Global Academic Journal of Economics and Business

Available online at https://www.gajrc.com
DOI: 10.36348/gajeb.2023.v05i06.002

OPEN ACCESS

ISSN: 2706-9001 (P)
ISSN: 2707-2584 (O)

Original Research Article

Determinants of Manufacturing Sector Growth in Malaysia

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Article History
Received: 05.09.2023
Accepted: 10.10.2023
Published: 30.11.2023

Abstract: The purpose of this study is to analyze the determinants of manufacturing sector's growth in Malaysia. It aims to evaluate the effects of the selected independent variables on the value-added of manufacturing in Malaysia. A time series data for the period of 1970 to 2019 is used and the multi regression analysis is employed. Results obtained indicate that the exports of goods and services, net inflows of foreign direct investment are statistically significant in determining the manufacturing growth. Therefore, the government should provide more incentives for export activities, such as the reduction in tariffs, tax, and increase in subsidiaries. This initiative will attract more sellers to export their goods with the incentives given by the government. At the same time, the government should take some initiatives such as reducing costs and increasing profits for those investors who are interested in investing in Malaysian businesses. This could help to attract more investors to invest and this would help the manufacturing sector increase production capacity, resulting in an increase in manufacturing value added.

Keywords: Manufacturing Sector Growth, Exports of Goods and Service, Net Inflows of Foreign Direct Investment, Inflation Rate, Malaysia.

INTRODUCTION

The manufacturing sector is one of the active and vital sector in Malaysia to support the economic development for subsequent years. Despite a rising trend in value-added manufacturing from 1970 to 2019, manufacturing performance has been plagued by fluctuations over the last 50 years. Moreover, there are various Malaysian plans that pertain to the initiatives to boost the growth of the manufacturing sector, but the performance of growth in this sector is still not stable. The fluctuation of value-added manufacturing also affects the performance of the country's GDP. Thus, it is crucial for Malaysia's government and economists to pay attention to this issue to reduce the impact of fluctuation problems.

Export of goods and services, FDI inflows, and inflation rate are the variables that influence manufacturing value added performance. These determinants also faced the same fluctuation problem over the past 50 years. The government has unveiled different monetary approaches and other actions to stabilise these determinants. However, the fluctuation problem affected the trend of export of goods and services, FDI inflows, and inflation rate, which became unsustainable. These determinants are quite unpredictable as their effects sometimes differ from the target that we set. Sometimes they will be affected by the sudden economic crisis and other external factors that lead to an unpredictable volatile trend. Therefore, it is important to identify these three determinants as either significant or not to the value-added of manufacturing.

This article is structured as follows: Section 2 deals with the literature review followed by the methodology in Section 3, which explain the data and

its sources, model specification and estimation method employed. Empirical results and discussion are presented in section 4. Finally, conclusion is provided in section 5.

LITERATURE REVIEW

Many studies have been carried out to analyse the relationship between several independent variables and manufacturing sector's growth. Discussed below are the selected variables (exports. FDI inflows and inflation rate) used in this study.

Export

Thangavelu and Owyong (2003) studied the impact of export performance and scale economies on productivity in Singapore's manufacturing industries over the period from 1974 to 1995. The dual approach, which is a cost function, was used to study the effects of export performance on total factor productivity (TFP). The study concluded that export growth has significantly contributed to the growth of productivity in certain industries.

Bernard and Jensen (1999) examined the importance of the role played by exports in boosting productivity growth in the U.S. manufacturing sector. The study showed that exports and productivity growth are positively correlated across manufacturing factories. The large exports also lead to the import-competing industries as well as non-tradable sectors. Thus, it can be concluded that the contribution of exporters to the productivity growth of the manufacturing sector is large and exceeds their share of output.

Furthermore, van Rensburg and Naude (1999) empirically studied the productivity and export growth in 22 South African manufacturing sectors. Time series data from 1972 to 1993 was used in this study. The approach used in this study is standard Granger-causality tests with an additional complement like cointegration analysis, which is derived from the regression model. Based on the results, it is found that export growth significantly influenced the productivity growth of the manufacturing sector.

Parida and Sahoo (2007) investigated the export-led together with the manufacturing export-led-growth hypothesis. There are four South Asian countries, including Pakistan, India, Sri Lanka, and Bangladesh, that were examined with the yearly data from 1980 until 2022. This study used Pedroni's panel cointegration techniques. In the long run, this study found that exports and GDP strongly support the export-led growth hypothesis.

Foreign Direct Investment, Net Inflows

Siddiqui and Parikh (2018) studied the relationship between FDI and the growth in manufacturing industries in India's economy. It mainly examined the impact of FDI on the growth of the aggregate economy, especially in the country's manufacturing industries. A Panel cointegration test, a random effect model, and a Granger causality test were applied in this study to examine the impact of FDI. Findings obtained indicate that FDI and growth in the manufacturing sector have a significant impact on each other at the majority of the industry level.

Ahmad and Tanin (2010) examined the long-term trend of FDI inflows with the time series data over the period 1975 to 2006, which mainly focused on the major factors of FDI in stimulating the economic growth of Bangladesh. The performance of the FDI trend was more focused on the export-oriented manufacturing sector. The method used in this study is ordinary least squares (OLS) with the regression method. The result showed that FDI inflows have a positive relationship and significantly impacted the economic growth, especially in the manufacturing sector of Bangladesh.

Ayanwale (2007) investigated the relationship of non-extractive FDI with economic growth in Nigeria as well as the determinants of FDI. Yearly time series data from 1970 to 2002 was used in this study. The data was analysed by the OLS method and the 2SLS method to accurately estimate the relationship of FDI components with the growth. Based on the study carried out, the manufacturing sector with FDI input negatively affects the economy or can also be categorised as having a less significant impact on the productivity performance.

Golam, Tanin, Fahian, and Uddin (2010) examined the relationship between FDI and GDP by using annual time series data for the period of 1970 to 2006 in Bangladesh. The OLS method, the 2SLS method, simple regression, and the ADF test were used to analyse the data. Overall, the large inflows of FDI created more development of industries, which significantly fuelled the growth in Bangladesh.

Inflation, Consumer Price

Chaudhry, Ayyoub, and Imran (2013) investigated the impact of inflation on sectoral growth in Pakistan using the annual time series data during the period from 1972 to 2010. The three main sectors in Pakistan were analysed in this study; the agriculture, manufacturing, and service sectors. The OLS method was used in this study for analysing the data. The study observed that the high inflation had the most harmful impact on the manufacturing sector, which means this sector was significantly impacted by the inflation.

Bans-Akutey, Mawufemor, Deh, Isaac, and Faisal (2016) empirically studied the impact of inflation on productivity growth in the manufacturing sector using time series data from 1968 to 2013. This study focused on the manufacturing sector in Ghana. The data was analysed by various methods, including the OLS regression test, the Johansen test (JT), and the Vector Error Correction Model (VECM). The results showed that there was a significant relationship between inflation and the productivity of the manufacturing sector in the long run, as well as that inflation caused a decline in manufacturing sector productivity.

Judith and Chijindu (2016) examined the linkage between inflation and manufacturing sector growth in Nigeria with the yearly data used from 1982 to 2014. Regression analysis and Granger causality were used in this study. Overall, the regression analysis showed that inflation have a negative or non-significant effect on the manufacturing sector growth in Nigeria.

Olusuyi and Oluwanisola (2021) studied the effect of inflation growth on the performance of the manufacturing sector in Nigeria. Multivariate VECM model and Granger causality techniques were adapted in this study to estimate the variables. The results of the VECM method indicate that inflation has a significant negative effect on the performance of manufacturing growth, where the probability and coefficient resulted in less than 5%.

METHODOLOGY

Theoretical Framework

An econometric model is constructed based on the empirical studies of the previous researches. This model was developed in order to examine the relationship between the dependent variable, which is value added manufacturing in Malaysia, and the independent variables, which include exports of goods and services, FDI net inflows, and inflation rate. The theoretical framework of this study is presented in Figure 1.

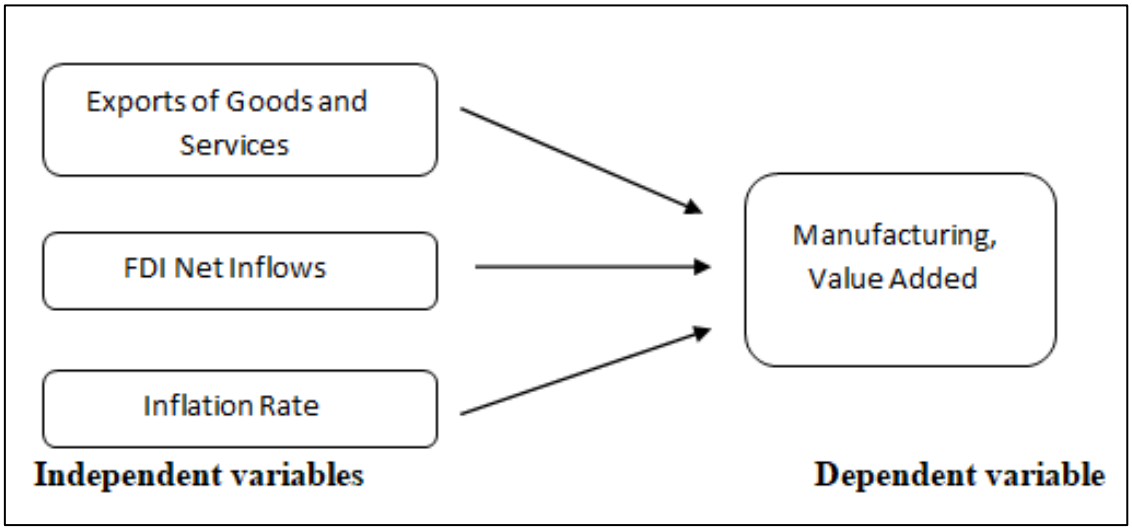

Figure 1: Theoretical Framework

Model Specification

Based on the theoretical framework, the equation of this model can be written as follows:

$$MVA_t = \beta_0 + \beta_1 EXP_t + \beta_2 FDINI_t + \beta_3 INFR_t + \mu_t \quad (1)$$

Where,
MVA_t = Manufacturing, value added (% in GDP)
EXP_t = Exports of goods and services (% in GDP)
$FDINI_t$ = Foreign direct investment, net inflows (% of GDP)
$INFR_t$ = Inflation rate (annual %)
μ_t = Error term

The first independent variable is exports of goods and services, which is the indicator for manufacturing value added. According to Ramadhani, Rachman, Firmansya, and Sugiyanto (2018), an increase in exports is vital to boost the manufacturing industry's development. Manufacturing sectors provide the opportunity for foreign exchange from export activities, and it may lead to the growth of production.

The second independent variable is FDI net inflows. There is a positive influence of the FDI net inflow on the manufacturing sector's growth (Azolibe, 2020). Non-resident investors made inward direct investment in certain reporting industries, which will definitely help to expand the market and increase the productivity of the manufacturing sector.

The third independent variable is the inflation rate. Inflation may lead to a decrease in the

value added of manufacturing to GDP. Cost-push inflation is one of the common factors that arise in an economy, which results in a rise in the cost of production due to the rising cost of inputs such as rising raw materials, utilities, and labour wages. This situation will pressure the manufacturers to reduce productivity due to the higher cost of input needed and the need to bear the risk of loss. Thus, there is a negative relationship between the inflation rate and the value added of manufacturing.

Estimation Method

The Ordinary Least Square method is used followed by the unit root test since a time series data is used in this study.

Unit Root Test

To examine the time series property of the variables, the Augmented Dicky Fuller (ADF) test is conducted. A parametric correction needs to be constructed by adding lagged difference terms of the dependent variable to the right-hand side of the test regression in order to test unit root test for higher order auto-regression. The equation can be written as follows:

$$(1) \quad \Delta Y_t = \gamma Y_{t-1} + \sum_{j=1}^{p} (\delta_j \Delta Y_{t-j}) + e_t$$

$$(2) \quad \Delta Y_t = \alpha + \gamma Y_{t-1} + \sum_{j=1}^{p} (\delta_j \Delta Y_{t-j}) + e_t$$

$$(3) \quad \Delta Y_t = \alpha + \beta t + \gamma Y_{t-1} + \sum_{j=1}^{p} (\delta_j \Delta Y_{t-j}) + e_t$$

RESULTS

Descriptive Statistics

Table 1 Shows the results obtained under descriptive statistical analysis. It shows the values of mean, standard deviation, minimum, maximum, and the number of samples for the variables that were used in this research. The total number of valid observations for the variables is 50 years, which is the time series data referred to from 1970 until 2019. The dependent variable of manufacturing value added (MVA) has a mean value of 23.17% and a standard deviation value of 4.33%, while the minimum and maximum values are 13.76% and 30.94%, respectively. For the exports of goods and services (EXP), the average value is 75.58% and the standard deviation is 24.34%, with a minimum value of 36.01% and a maximum value of 121.31%. The foreign direct investment net inflows (FDINI) resulted in a mean value of 3.72% and a standard deviation of 1.72%, while the minimum and maximum values were 0.06% and 8.76% simultaneously. Besides, the inflation rate (IR) has a mean value of 3.43% and a standard deviation of 2.88%. It also resulted in a minimum value of 0.29% and a maximum value of 17.33%.

Table 1: Descriptive Statistic

Variables	Year	MVA	EXP	FDINI	INFR
Observation	50	50	50	50	50
Mean	1994.5	23.17082	75.58346	3.71855	3.427812
Std. Deviation	14.57738	4.328865	24.34213	1.716272	2.883261
Minimum	1970	13.76391	36.01266	0.0566923	0.2900079
Maximum	2019	30.93622	121.3114	8.760474	17.32898

As can be seen from Table 2, all variables are stationary in the first differencing, or I (1). Then we proceed to estimate the relationship between the dependent variable (MVA) and the three independent variables.

Table 2: Unit Root Test

	Level		First Differences	
Variable		p-value		p-value
MVA	-1.309	(0.8857)	-3.781	(0.2039)
EXP	-0.210	(0.9914)	-5.191	(0.0001)
FDINI	-3.183	(0.0878)	-4.043	(0.0076)
INFR	-4.105	(0.6662)	-7.253	(0.0000)

Regression Analysis

Table 3: Regression Results

Variables	B	Std. Err.	*t*	*P* > |*t*|	[95% Conf.	Interval]
EXP	.1628255	.0084904	19.18	0.000***	.1457352	.1799158
FDINI	.4483977	.1228532	3.65	0.001***	.2011071	.6956883
INFR	-.0059693	.0761833	-0.08	0.938	-.1593183	.1473797
Constant	9.216975	.7737596	11.91	0.000***	7.659478	10.77447
R^2	0.9546		F-test Stat	157.26		
Adjusted R^2	0.9112					

Based on the results obtained as in Table 3, the equation can be written as below

$\widehat{MVA}$ = 9.216975 + 0.1628255$\widehat{EXP}$ + 0.4483977$\widehat{FDINI}$ − 0.0059693$\widehat{INFR}$

(0.7737596) (0.0084904) (0.1228532) (0.0761833)

Findings show that there exists a positive relationship between manufacturing (value added) and exports of goods and services. When there is an increase in manufacturing (value added), there will be an increase in exports of goods and services and vice versa. Foreign direct investment and net inflows also have a positive relationship with manufacturing and value added where an increase in foreign direct investment and net inflows could lead to an increase in manufacturing and value added. However, there is a negative relationship between manufacturing (value added) and the inflation rate, but it is not significant.

For the F-test, we reject H_0 since $F_s > F_c$, where 157.26>2.81. Therefore, it is proved that exports of goods and service, foreign direct investment inflows, and inflation rate significantly affect the manufacturing growth (value added) in Malaysia.

DISCUSSION

Malaysia's manufacturing sector has grown over time, with manufacturing value-added performance increasing from 1970 to 2020. Although manufacturing and value-added have improved over the last 50 years, manufacturing value- added fluctuation persists in the short run. The fluctuation in value-added manufacturing would directly impact the Malaysian economy and GDP growth. The value added manufacturing is one of the indicators used to understand the true state of an economy's manufacturing sector, as the manufacturing sector is critical to the growth of the Malaysian economy and other sectors. Therefore, the research on the manufacturing sector's growth in Malaysia is conducted to understand the relationship between the determinants and the value added of manufacturing.

This study shows the exports of goods and services, and FDI net inflows have a positive relationship with the value added of manufacturing, however, inflation rate shows a negative relationship with the value added of manufacturing and it is not significant. Exports of goods and services, foreign direct investment, net inflows, are statistically related to manufacturing value added. Furthermore, the variation of the dependent variable is well explained by the variation of the independent variables for testing the goodness of fit of the model.

CONCLUSION

The fluctuation of the value added of manufacturing and the other three determinants is a major focus. The study showed the first independent variable, the exports of goods and services, is significant and results in a positive relationship to manufacturing value-added. The government should apply more beneficial incentives for export activities, such as the reduction in tariffs, tax, increase in subsidiaries, service and so on. This initiative will attract more sellers to export their goods with the incentives given by the government. The higher the exports of goods and services, the higher the value added of manufacturing to generate the growth in the manufacturing sector in an economy. Thus, the government's incentives for exports are vital as more manufacturers would like to expand their productivity with the high export demand.

The second variable is foreign direct investment; net inflows are suggested to be the focus. The government should take some initiatives such as reducing costs and increasing profits for those investors who are interested in investing in Malaysian businesses. This method could help to attract more investors to inflows of foreign direct investment to our country. Capital inflows from FDI net inflows would help the manufacturing sector increase production capacity, resulting in an increase in manufacturing value added.

Furthermore, an appropriate inflation rate must be controlled by the Central Bank. To avoid price increases, the government could take a monetary approach, such as increasing government

spending in a country. When the inflation rate falls, the price of goods and services also falls, which leads to a lower cost of production. Therefore, a low inflation rate could help manufacturers increase their capacity for productivity due to the lower cost of input, which would boost the value-added of the manufacturing sector.

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