



## DETERMINANTS OF ECONOMIC GROWTH IN MALAYSIA 1970-2010

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### ABSTRACT

*This paper investigates the determinants of economic growth in Malaysia. Trade openness, foreign direct investment, government development expenditure and gross fixed capital formation are used as indicators of economic growth. The study used time series data for the period 1970 to 2010. The Johansen and Juselius cointegration approach was applied to determine the long-run relationship between the variables. The study found that trade openness and foreign direct investment have significant but negative impact on economic growth in short run. Our results also show that government development expenditure has the strongest effect on economic growth in Malaysia.*

**Keywords:** Economic growth, Malaysia

### INTRODUCTION

Malaysia continues to move towards its vision of becoming a high-income developed country and practices a system of export-oriented open economy. Lai (2003) has stated that economic growth is one of the key performance measures of the development and growth of the national economy. Economic growth shows the development of the physical economy as additional infrastructure and infrastructure growth over time. In addition, economic growth should have a basic purpose, which is to raise the standard of the national economy as a whole with the help of the government to eliminate the causes of underdevelopment and promote the efforts for a balanced development and lessen the gap between the rich and poor within societies (Shaari and Jomo, 1992). In general, Malaysia's economic growth in the period 1970 – 2010 shows a volatile trend. In the period of 1976 to 1980, economic growth achieved its highest level, 8.5 per cent. This achievement was made possible by export growth and private investment. Export value at current price increased at

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an average rate of 25.2 per cent per annum during 1976 to 1980 compared to 12.3 per cent in the period 1971 to 1975, while private investment increased by 13.6 per cent per annum in the same period. These developments have encouraged a more rapid growth of domestic production activities. The services sector is a major contributor to economic growth, particularly from a new source of growth in the financial sector, business services and communications. A strong economic growth in Asia, especially in China and India as well as the economies of the Association of Southeast Asian Nations (ASEAN) and oil-producing countries also affect global growth. This situation is further strengthened by the recovery in the manufacturing and services sectors, as well as robust exports and imports performance. During the year, Malaysia's economic growth exceeded expectations, registering a growth of 6.8 per cent, amounting to RM 558,382 million.

Trade openness plays an important role in the economic development of Malaysia. Exports of raw materials such as rubber and tin are important to the national economy. Economic diversification policy since the late 1970s has also led to a significant increase in exports. According to Yusuf (1990), an open economy is more vulnerable to external economic shocks through international trade and finance. Trade openness is seen as one of the engines that would stimulate economic growth. Its open economic position has made Malaysia one of the largest FDI recipients, thus making FDI inflow as an important element in shaping economic development of the country. More important, FDI can also trigger transfer of knowledge, promote the development of human resources, encourage the establishment of new industries and products, spur the introduction of new production processes and technologies, and promote growth of support services and research and development (R&D) (Zhang, 2006). In addition, FDI inflows can boost overall economic growth by increasing the level of competition in the domestic market and possess greater efficiency than local companies (Misztal, 2010).

FDI inflows were affected by the economic crisis in 1975 which had also affected the investors' confidence. The decline of FDI inflows in 1985 was also due to the decline in major commodities' prices in the world market. Falling prices of commodities such as petroleum, palm oil and tin which are our main export commodities, together with a decline in the demand for manufactured products affect the productivity of the Malaysian economy. The recession also affected investors' confidence to invest during this period. Malaysia's recession in this period resulted in a RM 2125,424 million in FDI inflow into Malaysia, a decline of 14.8 per cent in 1985 compared to the previous year. After the economic crisis from 1985 to 1997, FDI inflows continued to rise rapidly. This progress was driven by market developments, technological advancement, competitive pressures, privatization and supportive government policies. Government development expenditure consists of four major sectors in Malaysia, namely economic services, social services, security services and general services. Government expenditure level depends on the economic situation of the country. When the economy is in a recession, the government will increase the amount of development expenditure to boost economic growth. Government expenditure has increased over time, caused

by economic factors such as very huge changes in the economic structure since 1970. Development expenditure has been strongly emphasized by the government, in line with its policies to achieve the objectives of the New Economic Policy that began in 1971. Starting in 1985 until 1999, the government has given higher allocations to economic services by an average of over 13 per cent, followed by social services, an average of 7.04 per cent (Economic Report, 1999).

Malaysia's economic progress is also driven by gross fixed capital formation. Economic growth of a country desperately needs capital formation to assist in development projects. Gross fixed capital formation typically increases productivity and GDP growth. As stated by Ghali and Mutawa, (1999), fixed capital formation aims to increase productivity and income in the future. Open economic environment and economic uncertainties pose challenges to the country's economic growth. The economic downturns in 1985, 1998, 2001 and 2009 had affected Malaysia's economic growth. Therefore, the effect of changes in macroeconomic variables such as trade openness, foreign direct investment, government development expenditure and gross fixed capital formation on GDP growth of Malaysia should be examined. In addition, problems that may occur in the factors that influence economic growth should be determined so that economic growth can be generated more effectively in the future.

## LITERATURE REVIEW

Sinha and Sinha (2000) analyzed the effect of openness on GDP for Asian countries. Their results indicate that for Iran, Hong Kong, Pakistan, Singapore, Iraq, Myanmar, Israel and China, there is a positive correlation between openness and economic growth. Bakare (2011) examined the relationship between trade liberalization and economic growth in Nigeria. The results established a positive relationship between trade liberalization and economic growth in the case of Nigeria for the period 1979 to 2009. Meanwhile, Chaudhry *et al.* (2010) examined the causality relationship between trade liberalization and economic growth in Pakistan for the period 1972 to 2007. The empirical results using Johansen cointegration test and ECM indicate that there exist both short and long run relationships between these variables. Furthermore, empirical results from Granger causality test show that causality runs from trade liberalization to economic growth. They suggested that trade openness is of paramount importance for the long-term growth and economic development of Pakistan. Sakyi (2010), in the study of Ghana found a significantly positive short and long run relationship between trade liberalization and economic growth although the effect is reduced by their interaction. Bajwa and Siddiqi (2011) used panel data to examine the causal relationship between trade openness and economic growth for four South Asian countries.

Hussin *et al.* (2009) employed ARDL bound test to study openness and economic growth for Malaysia for the period 1970 to 2003. They found that openness has a strong positive impact on economic growth. Vamvakidis (2002) studied the relationship between openness and economic

growth in developed and developing countries over the period 1920 to 1990. The results revealed that there was no positive relationship between openness and economic growth before 1970. The correlation was even found to be negative in the 1930s, thus showing that the positive relationship between openness to international trade and economic growth was only a recent phenomenon. The relationship between FDI and economic growth has been studied by many researchers all over the world. Using many different approaches to study the relationship between FDI and GDP, researchers have conducted studies not only within one nation but also for regions or continents. Agrawal and Khan, (2011) studied the effect of FDI on economic growth in China and India and found that FDI promotes economic growth in both countries. Nabila *et al.* (2011) used a heterogenous panel for the period 1983 to 2008 to study the relationship between FDI and economic growth in selected Asian countries. Their results revealed that FDI and economic growth are positively related. Borensztein *et al.* (1998) studied the effect of FDI on economic growth for 69 developing countries. They found that an increase in FDI has a positive effect on economic growth. FDI is an important tool to transfer the level of technology from the developed to the developing countries and is a relatively important contributor to economic growth in developing countries. The relationship between government expenditure and economic growth has continued to generate series of controversies among scholars in the economic literature. Rivzi (2010) investigated the relationship between government expenditure and economic growth in the province of Sindh. They used thirty years data from 1979 to 2008 and the results show that there exist both long and short run relationships between development expenditure and economic growth.

Cheng (1997) examined the relationship between government expenditure and economic growth in South Korea for the period 1959 to 1993. The results show that a bi-directional causality exists between government expenditure and economic growth. The study by Al-Faris (2002) in GCC countries found that Wagner's law holds for all countries except for Bahrain where there was bi-directional causality. Similarly for Pakistan, Rehman and Ahmed (2007) in a study for the period 1972 to 2004 found a long-run relationship between government expenditure and economic growth and Wagner's law also holds in Pakistan. Rauf *et al.* (2012) found that there is no long run relationship between public expenditure and national income and there is no causality at all from national income to public expenditure or from public expenditure to national income. Their findings were not consistent with Wagner's law prediction and Keynesian hypothesis during the period 1979 to 2009. They argued that their results might be influenced by several other important factors that caused a rapid increase in government expenditures over a long period of time in the case of Pakistan. Meanwhile, Mitra (2012) analyzed the relationship between capital formation and economic growth in India. The results suggest that there is a long-run unidirectional causality running from capital formation to economic growth. Mansor, (2000) analyzed the productivity of public and private capital formation in Malaysia using annual data from 1961 to 1995. The results

suggest that public investment has been unproductive over the period under consideration but private investment is significantly related to economic growth.

Anthony and Peter (2011) examined foreign private investment, capital formation and economic growth in Nigeria. They employed the two-stage least squares (2SLS) method of estimation. Their results showed that foreign private investment has a negative impact on capital formation in Nigeria. In addition, they also found that both foreign private investment and capital formation significantly determine economic growth. Ray (2007) studied the relationship between economic liberalization and capital formation in India from 1970 to 2004. His findings suggest that there may not be statistically significant impact of economic liberalization on capital formation in India. Fauzi and Noraini (2012) used three panel estimation models which are pooled model, fixed effects model and random effects model to examine gross fixed capital formation and economic growth over the period 1981 to 2008 in the case of four ASEAN countries, namely Malaysia, Thailand, Indonesia and the Philippines. They found that gross fixed capital formation has a positive and significant effect on GDP growth in each ASEAN-4 country.

## DATA AND METHODOLOGY

### Model specification

$$\text{GDP} = f(\text{OPEN}, \text{FDI}, \text{GDE}, \text{GFCF}) \quad (1)$$

Where,

GDP = Gross Domestic Product

OPEN = Trade Openness

FDI = Foreign Direct Investment

GDE = Government Development Expenditure

GFCF = Gross Fixed Capital Formation

The specification of GDP function in equation-1 is drawn from the production function. We modify our model by using log for the variables so that all the variables in our model can show its impact in terms of percentage. Based on the GDP function, we finally specify the empirical model as follows:

$$\ln Y_t = \alpha_0 + \alpha_1 \ln \text{OPEN}_t + \alpha_2 \ln \text{FDI}_t + \alpha_3 \ln \text{GDE}_t + \alpha_4 \ln \text{GFCF}_t + u_t \quad (2)$$

where

$\alpha$  = the parameter for the explanatory variables

t = time series

ln = log

$\mu$  = error term

### **Sources of data**

This study uses annual data on economic growth (GDP), trade openness, FDI, government development expenditure and GFCF over the period 1970 to 2010. The data were obtained from various sources including Annual Reports of Bank Negara Malaysia, Department of Statistics Malaysia and the World Bank. The data for GDP (in RM million at constant price with base year 2000) were taken from the Department of Statistics Malaysia's official website. The data on openness were defined as exports plus imports divided by GDP for each year. The data on exports and imports (in RM million) were obtained from Department of Statistics Malaysia's official website. The data on FDI (in US dollars) were obtained from the World Bank website. Meanwhile, data on government development expenditure, gross fixed capital formation (in RM million) were obtained from Annual Reports of Bank Negara Malaysia.

### **Estimation procedures**

To examine the relationship between the potential explanatory variables and economic growth, we first carried out a unit root test before proceeding with other econometric estimation method. Next, we used Vector Autoregressive (VAR) approach and test for cointegration using Johansen and Juselius (1990) test for cointegration. We also test for Granger causality between economic growth and the explanatory variables so that we can identify the direction of causality. Later, the cointegration test based on Johansen's and Juselius' approach was also used to examine the long run relationship between economic growth and its determinants, while the Vector Error Correction Model (VECM) approach was used to analyze the short run relationship. Finally, we performed a diagnostic test by using Auto-regressive conditional heteroskedasticity (ARCH), normality and Lagrange multiplier (LM) tests to check the robustness of our model.

## **EMPIRICAL ANALYSIS AND RESULTS**

### **Cointegration test**

The integration test of the variables through the Vector Autoregressive (VAR) model was carried out by the Johansen procedure. Cointegration tells us about the presence of a long run relation among two or more variables. When we decide to go for the cointegration analysis, we assumed that all the variables are non-stationary. Secondly, they are all assumed to be integrated of the same order. Even if the variables are not integrated of the same order, we still can continue with the cointegration analysis. This situation is known as multi-cointegration. We used Akaike Information Criterion (AIC) to choose the optimum lag length for our cointegration analysis using the Johansen-Juselius test. AIC is a known criterion in selecting the maximum relevant lag length. If we get one or more cointegrated vector in the model, we say that there exist a long run relationship among the variables. We then perform the cointegration test where the dependent variable is GDP. The results for the cointegration test for linear deterministic trend with restriction based on Trace statistics and based on Max-Eigen statistics are reported in Table 1. Table 1 shows the results of

Johansen’s cointegration test for the period 1970 to 2010. In this analysis, trace statistics and Max-eigen statistics are compared to the corresponding critical values. The results of the trace statistics show that there are four cointegrating equations at the 5% significance level. The Max-eigen value test indicates four cointegrating equations at the 5% significance level. Based on the results, we then conclude that there is a long run relationship among the variables.

**Table 1: Test results from Johansen procedure**

H <sub>0</sub>	H <sub>1</sub>	Test Statistics: $\lambda$
<b>Trace Statistics: <math>\lambda_{trace}</math></b>		
r = 0	r > 0	204.3881*
r ≤ 1	r > 1	123.2364*
r ≤ 2	r > 2	55.22006*
r ≤ 3	r > 3	16.84941*
r ≤ 4	r > 4	2.474919
<b>Max-Eigen Statistics <math>\lambda_{max}</math></b>		
r = 0	r = 1	81.15175*
r = 1	r = 2	68.01632*
r = 2	r = 3	38.37065*
r = 3	r = 4	14.37449*
r = 4	r = 5	2.474919

Notes: \*\*\* Indicates significance at 1%, \*\* Indicates significance at 5%, \* Indicates significance at 10%

**Pair-wise granger causality test**

The Pair-wise Granger causality test is performed to see the causality between two variables that are being analyzed. This analysis aims to determine the direction of causality and identify which variable Granger-causes the other variable.

**Table 2: Pair-wise granger causality test**

Null Hypothesis:	Obs	F-Statistics	Probability
LOPEN does not Granger cause LGDP	37	2.53955	0.0620*
LGDP does not Granger cause LOPEN		0.82926	0.5179
LFDI does not Granger cause LGDP	37	0.32545	0.8585
LGDP does not Granger cause LFDI		1.79639	0.1576
LGDE does not Granger cause LGDP	37	0.42687	0.7879
LGDP does not Granger cause LGDE		2.34881	0.0786*
LGFCF does not Granger cause LGDP	37	0.72423	0.5828
LGDP does not Granger cause LGFCF		2.20975	0.0936*
FDI does not Granger cause OPEN	37	0.67268	0.6165
OPEN does not Granger cause FDI		3.79705	0.0137**
GDE does not Granger cause OPEN	37	1.46341	0.2398
OPEN does not Granger cause GDE		3.03804	0.0337**
GFCF does not Granger cause OPEN	37	1.42548	0.2515
OPEN does not Granger cause GFCF		4.63391	0.0054***

Notes: \*\*\*, \*\* and \*\*\* indicates significance at 1%, 5% and 10% levels respectively

This test is employed in testing the causality direction for GDP, OPEN, FDI, GDE and GFCF. The results of the Granger causality test are reported in Table-2. Table-2 shows the Granger causality between OPEN, FDI, GDE and GFCF. Results for OPEN show that the null hypothesis that OPEN does not Granger-cause GDP is rejected at the 10% significance level. This result is consistent with our expectation since we have been expecting that higher trade openness would enhance GDP. On other hand, the null hypothesis that GDP does not Granger-cause OPEN failed to be rejected at any significance level (1%, 5% and 10%), leading us to conclude that GDP does not Granger-cause OPEN. The results for FDI show that the null hypothesis that FDI does not Granger-cause GDP failed to be rejected since the p-value is bigger than any significance level (1%, 5% and 10%). We therefore conclude that FDI does not Granger-cause GDP. On other hand, the null hypothesis that GDP does not Granger-cause FDI failed to be rejected since the p-value is bigger than any significance level (1%, 5% and 10%), thus we conclude that GDP does not Granger-cause FDI. Results for GDE show that the null hypothesis that GDE does not Granger-cause GDP failed to be rejected since the p-value is bigger than any significance level (1%, 5% and 10%). We then conclude that GDE does not Granger-cause GDP. On other hand, the null hypothesis that GDP does not Granger-cause GDE is rejected at the 5% significance level. Therefore, it appears that Granger causality runs one way from GDP to GDE. These findings demonstrate that GDP can influence the level of government development expenditure.

Results for GFCF show that the null hypothesis that GFCF does not Granger-cause GDP failed to be rejected since the p-value is bigger than any significance level, concluding that GFCF does not Granger-cause GDP. On other hand, the null hypothesis that GDP does not Granger-cause GFCF is rejected at the 5% significance level, concluding that Granger causality runs from GDP to GFCF. This shows that economic growth is a fundamental determinant of growth in GFCF. Results for FDI and OPEN show that the null hypothesis that FDI does not Granger-cause OPEN failed to be rejected since the p-value is bigger than any significance level, concluding that FDI does not Granger-cause OPEN. On other hand, the null hypothesis that OPEN does not Granger-cause FDI is rejected at the 1% significance level, concluding that Granger causality runs from OPEN to FDI. This shows that greater trade openness will increase FDI inflows into the economy. Results for GDE and OPEN show that the null hypothesis that GDE does not Granger-cause OPEN failed to be rejected since the p-value is bigger than any significance level, concluding that GDE does not Granger-cause OPEN. On other hand, the null hypothesis that OPEN does not Granger-cause GDE is rejected at the 1% significance level, concluding that Granger causality runs from OPEN to GDE. In other words, a higher degree of openness of an economy will increase government development expenditure. This shows that openness is a crucial policy which will affect government development expenditure. Results for GFCF and OPEN show that the null hypothesis that GFCF does not Granger-cause OPEN failed to be rejected since the p-value is bigger than any significance level, concluding that GFCF does not Granger-cause OPEN. On the other hand, the



null hypothesis that OPEN does not Granger-cause GFCF is rejected at the 1% significance level, leading us to conclude that Granger causality runs from OPEN to GFCF.

### Cointegration analysis

The results based on Johansen and Juselius cointegration approach are presented in Table 3. On the other hand, a Vector Error Correction Model (VECM) can lead to a better understanding of the nature of any non-stationarity among the different component series and can also improve longer term forecasting over an unconstrained model. The results for the VECM method are summarized in Table 4.

**Table 3: Cointegration results for GDP determinants**

Variable	Coefficient	t-statistics
LOPEN	1.27633.4	10.69332 ***
LFDI	0.334077	0.394460
LGDE	2.161246	3.784809 ***
LGFCF	0.982530	3.926525 ***

**Note:** \*\*\*, \*\*, \* indicate significant at 1% , 5% and 10% significance levels

Based on the results, OPEN, GDE and GFCF are seen to significantly affect economic growth. Most important, the results indicate that GDE has the highest statistically significant positive impact on economic growth of Malaysia. In fact, a 1% increase in GDE is seen to cause a 2.16% rise in economic growth. The result for OPEN indicates that it has the second highest statistically significance positive effect on economic growth in Malaysia. The result shows that a 1% increase in OPEN cause a 1.27% rise of GDP in long run. This result suggests for adopting OPEN as a policy tool to accelerate economic growth. On the other hand, our finding indicates that FDI is insignificant in the long run. The result of FDI has an indirect effect on economic growth in Malaysia for the data set. This indirect effect phenomenon may be due to the still high import content of our export products, thus giving a negative impact on economic growth in Malaysia. Our analysis also shows that GFCF has a statistically significant positive effect on economic growth and this result indicates that GFCF plays a significant role to stimulate economic growth in Malaysia.

**Table 4: VECM results for GDP determinants**

Variable	Coefficient	t-statistics
C	0.062395	1.49042
D(LN_OPEN)	-3.03963	-2.80680**
D(LN_FDI)	-0.274301	-3.69524***
D(LN_GDE)	0.040153	-0.11805
D(LN_GFCF)	0.001657	0.18173
ECM (-1)	-0.343895	-4.39863***

**Note:** \*\*\*, \*\*, \* indicate significant at 1% , 5% and 10% significance levels

The VECM approach shows that OPEN and FDI are important short run determinants of GDP. However, government development expenditure and gross fixed capital formation are statistically insignificant in affecting economic growth in the short run. Based on the VECM results, OPEN shows significant impact in the short run. However, the negative coefficient shows that Malaysia experienced exchange rate depreciation and total imports exceed total exports which has created negative trade balance positions in almost all the years covered in the study. The result suggests that OPEN is not correlated with economic growth in the short run for the data set. Openness can be painful for an economy and our result shows that a 1% increase in OPEN would lead to a reduction of about 3.3% in GDP in the short run. The result for FDI is significantly negative based on the VECM approach. This phenomenon may be due to FDI being not correlated to growth in the short run for Malaysia. The result is ambiguous for Malaysia and suggests that FDI has an indirect effect on economic growth for the data set. The result shows that a 1% increase in FDI would reduce GDP by about 0.27% in the short run. The variable GDE carries a positive sign in the short run which implies that a 1% increase in GDE would increase GDP by about 0.04%. On the other hand, the variable GFCF carries a positive sign in the short run which indicates that a 1% increase in GFCF would increase GDP by about 0.001%. Furthermore, the error correction coefficient, -0.343895 is statistically significant at the 1% significant level and with the expected sign. This also indicates that the correction adjustment speed is at a moderate speed which is about 34.4%.

## CONCLUSION AND POLICY RECOMMENDATIONS

The main objective of this study is to examine the effect of openness, foreign direct investment, government development expenditure and gross fixed capital formation on economic growth behavior in Malaysia. Based on our results, we found that openness, foreign direct investment, government development expenditure and gross fixed capital formation have a statistically significant impact on economic growth in the long run. Therefore, openness, foreign direct investment, government development expenditure and gross fixed capital formation are crucial components to achieve economic objectives. On the other hand, our short run analysis based on the VECM model found that only openness and foreign direct investment show a statistically significant result while government development expenditure and gross fixed capital formation are found to be insignificant. Meanwhile, the result of the Granger causality test show that there is a unidirectional causality running from openness to economic growth. This finding supports our expectation that openness may lead to economic growth and confirms that policies which promote openness are important in influencing economic growth. The Granger causality test result for foreign direct investment show that there is no relationship between foreign direct investment and economic growth for the data set. In addition, the result shows that there is a one-way causality running from economic growth to government development expenditure. The result for gross fixed capital formation shows that there is a unidirectional causality running from economic growth to gross fixed capital formation. This finding suggests that stability and higher economic growth in

Malaysia will influence gross fixed capital formation. The results also show that openness plays a major role in influencing the inflow of foreign direct investment, government development expenditure and gross fixed capital formation. Moreover, the results show that there is a one-way causality running from openness to foreign direct investment, to government development expenditure and to gross fixed capital formation. These findings suggest that trade openness leads to good macroeconomic performance, plays an important role in the development of any economy and is assumed to be an engine of growth.

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