KnE Social Sciences
3rd JESICA
The 3rd Jakarta Economic Sustainability International Conference
Volume 2024

Research Article

Foreign Direct Investment and Economic Growth in Malaysia -- Re-examining Key Economic Fundamental

Aida Syazana Abu Bakar, and Abdul Razak Abdul Hadi*

UniKL Business School, Kuala Lumpur, Malaysia

Abstract.

The sustainable growth of Malaysia's economy is important to ensure full employment and efficient allocation of national resources. This empirical study is motivation driven to ascertain the relevant economic dynamics that can significantly affect national gross domestic product (GDP). Using quarterly secondary data from 2015 to 2022, we employed the Johansen-Juselius cointegration test as an estimation tool. The results revealed that net foreign direct investment (NFDI) is a significant economic factor that influences national income over, both, short- and long-run. As such, this external economic factor is one of the key determinants in underpinning the effectiveness of Malaysian government's fiscal policy. This paper analyzes Malaysian economic activities from the fiscal perspective over the past eight years.

Keywords: gross domestic products, total government revenue, net export, net FDI

Corresponding Author: Abdul Razak Abdul Hadi; email: abdrazak@unikl.edu.my

Published: 4 July 2024

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the 3rd JESICA Conference Committee.

1. INTRODUCTION

The real Gross Domestic Product (GDP) is a common measurement in gauging a country's economic growth. The inflationary impacts need to be adjusted in calculating the real GDP. In most cases, a country's GDP growth rate is normally based upon changes in its real GDP over a given period of time. The measurement of growth by the World Bank is based on national gross revenue as opposed to GDP. It also includes the transfer of earnings by individuals who work overseas. This so-called remittance economy provides an important source of national income for numerous developing countries such as Bangladesh, Pakistan and Philippines. It can be argued that cross-country comparisons of GDP may lead to an underestimation of the economic performance of certain nations [1].

National revenue or sometimes referred to as government revenue is an important component in computing a country's GDP. This revenue is generally derived from

taxes and non-tax sources but the tax component normally contributes the most to the government's coffer. The composition of government revenue streams may change over time. The common sources of tax component are corporate tax, personal income tax, duties as well as goods and services tax (GST). Meanwhile, some examples of non-tax revenue are dividends from state-owned firms, licenses, fines and penalties.

It is interesting to point out that the global manufacturing sector has experienced substantial growth in recent years and makes a substantial contribution to the GDP, amounting to 25 percent. Additionally, this sector contributes the most to countries' export activities worldwide. Besides manufacturing, the service sector plays an increasingly important role contributing 54 percent to the whole world's GDP [2].

Within the context of a Keynesian national accounts framework, the net exports of a given nation are indicative of the external demand for the output produced by said nation. The anticipated outcome of exports is to stimulate growth by alleviating balance of payments limitations, augmenting the nation's ability to obtain crucial intermediate and capital goods, and cultivating specialisation and enhanced productivity through exposure to knowledge spill overs, cutting-edge technologies, experiential learning, and superior management methodologies [3].

The objective of most nations is to attain rapid, sustainable growth in their economies. Looking at the global challenges which detrimentally affect many economies worldwide, it is quite a struggle to accomplish this sustainable economic growth. The purpose of this research is to probe into the relevant macroeconomic factors that strongly influence Malaysia's GDP. The role of foreign direct investment (FDI) on influencing economic growth has always been a debatable topic among academics. A number of empirical studies point out that FDI exerts some significant positive impact on growth of economic activities [4]. Their works also demonstrate some significant correlation between FDI and growth of economic activities. Nonetheless, Karim *et al* (2018) point out that host countries are advised to monitor closely the progress of their FDI activities since some of the international trade agreements might be associated with illicit undertakings such as corruption, cartels and money laundering [5].

This study involves the use of cointegration tests. This econometric time series technique helps in setting a condition whereby two or more non-stationary time series data are unified or moving in unison overtime. Once such a condition is set, the stipulated time series data are said to be cointegrated and they cannot diverge from their equilibrium position. Specifically, we will deploy Johansen-Juselius cointegration tests for estimating the presence of dynamic and equilibrium relations from our tested economic variables.

From this methodological procedure, we shall combine our underpinning theories with our variables of interest to gain new economic insights.

2. LITERATURE REVIEW

Talwar and Srivastava (2018) take in a more robust investigation in examining the theoretical relation between FDI and GDP for some diverse economies worldwide [6]. Their study considers six countries namely, Bhutan, Ethiopia, India, Brazil, the United States, and the United Kingdom. Only Ethiopia, India, and the United Kingdom exhibit a long-run causality between the two tested variables. Also, the vector error correction model (VECM) reveals no significant short-term causality between the variables in these three countries. Their research has some important implications for policy makers. FDI alone is not a significant factor that could influence growth in GDP over short haul. Their empirical results also show that India is able to sustain its GDP growth via FDI overtime due the high and significant speed of adjustment in its model (refer to the error correction terms).

In another study, Yussuf (2021) tests and analyses the East African Community's (EAC) equilibrium economic relationships using the Johansen-Juselius cointegration tests coupled with VECM and variance-decomposition (VDC) analysis [7]. His study reveals that the economic growth of the East African member states are highly cointegrated with their FDI. These results are based upon Johansen-Juselius cointegration and VECM tests. Interestingly, Yussuf's study reveals significant presence dynamic and equilibrium economic relationships (Kenya, Burudi and Rwanda). The results also show that in spite of unusual challenges, Tanzania and Kenya do show some improvements in rejuvenating their economic activities.

Naser (2017) uses Johansen-Juselius cointegration tests to investigate the impact of oil consumption, nuclear energy use and movements in oil price on long-term economic growth [8]. Using time series data from 1965 through 2010, he considers four highly developed and industrialized countries — U.S, Canada, Japan, and France. The cointegration test suggests that variables move together in all countries over time. The empirical results also show that energy consumption from oil and nuclear plants do affect growth in real GDP in all four countries. Specifically, oil consumption does influence growth in real GDP in the U.S, Japan, and France. As for Japan and France, increasing nuclear energy consumption by 1% will raise growth in real GDP by 0.108% and 0.262% respectively. In the case of Canada, increasing oil consumption by 1% will trigger growth in real GDP by 3.1%. It is evident that nuclear energy is a main driver to

stimulate economic growth in the U.S, Canadian, and France. It is interesting to observe a bidirectional relationship between Canadian oil consumption and its economic growth. This could be attributed to its fast speed of adjustment. It is also important to note that there is a strong relationship between Japan's real GDP growth and its nuclear energy consumption.

3. DATA AND METHODS

This empirical study employs econometrics time-series (ETS) in modelling the secondary quarterly data from 2015 to 2022, involving 32 observations. All data are extracted from the Bank Negara Malaysia (BNM) Monthly Highlights and Statistics Publication. Based upon the Keynesian income theory, as GDP increases, aggregate demand (AD) increases, demand for imported goods will increase, but in the long run, exchange rate will decrease. As mentioned earlier, this study puts its focus on examining long-run and short-run causalities between GDP and three macroeconomic variables – total government revenue (TGR), net export (NE) and net FDI (NFDI).

In testing for stationarity or trend-stationarity, the Augmented Dickey Fuller test (ADF) is a celebrated technique for this purpose. In the following process, the Johansen-Juselius cointegration test is deployed to measure the presence of cointegrating relationships between several non-stationary time series data. Unlike Engle-Granger cointegration test, Johansen-Juselius is more robust as it is capable of revealing more than one cointegrating relationship. Once the cointegration procedure has been finalized, the vector error correction method is applied to the variables of interest. VECM allows us to interpret both short and long-term equations to determine the number of cointegrating relationships. The Granger causality test is performed to find out the direction of causality in our model. This short-run causality test involves two statistical tests, namely t-tests and F-tests on the lagged values of independent variables.

3.1. Dependent and independent variables

In this study, GDP is assigned as the dependent variable and total government revenue (TGR), net export (NE) and net FDI (NFDI) as the independent variables.

3.2. Estimation methods

Our study is based upon theoretical framework advocated by Keynesian income theory. The estimation method used is the Johansen-Juselius Cointegration test. The focus is to examine the relationship between GDP and total government revenue (TGR), net export (NE), and net FDI (NFDI) from 2015 to 2022. Empirically, the model is expressed as follows:

$$GDP = (TGR, NE, NFDI) \tag{1}$$

4. EMPIRICAL FINDINGS

The GDP growth in Malaysia has been robust as the external factors like NFDI and export sector have been the engine room for economic growth over the past eight year. It is interesting to observe the statistical significance between GDP and its explanatory variables as demonstrated in seven tables below.

TABLE 1: Pearson Correlation Coefficients (N=32).

Probability > |r| under H_0: Rho=0				
	GDP	**TGR**	**NE**	**NFDI**
GDP Gross Domestic Product Constant (RM mil)	1.00000	0.71399 <.0001	0.76238 <.0001	0.14912 0.4153
TGR Total Government Revenue (RM mil)	0.71399 <.0001	1.00000	0.51720 0.0024	0.23888 0.1879
NE Net Export (RM mil)	0.76238 <.0001	0.51720 0.0024	1.00000	0.30772 0.0867
NFDI Net FDI (RM mil)	0.14912 0.4153	0.23888 0.1879	0.30772 0.0867	1.00000

From Table 1, we can see that all of the independent variables have positive associations with GDP. However, only TGR and NE are statistically significant as both have high correlations of 0.71399 and 0.76238 respectively with p-value smaller than 5% significance level. The NFDI variable is statistically insignificant at low correlation of 0.14912 with p-value greater than 5% (at 0.4153).

First, all data series must fulfil the requirements put up by any time series cointegration test using ADF technique. The results from the ADF in Table 3 indicate that the data are integrated at first difference. The same ADF procedure is imposed on the long-run residuals of our model and the results also suggest that these residuals do not have a unit root (i.e. stationary at level).

Table 2: ADF Stationary Test at Level.

Unit Root Tests (H_0: Data Series = Non-Stationary)							
Type	**Lags**	**Rho**	**Pr < Rho**	**Tau**	**Pr < Tau**	**F**	**Pr > F**
Zero Mean	0	0.2960	0.7448	0.91	0.8983		
	1	0.2890	0.7427	1.05	0.9196		
	2	0.2701	0.7407	1.65	0.9727		
	3	0.2445	0.7347	2.16	0.9907		
	4	0.2427	0.7328	1.97	0.9858		
	5	0.2668	0.7388	1.19	0.9359		
	6	0.2305	0.7297	1.34	0.9505		

Table 3: ADF Stationary Test at First Difference.

Unit Root Tests (H_0: Data Series = Non-Stationary)							
Type	**Lags**	**Rho**	**Pr < Rho**	**Tau**	**Pr < Tau**	**F**	**Pr > F**
Zero Mean	0	-34.9438	<.0001	-6.32	<.0001		
	1	-87.5759	<.0001	-6.24	<.0001		
	2	837.4885	0.9999	-5.02	<.0001		
	3	-85.4517	<.0001	-2.82	0.0064		
	4	-5.1826	0.1068	-0.98	0.2817		
	5	-9.9440	0.0205	-1.11	0.2341		
	6	-8.5813	0.0326	-0.95	0.2935		

At first difference, we accept the alternative hypothesis that the unit root is absent. As shown in Table 2 and Table 3, we can conclude that the data series in the model have fulfilled all the requirements set up by Johansen-Juselius cointegration procedure.

Table 4: Cointegration Rank Test Using Maximum Eigenvalue.

Johansen-Juselius Cointegration Tests				
H0:Rank=r	**H1:Rank=r+1**	**Eigenvalue**	**Maximum**	**Pr > Maximum**
0	**1**	0.7018	37.5140	0.0018
1	**2**	0.4511	18.5952	0.1085
2	**3**	0.1445	4.8364	0.7620
3	**4**	0.1038	3.3989	0.0653

The cointegration rank test using maximum eigenvalue indicates an equilibrium relationship between the variables. We shall reject the null hypothesis if the Max-Eigen statistic is smaller than the 5% critical value. From the test results, we accept the alternative hypothesis confirming the presence of one cointegrating vector at the

5% level. As such, it is evident that a long-run relationship does exist among the tested variables in our empirical model.

TABLE 5: Cointegration Rank Test Using Trace.

Johansen-Juselius Cointegration Tests						
H0:Rank=	**H1:Rank>r**	**Eigenvalue**	**Trace**	**Pr > Trace**	**Drift in ECM**	**Drift in Process**
0	**0**	0.7018	64.3445	0.0006	Constant	Linear
1	**1**	0.4511	26.8305	0.1050		
2	**2**	0.1445	8.2354	0.4407		
3	**3**	0.1038	3.3989	0.0653		

The result above supports the existence of cointegrating vector. Thus, we will accept the alternative hypothesis that the number of cointegrating relationships is at least one because the p-value of the Trace statistic is less than α of 5%.

TABLE 6: Vector Error Correction Model (VECM) (1).

ANOVADependent Variable: dGDP					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F-Value**	**Pr>F**
Model	5	3885833993	528704844	2.48	0.0604
Error	24	7528053734	365431813		
Corrected Total	29	11413887727			
R-Square		0.3404	**Adjusted R-Square**		0.2030
Parameter Estimates					
Variable	**DF**	**Parameter Estimate**	**Standard Error**	**t-Value**	**Pr > |t|**
Intercept	1	4758.76082	3296.94497	1.44	0.1618
ldGDP	1	-0.14714	0.29245	-0.50	0.6195
ldTGR	1	0.10027	0.33388	0.30	0.7665
ldNE	1	-0.15524	0.55946	-0.28	0.7838
ldNFDI	1	-1.09974	0.52755	-2.08	0.0479
lr	1	-0.54948	0.27192	-2.02	0.0546

Looking at the p-value of the error correction term (as denoted by lr), it is slightly higher than the α of 5%. Given our one-tail distribution as advocated in VECM, this p-value of 0.0546 needs to be divided by two leading to a final adjusted p-value of 0.0273. At this point, we must accept the alternative hypothesis which suggests the presence of significant long-term equilibrium relationship between the variables. There is almost 55% speed of adjustment towards equilibrium made by GDP in the system of equation. 0.54948 or 54.948% towards equilibrium. This percentage is regarded as

moderately acceptable considering the effect of external factors on Malaysia's domestic economic activities.

TABLE 7: Granger Causality Test.

Wald F-Test			
Test	**DF**	**Chi-Square**	**Pr > ChiSq**
1	3	6.08	0. 1078

Based on the results in Table 6, there is one short-term relationship on quarterly basis involving Net FDI and GDP. The rest of the independent variables have no significant relation with GDP at all. Since their p-values are greater than 5%, we can accept the null hypothesis and conclude there is no short run causality between them.

5. CONCLUSION

Our cointegration analysis produces empirical results that clearly support our expectation on the long-run causality between Malaysia GDP and the three independent variables. However, this study fails to prove the presence of short-term relationship between GDP with TGR and NE respectively. Changes in net FDI, on the other hand, could influence Malaysia GDP in the short-run.

The government of Malaysia may consider lowering trade barriers and starts promoting international trade by eliminating non-productive tariff and making the process of business registration much easier. Also, the government may allocate bigger financial resources and provide better technology to further support the development Malaysia's export industry. Such approaches would help support long-term economic growth. Nevertheless, the government should also be careful in its effort to attract FDI inflows since some local industries might lose their interest in either expanding their product development or in investing in future research and development activities. Future researchers are strongly recommended to analyse other external economic variables and start testing the credibility of the existing trade policies. Engaging in new methodological approaches could potentially produce some interesting empirical findings.

References

[1] Mustafa T, Hassan NM, Hassan NSN, Isyak FM, Zainduin. The effect of FDI towards GDP growth in Malaysia. e-Proceedings of International Conference on Language,

Education, Humanities &Social Sciences , Cawangan, Kelantan: Universiti Teknologi MARA ; 2021, p. 196–205.

[2] The World Bank. Beyond economic growth. 2nd ed. Washington DC: The World Bank; 2000.

[3] Xing Y, Pradhananga M. How important are exports and foreign direct investment for economic growth in the People's Republic of China? . Asian Development Bank Institute 2013.

[4] Barro R. Determinants of economic growth: A cross-country empirical study. Cambridge, MA: 1996. https://doi.org/10.3386/w5698.

[5] Karim BA, Karim ZA, Nasharuddin MN. Corruption and foreign direct investment (FDI) in ASEAN-5: A panel evidence. Economics and finance in Indonesia 2018;64:145–56.

[6] Talwar S, Srivastava S. Integration of GDP and FDI in economies at different stages of growth. Theoretical Economics Letters 2018;08:2199–219. https://doi.org/10.4236/tel.2018.811144.

[7] Yussuf YC. Cointegration test for the long-run economic relationships of East Africa community: evidence from a meta-analysis. Asian Journal of Economics and Banking 2022;6:314–36. https://doi.org/10.1108/AJEB-03-2021-0032.

[8] Naser H. On the cointegration and causality between oil market, nuclear energy consumption, and economic growth: evidence from developed countries. Energy Ecol Environ 2017;2:182–97. https://doi.org/10.1007/s40974-017-0052-0.