

# Wall Street rocket scientists crash to Earth

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An outside view of the New York Stock Exchange on Wall Street. There's a reason Wall Street resembles a rocket experiment gone wrong: rocket scientists helped make it happen. Known as quants, these are the mathematicians and physicists who devised the financial instruments and computer programs fueling stock markets' spectacular rise and collapse.

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And while in good times they became financial rock stars, quants -- short for quantitative analysts -- are now being cast as villains of an industry that abandoned its values.

"They thought they could make it easier to make money, one New York investment manager, speaking on condition of anonymity, told AFP.

"They thought you don't need to do your homework anymore."

Trained at leading universities like MIT, Harvard and Oxford, quants apply the logic and number-crunching powers of physics to the mess of money.

Some quants use mathematical modeling to analyze risk, some juggle huge quantities of economic data to understand price trends. Some run hedge funds. Some design ultra-complex securities and derivatives.

Peter Kolm, a former quant at Goldman Sachs and now associate professor at New York University's prestigious Courant Institute of Mathematical Sciences, says atoms and dollars aren't so different.

"The mathematics, the structure is similar," he said.

"Any fusion process, heat flow, how heat spreads in a room, or spreads on a particular surface ... there's similar behavior in the probability of how prices change over time."

Quants entered markets in the late 1970s, becoming in huge demand by the 1990s.

They earned big salaries to produce ever-more exotic and jealously guarded products dubbed "black boxes."

Thousands of hedge funds -- about seven percent of the total -- were based entirely on quant products, using intricate, split-second calculations to take multiple positions.

There were plenty of warnings.

Two of the most exalted quants -- Robert Merton and Myron Scholes -- won the 1997 Nobel economic science prize for their work on [stock options](#), but their hedge fund Long Term Capital Management collapsed a year later.

And as far back as 2003, Warren Buffet described quant instruments as "financial weapons of mass destruction."

Yet few listened: geeks were kings and their micro-chip alchemy was infallible.

"Everybody in the world thought they could come up with a model," said economics analyst Joel Naroff. "People knew they were taking larger bets, but the assumption was the bets were backed by mathematics."

The hottest quant products were Collateralized Debt Obligations (CDOs) and similar instruments like CMOs that turned high-risk toxic housing debt into seemingly safe bonds.

Quants literally appeared to have found a way to beat the system, turning the bad money of subprime mortgages into risk-free profit.

The mathematics was so complex that even traders had trouble understanding what they were selling. But the products worked.

"You put chicken in the grinder and out comes sirloin," veteran quant Michael Osinski recalled in last week's New York magazine.

But for all the dazzling algorithms, the quants had left out one crucial element: the possibility that the housing market might stop rising.

Which is what happened. House price fell, subprime mortgage holders defaulted en masse, and the entire economy slid into today's all-

encompassing financial crisis.

Marc Pado, a US market strategist at Cantor Fitzgerald, says the disaster shows what happens when automated programs replace humans.

"It was like putting a plane on automatic pilot. Everything is great while it works," he said.

"But as with anything computerized, it doesn't have human judgment. It's all based on what has been plugged into the formula. People say they thought it was a science, but (trading) is not a science -- that's the point."

Kolm defends quants, pointing out that traders, not quants make the judgement calls.

"Who put the blind faith in it? These were the business people calling the shots," Kolm said.

Traders didn't even want to hear about possible dangers, he said.

"Business people are going to say the same thing. They say it's profitable. Why is it risky? So you're going to be the bad guy at the party.... There are situations where risk mangers who blow the whistle, they essentially get shown the door."

Competition to enter the Courant Institute's course is down, but still intense, with 660 applicants chasing 30 places, compared to 900 eyeing 35 spots last year, Kolm said.

Still, these future Wall Street whizzes will likely learn humility instead of the old hubris.

"What makes a really good quant," Kolm said, "is someone who

understands the model really well -- and who understands what can go wrong."

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