Mean-Variance Portfolio Selection of Cointegrated Assets

presented by

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Abstract:

We consider the continuous-time mean-variance portfolio selection problem in a financial market in which asset prices are cointegrated. The asset price dynamics are then postulated as the diffusion limit of the corresponding discrete-time error correction model of cointegrated time series. The problem is completely solved in the sense that solutions of the continuous-time portfolio policy and the efficient frontier are obtained as explicit and closed form formulas. The analytical results are applied to pairs trading using cointegration techniques. Numerical examples show that identifying a cointegrated pair with a high mean reversion rate can generate significant arbitrage profits once the current state of the economy sufficiently departs from the long-term equilibrium. We propose an index to simultaneously measure the departure level of a cointegrated pair to equilibrium and the mean-reversion speed based on the mean-variance paradigm. An empirical example is given to illustrate the use of the theory in practice.

(Joint work with Mei Choi CHIU)

Biography:

Hoi Ying Wong is an associate professor in the Department of Statistics and co-director of interdisciplinary major program of Quantitative Finance and Risk Management Science at the Chinese University of Hong Kong (CUHK). He obtained PhD in Mathematics from Hong Kong University of Science and Technology before joining CUHK. His research interest is in applications of mathematics and statistics to finance and risk management problems. He has published papers in academic journals in applied mathematics, statistics and finance, such as SIAM Journal on Numerical Analysis, European Journal of Operational Research, Journal of Banking & Finance, Journal of Empirical Finance, Mathematical Finance, Quantitative Finance, and Computational Statistics & Data Analysis, among others. He is on the editorial board of International Journal of Theoretical & Applied Finance. He has consulting experience with Hong Kong Monetary Authority and several local banks in Hong Kong.