MODELLING AND FORECASTING THE CRUDE OIL DEMAND IN SRI LANKA: AN ECONOMETRIC APPROACH

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DECLARATION

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ABSTRACT

This study examines the effect of economic variables, Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Population and Oil Price on oil consumption in Sri Lanka using an Error Correction Model. Yearly data of oil consumption, Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Sri Lankan population and crude oil price during the period 1988 – 2013 were used in the analysis. All the data have been obtained by the online data sources of World Bank and United States energy information administration. This research involves estimating the elasticity of Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Sri Lankan population and crude oil price on crude oil consumption in Sri Lanka.

Unit root test confirmed that series are not stationary in its levels but they are stationary in first difference. Therefore the study uses the Engle-Ganger cointegation method to create a dynamic short run model. Also Chow - break point test was used to test the significance of a structural break down in the data set and the dummy variable was significant in allowing for the structural change.

The Vector Error Correction (VEC) model finds that Gross Domestic Product (GDP), Foreign Direct Investment (FDI), population and oil price are determinants of the oil demand. It shows that in the long run only FDI increases the overall oil demand while GDP and population increase the oil demand in the short run.

By using the selected model, oil demand was forecasted and the Mean Absolute Percentage Error (MAPE) of the fitted model was found less than 5 percent. Therefore the fitted model is recommended as the suitable model to forecast oil demand. As the crude oil storage is a common problem in Sri Lanka, forecasting oil demand can be used to find the solutions for the challenges in the petroleum sector.

Key words: Petroleum Sector, Demand, Sri Lanka, Crude oil

Table of Contents

List of Figures

List of Tables

List of Abbreviations

Abbreviation	Description
ADF	Augmented Dicky Fuller
AR	Auto Regressive
ARIMA	Auto Regressive Integrated Moving Average
ARMA	Auto Regressive Moving Average
CEB	Ceylon Electricity Board
CON	Consumption
CPC	Ceylon Petroleum Corporation
df	degrees of freedom
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDP(E)	Gross Domestic Product by expenditure approach
GDP(I)	Gross Domestic Product by the total Income generated
GDP(P)	Gross Domestic Product by production approach
iid	independent and identically distributed
LIOC	Lanka Indian Oil Corporation
LNCON	Logged values of oil consumption
LNFDI	Logged values of Foreign Direct Investment
LNGDP	Logged values of Gross Domestic Product
LNOILPRICE	Logged values of oil price
LNPOP	Logged values of population
MA	Moving Average
MAPE	Mean Absolute Percentage Error
Mbd	Million barrels per day
Mn	Millions

MSE	Mean Squared Error
OECD	Organization for Economic Corporation and Development
OLS	Ordinary Least Squares
POP	Population
RSS	Residual Sum of Squares
USD	Unites States Dollar
VAR	Vector Auto Regressive
VEC	Vector Error Correction
VECM	Vector Error Correction Model