Conditional Heteroskedasticity and Dependence Structure in Crude Oil and US Dollar Markets

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Abstract

This study constructs a flexible range-based volatility model to explore the volatility and dependence structures between the oil price and the US dollar exchange rate. An asset-allocation strategy is implemented to evaluate the economic value and confirm the efficiency of this model. The empirical results indicate that the use of price range information can not only enhance the explanatory power of volatility structures but also benefit investors by producing extra benefits of between 112 and 559 annualized basis points in an asset allocation strategy; less risk-averse investors can generate higher benefits. Moreover, an additional economic gain of between 11 and 33 annualized basis points can be achieved by taking the asymmetric dependence structure between crude oil and USDX markets into consideration.

JEL classification: C52; C53; G11; Q43; Q47

Keywords: Oil price; US dollar; Price range; Dynamic copula; Asset allocation strategy