IEIT WORKING PAPER SERIES

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이재득

WP-2020-002

경제통상연구원

April 2020

이 논문은 2020년도 경제통상연구원의 지원을 받아 수행된 연구임

Nonparametric Estimation of Jump Probability using Power Volatility Periodicity Filters in Realized US Dollar/Euro Exchange Rates

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Abstract The discrete daily and intraday jump probabilities of US dollar/euro returns from February 2010 to February 2018 is analyzed using five-minute returns considering several periodicity filters of volatility. When the max outlying statistics are used with Gumbel distribution with periodicity filters such as weighted standard deviation, shortest half scale, and median absolute deviation, the empirical estimates show that the five-minute US dollar/euro returns have lower daily jump probabilities by 13–28% at common critical levels. To detect intraday jumps using the max outlying Gumbel jump statistics, the five-minute US dollar/euro returns have lower daily jump probabilities by 2–10% when the periodicity filters are included at common critical levels. Therefore, when the periodicity filters of volatility are considered, the five-minute US dollar/euro returns have significantly lower daily and intraday jump probabilities than when the periodicity filters are not considered.

Keywords: Euro, Volatility, Daily and Intraday Jump Statistic, Gumbel Distribution, Periodicity Filter, Max Outlyingness.

JEL Classification: F3, F4