



Can You Hear Me Now?

Quants are learning difficult lessons about communication

BY SHERREE DECOVNY

Leading up to the credit crisis, according to some observers, experience and common sense took a backseat to financial modeling. Investors who believed they would be getting 250 bps above T-bills by purchasing over-the-counter instruments that were rated AAA should have realized that something in their analysis was incorrect. Either they were not really getting 250 bps, or the instruments were not really AAA.

In the aftermath, quants have been accused of not communicating the weaknesses in the underlying assumptions of certain models used for the creation, pricing, and risk management of credit derivatives. Defenders of quants claim that some tried but were ignored. “Lots of quants were worried about what was happening in the marketplace and the growth of some of these instruments, and they were warning about it 2–3 years before the financial crisis happened,” says Richard Lindsey, CEO of quantitative consulting firm Callcott Group and author of *How I Became a Quant*. “It wasn’t that they were unaware, but it’s that they didn’t carry enough weight within the organization to make the difference.”

Not everyone is willing to let quants off the hook so easily. “There is a bit of rewriting of history going on here,” says Paul Wilmott, course director for the Certificate in Quantitative Finance (CQF). “The more quantitative you are, the more you believe the model. That’s the problem.”

For years, some experts warned that the models used to value credit derivative instruments were faulty. For

example, CQF instructors advised students that if they could not value or risk-manage an instrument, they should not trade it. If they did trade it, they should trade it in small size. And if their boss insisted on trading it in greater size, they should make sure an enormous profit margin was added to offset a margin of error.

As the credit derivatives market grew, however, competition increased and it became difficult to add a large

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profit margin. “If the bank next door is halving their price and you want to do the deal, you’ve got to be competitive,” Wilmott points out. “Combine all that aggressive selling with the dubious models and it was just a disaster waiting to happen.”

A Failure to Communicate

Collateralized debt obligations (CDOs) are still being taught in the CQF curriculum because they are an excellent case study in what could go wrong. Besides, people have short memories, and CDOs may come back into vogue.

Quants are being told not only that they will need to communicate their ideas more effectively in the future, but that they also will have to sell them to their bosses while ensuring they understand the risks

KEY POINTS

- In the age of the internet and lightning-fast electronic trading, the demand for more complex products requires more complicated mathematical models to create and price those products.
- Quants need to learn to communicate their ideas effectively and sell ideas to their bosses while ensuring that decision makers understand the risks and tradeoffs.
- Building good products that stand up to rigorous stress tests against non-normal distributions and exceptional circumstances will be a challenge in the future.

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Although the ability to explain mathematical concepts to non-experts is an art that is difficult to master, quants can still improve their communication skills. The key is to figure out how to explain the same idea in different ways until the person understands. Some people respond well to real-life analogies, which others might dismiss as being overly simplistic. Similarly, some people learn by using numerical examples, while others prefer mathematical symbols that show the structure of a problem. “If you’ve got an audience that is full of people who like examples using 5’s and 7’s and 3’s and you’re talking about x and y and z , then you will lose them completely,” says Wilmott.

Graphical illustrations are helpful in explaining and understanding structured products. One technique is for quants to draw as many pictures as they can before they even try to determine the price of an instrument, assess risk, or sell a product.

Jargon is sometimes unavoidable because it typically has a very precise meaning in mathematics. Some experts recommend that quants try to concentrate not only on what they are saying but also on what the other person is hearing. Moreover, they need to watch out for body language that might indicate a lack of understanding and be

aware that people often lack the confidence to question people with impressive degrees and credentials.

Obviously, miscommunication isn't always an honest failure. Some quants do not want to articulate their strategies well because they do not want to share their proprietary insights. Others do not want to undermine their reputation by revealing strategies that are not as sophisticated as they would like others to believe. Certain hedge funds have been known to turn away money from investors who demand a full explanation of their activities.

Investors who do not want to put in the effort to understand quantitative approaches must share the blame. "There's an unspoken agreement between quants and the buyers of their products or technologies that often reinforces the desire to not understand," says Jeff Schwartz, managing director of Markov Processes International, a quantitative analysis platform provider.

Prior to the credit crisis, quants sliced and diced traditional products into very complex derivative instruments—to the point where nobody, including the salespeople and senior managers, understood how they worked. In the end, the products did not hold up to rigorous analysis. Previously, new products were stress-tested against standard scenarios that might cause them to melt down, usually two-sigma events (those with a 95 percent probability of occurring within a given time frame) or three-sigma events (99 percent probability of occurrence). In the future, products will be tested against non-normal distributions and exceptional circumstances that might have only a 1 percent chance of occurring.

Schwartz warns against overreacting to recent events, however. "If everything you're doing is designed to avoid this incredibly unlikely case, then it becomes very difficult to build products," he says.

Leveraging Computer Power

Despite qualms about quantitative models, the demand for more complex products requires more complicated

mathematical models to create and price those products. Thanks to the Internet, quants and investors have more information available to them than ever before. Electronic trading is the norm, and advanced technology enables orders to be processed and executed at lightning speed.

"Information is delivered and shared so rapidly now that the window for arbitrage opportunities has become much smaller," Schwartz notes. "If you walk into the CBOE [Chicago Board Options Exchange], you have a whole host of software technology peddlers offering wares to the traders, all of them trying to use super-fast information analysis to quickly uncover and execute arbitrage trades."

Quants started out in the 1970s and 1980s dealing with numerical electronic information. Today, the universe of available data has expanded to include non-numerical textual electronic information from companies, regulators (such as the U.S. Securities and Exchange Commission), the courts, government agencies, and other entities.

Further, since integrated circuits were invented in 1958, the transistor count on some chips has doubled about every two years. Today, quants have tremendous computer power on their desktop that allows them to collect and analyze data from an array of sources.

"A new breed of 'quantextual' investors and traders is emerging," says David Leinweber, founding director of the Center for Innovative Financial Technology at the University of California–Berkeley. "The growth of the web makes more of this available all the time. The commercial web technologies give people the hardware and software to exploit it."

For example, a solution from FirstRain crawls the web to find nuggets of information and discrete pieces of data that would not be found as efficiently, if at all, without such technology. It pulls this information from esoteric places, including articles in unconventional news sources, and tracks management changes that are

not necessarily announced. Finally, it can arrange information in an orderly, efficient, and customized way.

A system from Connotate allows users to create data sets out of information that is freely available on the web (for example, counting the number of listings for a particular item on eBay or the number of cars available on an automobile website). Pricing can be tracked and indexes can be created for products across various retailers. Specific companies' products can also be tracked.

"Our collective knowledge is greater now than it ever was in the past 10–15 years, especially because of the Internet and because of the way you can track stocks daily," says Paul Pignataro, founder of The Analyst Exchange, which provides training and consulting to investment banks, private equity firms, hedge funds, corporations, and individuals. "People are constantly updating models to fit that."

Quantitative trading will continue to grow, but better tools are needed to analyze and understand these approaches. To uncover risk, some investors have started using technologies that deploy Kalman filters, a mathematical technique used in control systems that manage, command, direct, or regulate the behavior of other devices or systems. They also have been using dynamic returns-based analysis models that quickly identify risk exposure within mutual funds and hedge funds.

In the future, maybe people will remember what sophisticated models are for, how they can be used, and where they do not work. Most importantly, they should keep in mind that modeling complements—but does not replace—experience and common sense. **■**

Sherree DeCovny is a freelance journalist specializing in finance and technology.

RECOMMENDED RESOURCES

"Models"
Financial Analysts Journal (Jan/Feb 2009)
(www.cfapubs.org)