Qualitative and Quantitative Research Review, Vol 6, Issue 2, 2021.
ISSN No: 2462-1978
eISSNNo: 2462-2117

ASSESSING THE OUTPUT AND PRODUCTIVITY OF MANUFACTURING SECTOR TO THE EXPORT IN MALAYSIA

TULASI MARTIN
Faculty of Industrial Management, Universiti Malaysia Pahang, Malaysia.

KESAVAN NALLALUTHAN
VIJIYAN YANKTESHERY
Faculty of Management and Economics, Universiti Pendidikan Sultan Idris. Tanjung Malim, Perak, Malaysia.

Date of receipt: 04/09/2020
First Review: 16/11/2020
Second Review: 01/01/2021
Acceptance: 21/03/2021

ABSTRACT

Objective: Malaysia is a developing country that has succeeded in achieving an impressive growth rate of industrial output with a sustainable export policy in the last thirty years. This study mainly focuses on the role of the manufacturing sector in exports in Malaysia. Specifically, this study has objectives of analyzing the factor of the manufacturing sector which is represented by the level of output and productivity, respectively that influence export of Malaysia and relationship between the manufacturing sector and exports in Malaysia. Improvement in the manufacturing sector in Malaysia can be achieved through the growth and strengthening of labor productivity.

Research Design & Methods: Regression and correlation methods were used to achieve the study objectives. Secondary data used to estimate empirical models in this study were obtained from statistical publications of the World Bank and Asian Development Bank (ADB). The data covered a period of 1981-2016. The use of simple regression and correlations models was able to test hypotheses that relate to the roles of the

manufacturing sector and exports as well as the relationship between the manufacturing sector and exports.

Findings: The study findings used regression analysis indicated that there were positive and significant influences of the output and productivity of the manufacturing sector on exports in Malaysia. The findings used correlation analysis indicated that there was a positive and significant relationship between the level of output and productivity that contributes to exports in Malaysia.

Implications & Recommendations: This study concludes that Malaysia's exports may increase while the manufacturing sector progresses. Hence, the implication is the need to take restructuring measures in the manufacturing sector to increase productivity growth.

Contribution & Value Added: The government has to identify the weaknesses that exist in the manufacturing sector and export activities. This effort will help contribute to increased exports in Malaysia.

Article type: Research article

Keywords: manufacturing sector, exports, level of output, productivity, economic growth**.**

INTRODUCTION

For the past three decades, Malaysia has specialized in the agricultural sector as the engine of national growth. However, since the 1980s Malaysia's focus has shifted to the manufacturing sector over agriculture. The manufacturing sector is one of the second-largest contributors to the country's exports and revenues. The manufacturing sector is very important as it involves the production of goods and services that are the catalyst for the country's economy. The growth of the advanced manufacturing sector can accelerate the economic growth of a country (Szirmai, 2015).

The manufacturing sector is important as a contributor to Gross Domestic Product (GDP), employment opportunities, and foreign

exchange (Ijirshar, 2015). In addition, the manufacturing sector is a key agenda for Malaysia by ensuring continued growth and development. Increasing labor productivity is one approach that can be taken to ensure that more output can be achieved by using labor input rates (Ismail et al., 2015). The manufacturing industry produces local essentials and exports of consumer goods. For example, electrical goods, clothing, tires, shoes, plastic goods, stationery, and so on. Most are located in the city center with a wide market and well-equipped facilities. The tire and machine components industry is also included in the manufacturing sector. The industries involved in the manufacturing sector in Malaysia can be classified into two namely resource-based industries such as food and beverage processing, wood-based products including furniture and paper, chemical industry, petrochemical industry, and rubber processing. The second type of industry is non-resource-based such as electronics, textiles, apparel, non-metallic products, and machinery or machinery companies (Goldthorpe, 2015).

During the Tenth Malaysia Plan, the manufacturing sector has shown great growth in the growth and development of the economy, (Elias, 2020). Growth in the manufacturing sector was supported by increased innovation, productivity, skilled human capital, and internationalization. The manufacturing sector is a major contributor to the country's economy. During the Eighth Malaysia Plan period, the manufacturing sector recorded growth at an average of 4.1 percent per annum. During the Ninth Malaysia Plan, the manufacturing sector is projected to grow at an average rate of 6.7 percent per annum, and the growth of the sector is expected to be contributed by industry driven by technology and innovation that will lead to greater export, income, and employment opportunities (Jomo, 2016).

LITERATURE REVIEW

Manufacturing sector productivity

In line with the New Economic Model (NEM) to boost Malaysia's economic income by 2020, the National Economic Advisory Council

(MPEN) has proposed several methods. These methods include developing competitive human capital to enhance labor skills. On the contrary, competitive human capital is essential to the growth and development of the nation's economy, especially in the manufacturing sector (Soltani et al., 2015).

Productivity and wages serve as a measure of human capital skills which is positively correlated labor productivity with the wages they earn. In other words, the salary received is the same as the productivity generated. This encourages organizations to pay higher rates than other organizations for increasing productivity and quality of work. While wage increases benefit workers in improving their living standards and them also play a role in rewarding their workers for their contribution to production. According to Nailah Hamzah et al., 2011), marginal productivity theory states that the level of labor productivity is influenced by the wage rate the laborer receives.

The manufacturing sector has been identified as a key sector in improving the country's economy to reduce poverty among the people in line with the goals of the New Economic Policy (NEP) in 1971. Before the New Economic Policy (NEP) 1971 was introduced, from the 1960s to the early 1970s, Moreover, the agriculture sector is a major sector providing employment opportunities in Malaysia as stated by (Ngo et al., 2014). This situation has directly changed the pattern of Malaysian employment from the agricultural sector to the manufacturing and construction sectors to achieve economic prosperity. As employment growth in the agricultural sector is declining, many job opportunities have been created in the manufacturing sector.

Ngo, (2014) reported that labor productivity in Malaysia had increased from 1.8 percent in 1995-2000 to 2.8 percent in 2000-2005. But compared to regional countries like China, Korea, and Singapore, Malaysia's labor productivity is still low. The Labour and Social Trends report in ASEAN (2007) shows that Malaysia's productivity is still high compared to the Philippines, Vietnam, Thailand, and Indonesia. In line with global development, Malaysia needs to produce quality and skilled

labor to support economic growth. This is because labor productivity is a determinant of national competitiveness in the global market. Productivity that meets consumer demand is a major contributor to economic growth and can be achieved by enhancing the quality of human capital through education and training. To achieve this objective, policies that can positively contribute to human capital development need to be emphasized to increase productivity in potential sectors. Furthermore, Loecker (2007) in his study conducted in Slovenia, states that the increase in exports will increase productivity and provide support for continued productivity and competitiveness in the market.

In addition, productivity growth is also supported by foreign direct investment (FDI) through technology and management skills. In addition, Lee and Min (2015) argue that research and development (R&D) also contributes positively to productivity levels. In conclusion, the key characteristics of competitive human capital are high educational qualifications to support knowledge and innovation development, high levels of technical and professional skills, and high levels of labor productivity.

Manufacturing sector goods produced by labor

Job opportunities can be considered with the expansion of the manufacturing sector as it will open up new jobs (Szirmai & Verspagen 2015). In order to increase the country's exports further, the increase in labor productivity is significant. The increase in labor productivity will boost the growth of the manufacturing sector and further boost the country's export growth. The manufacturing sector has a positive impact on job creation for all sectors of society. More workforces need to be trained to produce high-quality professional and skilled workers to improve the quality and efficiency of labor and thus help the country's productivity growth (Sanghi & Srija 2015).

The natural resource-based manufacturing industry and the non-natural-based manufacturing industry are two classifications of the manufacturing industry. Amri Hj Yahya (2010) has listed examples of

non-resource industries such as the electrical and electronics, automotive and resource-based industries such as timber-based industries, rubber-based industries, oil-based industries, petroleum refining, and natural gas refining industries, chemical-based industries, food, and beverage industries. In Malaysia, the major sectors that played a significant role in increasing exports were the electrical & electronic (E&E) industry by 33.4 percent and while the labor force by 23.7 percent. in 2014 were RM198.7 billion, exports of RM256.1 billion, and a total of 348,713 people were given job opportunities.

Sahar (2002) explained that growth and development will continue for a country's economy when labor productivity is high. The major exporting countries are the United States, China, and Singapore while the main importing countries are Taiwan, the United States, and South Korea. Over the past few years, electricity & electronics (E&E) has produced expert labor to produce a wide variety of types of semiconductor devices, consumer electronics, and information technology (ICT) products in the factory. Electric & electronic (E&E) manufacturers in Malaysia are looking at developments in the value chain to produce more quality goods in value (Hashmy 2017). Among the steps taken to achieve this quality are through research and development (R&D) work as well as external outsourcing work to local firms. Research and development (R&D) work is also being done to produce competitive goods in global markets and Asia (Zafar et al., 2019). The manufacturing industry, which is also a second-tier industry, runs the process of processing raw materials into finished and semi-finished goods. Japan and Korea through representatives of their companies are major contributors to the growth of the manufacturing sector (Raj-Reichert 2020).

In 2014, electronic components were the largest contributor to this sector accounting for 52.4 percent of the total approved investment. Products or activities belonging to this sub-sector include semiconductor devices, passive components, printed circuits, and other components such as media, substrates, and connectors (MIDA, 2015). International companies are the main impetus for the installation and testing activities of the conductor. In line with this, the semiconductor sector has shown an

increase over the past few years. Research tasks, inventions, upgrades in operations, and production reduction of subordinated goods are adopted by these companies for the purpose of enhancement. The growth of the semiconductor industry is further accelerated by outsourcing driven by increased demand for small and high-quality devices for mobile, automotive and green applications (Yacob et al., 2019).

Information technology products such as computers, computer peripherals, telecommunications products, and office equipment are these types of sub-sectors (MIDA, 2015). The electronics industry sub-sector accounted for 28 percent of total investment in 2014. Household appliances such as air conditioners, refrigerators, washing machines, vacuum cleaners, and other electrical appliances were the main products of this sub-sector. Domestic and domestic electricity products are manufactured by companies whose total volume in 2014 was over 381 companies. Local companies such as Pensonic, Leader Cable, and Power Switchgear are the majority in this production. The development in the electrical industry can be seen through the changing pattern of manufacturing work, from the only assembly-based industry, the Malaysian electricity industry to the invention and trade of local brands for the global market.

This fact is supported by statistics released by the Department of Statistics where there is an increasing number of competitive workers in the manufacturing sector in Malaysia each year comprising three categories of jobs such as management, professional, technical, and supervisory categories in the manufacturing sector.

DEVELOPMENT OF MALAYSIAN EXPORTS

A sharp increase in Malaysian export orientation was seen over the period 1951-1998. The empirical work of ADB is also in line with this information in that there is a high correlation between export growth rate and real GDP (ADB, 1999). Shaaf and Ahmadi (1999) reinforce this theory that Malaysia's high economic growth and development are driven by export policy. However, Malaysia and other Asian countries experienced

declines in export prices during the financial crisis which directly led to a decline in the value of nominal dollar exports from the countries involved (Yee et al., 2016).

Electronics and electrical machinery and equipment, computer equipment, office machines, and transport equipment are the most affected types of goods as a result of this crisis. All of these items have experienced a very high price drop. As a result, this price is not normalized except for the price of electronics. It was also one of the contributing factors that supported significant export growth in 1999. The Government is revising policies and adopting a set of actions to support private sector activity as a way of improving economic growth. In this regard, the change in Malaysia's export trade pattern is more important as it intensified trade promotion and export development in the nineties. The development of these export promotions requires a high level of expertise, undeniably a skilled and experienced labor force as well as specialized assistance departments (Mahmoud & Mitkees 2017).

The Trade and Malaysia Development Corporation (MTDC) funded by a fund called the Export Promotion Fund (EPF) is the result of the Export Promotion Council recognizing the importance of these needs. MTDC adopts future national export promotion strategies and action programs covering markets and products, modernizing various export-based services, joining other organizations that provide export promotion services, helping aid agencies streamline international and national trade promotion assistance. In addition, the MTDC also acts as a detector that helps identify international changes and trends that influence Malaysian trade. In addition to facilitating trade procedures, other trade and export facilities support programs also accommodate export-import forms and documents that directly advance Malaysian exports (Wu 2019).

THEORETICAL CONCEPT

Manufacturing sector

The increase in exports to Malaysia is a result of the growth of the manufacturing sector such as the electrical and electronics industry which

is a result of the expansion of the electrical and electronic manufacturing sectors. According to Teixeira and Queirós (2016), it highlights the basic idea that the manufacturing sector represents the economic base of countries, an important sector for generating structural change, productive employment, and sustainable economic growth. According to Chang (2012), Malaysia has experienced a slowdown in the growth of the manufacturing sector, which is further exacerbated by the advent of the knowledge economy (k-economy), which has led to the growth of the Malaysian economy driven by intensive knowledge-based services such as finance, engineering, and design for replacing the manufacturing sector.

It is undeniable that the knowledge economy plays an important role in the country's economic growth. This knowledge sector has been aided by the process of 'recycling' or 'outsourcing' these innovations. However, the manufacturing sector is significant for the development of today's productive knowledge (Raj-Reichert, G. 2020). The high productivity of the service work is in terms of services provided to the manufacturing sector, so it can be maintained without the presence of the manufacturing sector in the long run. However, as the country moves towards economic development, the manufacturing sector should not deteriorate. A study conducted by Aggrey et al., (2010) has proven that there is a high level of human capital relations and importance for increasing labor productivity in Kenya, Uganda, and Tanzania. Balance of skilled workers, average years of employee education, training, and level of education were the variables of human capital in this study. The findings of this study show that in Uganda countries workers' skills and average years of education have a positive impact on worker productivity. In Tanzania, employee training and management education levels have a positive impact on employee productivity.

In this regard, the study by Hanipah et al., (2012), showed that the country's economic growth was influenced by productivity growth, and factors such as rising levels of human capital input, use of new technologies, and entrepreneurship development were important to drive innovation and creativity. The increase in labor productivity is significant

to the strong development of the Malaysian economy as the increase in labor productivity directly improves the growth of a sector and instead improves economic growth. Further, job opportunities are enhanced through the development of the manufacturing sector. The manufacturing sector functions as a catalyst for economic growth. The competitiveness of the international manufacturing sector has proven to be the backbone of economic growth (Aizenman et al., 2018).

For example, an electrical and electronic industry company will not thrive if its manufacturing extraction declines. The same is true of the electrical and electronic manufacturing industry, where if the manufacturing extraction industry increases then the electric and electronic manufacturing efforts will increase. However, if the trading company that can market its products does not grow, then the growth of the electrical and electronic manufacturing industry will not grow. Various companies, producing the same raw materials, the same production process, and the same results according to Martin in Kartasapoetra (2000).

Theory and Importance of Export

Export growth helps to mitigate the impact of external shocks on the domestic economy and promote national integration into the world economy. Expansion of exports can stimulate economic growth through technological overflow, specialized learning, and labor and foreign capital accumulation. The volume of specialized inputs and the rate of growth will increase as the economy moves into international trade as suggested by Romer (1990). A basic theory of Export was a developing region as its export sector expanded as described by North (1955). He divides his basic theory into four basic concepts of export theory, which (1) have a clear description of the ways of external demand in regional development, (2) state the use of static economy-based models in short- and long-term comparisons, (3) regional growth it is ensured by the exploitation of natural resources while the level of external demand from other regions and states affects the growth of the region's export base, (4) the development of population activities, capital and labor movements, the

development of the external economy and the growth of the region affected by income from exports.

In addition, the export sector plays an important role in the economic growth of a region. However, rapid inflows of population and capital into certain regions, leading to rapid growth and economic activity are diversified and open so that the importance of the export sector diminishes (Sicaire et al., 2015).

Theory and empirical economic growth

According to Khalafalla and Webb (2001), structural modifications can cause root growth and this can have an impact on the relationship between exports and economic growth. In 1917, Ricardo proposed the theory of the relationship between trade and economic development. He argued that trade would enhance the progress of a nation (Ricardo, 2007). Cross-sectional studies, for example, Usman (2017), Raj and Chand (2017), Demir, (2018), and Kalaitzi and Chamberlain (2019) find different effects on the relationship between manufacturing exports and economic growth. According to Demir, (2018), out of 71 countries, there is specialization in exports related to technology manufacturing and economic development worldwide. He argues that most countries with expertise in high technology content exports are developing further.

On the other hand, less developed countries tend to increase their expertise in the export of "traditional" or low-tech goods such as textile and food products (Wintjes and Hollanders 2019). The ARDL boundary test approach and the Error Correction Method (ECM) have been used to derive the validity of the quarterly data export growth hypothesis from 1990 to 2008 for the country of Pakistan, G Al-Assaf (2014). The results of the empirical study show that exports are positively related to economic growth. The results confirm the validity of the export growth hypothesis found in the Pakistan case for both the short and long term. Real capital stock travel accelerates exports while exchange rates depreciate as a result of deteriorating economic growth. the consequences of export and economic growth according to Santos (2012, in G Al-Assaf - 2014).

There is a positive and negative relationship between exports and GDP through the results of the "Fully Modified Ordinary least squares technique". Because of the dependence on domestic production of capital goods following the absence of trade capital goods, poor countries will have 11% less income, Mutreja et al., (2014). As described by Liang and Zuradi (2012) the ELGH validity study for Malaysia for the period 1970-2011, the joint integration test and the Granger Cause test, and the results have been used. The results of the empirical study suggest that the long term shows a positive relationship with real exports and imports in line with economic growth, while the exchange rate negatively affects economic growth. In addition, (Balaguer and Jorda, (2001); Thilrwal, (1994); Ahmed, Jaleel and Harnihuran, Somchai (1995); Chow, 1987) during the period 1980-2007, the "Export-led growth hypothesis" was often associated with Mishra, (2011). Focus more on export factors as determinants of output growth and investigate the possible causes of export and short-term economic growth for India. The long-term existence of the two-way impact of exports and economic growth has been derived from the findings while the results show that export promotion policies have a positive impact on India's economic growth.

Recent studies by Lectard and Rougier (2018) state that, the increasing sophistication of exports in a common country has a significant impact on economic growth. They have established an index called "export sophistication" as a measure of the level of productivity associated with a country's export cart. Their findings confirm that sophisticated export growth correlates positively with economic growth. An expansive set of exporting capabilities is spread across the sector, due to the associated productivity gains. Therefore, they prove that "economic growth is not dependent on the quantity exported, but what matters is export quality".

A total of three hypotheses developed and tested based on the research questions are as follows:

H1: The output of the manufacturing sector has positive effects on exports in Malaysia.

H2: The productivity of the manufacturing sector has a positive relationship with exports in Malaysia.

H3: There is a relationship between the output of the manufacturing sector and the productivity of the manufacturing sector to exports in Malaysia.

The next figure 1 illustrates the research model.

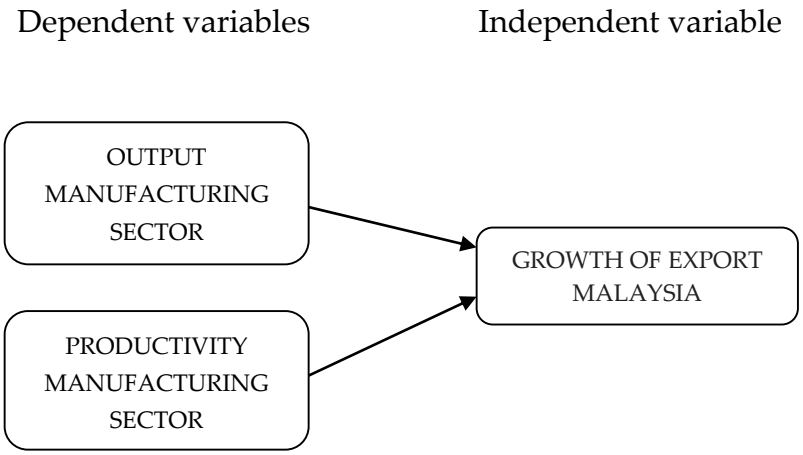


Figure 1: Research model

MATERIAL AND METHODS

Data collection

Time series secondary data from 1981-2016 obtained from several sources will be used in this study. The main sources of data are from the Asian Development Bank (ADB), the International Financial Statistic Yearbook, the World Bank 1989-1990, the International Monetary Fund (IMF) from 1990, and the Malaysian Economic Yearly Report. Heaton (2004: 16; in Andrews et al., 2012: 12) concludes that secondary data analysis (ASD) is "a research strategy which makes use of pre-existing quantitative data or pre-existing qualitative data for the purposes of investigating new

questions or verifying previous studies". Secondary data analysis is a conceptual study that benefits existing quantitative or qualitative data to discover new problems or test the results of previous studies by Heaton. The data collected were used to analyze this study as follows.

Table 1: Key indicators of the Malaysian economy 1981-2016

YEAR	Manufacturing Sector Output (RM Million)	Total Labour Force (RM Thousand)	Manufacturing sector productivity (RM Million) (Productivity = Output ÷ Total Labour Force)	Exports Malaysia (RM Million)
1981	9155	789	12000	27109
1982	9671	816	12000	28108
1983	10429	841	13000	32771
1984	11711	879	12000	38647
1985	11263	855	13000	38017
1986	12111	861	14000	35319
1987	13734	929	15000	45225
1988	16151	987	16000	55260
1989	18444	1171	16000	67825
1990	21340	1333	16000	79646
1991	24307	1470	17000	94497
1992	26859	1639	16000	103657
1993	30324	1742	17000	121238
1994	34842	1892	18000	153921
1995	39790	2052	19000	184987
1996	44681	2178	21000	197026
1997	50270	2002	25000	220890
1998	45155	1908	24000	286756
1999	90345	1991	45000	321560
2000	109998	2174	56000	373270
2001	103434	2184	47000	334284
2002	112076	2069	54000	357430

2003	125332	2131	59000	397884
2004	144007	2023	71000	481253
2005	154657	1989	78000	536234
2006	168736	2083	81000	589200
2007	178353	1977	90000	604300
2008	194652	1945	100000	663014
2009	173230	1807	96000	552518
2010	192493	2109	91000	638822
2011	212618	2244	95000	697862
2012	224730	2264	99000	702641
2013	232659	2316	101000	719992
2014	253337	2373	107000	765417
2015	263717	2323	114000	777355
2016	274209	2391	115000	785935

Source: Asian Development Bank Report

Here are the collected data to analyze this study.

ANALYSIS

Economic Model

In this study, the functional relationships are as follows:
EXS = f (OTP, PRV,) …….....(1)

Where;

EXP is Export

OTP is Output

PRV is Productivity

Log Form is a transformation of this original model. Doing so to avoid negative and incorrect data values must be huge. The results of the answers described in this chapter will refer to the equality below. The error term (e) is normally distributed. The logarithmic forms are written as follows:

Log Y = a + b log OTP + c log PRV.....(2)

Correlation Analysis

Correlation is a linear relationship between two variables. Correlation analysis is a calculation that determines the strength and condition of the relationship between two variables. The correlation coefficient marking is r (-1 ≤ r ≤ 1). 'Pearson' correlation, the Pearson coefficient describing the relationship between two variables that are either 'continuous' or 'scale' in SPSS is one of the most commonly used correlation analyzes in SPSS. The Pearson correlation was used in the discussion of this study. Calculating and examining the Pearson correlation coefficient is the most appropriate approach to study the bivariate relationship between the manufacturing and export sectors. The relationship of variables is a key function of Pearson correlation coefficient analysis and is based on the following formula:

$$rxy=\frac{N\sum xy-\sum x\sum y}{[(N\sum X2-(\sum x)2)][N\sum y2-(\sum y)2]}$$

By: x = Dependent variable

y = Independent variable

If the correlation coefficient is equal to 1, there is a strong positive relationship between the two variables.

Regression Analysis

To determine the relationship between dependent variables and independent variables regression analysis was used (Gogtayn et al., 2017). The relationship between the two variables can be linear and non-linear. Linear relationships are the primary focus of this study. The independent variables in this study are related relationships, so a simple linear regression model is used. The quantitative analysis method is the method of analysis in this study. To determine the degree of influence of the independent variables on the independent variables two models were used, namely the Linear Regression Model with the Ordinary Least

Square method to measure the relationship of variables. The whole form of the regression equation is as follows:

$Y = \alpha + \beta 1X^{1+} + \beta 2X^{2} + e$ ..... (3)

The above formulas are then transformed into semi-logarithmic forms with the following equations:

$LogY = \alpha + \beta 1$ LogOTP + $\beta 2$ LogPRV .....(4)

Where;

Log Y = Export Malaysia
Log OTP = Output
Log PRV = Productivity
α = constant
$\beta 1, \beta 2$ = coefficient of regression

y = 1, 2, 3 (time series data, year 1981-2016)

e = interrupt variables

The assumption of regression analysis was tested first, to obtain the correct and correct regression equations. Statistical testing is the procedure applied to assess the acceptance or subtraction of the null hypothesis (H0) from a sample. The decision to create H0 was made based on statistical test values derived from existing data (Gujarati, 2003: 120). The R2 test is used to identify the percentages of the models that display the variability of dependent variables. The higher the R2 percent (closer to 100%), the higher the model's ability to explain the dependent variable's behavior.

Data normalization and linearity tests between variables

Normal tests are applied to determine whether sample data have been extracted from normal dispersed populations (within a range of tolerances) Washington et al., 2020). Statistical tests, such as t-tests and one-way and two-way ANOVAs require a normal sample of scattered populations. If the validity of the assumption is invalid, then the test result obtained is not reliable. Compiled models have an impact on assumptions

of data validity. Statistical t-value or F value will be affected and will have a negative impact on confidence intervals and forecasts if the data obtained is abnormal.

A normal probability plot is one of the best ways to test data validity (Spanos, 2019). A normal probability plot will draw a straight line through which the data is normally distributed. Independent variables need to be proved to have a linear relation to the dependent variables before predictions of a parameter are performed. If it does not meet the assumptions of linearity, then the variables must be converted (by taking logs or squared sources) to obtain linear relationships. Graphical relationships are easy by using scatter plots.

Unit Root Test

Unit Root Test is performed to see the severity of each variable. A variable remains stationary if its mean and variance are constant over time. Stability can occur at the level or even the difference. Each of the variables in the regression equation should remain at the same level, whether in the form of a level or a variance, for example, the first difference. These terms need to be compliant with the actual and applicable options available. Estimated regression would be a false decision as a result of a very good selection of related decisions that does not exist. This can be ascertained that there is an R2 value greater than the DW statistical value as stated by Granger and Newbold (1986). DW per Durbin-Watson Statistics to identify the existence of autocorrelation problems. In this study, the Unit Root Test of the Dickey-Fuller (DF) method or the Dickey-Fuller (ADF) and Phillips-Perrons adjustment were applied.

RESULT AND ANALYSIS

Descriptive statistic

The dependent and independent variables were eliminated by the Gross Domestic Product deflator which 2010 was considered to be the base year (2010 = 100). Moreover, variables were taken from the Asian Development Bank (ADB) publications. This study uses annual data from 1981-2016

which is 36 years old. The current value series for all data set is in the local currency (millions of ringgit).

Unit Root Test

The first step in the budget is to test the variable properties that come with the unit root test (Unit Root Test). According to the study of Saima et al, (2008), it is not expected that there will be no variables in the integrated series of order I (2) or higher-order, the integration of the series will not be greater than I (1) because I (2) in this case will make it difficult to budget.

Table 2: Results of Unit Causes Tested by the Augmented Dickey-Fuller (ADF) and Phillips Perrons (PP)

Variable	PP Test (with intercept)		ADF (Stationary)	
	First Difference	level	First Difference	level
Malaysia				
Log OTP	-3.628	-1.923	0.225	-0.1401
LogPRV	-3.628	-1.325	0.225	-0.801
Log Y	-3.628	-0.677	0.225	-2.804

Table 2 shows the results of the Unit Root Test using the ADF and Philips-Perrons method. This study shows that all the variables in the time series are stationary and that the hypotheses in the Unit Cause Test accepted at the 1% level of significance for any of the variables considered. Therefore, we can conclude that all variables are investigated in the form of first difference (I). Therefore, we can conclude that all variables under investigation are in the same order as I (1) and we can proceed to the next step of the analysis by conducting the data validity test.

Qualitative and Quantitative Research Review, Vol 6, Issue 2, 2021.
ISSN No: 2462-1978
eISSNNo: 2462-2117

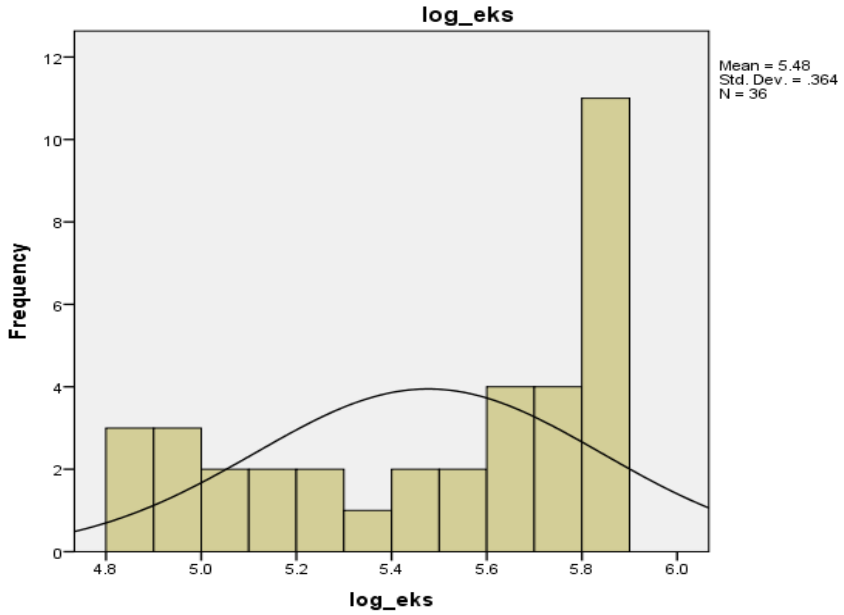
DATA NORMALIZATION TEST

Table 3: Independent and dependent variables

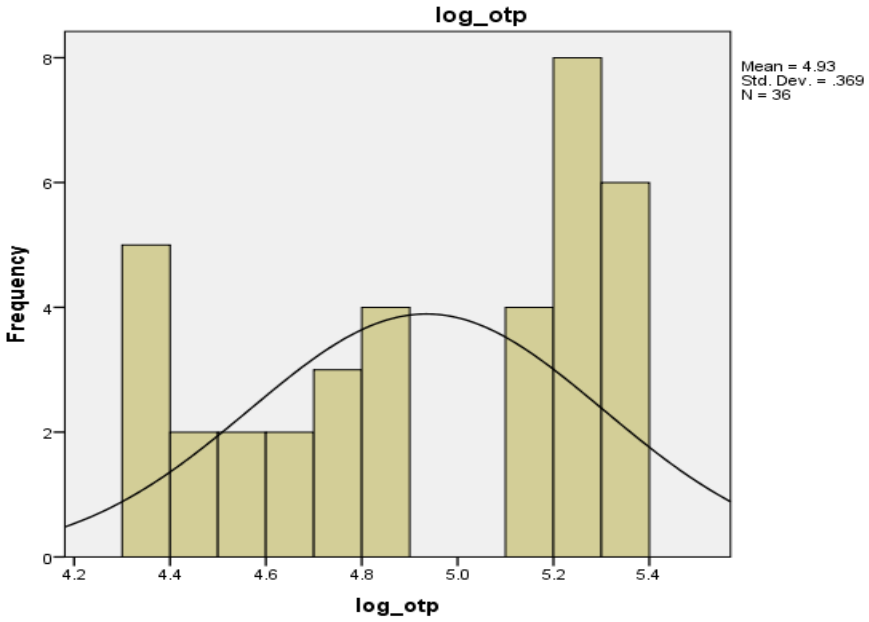
Variables					Shapiro-Wilk	
	Min	Median	Mod	Standard Deviation	Desperation	Significant
Log EXP	5.48	5.64	5[a]	0.364	0.852	0.001
Log PRV	1.72	1.70	2[a]	0.233	0.806	0.000
Log OTP	4.93	5.00	4[a]	0.369	0.876	0.000

To confirm the validity of the variables used in this study, normality tests were performed for each independent and dependent variable. The test results are as shown in table 4 above. It shows that all variables have the same mean, median, and mode. Two types of tests for normal can be run. For small data sets of 2000 elements, we can use the Shapiro-Wilk test or the Kolmogorov-Smirnov test. The Shapiro-Wilk test was used in this study because it involved data for only 36 years. From the table 3 the p-value for LogEXP is 0.001, for LogPRV is 0.000 and LogOTP is 0.000. Hypotheses accepted and conclude that the data obtained from these normal distributions prove that they are within the normal distribution and are suitable for analysis in the following study.

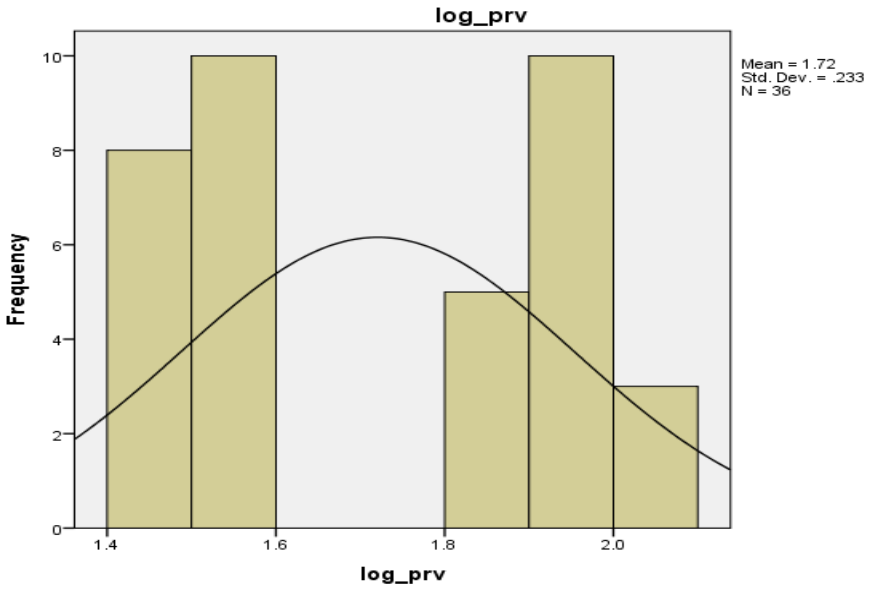
In Table 3 above it is found that all variables are within the normal standard deviation because the summed (total) result cannot be considered abnormal. After all, each item is normal. According to Palaniappan (2007), the proper standard deviation is needed in the +2 to -2 range for 'skewness'. This indicates that in the normalization test all variables found that all variables were normal. This means that the test performed must use parametric.



(a) Normal distribution curve for Export in Malaysia (LogEXP)



(b) Normal Output Distribution Curve (LogOTP)



(c) Product Normalized Distribution Curve (LogPRV)

Pearson Correlation Analysis

Pearson Correlation Analysis is to find the relationship between manufacturing sector output, manufacturing productivity, and exports in Malaysia. This analysis is to answer hypotheses 1 to 3, which suggests a positive relationship between the two variables tested. This correlation coefficient (r) must be in the range of +1 to -1. If the correlation coefficient is 0 then there is no relationship between the two variables. The greater the correlation coefficient value, the stronger the relationship between the two variables.

Correlation

The relationship between the independent variables LogPRV and LogOTP and the dependent variable LogY shows a linear relationship. The uniformity and variability in the data for one variable were approximately equal to all the data for the other variables indicating homoskedasticity. The bivariate correlation was implemented between

output, productivity, and exports. The output is in the form of a table below.

Table 4: Results of Pearson correlation analysis

Variables	LogOTP	LogPRV	LogEXP
		(n = 36)	
Log OTP	1	0.952**	0.982**
Log PRV	0.952**	1	0.888**
LogEXP	0.982**	0.888**	1

** significant at 0.01 level (1 tailed)

The results in Table 4 show that all independent variables have a significant relationship with the dependent variables. This result also indicates a positive relationship, meaning that any positive change in the dependent variable will result in a positive change in the dependent variable. LogOTP and LogPRV have strong links with LogEXP.

The relationship between productivity and exports in Malaysia

The relationship between these two variables is explained by the first hypothesis that 'productivity has no positive and significant relationship with exports in Malaysia'. The results of this hypothesis prove that while there is a positive and significant relationship between productivity variables at 0.01, the relationship between the two is strong with a value of r = 0.888. In conclusion, productivity contributes to exports in Malaysia.

The relationship between output and exports in Malaysia.

The relationship between these two variables is explained by the second hypothesis that 'The output of the manufacturing sector has no positive and significant relationship with exports in Malaysia'. Through the formulation of this hypothesis and it is accepted that there is a positive and significant relationship at 0.01, the correlation level is very strong between the two with a value of r = 0.982. Then this hypothesis is accepted.

This proves that the output of the manufacturing sector is very important and contributes to exports in Malaysia.

Influence of output and productivity on exports in Malaysia.

The relationship between these two variables is explained by the third hypothesis, 'There is no relationship between output and productivity to exports in Malaysia'. Given the hypothesis that it is clear that there is a significant positive correlation at 0.01, the relationship level is very strong between the two with a value of r = 0.952. This indicates that the hypothesis is accepted. The output of the manufacturing sector and the productivity of the manufacturing sector have a strong impact on exports in Malaysia.

Regression analysis

Table 5: Role of the output of the manufacturing sector to exports in Malaysia.
Model Summary[b](rumusan model)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.982[a]	.964	.963	.070	.597

a. Predictors: (Constant), LogOTP
b. Dependent Variable: LogEXP

Table 6: Role of the output of manufacturing sector to exports in Malaysia.
Model Summary[b](rumusan model)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.888[a]	.789	.783	.170	.239

a. Predictors: (Constant), LogPRV
b. Dependent Variable: LogEXP

Sugiyono (2011), through his study, has shown that simple regression shows the function of the relationship between the independent variable

and dependent variable. Before obtaining a realistic model, some Exploratory Data Analysis (EDA) was performed. The next step is to determine the model's accuracy. From the results of the ANOVA test, the model of this study can be determined, namely that output and productivity have a significant relationship with exports in Malaysia.

Table 5 shows that 96.4% of exports in Malaysia are affected by the output of the manufacturing sector while Table 6 shows 78.9% of exports in Malaysia are affected by the productivity of the manufacturing sector. This table is important to see the percentage of the relationship between the two dependent and independent variables. Meanwhile, 3.6% could not be explained by the model in the output of the manufacturing sector and 21.1% could not be explained by the model in the productivity of the manufacturing sector could be explained by other factors outside the model. The smaller the value of R2 the less the ability of the independent variable to explain the dependent variable.

Adjusted R^2, on the other hand, explains the extent to which the model formed can be generalized to the population, and generally, this adjusted value of R^2, approaches R^2. The adjusted output of the manufacturing sector R^2 from the survey findings was 0.963 or 96.3%. The productivity of the adjusted value-making sector R^2 from the survey findings was 0.783 or 78.3%. Thus the difference between the value of R^2 and Adjusted R^2 is 0.001 or 0.1% for the output of the manufacturing sector and 0.006 or 0.6% for the productivity of the manufacturing sector. Std. Error of the Estimate 'explains the smaller the value of Std. Error of the Estimate is better because the model is more accurate in predicting dependent variables (Wan Sulaiman & Mahbob, 2014).

Table 7 shows the ANOVA applied to examine the significance of the mean differences between two or more variables. Through this ANOVA test, the researchers were able to determine the model of this study, namely that output and productivity have a significant relationship with exports in Malaysia. The results show that industrial relations and exports and economic growth are significant at the 0.01 level ($p < 0.01$) and

have an F value (1244.45) greater than the critical F value (Fk = 5.31), so this regression model is acceptable.

Table 7: ANOVAs for regression analysis (Fit model)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.571	2	2.286	1244.45	.000[b]
Residual	.061	33	.002		
Total	4.632	35			

a. Predictors: (Constant), LogEXP
b. Dependent Variable: LogOTP,LogPRV

Next, this section describes more about independent variable factors and related dependent variables. This multiple linear regression analysis gives the value of coefficient B to find the factors that have a significant effect on the dependent variables. Each of these variables is independent of relative importance. The significance test used to evaluate the coefficient of the independent variable was significant for the model. Based on the resulting t value, the significance level is less than 0.05 ($p < 0.05$) and indicates that each of these independent variables can be used in this model as shown in Table 8.

Table 8: Formation of the export model in Malaysia

Variable	B	Standard Deviation	t	Sig.
Constant	.699	.164	4.380	0.000
LogOTP	.968	.982	30.000	0.000

$R^2 = 0.964$
Adj. $R^2 = 0.963$
$P < 0.05$

Table 8 shows that the dependent variable (output of the manufacturing sector) is significant to the dependent variable of export in Malaysia. Based on the t value, this study found that output is of the highest

importance to exports in Malaysia. This shows that both the government and the private sector need to increase the output of the manufacturing sector so that exports to Malaysia can grow exponentially. Next is the productivity of the manufacturing sector.

Table 9: Formation of the export model in Malaysia

Variable	B	Standard Deviation	t	Sig.
Constant	3.093	.156	14.494	0.000
LogPRV	1.385	.888	11.268	0.000

$R^2 = 0.789$
Adj. $R^2 = 0.789$
$P < 0.05$

Table 9 shows that both variables are significantly dependent on the independent variables that are exported in Malaysia. Based on the t value, this study found that output data is of the highest importance to exports in Malaysia. This shows that both the government and the private sector need to increase the output of the manufacturing sector so that exports to Malaysia can grow exponentially. Next is the productivity of the manufacturing sector.

IMPLICATIONS

The model analysis in this study shows that the increase in the manufacturing sector has a positive effect on export growth in Malaysia. Furthermore, through foreign investment, growth in manufacturing exports could increase. If it is associated with "forward and backward linkage" with domestic economic relations.

CONCLUSION

The manufacturing sector is the backbone of the country's economy. The growth of the manufacturing sector is highly dependent on productivity growth. The challenge of global competition is that the manufacturing sector needs to achieve excellent performance to move towards a

technology-oriented industry with high value-added in the future. Growth in the manufacturing sector based on input growth cannot lead to sustainable growth. On the contrary, it has been replaced by productivity growth, in particular, overall factor productivity that ensures sustained growth in the long run. Under productivity growth, the use of existing inputs is maximized and further increases production. The results obtained in this study show that exports and industrial important to economic growth. Indirectly it implies that steps need to be taken to improve the structure of the existing manufacturing sector to increase productivity, increase exports and contribute to economic growth. The government should focus on the weaknesses of the manufacturing and export sectors before implementing appropriate policies. Then the policy of the government should be evaluated for its effectiveness for further steps to be taken.

REFERENCES

Ahmed, Jaleel & Harnihuran, Somchai (1995). Unit Roots and in Estimating Causality between Exports and Economic Growth: EmpiricalEvidence from the ASEAN Countries, *Economics Letters, 49*, 329- 334.

Aizenman, J., Jinjarak, Y., Ngo, N., & Noy, I. (2018). Vocational Education, Manufacturing, and Income Distribution: International Evidence and Case Studies. *Open Economies Review*, *29*(3), 641-664.

Andrews, L., Higgins, A., Andrews, M.W. & Lalor, J.G. (2012). Classic Grounded Theoryto Analyze Secondary Data: Reality and Reflections. *The Grounded Theory Review*. *11*(1), 12-26.

Asian Development Bank (2000). Asian Development Bank Annual Report. Diperoleh pada 15 September 2017 daripada https://www.adb.org/documents/adbannualreport-1999.

Asian Development Bank (pelbagai tahun) (2019). Key Indicators and developing Asian and Pacific.

Balaguer, J., & Cantavella-Jordá, M. (2001). Examining the export-led growth hypothesis for Spain in the last century. *Applied Economics Letters*, *8*(10), 681-685.

Chang, H. (2012). The Manufacturing Sector and the Future of Malaysia's Economic Development. *Jurnal Pengurusan (UKM Journal of Management), 35*. Retrieved from http://ejournal.ukm.my/pengurusan/article/view/1212.

Chow, P. C. (1987). Causality between export growth and industrial development: Empirial evidence from the NICs. *Journal of development Economics*, *26*(1), 55-63.

Diperoleh pada 11 ogos, (2017). Daripada http://www.epu.gov.my/ms/statistikekonomi/imbangan-pembayaran. *Using Neural Network Approaches.* Masters thesis, Universiti Utara Malaysia.

Elias, J. (2020). The Gendered Political Economy of Southeast Asian Development. In *The Political Economy of Southeast Asia* (pp. 227-248). Palgrave Macmillan, Cham.

Gogtay, N. J., Deshpande, S. P., & Thatte, U. M. (2017). Principles of regression analysis. *Journal of the Association of Physicians of India*, *65*, 48-52.

Goldthorpe, C. C. (2015). *Rubber manufacturing in Malaysia: Resource-based industrialization in practice*. NUS Press.

Gujarati, D., & Porter, D. (2003). Multicollinearity: What happens if the regressors are correlated. *Basic econometrics*, *363*.

Hashmy, M. A. (2017). The Global Financial Crisis of 2008 and Its Effect on Manufacturing Sector of Malaysia. *Asian Journal of Research in Business Economics and Management*, *7*(4), 87-101.

Heaton, J. (2004). *Reworking qualitative data*. Sage Publication.

Ijirshar, V. U. (2015). The empirical analysis of agricultural exports and economic growth in Nigeria. *Journal of Development and agricultural economics*, *7*(3), 113-122.

Ismail, A., Ahmad, S. M., & Sharudin, S. Z. (2015). Labour productivity in the Malaysian oil palm plantation sector. *Oil Palm Industry Economic Journal*, *15*(2), 1-10.

Jomo, K. S. (2016). *Growth and structural change in the Malaysian economy*. Springer.

Kalaitzi, A. S., & Chamberlain, T. W. (2019). Further evidence on export-led growth in the United Arab Emirates: are non-oil exports or re-exports the key to economic growth?. *Review of Middle East Economics and Finance*, *15*(2).

Kartasapoetra, G. (2000). *Makro Ekonomi, Edisi Kedua, Cetakan Keempat Belas*. Raja Grafindo Persada. Jakarta.

Khalafalla, K. Y., & Webb, A. J. (2001). Export–led growth and structural change: Evidence from Malaysia. *Applied Economics*, *33*(13), 1703-1715.

Lectard, P., & Rougier, E. (2018). Can developing countries gain from defyingcomparative advantage? Distance to comparative advantage, export diversification and sophistication, and the dynamics of specialization. *World Development*, *102*, 90-110.

Lee, K. H., & Min, B. (2015). Green R&D for eco-innovation and its impact on carbon emissions and firm performance. *Journal of Cleaner Production*, *108*, 534-542.

Mahmoud, M. S., & Mitkees, H. (2017). Malaysia's Vision 2020 and the Role of leadership in Economic Development. *Asian Social Science*, *13*(8).

Malaysian International Trade and Industry (MITI). (2010). Malaysian International Trade and Industry report 2010. Kuala Lumpur: Percetakan Kerajaan.

Mishra, P. K. (2011). The dynamics of relationship between exports and economic growth in India. *International Journal of Economic Sciences and Applie Research*, *4*(2), 53-70.

Nailah Hamzah, Noorasiah Sulaiman & Abu Hassan Shaari Md Noor. (2011). *Upah dan Produktiviti Buruh: Satu Analisis dalam Sektor Pembuatan*. Persidangan Kebangsaan Ekonomi Malaysia ke VI (PERKEM VI), Ekonomi Berpendapatan Tinggi: Transformasi ke Arah Peningkatan Inovasi, Produktiviti dan Kualiti Hidup, Melaka Bandaraya Bersejarah, 5 –7 Jun 2011.

Ngo. J.Y, Omar, M, Awang, M. Kutty, F.M & Abdul Razaq Ahmad Tren (2012). Guna Tenaga Buruh Mengikut Sektor Pekerjaan Dan Tahap Pendidikan Dari Tahun 2001 Hingga.

North, D. C. (1955). Location theory and regional economic growth. *Journal of political economy*, *63*(3), 243-258.

Raj, S. K., & Chand, P. P. (2017). Analysis of Fiji's Export and Its Impact on Economic Growth. *International Journal of Business and Social Research*, *7*(3), 1-14.

Raj-Reichert, G. (2020). Global value chains, contract manufacturers, and the middle income trap: The electronics industry in Malaysia. *The Journal of Development Studies*, *56*(4), 698-716.

Ricardo, D. (2007). On the Principles of Political Economy and Taxation, London, 1817. *Bell & Sons*.

Romer, P. M. (1990). Capital, labor, and productivity. *Brookings papers on economic activity. Microeconomics*, 337-367.

Sahar, M. (2002). Labour productivity: An important business strategy in manufacturing. *Integrated manufacturing systems*, *13*(6), 435-438.

Sanghi, S., & Srija, A. (2015). Skill development and productivity of the workforce. *Economy Matters*, 36-51.

Shaaf, M., & Ahmadi, S. A. (1999). An artificial intelligence approach to the role of exports in the economic development of Malaysia. *Atlantic Economi Journal*, *27*(4), 363-375.

Sicaire, A. G., Vian, M., Fine, F., Joffre, F., Carré, P., Tostain, S., & Chemat, F. (2015). Alternative bio-based solvents for extraction of fat and oils: solubility prediction, global yield, extraction kinetics, chemical composition and cost of manufacturing. *International journal of molecular sciences*, *16*(4), 8430-8453.

Soltani, F., Jawan, J. A., & Talib, A. T. (2015). Development: the Malaysianexperience. *Journal of Public Administration and Governance*, *4*(4), 159-65.

Spanos, A. (2019). *Probability Theory and Statistical Inference: Empirical Modeling withObservational Data*. Cambridge University Press.

Sugiyono, P. (2011). Metodologi penelitian kuantitatif kualitatif dan R&D. *Alpabeta, Bandung*.

Szirmai, A. (2015). *Socio-economic development*. Cambridge University Press.

Szirmai, A., & Verspagen, B. (2015). Manufacturing and economic growth in developing countries, 1950–2005. *Structural Change and Economic Dynamics*, *34*, 46-59.

Teixeira, A. A., & Queirós, A. S. (2016). Economic growth, human capital and structural change: A dynamic panel data analysis. *Research policy*, *45*(8), 1636-1648.

Unit perancangan Ekonomi Malaysia (2017). Statistik Ekonomi – Imbangan Pembayaran.

Usman, M. (2017). Impact of high-tech exports on economic growth: Empirical evidence from Pakistan. *Journal on Innovation and Sustainability*, *8*(1), 91-105.

Wan Idros Wan Sulaiman & Maizatul Haizan Mahbob (2014). Kesignifikanan model kepuasan komunikasi dalam kontaks pengurusan maklumat sektor awam. Jurnal Komunikasi, 30(1):97-115.Diperoleh pada 11 Ogos, 2017 daripada http://www.ukm.my/jkom/journal/pdf_files/2014/V30_1_6.pdf.

Washington, S., Karlaftis, M. G., Mannering, F., & Anastasopoulos, P. (2020). *Statistical and econometric methods for transportation data analysis*. CRC press.

Wintjes, R., & Hollanders, H. (2019). Promoting Innovation, Capabilities and Impact for SMEs in Traditional Industries Calls for Variety in Inn ovation Support. *L'industria*, *40*(1), 45-74.

Wu, Y. (Ed.). (2019). *The Economics of the East Asia Steel Industries: Production, Consumption and Trade*. Routledge.

Yacob, P., Wong, L. S., & Khor, S. C. (2019). An empirical investigation of green initiatives and environmental sustainability for manufacturing SMEs. *Journal of Manufacturing Technology Management*.

Yee, L. S., HW, T. Z., Ying, L. J., & Xin, K. K. (2016). Determinants of Exports: Empirical Study in Malaysia. *Journal of International Business and Economics*, *4*(1), 61-75.

Zafar, M. W., Shahbaz, M., Hou, F., & Sinha, A. (2019). From non-renewable to renewable energy and its impact on economic growth: the role of research & development expenditures in Asia-Pacific Economic Cooperation countries. *Journal of cleaner production*, *212*, 1166-1178.