TIME SERIES REGRESSION MODELING OF ECONOMIC DEVELOPMENT AND CARBON DIOXIDE EMISSIONS

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The aim of the research is to explore the relationship between economic development and carbon dioxide (CO_2) emissions per capita for Sri Lanka, India, China, USA, Japan, France, Australia, Austria and Sweden. We tested whether the variables per capita and GDP per capita are stationary or non-stationary, concluded that the variables are non-stationary. Based on the co-integration analysis we further concluded that the said variables are co-integrated. Therefore we can say the said non-stationary time series variables are correlated. We found that non-stationary data outperform the regression models. The regression models were fitted for the stationarized variables.

The best fitted model for Austria, France, Japan, China, India, United States, Australia, Sweden and Sri Lanka the variable emissions per capita mainly driven by its own autoregressive term, the GDP per capita and the autoregressive term of GDP per capita.

For the above describe model, statistical characteristics such as Mean Square Error(MSE), *Akaike*-Information Criterion(AIC) and *Bayesian* Information Criterion(BIC) are smaller than the other models. And also the above describe model residuals are white noise and normally distributed. The variables are stationary in each fitted models. Thus we conclude the above describe models are most appropriate for predicting emissions for the countries studied.