

Ping Chen's Comment on Math and Economics

at **Krugman's** blogs at the New York Times

<http://krugman.blogs.nytimes.com/2009/09/11/mathematics-and-economics/?apage=2#comments>

Posted on Sept.11, 2009

Paul,

You clearly knew the policy implications of Lucas theory are wrong and Friedman's monetary policy is weak, and the efficient market hypothesis simply useless and harmful. But you did not realize that their math models are also wrong, not because of fancy mathematics, but oversimplified or even misleading math.

All the market fundamentalist including Friedman, Lucas, RBC are followers of Frisch model of noise-driven business cycles, which is a perpetual motion machine, and Frisch himself knew he was wrong since 1934.

Lucas model of microfoundations was wrong because he ignored the principle of large numbers.

Derivative market breaks down, because Black-Scholes model is explosive in nature. Geometric Brownian motion model can be applied to stock price changes only if trading volume is near constant.

The so-called efficient market hypothesis has nothing to do with market efficiency, since random noise only accounts for 30 percent of market fluctuation, the rest is nonlinear chaotic movements with clearly define persistent cycles.

We published these results since 1988. Mainstream economists simply took a blind eye to all these new evidence of non-linearity, complexity, and market instability because new science of complexity cannot be "integrated" into optimization approach like Lucas did. The problem in economics is that linear thinking blocks nonlinear modeling. Not "too much math", but "too narrow math." "Narrow" is in the sense that they try to explain non-Euclidean phenomenon by Euclidean geometry. Is there any physicist would consider the Lucas model as "elegant" when his free economic agent has near zero-th degree of freedom, but even a gas particle has six degree of freedom.

Economists need re-education in math. Their math tool in time series analysis is even fall behind biologists and physicians. How many physicians believe the observed heart beats and brain waves are purely random walk and celebrating their finding of biological systems working in efficient way like this! Just primitive math bears a fancy name. CAPM is a linear model, which is far detached from a nonlinear financial market.

Ping Chen, a physicist at Peking University and formerly U.Texas at Austin, working on chaos theory of business cycle theory and nonlinear model of asset pricing since 1984.

— *Ping Chen at PKU*

pchen@ccer.pku.edu.cn