TIME SERIES ANALYSIS ON SUPPLY AND DEMAND OF OIL IN THE PHILIPPINES

THESIS

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Undergraduate Thesis
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ABSTRACT

RADOVAN, ARNELLI MAY JASMIN F. Time Series Analysis on Supply and Demand of Oil in the Philippines. Undergraduate Thesis. Bachelor of Science in Applied Mathematics with specialization in Statistics. Cavite State University, Indang, Cavite, April 2016. Adviser: Mrs. Jennifer R. Mojica.

The study entitled "Time Series Analysis on Supply and Demand of Oil in the Philippines" was conducted at the Physical Sciences Department, College of Arts and Sciences, Cavite State University, Indang, Cavite, from January to March 2016 to: (*1*) determine a model that could be used to predict supply and demand of oil in the Philippines; (*2*) test the adequacy of the formulated model; and (*3*) predict the supply and demand of oil in the Philippine from 2015 to 2020.

The yearly record of the country's supply and demand of diesel oil was gathered from Department of Energy at Bonifacio Global City, Taguig.

Six models were formulated in this study, three for each variable. To select the best model that would predict the supply and demand of oil in the Philippines from 2015 to 2020, the following criterions were considered: coefficient of determination; standard error; sum of squared residual; mean square error; Akaike Information Criterion; and Bayesian Information Criterion.

Forecast values of supply and demand diesel oil from the year 2015 to 2020 were computed using the formulated models: ARIMA (0, 2, 2) and ARIMA (0, 2, 1), respectively. Correspondingly, with its following equation:

$$\hat{Z}_t = 0.36\,\hat{Z}_{t-1} + 0.21\,\hat{Z}_{t-2} + a_t$$

$$\hat{Z}_t = 0.70\,\hat{Z}_{t-1} + a_t$$

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Arnelli May Jasmin F. Radovan

An undergraduate thesis submitted to the faculty of the Department of Physical Sciences, College of Arts and Sciences, Cavite State University, Indang, Cavite, in partial fulfillment of the requirements for the degree of Bachelor of Science in Applied Mathematics with specialization in Statistics with Contribution No. T-CAS-2016-P____. Prepared under the supervision of Mrs. Jennifer R. Mojica.

INTRODUCTION

Oil is a high-demand global commodity and it plays an even greater role in the global economy. Oil is perhaps the world's most important natural resource. It is used for transportation, heating and electricity. Gasoline, kerosene, diesel oil, fuel oil, LPG, mixed xylene, propylene, benzene, toluene, naphtha, solvent and sulfur, asphalts, solvents and avgas are kinds of petroleum products that are produced in the country. Most of oil consumption is used in the transportation sector that is why it is considered a necessary product.

Diesel oil is used in the diesel engines found in most freight trucks, trains, buses, boats, and farm and construction vehicles. Some cars and small trucks also have diesel engines. Diesel oil is used in diesel engine generators to generate electricity.

Supply and demand is perhaps one of the most fundamental concepts of economics and it is the backbone of a market economy. The relationship between demand