The Impact of Natural Resources, Renewable Energy, Economic Growth on Carbon Dioxide Emission in Malaysia

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ABSTRACT

The purpose of this article is to analyze the impact of natural resources, renewable energy, and economic growth on carbon dioxide (CO_2) emission in Malaysia. Due to the increase in industrialization the state of Malaysia faces significant problems such as environmental pollution. In this study time series data has been used and the ARIMA equation has been used by the researcher in this study. The researcher collected the data from the year 1988 to 2017. The outcomes of the study suggest that natural resources and economic growth have a positive impact on CO_2 emissions, while renewable energy has a negative impact on CO_2 emissions. No scholar has examined the effect of natural resources, renewable resources and economic growth on CO_2 emissions in Malaysia. So this study will enrich the information and literature in the context of Malaysia. Future scholars should include more variables such as non-renewable energy sources, SO2 and NOX emissions.

Keywords: Carbon Dioxide Emission, Economic Growth, Renewable Energy, Natural resources, Malaysia
JEL Classifications: Q2, Q4

1. INTRODUCTION

In accordance with the researcher, Destek and Sarkodie (2019) alterations in the climate have actually become an important subject for argument all across the globe and a worldwide phenomenon because of the danger to sustainable growth and development. From the past few years, due to expansion and industrial development, the globe has experienced substantial economic development and growth. Particularly, Malaysia, China, South Africa, India, Brazil, and Russia has perceived histrionic growth in the rate of (Gross Domestic Product [GDP]) GDP because of the prompt industrialization (Begum et al., 2015). According to Dong et al. (2017) now, the entire globe is viewing to these states because of their higher potential to become the leaders of the globe (Wang, 2019). The developing state of Malaysia has been progressively booming (Begum et al., 2015). In accordance with the World Bank, the GDP in the state of Malaysia has intensely raised from (2187 billion US dollars) in the year 2010 to (11,079.3 billion US dollars) in the year 2018. Thus, at a greater level of economic

growth, equipment, technology, demanding ecological systems, and economy's physical alteration, fluctuating from industries such as from contamination to the sector of service like info interchange lessen the ecological contamination (Destek and Sarkodie, 2019). In contrast, the researcher Wu and Chen (2017) stated that an extensive utilization of natural resources because of greater economic growth increases severe ecological problems.

In accordance with the researcher Dong et al. (2017) the unmaintainable usage of natural resources in emerging and as well as in emerged states, produce serious ecological issues, for example, shortage of water, change in climate and deforestation. On the other hand, the far-reaching growth in the state of Malaysia led to a huge amount of ecological problems, especially, the emission of carbon dioxide (CO_2) (Kasayanond et al., 2019). The emission of CO_2 from social actions or events is typically recognized as an important indicator of possible, upcoming global warming (Panwar et al., 2011). In addition, the scholar Kopetz (2013) stated that the pursuit of commercial events, comprising

utilization of petroleum in the generation of power, transportation, residential and industrial activities actually contributes to emissions of greenhouse gas (GHG). This is recognized as the stage of pre industrialization while increasing economic development designates industrial development and rising demand for energy. Moreover, raised returns direct to improvement and development of communal indicators motivates investment for cleaner tools and spreads cognizance regarding clean atmosphere. The researcher Sarkodie and Strezov (2019) stated that the economic growth and development role is corresponding to ecological sustainability and to the weather change. In accordance with the researcher Balsalobre-Lorente et al. (2018) economic growth actually drive industrial development, which raises the extraction of natural resource and extends the production of agriculture. All such activities of the economy raise the amount of natural resource reduction, together with rising the extent and destructiveness leftover produced. As well as, the researcher Hajko et al. (2018) stated that the huge amount of consumption of natural resources via mining, deforestation, and agriculture as well as affect the atmosphere.

According to Destek and Sarkodie (2019), the consumption of natural resources is an important aspect in the production, thus appropriate supply leads to raise the consumption of oil and lessen the prices. The predicament among atmosphere and natural resources pulls the government of Malaysia to provide uneconomical subsidizations for the consumption of fuel, which reason to raise the carbon foot print of the production. In accordance with the researcher, Tietenberg and Lewis (2016) the extraction of natural resource supports in lessening the ecological corrosion because of energy necessity exclusion of waste substances into the air and onto the ground. In contrast, much better comprehension about the association between economic development, natural resources, and CO_2 emissions is not just productive for the officials of the governments and for the policymakers to lessen the emissions of CO_2, however as well as boosts growth in the sector of renewable energy. In accordance with the researcher Fei et al. (2011) it is worth stating that a huge amount of investigations have studied the relationship of natural resources and economic growth, however not investigated the impact natural gas, renewable resources, and economic development on carbon emissions. As a result, this research paper

will fill this gap. Changes in CO_2 emissions from the consumption of fossil fuels is shown in Figure 1.

In accordance with the past researches the state of Malaysia in the past 4 decades, has quickly changed from the agricultural economy to the industrial economy, which ascribed to the enhanced (235.6%) emissions of carbon raise from the year 1990 to the year 2005. The growth of carbon emission was mainly because of the rise in state demand of energy of (210.7%) from the year 1990 to the year 2004 (Safaai et al., 2011). The projection and carbon emission growth in Malaysia is reported below in Figure 2. In accordance with the report of (IEA) "International Energy Agency" the carbon emission in the state of Malaysia was almost (194 million tons) for the year 2011, which has observed a rise of almost (290.7%) from the year 1990 (Begum et al., 2015). Investigation utilizing a (LEAP) "Long Range Energy Alternative Planning System" expected that without the measures of reduction, the emission of CO_2 (in the state of Malaysia in the year 2020 will be approximately (285.73 Million tons), a (68.86%) raise contrasted to the year (2000) (Safaai et al., 2011). Though in the year 2009, the state of Malaysia voluntarily declared at the UN environment change meeting in the area of Copenhagen their promise to lessen almost 40% of its "GHG" emissions from the levels of 1990 by the year 2020 (Salahudin et al., 2013). CO_2 emissions in (metric tons per capita) from the year 2003 to 2010 is reported in the Figure 3. However, this promise has not been met with much hopefulness specified inadequate assistance from the present legislature and constrained ecological cognizance (Ahmad et al., 2011). Such as, there is no legislature which embraces ecological sustainability compulsory for key GHG releasing divisions, for example, gas, transportation, oil and energy (Salahudin et al., 2013). The unequaled growth of CO_2 emission, together with industry routinely practices will possibly lock-in the state of Malaysia for the unmaintainable route of growth (Gul et al., 2015). In accordance with the researcher Shafie et al. (2011) the state of Malaysia ought to be strategic in applying strategies which assist typical application of innovative technical developments so as to evade or diminish the impact of CO_2 or lock-in. As the emerging states ready for a rising need for construction, it is vital to spend in more energy effective structures and avoid the impact of carbon lock-in. The research model is shown in Figure 4.

**Figure 1:** Changes in CO_2 emissions from the consumption of fossil fuels
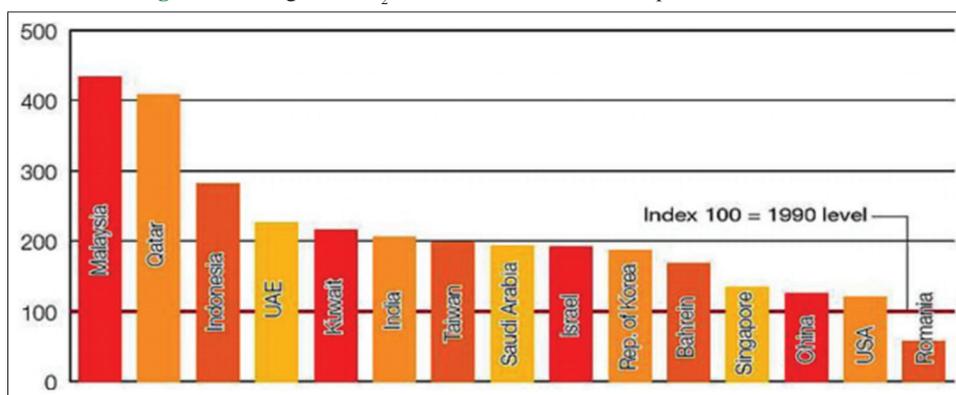
Source: (WWF 2009)

Figure 2: The projection and carbon emission growth in Malaysia

| Year	Carbon Emission Growth	Carbon Emission	Reference/Source
1990 – 2004	221 %		Al-Jazeera (2007); Watkins (2007)
1990 – 2009	235.6%		Energy Commission (2011); IEA (2011)
1990 – 2011	290.7%		IEA (2013)
2010		185 million tonnes	IEA (2014)
2011		194 million tonnes	IEA (2013)
2020 (projected)		285.73 million tonnes	Safaai et al. (2010)

Source: (Zaid et al., 2015)

Figure 3: CO_2 emissions in (metric tons per capita) from the year 2003 to 2010
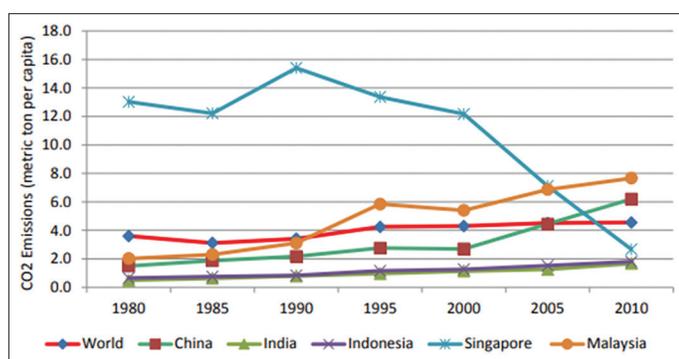
Source: World Bank (2015)

Figure 4: Research Model
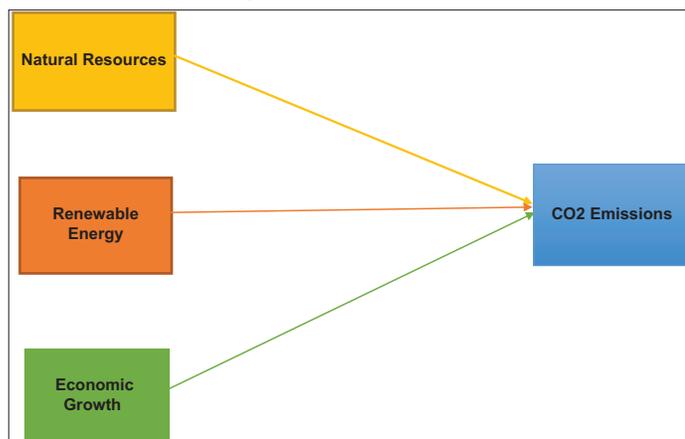
On the basis of the above-mentioned discussion this article includes the following research objectives:

1. To determine the effect of natural resources on CO_2 emission in Malaysia;
2. To examine the effect of renewable resources on CO_2 emission in Malaysia;
3. To study the impact of economic growth on CO_2 emission in Malaysia.

On the basis of the research objectives following research questions has been articulated by the researcher:

1. What is the impact of natural resources on CO_2 emission?
2. What is the impact of renewable resources on CO_2 emission?
3. What is the impact of economic growth on CO_2 emission?

This article contributes to prolonging the information. Such as the current paper is a primary effort to examine the connection between renewable resources, natural resources, and economic development and CO_2 emissions in the context of Malaysia. In addition, the author of this article added natural resources as an independent construct to CO_2 emission association, as it was overlooked in past studies. This article is divided into five parts. For example, first part is regarding introduction, the second part is about the literature review, the third part is regarding the research methodology, the fourth part is about the data analysis and results and the fifth part is regarding the discussion and conclusion.

2. LITERATURE REVIEW

2.1. Renewable Energy and Natural Resources and CO_2 Emission

The researchers Bölük and Mert (2014) and Farhani and Shahbaz (2014) discovered that the consumption of renewable energy and as well as of non-renewable raise the emissions of CO_2 in the states of MENA and European Union states. In accordance with the researcher Shafiei and Salim (2014), Dogan and Seker (2016), and Jebli et al. (2016) the consumption of renewable energy lessens the emissions of CO_2 in the states of European Union states and in OECD, states. In addition, the researcher Al-Mulali et al. (2015) indicated that the consumption of renewable energy in Vietnam has no impacts on the emissions of CO_2. The researcher Apergis and Payne (2012) investigated the causal association among renewable energy and CO_2 emissions, for a set of nineteen emerged and non-emerged states during the period of 1984 to 2007. The study indicated that there is a positive and long run association among the consumption of renewable energy and CO_2 emissions. Moreover, the researcher Vaona (2012) investigated the impact of energy utilization of renewable energy and the findings of the study specify that greater consumption of renewable energy stimulates economic growth however that raise in production lessens the rate of growth of consumption of renewable energy, probably because of the higher effectiveness in energy consumption.

In contrast, the researcher Balsalobre-Lorente and Shahbaz (2016) stated that the consumption of renewable energy lessons the emissions of CO_2. Additionally, the researcher Haydt et al. (2011) investigated the causal association between economic growth, emissions of CO_2 and renewable energy production for a group of 4 states such as United States, Spain, Denmark, Portugal during the period of 1960 to 2004. These researchers stated that the rising renewable energy share primarily has an adverse influence on economic growth and as well as a positive impact on the reduction of CO_2 emissions. Other researches indicated that the technologies of renewable energy have actually become more efficient than regulation actions in decreasing ecological contamination (Balsalobre-Lorente and Shahbaz, 2016; Sebri and Ben-Salha, 2014). In accordance with the impact of the consumption of renewable energy on the emissions of CO_2 and following the studies of (Balsalobre-Lorente and Shahbaz, 2016; Haydt et al., 2011; Vaona, 2012; Dogan and Ozturk, 2017), the research confirms the negative association among the consumption of renewable energy and CO_2 emissions. This course lessens the positive impact of renewable energy consumption during ecological quality enhancements. The analysis of the correlation indicates a negative association between renewable energy and CO_2 emissions. Moreover, the researcher Kaika and Zervas (2013) investigated the impact of natural resources on CO_2 emissions. The findings of his study revealed that natural resources have a positive effect on CO_2 emissions. The researcher Bozkurt and Akan (2014) stated that when there is an increase in natural resources then there will be an increase in the emissions of CO_2. In addition, the scholar Balsalobre-Lorente et al. (2018) conducted research on the nexus between natural resources, renewable energy, and CO_2 emissions. The results of his study demonstrated that renewable energy has a negative impact on CO_2 emissions, while natural resources have a positive impact on CO_2 emissions.

Hypothesis 1: The effect of Renewable Energy on CO_2 emission is significant.

Hypothesis 2: The impact of Natural Resources on CO_2 emission is Significant.

2.2. Economic Growth and CO_2 Emission

The researcher Arouri et al. (2012) the relationship among economic growth and CO_2 emissions during the era of (1951-1986) from one hundred and thirty states through utilizing panel-data models of predication and the tools of parametric. The results of the research showed that (N-shape curve) was for "Cubic Creation" and "U-shape" was for quadratic terms. The examination for the state of Taiwan and the causal relationship between energy consumption and economic growth conducted by the researcher Bozkurt and Akan (2014) for the era of 1955-1993. The studies showed positive impacts. The causality instance of South Korea and Singapore for the relationship between energy consumption and the GDP was examined by (Hossain, 2011). The period of the sample was prolonged between the year (1961 and 1990). In the research, the (AIC) "Akaike's Information Criterion" is used so as to describe the optimum interval span for the system. Relied on the outcomes regarding the stationarity of the constructs, the co-integration and the tests of causality follow. The researcher Panayotou (2016) used various method to a common (Polynomial Specification) of an (EKC). They created a dynamic framework

including technical and organizational alteration, and the intensity of energy also the GDP level. The 3 kinds of emissions such as SO2, NOX, and CO_2 in 4 OECD states such as United States, United Kingdom, West Germany, and the Netherlands were analyzed with the yearly data of 34 years between (1960 to 1993) by each state. The findings of their framework demonstrate that the economic growth had a positive effect on NOX and CO_2 emissions whereas the negative impact on the emissions of SO2, and the technical and physical alterations had an adverse influence on the emissions.

In addition, the researcher Omri (2013), discovered the relationship among GDP and CO_2 emissions for the era of (1960-1996) for one hundred states utilizing the test of Pool ability. Their outcomes demonstrated the upward leaning association among GDP and the emissions of CO_2 for the one hundred states. In simple word, there is a positive association between economic development and the emissions of CO_2. Furthermore, the researcher Fujii et al. (2013), examined the nexus among CO_2 economic growth and CO_2 emissions in various sectors for the era (1970 to 2005). The results of this article showed that few sectors for example construction, wood and paper had an inverted (U-shaped) association. The researcher Lee and Brahmasrene (2013), examined the association among the economic growth of tourism, emissions of CO_2 and "Foreign Direct Investment" (FDI) for the era (1988 to 2009). The results of this article showed that tourism and FDI had a positive effect on economic development and growth and economic growth had a positive impact on the emissions of CO_2. Furthermore, the researched Alam et al. (2016), examined the influence of energy consumption, growth of population and income on the emissions of CO_2. The findings of the paper showed that the emissions of CO_2 raised with raising the income and use of energy in 4 particular states, and there is a significant relationship among the growth of population and the emissions of CO_2 in the state of Brazil and in the state of India. In accordance with the researcher Balsalobre-Lorente et al. (2018) the analysis of the correlation demonstrates a positive relationship between economic growth and CO_2 emissions.

Hypothesis 3: Economic Growth has a significant effect on CO_2 emissions.

3. RESEARCH METHODS

To collect the data on natural resources, renewable energy, economic growth, and CO_2 emissions the author of this article used the data from the period of 1988 to 2017. The data from the past 10 years has been used by the researcher. In order to collect data the scholar of this paper used time series data from the period of 1988 to 2017. To analyze the data E-views software has been used by the examiner of this paper. The researcher used different tests in this study, for example, the test of heteroscedasticity, unit root test, correlation test, and ARIMA test. This research is based on a quantitative method.

On the basis of the theoretical framework of the study, the following econometric models are developed regarding each dependent variable.

$$CO_{2i,t} = \alpha_1 + \alpha_2\, NR_{i,t} + \alpha_2\, GDP_{i,t} + \alpha_2\, RE_{i,t} + \varepsilon_{i,t}$$

While CO_2 emission is the dependent variable, which is measured with proxy as a metric ton per capita, α_1 is constant, α_2 is the natural resources as mean of total natural resource in a year, α_3 is the economic growth which measured with GDP growth, α_4 is renewable energy which is measured with percentage of final consumption in a year, in last $\varepsilon_{i,t}$ is the error term.

4. EMPIRICAL FINDINGS

The descriptive statistics are used to assess the descriptive features of the data for ensuring the normality and adequacy of data. For this purpose, it is ensured that there is no outlier in the data of any variable and data is normally distributed. The mean value, minimum and maximum statistics, standard deviation as well as skewness statistics are some key indicators in descriptive statistics that are used and interpreted to ensure normality and appropriateness of data. The skewness statistics is a very good

Table 1: Descriptive statistics (n=30)

	GDP	NR	RE	CO₂
Mean	4.142284	9.273942	4.6363663	7.362891
Median	5.192714	9.750361	4.448305	7.511668
Maximum	7.424847	14.25258	5.746680	8.032992
Minimum	−1.513529	5.510048	3.819042	5.422100
Std. dev.	2.368872	2.557113	0.565411	0.910318
Skewness	−0.951528	0.182251	0.813848	−0.819283
Kurtosis	2.226433	2.632856	2.955739	2.179463
Jarque-Bera	10.68488	0.111523	1.104731	1.399242
Probability	0.004784	0.005764	0.005587	0.006774
Sum	47.42284	93.73942	45.72900	71.37053
Sum sq. dev.	50.50400	58.84946	2.877211	7.458113
Observations	30	30	30	30

Table 2: Correlation results (n=30)

Correlation				
t-Statistic				
Probability	GDP	RE	NR	CO₂
GDP	1.000000			

RE	−0.088483	1.000000		
	−3.212738	-----		
	0.0299	-----		
NR	0.133383	−0.376685	1.000000	
	3.773246	−2.150144	-----	
	0.0010	0.0233	-----	
CO₂	0.356559	0.734617	−0.406455	1.000000
	2.546504	3.062442	−2.258252	-----
	0.0274	0.0155	0.0238	-----

indicator of normality of data which should fall within the range of −1 to +1.

Table 1 is depicting the overall acceptability and normality of data of both variables. Since, the number of years taken as observations for the current study were 10 years, therefore, N=10 for all variables. Each variable shows that skewness value is under the threshold range from −1 to +1, which prove the normality, while the mean median and standard deviation shows that there is no outlier in the data,

4.1. Correlation Test
The correlation test is used to examine whether there is an association between variables of study or not and what type of association is present between them. The most used test for assessment of correlation between variables is the Pearson correlation test, which is the following;

It is obvious from the results given in Table 2 that the correlation of each variable with itself is. It can be seen that correlation of GDP with itself is 1, RE with itself is 1, the correlation of NR with itself is also 1 and in last correlation of CO_2 with itself also 1. It means that the discriminant validity of current data is ensured because a variable must correlate with itself more than within any other variable. The table includes the correlation value along with the P-value and t-statistics against this correlation value to suggest the significance of these results. The acceptable correlation value for a positive correlation is normally >0.3 and its P-value must be <0.05. The significance of results further requires the t-statistics to be more than t-tabulated. The correlation value between GDP, RE, NR and CO_2 are significant current results having t-value greater than t-tab and P < 0.05.

4.2. Panel Unit Root Tests
It is the prerequisite and the assumption of the secondary data, the data for each construct should be stationed at the level or at first difference I (1). For this purpose; ADF Fisher Chi-square (ADF Fisher) and Levin et al. (LLC) are applied to check the stationarity of the data (Table 3).

As early mentioned in graph presentation, mostly variables are stationary at level, results of ADF and LLC test indicated all the variable and stationery at 1st difference, which fulfils the condition of ARIMA analysis, however, outcomes also showing that some variable is stationary at level as well

4.3. Cointegration Test
Cointegration test is used to assess it in the current study and obtain decision for major analysis, following Table 4 presenting the results.

Table 3: Unit root analysis

Constructs	ADF test		LLC test	
	At level	1st difference	At level	1st difference
GDP	28.5654*	25.8970*	−4.30799***	−3.98399***
NR	26.5808	33.3896*	−3.71221**	−4.21096***
RE	36.5799*	47.2471***	−0.65915	−2.07879*
CO₂	22.0843	53.2398***	−2.09090*	−8.97472***

*, **, *** denoted as significance at level, 5%, 1% and 0.1% respectively

Table 4: Cointegration test

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
CO_2	−2.769266	0.6067	−20.51935	0.0001
GDP	−4.697617	0.1119	−13.08602	0.0110
NR	−4.741059	0.1073	−8.457973	0.6175
RE	−3.302082	0.4070	−11.83524	0.1132

*MacKinnon (1996) p-values
Warning: p-values may not be accurate for fewer than 25 observations

Intermediate Results	CO_2	GDP	NR	RE
Rho - 1	−1.125426	−1.454002	−0.939775	−1.315027
Rho S.E.	0.406399	0.309519	0.198220	0.398242
Residual variance	0.236757	4.229949	0.967856	0.250560
Long-run residual variance	1.229747	4.229949	0.967856	0.250560
Number of lags	1	0	0	0
Number of observations	8	9	9	9
Number of stochastic trends**	4	4	4	4

**Number of stochastic trends in asymptotic distribution

Table 5: ARIMA results

Dependent variable: CO_2				
Variable	Coefficient	Std. error	t-statistic	Prob.
GDP	0.092517	0.079181	1.981620	0.0375
NR	0.245020	0.168224	2.056507	0.0155
RE	−0.277497	0.436821	−2.658158	0.0149
C	5.763632	3.632251	1.586794	0.1637
R-squared	0.604304	Mean dependent var.		7.137053
Adjusted R-squared	0.406457	S.D. dependent var		0.910318
S.E. of regression	0.701325	Akaike info criterion		2.417484
Sum squared resid.	2.951142	Schwarz criterion		2.538518
Log likelihood	−8.087422	Hannan-Quinn criter.		2.284710
F-statistic	13.05390	Durbin-Watson stat.		1.421496
Prob (F-statistic)	0.000090	Wald F-statistic		22.64518
Prob (Wald F-statistic)	0.001133			

Table 4 showing that all null hypothesis of the test is reject and series is cointegrated. Now, researcher can move for major analysis, on time series data ARIMA model is most appropriate option rather than other.

4.4. ARIMA Model Analysis

In statistics and econometrics, and in particular in time series analysis, "an autoregressive integrated moving average model is a generalization of an autoregressive moving average model. Both of these models are fitted to time series data either to better understand the data or to predict future points in the."

Findings of the above-mentioned Table 5 show that GDP has a significant and positive impact on CO_2 emission in Malaysia when GDP increased it will bring 9% significant and positive impact on CO_2 emission in Malaysia. Which mean that if GDP grows with one unit it will bring 8% positive variation in CO_2 emission. Same as the second table shows that natural resources have a positive and significant impact on CO emission. While renewable energy has a negative and significant impact on CO_2 emission of Malaysia with 27%.

4.5. Heteroscedasticity Test

Changes in pattern variation is one of the problem which exit in the time series data, the heteroscedasticity test was utilized to checked it.

Table 6: Heteroskedasticity test: Breusch-Pagan-Godfrey

F-statistic	0.009944	Prob. F(3,6)	0.9985
Obs*R-squared	0.049476	Prob. Chi-square(3)	0.9971
Scaled explained SS	0.011665	Prob. Chi-square(3)	0.9997

Basically there is two hypothesis regarding heteroscedasticity test "The H0 of heteroscedasticity model indicated that there is heteroscedasticity in data whereas HA indicated that there is no heteroscedasticity in the data," so this study results reject the H0 and accept the H1 because F value is less than f tabulated and $P > 0.05$, both shows the insignificance of the test (Table 6).

5. DISCUSSION AND CONCLUSION

The purpose of this article was to analyze the impact of natural resources, renewable resources and economic growth on CO_2 emissions in the state of Malaysia. Due to the increase in industrialization the state of Malaysia faces significant problems such as environmental pollution. In this study ARIMA equation has been used by the researcher and time series data from the period of 2008 to 2017 has been used by the scholar of this study.

In this study three hypothesis were developed which are as follows:
Hypothesis 1: The effect of Renewable Energy on CO_2 emission is significant.

Hypothesis 2: The impact of Natural Resources on CO_2 emission is significant.

Hypothesis 3: Economic Growth has a significant effect on CO_2 emissions.

The outcomes of this paper reveal that the effect of renewable energy on CO_2 emission is negative. The first hypothesis of this paper is consistent with the investigations of the researchers (Balsalobre-Lorente and Shahbaz, 2016; Haydt et al., 2011; Vaona, 2012). As when the renewable energy in the state increases the emission of CO_2 will be lessened. Moreover, the outcomes of this article demonstrate that the effect of natural resources on CO_2 emission is positive. The second hypothesis is supported by (Balsalobre-Lorente et al., 2018). As when there is an increase in natural resources then there will be an increase in the emissions of CO_2. Additionally, the outcomes of this study indicate that the influence of economic growth on CO_2 emission is positive. The third hypothesis is in accordance with the results of the study of (Lee and Brahmasrene, 2013). In short, renewable energy has a negative effect on CO_2 emission, whereas economic growth and natural resources have a positive effect on CO_2 emission.

5.1. Implications of the Study

There are several studies on the nexus of natural resources and economic growth and most of the studies on this subject were conducted in the state of China, Brazil, Russia, India and so on. But this is the primary study in the Malaysian context. As no scholar has examined the effect of natural resources, renewable resources and economic growth on CO_2 emissions in Malaysia. So this study will enrich the information and literature in the context of Malaysia. From this article policy makers will know how much the issue of CO_2 emission is serious to the environment. Thus, the government should play a major role in the reduction of CO_2 emissions such as government and policy makers should formulate and implement strategies to overcome the environmental issues in the state of Malaysia.

5.2. Future Indications and Limitations

Because of the time limitation, the researcher collected the data from the past 10 years only. Future researchers should use the data for 20 years. In addition, the future scholar should use Environmental Kuznets Curve in their study to analyze the relationship economic growth, renewable energy, natural sources, and CO_2 emissions. In this study, only economic growth, renewable energy, natural sources, and CO_2 emissions have been taken for the analysis. Future scholars should include more variables such as non-renewable energy sources, SO2 and NOX emissions.

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