Ghost in the machine:

Pairing artificial and human intelligence

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Key takeaways

- Quantitative and traditional investment strategies share the same goal of market outperformance but approach the problem of how to accomplish it in fundamentally different ways.
- These differences give each style its own unique set of strengths and weaknesses, which are clearly expressed in distinctive portfolio characteristics for each style.
- This in turn creates an opportunity for retirement investors to increase diversification and portfolio efficiency through thoughtful manager selection.

Artificial intelligence. Big data. Machine learning. Algorithmic and statistics-based trading. More than mere buzzwords, these technologies are redefining the asset management industry today. But what are the practical implications for retirement investors? Is one approach superior to the other, or is there room for more than one in a well-designed retirement plan? Below, we explore some of the similarities and differences between traditional active managers and so-called "quants" and offer some perspective on how each might be utilized in the context of a retirement account.

To be clear, fundamental and quantitative strategies share the same objective: They both seek to identify and exploit market inefficiencies to generate excess return. And the lines of demarcation aren't exactly clear: In an effort to improve security selection, many fundamentally oriented managers employ some (or even all) of the same cutting-edge data techniques as quantitative investors. But for quants, these new forms of analysis compose the very core of the process. So while these two different processes aren't mutually exclusive, the extent to which security selection relies on rules-based execution (as opposed to human intuition) is what genuinely separates one style from the other.

Fundamental vs. quantitative investors

Fundamental investors

- Focus on traditional financial analysis
- Emphasize company financial statements, management meetings, competitor and industry analysis
- Rely heavily on human intuition and intellect to select investments
- Are more susceptible to behavioral biases but may identify opportunities that are not easily identified by data alone

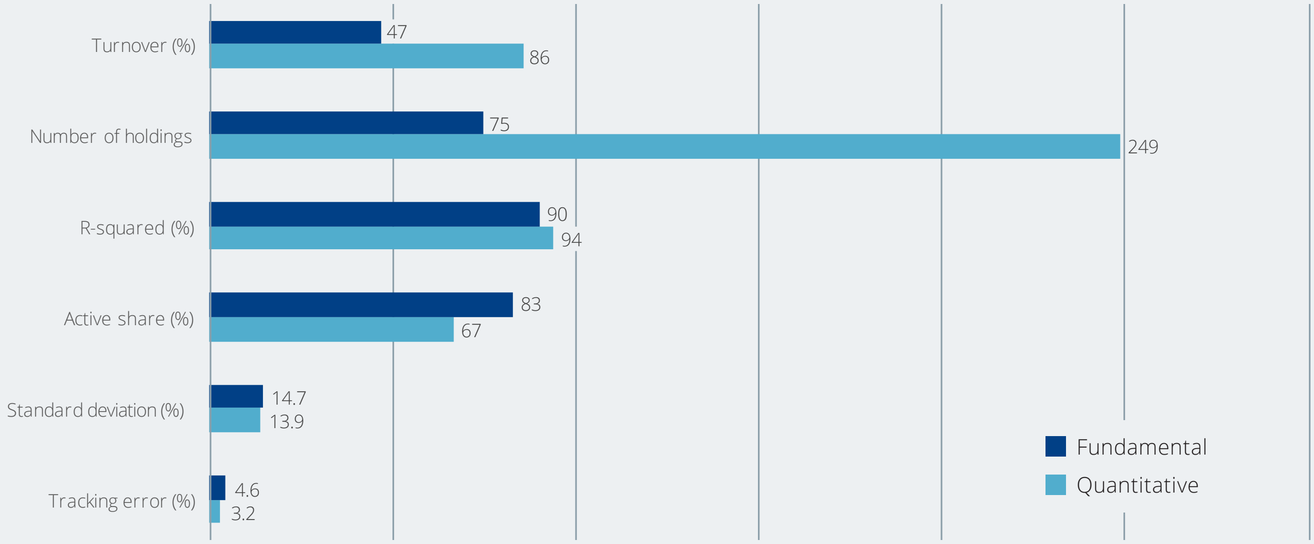
Quantitative investors

- Rooted in statistics, computation, "big data"
- Incorporate non-traditional data (i.e., web search data, "natural language processing," satellite imagery)
- Allow security-level decisions to be heavily influenced by computer models; appy human intuition to model creation and maintenance
- Less susceptible to behavioral biases but may miss idiosyncratic opportunities

As you might expect, differences in how these two types of investors view the world can lead to material differences in the characteristics of their underlying portfolios. For example, in a review of domestic equity funds in the eVestment database, we found (perhaps unsurprisingly) that fundamental strategies are generally more "active," with a smaller number of holdings, a higher active share and higher tracking errors, than their quant-oriented counterparts. On the other hand, quantitative strategies tend to turn over their portfolios more frequently, are generally more style pure[1] than their fundamentally managed peers and at the same time exhibit slightly lower return volatility.

Same goal, different paths

Quantitative and fundamental strategies exhibit distinctive portfolio characteristics



Source: eVestment

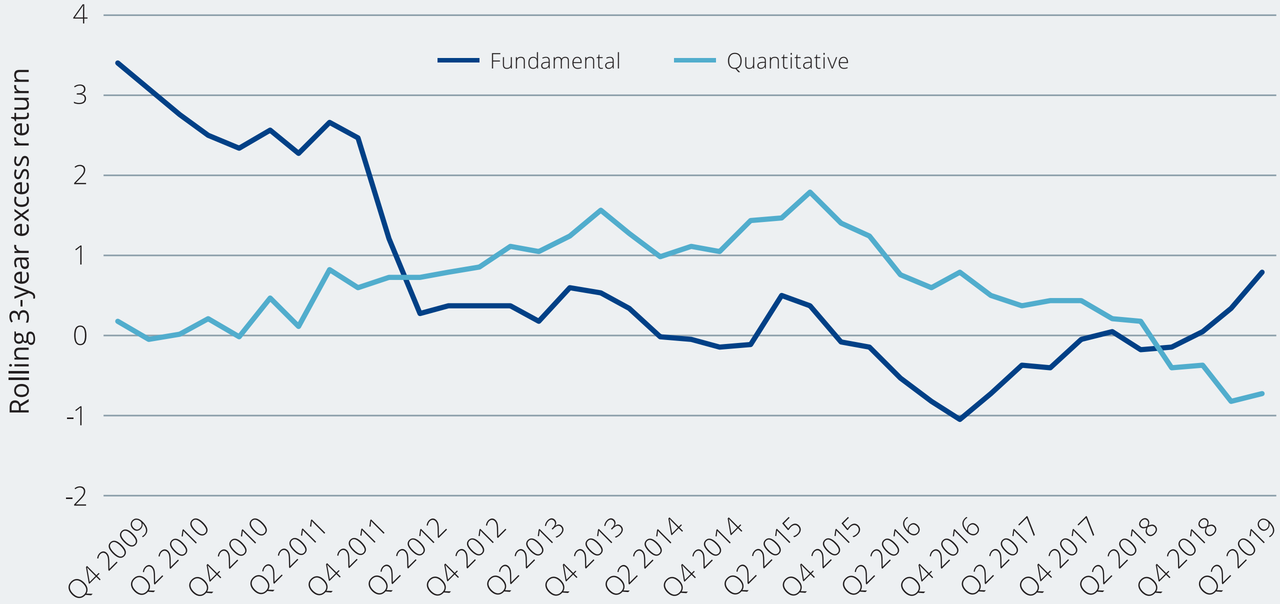
More important, however, our analysis did not find that one approach consistently outperforms the other on a risk-adjusted basis. Given this, the decision to invest in a quantitative or fundamental strategy is not simply a function of returns but instead more a question of portfolio construction and philosophical orientation.

That said, differences in portfolio construction methods can (and often do) create differing return patterns which, in our view, can be exploited to the benefit of the broader investment portfolio. To illustrate this point, we analyzed large-cap U.S. equity strategies listed in the eVestment database and measured the tendency of each to generate market-beating returns over time, both within and across categories. On average, we found that quantitative strategies tend to be more highly correlated with one another than fundamental managers — likely a result of the homogenizing effect of the restrictive (and often quite similar) portfolio construction constraints that many quantitative managers utilize. By contrast, fundamental strategies are typically more differentiated from one another — which is, in turn, likely a function of their more concentrated nature — due to their ability to go "off script" by placing a greater emphasis on out-of-benchmark names or to take large geographic or sector bets.

Perhaps most important, our analysis also found that these styles have tended to perform differently at different times in recent years, with some periods favoring quant managers over fundamental and others favoring fundamental over quant.

Vive la différence

Fundamental- and quant-based styles outperform at different times



Source: eVestment

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This, of course, means that maintaining exposure to both investment styles within a particular asset class may pay dividends in the form of greater diversification (while at the same time relieving investors of the difficult choice of having to pick one investment style over the other).

Indeed, our analysis found that pairing fundamental and quantitative strategies in the U.S. large-cap equity space generally allowed the average excess-return correlation — a measure designed to show whether or not two investments are generating market-beating returns at the same time and in response to the same environmental factors — to fall to almost zero.[2] This suggests an opportunity to increase the risk-adjusted returns of the entire combined portfolio by pairing fundamental and quantitative managers within the same asset class — at least in the case of U.S. large-cap equities. (We suspect this dynamic holds in other areas of the investment landscape as well.)

Greater than the sum of the parts: Pairing quant and fundamental managers

Fundamental and quantitative managers share a common objective: Both seek to identify and exploit market inefficiencies to generate market-beating returns. But they go about this task in fundamentally different ways — so different, in fact, that they tend to perform differently when faced with the same set of market circumstances.

This opens the potential for an entirely new dimension of diversification — a dimension for diversification that exists within a single asset class. Said another way, it should be possible to pair two well-considered (and thoroughly researched) investment managers from these disparate styles in such a way as to produce risk-adjusted returns that are superior to holding either style individually. The results of such a combination, then, may indeed be greater than the sum of its parts.

1 As indicated by the lower tracking error and higher R-squared values observed, on average, for quantitatively managed U.S. large-cap portfolios in the eVestment database.

2 The average pairwise excess-return correlation between fundamental and quantitative strategies in this analysis was +0.02, significantly lower than fundamental strategies (+0.09) and quantitative strategies (+0.15).

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