Managing risk with investment factor analysis

How to identify biases that can impact portfolios

July 2021

AUTHORS

Yazann Romahi
Chief Investment Officer,
Quantitative Solutions,
J.P. Morgan Asset Management

Garrett Norman
Investment Specialist,
J.P. Morgan Asset Management

Gareth Turner
Investment Specialist,
J.P. Morgan Asset Management

IN BRIEF

- Investment factor analysis can help investors navigate a world of uncertainty and fragility while preparing them to capture opportunities.

- Market volatility during the pandemic has served as an important reminder of the potential for sharp moves within asset classes—e.g., at the factor level—to drive portfolio risk and return, whether or not an investor is explicitly applying factor-based approaches.

- We expect cycles of factor performance to speed up over time, making it increasingly important for investors to identify, understand and monitor factor bias within portfolios; we recommend conducting two types of factor analysis: returns-based and holdings-based.

- Through Spectrum, our proprietary technology platform, we are able to decompose structural and dynamic biases within client portfolios, providing information that can help investors achieve their objectives.

WHY MEASURE FACTOR EXPOSURE? TO UNDERSTAND DRIVERS OF PORTFOLIO RISK

The COVID-19 pandemic accelerated or upended a number of trends across economies and societies and in politics, helping fuel the most extreme U.S. equity bear market in a century. As we sort through the ramifications, one thing is very clear: Investors need to be ever more aware of potential drivers of risk and return, not only across broader markets but also within them. That will require paying close attention to their portfolios' factor exposures—through factor analysis.

Factors are risks that a group of securities have in common, some of them compensated (such as value, quality and momentum) and others not compensated (such as region or sector). Factors can be just as cyclical as equity markets, if not more so. and during the pandemic factors experienced volatility and dispersion cycles as extreme as those of equities.

Looking ahead, we believe that faster factor cycles and higher factor volatility will persist, creating both risks and opportunities. That's why we recommend every equity investor taking any level of active risk in their portfolio—which means that factors are embedded in their portfolio, explicitly or not—must identify and understand them.

We're measuring and monitoring our own portfolios' factors and leveraging those insights as part of our Multi-Asset Solutions platform. The goal: avoiding unintentional factor biases— unintended tilts toward a factor—in which a portfolio's exposures are significantly greater (or less) than expected. Such tilts could expose the portfolio to the risk of catching the wrong side of a factor cycle and experiencing an unexpected outcome.

J.P.Morgan
Asset Management

Sharp moves within asset classes highlight the need for enhanced risk analysis and management through factor analysis

EXHIBIT 1: U.S. EQUITY FACTORS' PERFORMANCE VS. RUSSELL 1000
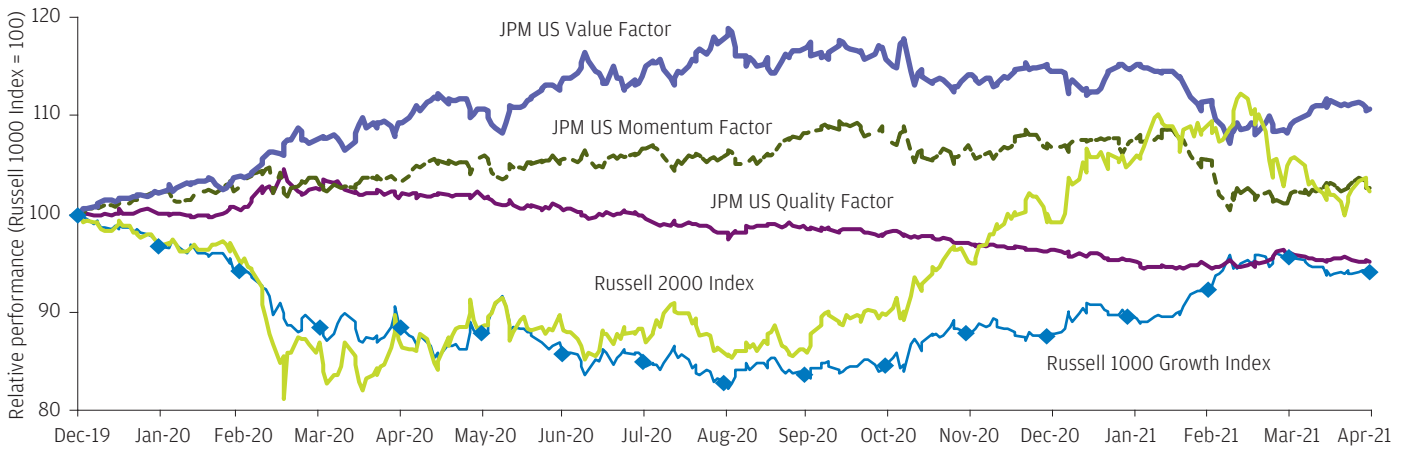
Source: J.P. Morgan Asset Management, FactSet; data as of March 31, 2021.

We believe suffering losses from an exposure you didn't know you had can be more disruptive than a loss from an exposure you were aware of. In our work with clients, we often see suboptimal outcomes in the face of unexpected losses as clients either act too slowly while seeking to understand what happened, or too rashly as they look to sell (often at the most inopportune time) whatever inflicted the unexpected damage.

How do we identify which factor biases may exist in a portfolio? Several different approaches are required. Identifying factor biases is a necessary first step in managing portfolio risk before considering potential action to neutralize or lessen unintended factor exposures. To accomplish this, we continue to enhance the factor analysis engine in Spectrum, our proprietary portfolio management system, which also includes research and risk analysis capabilities.

FACTOR ANALYSES CAN HELP INVESTORS NAVIGATE UNCERTAINTY

Markets have cycled through a range of extreme and unprecedented events during the global pandemic, testing portfolios.

Value extended the most extreme drawdown in over 30 years in 2020 before being revitalized by a series of vaccine announcements late in the year. Value's rise has continued during the subsequent reflation rally (**EXHIBIT 1**). Small cap stocks (the size factor) also experienced extreme volatility, as did growth (on the upside), reaching historic heights in mid-2020 before reversing more recently.

Investors with a portfolio affected by any of these factor biases—and who were unaware of them—might have been surprised by the degree to which their portfolio's performance differed from the broader market's. That made many of them susceptible to trading at inopportune times (e.g., reducing exposure to the value and size factors when they were at their cheapest or piling into the growth factor when it was most expensive.[1])

The recent factor moves appear to be cyclical rather than structural in nature, as we discussed in a recent quarterly *Factor Views*,[2] and serve as examples of what may come in future years. That's why we believe investors need to be ever more aware of which factor biases are present and how factor exposures affect their portfolios.

The recent market moves bear out our hypothesis of a few years ago: A growing awareness of factors among market participants and greater liquidity in tradable market factors have allowed a larger proportion of market participants to access factors directly than in prior years. As a result, faster factor cyclicality—and more severe factor volatility—could well be on the horizon.[3]

---

[1] This paper primarily references well-known equity factors such as value, quality, momentum and size, but factor analyses can span all asset classes. Factor analyses can even diagnose and understand a portfolio's likely performance by theme—in other words, reveal exposure to stocks that stand to gain or lose due to their alignment with various themes, such as "work from home" or "COVID-19 reopening."

[2] Yazann Romahi and Garrett Norman, "*Factor Views* 2Q 2021: Themes from the quarterly Quantitative Solutions Research Summit," J.P. Morgan Asset Management, April 21, 2021, https://am.jpmorgan.com/us/en/asset-management/adv/insights/portfolio-insights/asset-class-views/factor/.

[3] Yazann Romahi, Joe Staines and Garrett Norman, "Factor Crowding, Timing and the Future of Factor Investing," J.P. Morgan Asset Management, April, 2018.

But there is more to factor analysis than identifying risk: Factor analysis can also help reveal how to appropriately capture opportunities. As Michael Cembalest, the Chairman of Market and Investment Strategy for J.P. Morgan Asset & Wealth Management, wrote recently, accessing value in a sector-neutral manner is likely a better stock selection tool in portfolios than more naive approaches.[4] How can investors know whether they have the managers in place to benefit from such opportunities?

However compelling the opportunity, investors would do well to first diagnose their portfolio's existing factor exposure.

HOW CAN INVESTORS UNDERSTAND AND MEASURE FACTOR BIASES WITHIN THEIR PORTFOLIOS?

A portfolio's factor exposures can be measured from two perspectives: returns-based, covering a portfolio's history, and holdings-based, examining what's owned in the present. We favor using both for the most complete, holistic view and to form the best judgment of what action steps to recommend.

Spectrum includes tools to accomplish both.

- **Returns-based analysis:** This approach looks at a portfolio's historical performance and identifies relationships among factors that have emerged over time and have had an impact on returns. This lens allows us to understand patterns that may have persisted for years.

- **Holdings-based analysis:** Rather than decomposing returns over time, this lens analyzes every stock in a portfolio at a given moment, whether in the present or historically (or both, for comparison), sliced by factor—value, high or low quality, small or large cap, etc.—to reveal any factor biases.

Now J.P. Morgan Asset Management is sharing these analytical capabilities with clients—taking the output of our factor models and, with a human touch, interpreting the implications and potentially beneficial next steps. Let's look at how each approach works.

---

[4] Michael Cembalest, "Absolute Value: After a huge rally, where do value stocks stand? It depends on who's asking and why," *Eye on the Market,* J.P. Morgan, April 14, 2021. The analysis finds that the value factor "worked very well as a stock selection tool from 2002 to 2017-18" and "recovered more rapidly in the last 3-4 months."

Returns-based analyses

Our returns-based analyses identify the range of factors that best explains a given portfolio's (or manager's) performance, in a way akin to asset pricing models, applying many regression methodologies and, typically, surveying a wide set of inputs to maximize the fit of the model to the data. The analyses provide a clear means for diagnosing risk and returns—attributing what portion of a portfolio's returns were driven by market betas, factors and residual drivers such as manager skill (alpha).

Returns-based analyses are particularly useful for unpacking structural bias in portfolios (or strategies) that have a consistent investment approach, and serve as a first port of call when holdings information is unavailable or difficult to access. (Returns-based analyses can run into difficulty assessing changing factor exposures over time when a portfolio is dynamic in nature.)

One shortcoming of returns-based analyses can be that they need long data series—typically more than three years of monthly returns. They are also prone to interference from statistical noise that may result from stale pricing of less liquid exposures, and other challenges inherent in statistical analysis. Conducting rolling analyses may help address some of these issues, but this introduces trade-offs (for example, by definition they shorten the analysis period).

Holdings-based analyses

Holdings-based analyses determine factor exposures by considering a portfolio's actual investments at a given time—typically measured as active exposure relative to a reference benchmark. This approach can be applied to a single snapshot or to holdings across a series of time frames (monthly or quarterly, for example). Holdings-based analyses allow for assessing portfolios with limited performance history. They can better handle dynamic portfolios and show style drift sooner than a returns-based approach would, because drift takes time to show up in investment returns.

Holdings-based analyses can also provide a more intuitive means of understanding the root cause of factor biases, decomposing the impact from asset allocation decisions, manager selection and the active management of underlying exposures. J.P. Morgan Asset Management's investment teams use these diagnostics regularly in managing portfolios, monitoring factor

bias on a real-time basis to determine the best means of effecting their allocation views and to manage portfolio risks.

Toward the end of 2020, for example, our Multi-Asset Solutions team sought to express a more cyclical, value-oriented profile across portfolios; however, many underlying equity managers were also shifting to these same themes at the time. By studying evolving factor exposures and testing the impact of potential portfolio moves, our investors were equipped to navigate the recent factor rotation while keeping alert for potential risks that could have exposed portfolios to outsize losses.

Next steps: Reaching a decision

When the conclusions of both returns- and holdings-based analyses align, the takeaway is clear—for example, if both find a value bias, the portfolio likely has a value bias. Then an investor would assess whether they are happy with the extent of this bias or would like to balance it with other (diversifying) factor exposures.

But if one analysis finds a positive exposure to value and the other doesn't, where does the truth lie? That's when we impart our expertise, working through the data to help make the most accurate diagnosis, as when a doctor reads an MRI. Indeed, we believe the exercise can be most valuable when the outputs differ because it gives us an impetus to understand the portfolio's less apparent risk exposures. A mix of qualitative and quantitative information may lead to the best decision.

We aim to make our factor analyses as transparent and accessible as possible—sharing detailed information on our inputs and assumptions with clients and helping separate the signal from the noise. If unintended or unwanted factor biases are observed, we can model various ways clients can correct for them. We take both a risk management and a portfolio management perspective, so the analysis is not just accessible but also actionable.

OUR PROPRIETARY TECHNOLOGY ENABLES NEW RIGOR IN FACTOR ANALYSIS

To take factor analysis from concept to practice, we leverage the vast data and analytical resources of J.P. Morgan Asset Management. Our factor analysis capability continues to evolve in Spectrum, our single-platform proprietary system for portfolio management, research, risk and client reporting. Today, we can analyze portfolios using a variety of different lenses: by factors, themes, market cap, industries, sectors, geographies and many others (**EXHIBIT 2**).

What's new in factor analysis?

In addition to determining a portfolio's aggregate factor bias, we can further diagnose what is driving this bias, whether it is from a sector perspective or if it relates to a market cap bias or to other features of the portfolio. By understanding the investment objectives and risk tolerance of the client example in Exhibit 2, we are able to model and recommend various ways to improve the portfolio's factor footprint—for example, by introducing a single-factor equity strategy that complements the portfolio's existing exposures.

Going a step further, we can now also diagnose more thematic factor biases, such as a portfolio's bias away from tech disrupters or toward climate-related themes. This evolution from traditional or academically oriented factor analysis is becoming increasingly important as markets assimilate more granular groupings of stocks and themes.

Even as the end of a dramatic period of social, economic, political and market upheaval comes into sight, the future continues to hold uncertainties for investors. That makes it more important than ever to identify and understand potential drivers of portfolio risk and return and, when necessary, to act to neutralize or lessen unintended ones.

Measuring and monitoring factor biases within portfolios, and using the full set of tools now available, is a technology we expect can help investors meet their objectives.

Our proprietary technology platform can decompose a range of risk and return drivers

Groupings GICS Level 1 ▾   ROE ▾   None ▾

ID	Weight %	AGG	Earning Quality
⌄ Communication Services(31)	4.32%	0.49	0.45
› F5 (Smallest)(4)	0.60%	0.32	0.79
› F4(4)	0.76%	0.31	0.57
› F3(5)	0.59%	0.58	0.55
› F2(6)	1.19%	0.60	0.33
› F1 (Largest)(7)	1.18%	0.52	0.28
› Consumer Discretionary(66)	11.96%	0.45	0.55
› Consumer Staples(37)	6.25%	0.49	0.48
› Energy(29)	4.38%	0.50	0.54
› Financials(70)	13.04%	0.48	0.49
› Health Care(67)	12.43%	0.53	0.48
› Industrials(79)	14.48%	0.50	0.52
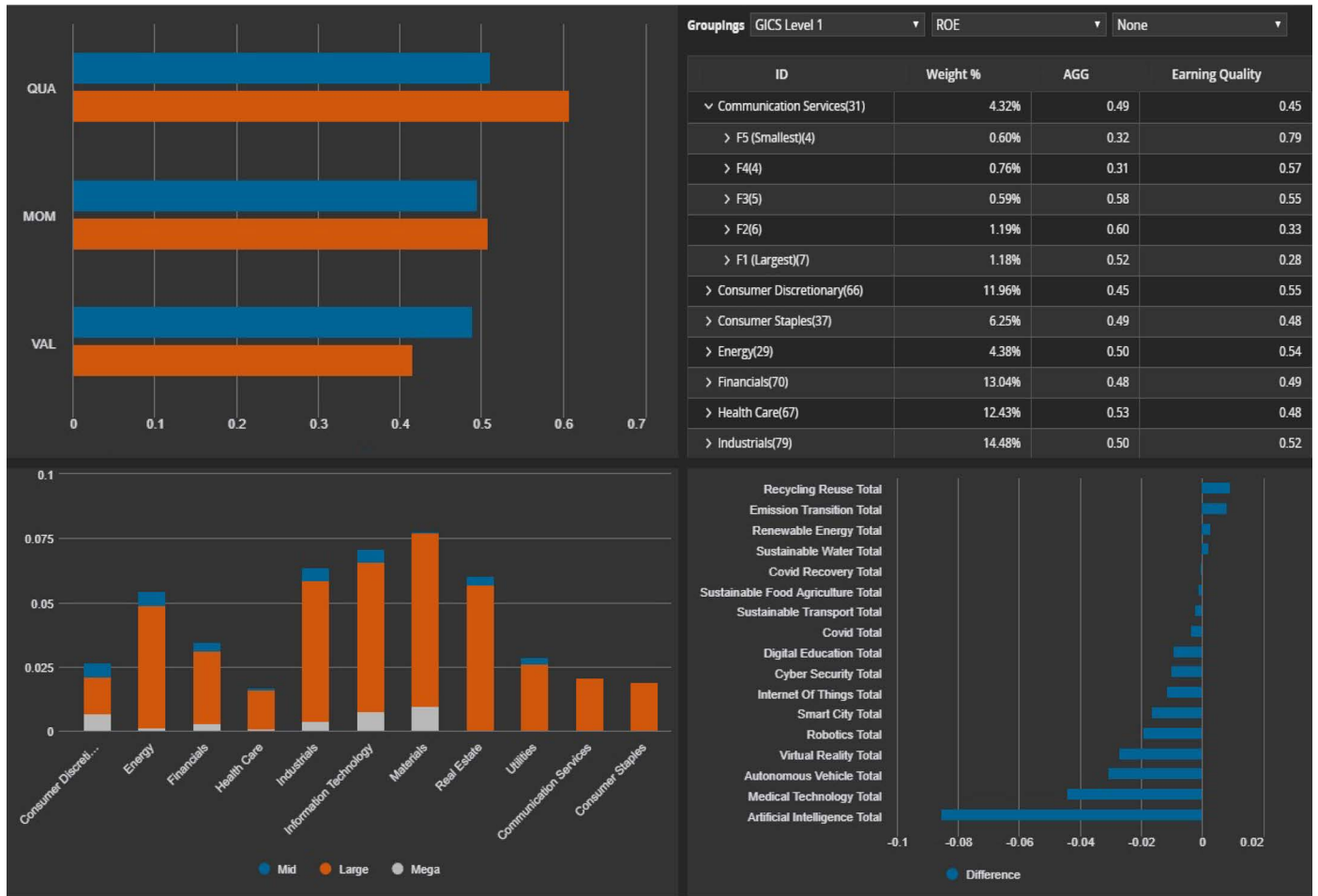
Source: J.P. Morgan Asset Management, 2021. QUA: quality; MOM: momentum; VAL: value.

QUANTITATIVE RESEARCH FOCUSED ON INNOVATION

Harnessing our firm's deep intellectual capital and broad investment capabilities, we provide our clients with a diverse suite of beta strategies to help build stronger portfolios.

- Empower better investment decisions through **unique insights** and **proprietary research** on strategic and alternative beta.
- Deploy the talents of an investment team dedicated to quantitative research and portfolio construction.
- Invest across a broad spectrum of strategic and alternative beta strategies, created specifically to address client needs.
- Partner with one of the world's leading asset managers and tap into two decades of **industry innovation**.

J.P. MORGAN ASSET MANAGEMENT

IMPORTANT DISCLAIMER

J.P.Morgan
Asset Management