

Efficient Estimation of Dynamic Covariance via Risk Factors Mapping and its Applications to Financial Risk Management

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Abstract

This paper aims at exploring a modified method of dynamic covariance estimation via risk factors mapping. One important feature of the method is to be able to handle dependence estimation of assets of a large portfolio with high computational efficiency. The essence of our methodology is to apply a multivariate generalized autoregressive conditional heteroscedasticity (MGARCH) model to a small number of risk factors which drive the portfolio value. The idea of risk mapping is demonstrated by an empirical study with focus on Hong Kong stock market. Assessment of the mapping effectiveness is also discussed.

Keywords: Dynamic covariance; Multivariate GARCH; Risk factor mapping; Value at risk.