

AN EMPIRICAL ANALYSIS ON THE RELATIONSHIP BETWEEN MACROECONOMIC FACTORS AND ECONOMIC GROWTH: EVIDENCE FROM MALAYSIA

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Abstract: *Malaysia is one of the most successful developing countries and is now on its way to becoming a developed country. Although Malaysia has experienced severe negative GDP growth, the country has proved to the world that they are capable of overcoming difficulties. This research looks on the relationship between economic growth and macroeconomic factors such as interest rates, inflation, foreign direct investment, and trade openness in Malaysia. Method of model estimation which is Ordinary Least Squares is employed in this study. The results show that only the relationship between inflation and economic growth is positive, while the relationship with interest rate, foreign direct investment, and trade openness is negative.*

Keywords: *interest rates, inflation, foreign direct investment, trade openness, economic growth, Malaysia*

Background of study

Malaysia is a successful developing country in Asia, which is moving towards the goal of becoming a developed country with its own model. Malaysia's economic model is shifting from an agricultural economy to a diversified one. According to the World Bank, manufacturing has developed a lot in recent years and its contribution to GDP is very high, accounting for 25% and more than 60% of total exports. The service sector has surpassed the largest sector, accounting for 54% of GDP. In addition, mining accounts for 9% of GDP. To guide Malaysia towards the Vision 2020, the Malaysian government has implemented many policies such as the 1970 New Economic Policy, the New Economic Model (NEM), Tenth Malaysia Plan (10MP), the Government Transformation Plan (GTP), and the Economic Transformation Plan (ETP).

Interest rate plays an important role in the economic growth of Malaysia. Interest rates have a significant impact on savings and investment, which further affects economic growth. Countries

with high savings rates grow faster than countries with low savings rates. During the period of interest rate targeting, monetary policy uses short-term interest rates to achieve its ultimate objective, namely, long-term sustainable economic growth, while maintaining price and financial stability (Karim and Karim, 2014). Besides that, inflation plays an important role in the economic growth. Low inflation and sustainable economic growth have been one of the main characteristics of the Malaysian economy. Moreover, trade openness plays an important role in the GDP growth of Malaysia. Athukorala (2010) argues that open economies are more exposed to external economic shocks due to international trade and finance. One of the engines of economic growth is trade openness. Malaysia's open economic status makes it one of the largest recipient countries of foreign direct investment, and the inflow of foreign direct investment has become an important factor affecting the country's economic development. Malaysia's open economic status makes it one of the most important recipients of foreign direct investment, and the entry of FDI has become an important factor affecting the economic growth of the country. More crucially, FDI can promote the transfer of knowledge, facilitate the development of human resources, encourage the establishment of new industries and products, encourage the introduction of new manufacturing processes and technologies, and promote the expansion of support services and research and development (R&D) (Osano and Koine, 2016).

For decades, economists have been researching GDP growth. The selection of determinants that impact GDP growth is still vague. A wide range of potential determinants can be used as explanatory variables. However, identifying specific variables that cause GDP growth is difficult. This could be due to a lack of data, distinct country characteristics, different time periods, or other factors. These commonalities make Malaysia the focus of this study. The purpose of the study is to investigate the relationship between economic growth and macroeconomic factors including Malaysia's interest rate, inflation, foreign direct investment (FDI), and trade openness. It is vital to figure out which of these four potential macroeconomic factors has the significant on economic growth of Malaysia. There is a substantial body of literature on this topic, and there is widespread concern in both theoretically and empirically, for a variety of reasons. This paper attempts to fill up the gap of the study by Samargandi, Fidrmuc and Ghosh (2015), which advocates for the inclusion of more macroeconomic variables affecting economic growth beyond financial development. Interest rate is crucial to promoting economic growth by increasing or decreasing the money supply. Furthermore, FDI is one of the determinants of economic growth that we should pay attention to. In addition, today, we live in a globalized world, and trade openness is an important aspect to consider because it will affect economic growth.

Literature Review

The Relationship between Interest Rate and Economic Growth

The relationship between real interest rates and economic growth was investigated by Bruce et al. (2013). Using sensitivity analysis and VAR estimates in their analysis, they found a moderate negative correlation between real interest rates and productivity, a measure of economic growth. This negative correlation means that the long-term costs of a period of low interest rates tend to be slightly offset by a period of high productivity growth. Instead, in an era of high interest rates, the long-term gains will be offset by low productivity growth (Jelilov, G., Waziri, F. and Isik, A., 2016). They also looked at the long-term predicted variability of trust fund accumulation and discovered that the negative correlation decreased the random interval's variability. Chughtai et al. (2015) used annual time series data from 1981 to 2013 to investigate the effect of interest rate on economic growth in Pakistan using a simple linear

regression model. Interest rates have a negative effect on economic growth, according to the findings. Lorytyer (2017) used the annual time series data from 1980 to 2015 to test the impact of interest rates on economic growth in Nigeria by using the Error Correction Model (ECM). Interest rates have a significant impact on economic growth.

The Relationship between Inflation and Economic Growth

Kasidi and Mwakanemela (2013) established the inflation-growth relationship when they studied the effect of inflation on economic growth in Tanzania from 1990 to 2011. The elasticity coefficient is used to determine the degree to which GDP changes in response to price level changes, and the correlation coefficient and co-integration technique are used to define the relationship between the two. Inflation has a negative effect on economic growth, according to the findings. It is also shown that there is no co-integration relationship between inflation and economic development during the study period, implying that there is no long-term relationship between the two in Tanzania. Umaru and Zubairu (2012) studied the effect of inflation on economic growth and development in Nigeria from 1970-2010. To determine the stationarity of variables and the course of causality, the unit root test and Granger causality test were used. However, all variables are found to be stable, with GDP causing inflation, but inflation not causing GDP. In addition, inflation stimulates the evolution of production and total factor productivity, which helps to boost economic growth. The study then concluded that policymakers should try to raise Nigeria's level of output by boosting productivity. This would help to lower the prices of goods and services, thereby boosting growth. It is believed that inflation can be minimized by increasing the level of output (GDP).

The Relationship between Foreign Direct Investment and Economic Growth

According to Silajdzic and Mehic (2015), FDI is thought to influence economic growth directly by promoting total fixed capital formation and indirectly by promoting information stock. Rather, FDI is projected to have a direct impact on economic growth in the conventional framework, as it is seen as a complement to domestic investment and a significant complement to the capital and investment shortfall. Further research reveals that FDI has a positive impact on the economic growth of developing countries through information spillover. Technology and innovation initiatives have been identified as key factors underpin growth performance (Silajdzic and Mehic, 2015). Similarly, Nistor (2014) discovered that FDI has a positive influence on the economy of the host countries, with different effects according on the area and region of foreign investment. Its impact is primarily determined by the quality and quantity of inflows. The findings indicate that FDI inflows and human capital development have a significant impact on the host country's economic growth (Fadhil & Almsafir, 2015).

The Relationship between Trade Openness and Economic Growth

In the literature on growth and development, the relationship between trade openness and economic growth is a contentious topic. The problem, however, is far from being solved. According to the theory of comparative advantage, if a country wishes to trade with another country, the latter will manufacture goods for which it has a comparative advantage. It focuses on industries with better factor endowments and larger- scale production. As a result, the sector's output and exports will rise, boosting overall economic growth. Other economists have further popularized this hypothesis. Kim et al. (2011) examined the relationship between trade growth in low - and high-income countries using the threshold regression method. Their findings reveal that in high-income nations, trade openness increases capitalization, financial development, productivity, and economic growth, whereas in low- income countries, the effects are negative and statistically significant. Hye, Wizarat and Lau (2016) used a new endogenous

growth model, the auto-regressive distributive lag model and the rolling window regression approach to determine the relationship between trade openness and economic growth in the long and short term. They conclude that there is a long-term negative correlation between trade openness and economic growth, and the rolling window regression results show that the influence of the trade openness index on economic growth is not stable across the sample.

Methodology

GDP growth is used as the dependent variable in this research. In addition, interest rate (IR), inflation rate (INF), foreign direct investment (FDI), and trade openness (TO) are among the selected macroeconomic factors as an independent variable. This study uses EViews 7 to analyze the collected data and determine the statistical link between variables (Ma et al., 2018). Ordinary least square method (OLS) is incorporated to analyze the data in this research..

Model Specification

$$Y = f_{30} + f_{31} X_1 + f_{32} X_2 + f_{33} X_3 + f_{34} X_4 + E_t \quad (1)$$

$$\text{Growth}_i = \beta_0 + \beta_1 \text{IR} + \beta_2 \text{INF} + \beta_3 \text{FDI} + \beta_4 \text{TON} + \varepsilon_i$$

Where:

Y = Growth = GDP

X1 = IR = Real Interest Rate

X2 = INF = Inflation

X3 = FDI = Foreign Direct Investment

X4 = TON = Trade Openness

β_0 is the constant term; $\beta_1 - \beta_3$ is the coefficient of each variable, ε is the error term.”

Findings

Regression Result

Table 1: Regression Analysis

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Interest Rate	-0.343495	0.095467	-3.598034	0.0009
Inflation	0.023269	0.174921	0.133028	0.8948
FDI	-4.36E-10	1.47E-10	-2.955549	0.0052
Trade Openness	-0.018787	0.012193	-1.540763	0.1311
Constant	9.936145	2.271294	4.374663	0.0001
Prob (F-statistic)	0.002113			
Durbin-Watson Stat	1.912226			

Regression equations are equations that represent linear relationships between variables, as shown in Table I. The estimated regression model:

$$\text{GDP} = \beta_0 + \beta_1 \text{IR} + \beta_2 \text{INF} + \beta_3 \text{FDI} + \beta_4 \text{TO} + \mu$$

$$\text{GDP} = 9.9361 - 0.3435 \text{IR} + 0.0233 \text{INF} - 4.36 \text{E-}10 \text{FDI} - 0.0188 \text{TO}$$

1. The Relationship between Interest Rate and Economic

Coefficient = -0.343495. This means that interest rates and economic growth have a negative correlation of 0.3435. Interest rates is negatively correlated with GDP growth.

2. The Relationship between Inflation and Economic Growth

Coefficient = 0.023269. This means that inflation and economic growth have a positive correlation of 0.0233. Inflation is positively correlated with GDP growth.

3. The Relationship between Foreign Direct Investment and Economic Growth

Coefficient = -4.36E-10. This means that foreign direct investment and economic growth have a negative correlation of 4.36E-10. Foreign direct investment is negatively correlated with GDP growth.

4. The Relationship between Trade Openness and Economic Growth

Coefficient = -0.018787. This means that trade openness and economic growth have a negative correlation of 0.0188. Trade openness is negatively correlated with GDP growth.

Diagnose Tests

1. Multicollinearity

The model is significant. As can be seen from the results, the P value is 0.0021, which is less than the significance level of 0.05. This research can conclude that all the independent factors are significant for economic growth (GDP growth) based on these findings. Because most t-tests are significant, the model has no multicollinearity. This also meets the F-test.

Table 2: Simple Correlation Coefficient

	Correlation				
	GDP	INTERSTR...	INFLATION	FDI	TRADE
GDP	1.000000	-0.388520	0.194088	-0.291625	-0.094279
INTER...	-0.388520	1.000000	-0.161192	-0.172145	-0.190147
INFLAT...	0.194088	-0.161192	1.000000	-0.094239	-0.275630
FDI	-0.291625	-0.172145	-0.094239	1.000000	-0.079958
TRADE	-0.094279	-0.190147	-0.275630	-0.079958	1.000000

By using the variance inflation factor:

H0 = The model has multicollinearity

H1: = The model has no multicollinearity

Decision Rule: If the value of correlation is below 0.95, reject H0. Else, do not reject H0.

Value of Correlation = all values of correlation are below 0.95

Decision Making: Reject H0, as all values of correlation are below 0.95.

Inference: There is plenty of sign to prove that the model has no multicollinearity.

Table 3: Variance Inflation Factor

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
Interest Rate	0.009114	2.022323	1.152621
Inflation	0.030597	2.908541	1.175534
Foreign Direct Investment	2.17E-20	1.125003	1.076672
Trade Openness	0.000149	17.73444	1.185333
C	5.158775	26.02193	NA

By using the variance inflation factor:

H₀ = The model has multicollinearity

H₁: = The model has no multicollinearity

Decision Rule: If the centered VIF is below 5, reject H₀. Else, do not reject H₀.

VIF = 1.1526, 1.1755, 1.0767, 1.1853

Decision Making: Reject H₀, as VIF are below 5.

Inference: There is plenty of sign to prove that the model has no multicollinearity.

2. Heteroskedasticity Tests

Table 4: Heteroscedasticity Tests

Heteroskedasticity Test: Breusch-Pagan-Godfrey test			
Null hypothesis: Homoskedasticity			
F-statistic	0.799623	Prob. F (4.41)	0.5325
Obs*R-squared	3.328861	Prob. Chi-Square (4)	0.5044
Scaled explained SS	12.92811	Prob. Chi-Square (4)	0.0116

H₀: The model is homoscedasticity

H₁: The model is heteroskedasticity

$\alpha = 0.05$

Decision Rule: If the P-value is below the significance level of 0.05, reject H₀. Else, do not reject H₀.

P-value = 0.5044

Decision Making: Do not reject H₀, as P-value is 0.5044, more than the significant level of 0.05.

Inference: There is not enough sign to prove that the model is heteroscedasticity, that is, that the model is homoscedasticity.

3. Serial Correlation

H0: The model is serial correlation

H1: The model is no serial correlation

Range = 1.7 to 2.3

Decision Rule: If the Durbin-Watson Statistic is lie in the range of 1.7 to 2.3, reject H0. Else, do not reject H0.

Durbin-Watson Statistic = 1.912226

Decision Making: Reject H0, as Durbin-Watson statistic is 1.912226, lie in the range of 1.7 to 2.3.

Inference: There is enough sign to prove that the model is no serial correlation.

Summary of Statistical Analysis

Table 5: Summary of Findings

Test	Consequence	Expected Relations
Interest Rate and Economic Growth	Negative	Negative
Inflation and Economic Growth	Positive	Negative
Foreign Direct Investment and Economic Growth	Negative	Positive
Trade Openness and Economic Growth	Negative	Positive

Conclusion

This research investigates the impact of macroeconomic factors, such as interest rates, inflation, foreign direct investment, and trade openness, on economic growth in Malaysia using OLS multiple regression analysis. Through multiple linear regression estimation, there was a significant negative correlation between interest rates and economic growth in Malaysia. Nevertheless, the consequence of Foreign Direct Investment was significant and negatively correlated with economic growth, which was contrary with our expectations. The inflation results were insignificant and positively correlated with economic growth, contrary to our assumptions. Trade openness also contrary to our expectations, it was not significant and there is a negative correlation, indicating that GDP was not affected by the trade openness variable. Policymakers will benefit from the study since it identifies significant variables, such as interest rates and foreign direct investment, that can be used to alter the impact of economic growth in Malaysia. It is highly encouraged that future researchers can carry out similar studies and need to include data from other countries. The results will be more useful for reference in other nations if the economic conditions of different countries are compared. This will effectively assist government in identifying the important factors that are likely to influence economic growth. They can strengthen their policies to ensure that the economy develops gradually by reducing the unpredictability of economic movement.

References

- Athukorala, P.C., 2010. Malaysian economy in three crises(No. 2010-12).
- Bruce, E., Ananth S., and Hansen, 2013. Uncovering the relationship between real interest rates and economic growth, Ann Arbor MI: University of Michigan Retirement Research Centre (MRRC).
- Chughtai, M. W., et al., 2015. Impact of major economic variables on economic growth of Pakistan. *Acta Universitatis Danubius: Oeconomica*1, 1(2).
- Fadhil, M. and Almsafr, M. 2015. The role of FDI inflows in economic growth in Malaysia (Time Series: 1975-2010). *Procedia Economics and Finance*. 23. pp.1558-1566.
- Hye, Q.M.A., Wizarat, S. and Lau, W.Y., 2016. The impact of trade openness on economic growth in China: An empirical analysis. *The Journal of Asian Finance, Economics, and Business*, 3(3), pp.27-37.
- Jelilov, G., Waziri, F. and Isik, A., 2016. Interest rate behaviour and its relationship with economic growth in Nigeria: an error correction model approach. *The Empirical Economics Letters*, pp.245-255.
- Karim, Z.A. and Karim, B.A., 2014. Interest rates targeting of monetary policy: An open economy SVAR study of Malaysia. *Gadjah Mada International Journal of Business*, 16(1), pp.1-23.
- Kasidi, F and Mwakanemela, K., 2013. Impact of inflation on economic growth: A case study of Tanzania. *Asian Journal of Empirical Research*, 3(4), pp.363–380.
- Kim, D.H., Lin, S.C. and Suen, Y.B., 2011. Nonlinearity between trade openness and economic development. *Review of Development Economics*, 15(2), pp.279-292.
- Lortyer, A.I., 2017. Interest rate behaviour and the Nigerian economy: An ECM Approach, *JORIN*, 1596-8303.
- Ma, L., Hu, C., Lin, R. and Han, Y., 2018, December. ARIMA model forecast based on EViews software. In *IOP Conference Series: Earth and Environmental Science* (Vol. 208, No. 1, p. 012017). IOP Publishing.
- Nistor, P. 2014. FDI and economic growth, the Case of Romania. *Procedia Economics and Finance*, 15, pp.577-582.
- Osano, H.M. and Koine, P.W., 2016. Role of foreign direct investment on technology transfer and economic growth in Kenya: a case of the energy sector. *Journal of Innovation and Entrepreneurship*, 5(1), pp.1- 25.
- Samargandi,,N. Fidrmuc, J. and Ghosh, S., 2015. Is the relationship between financial development and economic growth monotonic? Evidence from a sample of Middle-Income Countries, *World Development*, 68(C), pp66-81.
- Silajdzic, S. and Mehic, E. 2015. Knowledge spillovers, absorptive capacities and the impact of FDI on economic growth: Empirical evidence from transition economies. *Procedia Social and Behavioral Sciences*, 195, pp.614–623.
- Umaru, A. and Zubairu, A.A., 2012. Effect of inflation on the growth and development of the Nigerian economy (An empirical analysis). *International Journal of Business and Social Science*, 3(10).