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The Professor Who Chases Financial Bubbles

By ELEANOR LAISE

Didier Sornette has immersed his life in risk. He rides motorcycles, windsurfs and water skis long stretches of a 120-mile route between Nice and Corsica. Now comes a daunting professional challenge: "The Financial Bubble Experiment."

Mr. Sornette, 52 years old, is the director of the Financial Crisis Observatory at the Swiss Federal Institute of Technology in Zurich, or as he calls it, "the MIT of Europe." Late last year, he launched the bubble experiment by identifying four developing bubbles and forecasting when they'll peak. His predictions are locked away in encrypted files that can't be altered, to be revealed only when the forecasted bubble peaks have passed, on May 1.

"My colleagues think I am crazy to risk my neck" making such predictions, says Mr. Sornette. Academics tend to be rather cautious, he says, to protect their reputations. "You have to find a guy like me, a maverick who has low risk aversion."

Wall Street firms and governments around the world are looking for the sort of predictive system that Mr. Sornette claims to offer. Some big banks and investment-research firms, including BNP Paribas SA's Fortis Bank and Morningstar Inc.'s Ibbotson Associates, have already tested his models with some success. In a research report early last year, for example, Fortis used Mr. Sornette's model to identify bubble-like behavior in some credit-default swap indexes.

The firm forecasted the indexes would decline—but earlier than actually happened. Still, "it's interesting to have a tool available that can give you warning signals," says Peter Cauwels, a director at Fortis.

In recent weeks there has been movement in Congress to create a new agency that would house data and analytic tools aimed at detecting and preventing future financial collapses.

The notion that bubbles can be identified while they're still inflating is not a popular one. Former Federal Reserve chairman Alan Greenspan noted in a famous 2002 speech how difficult it is to identify a bubble until after the fact, "that is, when its bursting confirmed its existence." Other academics have seized on Mr. Sornette's misfires, including a prediction that U.S. stocks would continue to tumble in 2003 and 2004, to cast his system as a failure.

Mr. Sornette says that his observatory can track tens of thousands of stocks, bonds, and other securities.

The term "observatory" is also meant to underscore his scientific, quantitative approach to studying bubbles.

Mr. Sornette works with a handful of postdoctoral fellows and senior researchers, sifting through data on an institute supercomputer called "Brutus."

As a professor of finance, physics and geophysics, Mr. Sornette has a passion for predicting events in complex systems. He has studied earthquakes, epileptic seizures, and the popularity of YouTube videos.

The six-person observatory, which is funded by the Swiss Federal Institute of Technology, is designed to scientifically test the idea that financial markets have a degree of predictability, particularly during periods when bubbles develop.

Rocket Science?

With a Ph.D. in physical sciences, Mr. Sornette worked on methods to predict the rupture of pressure tanks on European Ariane rockets in the early 1990s. He realized that the tanks didn't just rupture without warning. Mr. Sornette was able to identify patterns in acoustic emissions, which are waves produced by stressed materials, that had some predictive power.

Realizing that financial crashes are somewhat like market "ruptures," he became interested in studying market fluctuations. "It was an act of faith" to apply the type of work he was doing on the rockets' tanks to the markets, he says. "You make this stupid analogy, which can sometimes be very productive."

But instead of immersing himself in the financial world, Mr. Sornette in 1996 became a geophysics professor at the University of California Los Angeles. After years of studying earthquakes, he has reached at least one definitive conclusion: "I think earthquakes are much, much more difficult to predict than anything else," he says.

When Mr. Sornette isn't busy risking his academic reputation, the Paris-born son of a helicopter pilot dabbles in extreme sports. While at UCLA, Mr. Sornette zipped around on a Kawasaki Ninja ZX12 motorcycle. "I cannot tell the speed that I reached for fear of prosecution," he says.

And he continued to flex his forecasting muscles, looking for certain "fingerprints" in market prices that help him identify bubbles. While there's lots of complex math behind it, one key pattern is essentially this: periods of unsustainable growth, in which the growth rate is itself accelerating, punctuated by waves of panicky selling. Key elements are the "positive feedback" generated by optimistic investors pushing the price ever higher into bubble territory even as more pessimistic investors produce waves of selling. In the midst of this tug of war, there's an accelerated development of the bubble.

Only about two-thirds of bubbles end in a crash, Mr. Sornette says. But in his view, as the bubble develops, it becomes increasingly unstable so that any number of small disturbances could cause it to pop. (He uses the analogy of a ruler held vertically on a finger. Any small movement will cause it to fall.) So while market-watchers often seek the causes of a crash in the events immediately preceding it, he believes the fundamental origin is in the longer-term build-up of instability.

Mr. Sornette scored an early forecasting success in January 1999, when he predicted that the Nikkei index would recover from its doldrums, rebounding sharply by the end of that year.

There were also failures. In late 2002 Mr. Sornette predicted the U.S. stock market's bearish mood would continue over the next two years. Instead, the market posted big gains over that period. "That was

a major failure and it has hurt my reputation," Mr. Sornette says.

Mr. Sornette says he generally stays away from trading, which he considers too time-consuming. But once several years ago, he says he turned his predictions into profit, making a 400% return in one day trading put options based on a crash forecast. Now, through a firm called Insight Research LLC, he sells software for analyzing financial risks.

James Xiong, senior research consultant at Ibbotson Associates, says he has used Mr. Sornette's approach to make his own successful market forecasts. Vineer Bhansali, a managing director and portfolio manager at Allianz SE's Pacific Investment Management Co., says that several years ago he used Mr. Sornette's model to trade stocks in his personal account, and made a little money. "It worked reasonably well," Mr. Bhansali says. "But to do it properly you have to do it in a disciplined manner."

Skeptics Weigh In

Others remain skeptical. "There's no perfect model," says J. Barkley Rosser, economics professor at James Madison University. "You hit it one time, and you'll miss it another." Referring to one of Mr. Sornette's recent predictions on Chinese stocks, Mr. Rosser says, "I think they were lucky on this one."

Nassim Taleb, who popularized the term "black swan" to describe extreme events that are highly unpredictable, is well acquainted with Mr. Sornette's work but still doesn't believe that any models can be used to make precise predictions. However, he says that Mr. Sornette's work, which is rooted in disciplines distinct from traditional economic models, "is vastly more useful to me than anything else in economics."

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