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## Morningstar Factor Monitor: Q1 2025

The low-volatility and yield factors were the best-performing factors globally, while quality and momentum struggled.

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### Morningstar Inc.

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This is the first installment of the Morningstar Quarterly Factor Monitor, which is designed to highlight factor performance trends. This publication tracks the Morningstar Global Factor Indexes, providing insights into their performance drivers and notable facets of their portfolio composition.

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#### Key Takeaways

- ▶ As the specter of a trade war grew in the first quarter of 2025, the more defensive low-volatility and yield factors tended to outperform both the market and other factors. That trend was observed globally as well as in the US.
- ▶ The yield factor fared well outside the US, in both developed and emerging markets, though, in those regions, low volatility finished in third place behind value.
- ▶ The value factor beat the market across all regions covered in this report in the first quarter. This marked a sharp turn in the US, where value steeply underperformed in 2024.
- ▶ Quality and momentum were among the worst-performing factors in the first quarter of 2025, but among the best-performing in 2024. Sharp reversals in market direction create a headwind for momentum, but all factors experience performance cyclicalities. Because of their volatility, it is difficult to effectively time factor exposures.
- ▶ Factors are lowly correlated with each other, so they are complementary and can offer strong diversification benefits when combined in a portfolio.
- ▶ Regardless of the market conditions, the Morningstar Global Factor Indexes are effective tools for monitoring factor trends.

## A Lens for Market Performance

Factors are key drivers of stock returns. These are common security characteristics, like low valuations or small size, that can help explain why one group of stocks performs differently from another. The value, momentum, quality, small size, yield, and low-volatility factors have historically been linked to strong performance over the very long term<sup>1</sup>. These factors have been widely documented, and their persistence is supported by strong economic rationale, related to either compensation for risk or investor behavior<sup>2</sup>.

Despite their long-term record, factors experience performance cyclicity<sup>3</sup>. Even so, factors provide an effective lens through which to understand market performance.

The Morningstar Global Factor Indexes are useful tools for monitoring these trends. These indexes are designed to deliver strong, investable exposure to their target factors. They apply a consistent framework, each covering stocks representing 30% of their parent benchmarks by market value, and tilt weighting their constituents (from float market cap) to upweight those with the strongest factor characteristics. The appendix provides additional details on the index construction methodology.

## Performance (Q1 2025)

### Global Leaders

As the specter of a trade war grew in the first quarter of 2025, the more defensive low-volatility and yield factors tended to outperform both the market and other factors. That trend was observed globally as well as in the US, where the market ended in the red for the quarter. The yield factor fared well outside the US, in both developed and emerging markets, though, in those regions, low volatility finished in third place behind value.

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<sup>1</sup> Low volatility has historically been associated with better risk-adjusted performance than the market, not necessarily higher absolute returns.

<sup>2</sup> For more on the value and small size factors, see: <https://www.jstor.org/stable/2329112>. For more on momentum factor, see: <https://www.jstor.org/stable/2328882> and <https://www.jstor.org/stable/2329556>. For more on the quality factor, see: <https://ssrn.com/abstract=2312432>. For more on low volatility, see: <https://ssrn.com/abstract=2049939>. For more on the yield factor, see: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=480171](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=480171).

<sup>3</sup> Factors can remain out of favor for long periods, as Morningstar's Zach Evans highlights with the small cap factor: [https://www.morningstar.com/funds/why-bother-with-small-cap-etfs?utm\\_source=eloqua&utm\\_medium=email&utm\\_campaign=newsletter\\_smartinvestor&utm\\_content=57883](https://www.morningstar.com/funds/why-bother-with-small-cap-etfs?utm_source=eloqua&utm_medium=email&utm_campaign=newsletter_smartinvestor&utm_content=57883).

**Exhibit 1** Global Performance Summary

|   | Q1 2025 |         | 1 Year |         | 5 Year |         | 10 Year |         | Since Inception |         |      |
|---|---------|---------|--------|---------|--------|---------|---------|---------|-----------------|---------|------|
|   | Rtn     | Std Dev | Rtn    | Std Dev | Rtn    | Std Dev | Rtn     | Std Dev | Rtn             | Std Dev | SR   |
| Morningstar Global Low Volatility Factor  | 5.51    | 8.81    | 12.10  | 10.12   | 12.61  | 12.27   | 8.18    | 11.89   | 7.67            | 12.43   | 0.56 |
| Morningstar Global Momentum Factor        | -2.27   | 22.75   | 8.94   | 13.23   | 17.66  | 18.66   | 11.53   | 16.52   | 7.84            | 18.39   | 0.44 |
| Morningstar Global Quality Factor         | -4.95   | 17.33   | 2.93   | 11.90   | 14.70  | 17.60   | 9.49    | 15.66   | 8.77            | 16.49   | 0.52 |
| Morningstar Global Size Factor            | -0.42   | 14.02   | 3.80   | 12.10   | 14.82  | 17.19   | 7.35    | 16.37   | 7.28            | 18.30   | 0.41 |
| Morningstar Global Value Factor           | 4.54    | 12.62   | 7.52   | 10.76   | 16.41  | 15.61   | 8.13    | 15.19   | 7.34            | 17.14   | 0.43 |
| Morningstar Global Yield Factor           | 5.47    | 12.29   | 12.54  | 9.74    | 19.60  | 15.27   | 10.18   | 15.08   | 9.20            | 16.64   | 0.54 |
| Morningstar Global Multifactor            | 1.64    | 12.43   | 9.30   | 9.88    | 15.85  | 13.97   | 9.44    | 13.05   | 9.14            | 14.02   | 0.61 |
| Morningstar Global Target Market Exposure | -1.25   | 14.96   | 7.37   | 10.00   | 15.68  | 15.75   | 9.37    | 14.77   | 7.87            | 16.42   | 0.47 |

Source: Morningstar Indexes. Performance shown in GR USD. The inception date is June 20, 2008.

**Exhibit 2** Global Risk Summary (Since Inception)

|   | Tracking Error | Beta | Max Drawdown | Down-Capture Ratio | Up-Capture Ratio |
|---|----------------|------|--------------|--------------------|------------------|
| Morningstar Global Low Volatility Factor  | 6.73           | 0.70 | -30.68       | 68.25              | 76.24            |
| Morningstar Global Momentum Factor        | 6.61           | 1.05 | -53.92       | 106.70             | 104.83           |
| Morningstar Global Quality Factor         | 3.44           | 0.98 | -41.50       | 96.43              | 100.68           |
| Morningstar Global Size Factor            | 3.75           | 1.10 | -49.07       | 108.54             | 104.15           |
| Morningstar Global Value Factor           | 4.86           | 1.00 | -47.38       | 99.86              | 97.98            |
| Morningstar Global Yield Factor           | 3.92           | 0.98 | -45.44       | 94.15              | 100.55           |
| Morningstar Global Multifactor            | 4.54           | 0.83 | -36.90       | 80.76              | 90.58            |
| Morningstar Global Target Market Exposure | 0.00           | 1.00 | -46.15       | 100.00             | 100.00           |

Source: Morningstar Indexes. Performance shown in GR USD.

The Morningstar Global Yield Factor Index benefited from favorable intra-sector stock exposure, particularly in the consumer cyclical, healthcare, and technology sectors. Among the top contributors were its overweighting in Alibaba, CVS, and Cisco, along with its omission of Tesla and Nvidia. Sector tilts were not a significant contributor to the yield factor index's performance since this index applies tight sector constraints relative to its parent benchmark, as do the value, small size, and quality factor indexes.

The Morningstar Global Low Volatility Factor Index allows for greater sector tilts relative to its parent benchmark, which contributed to its strong performance, including its overweighting in the financial services and consumer defensive sectors, and underweighting of the poor-performing technology sector. Favorable intra-sector stock exposure also helped, such as avoiding Nvidia, as well as overweighting Deutsche Telekom and Allianz.

**Exhibit 3** Global Attribution

| Top Contributors                         |   |               |            |        | Top Detractors                                  |               |            |                         |
|--|---|---------------|------------|--------|---|---------------|------------|-------------------------|
|  | Name                                      | Active Weight | 3M Returns | Effect | Name  | Active Weight | 3M Returns | Contr. To Active Return |
| Morningstar Global Low Volatility Factor | Berkshire Hathaway Inc Class B            | 1.85          | 17.49      | 0.5    | Microsoft Corp                                  | 3.48          | -10.76     | -0.83                   |
|  | Allianz SE                                | 1.34          | 24.13      | 0.35   | Infosys Ltd                                     | 0.74          | -16.32     | -0.15                   |
|  | Novartis AG Registered Shares             | 1.71          | 17.12      | 0.33   | CSL Ltd   | 0.96          | -10.18     | -0.11                   |
|  | Coca-Cola Co                              | 1.64          | 15.88      | 0.3    | Tata Consultancy Services Ltd                   | 0.52          | -10.16     | -0.06                   |
|  | Johnson & Johnson                         | 1.48          | 15.59      | 0.29   | Royal Bank of Canada                            | 0.82          | -5.76      | -0.06                   |
| Morningstar Global Momentum Factor       | Rheinmetall AG                            | 0.21          | 123.88     | 0.25   | Nvidia Corp                                     | 3.68          | -19.29     | -1.57                   |
|  | Philip Morris International Inc           | 0.37          | 33.06      | 0.19   | Broadcom Inc                                    | 2.53          | -27.56     | -1.14                   |
|  | Rolls-Royce Holdings PLC                  | 0.50          | 35.76      | 0.19   | Taiwan Semiconductor Manufacturing Co Ltd       | 2.06          | -16.03     | -0.50                   |
|  | AbbVie Inc                                | 0.54          | 19.04      | 0.18   | AppLovin Corp Ordinary Shares - Class A         | 1.01          | -18.18     | -0.20                   |
|  | GE Aerospace                              | 0.67          | 20.23      | 0.17   | Vertiv Holdings Co Class A                      | 0.34          | -36.42     | -0.15                   |
| Morningstar Global Quality Factor        | Berkshire Hathaway Inc Class B            | 2.87          | 17.49      | 0.66   | Nvidia Corp                                     | 3.89          | -19.29     | -1.59                   |
|  | Visa Inc Class A                          | 3.33          | 11.08      | 0.42   | Alphabet Inc Class A                            | 4.90          | -18.21     | -1.17                   |
|  | Wheaton Precious Metals Corp              | 0.44          | 37.92      | 0.16   | Taiwan Semiconductor Manufacturing Co Ltd       | 3.84          | -16.03     | -0.78                   |
|  | Texas Pacific Land Corp                   | 0.72          | 19.95      | 0.13   | Tesla Inc                                       | 0.51          | -35.83     | -0.73                   |
|  | Progressive Corp                          | 0.47          | 20.42      | 0.12   | Microsoft Corp                                  | 2.54          | -10.76     | -0.72                   |
| Morningstar Global Size Factor           | CVS Health Corp                           | 0.07          | 52.79      | 0.07   | Marvell Technology Inc                          | 0.11          | -44.23     | -0.11                   |
|  | Okta Inc Class A                          | 0.17          | 33.53      | 0.06   | The Trade Desk Inc Class A                      | 0.10          | -53.44     | -0.10                   |
|  | Uber Technologies Inc                     | 0.10          | 20.79      | 0.05   | Deckers Outdoor Corp                            | 0.15          | -44.95     | -0.10                   |
|  | Progressive Corp                          | 0.08          | 20.42      | 0.05   | ON Semiconductor Corp                           | 0.16          | -35.46     | -0.08                   |
| Morningstar Global Value Factor          | VeriSign Inc                              | 0.19          | 22.67      | 0.05   | Block Inc Class A                               | 0.15          | -36.07     | -0.08                   |
|  | AT&T Inc                                  | 1.99          | 25.79      | 0.54   | Hewlett Packard Enterprise Co                   | 0.52          | -27.14     | -0.16                   |
|  | CVS Health Corp                           | 0.75          | 52.79      | 0.37   | Dell Technologies Inc Ordinary Shares - Class C | 0.53          | -20.60     | -0.13                   |
|  | Verizon Communications Inc                | 1.97          | 15.46      | 0.34   | Target Corp                                     | 0.38          | -22.12     | -0.11                   |
|  | Johnson & Johnson                         | 1.15          | 15.59      | 0.25   | Bank of America Corp                            | 1.92          | -4.45      | -0.10                   |
| Morningstar Global Yield Factor          | International Business Machines Corp      | 1.38          | 13.87      | 0.22   | Toyota Motor Corp                               | 0.56          | -10.99     | -0.10                   |
|  | Alibaba Group Holding Ltd Ordinary Shares | 2.10          | 54.25      | 1.12   | Broadcom Inc                                    | 1.11          | -27.56     | -0.72                   |
|  | CVS Health Corp                           | 1.31          | 52.79      | 0.62   | Salesforce Inc                                  | 0.63          | -19.73     | -0.21                   |
|  | HSBC Holdings PLC                         | 1.42          | 18.33      | 0.29   | Caterpillar Inc                                 | 0.90          | -8.76      | -0.10                   |
|  | RTX Corp                                  | 1.72          | 15.05      | 0.28   | Adobe Inc                                       | 0.41          | -13.75     | -0.10                   |
|  | Altria Group Inc                          | 1.30          | 16.85      | 0.24   | General Motors Co                               | 0.65          | -11.49     | -0.09                   |

Source: Morningstar Indexes. Performance shown in GR USD.

### Global Laggards

Quality and momentum tended to rank as the worst-performing factors for the quarter, a sharp reversal from 2024, when these factors were at the top of the global leaderboard. These two factors finished last globally, as well as in the US and emerging markets. Quality also ranked at the bottom of the group in developed markets outside the US (DM xUS) and in US small caps. However, momentum edged out small size and value in DM xUS and US small cap, respectively.

The underperformance of quality might come as a surprise, as investors might expect quality stocks—firms with strong profitability and balance sheets—to be more resilient to market turbulence than most. However, historically, the Morningstar quality factor indexes exhibited a similar level of risk to their parent benchmarks.

The underperformance of the Morningstar Global Quality Factor Index was because of unfavorable intra-sector stock exposure, particularly in the healthcare, communication services, and technology sectors. For example, the index's overweighting in Novo Nordisk, Alphabet, and Nvidia hurt performance. Sector tilts did not have a significant impact, as those are tightly constrained relative to the parent benchmark.

Momentum's poor performance might come as less of a surprise. Momentum has historically tended to struggle in periods of high market volatility, as performance leadership is less likely to persist when the market changes direction. For example, during the late stages of a market rally, momentum tends to favor procyclical stocks, which often underperform during market corrections. Following a strong year for global stocks in 2024, the Morningstar Global Momentum Factor Index tilted toward more cyclical names, as its high beta in Q1 suggests. This created a headwind as market volatility picked up.

The Morningstar Global Momentum Factor Index owes much of its underperformance to unfavorable stock exposure in the technology sector, including its overweighting in Broadcom and Nvidia.

### US

The low-volatility factor index was the strongest-performing among both US large-cap and small-cap stocks. The strong performance in the large-cap segment was primarily because of strong intra-sector stock exposure, particularly within the technology and financial services sectors. Avoiding Nvidia paid off, as did overweighting Berkshire Hathaway and Johnson & Johnson. Sector tilts contributed to a lesser extent, including the index's overweighting in the strong-performing consumer defensive sector and underweighting of technology.

On the other end of the spectrum, the Morningstar US Quality Factor Index struggled from unfavorable stock exposure in the consumer cyclical, healthcare, communication services, and technology sectors, including its overweighting in Alphabet, Arista Networks, and Nvidia.

**Exhibit 4 US Performance Summary**

|   | Q1 2025 |         | 1 Year |         | 5 Year |         | 10 Year |         | Since Inception |         |      |
|---|---------|---------|--------|---------|--------|---------|---------|---------|-----------------|---------|------|
|   | Rtn     | Std Dev | Rtn    | Std Dev | Rtn    | Std Dev | Rtn     | Std Dev | Rtn             | Std Dev | SR   |
| Morningstar US Low Volatility Factor            | 5.68    | 12.94   | 13.24  | 12.29   | 15.24  | 14.17   | 10.66   | 12.93   | 10.28           | 12.44   | 0.75 |
| Morningstar US Momentum Factor                  | -5.61   | 31.55   | 9.84   | 18.27   | 19.81  | 20.77   | 14.52   | 18.09   | 11.13           | 18.75   | 0.59 |
| Morningstar US Quality Factor                   | -6.77   | 24.04   | 5.37   | 14.75   | 19.09  | 19.53   | 12.92   | 16.84   | 12.72           | 16.37   | 0.74 |
| Morningstar US Size Factor                      | -2.29   | 18.27   | 3.94   | 14.78   | 16.20  | 18.55   | 9.11    | 17.33   | 10.23           | 18.39   | 0.56 |
| Morningstar US Value Factor                     | 2.26    | 15.84   | 6.65   | 13.62   | 16.70  | 17.40   | 9.37    | 16.72   | 9.64            | 17.38   | 0.55 |
| Morningstar US Yield Factor                     | 0.56    | 15.69   | 13.41  | 11.91   | 21.52  | 16.64   | 11.73   | 16.22   | 11.80           | 16.44   | 0.69 |
| Morningstar US Multifactor                      | -0.69   | 17.23   | 9.89   | 13.25   | 18.52  | 15.63   | 12.07   | 14.22   | 12.00           | 14.04   | 0.79 |
| Morningstar US Target Market Exposure           | -4.46   | 19.43   | 8.14   | 12.72   | 18.48  | 17.21   | 12.38   | 15.60   | 11.36           | 15.98   | 0.68 |
| Morningstar US Small Cap Low Volatility Factor  | 0.35    | 14.99   | 7.83   | 14.76   | 11.73  | 15.17   | 8.26    | 14.56   | 10.29           | 14.35   | 0.67 |
| Morningstar US Small Cap Momentum Factor        | -10.96  | 36.08   | 11.49  | 30.93   | 21.74  | 26.51   | 10.87   | 22.95   | 8.88            | 23.06   | 0.43 |
| Morningstar US Small Cap Quality Factor         | -6.52   | 20.76   | -5.86  | 18.70   | 15.42  | 19.95   | 9.70    | 17.69   | 10.52           | 17.65   | 0.59 |
| Morningstar US Small Cap Size Factor            | -11.28  | 21.98   | -4.32  | 23.02   | 14.41  | 23.97   | 6.67    | 22.04   | 9.60            | 22.54   | 0.47 |
| Morningstar US Small Cap Value Factor           | -6.67   | 21.39   | -1.56  | 21.03   | 19.04  | 24.23   | 7.37    | 22.71   | 9.77            | 23.24   | 0.47 |
| Morningstar US Small Cap Yield Factor           | -4.24   | 19.25   | -0.63  | 19.11   | 20.90  | 21.86   | 9.48    | 20.80   | 12.08           | 20.32   | 0.61 |
| Morningstar US Small Cap Target Market Exposure | -7.53   | 22.15   | -1.57  | 20.32   | 15.33  | 21.46   | 7.75    | 19.79   | 9.41            | 20.08   | 0.49 |

Source: Morningstar Indexes. Performance shown in GR USD. The inception date is June 20, 2008.

**Exhibit 5 US Risk Summary (Since Inception)**

|   | Tracking<br>Error | Beta | Max<br>Drawdown | Down<br>Capture<br>Ratio | Up Capture<br>Ratio |
|---|-------------------|------|-----------------|--------------------------|---------------------|
| Morningstar US Low Volatility Factor            | 7.72              | 0.69 | -28.62          | 65.53                    | 74.83               |
| Morningstar US Momentum Factor                  | 7.39              | 1.08 | -50.93          | 108.87                   | 104.88              |
| Morningstar US Quality Factor                   | 4.29              | 0.99 | -37.20          | 96.65                    | 102.35              |
| Morningstar US Size Factor                      | 5.31              | 1.11 | -46.51          | 111.99                   | 103.86              |
| Morningstar US Value Factor                     | 6.61              | 1.01 | -44.76          | 103.08                   | 96.21               |
| Morningstar US Yield Factor                     | 4.94              | 0.98 | -42.02          | 93.22                    | 97.16               |
| Morningstar US Multifactor                      | 4.66              | 0.84 | -32.73          | 79.51                    | 89.21               |
| Morningstar US Target Market Exposure           | 0.00              | 1.00 | -41.49          | 100.00                   | 100.00              |
| Morningstar US Small Cap Low Volatility Factor  | 8.52              | 0.67 | -32.47          | 62.26                    | 74.74               |
| Morningstar US Small Cap Momentum Factor        | 9.68              | 1.04 | -54.37          | 106.23                   | 103.10              |
| Morningstar US Small Cap Quality Factor         | 5.00              | 0.85 | -36.42          | 83.70                    | 91.13               |
| Morningstar US Small Cap Value Factor           | 6.07              | 1.12 | -49.74          | 113.67                   | 111.35              |
| Morningstar US Small Cap Yield Factor           | 4.61              | 0.99 | -44.16          | 92.25                    | 102.03              |
| Morningstar US Small Cap Target Market Exposure | 0.00              | 1.00 | -45.80          | 100.00                   | 100.00              |

Source: Morningstar Indexes. Performance shown in GR USD.

**Developed Markets ex-US****Exhibit 6 Developed Markets ex-US Performance Summary**

|  | Q1 2025 |         | 1 Year |         | 5 Year |         | 10 Year |         | Since Inception |         |      |
|--|---------|---------|--------|---------|--------|---------|---------|---------|-----------------|---------|------|
|  | Rtn     | Std Dev | Rtn    | Std Dev | Rtn    | Std Dev | Rtn     | Std Dev | Rtn             | Std Dev | SR   |
| Morningstar Developed Markets ex-US Low Volatility Factor  | 8.70    | 10.21   | 13.71  | 11.06   | 10.89  | 12.64   | 6.23    | 12.35   | 5.79            | 13.47   | 0.40 |
| Morningstar Developed Markets ex-US Momentum Factor        | 6.78    | 20.79   | 5.81   | 9.68    | 14.46  | 16.95   | 6.90    | 15.48   | 4.37            | 18.19   | 0.26 |
| Morningstar Developed Markets ex-US Quality Factor         | 1.86    | 16.78   | -2.03  | 11.69   | 10.66  | 18.23   | 6.82    | 15.92   | 5.43            | 17.63   | 0.32 |
| Morningstar Developed Markets ex-US Size Factor            | 5.93    | 14.91   | 7.95   | 12.09   | 12.38  | 17.06   | 5.95    | 16.16   | 5.00            | 18.63   | 0.29 |
| Morningstar Developed Markets ex-US Value Factor           | 10.56   | 15.95   | 11.00  | 11.78   | 16.07  | 17.19   | 5.95    | 16.92   | 5.03            | 19.04   | 0.29 |
| Morningstar Developed Markets ex-US Yield Factor           | 10.71   | 14.28   | 11.60  | 11.00   | 16.88  | 16.15   | 7.94    | 15.57   | 6.49            | 18.23   | 0.37 |
| Morningstar Developed Markets ex-US Multifactor            | 7.54    | 14.02   | 6.17   | 9.95    | 13.39  | 14.24   | 7.22    | 13.41   | 6.63            | 15.27   | 0.42 |
| Morningstar Developed Markets ex-US Target Market Exposure | 6.40    | 15.09   | 5.76   | 10.63   | 12.84  | 16.11   | 6.15    | 15.17   | 4.61            | 17.45   | 0.28 |

Source: Morningstar Indexes. Performance shown in GR USD. The inception date is June 20, 2008.

#### Exhibit 7 Developed Markets ex-US Risk Summary (Since Inception)

|  | Tracking<br>Error | Beta | Max<br>Drawdown | Down-<br>Capture<br>Ratio | Up-Capture<br>Ratio |
|--|-------------------|------|-----------------|---------------------------|---------------------|
| Morningstar Developed Markets ex-US Low Volatility Factor  | 6.85              | 0.72 | -32.11          | 70.86                     | 79.76               |
| Morningstar Developed Markets ex-US Momentum Factor        | 6.54              | 0.97 | -52.26          | 96.82                     | 96.37               |
| Morningstar Developed Markets ex-US Quality Factor         | 4.33              | 0.98 | -46.02          | 96.44                     | 100.08              |
| Morningstar Developed Markets ex-US Size Factor            | 2.91              | 1.06 | -49.83          | 102.64                    | 103.76              |
| Morningstar Developed Markets ex-US Value Factor           | 4.86              | 1.06 | -45.20          | 106.28                    | 107.02              |
| Morningstar Developed Markets ex-US Multifactor            | 4.21              | 0.85 | -39.37          | 81.59                     | 91.97               |
| Morningstar Developed Markets ex-US Yield Factor           | 3.54              | 1.02 | -49.58          | 96.95                     | 104.51              |
| Morningstar Developed Markets ex-US Target Market Exposure | 0.00              | 1.00 | -48.51          | 100.00                    | 100.00              |

Source: Morningstar Indexes. Performance shown in GR USD.

The Morningstar Developed Markets ex-US Yield Factor Index and Morningstar Developed Markets ex-US Value Factor Index owe much of their strong performance to favorable exposure to stocks in the financial services and healthcare sectors. Novartis and UniCredit were among the top contributors to the yield factor index's strong performance. Banco Santander and Banco Bilbao Vizcaya Argentaria were the top contributors to the value factor index. Both indexes also benefited from omitting Novo Nordisk.

Quality was the worst-performing factor index for the region, hurt by poor intra-sector stock exposure, particularly in the healthcare and technology sectors. Novo Nordisk, Tokyo Electron, and Shin-Etsu Chemical were among the top detractors.



## Emerging Markets

### Exhibit 8 Emerging-Markets Performance Summary

|   | Q1 2025 |         | 1 Year |         | 5 Year |         | 10 Year |         | Since Inception |         |      |
|---|---------|---------|--------|---------|--------|---------|---------|---------|-----------------|---------|------|
|   | Rtn     | Std Dev | Rtn    | Std Dev | Rtn    | Std Dev | Rtn     | Std Dev | Rtn             | Std Dev | SR   |
| Morningstar Emerging Markets Low Volatility Factor  | 0.34    | 9.82    | 9.20   | 10.92   | 12.85  | 11.90   | 7.24    | 12.66   | 6.27            | 15.23   | 0.40 |
| Morningstar Emerging Markets Momentum Factor        | -4.04   | 19.72   | -5.98  | 7.97    | 10.03  | 18.34   | 5.54    | 17.54   | 3.31            | 21.53   | 0.21 |
| Morningstar Emerging Markets Quality Factor         | -3.91   | 13.62   | 4.08   | 10.95   | 7.15   | 20.94   | 5.05    | 17.92   | 4.30            | 21.14   | 0.25 |
| Morningstar Emerging Markets Size Factor            | 0.17    | 14.73   | 3.20   | 10.27   | 11.75  | 16.58   | 3.55    | 17.20   | 3.55            | 21.02   | 0.21 |
| Morningstar Emerging Markets Value Factor           | 5.18    | 15.68   | 12.13  | 11.74   | 14.68  | 16.44   | 6.37    | 18.62   | 4.98            | 21.38   | 0.28 |
| Morningstar Emerging Markets Yield Factor           | 4.19    | 14.57   | 13.47  | 9.80    | 14.92  | 14.99   | 6.25    | 16.48   | 5.41            | 19.25   | 0.31 |
| Morningstar Emerging Markets Multifactor GR USD     | -1.42   | 13.95   | 0.70   | 8.68    | 10.30  | 13.90   | 5.59    | 14.78   | 5.73            | 18.04   | 0.33 |
| Morningstar Emerging Markets Target Market Exposure | 2.24    | 16.51   | 7.26   | 9.96    | 8.97   | 16.15   | 4.55    | 16.77   | 3.45            | 20.34   | 0.21 |

Source: Morningstar Indexes. Performance shown in GR USD. The inception date is June 20, 2008.

### Exhibit 9 Emerging-Markets Risk Summary (Since Inception)

|   | Tracking Error | Beta | Max Drawdown | Down-Capture Ratio | Up-Capture Ratio |
|---|----------------|------|--------------|--------------------|------------------|
| Morningstar Emerging Markets Low Volatility Factor  | 7.56           | 0.71 | -41.20       | 61.23              | 75.02            |
| Morningstar Emerging Markets Momentum Factor        | 7.66           | 0.99 | -58.53       | 100.87             | 100.28           |
| Morningstar Emerging Markets Qual Factor            | 13.26          | 0.83 | -46.25       | 85.01              | 89.41            |
| Morningstar Emerging Markets Size Factor            | 4.45           | 1.01 | -51.16       | 96.78              | 97.44            |
| Morningstar Emerging Markets Value Factor           | 5.61           | 1.01 | -51.17       | 96.88              | 102.61           |
| Morningstar Emerging Markets Yield Factor           | 4.72           | 0.92 | -47.43       | 86.95              | 95.11            |
| Morningstar Emerging Markets Multifactor            | 4.76           | 0.87 | -47.88       | 80.05              | 89.98            |
| Morningstar Emerging Markets Target Market Exposure | 0.00           | 1.00 | -53.11       | 100.00             | 100.00           |

Source: Morningstar Indexes. Performance shown in GR USD.

The Morningstar Emerging Markets Value Factor Index was the top-performing factor index in its region, buoyed by favorable stock exposure in the technology sector, including overweighting SK Hynix, SK Square, and United Microelectronics, and omitting Taiwan Semiconductor.

Because value tends to work well when momentum doesn't, it is not surprising that the Morningstar Emerging Markets Momentum Factor Index was the worst-performing in the region during the first

quarter. This was primarily attributable to unfavorable intra-sector stock exposure, particularly in the consumer cyclical and technology sectors. The index's omission of Alibaba, Xiaomi Corp, and Samsung Electronics were among the top performance detractors.

### Performance Cyclicalty

Factor leadership is notoriously volatile, as Exhibit 10 illustrates. For example, momentum was at the top of the global leaderboard in 2024 yet near the bottom in Q1 2025. Momentum is particularly susceptible to poor performance when the market changes direction, but it's not the only factor to thrive in one period and struggle in another. Because factor performance is volatile, it is difficult to effectively time factor exposures.

**Exhibit 10** Global Quilt Chart

| 2015                          | 2016                         | 2017                          | 2018                          | 2019                          | 2020                         | 2021                          | 2022                          | 2023                          | 2024                          | Q1 2025                      |
|-------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|
| Momentum Factor<br>1.1        | Value Factor<br>15.9         | Momentum Factor<br>34.8       | Low Volatility Factor<br>-4.5 | Quality Factor<br>30.0        | Momentum Factor<br>37.5      | Yield Factor<br>22.2          | Value Factor<br>-5.1          | Quality Factor<br>31.2        | Momentum Factor<br>32.8       | Low Volatility Factor<br>5.5 |
| Quality Factor<br>0.5         | Yield Factor<br>14.4         | Quality Factor<br>29.8        | Momentum Factor<br>-6.4       | Momentum Factor<br>27.4       | Quality Factor<br>23.9       | Multifactor<br>22.1           | Yield Factor<br>-6.6          | Yield Factor<br>24.0          | Quality Factor<br>22.6        | Yield Factor<br>5.5          |
| Multifactor<br>-0.3           | Size Factor<br>9.8           | Multifactor<br>26.4           | Multifactor<br>-8.4           | Global TME<br>27.1            | Global TME<br>16.4           | Value Factor<br>20.0          | Low-Volatility Factor<br>-9.1 | Global TME<br>22.7            | Multifactor<br>21.4           | Value Factor<br>4.5          |
| Low-Volatility Factor<br>-1.9 | Low-Volatility Factor<br>8.7 | Global TME<br>24.5            | Yield Factor<br>-8.5          | Size Factor<br>26.0           | Multifactor<br>11.7          | Size Factor<br>19.4           | Multifactor<br>-13.3          | Value Factor<br>18.1          | Global TME<br>17.7            | Multifactor<br>1.6           |
| Global TME<br>-2.0            | Global TME<br>8.6            | Size Factor<br>22.7           | Global TME<br>-8.7            | Yield Factor<br>25.3          | Size Factor<br>10.7          | Global TME<br>19.1            | Size Factor<br>-15.0          | Size Factor<br>16.3           | Yield Factor<br>14.4          | Size Factor<br>-0.4          |
| Size Factor<br>-2.2           | Multifactor<br>5.7           | Low-Volatility Factor<br>21.4 | Value Factor<br>-9.1          | Multifactor<br>23.1           | Low-Volatility Factor<br>5.9 | Quality Factor<br>18.3        | Global TME<br>-17.6           | Multifactor<br>16.0           | Low Volatility Factor<br>12.2 | Global TME<br>-1.2           |
| Yield Factor<br>-6.4          | Quality Factor<br>4.4        | Yield Factor<br>21.3          | Quality Factor<br>-10.6       | Low-Volatility Factor<br>20.9 | Yield Factor<br>5.8          | Low-Volatility Factor<br>18.2 | Momentum Factor<br>-18.9      | Momentum Factor<br>11.6       | Value Factor<br>10.4          | Momentum Factor<br>-2.3      |
| Value Factor<br>-7.2          | Momentum Factor<br>1.2       | Value Factor<br>19.2          | Size Factor<br>-11.7          | Value Factor<br>20.7          | Value Factor<br>0.7          | Momentum Factor<br>16.0       | Quality Factor<br>-27.4       | Low-Volatility Factor<br>10.3 | Size Factor<br>10.4           | Quality Factor<br>-4.9       |

Source: Morningstar Indexes. Performance shown in GR USD.

The silver lining is that factors are lowly correlated with each other, as Exhibit 11 shows, so they are complementary and can offer strong diversification benefits when combined in a portfolio. For instance,

the Morningstar Global Multifactor Index, which combines value, momentum, quality, and low volatility, tended to have lower active risk relative to the Morningstar Global Target Market Exposure Index than its corresponding global single-factor indexes. And it never landed at the top or bottom of the factor leaderboard. Yet, its return since inception in June 2008 ranked near the top.

**Exhibit 11** Global Excess Return Correlation Matrix (10 Year)

|                                  |       |       |       |       |      |      |      |  |
|----------------------------------|-------|-------|-------|-------|------|------|------|--|
| 1 Morningstar Gbl Low Vol Ftr    | 1.00  |       |       |       |      |      |      |  |
| 2 Morningstar Gbl Mtum Ftr       | -0.23 | 1.00  |       |       |      |      |      |  |
| 3 Morningstar Gbl Qual Ftr       | -0.47 | 0.15  | 1.00  |       |      |      |      |  |
| 4 Morningstar Gbl Size Ftr       | 0.04  | -0.26 | -0.33 | 1.00  |      |      |      |  |
| 5 Morningstar Gbl Val Ftr        | 0.47  | -0.49 | -0.61 | 0.54  | 1.00 |      |      |  |
| 6 Morningstar Gbl Yld Ftr        | 0.48  | -0.56 | -0.59 | 0.48  | 0.93 | 1.00 |      |  |
| 7 Morningstar Global Multifactor | 0.76  | 0.16  | -0.23 | -0.16 | 0.26 | 0.22 | 1.00 |  |

Source: Morningstar Indexes. These calculations are based on excess returns against the Morningstar Global Target Market Exposure Index.

### Long-Term Performance

Factors can test the patience of even the most stoic investors. That's especially true of the value factor in the US. The Morningstar US Value Factor Index has lagged its parent benchmark since its inception in June 2008 by 1.72 percentage points annualized. That margin of underperformance was even larger over the past decade. The global value factor also landed toward the bottom of the leaderboard but lagged by a smaller margin than the value factor in the US.

With the poor long-term performance of value, it may come as a surprise that the yield factor was the best-performing globally, in DM xUS, and among US small caps. The yield factor is similar to value in that stocks trading at lower valuations tend to offer higher yields, which the Morningstar yield factor indexes measure based on both net buybacks and dividend distributions. However, it offers distinct portfolio and performance characteristics.

High-yielding stocks tend to generate strong free cash flow, be more mature than their lower-yielding counterparts, and be more defensive. While the value factor may also pick up some of these companies, it also tends to include distressed stocks with weak or deteriorating cash flows. As such, the yield factor tends to exhibit lower volatility and sensitivity to market fluctuations (measured by beta) than the value factor.

Among US large-caps stocks, the Morningstar US Quality Factor Index was the best-performing over its life, in stark contrast to its place at the bottom of the rankings in Q1 2025. This is a good reminder that even the best-performing strategies over the long term can look awful over the short term.

High volatility is a trademark of emerging-markets stocks, so it's notable that the low-volatility factor index was the best-performing in emerging markets since inception. Low volatility should not be

expected to top the return leaderboards over the long run. If anything, lower-risk portfolios should be expected to deliver lower returns, according to academic theory. That said, the low-volatility factor has historically delivered better risk-adjusted performance than the market, even if its raw returns do not always impress.

## **Portfolio Highlights**

### **March Rebalance**

The Morningstar Global Factor Indexes are reconstituted semiannually in June and December and rebalanced quarterly. As such, there tend to be bigger changes in the second and fourth quarters than in the first and third. There were no new constituents added to any of the factor indexes covered in this report at the March rebalance.

### **Sectors**

The Morningstar Global Factor Indexes anchor their regional and sector weightings to that of their parent benchmarks. The slower-moving, fundamental factor indexes, value, quality, size, and yield, apply tighter sector and regional constraints and measure factor exposures on a sector-relative basis within each region to determine eligibility. This is intended to mitigate unintended biases that might otherwise creep into the indexes and facilitate greater comparability. As such, these indexes share similar sector exposures to their parent benchmarks.

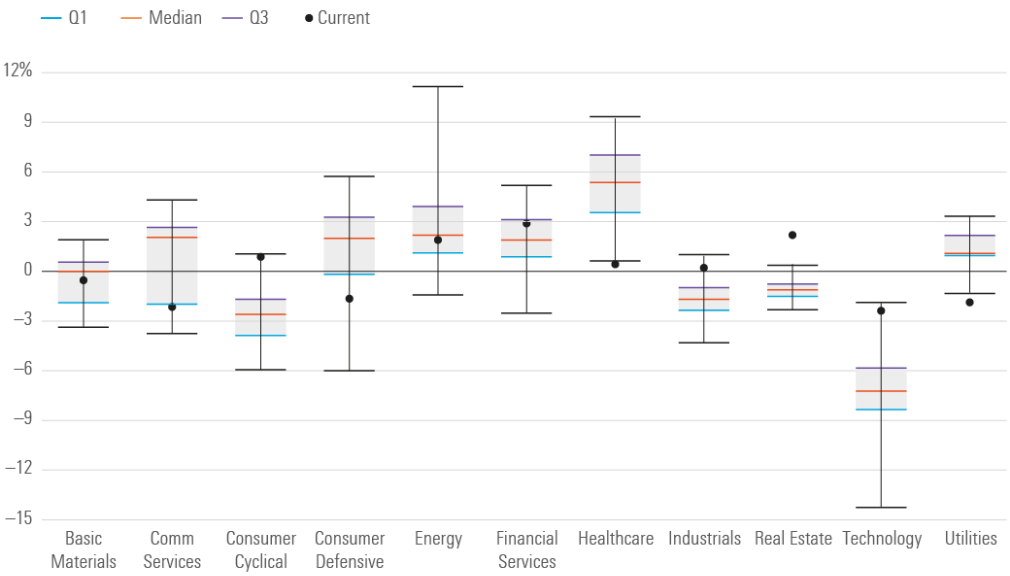
That said, there are some persistent tilts. The value and yield factors tend to lean into the financial services and healthcare sectors and away from technology.

The faster-moving, price-driven, low-volatility and momentum factor indexes apply looser regional and sector constraints and measure factor exposures on a regional-relative basis, without adjusting for sector membership. This is done because these price-driven factors are more comparable across sectors than the fundamental factors and have historically benefited more from their sector tilts.

Not surprisingly, the Morningstar low-volatility factor indexes tend to overweight more defensive sectors, such as utilities, healthcare, and consumer defensive, and underweight technology and industrials. However, some of the low-volatility factor's sector tilts fluctuate over time. For example, financial services stocks are currently more heavily represented in the Morningstar Global Low Volatility Factor Index than they are in the benchmark. But during the 2008-09 global financial crisis, this sector was one of the more volatile areas of the market and was underweighted in the index.

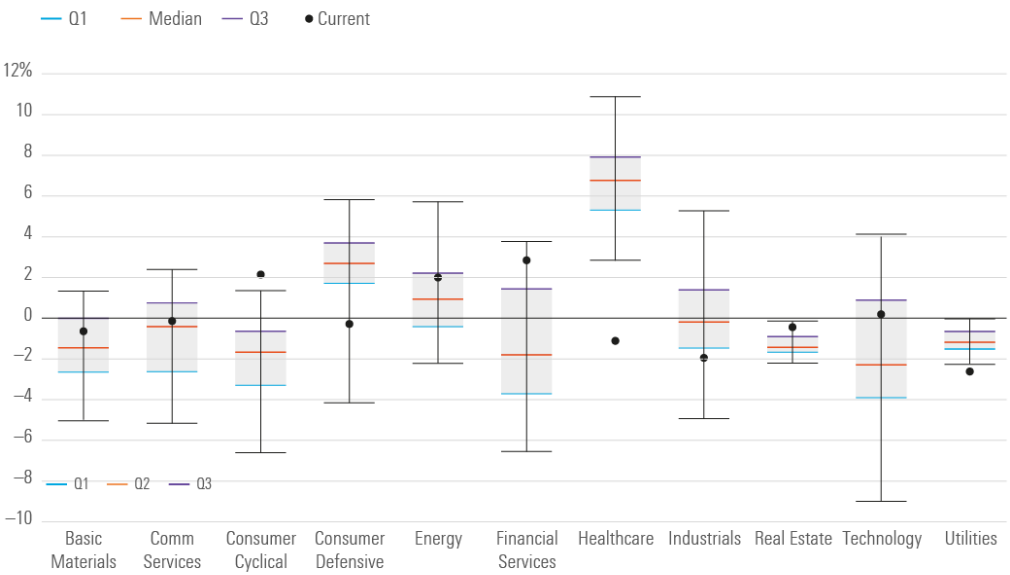
The Morningstar momentum factor indexes' sector tilts are even more dynamic. For instance, while the Morningstar Global Momentum Factor Index has tended to overweight the technology and consumer cyclical sectors, it is currently slightly underweight those sectors, following their recent lackluster.

Exhibit 12 Value Factor Active Sector Weights



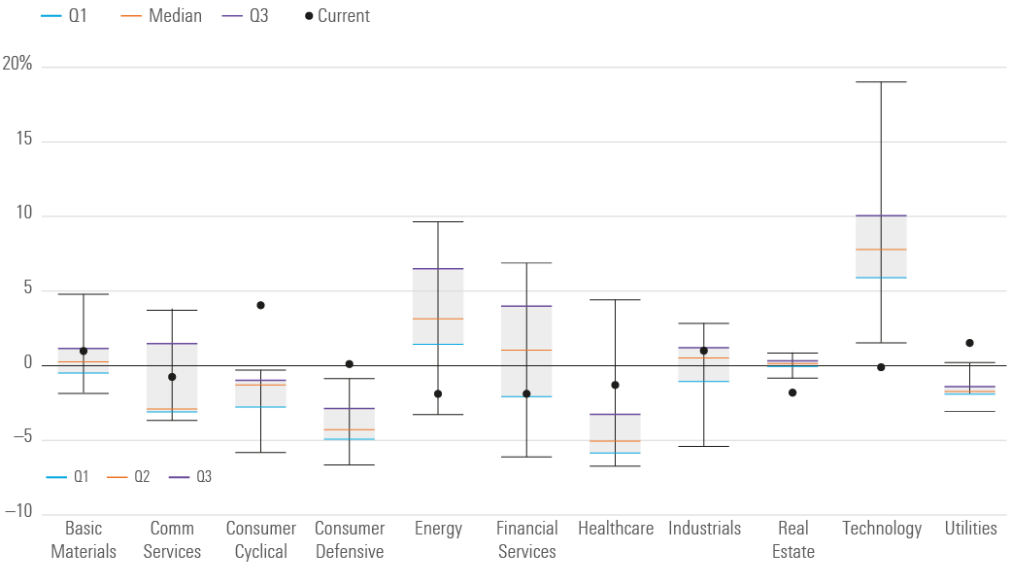
Source: Morningstar Indexes.

Exhibit 13 Yield Factor Active Sector Weights



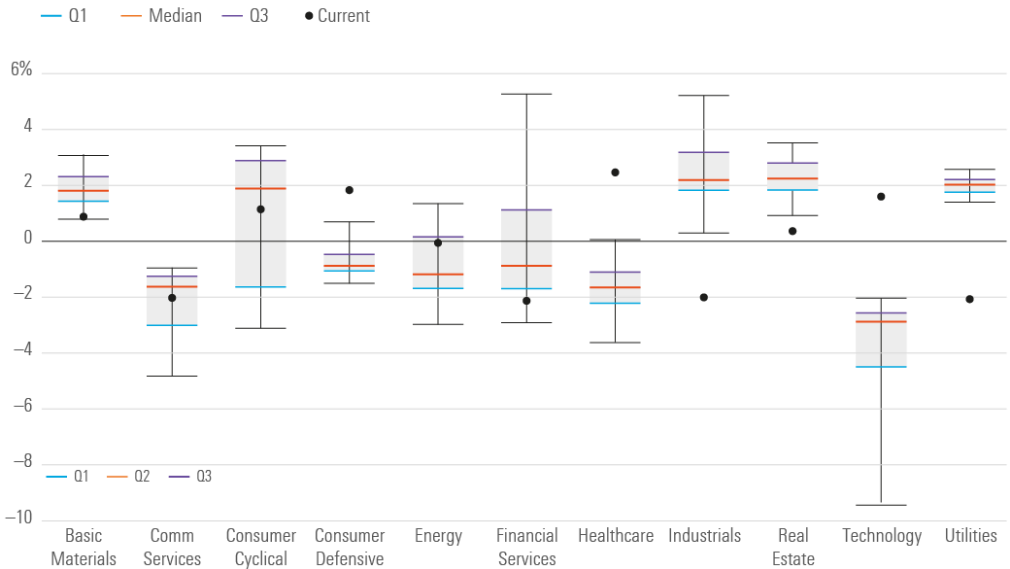
Source: Morningstar Indexes.

Exhibit 14 Quality Factor Active Sector Weights



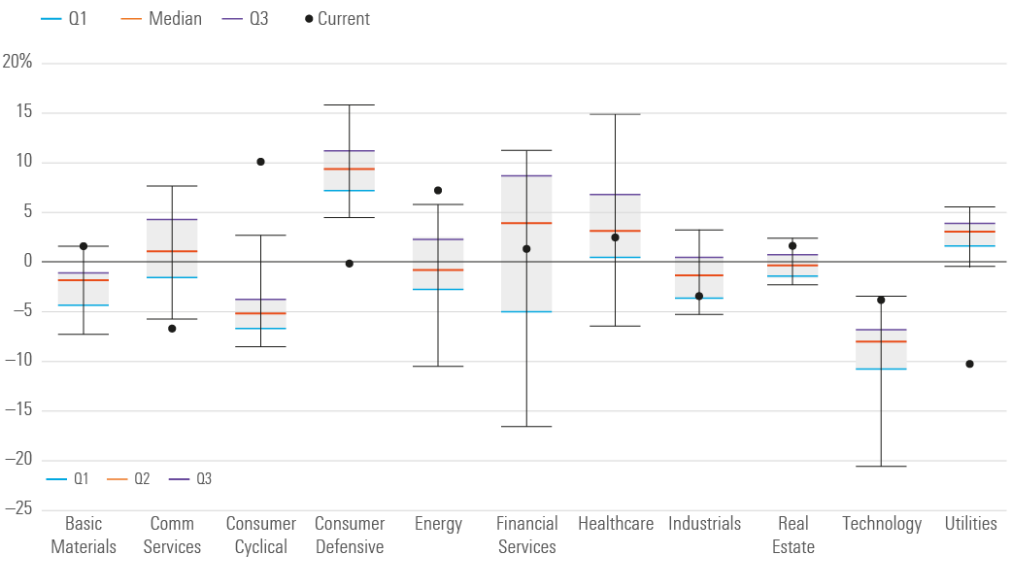
Source: Morningstar Indexes.

Exhibit 15 Size Factor Active Sector Weights



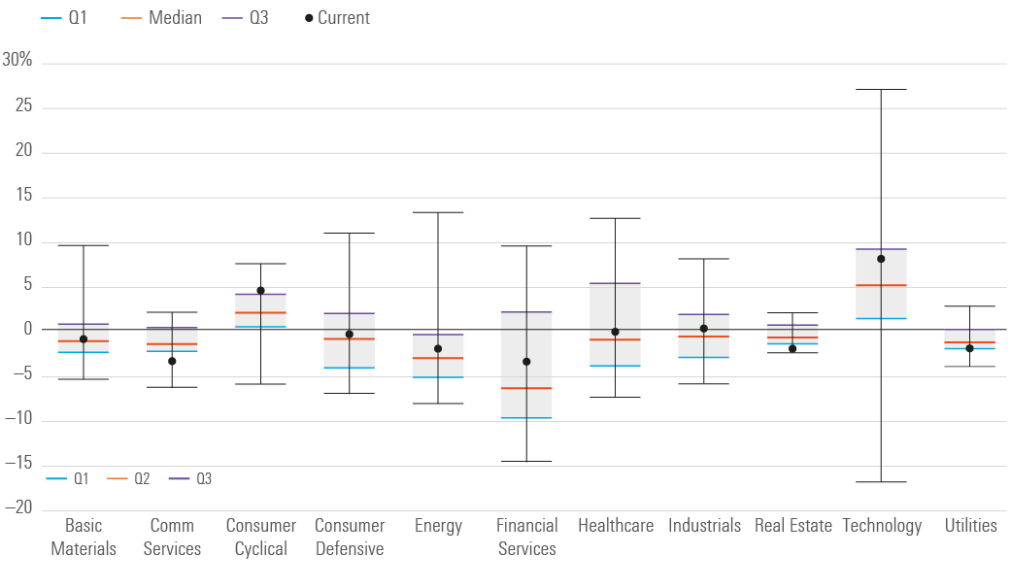
Source: Morningstar Indexes.

Exhibit 16 Low-Volatility Factor Active Sector Weights



Source: Morningstar Indexes.


Exhibit 17 Momentum Factor Active Sector Weights



Source: Morningstar Indexes.

Factors Drive Performance

Factor leadership is volatile, but factors are key return drivers that can help explain variations in performance across the market. Portfolio factor exposures often have a bigger impact on performance than a manager's stock-selection prowess. As such, factor performance is crucial to understand.

Regardless of the market conditions, the Morningstar Global Factor Indexes are effective tools for monitoring factor trends. These indexes are designed to provide efficient, investable exposure to industry standard factors with a consistent framework. They can facilitate precise performance benchmarking and efficient asset allocation. For more information, visit <https://indexes.morningstar.com/factors>. 



## Appendix

### Factor Definitions

*Low Volatility:* This factor is the weighted average of idiosyncratic volatility over the past six months (50%), total volatility over the past six months (25%), and MAX5/lottery factor (25%), which is based on the highest five-day returns over the past month where lower values are favored. This composite provides a more complete view of risk than a security's total volatility alone.

Stocks with low past volatility tended to offer better risk-adjusted performance than those with high volatility. Unlike many of the other factors, there isn't a clear risk-based explanation for this effect. The anomaly is typically explained through investor behavior, given leverage and tracking error constraints. Professional investors overly focused on returns and unable to leverage their portfolios might crowd into volatile stocks, which have greater upside potential than their more-staid counterparts. Retail investors looking for lotterylike upside might do the same. As a result, not only are low-volatility stocks more resilient during "risk-off" market environments, but they may also be priced to offer a more favorable risk/reward trade-off over the long term.

*Momentum:* This factor is measured as the trailing 12-month total return (in local currency), excluding the most recent month, minus the local risk-free rate. This definition aligns with the momentum factor as defined by the academic literature.

Momentum describes short-term performance persistence. Momentum strategies target stocks with strong recent returns, based on the premise that they are likely to continue to outperform. Prices may adjust more slowly than they should to new information, as investors often initially underreact. This alone can cause performance to persist. Once a trend is established, more investors may continue to buy, further fueling price momentum.

*Quality:* This is measured as the equally weighted z-score of a company's profitability (trailing 12-month return on assets) and the z-score of its financial leverage (trailing 12-month debt/invested capital).

The shares of companies with strong profitability and balance sheets performed better historically than less profitable and more highly indebted counterparts. They tended to hold up better than the market during downturns, which intuitively wouldn't lead to an expectation of higher returns. However, investors may have historically underestimated the long-term durability of these firms' strong cash flows, leading to an impressive long-term track record of risk-adjusted returns.

*Value:* This factor's definition aligns with the Morningstar Style Box methodology, which incorporates historical and forward-looking value and growth metrics. The actual factor is value-growth, where the value inputs include price/earnings (50.0%), price/book (12.5%), price/cash flow (12.5%), price/sales (12.5%), and dividend yield (12.5%).

The value factor targets stocks trading at low multiples on fundamental measures like earnings, book value, cash flow, sales, and dividends. Value investing is backed by strong economic rationale and empirical evidence. Lower valuations should reflect higher expected returns, either as compensation for risk or because investors may be overly pessimistic about these stocks' prospects.

## Index Construction

### Single-Factor Indexes

The Morningstar Global Factor Indexes are from a corresponding standard parent benchmark from the Morningstar Target Market Exposure Index family, which represents the top 85% of equity market capitalization in its segment. The focus on large- and mid-cap stocks facilitates high-investment capacity. To be eligible for inclusion, each stock must have valid factor exposure scores.

Within each parent index, constituents are ranked by their factor exposure. All factors are measured relative to each broad region. The quality, size, value, and yield factor exposures are also measured on a sector-relative basis. This improves comparability and mitigates persistent sector biases. For low volatility and momentum, no sector relative adjustments are made, as these price-driven signals tend to be more comparable across sectors. The highest ranking 30% of the parent index's float-adjusted market capitalization is targeted for inclusion in each index. Focusing on a percentage of the parent index as opposed to a fixed number of securities ensures that a consistent portion of the market is represented.

Constituents are weighted by the product of their float-adjusted market capitalization and strength of their factor exposure, subject to constraints to limit unintended risk. The indexes are reconstituted and rebalanced semiannually.

For further details, please reference the [Construction Rules for the Morningstar Global Factor Indexes](#).

### Multifactor Indexes

The Morningstar Global Multifactor Indexes use optimization to target low volatility, momentum, quality, and value. As a part of this optimization framework, the indexes aim to maximize portfolio-level factor characteristics under constraints to limit unintended risk and transaction costs while offering significant liquidity.

Morningstar Indexes offers multifactor indexes derived from various broad regional parent indexes, and the construction rules that follow are applied similarly for each variant.

Each multifactor index is derived from its corresponding standard parent benchmark from the Morningstar Target Market Exposure Indexes, representing the top 85% of equity market capitalization in its segment. The focus on large- and mid-cap stocks facilitates high-investment capacity.

The portfolios are long-only and enforce a minimum nonzero weight of 1 basis point (0.01%) to avoid economically insignificant allocations. To limit unintended active risk against the parent index, sector and country constraints are enforced. This allows a bit of flexibility for the optimizer to over- and underweight securities relative to the parent indexes while limiting the deviations to mitigate unintended biases. Turnover is also controlled to mitigate transaction costs.

For further details, please reference the [Construction Rules for the Morningstar Global Multifactor Indexes](#).

### About Morningstar Indexes

Morningstar Indexes was built to keep up with the evolving needs of investors — and to be a leading-edge advocate for them. Our rich heritage as a transparent, investor-focused leader in data and research uniquely equips us to support individuals, institutions, wealth managers and advisors in navigating investment opportunities across major asset classes, styles and strategies. From traditional benchmarks and unique IP-driven indexes, to index design, calculation and distribution services, our solutions span an investment landscape as diverse as investors themselves.

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