
Estimating the empirical distributions of exchange rates volatility in Sri Lanka

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The exchange rate is the worth of a country's currency compared to another foreign currency. It is important to identify the empirical distribution of the exchange rates, as these rates are indicators of the economy of a country. This study aims to identify the accurate distributions of eight exchange rates (i.e. USD, EURO, GBP, CHF, CAD, AUD, SGD and JPY) against the Sri Lankan Rupees among potential distributions. This is the first study that identifies the empirical distributions of exchange rates in Sri Lanka. According to the findings of previous studies, most of the exchange rates are non-normal due to their volatile behavior. With respect to the statistical properties of the data, all considered exchange rates in this study were skewed and the kurtosis values indicated severe non-normality. Three candidate distributions, namely, the Generalized lambda distribution (GLD), the Skew-normal (SN) and the Normal Inverse Gaussian (NIG) were considered in the study. Formal goodness of fit (GOF) tests and graphical GOF techniques were applied to evaluate the suitability of the fitted distributions. Moreover, the Kullback-Leibler divergence was calculated to find the amount of information loss when the probability distribution function (PDF) approximates the original data. The best-fitted PDF was the GLD with the parameter estimation method of the maximum product of spacings for all the considered exchange rates. The findings of this study will direct the researchers in accurate model fitting incorporating the identified distribution, which would further support the country's international trading, employment, investors and stakeholders in decision-making.

Keywords: Empirical distribution, Exchange rates, Non-normality, Sri Lankan Rupee

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