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Finiteness of variance is irrelevant in the practice of quantitative finance

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Abstract

Outside the Platonic world of financial models, assuming the underlying distribution is a scalable "power law," we are unable to find a consequential difference between finite and infinite variance models—a central distinction emphasized in the econophysics literature and the financial economics tradition. Although distributions with power law tail exponents $\alpha > 2$ are held to be amenable to Gaussian tools, owing to their "finite variance," we fail to understand the difference in the application with other power laws ($1 < \alpha < 2$) held to belong to the Pareto-Lévy-Mandelbrot stable regime. The problem invalidates derivatives theory (dynamic hedging arguments) and portfolio construction based on mean-variance. This article discusses methods to deal with the implications of the point in a real world setting. © 2008 Wiley Periodicals, Inc. Complexity, 2009

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