2nd International Conference of Multidisciplinary Approaches (iCMA), 2015
Faculty of Graduate Studies,
University of Sri Jayewardenepura,
Sri Lanka
ISSN: 2386 – 1509

FOURIER ANALYSIS ON MODELING SECTOR RETURNS OF SRI LANKAN SHARE MARKET

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Sector returns of Sri Lankan share market shows wave like patterns. Wave can be viewed either in time domain or in the frequency domain. Time domain analysis is known as time series analysis. The frequency domain analysis is known as Spectral Analysis or Fourier analysis. Fourier transformation has been applied to transform a series into set of trigonometric series. Initially the technique was established in physics and engineering in order to explain the heat waves, sound waves etc. Later it has applied in explaining the behavior of economic variables. However applications of Fourier analysis in economic time series were limited in Sri Lankan context. Current study was focused on testing Fourier transformation along with Multiple Regression on forecasting sector returns of Sri Lankan share market. Random sample of five business sectors of Colombo Stock Exchange (CSE) were selected as the sample. Auto Correlation Functions (ACF) and Partial Autocorrelation Functions (PACF) were used to test the stationary of data series. Model assumptions were tested by residual plots, Anderson Darling test and Durbin Watson Statistic. Mean Square Error (MSE) and Mean Absolute Deviation (MAD) were used for model assessment. Tested technique was successful in four out of the five sectors. MSE and MAD of the models were less than 7 in all the models in both model fitting and verification. Residuals of the models were normally distributed and uncorrelated. It was concluded that Fourier transformation along with Multiple Regression is suitable in forecasting sector returns of Sri Lankan share market. It is recommended to test the aforesaid technique on individual company returns as well.

Keywords: Spectral Analysis, Fourier transformation