

Liuren Wu: “Disentangling Short-run and Long-run Dependence between Stock Index and Index Volatilities”

Abstract:

Stock index and its return volatility show both short-run instantaneous correlation between their innovations and long-run structural dependence between their levels. On the one hand, positive shocks to volatility increase the cost of capital and reduce the valuation, thus generating a negative instantaneous correlation between shocks in the index return and return volatility. On the other hand, holding the debt level and business risk fixed, a lower equity index level implies a higher level of leverage and accordingly, a higher level of equity volatility. In this paper, we propose a class of models that distinguish these two sources of dependence, and we analyze their different contributions to the pricing of equity index options across different strikes and maturities. We design and estimate several specifications within the class using S\&P 500 index options, and we assess the estimated index return and volatility dynamics.