

Analysis of electricity consumption in malaysia



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ABSTRACT

In this paper we examine the factor that effect the electricity consumption. Electricity consumptions (EC) need to be study in order to avoid the electricity shortage that occasionally hampered its economy growth in the future because many study find that increase in GDP will lead increase the electricity consumption and Malaysia as the country that right now under development to 2020 need to know their EC therefore they wouldn't have negative effect during 2020 and sustainability will be control and policy can establish. The factor consist of GDP, population, oil price as proxy of electricity price and structural change in economy . The data collected from 1980-2009 and using the study Ordinary Least Square (OLS) and unit root test.

Keyword: Electricity consumption , GDP, OLS, unit root test,

INTRODUCTION

Malaysia is one of the country that under development. In order to achieve to be are developing country their need concern about any factor that can affect them in the future. Malaysian population has been increasing and need to be achieved to 75 million in 2020. Now a day Malaysia population was only 25 million. Berhad (TNB), supplies power to Peninsular Malaysia, while in East Malaysia, the Sabah Electricity Sdn Bhd (SESB) and the Sarawak Electricity Supply Corporation (SESCO) provide power to the States of Sabah and Sarawak respectively

Objective of this study is to know the relationship electricity consumption with factors that can affect it. The variable of this study was GDP, population,

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oil price, number of houses and structure change in economy. How this all variable can affect electricity consumption can be determine after we regress it using Ordinary Least Square (OLS) testing.

Electricity consumption in Malaysia recoded as the second highest among ASEAN members (Tang, 2008) EC in Malaysia have been increase during 1980-2009. (Hussain and Nur salwati, 2011) in study of Assessing the Elasticity of Electricity Consumption for Rural and Urban Areas in Malaysia said the main causes for increasing in electricity consumption was development of transport sectors such as the railway system, particularly the light rail transit in Kelang Valley and inter-city commuter train service and tremendous development of Information Communication Technology (ICT)

Gross Domestic Product

GDP is the factor that most important to determined the EC in this study. Standard of living have been effect by economic growth and this will lead to effecting EC also. This study should be have positive relationship and significant between GDP and EC.

Population

Population and EC expected have strong relationship. Increasing in population will lead people will more and more using the electricity.

Oil Price

Because of no data available for electricity price, this study using oil price as proxy. In order to generate the electricity, oil is needed to generate it. Oil price and EC expected to have negative relationship.

Structures Change in Economy

The growth of heavy industry the main contributor of electricity consumption growth. In cases of Malaysia, manufacturing activity contributed to growth in electricity consumption because in this country manufacturing is one of the most important industry using the electricity. This study will use manufacturing data to see whether it's this industry contribute to EC. EC expected have positive relationship with this structure change in Malaysia.

LITERITURE REVIEW

In the last 3 decades , because of the enhance of living standards and the development of developing countries causing the electricity consumption increasing many study and analysis have been done to study the relationship and factor that make EC increasing.

Ranjan and Jain analyzed the impact of population and weather sensitive parameter on the electricity consumption in Delhi during the period 1984-1993. They developed different multiple linear regression models for the various seasons. The variable

According to Bo Q. Lin in the study of electricity demand in the people's Republic China he develop a long run electricity demand to analyze the main factor that can effect electricity demand in PRC this study using unit root test and co integration model The result was The there exists a stable long-run relationship among the variables in the model over the sample period. As expected, the relationship among variables is more stable

and significant after the PRC.

Silk and Joutz (1997) study result was electricity consumption is not sensitive to the change in its own price, income, as well as price of substitute.

Halicioglo (2007) studied the elasticity of electricity demand in Turkey for the 1968-2005 periods and found that the income and price elasticity in the long run are greater than income and price elasticity in the short run. It showed that the level of sensitivity has increased in the long run due to population's ability to respond to the policy changes and the changes can be seen in the long run. Generally, it was in line with the theory of elasticity where the short run elasticity is expected to be lower than the long run elasticity.

Akinlo (2009) investigates the causality relationship between energy consumption and economic growth for Nigeria. The results of our estimation show that real gross domestic product

(rGDP) and electricity consumption (ele) are co integrated and there is only unidirectional Granger causality running from electricity consumption (ele) to (rGDP).

Kraft and Kraft (1978), using causality test between electricity consumption and GNP for the USA, and the result of a unidirectional causality running from GNP to energy consumption.

Altinay and Karagol (2005) this paper study the causal relationship between electricity consumption and real. Both of the series were found to be a stationary. Both have strong evidence for unidirectional causality running from the electricity consumption to the income. This implies that the supply

of electricity is significantly important to meet the growing electricity consumption.

Seung-Hoon Yoo(2005) This paper study the short- and long-run causality issues between electricity consumption and economic growth in Korea by using the co-integration and error-correction models. The results show that there exists bi-directional causality between electricity consumption and economic growth. This means that an increase in electricity consumption directly affects economic growth and that economic growth also stimulates further electricity consumption.

DATA AND METHODOLOGY

Research and Data Variable

This section described briefly about the statistical technique applied to analyze the data collected. This stud collected data for the yearly data 1980-2009. The variable for this study was electricity consumption (EC), GDP, population (POP), collected from Department of Statistic Malaysia (DSOM). Data on oil price (OP) as proxycy for price of electricity causes of there is no data available. Data structural change in economy (SCiE) whereby manufacturing aindustry is one of the bigger contribution in Malaysia and it will divided first with GDP.

a)Unit Root Test

The ADF test is selected and it is test for a unit root which is more stationary whether in the level, first difference, or second difference of the series. In addition, EViews reports the critical values at the 1%, 5% and 10% levels.

Hypothesis

$H_0 : \beta = 0$ (Data has unit root test)

$H_1 : \beta \neq 0$ (Data has no unit root test)

FINDINGS The regression is done using the Unit Root test. All of the data regress . In order to make the variable significant, the 1st and 2nd differences are used while regression is made in the Unit Root Test as shown below:

b) Unit Root Test table

VARIABLES

ADF-STATISTICS

CRITICAL VALUES

ORDER OF INTEGRATION

lnEC

0.001

1%level-4.339330

5%level-3.587527

10%level-3.229230

Stationary at 2st difference

lnGDP

0.036

1%level-4. 323979

5%level-3. 580623

10%level-3. 225334

Stationary at 1st difference

lnPOP

0. 0014

1%level-4. 374307

5%level- 3. 603202

10%level- 3. 238054

Stationary at 2nd difference

lnOP

0. 001

1%level-4. 323979

5%level-3. 580623

10%level-3. 225334

Stationary at 1st difference

lnSCiE

0. 0002

1%level-4. 323979

5%level-3. 580623

10%level-3. 225334

Stationary at 1st difference

All the independent variables are stationary at second difference and the dependent variable is stationary at first difference.

b) Ordinary Least Square (OLS)

The OLS Method used to see the relationship between dependent and independent variables involves in this study. The OLS command will estimate the parameters of a linear regression equation by the method of ordinary least squares. The null hypothesis is rejected if the p-value is small .

FINDING: Simple Regression

Table1:

Model

EC= GDP

EC= POP

EC= OP

EC= SCiE

Constant

-16835.09

-108084.8

15563.26

-16665.17

Coefficient

18.09687

7.730338

1158.293

5739.691

P-Value

0.001

0.001

0.0003

0.001

R-Squared

0.873864

0.968905

0. 374287

0. 898953

Adjusted

R-Squared

0. 869359

0. 967794

0. 351940

0. 895345

T-Statistic

13. 92774

29. 53735

4. 092546

15. 78290

Akaike

info criterion

21. 72685

20. 32654

23. 32838

21. 50507

Durbin Watson

0. 553120

0. 107273

0. 201550

1. 254345

FINDING: Multiple Regressions

Table2:

Model

$$EC = \beta_0 + \beta_1GDP + \beta_2OP + \beta_3POP + \beta_4SCiE + e$$

Constant

-102691. 5

Coefficient

GDP

OP

POP

SCiE

-0.596142

315.2618

6.960402

274.6891

P-Value

GDP

OP

POP

SCiE

0.7426

0.0011

0.0000

0.5784

R-Squared

0.988510

Adjusted R-Squared

0.986672

T-Statistic

GDP

OP

POP

SCiE

-0.332018

3.673377

7.074021

0.563032

Akaike info criterion

19.53093

Durbin Watson

0.825399

*** denote significance at the 1% level

** denote significance at the 5% level

CONCLUSION

The main purpose of the study is to know the relationship among electricity consumption, GDP, population, oil price and structure change in economy in

order to get result to use in making decision about our Malaysian future.

These imply that electricity consumption is an important factor for Malaysia's economic development as Malaysia is an energy-dependent country. This high demand of electricity is parallel with Malaysia's economic policy which is to be a developed country in 2020.. Therefore, sufficient supply of electricity is needed to support the industrial development and to improve the efficiency of capital, employment and other factors. In view of policy of government, the findings of this study recommend that electricity consumption played a main role in economic growth. Therefore, policies to control the supply of electricity are compulsory to make sure that the electricity is sufficient to support Malaysia's economic development.