



Colloquium

When Physicists Went to Wall Street — Making Sense of the Financial Markets Through Econophysics

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Abstract :

If you come from a STEM background, your mental image of a "stock price" is probably a randomly jittering curve, while the market's participants and rules of the game remain unfamiliar territory. This talk offers a different way in: rather than starting from a finance textbook, we'll approach the financial markets through the eyes of physicists.

After the Cold War ended, many physicists moved into Wall Street. In 1995, physicist Eugene Stanley formally coined the term "econophysics," marking the point at which this wave of crossover researchers began systematically applying tools from statistical physics to re-examine empirical financial data. They found a number of phenomena that contradicted conventional finance textbooks — for instance, stock returns do not follow a normal distribution but instead show pronounced fat tails — and catalogued a set of statistical regularities that recur across markets and eras, known as "stylized facts."

To explain where these regularities come from, researchers have developed a range of modeling approaches, including analytical theoretical modeling, computer simulation (agent-based models), analogy models borrowed from other physical systems, and behavioral experiments. Among these, agent-based models — which simulate individual investors' behavior and observe how market-wide phenomena "emerge" — are especially representative.

Through this journey from physics into finance, the audience will not only get acquainted with the emerging field of econophysics, but will also come to understand how stock prices are actually determined, what types of participants make up the market, how herding effects shape it, and a number of financial terms that are often heard but not always truly understood.

This talk will be delivered in Mandarin, with slides in English.