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## JPMorgan dumps tradition; Firm creates a new asset allocation tool that embraces 'fat-tail' events

**BYLINE:** Joel Chernoff

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JPMorgan Asset Management officials are rethinking asset allocation, tossing out the traditional mean-variance optimizer in favor of a new approach that assumes returns don't fit neatly on a bell-shaped curve. It also incorporates downside risk.

Experts have been pointing out flaws in the optimizer for years, but JPMorgan executives are at the forefront in coming up with an alternative.

JPMorgan's approach rejects the conventional wisdom that returns are normally distributed on a bell-shaped curve and that returns are independent of each other. By assuming that "fat-tail" events -- such as the 1998 Russian debt default crisis, the bursting of the tech-stock bubble in 2000 and the current subprime mortgage disaster -- happen more frequently than expected, using standard deviation as a measure of risk gets thrown out the window.

Instead, JPMorgan's research assumes a non-normal distribution of returns and incorporates a measure of downside risk called conditional variance at risk, defined as the average real loss (or gain) in the worst 5% of cases in a simulated return distribution.

JPMorgan is not alone in seeking a better solution to the asset allocation puzzle. Officials at the \$175 billion California Public Employees' Retirement System, Sacramento, are considering using downside risk in the fund's upcoming asset allocation review (Pensions & Investments, March 23). Separately, some managers -- including Pacific Investment Management Co. and Acadian Asset Management Inc. -- incorporate tail risk in some of their strategies.

"The Morgan work is very, very thoughtful and it's provocative. It goes along with other work that is being developed to start the discussion of how modern portfolio theory needs to be revisited in light of (changes to) both our regulatory and investment environment," said Cynthia F. Steer, managing director, chief research strategist and head of beta research, Roger Scasey Inc., Darien, Conn.

"Traditional finance theory is taking a beating here," said Kathleen DeRose, senior managing partner and head of portfolio management and research at Hagin Investment Management, New York. "If you're using a risk model that comes from the old theory, and the old theory has been turned upside down, chances are you will have to remake your risk model," she added.

### Allocation changes

Rumi Masih, New York-based managing director and head of JPMorgan's strategic investment advisory group, said any changes in asset allocations using the firm's new model will depend heavily on capital market return assumptions.

But Ms. Steer said using a non-normal distribution of returns -- one that eschews the bell-shaped curve of a normal distribution implicit in the traditional mean-variance optimizer -- means significant changes in allocations.

"In a skewed world, we'd move less toward equities and more toward fixed income, less toward illiquid investments and more toward having a real form of liquidity," she said. The new approach can correct a misperception that emerging market equities are much riskier than U.S. or other developed-market stocks, Ms. Steer added.

Steven J. Foresti, managing director at Wilshire Associates Inc., Santa Monica, Calif., praised JPMorgan's work as "promising," but noted it wouldn't have saved investors from 2008's catastrophic markets.

“I think it's important that institutions don't look at this work and think they could have circumvented a lot of the pain ... because there's only one portfolio that could have done that: Treasuries,” he said.

As long as institutional investors have an investment objective, they have to accept a certain amount of risk, he explained. “Ultimately, if you've got a hurdle rate in terms of return, there's only so much an institution can do to (reduce) downside risk.”

Mr. Foresti said Wilshire officials are developing their own revamped approach to asset allocation, one that turns to leveraging less risky asset classes and reducing equity allocations.

Mr. Masih said the new asset allocation tool is not intended to be a panacea, but rather is designed to create more efficient portfolios and to help investors obtain a better understanding of the risks they are taking. The new approach would create “enhanced asset allocations over the long term,” he said.

A paper written by two members of JPMorgan's strategic investment advisory group -- Abdullah Sheikh, director of research, and Hongtao Qiao, adviser -- found that many of the assumptions in the traditional mean-variance optimizer are flawed.

‘Serially correlated’

In addition to the fact that returns in the real world don't follow a normal distribution, the authors found that in many cases -- particularly for illiquid and hard-to-value asset classes such as hedge funds and private equity -- returns are “serially correlated,” that is, returns for one month often follow the prior month. (The traditional optimizer assumes returns are “independent and identically distributed” from one period to the next.)

The problem is that serial correlation, if not adjusted, “masks true asset class volatility and biases risk estimates downwards, leading to underestimation of overall portfolio risk,” according to a summary of the paper.

Another well-known problem with the traditional optimizer is that it minimizes the likelihood and severity of so-called “fat-tail” or extreme events.

A third issue with traditional asset allocation models is they assume that relationships between asset classes stay constant, thus overstating the benefits of portfolio diversification. But correlations jump during times of extreme market stress.

JPMorgan's new approach uses several fixes: It “unsmooths” serial correlations, resulting in higher volatility and greater downside risk; it incorporates extreme events; and uses “copula” theory that evaluates the effect of converging correlations at the total portfolio level -- allowing investors to see how asset classes behave together instead of separately.

In addition, JPMorgan's tool uses conditional value at risk to measure downside risk. In one hypothetical example, a \$1 billion portfolio could lose \$168 million -- or 16.8% -- in the worst 5% of simulated returns using the new model. The traditional calculation produces a possible worst-case loss of only \$74 million.

Using CVaR also results in a more efficient asset mix, according to the JPMorgan summary. In the example, bonds go to 34.5% from 30%, while U.S. large-cap equities are slashed to 21.7% from 40%. International equity is trimmed to 5.8% from 10%, while emerging market stocks are increased to 8.5% from 5%. Overall, alternatives -- comprising real estate investment trusts, hedge funds of funds and private equity -- are nearly doubled to 29.5% from 15%.

The result is reduced volatility compared with the traditional approach, and a slightly improved Sharpe ratio, which is a measure of portfolio efficiency.

No caps

One of the more striking results is that allocations to asset classes do not have to be capped. Small differences in assumptions can cause over allocations to individual asset classes in the traditional optimizer, and thus most investors impose constraints on those allocations. However, Mr. Masih said pension executives still might recommend restraints to their boards.

Andrew W. Lo, the Harris & Harris Group Professor of Finance at the MIT Sloan School of Management, Cambridge, Mass., said the paper is a “positive step” in “getting institutional investors more aware of tail risk and to make them think more about it.”

But he noted that, from an academic perspective, there was nothing new in the paper. He observed that CVaR is “a very old measure.” He added that using the Sharpe ratio as a measure of portfolio efficiency can be misleading because the ratio “wasn't designed to reflect the risk of tail events.”