Puzzling the quants

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Stock market rally proves treacherous for some quantitative funds.

By Irwin Speizer

The mathematical models used by quantitative funds are supposed to take the guesswork out of selecting securities, at least for the fund manager sophisticated enough to write the complex programs. Investors, however, have recently learned that unexpected events can trip up quant fund managers just as much as they can the fundamental players.

Take the powerful rally that began on March 9 and lifted the broad stock market 27% by mid-April. The buzz among quant investors and analysts has been that the big upward move caught quant models by surprise - at least those playing the U.S. equity market. According to Barclays Capital analyst Matthew Rothman, a clear majority of roughly 80 quant managers responding to a recent survey have lost money since the rally began or have been stopped out of their positions. The managers surveyed used long-only and/or long/short strategies with intermediate- to long-term holding periods, and a majority of them lost money while the stock market was rising.

Rothman, who covers U.S. quantitative equity strategies, concluded that "Quants and fundamental stock pickers alike are getting their stock picks wrong and, in the process, are experiencing outsized negative returns." The March results for several big-name funds appear to bear this thesis out. Steve Evans's $870 million Tudor Tensor fund lost 3.35% in March and DKR Quantitative Strategies was down 1.4% for the month through March 27. However, D. E. Shaw's Oculus fund gained 1.4% in March.

At Merrill Lynch, technical research analyst Mary Ann Bartels concluded that the losses couldn't be explained simply as quant funds long the wrong stocks - but also by the fact that many quants watched the March rally from the sidelines. In an April 13 report, she noted that although the S&P Index soared in March and early April, quant fund equity market exposure has dropped sharply since late March. The result: Many quant funds missed the rally.

What happened in March is that the wrong stocks rallied - wrong, at least, in the sense that other stocks were expected to perform better. What Rothman found was that, in effect, stocks with crummy fundamentals soared, leaving behind stocks that look better on paper. Investors acted in ways contrary to how quant models said they should, based on historical performance.

Just how serious a setback the period proves to be for equity-based quant managers will take time to sort out. At least initially, it appears that the damage was limited, with effects far more benign than the quant meltdown of August 2007, when heavy leverage combined with a liquidity crisis unexpectedly resulted in correlations that were close to one. Quants carry much less leverage these days at an estimated ratio of 4-to-1, compared to early 2007, when leverage ran more than 10-to-1.

Quant models are employed not only to evaluate equities but also to analyze a range of other asset classes, from convertibles to currencies. The key to quant analysis is that it applies mathematical formulas, often borrowed as much from the scientific world as from finance, to analyze data and trends and thus guide decisions to buy and sell.

The catalyst for the 2007 quant collapse was a systemic bias toward value stocks by equity quant funds at a time when growth stocks turned out to be the big winners. It subsequently became clear that many quant models made the same mistake simultaneously.

"Managers didn't realize how much money was being deployed in the exact same type of strategies," says Andrew Lo, a professor of finance at the Massachusetts Institute of Technology who also serves as chief science officer of quant fund AlphaSimplex. "It was a crowded trade phenomenon. When one fund decided to unwind, it caused a deterioration of everyone's portfolio. That caused further pressure. You had this vicious cycle that resulted in a number of funds going out of business."

The episode left investors suspicious of quants for months afterward, regardless of the underlying asset class or strategy. "In late 2007, if you said you were a quant manager, most people laughed at you a little bit," says Rishi Narang, founder of Telesis Capital, which invests in quant hedge funds. "No one wanted to hear anything else you had to say."

The August 2007 rout had a sweeping impact. Global Alpha, the flagship fund of Goldman Sachs Asset Management, lost 38% in 2007 and was subsequently hit by a massive wave of redemptions. From a peak of $12 billion in assets at the start of 2007, Global Alpha fell to $2.5 billion by mid-2008. This March, Mark Carhart and Raymond Iwanowski, co-heads of the fund, and Giorgio De Santis, co-head of the division's research, left Goldman. Tykhe Capital, a quantitative firm set up by three D. E. Shaw alumni, also lost money in 2007.

At Thales Fund Management, the signature $1.1 billion Thales Holdings lost 10.8% in 2007 and, after a redemption run, was liquidated in early 2008. Also shuttering smaller quant funds were Lancelot Investment Management, Cornerstone Quantitative Investment Group, Quant Trading, Analytic Investors and Ascend Capital.

The volatile markets of 2008 gave the survivors a chance at a comeback, particularly those funds using high-frequency trading programs. One investor index of quant funds rose 23% last year. "I think quants ultimately ended up doing pretty well - at least those able to stay in the business," Lo says. "A fair amount of money left the industry, so quants did quite well both because of the additional alpha on the table and because of the fact that volatility increased so much in 2008 and a lot of these strategies are generally long volatility."

Lo's AlphaSimplex, a $700 million macro fund, gained 14% in 2008. Goldman's Global Alpha rose about 3%, and Tudor Tensor gained 36% last year. At Thales, Marek Fludzinski raised $350 million to launch a short-term-trading fund. That vehicle, Thales Statistical Arbitrage, netted 13.45% from its May inception through December 2008. Citadel Investment Group, whose signature multistrategy portfolio struggled in 2008 under punishing trading losses and significant redemption runs, made up for some of the setbacks through its quant portfolios. The two high-frequency tactical trading vehicles managed a combined $3 billion in assets and each gained about 40% in 2008. (Some key managers of Citadel's market-making business have since left the firm, including Pav Sethi, former global head of volatility arbitrage, and Matt Andresen, president of Citadel Execution Services.)

Although the pattern of losses in 2007 followed by gains in 2008 was common for equity-based quants, results were by no means uniform. For example, Whitebox Intermarket Advisors, which uses a combination of quant models and fundamental analysis, soared 40% in 2007, thanks to its focus on small- to mid-cap equities, which fared better than value-based strategies. But that same strategy didn't work well in 2008 as massive deleveraging took place, and the fund lost 18.45%. Similarly, D.E. Shaw (composite), which allocates roughly half to quant strategies, gained 7% in 2007 but lost 11.2% in 2008.

Meanwhile, Renaissance Technologies posted eye-popping returns in 2008 for its signature Medallion Fund, a high-frequency trading vehicle, with a reported gain of 80%. That fund is closed to outside investors, and those trying to capture some of the magic through Renaissance's newer institutional funds have been sorely disappointed. Renaissance Institutional Futures Fund lost 12.91% in 2008, while Renaissance Institutional Equities Fund gave up 16.72%.

This year's start was promising for many quants. One investor index put quant funds up about 6% in January. But the index took a U-turn in February and is now down nearly 2% for the year through March. Year-to-date performance is scattered. For the first quarter, Tudor Tensor lost 3.47%, Whitebox Intermarket gained 3.5%, and AlphaSimplex rose 1.5%. Citadel's quant funds have both stayed in the black, up 3% and 4% for the year through March. RIEF was down 8.62% in the first quarter; RIFF was up 2.08%.

Narang argues that some equity-based quants probably did misplay the March rally, but that the overall impact is hardly worrisome. He observes that plenty of equity-based quants actually made money during the rally. Four of the six equity traders that Narang invests with, most of whom have holding periods between one day and several months, netted gains for the period from March 9 to 31. Their net average return was well over 1% for the period, and the worst performer lost a bit more than 2%. "The premise that quants are having some kind of heart attack as a group is just wrong," Narang says.

Barclays' Rothman suggests that the impact of the errant equity plays by quants in March may have significance beyond simply how much money these funds lost. Those equities, which Rothman says rose more 134% in the rally, are "low-priced, beaten down, cheap stocks of dubious quality." In short, they are stocks that may not hold onto their gains. And if they don't, a market correction may be in order.

Those quants that missed the rally could take comfort should their assessments prove correct over the long run. But being right in the end and making money along the way are not necessarily the same thing. Noted Rothman in his report, "As a prior boss repeatedly reminded me, and I humbly note here, there is no difference between being early and being wrong."