

IN CONVERSATION

Value-at-Risk Inventor Longerstaey on the Perils of Oversimplification

Jacques Longerstaey (*right*) was part of the team that invented value-at-risk at **JPMorgan** in the 1990s, a venture that was spun off to become **Riskmetrics Group**. Longerstaey went on to work at **Goldman Sachs Asset Management**, **Putnam Investments** and most



recently **State Street Global Advisors**, where he was chief risk officer until October. He tells Bloomberg's **Nicholas Dunbar** about the limitations of VaR and the role of risk managers.

Q: You were part of the team that created VaR at JPMorgan. What are your recollections?

A: 20-odd years ago, JPMorgan's chairman, Dennis Weatherstone, gave a mandate to the risk management group to measure the risks in the bank's growing trading businesses. The challenge at the time was "at the end of the day, I want one number." So the risk management worked on it and came up with value-at-risk, and Dennis got his one number. The concepts of portfolio diversification were already well established and in a sense it was nothing more than a repackaging. But it did lead JPMorgan to build a product that could be used by others and that ended up being Riskmetrics.

Q: Why did VaR become so widely used?

A: Nobody at the time really understood the main objective of the firm, because usually when investment banks offer something for free there's a reason behind it. The regulators at the time were starting to think about moving on from the Basel I framework and impose capital requirements on trading books. The first incarnations that we saw were very simplistic and didn't take into account any diversification, and therefore would have been very punitive for the bank. So Riskmetrics was more than a client tool, it was a way to popularize these methodologies so that all the banks would go to the regulators and ask to be allowed to use internal models to lower their capital requirements. This is one of those things that may have had positives and negatives.

Q: Some people say that VaR-based capital requirements contributed to banks needing government bail-outs in the crisis. What lessons have you learned in the last 20 years?

A: The first thing I would say is, Dennis, you created a monster by asking for one number. You just can't boil down risk into one number. It's easy, it's intuitive - but life is a little more complex than that. This applies as much to an absolute metric like VaR used by trading firms as for a relative one like tracking error used by portfolio managers. How should we address the limitations of the one number? By understanding all the pieces that lead to the number, whether VaR or tracking error. As a practising risk manager, I'm more interested in what the sources of risk actually are.

Q: How does that work in practice?

A: Consider a simple foreign currency equity portfolio with exposure to the Hong Kong dollar. Run that through any historical valuation or volatility model, and it will tell you the contribution to risk from currency is zero. Why? Because the currency is pegged. But the risk is what happens if the peg disappears one day. Here's another example. A few years ago we were overseeing some U.S. equity portfolios in the mid-2000s that had significant exposure to financials. For a long time, financials hadn't displayed volatility, so therefore the contribution in the risk model was very small - until the financial crisis. So the lesson is, do you have exposure to things that display no volatility until they actually do? Do you have exposure to things you've categorized in such a way that they get embedded with other things, and then start behaving differently? Take subprime. Nobody thought about what subprime actually was until shortly before it exploded.

Q: Are there any other lessons about using VaR and tracking error?

A: It's important to remember that the numbers aren't precise. I remember an advisory assignment for a financial institution where the people said they wanted to make sure they calculated VaR to the second decimal point. I thought,

no you don't understand what the issue is. VaR is a bit like altitude in an old aircraft where you use a pressure-based altimeter. There's a reason why vertical separations between aircraft used to be so big - two thousand feet or so. In fact, with risk models the uncertainty is significantly larger.

Q: How important is data in building good risk models?

A: One problem is that people fall in love with the data. A lot of the metrics we use are built round methodologies that try to map the whole distribution of returns. That's a very effective way to build portfolios for normal markets. But in the tail end of the distribution the behavior may be very different. For those of us who work for banks and actually have to calculate operational risk as well, that data is very different from financial market data. For one thing, it's not certain that whatever data you use applies to your process, and when we try to map these things as a single contribution, I'm not convinced that this is the right way to do it. It's comforting to say "have my arms around this", rather than saying, "I don't - there isn't any data that explains the risk profile of this portfolio". That is why you need to go back to the belt-and-suspenders approach of having position limits that you may find constraining but will actually protect you.

Q: What about the future of financial risk modeling?

A: Risk models over the last 20 years originated in two very different parts of the market. The traditional VaR models and their variants saw the light of day in the trading desks of banks. There's a lot of traders who moved out of banks to create hedge funds who took that philosophy with them. The long-only asset management industry for a long time has used factor-based models - fundamental, statistical and macro models. The evolution has been parallel for 20 years: if you want a factor model, you go to one vendor, while if you want VaR with variance-covariance or Monte Carlo you go to another. Nobody's brought it together. I think that is the next step you will see.