

Equity Factor Insights

QUARTERLY REPORT: JULY 2023

FOR PROFESSIONAL INVESTORS ONLY

Value rallies in Q2 as risk appetite revives

Value reclaims lead as risk-off storms subside

With most factors outperforming on average (albeit modestly), Value gained a slight edge over Quality amid waning worries about global banking-sector stability and an imminent economic slump.

Momentum signals firming patterns

Momentum delivered the best performance on average, indicating that return patterns are solidifying.

Technology, Discretionary and Financials exposures call the shots

Returns diverged across markets, with Value doing best in those most exposed to the recovery in Financials, and Quality holding its own in markets riding the Tech boom.

EM factors veer from DM patterns on EM Tech sell-off

All EM factors beat the benchmark, led by Size, Low Vol and Yield. Unlike DM peers, EM Tech-heavy stocks fell, helping the three winning factors and hurting Quality.

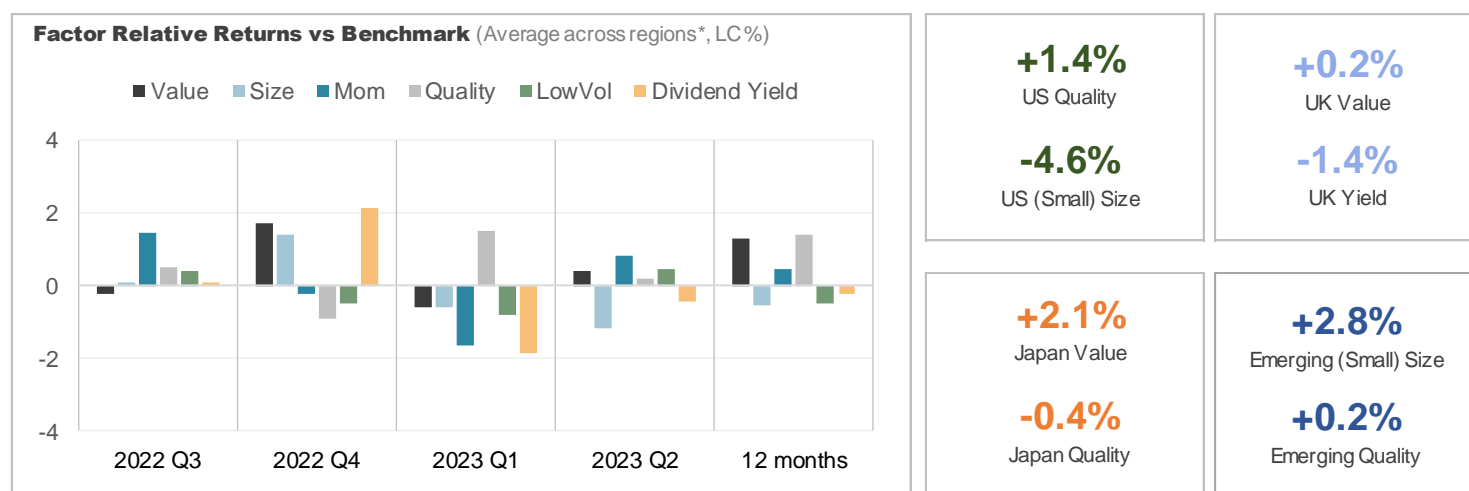
Factor re-ratings continue

Forward P/Es for most factors are at or closing in on 10-year averages in absolute and relative terms. Quality/Value premiums are also mostly back to long-term norms.

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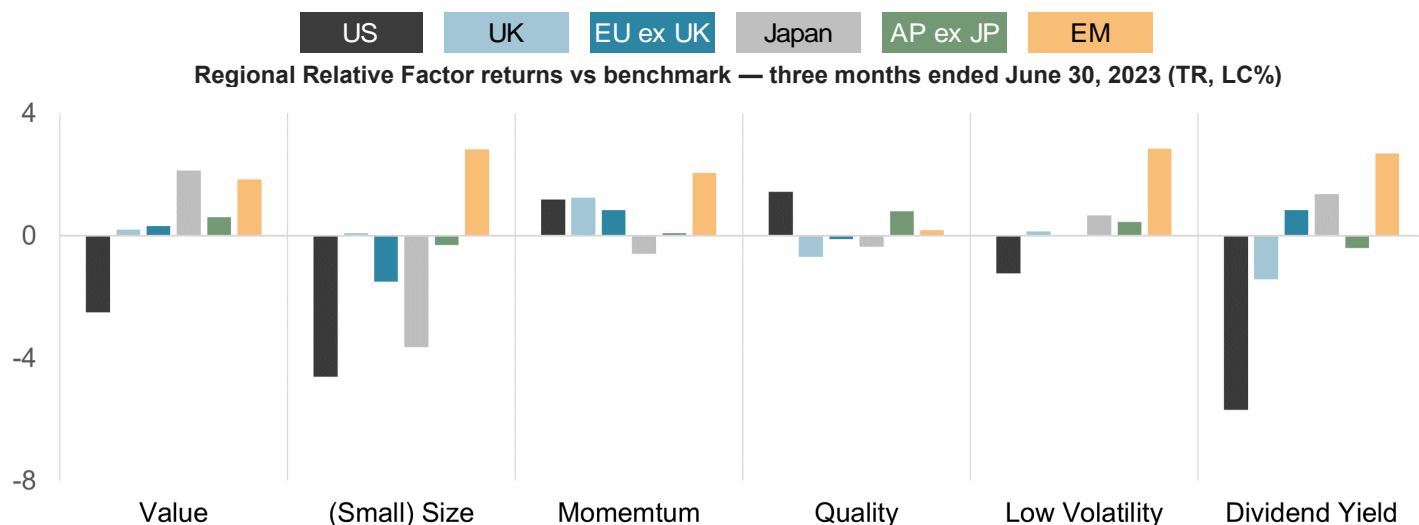
Regional Factor Performance Highlights — Second Quarter 2023 Relative Returns



Source: FTSE Russell / Refinitiv. *Combined average of factor performance across FTSE USA, FTSE UK, FTSE Europe ex UK, FTSE Japan, FTSE Asia Pacific ex Japan and FTSE Emerging regional indexes. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. This report should not be considered 'research' for the purposes of MIFID II. Please see Appendices at the end and FTSE Russell website for important legal disclosures and details on rules-based factor indicator calculations and construction methodology.

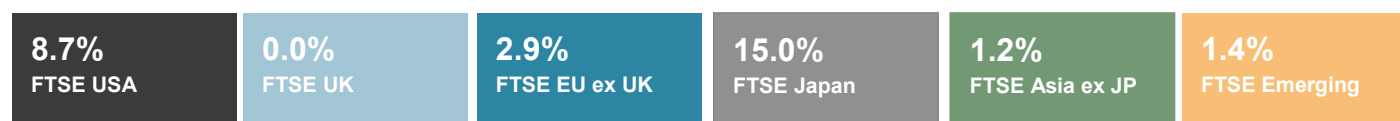
Global View – Factor and Benchmark Performance Highlights – Q2 2023

Factors broadly outperformed, though gains were mostly muted. Value was ahead in most markets, particularly those with big exposures to the robust recovery in Financials (EM & Japan) as the banking crisis ebbed. Quality lost steam, performing best in markets benefiting most from booming Tech stocks (the US & Asia Pac). Unlike DM peers, all EM factors outperformed, led by Size.

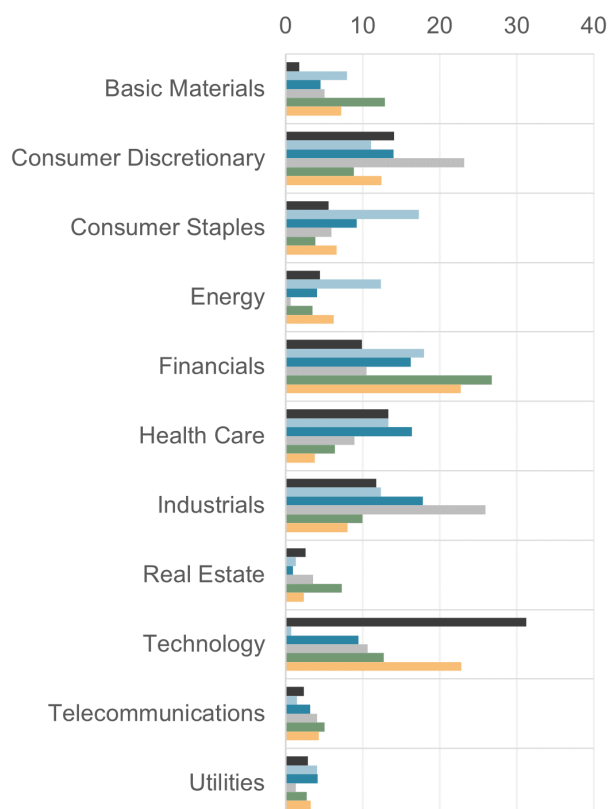


Regional Equity Market Returns Q2 2023 (TR, LC %) – Japan & US soar, UK loses steam

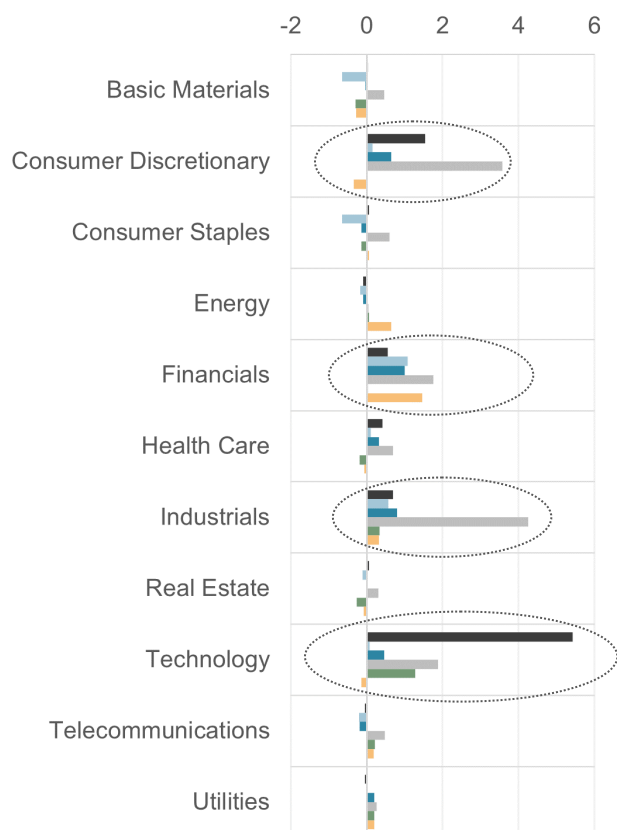
Market returns revolved around varying progress in taming inflation and the implications for monetary policy. Japan and the US far outpaced peers, led by high-flying Tech & Discretionary stocks (which notably fell in EM) and the hefty rebound in Financials.



Benchmark Industry Weights, 3M average (%)



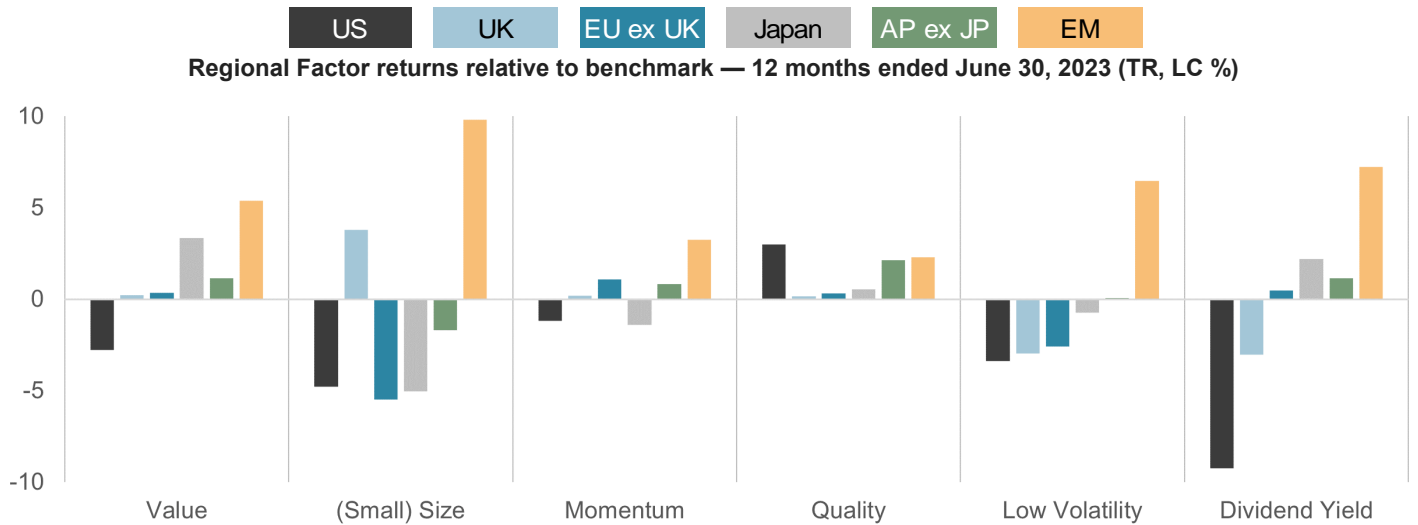
3M – Contributions to Total Benchmark Returns (%)



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Industry results based on Industry Classification Benchmark (ICB) data. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

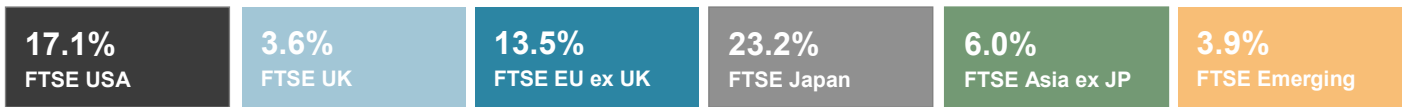
Global View – Factor and Benchmark Performance Highlights – Last 12 Months

Value, Quality & Yield were the top performers for the 12 months, while Size & Low Vol mostly lagged. Quality did best in markets with bigger tilts to growth-heavy sectors (the US & Asia Pac), while Value did best in markets with the biggest exposures to outperforming Industrials and Financials (Japan & Europe). All EM factors outperformed, led by Size & Yield.

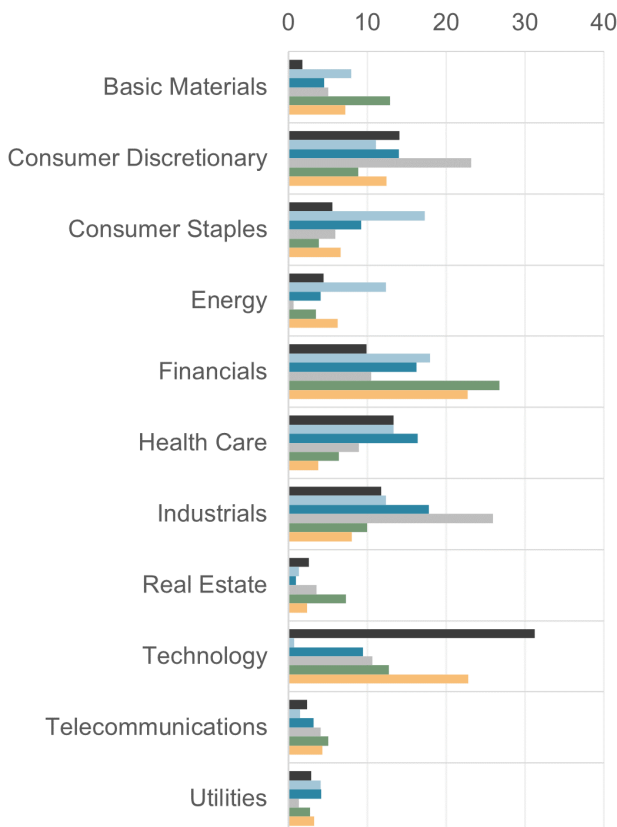


Regional Equity Market Returns 12M (TR, LC %) – Japan tops the charts

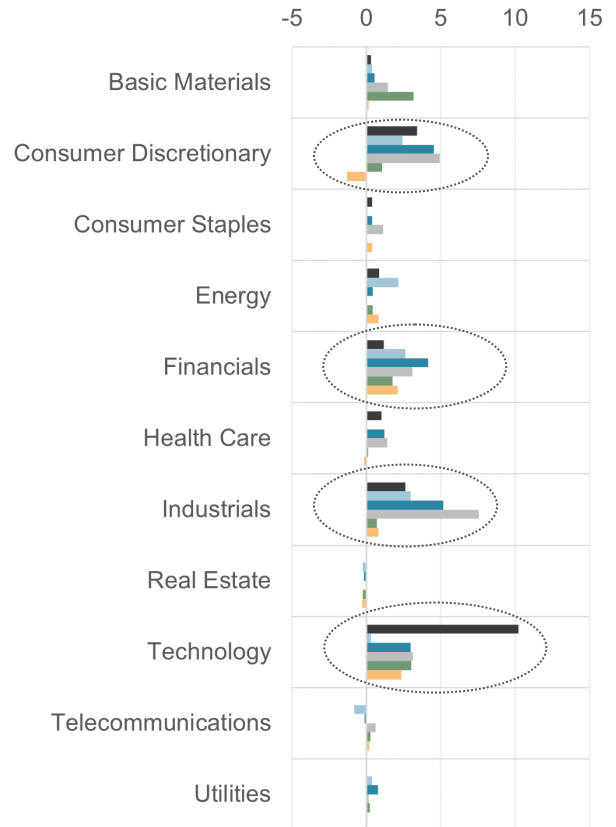
Amid widespread gains, Japan, the US and Europe topped the charts for the 12 months, paced by Tech, Discretionary, Industrials & Financial stocks. Real Estate broadly fell; EM Discretionary stocks and UK Telecom were notable decliners.



Benchmark Industry Weights, 3M average (%)



12M – Contributions to Total Benchmark Returns (%)



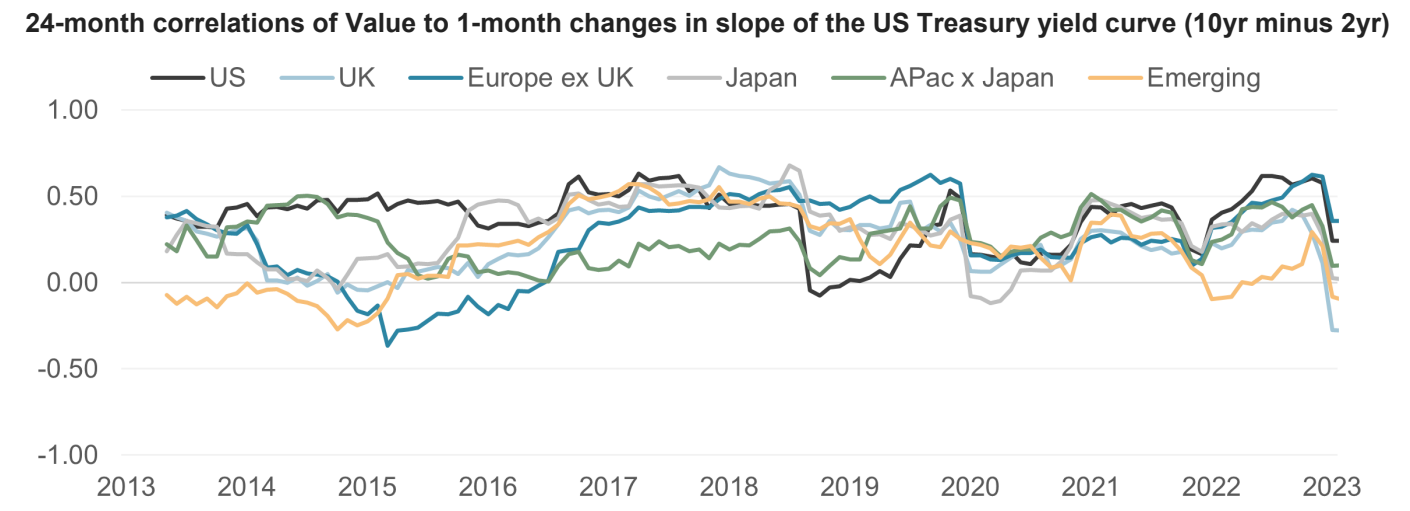
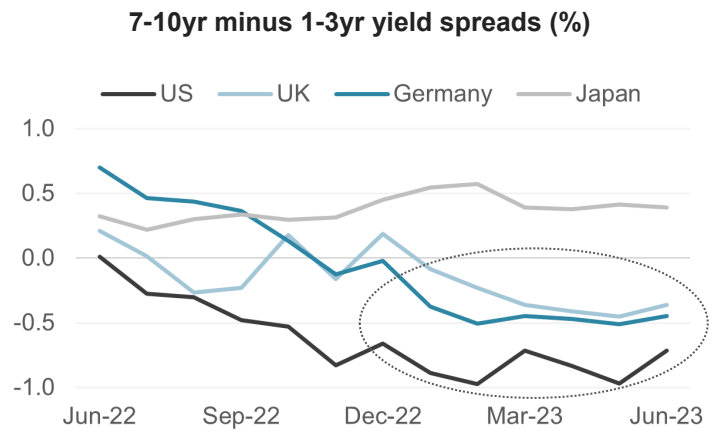
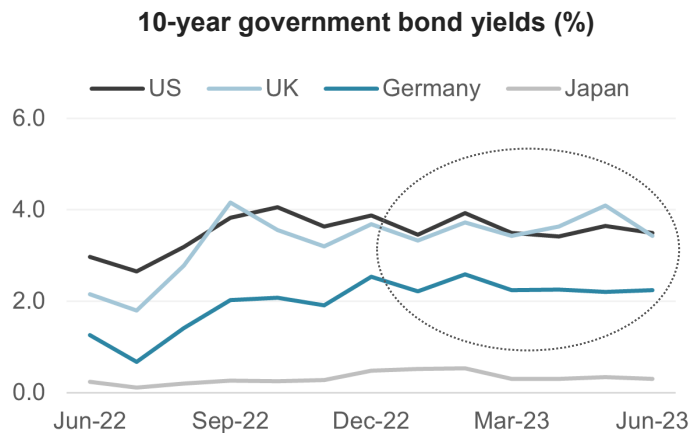
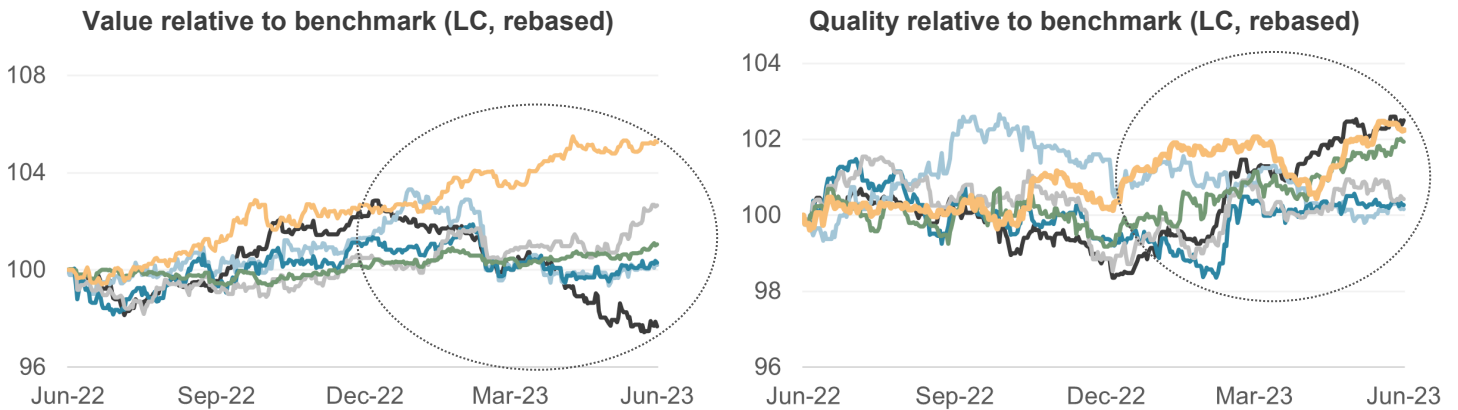
Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Industry results based on Industry Classification Benchmark (ICB) data. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

Global View – Factor rotation

Value retakes the lead as risk appetite revives

After faltering in Q1, Value rebounded in most markets in the Q2 rally, with most of its outperformance coming in June as the US banking scare subsided and economic data remained surprisingly resilient. But Quality also held its own, doing best in markets with big tilts to high-flying Tech stocks, particularly in the US (top charts). Sentiment was buoyed by the relative stability in long bond yields in Q2 (middle, left chart), reflecting well-anchored market expectations for longer-term inflation and interest rates. But short yields spiked as officials at the major central banks signaled more rate hikes in the months ahead. As a result, yield curve inversions in the US, UK and Germany deepened (middle, right chart) as recession worries continued to loom large.

As the bottom chart shows, 24-month correlations between global Value returns and changes in the slope of the US yield curve have generally been positive and have grown far less so this year (downshifting to neutral in Japan, and turning negative in the UK and EM), posing a modest tailwind for the factor in most markets.

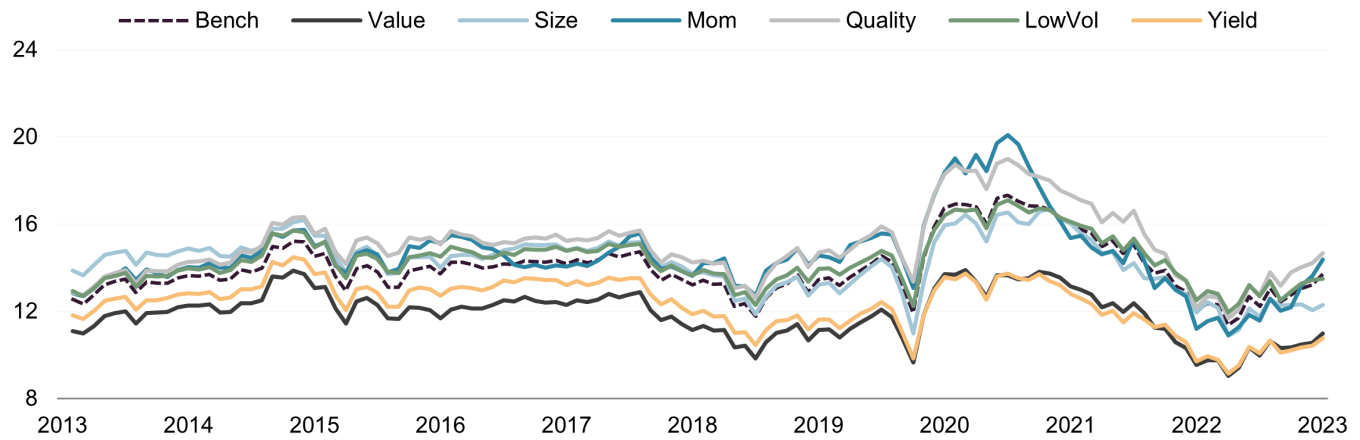


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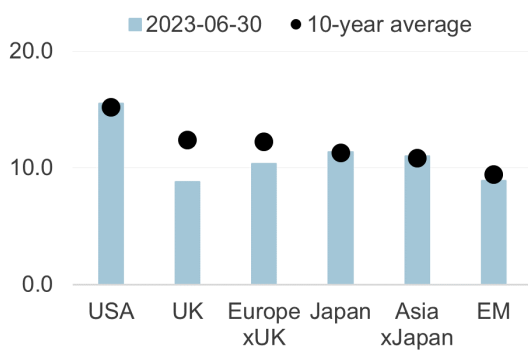
Global View – Factor Valuations

Following this year's global rally, forward P/Es for most factors are now in line or closing in on 10-year averages across markets, particularly in the US, Asia Pacific and EM. On average, Quality and Momentum remain the most expensive, while Yield and Value remain the cheapest. As has long been the case, US factors trade at big premiums to those of peers.

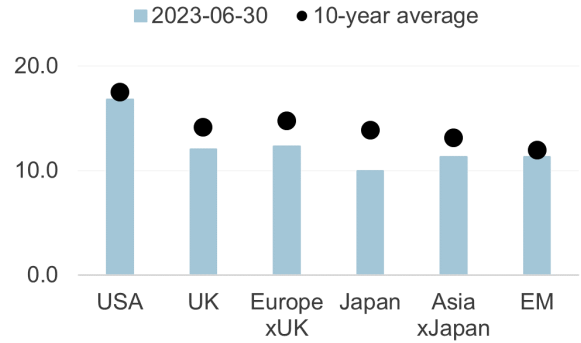
12-month forward factor P/E ratios, average of six regions*



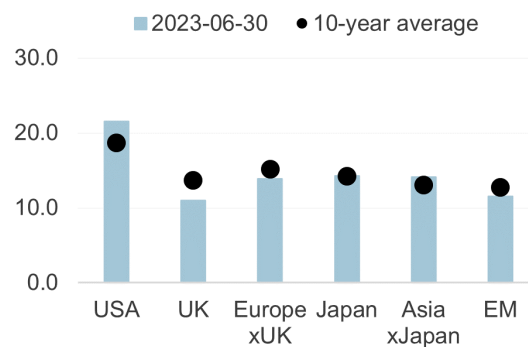
Value - 12M forward P/E



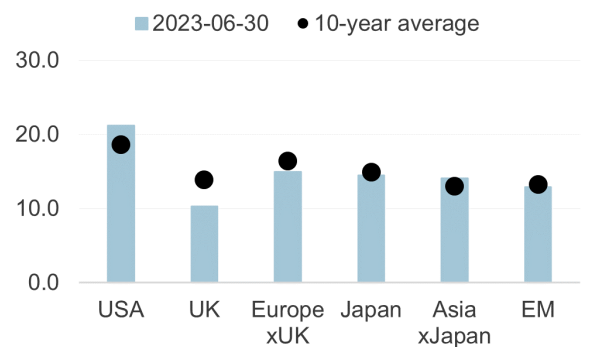
Size - 12M forward P/E



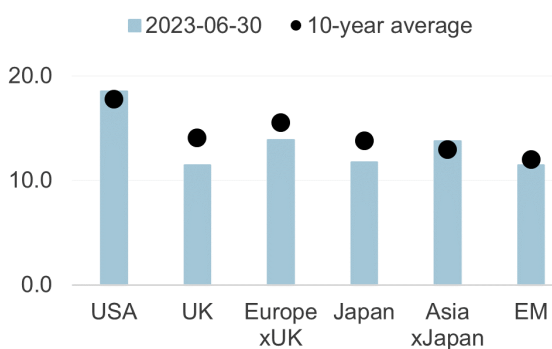
Momentum - 12M forward P/E



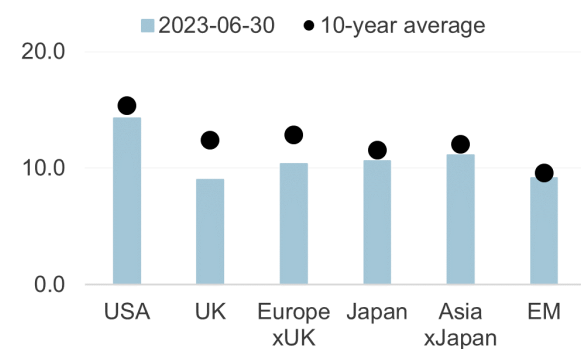
Quality - 12M forward PE



Low Volatility - 12M forward PE



Yield - 12M forward PE



Source: FTSE Russell/Refinitiv. All data as of June 30, 2023. *Combined average 12M forward P/Es for FTSE USA, FTSE UK, FTSE Europe ex UK, FTSE Japan, FTSE Asia Pacific ex Japan and FTSE Emerging regional indexes. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please end for important disclosures and information on factor calculations. For professional investors only.

US Equity Factor Insights

Second Quarter 2023

Key Observations

- Quality and Momentum were the lone outperformers in Q2, extending the former's lead for the YTD and 12 months. Yield and Size were the biggest laggards, a dramatic U-turn from 2022 patterns.
- Quality overwhelmingly benefited from the rush into mega-cap Tech and Discretionary stocks deemed best positioned to profit from advances in artificial intelligence and other new technologies.
- Investor favor for larger-cap (and more expensive) players across sectors, particularly within Tech, Discretionary and Energy, detracted the most from Yield, Size and Value.
- Following strong Q2 re-ratings, forward P/Es for most US factors are now in line or modestly above 10-year averages.
- However, Yield, Size and Value remain at far bigger discounts to the broad market and other factors versus history, while Quality now trades well above its long-term premium to the market — and substantially so versus Value.



Factor returns relative to benchmark (rebased)



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

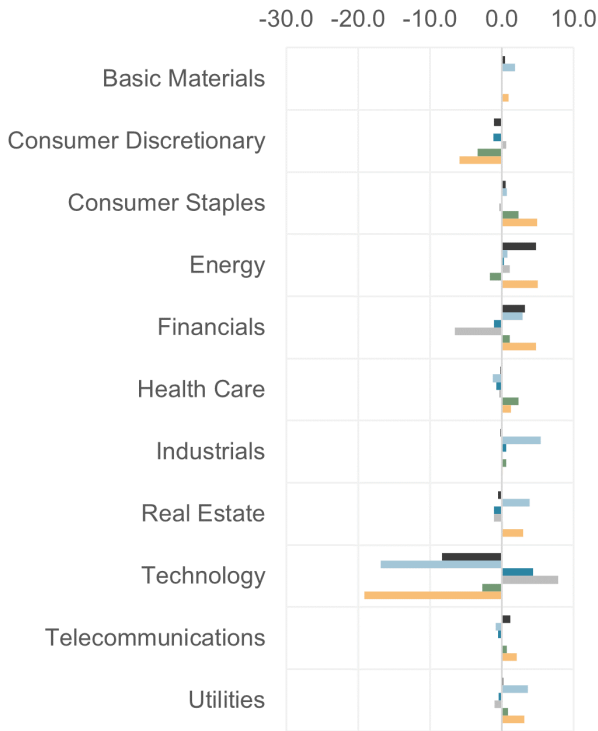
US Factor Performance & Industry Attributions — Q2 2023

'Magnificent Seven' Tech boom keeps Quality in the winner's column

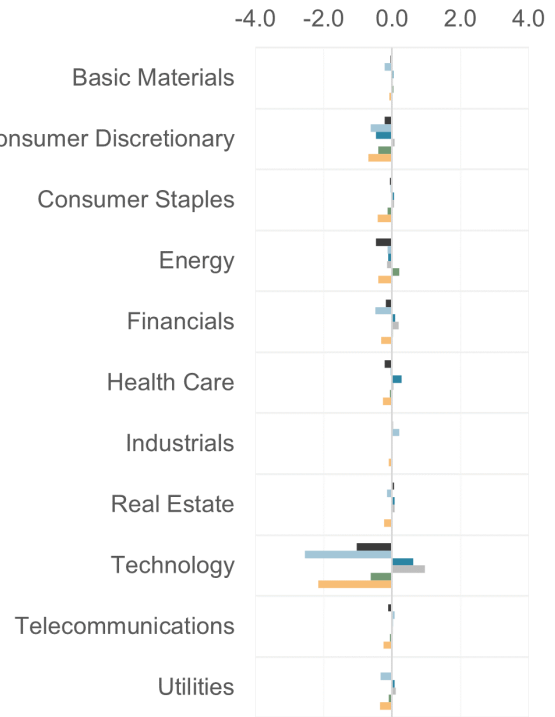
Quality and Momentum were the sole outperformers among US factors in the Q2 rally, with both overwhelmingly benefiting from their large exposures to this year's huge rebound in mega-cap Tech stocks (which was in turn a major drag on Yield, Size and Value), and to their large underweights in lagging Financials. Overweights in Energy also detracted from Yield, Size and Value.

2023 Q2	Relative to Benchmark (TR %)					
FTSE USA	Value	Size	Mom	Quality	Low Vol	Yield
8.7%	-2.5	-4.6	1.2	1.4	-1.2	-5.7

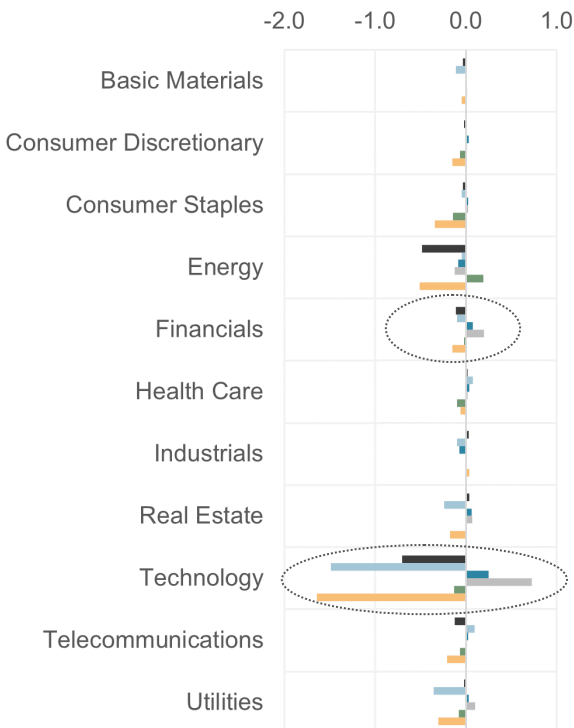
Industry active weights, Q2 2023 average



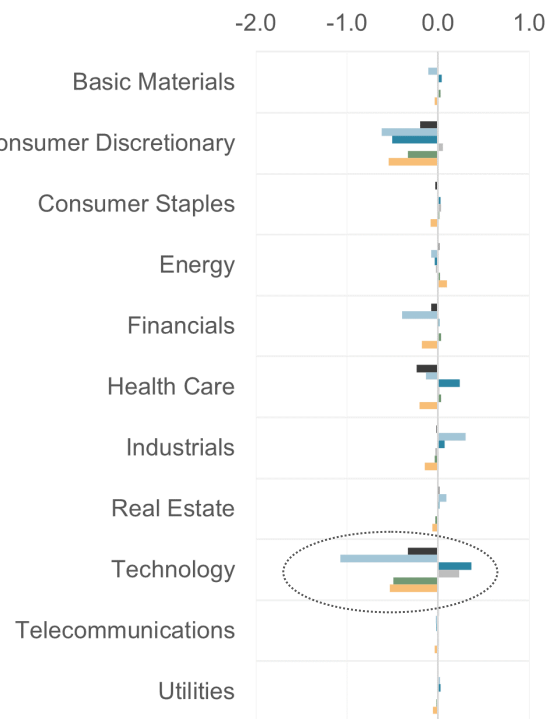
Total industry effects, Q2 2023



Industry allocation effects, Q2 2023



Stock selection within industry, Q2 2023

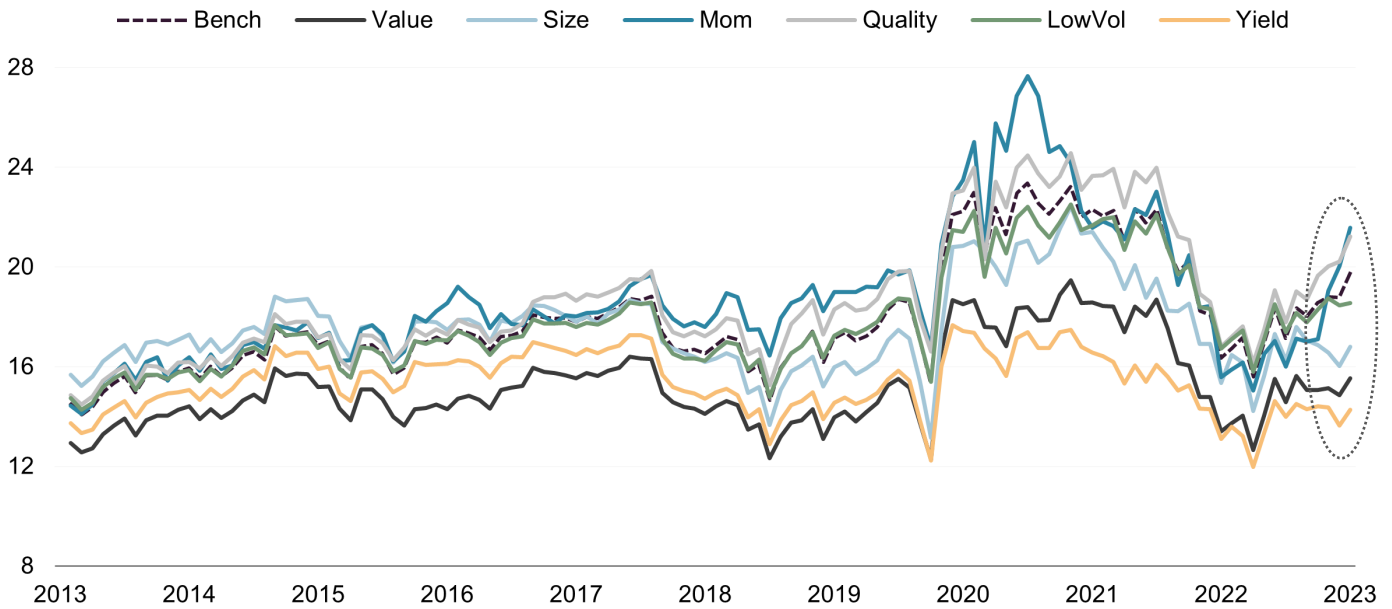


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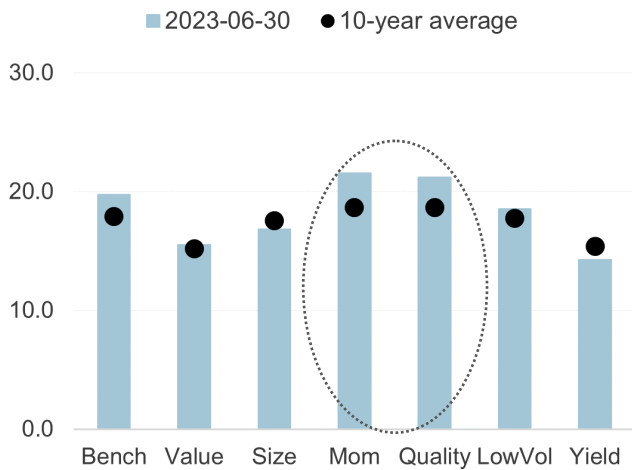
US Factor Valuations

Forward P/E's for most factors continued to climb in Q2. All now stand close to or slightly above their 10-year averages in absolute terms. With their recent outperformance, Quality and Momentum are now above their historical premium versus the benchmark, while Yield, Size and Value remain at deeper discounts to the market. In turn, the Quality premium to Value has ballooned to a spread of 5.7 points, or well above its long-term average of 3.4 points.

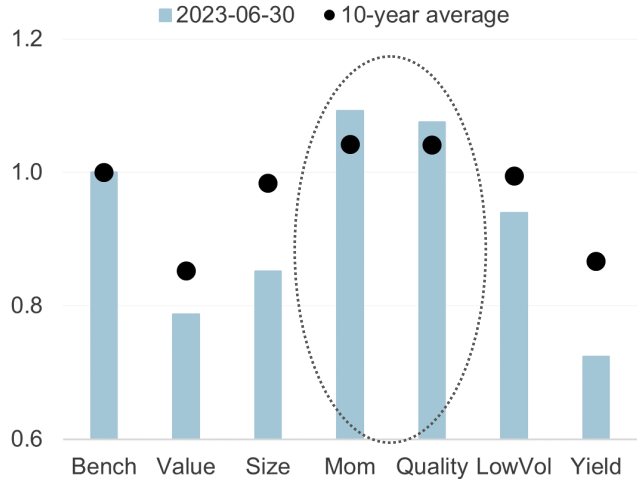
FTSE USA – Absolute 12M forward P/E's



Current Absolute 12M forward P/E vs history



Current Relative 12M forward P/E vs history



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

UK Equity Factor Insights

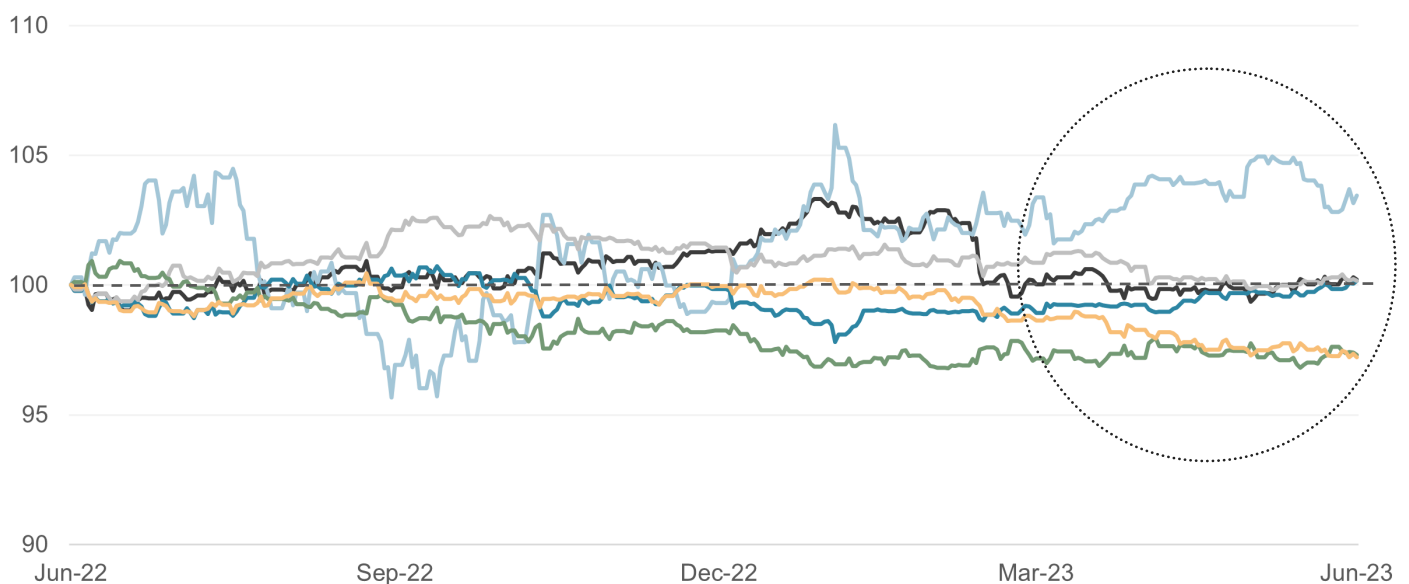
Second Quarter 2023

Key Observations

- Most UK factors ended Q2 barely ahead of the lackluster broad market, while Yield and Quality lagged. Size extended its lead for the YTD and 12 months, while Yield sank deeper into negative territory.
- Returns largely revolved around allocations and stock selection within Financials, Industrials and Discretionary — bolstering Momentum and detracting from Yield and Value. The bias for large-caps within the same three industries weighed most on Size, offsetting additive allocation effects.
- Forward P/Es for most factors reversed much of their Q1 gains and remain well below 10-year averages in both absolute and relative terms. Notably, Quality now trades at a discount to the market (in contrast to its historical premium), and at its long-term average premium to Value.
- Size remains the most expensive factor, trading at even larger premiums to the market and other factors versus history.



Factor returns relative to benchmark (rebased)



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

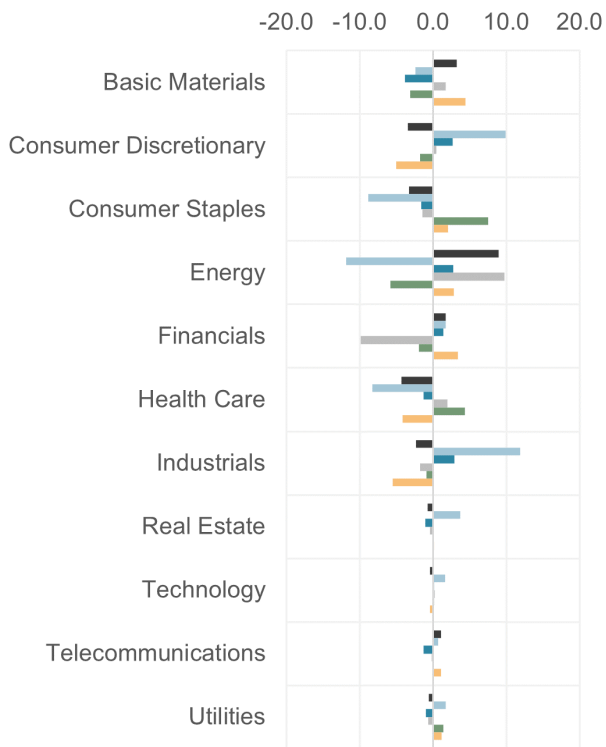
UK Factor Performance & Industry Attribution — Q2 2023

Momentum leads in lackluster quarter, Yield and Quality struggle

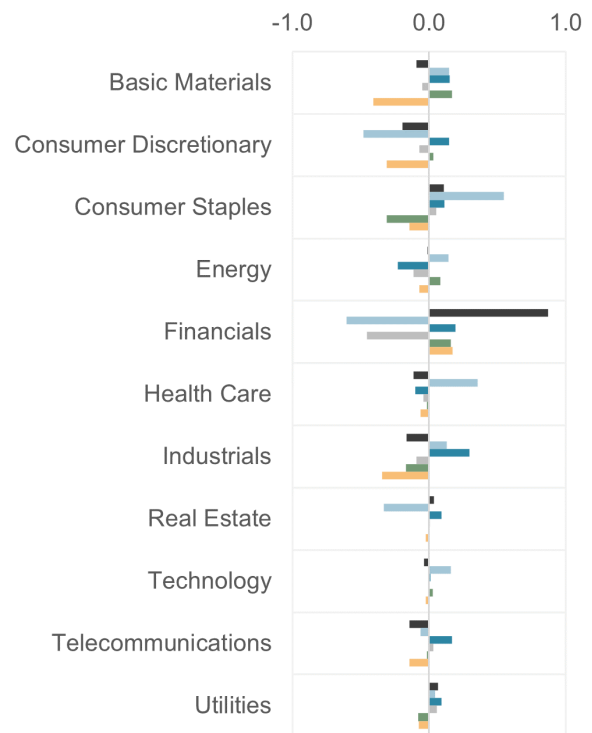
Most factors ended Q2 barely ahead of the market, while Yield and Quality were the biggest laggards. Momentum benefited most from positive allocation effects and stock selection within Financials, Industrials & Discretionary (which were major drags on Yield and Value). Size was hurt most by the large-cap bias within the same three industries, despite additive allocation effects.

2023 Q2	Relative to Benchmark (TR %)					
FTSE UK	Value	Size	Mom	Quality	Low Vol	Yield
0.0%	0.2	0.1	1.2	-0.7	0.1	-1.4

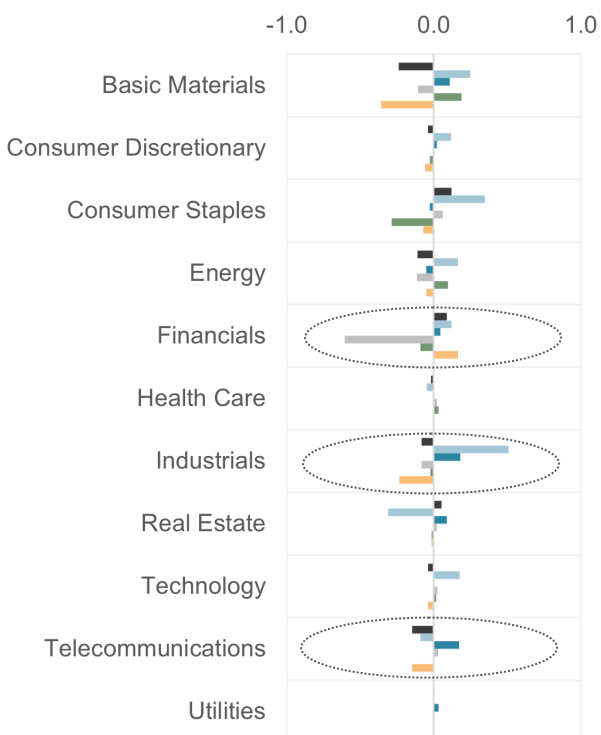
Industry active weights, Q2 2023 average



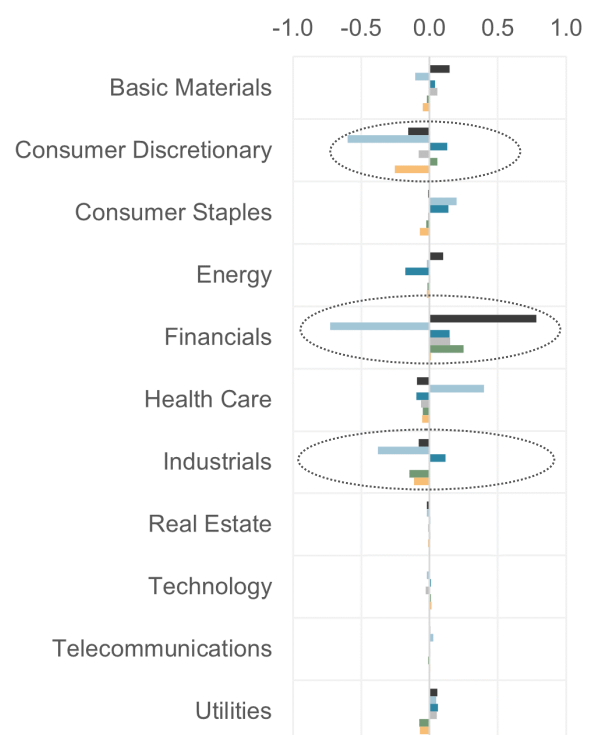
Total industry effects, Q2 2023



Industry allocation effects, Q2 2023



Selection effect within industry, Q2 2023

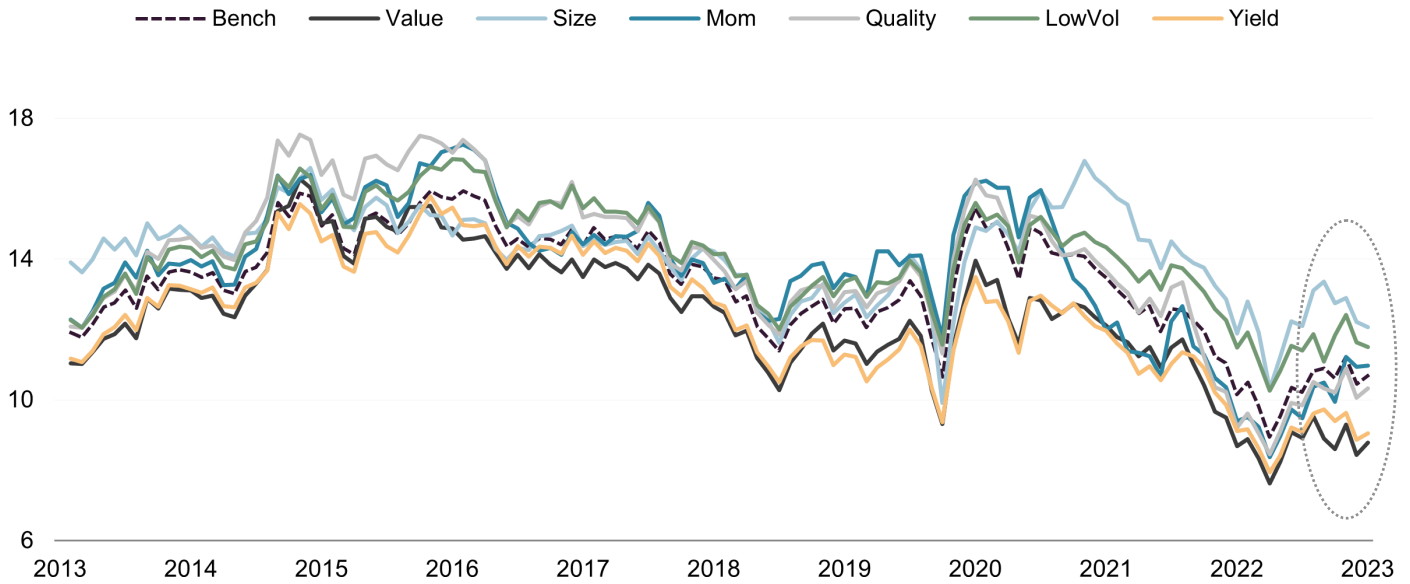


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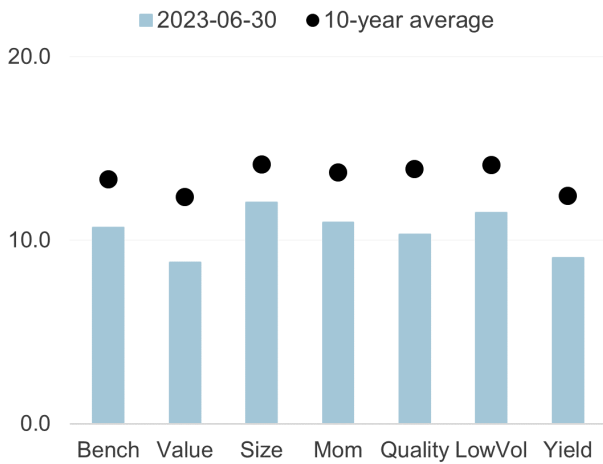
UK Factor Valuations

Forward P/Es for most factors eased in Q2 and remained well below 10-yr averages in absolute terms. Value and Yield continue to trade at bigger discounts to the benchmark versus history, while Quality also stands at a discount (versus its historical premium). Size, Momentum and Low Vol are now in line or above historical premiums versus the broad market. Despite recent underperformance, Size and Low Vol remain the most expensive factors in both absolute and relative terms. The Quality/Value premium narrowed, to 1.5 points, matching its historical spread.

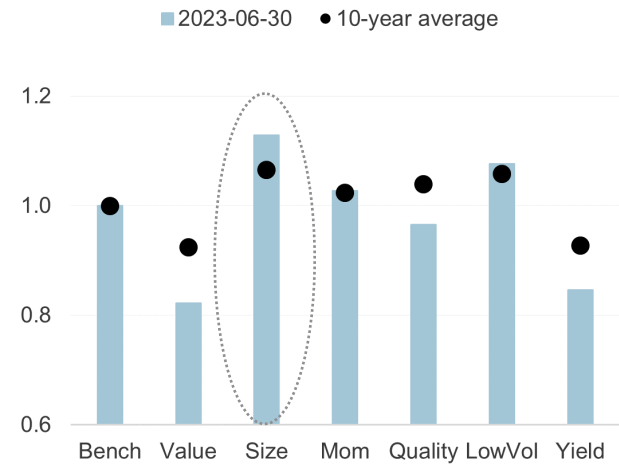
FTSE UK – Absolute 12M forward P/Es



Current Absolute 12M forward P/Es vs history



Current Relative 12M forward P/Es vs history



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

Europe ex UK Equity Factor Report

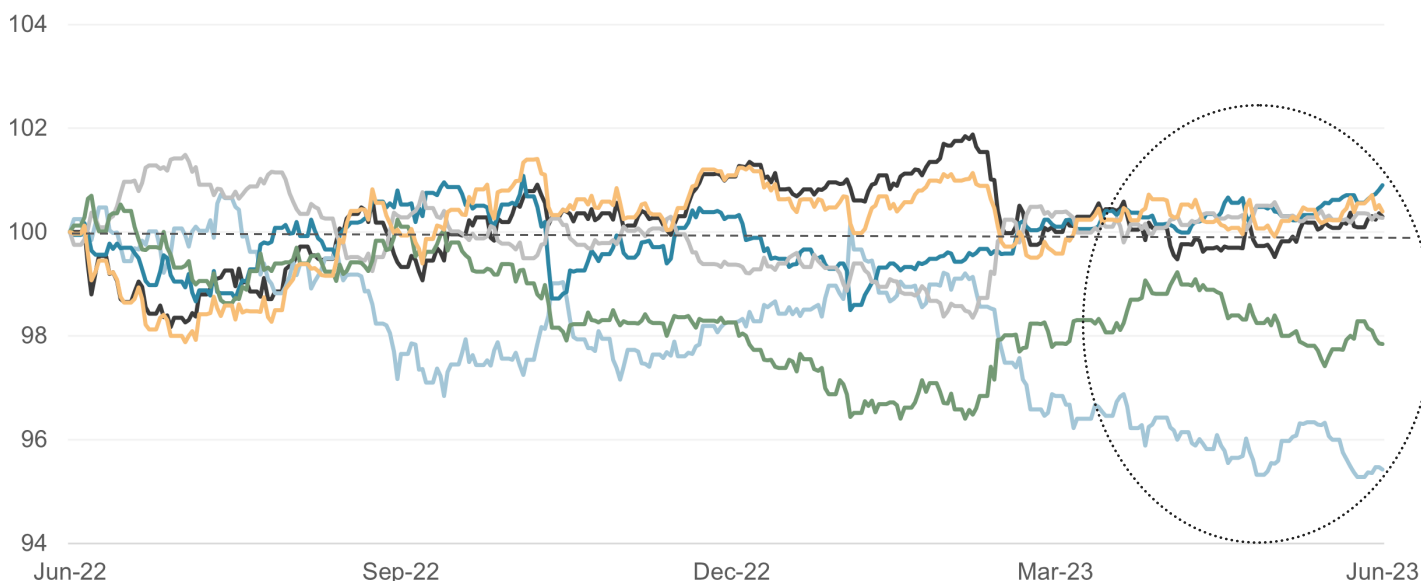
Second Quarter 2023

Key Observations

- Value and Yield regained their edge over Quality in the Q2 rally, adding traction to their YTD and 12-month performances. Size remained by far the worst performer for the quarter and longer-term span.
- Factor performance in Q2 largely revolved around exposures to the hefty recovery in Financials as worries about the global banking scare subsided — helping Value, Yield and Momentum, while hurting Quality.
- Size continued to suffer from the strong investor favoritism for larger players across most industries, particularly within Industrials, Materials and Health Care.
- Most forward P/Es ended Q2 flat or lower and remain below 10-year averages in both absolute and relative terms.
- Value and Yield remain at deeper-than-normal discounts to the market and other factors, while Quality and Momentum now trade roughly in line with their long-term premiums. The Quality/Value premium is back to its long-term average.



Factor returns relative to benchmark (rebased)



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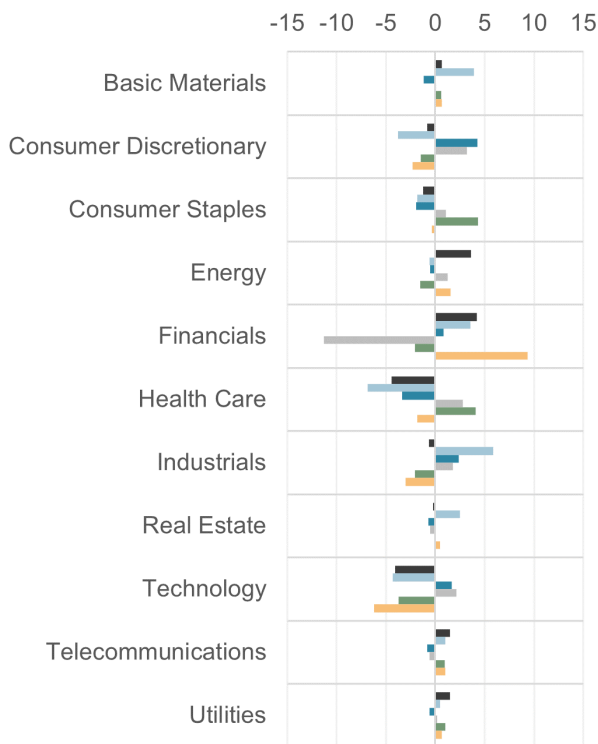
Europe ex UK Factor Performance & Industry Attribution — Q2 2023

Value retakes leadership on Financials rebound

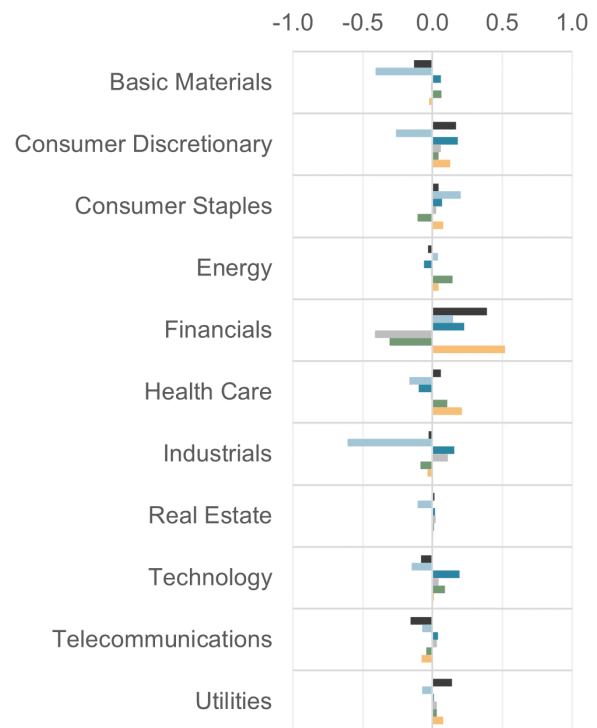
Yield and Value regained leadership from Quality, thanks largely to overweights in and strong stock selection within outperforming Financials (which dragged on Quality). Stock selection within Discretionary and Health Care also helped. Size suffered from the investor bias for larger players across most industries, particularly in Industrials, Materials & Health Care.

2023 Q2	Relative to Benchmark (TR %)					
	Value	Size	Mom	Quality	Low Vol	Yield
FTSE Dev Europe ex UK	0.3	-1.5	0.8	-0.1	0.0	0.8

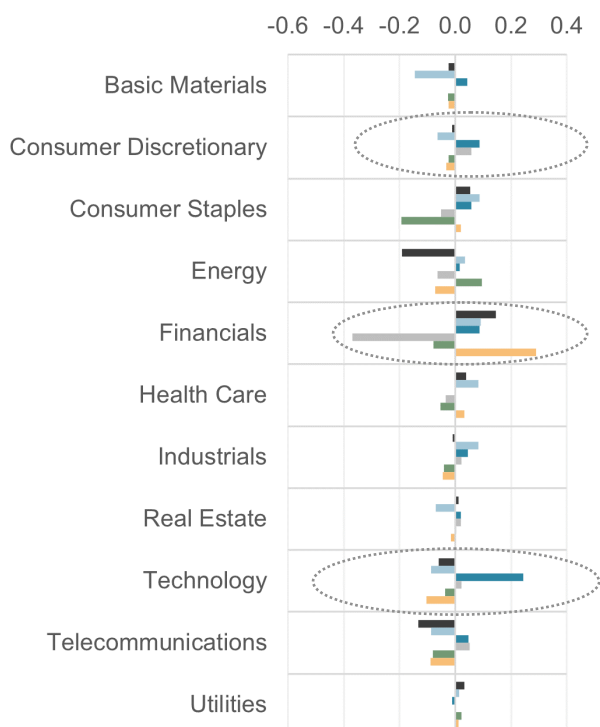
Industry active weights, Q2 2023 average



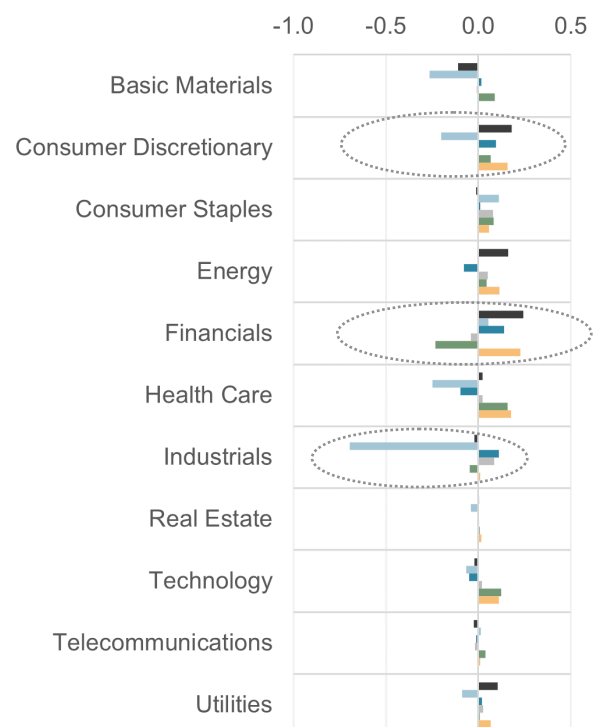
Total industry effects, Q2 2023



Industry allocation effects, Q2 2023



Selection effect within industry, Q2 2023

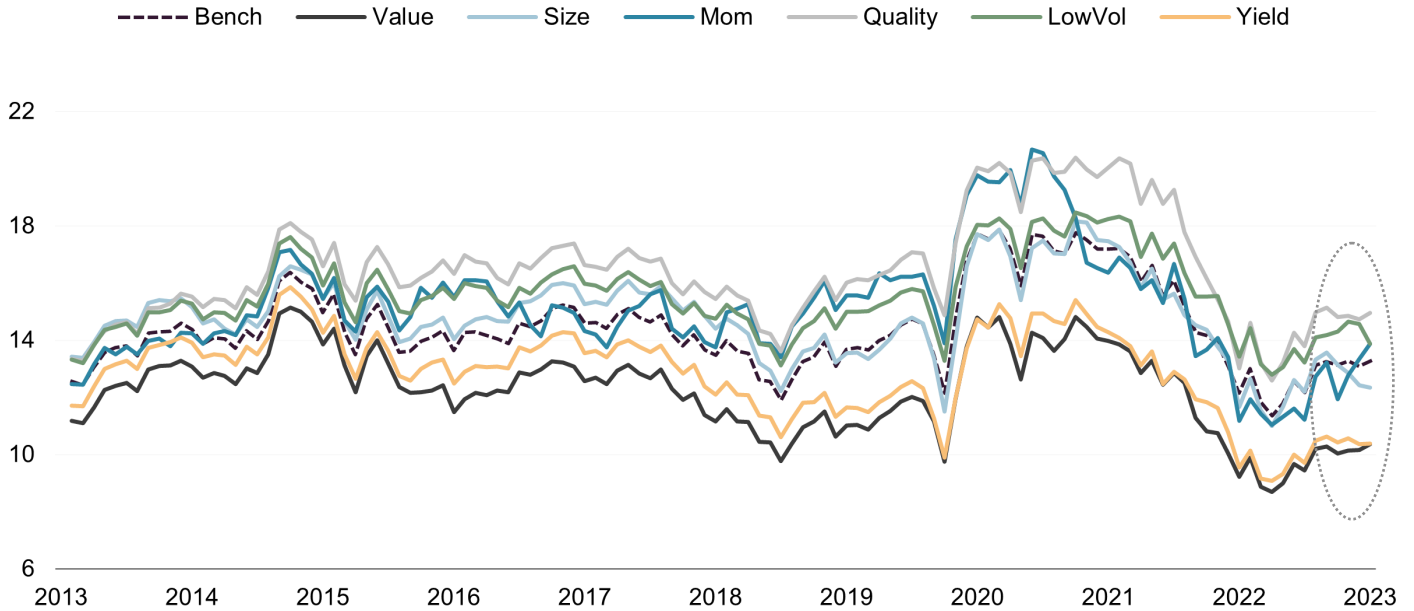


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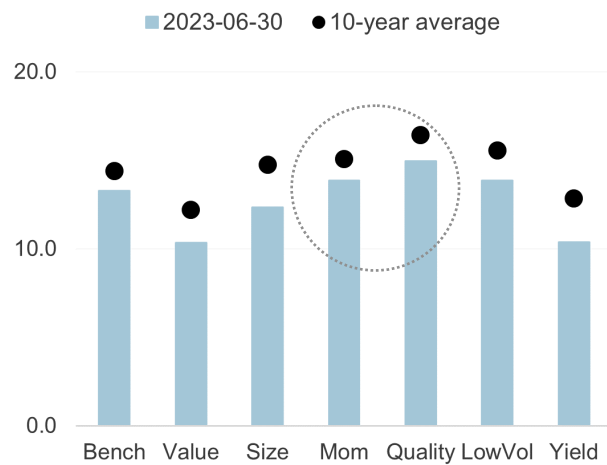
Europe ex UK Factor Valuations

Forward P/E's for most factors ended Q2 flat or lower (except Momentum), though most are still below 10-year averages in both absolute and relative terms. Yield, Value and Size continue to trade at deeper-than-average discounts to the broad market and other factors, while the Momentum and Quality premiums to the market are now roughly in line with long-term averages. Quality's premium versus Value remains around its 10-year average spread of 4.2 points.

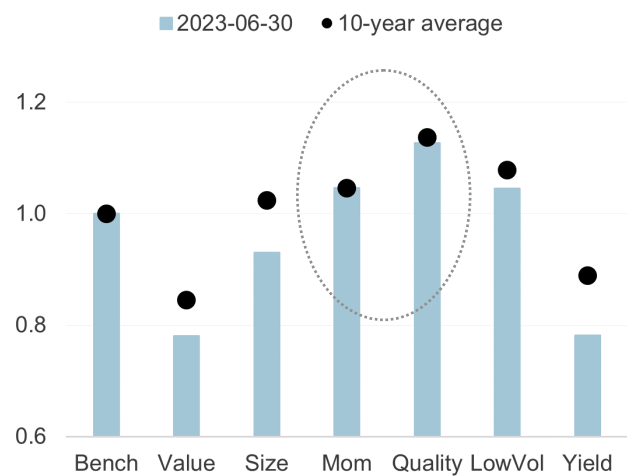
FTSE Europe ex UK – Absolute 12M forward P/E's



Current Absolute 12M forward P/E's vs history



Current Relative 12M forward P/E's vs history



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Japan Equity Factor Report

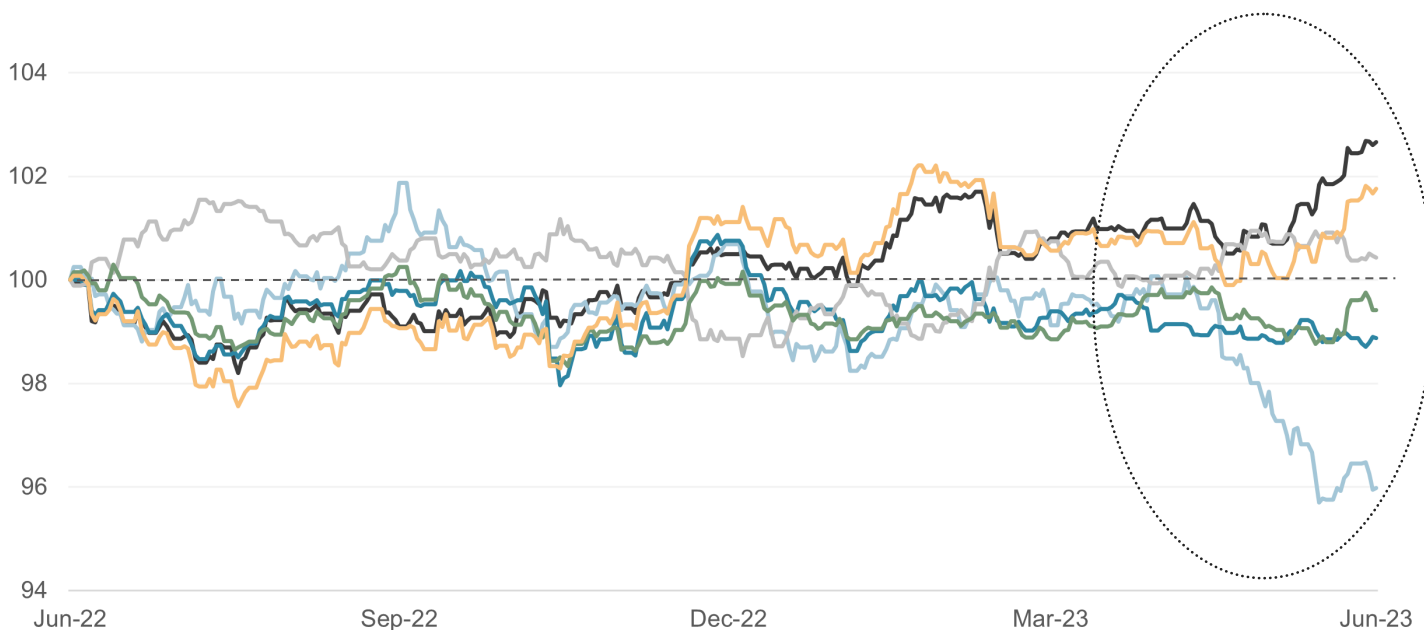
Second Quarter 2023

Key Observations

- Value (and Yield) reclaimed leadership from Quality in the Q2 rally, extending their long-running winning streaks. Size badly lagged in the quarter, bringing it more deeply into negative territory for the YTD and 12 months.
- Value’s advantage came mainly from positive allocation effects in rebounding Financials and lagging Health Care, as well bargain-hunting within the strongly outperforming Industrial and Discretionary industries.
- Size was hit hardest by its overweight in Real Estate and the broad investor preference for larger players, particularly within Industrials and Discretionary.
- Forward P/Es for most factors are now at or near 10-year averages. Size is the cheapest factor, trading at a far deeper discount to the market versus history, while Quality and Momentum are at or above their historical premiums. The Quality/Value premium is roughly around its long-term average.



Factor returns relative to benchmark (rebased)



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

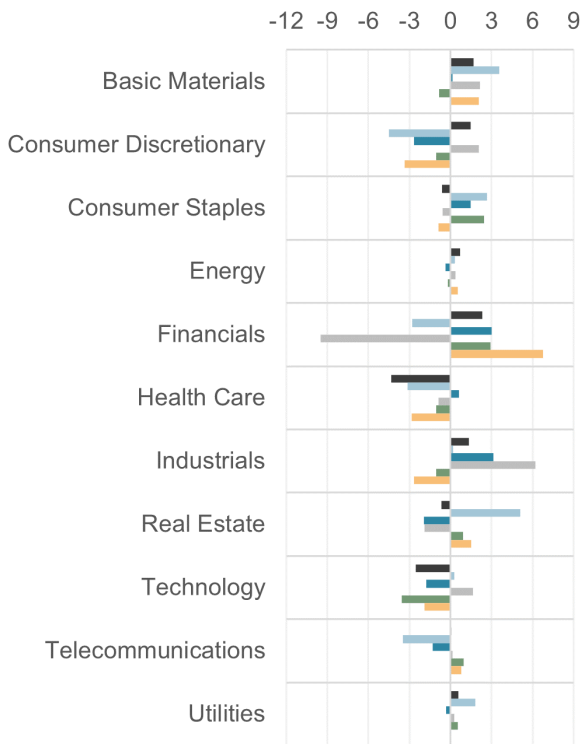
Japan Factor Performance & Industry Attribution — Q2 2023

Bargain-hunting helps Value regain edge over Quality

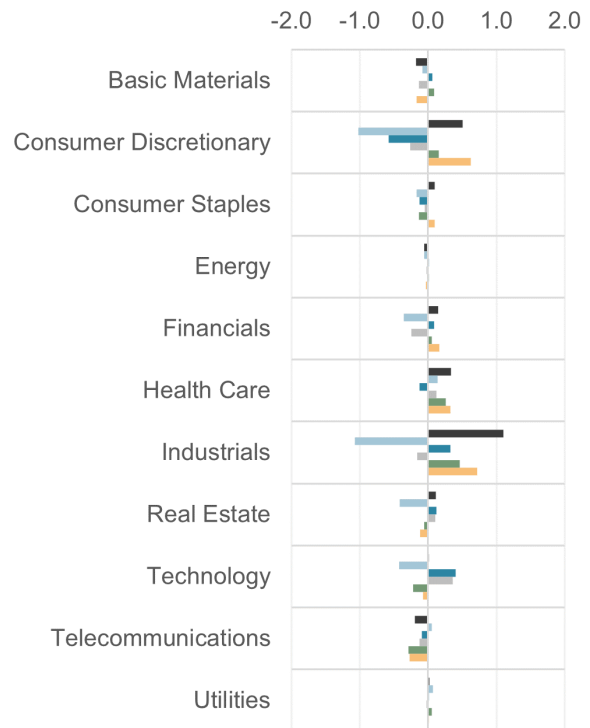
Value and Yield strongly outpaced the market and other factors in Q2, particularly Size. Value and Yield's gains came mostly from large overweights in Financials, underweights in Health Care and additive stock selection within Discretionary and Industrials. Size was hurt most by its large overweight in Real Estate, and the broad-based shift to larger stocks, particularly within Industrials.

2023 Q2	Relative to Benchmark (TR %)					
FTSE Japan	Value	Size	Mom	Quality	Low Vol	Yield
15.0%	2.1	-3.6	-0.6	-0.4	0.7	1.4

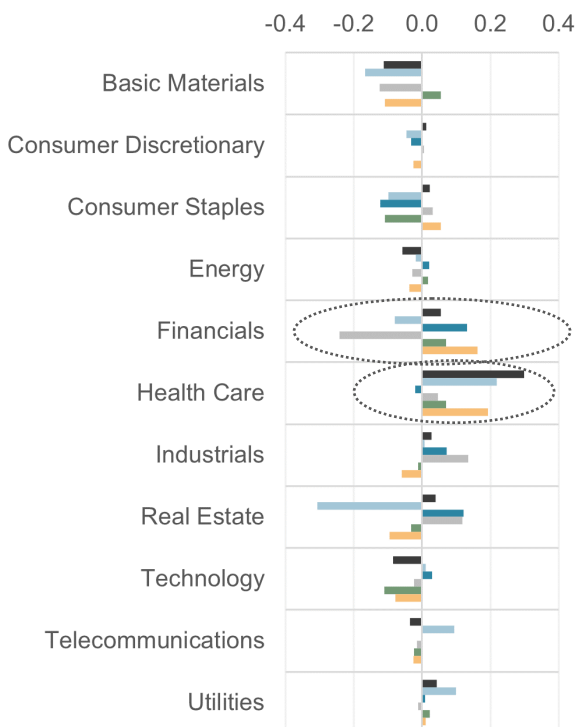
Industry active weights, Q2 2023 average



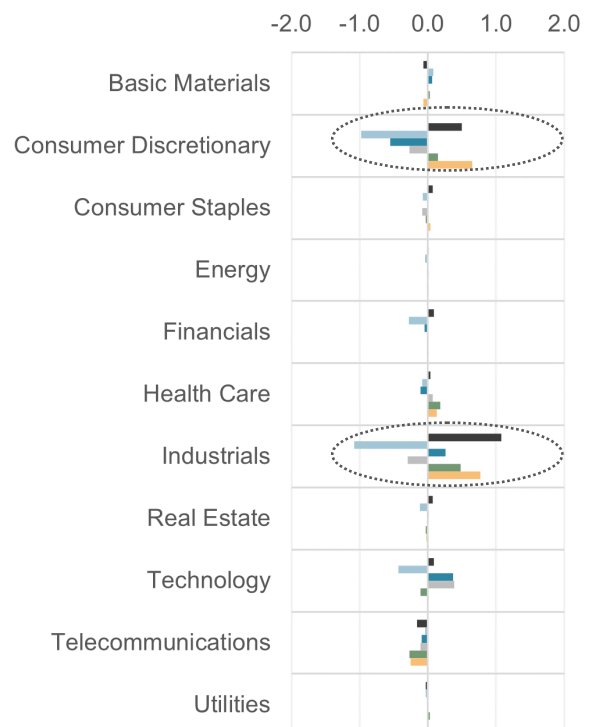
Total industry effects, Q2 2023



Industry allocation effects, Q2 2023



Selection effect within industry, Q2 2023

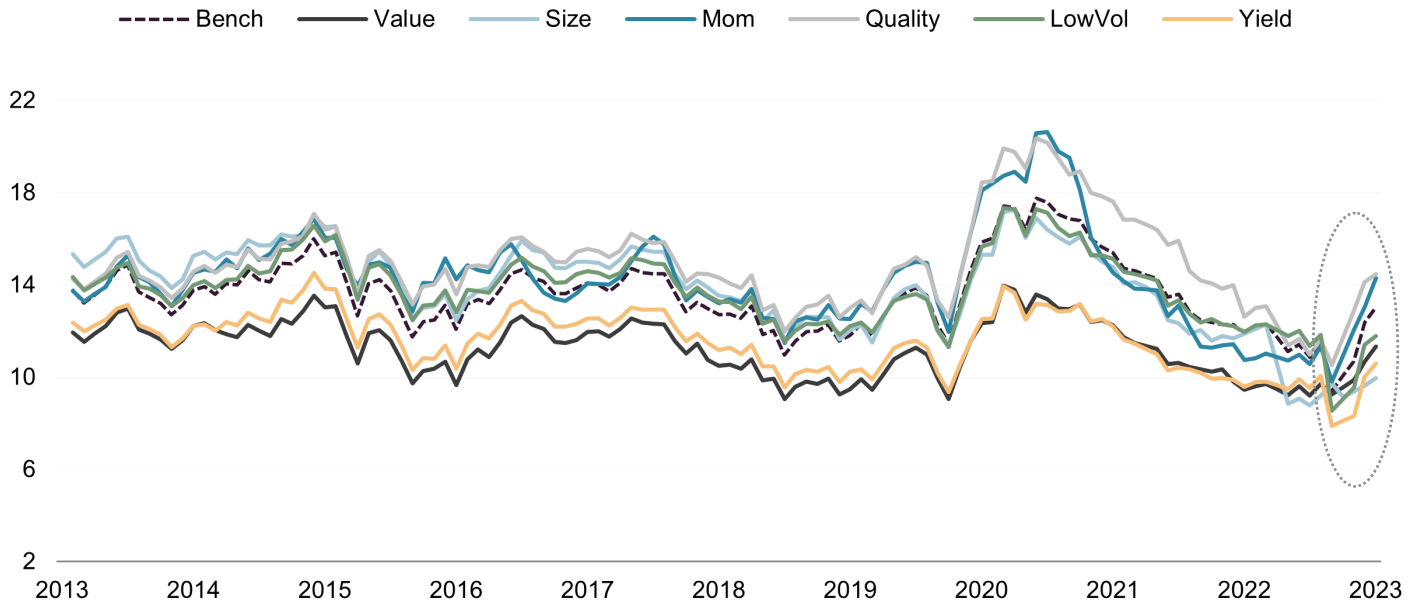


Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Industry results based on Industry Classification Benchmark (ICB) data. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

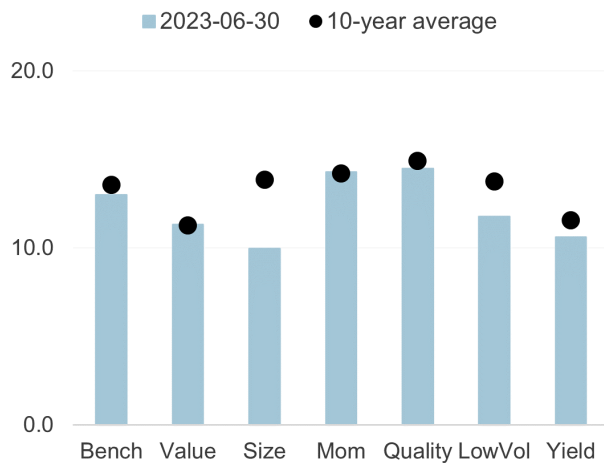
Japan Factor Valuations

Following Japan's robust Q2 rally, forward P/E's for most factors are now at or near 10-year averages in absolute terms. Size is by far the cheapest factor, carrying a much bigger-than-normal discount to the market and other factors in both absolute and relative terms. But Value, Momentum and Quality trade well above their historical averages relative to the market. Unlike its peers in other markets, Japan's Quality/Value premium, at 2.1 points, is still significantly below its long-term average spread of 3.6 points.

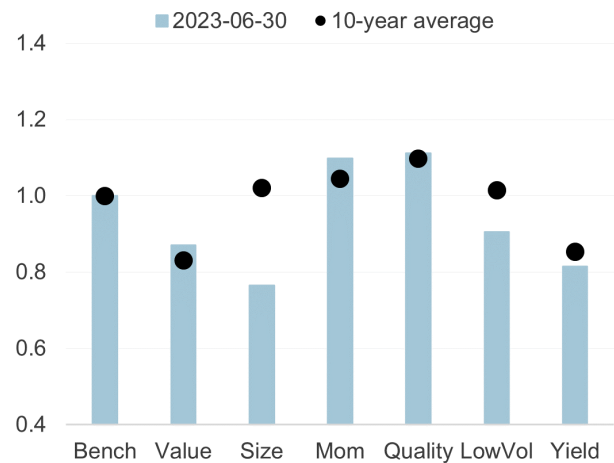
FTSE Japan – Absolute 12M forward P/E's



Current Absolute 12M P/E's vs history



Current Relative 12M P/E's vs history



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

Asia Pacific ex Japan Equity Factor Insights

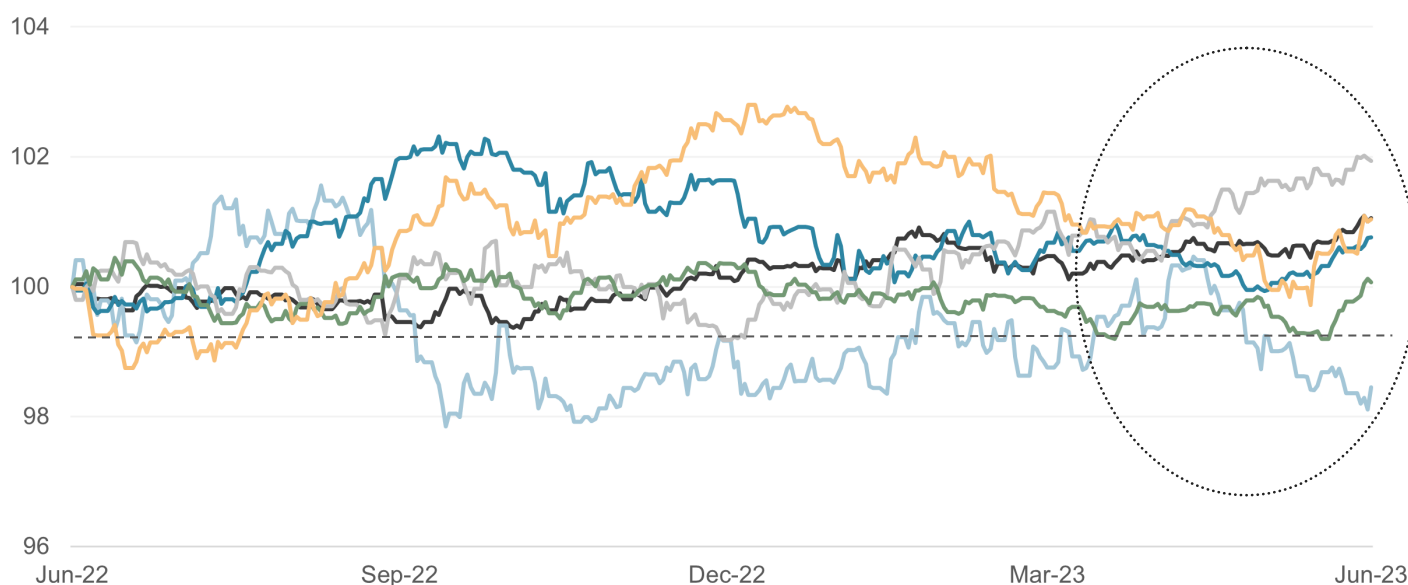
Second Quarter 2023

Key Observations

- Quality and Value remained the top performers in Q2, while Yield and Size lagged. All but Size outperformed for the 12 months, with Quality surging to a solid lead for the period.
- Factor performance in Q2 hinged overwhelmingly on exposures to high-flying Tech stocks — by far the biggest booster for Quality and a major detractor for Yield and Size.
- Value benefited largely from bargain-hunting across industries, particularly within Discretionary and Financials.
- Forward P/Es for most factors are back in line or above 10-year averages, with the exception of Size and Yield, which continue to trade well below their historical discounts to the market and other factors.
- Quality and Momentum now rank as the most expensive factors, trading at slightly bigger-than-average premiums to the market. The Quality/Value premium remains far larger than normal.

Value Size Mom Quality Low Vol Yield

Factor returns relative to benchmark (rebased)



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

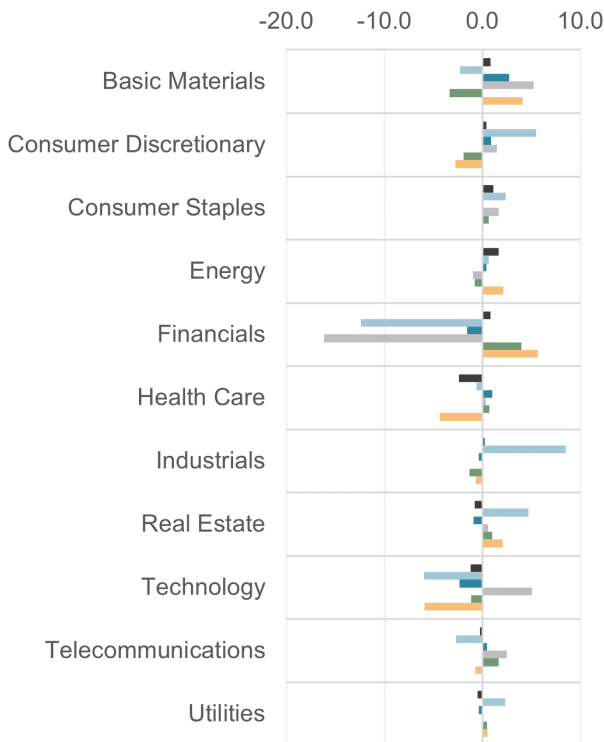
Asia Pac ex Japan Factor Performance & Industry Attribution — Q2 2023

Quality and Value stand out amid muted factor performances

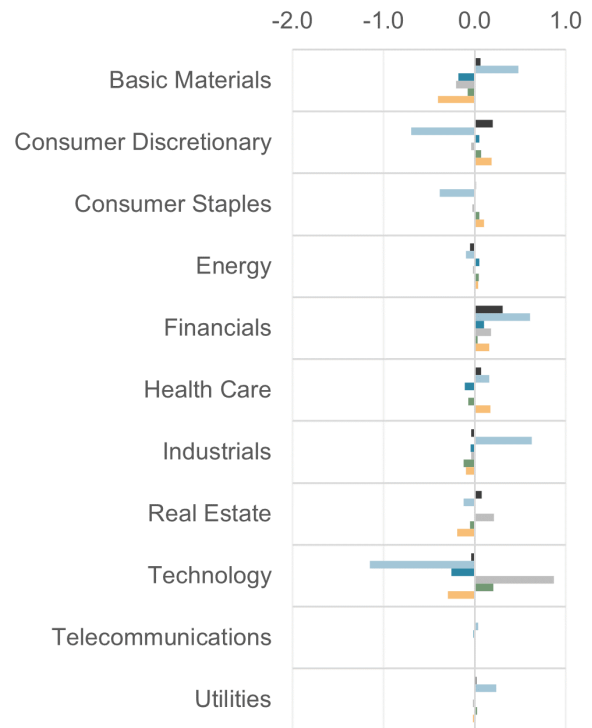
As in the prior quarter, Quality and Value were the top performers, while long-time winner Yield lagged. Quality's edge owed much to its large exposure to Tech outperformance (while underweights were drags for Size and Yield). Value benefited most from stock selection within Discretionary and Financials. Preferences for large-cap Tech & Discretionary stocks also hurt Size.

2023 Q2	Relative to Benchmark (TR%)					
FTSE Dev Asia Pacific ex JP	Value	Size	Mom	Quality	Low Vol	Yield
1.2%	0.6	-0.3	0.1	0.8	0.4	-0.4

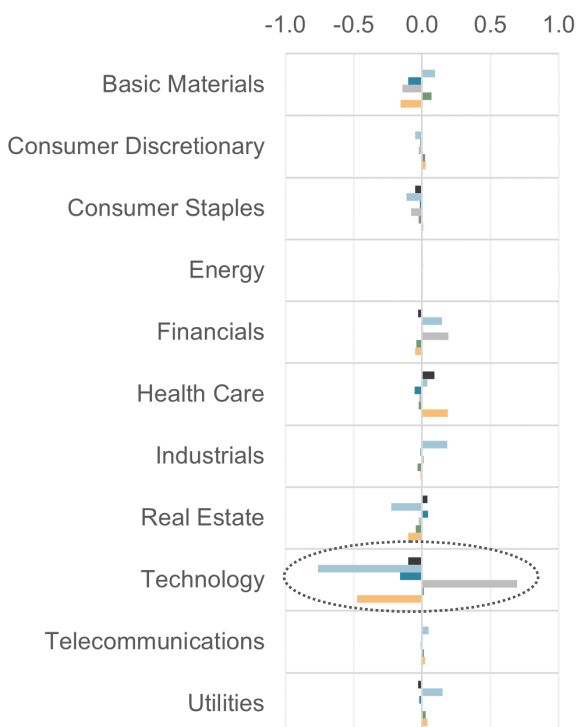
Industry active weights, Q2 2023 average



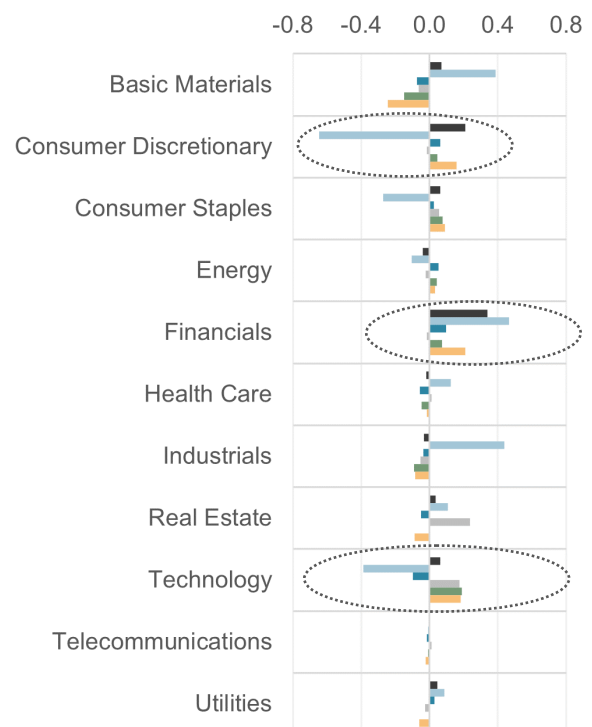
Total industry effects, Q2 2023



Industry allocation effects, Q2 2023



Selection effect within industry, Q2 2023

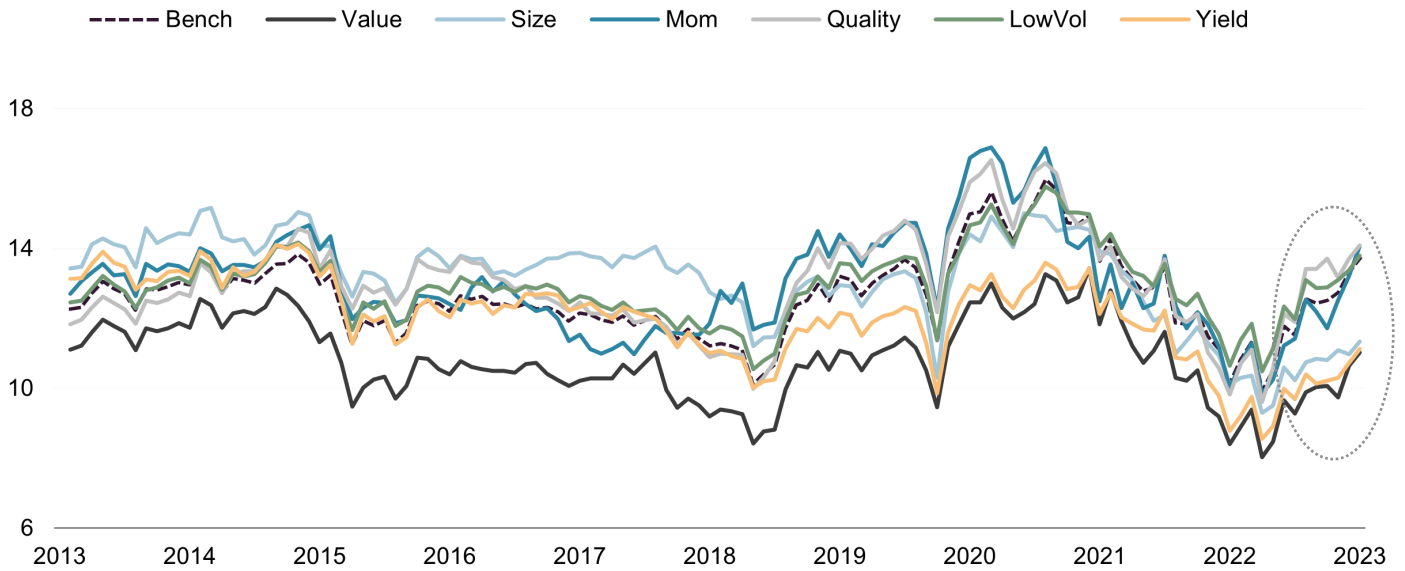


Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Industry results based on Industry Classification Benchmark (ICB) data. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

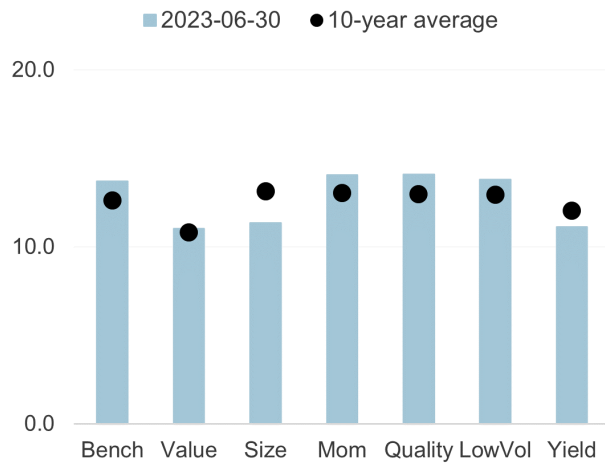
Asia Pacific ex Japan Factor Valuations

Following big Q2 re-ratings, forward P/Es for most factors (except Size and Yield) are now in line with or above 10-year averages in absolute terms. Size, Yield and Value still trade at deeper discounts to the benchmark and other factors versus history. Quality and Momentum rank as the most expensive relative to history, in both absolute and relative terms. The Quality/Value premium, at 3.1 points, remains well above its long-term average spread of 2.2 points.

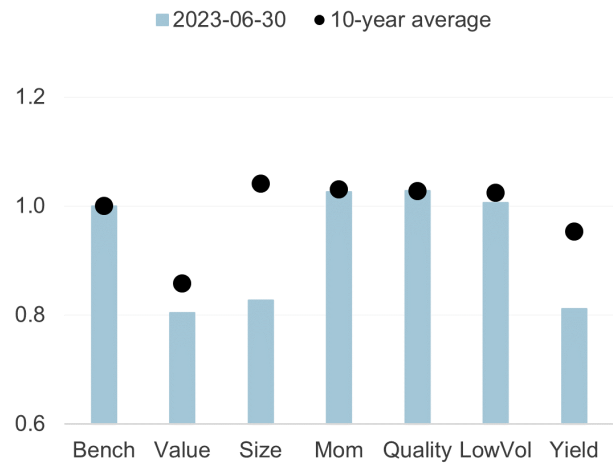
FTSE Asia Pacific ex Japan – Absolute 12M forward P/Es



Current Absolute 12M forward P/Es vs history



Current Relative 12M forward P/Es vs history



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

Emerging Markets Factor Report

Second Quarter 2023

Key Observations

- Deviating from DM trends, all EM factors once again beat the benchmark in Q2, this time led by Size and Low Vol. All factors also outperformed for the 12-month period, with Size firmly in the lead and Quality ranking at bottom.
- Factor performances swung mostly on exposures to the sell-off in Tech and Discretionary stocks — helping Size, Low Vol and Yield and hurting Quality.
- Big overweights in Financials also helped Low Vol, Yield and Value, though negative stock selection within that sector was an offset for all three.
- Though more muted than for DM peers, the Q2 uptick in EM forward P/Es pushed most of them closer to 10-year averages in absolute and relative terms.
- Value and Yield remain the cheapest factors, trading at slightly bigger-than-normal discounts to the market, while the Quality premium is now roughly in line with historical averages versus the market and Value.



Factor returns relative to benchmark (rebased)



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

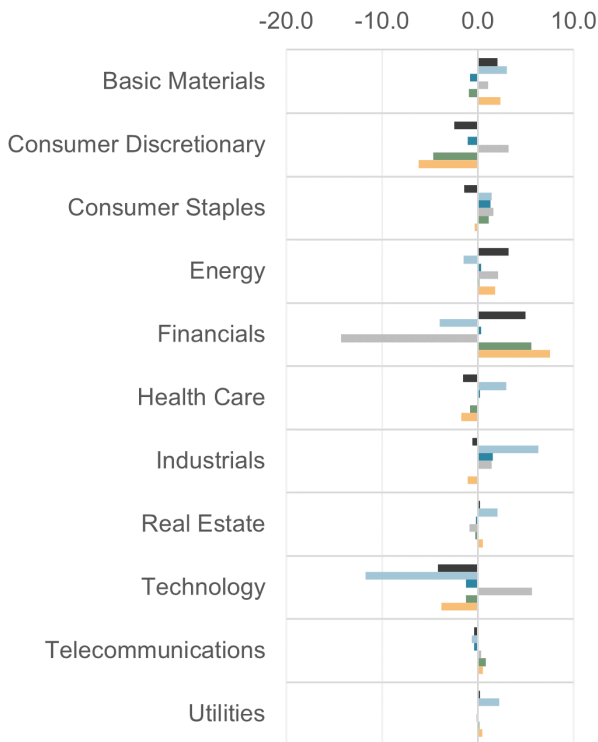
Emerging Markets Factor Performance & Industry Attribution — Q2 2023

EM Size extends its lead, in major divergence from global trends

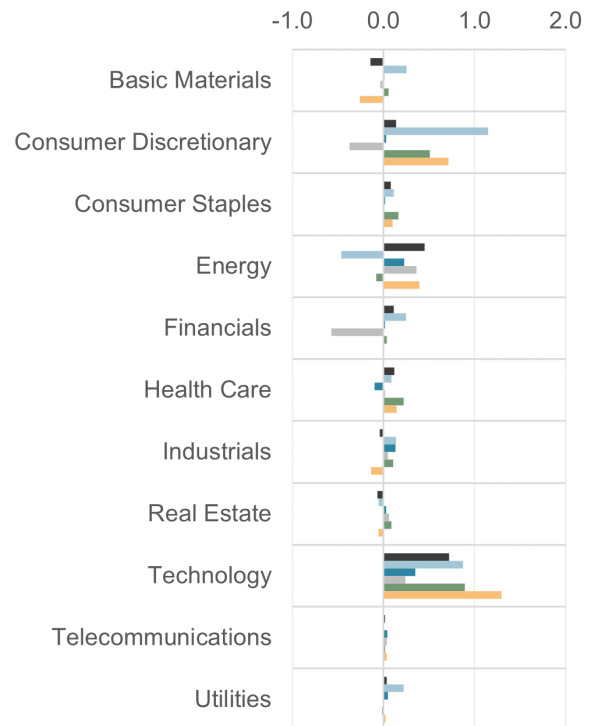
In contrast to DM peers, all EM factors outperformed the benchmark in Q2. Size, Low Vol and Yield topped the charts, helped mostly by their avoidance of the sell-off in EM Tech & Discretionary stocks. Low Vol, Yield and Value also benefited from big Financials overweights, offset by negative stock selection in that sector. Large underweight in Financials hurt Quality most.

2023 Q2	Relative to Benchmark (TR %)					
FTSE Emerging	Value	Size	Mom	Quality	Low Vol	Yield
1.4%	1.8	2.8	2.0	0.2	2.8	2.7

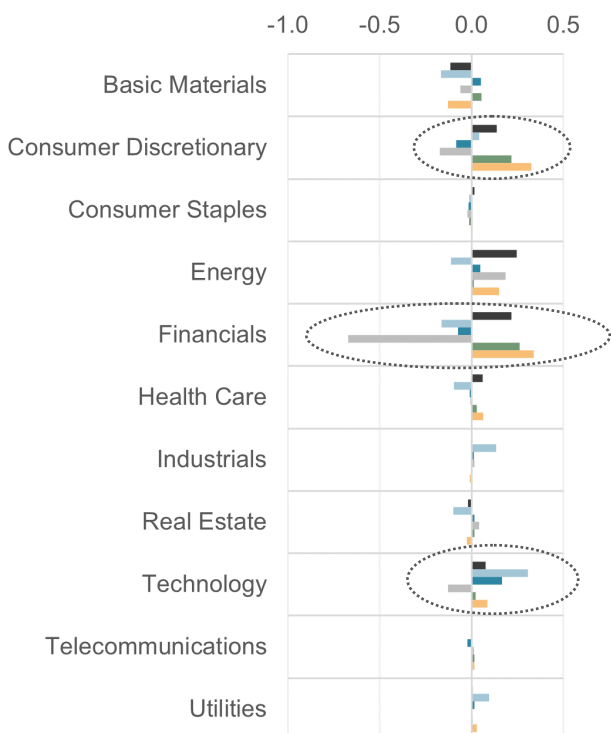
Industry active weights, Q2 2023 average



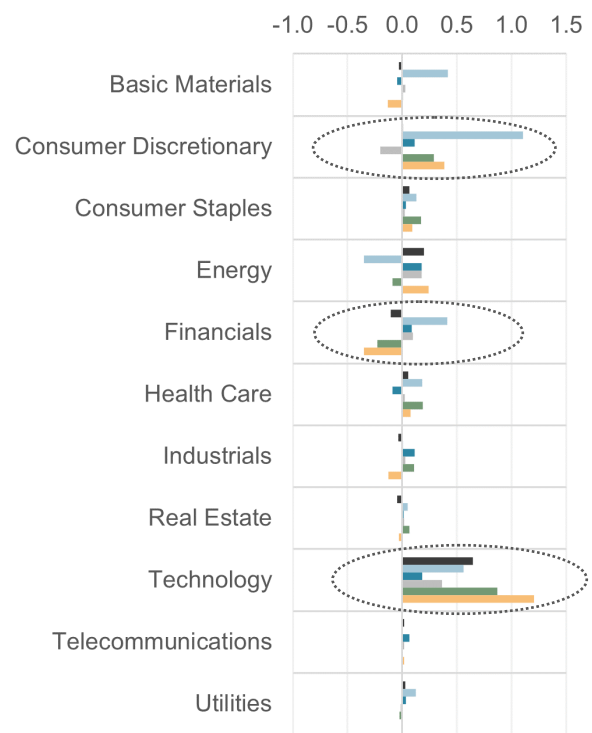
Total industry effects, Q2 2023



Industry allocation effects, Q2 2023



Selection effect within industry, Q2 2023

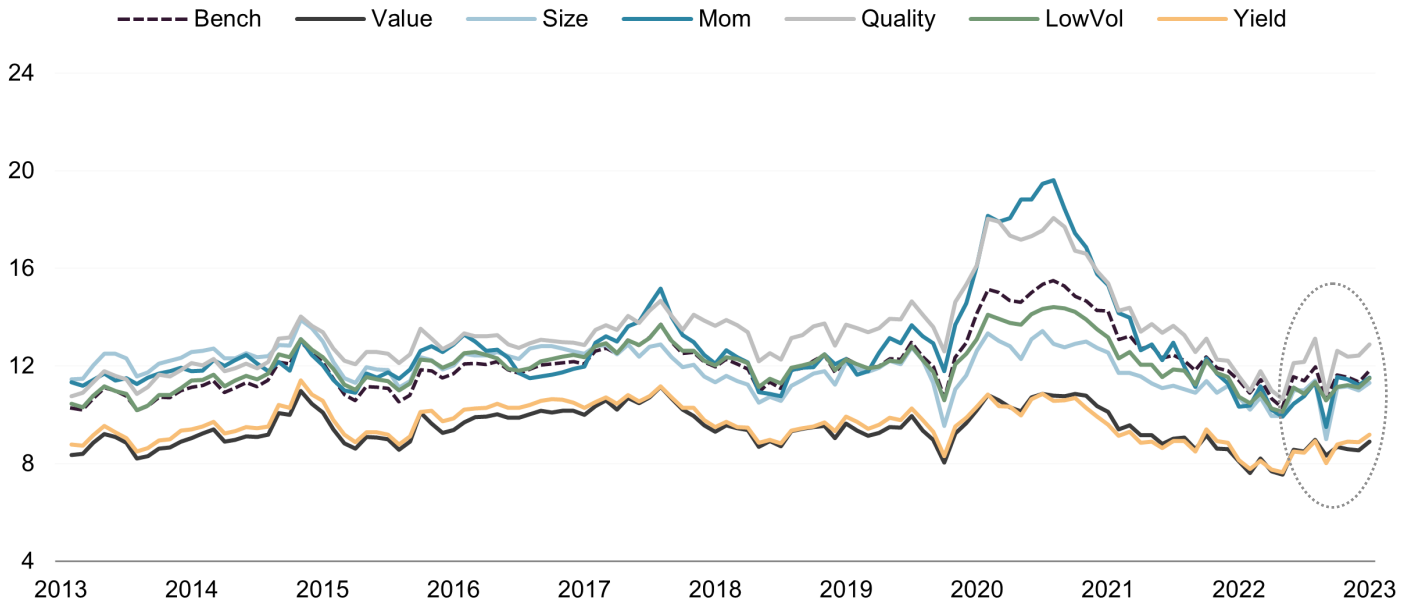


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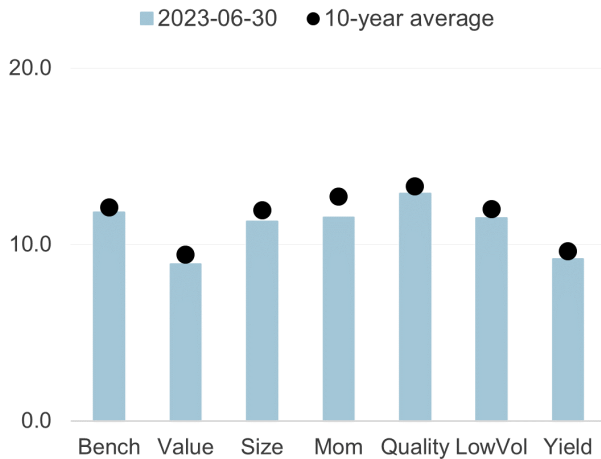
Emerging Markets Factor Valuations

The rebound in forward P/E's this year has been more muted for EM than its developed peers, but most factors have moved closer to 10-year averages in both absolute and relative terms. Value and Yield remain the least expensive, trading at bigger discounts to the market and other factors versus history. Quality is the most expensive, trading at premiums roughly in line with long-term averages relative both to the market (at 1.1) and versus Value (at around 4 points).

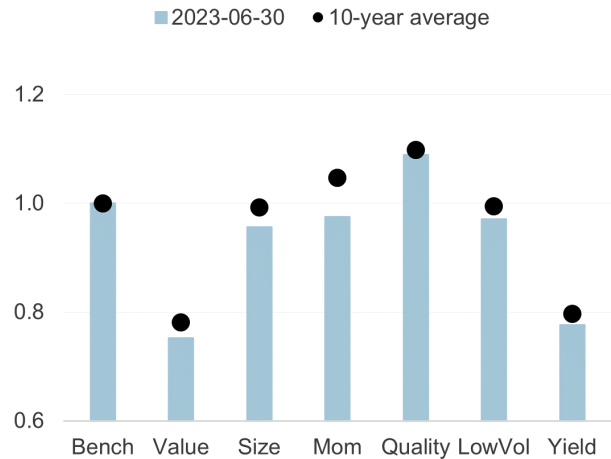
FTSE Emerging – Absolute 12M forward P/E's



Current Absolute 12M forward P/E's vs history

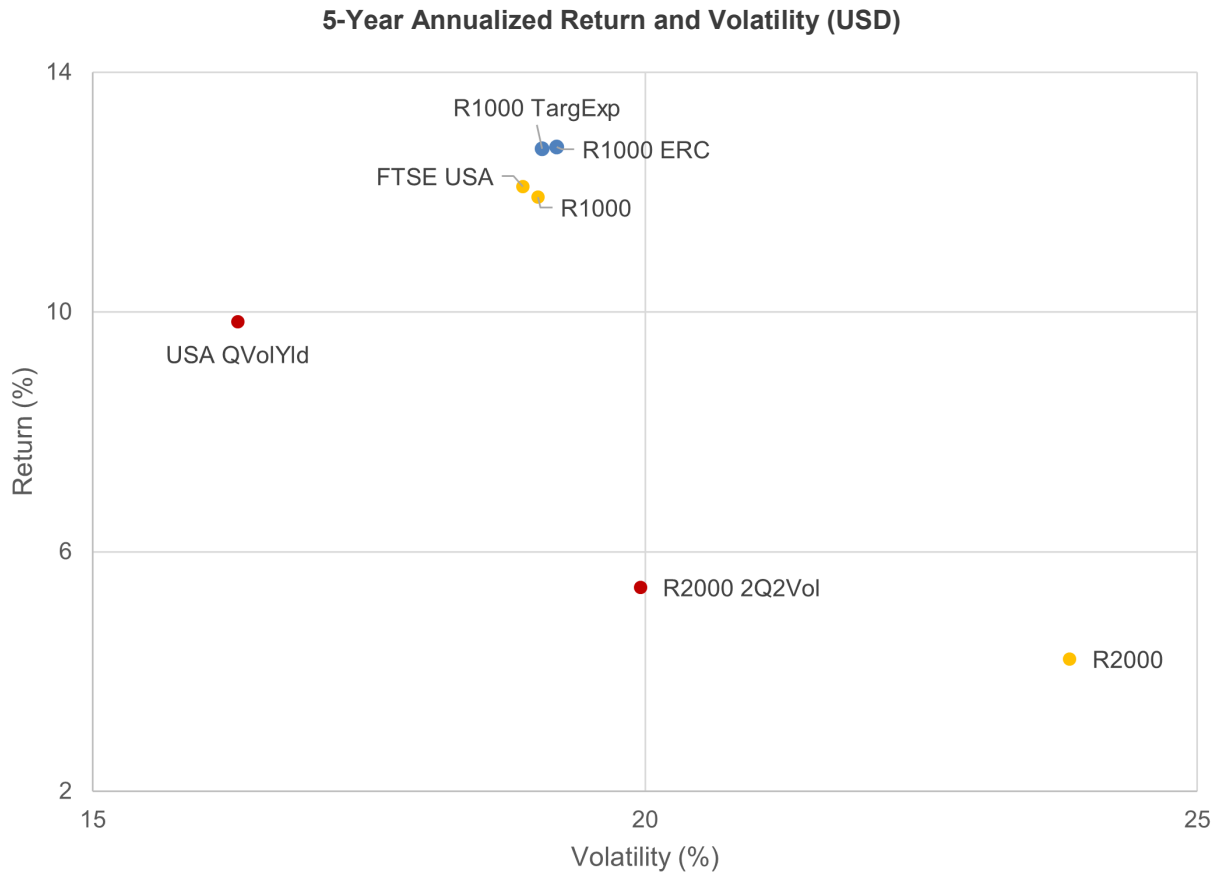


Current Relative 12M forward P/E's vs history



Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Results shown for regional factor returns represent hypothetical, historical performance, at Tilt 1, based on FTSE Global Equity Index Series and the FTSE Global Factor Index Series. Past performance is no guarantee of future results. Please see end for important disclosures and information on factor calculations. For professional investors only.

FTSE Russell US Factor Index Risk/Return Performance



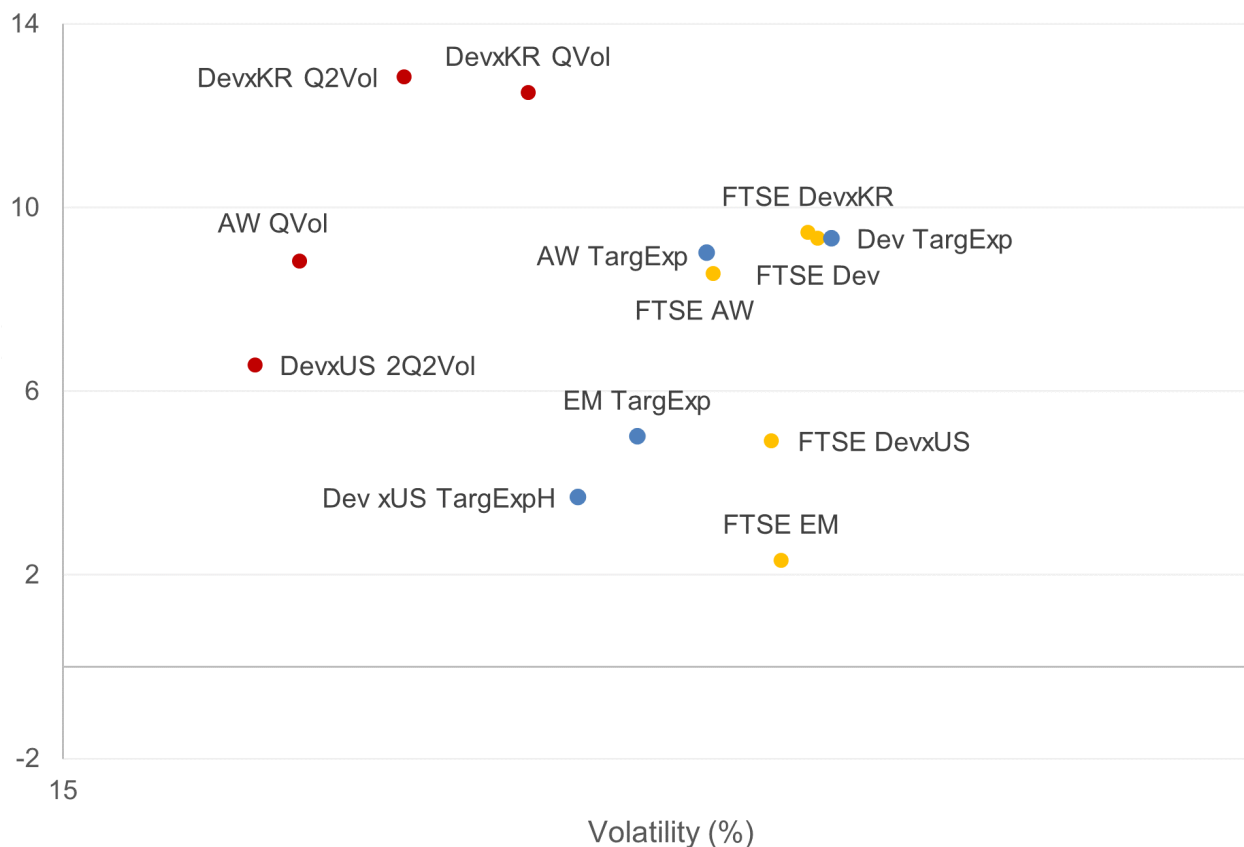
Annualized Returns and Volatility (USD %)

Label	Index	1-yr return	5-yr return	5-yr volatility
Diversified Indexes				
● R1000 ERC	Russell 1000 Comprehensive Equal Factor Risk Contribution	20.6	12.8	19.2
● R1000 TargExp	Russell 1000 Comprehensive Target Exposure Factor Index	19.4	12.7	19.1
Defensive Indexes				
● R2000 2Q2Vol	Russell 2000 2Qual/2Vol 3% Capped Factor Index	10.5	5.4	20.0
● USA QVolYld	FTSE USA Qual/Vol/Yield Factor Index	5.5	9.8	16.3
Benchmarks				
● FTSE USA	FTSE USA Index	19.6	12.1	18.9
● R1000	Russell 1000® Index	19.4	11.9	19.0
● R2000	Russell 2000® Index	12.3	4.2	23.8

Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Past performance is no guarantee of future results. Please see end for important disclosures. For professional investors only.

FTSE Russell Global Factor Index Risk/Return Performance

5-Year Annualized Return and Volatility (USD)



Annualized Return and Volatility (USD)

Label	Index	1-yr return	5-yr return	5-yr volatility
Diversified Indexes				
● AW TargExp	FTSE All-World Comprehensive Target Exposure Factor Index	20.3	9.0	17.6
● Dev TargExp	FTSE Developed Comprehensive Target Exposure Factor Index	20.5	9.3	18.2
● Dev xUS TargExpH	FTSE Developed ex US Comprehensive High Target Exposure	13.2	3.7	17.1
● EM TargExp	FTSE Emerging Comprehensive Target Exposure Factor Index	9.0	5.0	17.4
Defensive Indexes				
● AW QVol	FTSE All-World Target Exposure Qual Vol Factor Index	15.4	8.8	16.0
● DevxKR Q2Vol	FTSE Developed ex Korea Qual/2 Vol Factor Index	17.0	12.8	16.4
● DevxKR QVol	FTSE Developed ex Korea Qual/Vol Factor Index	17.6	12.5	16.9
● DevxUS 2Q2Vol	FTSE Developed ex US 2Qual/2Vol 5% Capped Factor Index	19.0	6.6	15.8
Benchmarks				
● FTSE AW	FTSE All-World Index	16.9	8.6	17.7
● FTSE DevxKR	FTSE Developed ex Korea Index	19.0	9.5	18.1
● FTSE DevxUS	FTSE Developed Ex US Index	17.5	4.9	17.9
● FTSE Dev	FTSE Developed Index	18.9	9.3	18.1
● FTSE EM	FTSE Emerging Index	1.3	2.3	18.0

Source: FTSE Russell / Refinitiv. All data as of June 30, 2023. Past performance is no guarantee of future results. Please see end for important disclosures. For professional investors only.

Important Notes and Information

Note on Market Maps Factor Data

FTSE Russell employs a bottom-up “tilting” approach to create factor indexes. Factor scores are calculated that range from 0 to 1, with higher scores being better. The underlying cap-weighted benchmark weights are multiplied by these scores, and this product is renormalized to give the factor index weights.

Intuitively, the index weights start with the benchmark weights and “tilt” towards stocks with better factor scores and away from stocks with worse factor scores. The magnitude of the index’s factor exposure can be controlled by raising the factor scores by an exponent, with higher exponents yielding higher factor exposure. All data in the Market Maps Equity Factor Insights report uses an exponent (or tilt size) of 1.

See FTSE Global Factor Index Series Ground Rules v4.4, January 2019, below for further details on rules-based factor calculations and construction methodology.

Information on Factor Index Ground Rules and Construction Methodology

[FTSE Global Factor Index Series Ground Rules v4.4, January 2019](#)

[Factor Exposure Indexes: Index Construction Methodology \(Aug 2014\)](#)

Links to FTSE Russell Factor Research Papers

[The role of diversification return in factor portfolios \(July 2021\)](#)

[Comparing Value factor performance in global equity markets \(June 2021\)](#)

[SI indexes: Top-down targets or bottom-up aesthetics? \(June 2021\)](#)

[Do factors carry information about the economic cycle, part 2 \(Feb 2021\)](#)

[Do factors carry information about the economic cycle, part 1 \(Dec 2020\)](#)

[Russell Growth and Value indexes: the enduring utility of style \(Dec 2020\)](#)

[Inverting factor strategies: No more monkey business \(Sept 2020\)](#)

[Portfolio factor allocation schemes \(March 2020\)](#)

[Target factor exposure investment applications and solutions \(February 2020\)](#)

[Factor investing considerations: questions and answers \(Nov 2019\)](#)

[Size exposure spectrum and factor tilts \(July 2019\)](#)

[Factor behavior through the cycle \(June 2019\)](#)

[Factor valuation considerations \(Feb 2019\)](#)

[Implementation considerations for defensive strategies: A look at three approaches \(Feb 2019\)](#)

[Alternative approaches to multi-factor index construction: Like-for-like comparisons \(Nov 2018\)](#)

[Factor indexes and factor exposure matching: Like-for-like comparisons \(Oct 2018\)](#)

[Multi-factor indexes: The power of tilting \(August 2018\)](#)

[Implementation considerations for factor investing \(Mar 2018\)](#)

Glossary of Terms

VALUE

Earnings Yield (E/P) – Latest reported annual earnings per share divided by full market capitalization. Earnings are based on net income from continuing operations, before amortization of goodwill and extraordinary items and after tax, minority interests, preferred dividend, at fiscal year end.

Cash-Flow Yield (CF/P) – Latest reported annual cash-flow yield is cash earnings per share divided by full market capitalization. Cash earnings are earnings plus depreciation, amortization, deferred taxes, other non-cash items, extraordinary item and changes in working capital for the most recent fiscal year.

Sales-to-Price (S/P) – Latest annual sales from continuing operations per share for the full fiscal year divided by full market capitalization. Sales values are generally as reported but occasional adjustments may be made. They are also computed for banks, insurance and other financial companies based on appropriate definitions. Sales are attributed across different share classes, where common equity is comprised of more than one share type.

MOMENTUM

Measure of changes in total stock returns in local currency terms over those of the previous year excluding the most recent month.

SIZE

Size is calculated as the natural logarithm of each company's full market capitalization in US dollars.

QUALITY

PROFITABILITY

Return on Assets (ROA) – Net income divided by average total assets, calculated relative to the regional median stock level.

Delta Turnover – Net sales revenue divided by average total assets, calculated relative to the regional median stock level.

Accruals – Net operating assets (NOA) for the most recent reporting period minus NOA from the previous reporting period, as calculated with following formula: Change in working capital + change in non-current net operating assets + change in net financial assets ([short-term investments + long-term investments] – [long-term debt + short-term debt + preferred stock]), divided by average total assets. Calculated relative to the regional median stock level.

LEVERAGE

Leverage Ratio – Operating cash flow divided by total debt. A company whose net operating cash flow is greater than total debt or has no debt is assigned a maximum Leverage Ratio of one.

VOLATILITY (LOW)

Standard deviation of five years of weekly local total returns prior to the rebalance month. A minimum of 52 weekly return observations are required to calculate volatility.

YIELD

Dividend Yield 12M – Calculated as the natural logarithm of each company's 12-month trailing dividend yield.



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