

# **State-dependent Intra-day Volatility Pattern and Its Impact on Price Jump Detection - Evidence from International Equity Indices**

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## **Abstract**

Current price jump tests assume a constant intra-day volatility pattern (IVP) over sample period. We test this assumption by allowing IVP to depend on some state variables such as the sign of previous returns or the relative levels of volatility. Estimation results from 5-minute GARCH model for four equity indices show that squared-return-based IVP weights increase in early morning hours when previous returns are negative, suggesting an asymmetric IVP. For a jump-robust IVP estimator, distinct responses are found for days with Realized Variance (RV) increasing from the previous day. Our results are consistent with and complement recent studies on time-varying IVP. Price jumps obtained using the state-dependent IVP are more prudent, show lower degree of clustering and are less concentrated over trading hours.