stagflationary environment in the UK than elsewhere. There are also lingering concerns about the UK's external economic footing once other impacts have faded. Sentiment toward the UK and its risk assets remains depressed however, which could prove supportive in the event of any improvement in fundamentals.

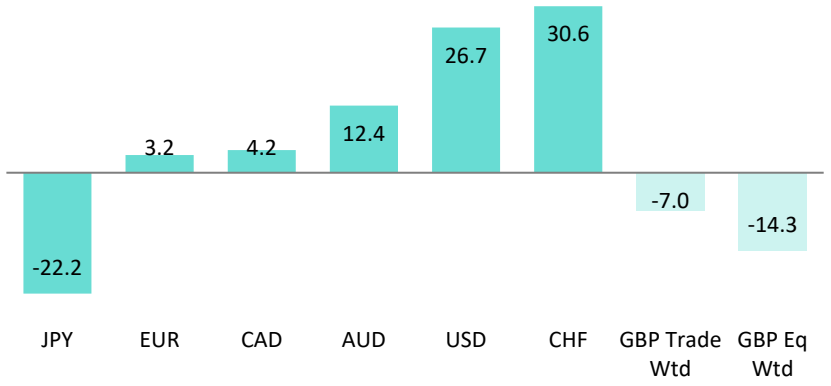
GBP BASKET REAL EXCHANGE RATE PERCENTILE

Jun 30, 1971 – Mar 31, 2023



REAL EXCHANGE RATE VS THE GBP: % FROM MEDIAN

As of Mar 31, 2023



Sources: Bank of England, Eurostat, MSCI Inc., OECD, Refinitiv, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: Australian inflation data are quarterly and as of December 31, 2022. Eurozone inflation data is preliminary as of March 31, 2023. All other inflation data are as of February 28, 2023.

EUR vs Developed Markets Currencies

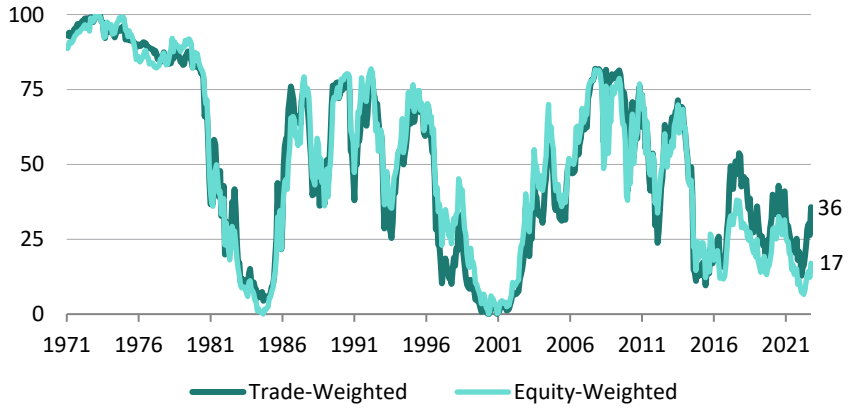
Facts & Figures First Quarter 2023

The euro rose by 0.9% in trade-weighted terms in 1Q 2023, meaning it is now 5.8% above its July 2022 low. A brightening of the European growth outlook, as energy prices subsided, has been the biggest factor behind the euro's recovery. ECB hawkishness, in the face of sticky core inflation, has also supported the euro in recent months. In the medium term, a weakening dollar may be a tailwind. However, despite improvement, growth conditions continue to be challenging.

- The moderation in gas prices as a result of elevated storage levels and warmer than usual weather has improved the outlook for this year. Consensus growth estimates for 2023 bottomed last year at -0.1%, and now stand at 0.5%. Though some risks remain around gas supply for next winter, this factor has likely largely run its course as a source of positive surprises. More broadly, tightening monetary policy and declining credit growth remain headwinds to economic growth.
- Even though headline inflation may have peaked in October, the ECB is expected to tighten policy further as core inflation in the region proves persistent. The bank has already raised rates by 3.5 pp so far this cycle. This has helped to narrow interest rate differentials between the Euro area and its peers since the latter half of last year, supporting the currency.
- The euro's rebound has seen its valuation increase. On an equity weighted basis, its REER stands at the 17th percentile, while it is at the 36th percentile on a trade-weighted basis. These values are 13.2% and 2.7% below median, respectively. The direction of the dollar remains key for the euro outlook, especially for the equity-weighted index which has a 78% weight to the USD. The greenback may stay supported in the near term as recession fears grow and a Fed pivot remains elusive. However, in the medium term, improved global growth, further BOJ tightening, or an eventual Fed cutting cycle are potential catalysts for a dollar reversal.
- To see sustained, domestically generated outperformance of the euro we likely need to see increased fiscal and regulatory convergence, particularly between periphery and core, to boost potential growth. This includes delivering on the NextGenerationEU and REPowerEU plans, but also completing the capital markets union, growing issuance of jointly issued bonds and increasing budgetary flexibility.

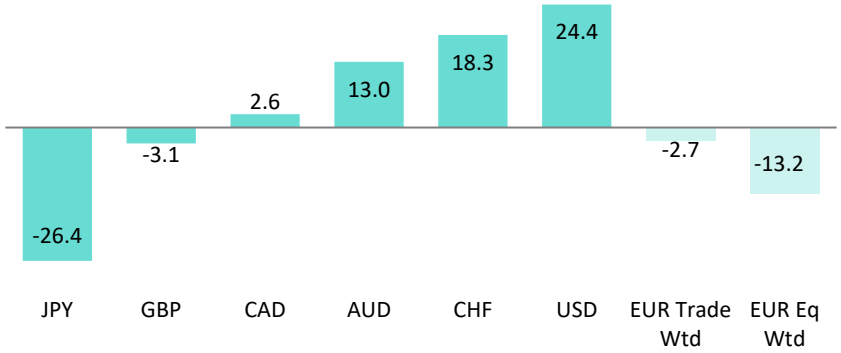
EUR BASKET REAL EXCHANGE RATE PERCENTILE

Jun 30, 1971 – Mar 31, 2023



REAL EXCHANGE RATE VS THE EUR: % FROM MEDIAN

As of Mar 31, 2023



Sources: European Central Bank, Eurostat, MSCI Inc., OECD, Refinitiv, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: Australian inflation data are quarterly and as of December 31, 2022. Eurozone inflation data is preliminary as of March 31, 2023. All other inflation data are as of February 28, 2023.

Digital Assets

Facts & Figures First Quarter 2023

The price of bitcoin surged 72% in 1Q, sharply reversing course after a miserable 2022 for most digital asset prices. Indeed, bitcoin's price fell 64% in 2022, so even after the rebound in 1Q 2023, the digital currency remains almost 40% below its year-end 2021 level. Still, the 1Q resurgence was not limited to bitcoin, as the CMC Crypto 200 ex BTC Index gained 48%.

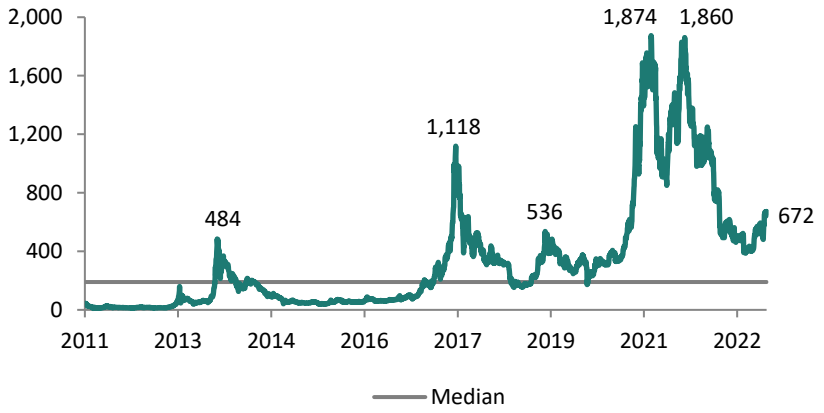
- Investors turned more bullish on digital assets in 1Q as interest rates declined amid concerns about slowing economic growth. Moreover, turmoil in the banking sector may have also boosted digital asset demand as investors looked to digital currencies as potential alternatives to traditional finance.
- There are few reliable options for valuing digital assets. One metric—price-to-transactions per coin (P/TC)—can be viewed as a crude valuation metric for bitcoin. Transactions per coin offers a way to gauge the utility of coins in circulation. Thus, a high P/TC could indicate speculation, with bitcoin being priced expensively for every unit of its transaction volume. But transactions per coin only show bitcoin's utility as a medium of exchange and doesn't inform on how users "stake" bitcoins, which can indicate bitcoin's utility as a store of wealth.
- Digital asset investing carries numerous risks; the most obvious is high price volatility. Indeed, the annualized standard deviation of bitcoin has been nearly 5x that of major equity indexes in the past five years. Other less established digital assets are likely to have even higher volatility. As investors learned in 2022, fraudulent activity and other risky financial behavior remain a major issue among digital assets, due in large part to lack of regulation. However, more regulations are expected to be put in place in the next few years and could offer more stability to digital asset prices. Other pertinent risks for investors include complicated tax considerations and the negative environmental impacts of proof-of-work cryptocurrency mining.
- Bitcoin is just one of thousands of different cryptoassets that utilize blockchain technology. Implementation options have historically been limited, but passive and active options—including dedicated custodians, cryptoasset trusts, and venture capital and hedge funds—continue to be introduced.

BITCOIN PRICE

Dec 31, 2015 – Mar 31, 2023 • US Dollars

RATIO OF BITCOIN PRICE TO TRANSACTIONS PER COIN

Aug 31, 2011 – Mar 31, 2023



Sources: Blockchair.com and Thomson Reuters Datastream.

Notes: Bottom chart represents the USD price of bitcoin divided by the number of transactions per coin outstanding. All data are daily.

Notes on Data

First Quarter 2023

Note on CA House Views

- All performance data is quoted in US dollars unless otherwise noted.

Notes on Our Cyclically Adjusted Price-to–Cash Earnings Calculations

- For most equity markets, we construct a cyclically adjusted price-to–cash earnings (CAPCE) ratio. The cyclically adjusted price-to–cash earnings (CAPCE) ratio is calculated by dividing the inflation-adjusted index price by trailing ten-year average inflation-adjusted cash earnings. Cash earnings are defined as net income from continuing operations plus depreciation and amortization expense. MSCI does not publish cash earnings for banks and insurance companies and therefore excludes these two industry groups from index-level cash earnings.
- EM is cyclically adjusted by trailing five-year data.
- On our equity valuation charts, we use a consistent approach to our median and percentile calculations for valuation ratios across all regions. All charts are labeled to indicate the current valuation's percentile versus the historical median. We typically consider the range from the 25th to the 75th percentile as fairly valued. Valuations in the 75th to 90th percentile are typically overvalued relative to history, and in the 10th to 25th percentile, undervalued. The top 10th and bottom 10th percentiles generally represent very overvalued and very undervalued relative to history, respectively. An asset class's valuation call takes into account valuations, fundamentals, momentum, sentiment, and other factors, and calls do not mechanistically change with percentiles; rather these ranges are used as guides for our valuation calls.

Notes on the 12-Month Absolute and Relative Price Momentum

- The 12-month absolute momentum is the trailing 12-month index price return in local currency terms.
- The 12-month relative momentum is calculated as the geometric difference between each market's trailing 12-month price return in local currency terms.

Notes on Specific Data Providers

- Dealogic updates its database on a regular basis; therefore, historical data may change.
- Hedge Fund Research data are preliminary for the preceding five months.
- Total return data for all MSCI indexes are net of dividend taxes.
- US CPI data lag by one month.

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