Title: Modelling Dependence in Conintegrated Data: Copula-Based Cointegration Vector Autoregressive Models

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Abstract:

The copula method is well applied in finance and actuarial science but its application in economic studies is limited and its use in the cointegration framework virtually nil. This paper explores the use of copula method to analyze the remaining dependence after a cointegration relationship is modeled. Specifically, simulated data is used to characterize the behavior of the dependence parameter of several copulae fitted to the distribution of the residuals after cointegrated VAR and VECM models are fitted. The Clayton copula, Frank copula, Gaussian copula, Gumbel copula and Plakett copula are used. The density forecasting ability of the copula-based VAR and VECM is then compared with that of standard models via conditional KLIC divergence measure using simulated data. The consumption-income relationship in Japan is then modeled with copulae and the various models are evaluated using Hansen's SPA test. The results reveal that the copula-based models generally show better density forecasting ability compared with standard models in both simulated data and empirical data.