



Practical Applications of  
**Fact, Fiction, and Factor Investing**

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and Tobias J. Moskowitz





# Fact, Fiction, and Factor Investing

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## Overview

In *Fact, Fiction, and Factor Investing* from the January 2023 issue of *The Journal of Portfolio Management*, authors **Michele Aghassi, Cliff Asness, Charles Fattouche, and Tobias Moskowitz** of **AQR Capital** assess the validity and veracity of 10 claims about factor investing. They conclude that five are fact and five are fiction. Ultimately, the authors argue that while factor investment strategies entail inherent risks, they are profitable long-term strategies, and provide valuable diversification that is not dependent on market conditions or macroeconomic environments.

## Practical Applications

- **The extensive evidence underlying factor investing can help investors stick with their investment decisions, especially during tough times.** A substantial body of academic literature, out-of-sample evidence, and economic theory supports factor investing as a viable alternative investment, and understanding this can help investors stick with these strategies during drawdowns.
- **While factor investing provides diversifying return premiums in a variety of economic conditions over the long term, factors are not hedges.** The long-term premium compensates investors for bearing factor risks—but those risks can lead to short-term periods in which one factor dominates the others, or factors provide little diversification to traditional assets.

## Key Definitions

### Factor

Factors are characteristics that help explain the risk and return behavior of a security. The most common factors are value, small size, low volatility, high yield, quality, and momentum.

### Factor investing

Factor investing is an investment strategy that chooses securities based on factors associated with higher returns, lower risk, or both. There are many types of factors, including style (growth, value), size (large cap, small cap), risk (volatility, momentum), and fundamental (profitability, dividends). The Fama–French (1993) three-factor model started with a stock's beta and added size (e.g., small cap) and value (e.g., high ratio of book value to market equity) as factors of superior returns. The Fama–French (2015) five-factor model added profitability and investment as additional factors.

- **Factor timing is difficult, and a consistent and disciplined exposure to a well-diversified multifactor portfolio is hard to beat.** Tactical timing may incur a penalty related to forgone diversification, and so, strategic diversification generally trumps tactical timing.

## Discussion

The authors evaluate the 10 claims about factor investing and find that half are fact and half are fiction:

- Fact
  - Factors are risky.
  - Factors work across many markets and conditions.
  - Factors were not and are not too crowded, despite being well known.
  - Factor discipline generally trumps timing, tinkering, and trading.
  - Sticking with factor investing is hard but worth it.
- Fiction
  - Factor investing is based on data-mined factors with no good economic story.
  - Factor diversification often fails when you need it most.
  - Factors do not work in the new economy.
  - Everyone should invest in factors.
  - You know when you are in a drawdown/recovery and when to cut/add risk.

## Theories and Research Supporting Factor Investing

Critics of factor investing often argue that the factors may have been discovered by chance, due to research practices of data mining and overfitting, rather than reflecting reality. The central concern is that researchers may find patterns in data that are merely aberrations of random chance. This critique can be compounded by the fact that a very large number of factors have been introduced. While the authors acknowledge these concerns, they argue that the economic theories behind factor investing, more strenuous statistical tests, out-of-sample testing, and a better understanding of how factors can be grouped adequately address the critiques.

## Economic Theory

Factor investing is based on two economic theories that create a more compelling economic story than many critics believe. The first theory relies on risk; it states that factor investing provides long-term positive returns as a compensation for additional risk. This theory helps explain the statement that factors are risky, as data support this in the short term. Historically, there have been periods in which factors underperformed over several years. Factor investing is a long-term strategy that provides long-term premiums, but it also can create significant financial pain in the short term.

The second theory is based on behavior. It states that factor investing deviates from, and takes advantage of, the preferences and beliefs of other investors. Under both theories, factor investing can avoid arbitrage because there is always a natural set of investors willing to take the other side of those bets.

This balance of supply and demand explains why factors are not too crowded despite being well known and addresses the fiction that everyone should invest in factors. According to the authors, this is untrue for two reasons.

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“Everyone can’t invest in factors. Period. Factor investing, by definition, deviates from market weights ... if everyone invested in factors ... prices would change until they matched market weights and the premium would disappear.”

—Fact, Fiction, and Factor Investing

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First, factors provide a premium only because there are investors who are willing to take the other side. If a factor became overcrowded, there would be a slow decay in its efficacy until it reached zero. Overcrowding was used to explain the poor performance of factors, especially the value factor, during the recent 2018–2020 drawdown period—but the authors show that crowding was not likely to blame. Over the period, value spreads, a measure of how “cheap” the value factor is relative to its history, showed the value factor to be historically cheap. Further evidence comes from the empirical pattern of losses: The abrupt and sharp



downturn into negative returns territory, as opposed to a slow decay in efficacy, is more indicative of swings in the demand for factors than a slow arbitrage. This aligns with theories to explain factor premiums.

Second, factors entail inherent risks and behaviors that many investors find unappealing. Anyone who chooses to invest in factors should be able to stick with them over the long term, even when things are going poorly in the short term.

### **Strength of Support**

More recent research in factor investing has called for stronger statistical testing and out-of-sample tests based on an acknowledgement that data mining practices may lead to false discoveries. These articles instituted a higher standard of statistical significance and confidence level, by using a more stringent statistical threshold rather than the standard *t*-stat threshold of 2.0. This makes it far less likely that researchers will reach an incorrect conclusion or identify a fake factor. Out-of-sample tests use data sets separate from the original sample to gain greater confidence that results are indicative of a real relationship, not just due to random chance in the original data set. Importantly, under both more rigorous standards for statistical significance and out-of-sample tests, factors such as value, momentum, carry, and defensive/quality still generate statistically significant and reliable premiums across a century of data, multiple markets, and asset classes.

### **Factor Themes**

Finally, the authors argue that it is more accurate to think of there being dozens of factor themes rather than several hundred individual factors, because factors tend to cluster around similar concepts or ideas. For example, there are more than 80 versions of the value factor, all of which are closely related. Looking at both research and practical application, it becomes clear that the number of factors actually used by the factor-investing community is far smaller than the large number often claimed. The factors that actually are used display the strongest in-sample statistical significance and are supported by both out-of-sample evidence and stronger economic rationales.

## Factor Diversification

Critics also charge that factors fail to protect investors from poor market performance by providing diversification (“factor diversification often fails when you need it most”). The authors argue that understanding the importance of time scales and the difference between a hedge and diversification help clarify why beliefs about the failure of diversification are incorrect.

The first mistake is that these beliefs often focus too narrowly on the short term. Over short periods, the range of possible outcomes is larger, meaning that there is a greater likelihood that factors will “fail” to diversify. Historically, factor investing has done both extremely well and extremely poorly when the market is down. On average, however, there is close to zero correlation between market conditions and factors. However, different design choices made when constructing factors can increase or decrease their sensitivity to macroeconomic conditions. Additionally, individual factors can dominate multifactor strategies over the short term, but long-term performance results from more-balanced gains across all factors. Factor investing does not eliminate short-term fluctuations, but it does reduce risk over the long term.

The second mistake is to confuse diversification with hedging. A hedge is meant to directly offset a specific risk and usually is not profitable in the long term. Diversification, on the other hand, means that two return streams are not completely aligned. It can be beneficial over the long term—but it is not a hedge, and so does not preclude the possibility of negative returns or one factor briefly dominating.

## Factor Timing and Economic Changes

The authors assert that factor discipline with a well-diversified multifactor portfolio generally outperforms attempts at “factor timing.” They argue that factor timing is deceptively difficult, primarily because it may incur a penalty related to forgone diversification. This penalty is larger for strategies with low correlations with one another, as is the case for factor strategies. Nonetheless, the authors allow that an opportunity may be attractive enough to warrant action on rare occasions. Still, they caution that even in these situations, there is no guarantee of short-term gains.

Factor timing is even more difficult than typical efforts at market timing because factors are more dynamic and require constant rebalancing even before timing is considered. The reality is that while investors may know when they are in a drawdown, the knowledge does not provide enough information to determine how subsequent returns will be affected by adding or reducing risk.

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“[S]uccessful macroeconomic-based factor timing requires being “right twice”: 1) being correct in predicting the macro environment and 2) forecasting factors’ exposures to macro conditions, which, as shown previously ... are weak to nonexistent in most implementations.”

—**Fact, Fiction, and Factor Investing**

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Finally, the authors refute the contention that factors have been rendered obsolete by economic changes. That claim is generally advanced when something that normally produces positive returns faces a sustained period of underperformance. However, that claim fails to account for the robustness that factors have displayed. Factors have continued to work throughout the numerous and substantial economic transformations of the past couple of centuries. Further, their persistence should be expected, because factors are based on underlying risk-based and behavioral explanations that do not vary over time and exist in older and newer economies alike.

## Conclusion

The authors ultimately conclude that sticking with factor investing is hard but worth it. Conflicting assertions and prevalent misconceptions can make it very difficult to stick with factor investing. Factors inevitably experience drawdowns that are hard to predict and explain, since they are not connected to the market. Moreover, these drawdowns can last for several years and can occur when the rest of the market is performing well. When recoveries do occur, they are rarely smooth and easy. Many investors therefore will either face too many financial pressures



to maintain a factor strategy, or, more likely, will become too frustrated and abandon factors.

Still, for investors who are able to stick with factors, the challenges they bring also offer the promise of premiums in the long term. In fact, the drawbacks are precisely what prevent overcrowding and make factor investing profitable for those who choose to pursue it.

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