

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

THESIS

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

**Undergraduate Thesis  
submitted to the Faculty of the  
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Bachelor of Science in Applied Mathematics**



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*Time series analysis on supply and demand  
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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 criteria 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:

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

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

## TABLE OF CONTENTS

	Page
<b>BIOGRAPHICAL DATA</b> .....	iii
<b>ACKNOWLEDGMENT</b> .....	iv
<b>ABSTRACT</b> .....	vii
<b>LIST OF TABLES</b> .....	xi
<b>LIST OF FIGURES</b> .....	xii
<b>LIST OF APPENDICES</b> .....	xiii
<b>INTRODUCTION</b> .....	1
Objectives of the Study .....	3
Significance of the Study .....	3
Scope and Limitation of the Study .....	3
Time and Place of the Study .....	4
Definition of Terms .....	4
<b>REVIEW OF RELATED LITERATURE</b> .....	6
<b>METHODOLOGY</b>	
Time Series Analysis .....	15
Sources of Data .....	15
Variables of the Study .....	15
Graphical Analysis .....	15
Descriptive Analysis .....	16
Box-Jenkins ARIMA Model Building .....	16
Autocorrelation and Partial Autocorrelation .....	18

	Page
Models for Stationarity Time Series	
Autoregressive ( $p$ ) .....	18
Moving Average ( $q$ ) .....	19
Autoregressive Moving Average ( $p, q$ ) .....	19
Dickey-Fuller .....	19
Model for Non-Stationarity Time Series	
Methods for differencing .....	20
ARIMA ( $p, d, q$ ) Model .....	20
Estimation of Parameters .....	22
Sampling Distribution of the Estimates .....	24
Testing the Significance of the Coefficients .....	24
Model Adequacy (Box-Ljung) .....	25
Model Assumptions Checking	
Normality .....	26
Mean Zero .....	26
Independence and constant variance .....	27
Methods of Forecasting .....	27
Confidence Interval .....	29
Model Criteria	
Coefficient of Determination ( $R^2$ ) .....	29
Standard Error (SE) .....	30
Residual Sum of Squares (RSS) .....	30
Akaike Information Criterion (AIC) .....	31
Bayesian Information Criterion (SBC) .....	31

	<b>Page</b>
Measure for Accuracy: Mean Percentage Error .....	30
Statistical Software .....	30
<b>RESULTS AND DISCUSSION</b>	
Graphical Analysis and Descriptive Analysis .....	31
Test for Stationarity .....	33
First Differencing .....	35
Second Differencing .....	38
Dickey-Fuller Test .....	40
Test for Normality .....	41
Mean Zero .....	41
Competing Models .....	42
Selection for Appropriate Model .....	44
Testing for Adequacy; Box-Ljung Test .....	45
Testing for Accuracy .....	48
Forecast .....	48
<b>SUMMARY, CONCLUSION, AND RECOMMENDATION</b>	
Summary .....	49
Conclusions .....	50
Recommendations .....	50
<b>REFERENCES</b> .....	51
<b>APPENDICES</b> .....	53



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

**Arnelli May Jasmin F. Radovan**

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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.

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## **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