Good Jump and Bad Jump Risk Matters: Evidence from S&P500 Returns and Options

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Abstract

The understanding of the relationship between an asset's expected return and its volatility is pivotal in asset pricing. In this paper, we extend the asymmetric double exponential jump-diffusion model grounded in the affine GARCH framework. We propose a model within the affine GARCH setting that uses two exponential distributions to separately model good and bad jump innovations. Furthermore, we deduce a closed-form solution for option pricing within this model structure. Our results suggest that the integration of jump components into the variance process significantly bolsters model estimation performance - the bad jump component markedly outstrips its good counterpart in contribution. In our empirical evaluation, we discern the variance risk premiums attributable to these good and bad jumps through model estimation. A cross-sectional regression reveals that both variance risk premiums serve as priced risk factors. Moreover, a time-series examination underscores the prevailing role of the bad jump variance risk premium in forecasting returns.