Department of Statistics and Data Science
THE CHINESE UNIVERSITY OF HONG KONG

SEMINAR

DEPARTMENT OF STATISTICS AND DATA SCIENCE
THE CHINESE UNIVERSITY OF HONG KONG

A General Family of Quantile Regression and Coherent Risk Measures

INVITED SPEAKER

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TIME

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VENUE

LSB LT2 · CUHK

ABSTRACT

Regression models beyond the mean, such as quantile regression and expectile regression, are extremely useful in many real-world applications where the effects of explanatory variables vary across different outcome levels (e.g., income, health, and risk). In such cases, mean regression methods like ordinary least squares (OLS) can be too limited. Coherent risk measures play a crucial role in finance and risk management as they provide a mathematically sound and economically meaningful way to assess financial risk. They address key limitations of older measures such as Value-at-Risk (VaR) and ensure consistency in decision-making.

Our work makes a novel contribution by introducing a new family of regression models beyond the mean, namely Generalised Quantile Regression (GQR), in conjunction with coherent risk measures. Many traditional regression models and risk measures can be viewed as special cases of GQR. As a flexible nonparametric regression framework, GQR demonstrates excellent performance in handling high-dimensional and large datasets—particularly those generated by distributed systems—providing a convenient framework for statistical analysis. We derive the corresponding estimators and establish their asymptotic properties. Simulations and real data analyses are conducted to illustrate the finite-sample performance of the proposed methods.