Tail Risk in Bitcoin under the Basel Framework

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Abstract

We examine Bitcoin's tail risk within the Basel framework using Value-at-Risk and Expected Shortfall. Daily data from 2018 to 2024 are analyzed by comparing the Stochastic Volatility with Correlated Jumps (SVCJ) model with its nested specifications and standard GARCH-type benchmarks (Duffie et al., 2000). The SVCJ framework is particularly suitable for cryptocurrencies, as it jointly captures stochastic volatility and correlated jumps in both returns and variance. Empirical results indicate that SVCJ delivers more accurate tail-risk forecasts than alternative models across horizons and confidence levels. To our knowledge, this is the first study to systematically evaluate the SVCJ model for Bitcoin tail risk, underscoring its relevance for robust risk management under Basel standards.