



# How Game-Theoretic Probability Makes Sense of Cournot's Principle

Glenn Shafer

(Rutgers University)

20/11/2024, 4:15 pm

Department of Statistics, Ludwigstr. 33, Room 144

and online via Zoom ([Link](#))

(Meeting-ID: 631 1190 7291; Password: StatsCol)

Sufficiently high probability is practical certainty. This maxim, now called Cournot's principle, was repeated by scholars for centuries before Jacob Bernoulli made probability numerical, and it has been essential to statistical inference ever since. Cournot taught us that it is the only way probability theory makes contact with phenomena. We test hypotheses by checking whether events of small probability happen. We make predictions using the law of large numbers and the central limit theorem. In the 20th century, when mathematicians decided that probabilities come in the form of complete probability measures, Cournot's principle was destabilized. How can it be reconciled with the "lottery paradox", the obvious fact that an event of small probability always happens? Game-theoretic probability's notion of a testing strategy rescues Cournot's principle from the lottery paradox by showing that practical applications of Cournot's principle are a form of inductive reasoning.

See the website [www.probabilityandfinance.com](http://www.probabilityandfinance.com) for books and paper references.

## About the Speaker:

Glenn Shafer is a University Professor at Rutgers University. He has been a university educator for 50 years and is best known for his work in the 1970s and 1980s on the Dempster-Shafer theory, an alternative theory of probability that has been applied widely in engineering and artificial intelligence. He is also known for his initiation, with Vladimir Vovk, of the game-theoretic framework for probability. They published two books on the subject: *Probability and Finance: It's Only a Game!* and *Game-Theoretic Foundations for Probability and Finance*.