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Analysis of Malaysia's Economic Relations

Xinwei Fang[1,a,*]

[1]*Rotman Commerce, University of Toronto, Toronto, ON M5S 1A1, Canada*
a. xinweifang59@gmail.com
**corresponding author*

Abstract: The paper examines the economic relations in Malaysia over the past 25 years, focusing on the relationship between real Gross Domestic Product (GDP) and inflation rate change, as well as the relationship between real GDP growth rate and unemployment rate change. Using data from the World Bank from 1998 to 2022, the study employs Phillips curve analysis to understand the impact of the output gap on inflation and Okun's law analysis to explore the connection between economic growth and unemployment. The findings reveal a weak correlation between real GDP growth and inflation rate change in Malaysia, suggesting the need to consider additional factors such as money supply and international market dynamics in economic analysis. Nevertheless, there is a strong negative correlation between the growth rate of real GDP and the change in the unemployment rate, suggesting that an increase in economic activity leads to a decrease in the unemployment rate. These insights can inform policymakers in Malaysia in formulating effective economic policies to maintain stable growth and employment rates.

Keywords: Malaysia, Economic Relations, Phillips Curve, Okun's Law, GDP Growth.

1. Introduction

This paper aims to explore the relationship between Malaysia's real gross domestic product (GDP) and inflation rate change, real GDP growth rate and unemployment rate change by analyzing the data of Malaysia for the last 25 years. Malaysia, as a developing country in Asia, has been comparatively healthy in economic structure, growing steadily since 1990 and maintaining a stable GDP per capita growth rate. The Phillips curve investigated the relationship between two key macroeconomic variables of monetary policy, comprising inflation and the output gap, which is defined as the difference between actual output and potential output. The study is crucial for Malaysia as it allows for the analysis of the impact of the output gap on inflation and provides a range of options for the government to set targets that optimize economic performance. Okun's law focused on the relationship between the two variables of output and unemployment, analyzing the connection between unemployment and the real rate of economic growth. The study helps to monitor the economic health of Malaysia, provide reliable forecasts of future economic and labor market developments, and provide insights into the country's economic policy decisions.

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2. Data Sources and Description

2.1. Data Acquisition

The data used in this paper come from the World Bank, a highly regarded international financial institution. All data were selected to span a 25-year period from 1998 to 2022, providing a reliable dataset for analysis. For the GDP deflator inflation, the specific indicator used is "Inflation, GDP Deflator - Malaysia" from the World Bank database [1]. The GDP deflator inflation rate measures the percentage change in the prices of all domestically produced goods and services, making it an important indicator for assessing inflation trends in an economy. The data source chosen for the unemployment rate is "Unemployment, Total (% of total labor force) (modeled ILO estimate) - Malaysia" from the World Bank's database [2]. The International Labor Organization's unemployment estimates provide a standardized and internationally comparable measure of unemployment across countries, ensuring consistency and comparability in assessing global labor market conditions. The real GDP data utilized is "GDP (constant LCU) - Malaysia," also sourced from the World Bank database [3]. The indicator measures GDP in local Malaysian currency and uses a fixed base year inflation-adjusted GDP, which allows for a more accurate assessment of the real output of goods and services in the Malaysian economy. This adjustment reduces the distorting effects of price fluctuations, thereby facilitating a more accurate analysis of real economic growth or contraction over time.

2.2. Data Explanation and Assumption

The GDP deflator inflation rate measures the percentage change in the prices of all domestically produced goods, which services as a broad measure of inflation in an economy. The unemployment rate represents the percentage of the total labor force that is not employed but is actively seeking employment, which is a comprehensive measure of labor market conditions and labor force participation in Malaysia. Real GDP is a measure of the value of goods and services produced in an economy, adjusted for inflation to reflect changes more accurately in economic output over time. All data used in the analysis were searched through publicly available databases to ensure the completeness of the data without any missing values. Therefore, no assumptions were made about the data portion of this paper.

3. Phillips Curve Coefficients Analysis

The analysis carried out involved the estimation of coefficients in a specific version of the Phillips curve, which measures the relationship between changes in GDP deflator inflation and real GDP [4] The calculation of the change in the inflation rate, based on 26 years of inflation data, reveals significant dynamics. The largest change occurred between 2008 and 2009, with a significant drop of almost 16%. By using the Microsoft Excel LINEST function, the slope coefficient (b) is estimated to be 0.00095 and the intercept (a) has a value of approximately -0.79, as shown in Table 1. The value of the slope is a small positive number close to zero, indicating that real GDP has a very small impact on changes in inflation in this Phillips curve equation. Meanwhile, the negative intercept value indicates that there is an initial negative correlation between real GDP and changes in inflation when real GDP is zero. The complete statistical results are detailed in Table 1.

Table 1: LINEST Regression Output for Philips Curve

	Coefficients		
	Slope - b	***Intercept - a***	

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Table 1: (continued).

	0.000945	-0.787727285	
Standard Errors =	0.004058	4.0883852186	
R^2 =	0.002353	6.2789360724	
F =	0.054255	23	= ***Degree of Freedom***
	2.139024	906.77587864	
	SSE	SSR	
t-statistics =	0.232928028	-0.192674428	

3.1. Standard Phillips Curve Elaboration

Based on the above-known Phillips Curve equation ($\pi_t - \pi_{t-1} = a + bYt$), the transformation by algebra gets the value of alpha to be the same as the value of the slope, with a value of nearly 0.00095, as shown in Table 2. The value of the natural level of output is around 833.31 billion. The positive value of alpha, which is used to measure the response of changes in inflation to deviations of real GDP from its natural level, is very small. This indicates that when real GDP exceeds its natural level, inflation also rises, reflecting the positive correlation between the two variables. Nevertheless, given the minimal value of the alpha coefficient, the actual change in inflation reflected in real GDP is similarly insignificant [5]. The calculated natural level of output represents the level of real GDP at which inflation corresponds to full employment and stable inflation in the economy. This is the equilibrium level of output in the economy. It is widely acknowledged that the Malaysian economy boasts a robust productive capacity, with a natural output rate situated within the upper middle range, indicative of a commendable level of productive capacity and economic equilibrium.

Table 2: Standard Phillips Curve

Alpha (α)	b	0.000945
Natural level of output (Y-bar in billions)	-a/b	833.309042

3.2. Analysis of Phillips Curve in Malaysia

The theoretical expectations in this paper are found to be partially inconsistent with the actual results. Malaysia, a developing country in Asia, does not demonstrate a linear relationship between GDP growth and inflation rate. The data indicates that the correlation between real GDP and inflation in Malaysia is notably weak, approaching zero. This indicates that the growth of real GDP does not exert a significant influence on the fluctuations of the inflation rate. Conversely, the inflation rate typically rises in tandem with GDP growth. Though the real GDP cannot be used as an absolute measure of inflation, it is an important indicator that can capture inflation [6]. This is because an increase in real GDP is indicative of an increase in economic activity, which in turn leads to an increase in consumption, investment, and exports [4]. This, in turn, stimulates price increases.

In addition, the expansion of economic output may also elevate the probability of rising production costs, including labor costs and raw materials costs. These cost increments may be transmitted to product prices, thereby exerting an inflationary influence. If the money supply expands at an accelerated pace during the course of economic growth, resulting in an excess supply of money, it will consequently exert upward pressure on the price level. Meanwhile, economic growth too fast will lead to an unbalance between demand and supply, and there will be an oversupply of goods in the consumer spending field, which will lead to inflation [7]. According to the information in Table 1, the R-squared value of this model is around 0.0024, which represents that the difference between

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real GDP and natural level of output is limited in explaining the inflation changes in this model, and the model cannot explain the variability in the dependent variable properly. The standard error of the slope is close to zero, which indicates that the estimate of the slope is relatively stable in the model and has a more significant effect on the dependent variable.

However, the standard error of the intercept is considerable, approximately 4.1, which indicates a certain degree of uncertainty in the estimation of the intercept. The F-statistic of the model is approximately 0.05, indicating that the entire model is not statistically significant. This implies that the relationship between real GDP and inflation is not sufficiently robust to explain the observed changes in inflation [8]. This may suggest that other factors may be influencing inflation, which should be considered in future models. Moreover, the t-statistic values for the slope and intercept are 0.23 and 0.19, respectively, which are relatively low. This indicates that the coefficients of the slope and intercept in the model are less reliable as explanatory variables and that their estimates are not significant. Consequently, additional data and model adjustments may be necessary to enhance the reliability and statistical significance of these coefficients.

4. Okun's Law Coefficients Analysis

The analysis conducted consisted of the estimation of Okun's law coefficient, which measures the negative correlation between the real economic growth rate and the change in the unemployment rate [9]. By using 26 years of unemployment and real GDP data, get the change in the unemployment rate and the real GDP growth rate for 25 years. The largest change in the unemployment rate occurs from 2019 to 2020 with an increase of 1.28%.

The Microsoft Excel LINEST function was employed to estimate the slope coefficient (b), which yielded a value of -0.41. This indicates a negative correlation between the change in the unemployment rate and the GDP growth rate. The estimated value of the intercept is approximately 0.41, representing the baseline level of the change in the unemployment rate in addition to the real GDP growth rate. The complete statistical results are presented in Table 3.

Table 3: LINEST Regression Analysis for Okun's Law

	Coefficients		
	Slope - b	***Intercept - a***	
	-8.411040575	0.405960817	
Standard Errors =	1.204658891	0.068707606	
R^2 =	0.679440831	0.228031506	
F =	48.74962458	23	***=Degree of Freedom***
	2.534900903	1.195962457	
	SSE	SSR	
t-statistics =	-6.982093138	5.908528078	

4.1. Standard Okun's Law Elaboration

Based on the equation of Okun's law equation known above $(\pi_t - \pi_{t-1} = -\beta\left(g_{yt} - g\right))$, the value of beta obtained by using algebraic transformation is equal to the value of slope but of the opposite sign with a value of approximately 8.41, as shown in Table 4. The size of the beta is relatively large, which indicates a strong negative relationship between the difference in real GDP growth rate and estimated natural real GDP growth rate and unemployment changes [6][10]. When the real GDP growth rate increases, unemployment rate changes tend to decrease significantly. While g represents the baseline level of GDP growth rate that is not explained by the change in the unemployment rate,

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with a value of nearly 0.048, as shown in Table 4. This indicates that even if there is no change in the unemployment rate, there exists a positive change in the GDP growth rate [7]. Malaysia is an emerging quasi-developed country in Asia, its real GDP has been growing steadily in years.

Table 4: Standard Okun's Law

Beta (β)	-b	8.411040575
g	-a/b	0.048265231

4.2. Analysis of Okun's Law in Malaysia

This result is consistent with my theoretical expectation as it is a common phenomenon based on historical cases. The unemployment rate will continue to fall after other indicators of economic activity turn positive [8], and Malaysia's data also represents a strong negative correlation between its output and unemployment rate. The growth of the output depends on the supply of labor, labor productivity, and capital, thus there exists a positive relationship between output and employment. When output increases, it will require more labor to perform the production, which will lead to more jobs for people, thus reducing the unemployment rate [7]. According to Table 3, the value of the R-squared of this model is nearly 0.68, which indicates that the real GDP growth rate in the model can explain 68 percent of the change in the unemployment rate, which is relatively high and demonstrates that the model has a high predictive power, the standard error of the slop and intercept in the model are both small, implying that the coefficients are estimated reliably. The value of F-statistics is about 48.75, a large F-statistic represents that the model is statistically significant in explaining the changes in the dependent variables. Significantly, the absolute values of the statistics of this model coefficients for both the slope and the intercept are relatively large, approximately 6.98 and 5.91 respectively. This suggests that the estimate of the model coefficients is significant concerning the standard errors and that both the slope and the intercept have a significant effect on the unemployment changes in Malaysia, which makes it an explanatory and reliable model.

5. Conclusion

Analyzing the data model of Malaysia indicates that Malaysia's real GDP and inflation change have a weak positive correlation to zero, which implies the impact of real economic growth on inflation is not significant in Malaysia. In this regard, it is necessary to consider other factors such as money supply, investment in different sectors, and the impact of the international market to have a more accurate understanding of the economic performance. In addition, it is also crucial to focus on other factors affecting inflation, such as the international trade situation and the supply of commodities, to formulate policies with more comprehensive information. Meanwhile, there is a strong negative correlation between the real GDP growth rate and unemployment rate changes in Malaysia, which represents that the increase in economic activities can promote employment growth, and the government can get insights from it and take measures to support economic growth and create more employment opportunities. This finding can be useful to Malaysia as an important basis for policy evaluation and adjustment, where the government can monitor the trend of real GDP growth rate and unemployment rate and adjust policy measures promptly to maintain stable economic growth and a desirable national employment rate.

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