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MARKETS | STREETWISE

## An Algorithm, an ETF and an Academic Study Walk Into a Bar

Most of the supposed market anomalies academics have identified don't exist, or are too small to matter



Wall Street license plate souvenirs are displayed near the New York Stock Exchange. PHOTO: BLOOMBERG NEWS



*By James Mackintosh*

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Tie together an algorithm, an exchange-traded fund and an academic study finding an anomaly in the markets, and voilà! You have a formula for making money. Trouble is, it turns out that most of the supposed anomalies academics have identified don't exist, or are too small to matter.

A new study making waves in quantitative finance tested 447 anomalies identified by academics and found more than eight out of 10 vanish when rigorous tests are applied. Among those failing to reach statistical significance: one anomaly recently set out by the godfathers of quantitative finance, Nobel-winning economist Eugene Fama and his colleague Kenneth French.

The study, "Replicating Anomalies," published this week by Kewei Hou and Lu Zhang at Ohio State University and Chen Xue at the University of Cincinnati, is the biggest test of examples of inefficient markets carried out so far. The trio applied consistent analysis to the supposed anomalies, used the same database of stocks and set higher standards for statistical significance. Simply reducing the influence of the plethora of rarely traded penny stocks—which make up just 3% of market value but 60% of all listings—by using market capitalization weightings made more than half of past findings no longer significant.

Messrs. Hou, Xue and Zhang warn that academics have been fiddling the statistics to come up with interesting findings, known to statisticians as data mining or p-hacking. "The anomalies literature is infested with widespread p-hacking," they write.

It isn't all bad news for investors and those trying to make a living flogging what have become known as "factors." The research confirmed that the most popular factors have indeed outperformed the market over long periods even when faced with rigorous tests, but found much smaller returns than previous studies estimated.

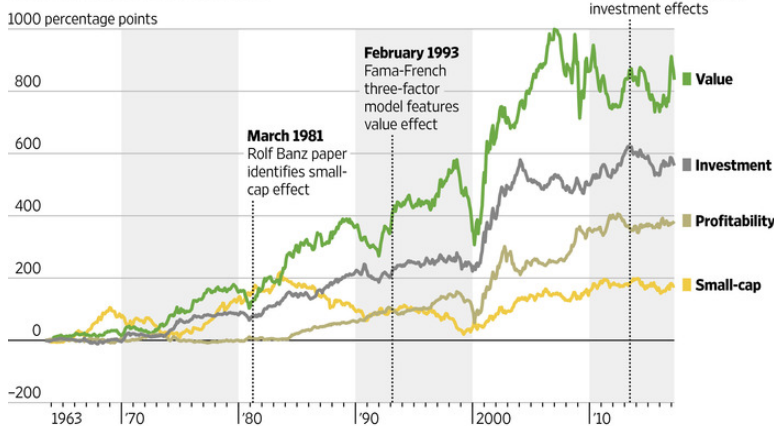
Market anomalies that passed the new study's tests included several of the biggest. Cheap stocks indeed beat expensive ones; share prices have momentum; companies that invest a lot underperform, and quality of earnings matters. Known as value, momentum, investment and quality, these have become the biggest of the so-called "smart beta" ETFs sucking in tens of billions of dollars.

A lot depends on exactly how the factors are implemented, though, and the researchers dismissed one of the industry-standard Fama-French factors as statistically insignificant: Companies with high operating return on equity don't outperform meaningfully on their tests. Other measures of return on equity did outperform sufficiently, however, underlining the sensitivity of some factors to exactly how they are defined.

## Factors to Beat the U.S. Market

Academics often identify stock anomalies that have beaten the market in the past. Many were simply wrong, according to a new study, but some stopped working after publication and others turned out to be weaker than thought.

### Factor cumulative outperformance\*



\*Performance of long-short portfolios on each factor. Investment factor is long companies which invest little, short companies which invest a lot. Note: Through March 31. Source: Kenneth French

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One lesson for investors is to be careful about trying to make money by repeating what seems to have worked in the past. If it was so easy, everyone would do it and it would stop working.

A former student of Mr. Fama, Cliff Asness, founder of quantitative hedge-fund manager AQR Capital Management, said he tries to avoid being

caught out by false findings by trading on anomalies he can explain, economically or through investor behavior. To assess whether the market anomalies will continue, he looks for ones which carried on after being identified, can be seen in other markets or asset classes, and where minor changes to how they are defined don't much affect the result. These include most famously value, momentum and corporate quality, among others.

Still, he worries that the "awesome effort" in the new paper might lead some to overreact and reject all factors, even those which Messrs. Hou, Xue and Zhang found evidence for.

"Many factors are demonstrably silly, or are highly correlated versions of the same idea," he said. "Where I get worried is about overreaction [to the paper] and the cynicism it breeds."

Investors are still likely to be confused. There are well over 100 value and high-dividend ETFs in the U.S. alone, tracking large, small or midsize stocks, based on different definitions and often combined with other factors such as momentum, quality or low volatility. Intelligently choosing between them would mean examining how indexes are constructed and comparing to the long-term academic studies to see which methodology was best; in practice for most investors there is little more to go on than a few years of performance data and fees.

Worse still, the markets are reasonably efficient. If it turns out that shares usually rise just after Christmas or fall on Mondays when it rains in New York, traders will quickly find a way to profit from the anomaly, and it will disappear.

The danger for investors who have piled into “smart beta” ETFs betting on value or quality is that exactly this happens. Small-capitalization companies stopped outperforming after the landmark study identifying the so-called small-cap effect in 1981, for example, and haven’t looked good since (see chart).

Any factor that might keep working after discovery has to be hard to arbitrage away. For quality, a story can be told of get-rich-quick investors overpaying for sexy high-growth companies, but not—until recently—for shares of boring providers of steady profits. Whatever the story, the more popular the factor becomes with investors, the smaller its outperformance will be in future.

Messrs. Hou, Xue and Zhang provide a handy dismissal of factors which didn’t even work that well in the past. But ultimately no one knows whether even previously robust factors like value and momentum will keep working.

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