An application of nonparametric Kernel Density Estimators in Colombo stock market indices

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The Colombo Stock Exchange (CSE) is the major financial trading agency in Sri Lanka. All Share Price Index (ASPI) and Standard & Poor Sri Lanka 20 (S&P SL 20) are main indices of CSE. The estimation of the density distributions of the fluctuation of stock market indices is main and challenging task of the financial market. This paper investigates the density distributions of returns and its variants of Colombo Stock Market Indices ASPI and S&P SL 20. The technique of nonparametric kernel density estimation with appropriately chosen bandwidths are used as a more flexible functional-free approach in fitting the distribution function depicting peaks and fat tails as well for stock market returns and log returns. The results show that the nonparametric kernel density estimators can successfully be applied to estimate the unknown density functions for daily stock market data due to the availability of dense data sets, particularly representing the tail parts of density distributions in contrast to the absence of that in traditional techniques such as single normal density estimators or Lorentzian distributional applications. Finally, concerning on the importance, drawbacks and the inherent nature of nonparametric methods used, some concluding remarks are given about the analysis on the returns and log returns of stock market indices.

Key words: Nonparametric Kernel Smoothing, Stock Market Indices, Density Distribution

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