

Unemployment and Economic Growth: An Empirical Verification of Okun's Law in Malaysia

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Abstract

The study investigates the nexus of the unemployment rate and the economic growth and also to verify the existence of Okun's law in Malaysia. Annual time series data was used spanning from 1980 to 2020 and the data were obtained from the international monetary fund (IMF), world bank data bank and Department of Statistics Malaysia. Since unemployment was not stationary at level, an ARDL bound test was used to test the relationship. The findings show that unemployment is negative and has a long-run relationship to GDP, but FDI is positively related and has a both long-run and short-run relationship with GDP. As a result, the study revealed that there is a correlation between unemployment and Malaysia's economic growth. Finally, Okun's law was determined using the granger causality test, which was used to ascertain the causal relationship between unemployment and economic growth. The outcome demonstrates that there is only one way causal relationship which, unemployment causes the variation in economic growth, confirming Okun's law applicability. The government should put in place policies that will drive unemployment down in order to achieve growth in the economy and encourage foreign direct investment.

Keywords: Unemployment, Economic Growth, Foreign Direct Investment, Ordinary Least Squares (OLS), Autoregressive Distributed Lag (ARDL)

Introduction

Unemployment occurs when there is a lack of available jobs in a country, leaving a portion of the labor force without jobs, this directly or indirectly affects an economy by reducing the output of that economy. Jonathan (2009), An inability to find work although it is actively sought. Okun's law shows that unemployment and economic growth have a negative relationship, though many economists have tried to find out the viability of this theory and found that this theory does not apply to all countries, it is found out that not all countries' unemployment rates affect economic growth either directly or indirectly. This variation is caused due to many factors like structural unemployment and so much more. In this study we seek to find out the effects unemployment rate has on the Malaysian economy. The year 1973 and 1974 were exceptional years that Malaysia experienced inflation. This was due to the rise in oil prices as it was not only the Malaysian economy that was affected, but all over the world. In early 1973, the main course of inflation was the shortage of food and raw materials followed by increase in oil prices at the end of the year 1973. This caused the Malaysian economy to experience an all-time high inflation, recorded at 17.29%.

Overview of Unemployment Rate

Based on the report published by the Department of Statistics Malaysia (DOSM), the unemployment rate in January 2021 increased moderately from 4.8 percent in December 2020 to 4.9 percent in January 2021. The reintroduction of the Movement Control Order (MCO) in most states, with only five important economic sectors permitted to work and inter-state and inter-district travel activities limited, resulted in an unequal recovery momentum for companies and the employment rate. However, the statistics based on the labour force survey, showed that the increase in employed people was much higher than the increase in unemployed people (The Malay Mail, 2021). This indicates that business demand for labour has improved.

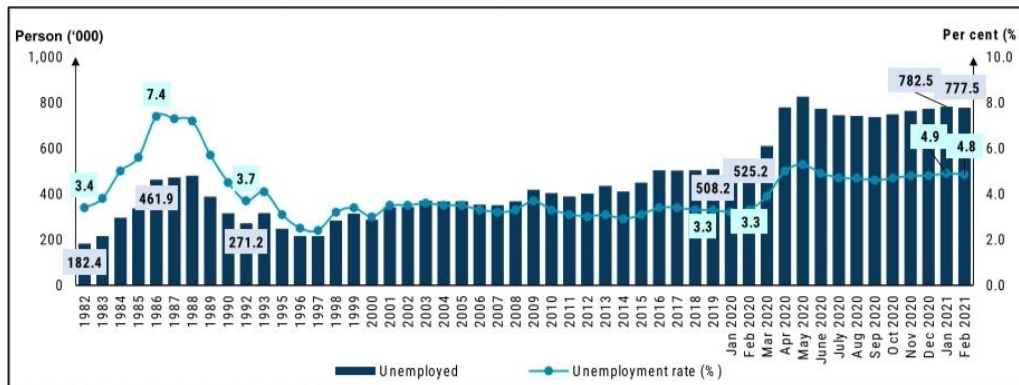


Figure 1: Unemployment Rate in Malaysia, 1982-2021

Source: Department of Statistics Malaysia, DOSM

Figure 1 shows total number of unemployment and also unemployment rate in Malaysia from 1982 to 2021(February). The highest unemployment rate was from 1986 to 1988 where the rates is about more than 7 percent. The rate of unemployment then keeps declining and finally achieved around 3 percent of unemployment rate (full employment). For almost three decades Malaysia maintain her full employment rate from (1990 to 2020). However, due to the pandemic Covid-19 and implementation of movement control order (MCO) starting 18 March 2020, the unemployment rate had immediately increased to almost 5 percent. Recent report by Department of Statistic Malaysia highlight that the unemployment rate as at June 2021 were still at 4.8 percentage involving 768,700 persons unemployed.

Overview of Current Economic Growth in Malaysia

According to a report by the International Monetary Fund, Malaysia's economic growth is expected to rebound in 2021, an increase of 6.5 percent, driven by the strong recovery in construction and manufacturing. The recovery of various industries will be inconsistent, depending on the improvement of external and internal demand. The current account surplus is also expected to shrink as the demand for pandemic-related goods diminishes and local demand rises, therefore, inflation will return to 2 percent. Malaysia's economy approached the pandemic in a good position, but has been hit particularly hard (Murugiah, 2021). Bank Negara Malaysia (BNM) highlighted that in the second half of 2020, the global economy plans to continue its slow and unstable recovery journey in 2021. Due to pandemic of Covid-19, the development especially the launch of vaccination, the continued structural changes in the economy, and the degree of the scarring effect of unemployment in the labor market, will continue to shape global growth prospects. Figure 2 shows the historical trend of Malaysia's GDP growth from quarter one 1995 to quarter one 2021. The trend indicates that the pandemic of Covid-19 gives a huge impact to the Malaysian economic compare to the financial crisis in 1998.

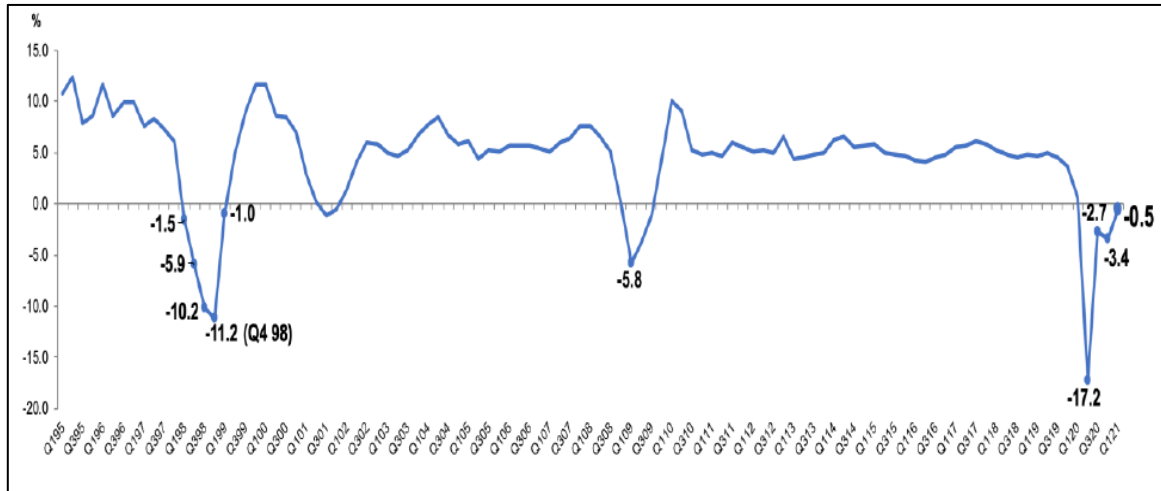


Figure 2: Malaysia's GDP Growth (1995: Q1 – 2021: Q1)
Source: Department of Statistics Malaysia, DOSM

Okun's Law

Okun's Law was put forward by Arthur Okun. It provides an important concept for macroeconomic issues and has been extensively studied in economic literature. He stated that there should be a significant negative correlation between a country's unemployment rate and GDP growth rate. The essence of the rule of the thumb for Okun's Law is that to observe the relationship between the changes in the unemployment rate and the growth rate is GDP. According to Jin & Harper (2019), mentioned that the law suggested that there should be a negative relationship between the changes of growth rate in GDP and the unemployment rate. From a numerical point of view, the law shows that a 1% drop in the rate of unemployment, may lead to an increase in GDP growth rate by 2 percent. In recent years, many studies have been conducted to verify the validity of the proposed nexus between changes in the GDP growth rate and unemployment rate, but the findings are still undetermined.

Therefore, this study aims to investigate the nexus between both unemployment rate and economic growth, and also to study the impact of the unemployment towards economic growth in Malaysia. The study works towards providing answers that have long term effects to the economy, by finding out solutions to increase the economic growth and also mainly to find out what type of causal relationship between unemployment and economic growth. Thus, the main objective of this study is to examine the effect of unemployment has on economic growth and to investigate whether the Okun's Law applies to the Malaysian economy. The aim of this research is to investigate how economic growth in Malaysia is impacted by unemployment rate in order to recommend possible solutions to minimize the effects on economic growth of Malaysia.

Literature Review

The Theoretical Framework of Okun's Law

When discussing the theoretical framework of Okun's law, it is necessary to comprehend the different methods that Okun used in his papers. Based on his main findings, a 1 percent incremental in output is related to a 3 percent declining in the unemployment rate. Meanwhile, an increase 1 percent in the unemployment rate is related to a decrease in output growth by 2 percent. The framework is based on two methods: (1) the difference method and (2) the gap method. In this section, we will introduce these methods and the theoretical basis they follow.

The difference method

First, Okun defines the difference model as the effect of the percentage change in the actual growth rate within a predetermined period of time on the percentage change in the unemployment rate over the same period. This assumption can be expressed mathematically as follows:

$$\Delta U_t = \alpha + \beta \Delta \log Y_t + \Delta \varepsilon_t \quad (1)$$

Where Δ represents the absolute change in the previous period, α represents the constant, β represents the Okun coefficient, U_t is the unemployment rate in period t , Y_t is the output growth rate (because we discussed the percentage change, so logarithm) and ε_t is the error term. The higher the intercept value, the more difficult it is to reduce unemployment, or stronger growth is needed to prevent more unemployment.

The gap method

The idea behind this approach is to establish a link between the unemployment rate and the gap between potential and actual output. Okun states this fact as follows: "If the total demand is low, there will be no potential GNP, there is unrealized potential or there is a gap between actual output and potential output". Marth & Stefan (2015) assumes that there are potential levels of output, employment, and natural unemployment. According to Okun, the production capacity of a country determines the potential output. If it changes, it is due to technological change or factor accumulation. The long-term employment level and natural unemployment rate are determined by the labor force scale and labor market friction. It is better to measure the potential output and unemployment rate as accurately as possible, rather than assuming that the equilibrium unemployment rate and potential growth rate remain unchanged.

$$E_t - E_t^0 = Y(Y_t - Y_t^0) + W_t \text{ with } Y > 0 \quad (2)$$

Where E_t indicates the logarithm of employment, Y_t indicates the logarithm of output, U_t represents the unemployment rate, which symbolizes the potential level.

Empirical studies

Anning et al. (2017) investigated the impact of inflation and unemployment on Iraq's economic growth. Considering that most of the research on the Phillips curve is concentrated in developed economies, the Iraqi economy is used in the survey because it is a developing economy. Their research results show that there is an equilibrium relationship between unemployment and inflation in the economy, supporting the applicability of the Phillips curve hypothesis. Mohseni and Jouzaryan, (2016) studied the effects of unemployment and inflation on Iran's economic growth, as well as the long-term and short-term relationship, and found that there is a negative inflation and unemployment relationship on Iran's economic growth in both the long-term and the short-term.

There is also study done by Ademola and Badiru (2016) focusing the impact of inflation and unemployment on Nigeria's economic growth, using ordinary least squares OLS estimates, and found that unemployment and inflation have a positive correlation with Nigeria's economic growth. In addition, the findings are due to Nigeria's dependence on crude oil. Yelwa et al, (2015) also studied the relationship between unemployment, inflation, and economic growth in Nigeria's economy. The results using OLS estimates show that in the long run, interest rates and total expenditure have a significant impact on growth, while inflation and unemployment have a negative impact on Nigeria's economic growth.

Shahid, (2014) used the Autoregressive Distribution Lag (ARDL) method to examine the impact of inflation and unemployment on economic growth in Pakistan from 1980 to 2010. The results show that there is a long-term relationship between inflation and unemployment in the Pakistani economic group. While Makaringe et al. (2018) used quarterly data to estimate the ARDL model and investigated the trend and impact of unemployment in South Africa on economic growth, the results showed that there is a long-term relationship between the unemployment rate and economic growth in South Africa.

Bayar, (2014) also used quarterly data to examine the relationship between unemployment, economic growth, exports, and foreign direct investment (FDI) inflows in Turkey by applying the ARDL boundary test in the estimation to find a long-term relationship between unemployment and economic growth. His study concludes that there is a long-run relationship between unemployment, economic growth, export, and FDI inflows in Turkey. Study done by Iloabuchi, (2019) also investigated the impact of unemployment on Nigeria's economic growth, using data from 1999 to 2017. The OLS results show that there is a correlation between economic growth and unemployment, while the causality test shows that there is no causal relationship between unemployment and economic growth. The survey results show that there is a negative and insignificant correlation between unemployment and economic growth in Nigeria.

Dankumo et al. (2019) tried to find out the applicability of Okun's Law in Nigeria. They used data spanning from 1996 to 2017 in order to examine the impact of unemployment towards economic growth and used the ARDL model and the result indicates that there is a long-run relationship between unemployment, economic growth corruption and political instability. The findings indicated that Okun's law is not applicable to the Nigerian economy. Study by Suleiman et al., (2017) investigated the impact of unemployment on Nigeria's economic growth. The study used co-integration tests and dynamic ordinary least squares (DOLS). The DOLS results is contradict with the theory where it shows that unemployment has a positive effect on economic growth, However, the effect was not significant during the study period. There is also a unidirectional relationship between economic growth and unemployment in the country.

Ball et al, (2017) investigated the fit of Okun's law at 50, the result indicated that Okun's law in most countries has a strong relationship and is fairly stable over time. also, found that the coefficient i.e., 1% change in growth results in 3% change in the unemployment rate, varies substantially across countries, they stated that the variation is mostly due to idiosyncratic features of the labor market across nations. (Zanin 2014) the study focuses on OECD countries by studying estimates for male and female age cohorts with the time span of 1998-2012 the study found that the Okun's coefficient is not always significance for each subgroup and found a common pattern of higher Okun's coefficient for the youngest subgroup. This investigation concluded that the young population is more exposed to business circles in the OECD countries.

Methodology

Time series variables will be used for the purpose of this research, it is mandatory to examine and confirm the presence of multicollinearity, homoscedasticity and autocorrelation in the variables, to avoid spurious regression in model estimation. In the following, Ordinary Least Square (OLS) estimators will be used to investigate the relationships between economic growth and unemployment, where economic growth is the dependent variable in the model. If there is absence of multicollinearity, autocorrelation and presence of homoscedasticity in the data, then we move ahead to conduct our estimation. if any is found in the data, then the data will be corrected and used. To determine the applicability of Okun's law in the study interest, we will

test the formula for the Okun's law.

The multiple linear models used in this study is specified below with four variables among which one is the dependent variable, and RGDP is used as a proxy for economic growth. The model is specified as a functional form as follows:

$$RGDP = f(Unempl, FDI) \quad (3)$$

Where *RGDP* is the Real Gross Domestic Product, *Unempl* indicates Unemployment rate and *FDI* indicates Foreign Direct Investment.

The model is specified of its stochastic form:

$$gdp_t = \beta_1 + \beta_2 Unempl_t + \beta_3 fdi_t + \mu_t \quad (4)$$

Where *gdp* indicates the GDP growth rate, *Unempl* indicates the rate of unemployment and *fdi* indicates Foreign Direct Investment. β_1 , β_2 and β_3 - Parameters and μ indicates the Error term (white noise). The priori expectations are as follows: $\beta_1 > 0$, $\beta_2 > 0$ and $\beta_3 > 0$ (i.e β_1 β_2 β_3 are non-negative values).

The dataset used for this study comprises of three (3) variables. The main variables consist of unemployment rate and GDP growth rate as a proxy for economic growth, while the control variable represent by FDI variable (See Dinh, et al 2019 and Othman et al., 2018). The data from 1980 to 2020 were used for the analysis and the time period in the form of annual basis is selected for this research. The data used in this study are gathered mainly from two sources which are from the Department of Statistics Malaysia and World Bank.

Results and discussion

The data gathered in this study includes GDP growth, unemployment rate, and data for foreign direct investment (FDI). Table 1 shows the descriptive statistics of the data uses for this analysis.

Table 1: Descriptive Statistics

STATISTICS	UNEMPL	FDI	GDP
Mean	0.0389	0.0384	0.0578
Standard Error	0.0018	0.0028	0.0054
Median	0.0344	0.0351	0.0594
Std. Dev.	0.0120	0.0180	0.0346
Sample Variance	0.0001	0.0003	0.0011
Kurtosis	2.8254	1.0491	4.4289
Skewness	1.8174	0.5822	-1.7064
Range	0.0495	0.087	0.1736
Minimum	0.0245	0.0006	-0.0736
Maximum	0.074	0.0876	0.1
Sum	1.5958	1.5763	2.3708
Observation	41	41	41

Source: Author's Eviews Computation

Descriptive statistics are used to summarize the fundamental characteristics of collected data. They provide concise summaries of the sample and measures. FDI is normally distributed as seen from the probability of Jacque Bera. The general principle stated that if the probability is greater than 10%, we reject the null hypothesis (H_0) and if the probability value is less than 10%, we fail to reject H_0 concluding that the Jarque-Bera probability in our observed data is normally distributed.

Unit Root Test

The result shows in the Table 2 indicates that, all the variables are non-stationary at level but become stationary in the first differences. Therefore, this result shows that all the variables are integrated with the same order of integration.

H_0 ; there is a unit root (series is nonstationary)

Table 2: unit root table

Variables	Level		First Difference	
	C	C & T	C	C & T
Unempl	0.4143	0.6662	0.0012	0.0073
Fdi	0.0395	0.1128	0.0000	0.0000

Source: Author's Eviews Computation

Notes: C represent Intercept and T represent Trends

When dealing with time series, it is necessary to judge whether the series is stable. The unit root test tests whether the time series variable is non-stationary and has a unit root. This is because the regression of non-stationary series to other non-stationary series will lead to false regression, which leads to differences in parameter estimates. The above unit root table shows that not all the variables are stationary at level, *Unempl* has a P value for both intercept and trend and intercept of 0.4143 and 0.6662 which in dictates that the variable is not stationary at level due to the P value higher than 0.05, but at first difference the *Unempl* becomes stationary. While for *FDI* the variable is stationary at level but only intercept, for trend and intercept the P value is greater than 0.05.

Estimated Short-Run Analysis

Results in Table 3 indicate the short-run relationship between the variables using the Error Correction Model Cointegration test.

Table 3: Error Correction Model Cointegration test

Variables	Co-integration Form			
	Coefficient	Std. Error	t-Statistics	P value
D(<i>Unempl</i>)	-1.496825	0.852400	-1.756011	0.0896**
D(<i>FDI</i>)	1.055411	0.282065	3.741719	0.0008*
Coint.Eq(-1)	-1.571693	0.220713	-7.120959	0.0000*

Notes: the asterisks (*) and (**) represent statistically significant at 1% and 5% level of significance respectively.

Source: Author's Eviews Computation

The short-run estimates in the table above signifies that there is a strong short-run relationship between *GDP* and *Unempl* at 10% level of significance, while *GDP* and *FDI* also have a strong short-run relationship at 5% level of significance. The cointegration equation (Coint.Eq(-1))

that evaluates the speed of adjustment between short-term imbalance (actual) and long-term equilibrium (expected) has the correct sign and is statistically significant at the 5% level of significance. According to the estimated coefficient, if the correct policy measures are taken, in the case of short-term imbalances, a long-term correction requires a speed of 1.6 year.

Robustness Check

In this section, the necessary tests have been conducted to detect the presence of autocorrelation and heteroskedasticity. The serial correlation LM test proposed by Breusch Godfrey was used to investigate the presence of serial correlation. The heteroskedasticity test by Breusch pagan was used to investigate the presence of heteroskedasticity in the model (see Table 4)

Table 4: Serial Correlation and Heteroskedasticity test

Tests	Null Hypothesis	F-Statistics	P-Value
Serial Correlation	No Autocorrelation	0.8043	0.4578
Heteroskedasticity	No Heteroskedasticity	1.0136	0.3744

Source: Author's EViews Computation

For robustness check, the P-values are required to be insignificant to accept the null hypothesis, the estimated result in the table above shows that the model is a good fit, with the test conducted, where there is no serial correlation and heteroskedasticity. This is since all the P values are insignificant. Therefore, the hypothesis stated above will not be rejected.

Okun's Law Detection (Causality Test)

In this section we will test the presence or applicability of Okun's law in the economy using the Granger causality test, to find out if unemployment causes or is related to economic growth.

Table 5: Unemployment and GDP Growth Pairwise Granger Causality

Null Hypothesis	F-Statistics	P-Value
UNEMPL does not granger cause GDP	3.8296	0.0316
GDP does not granger cause UNEMPL	1.0600	0.3576

Source: Author's EViews Computation

The causality test as presented in Table 5 implies that *Unempl* causes *GDP* the P-values is less the 0.05 significance level, therefore We failed to reject the original hypothesis and conclude that there is a causal relationship between unemployment and economic growth, indicating that Okun's law applies to the Malaysian economy.

Conclusion

This paper analyzed the impact of unemployment rate on the economic growth in Malaysia using GDP as a proxy for economic growth and the unemployment rate to determine whether or not Okun's law exists in Malaysia. Considering the nature of governance in Malaysia, the study included control variables such as and foreign direct investment (FDI) to see if they can explain the relationship further, emphasizing the fact that the system of government is and has been an adversary of growth in the economy. From the findings, the unemployment rate is negatively related to GDP. This indicates that less unemployment lead to highest economic growth. This result is in line with Okun's law, which implies that a 1% decrease in unemployment leads to a 2% increase in GDP, despite the fact that the relationship is adverse.

Nonetheless, Okun's law is regarded as the most appropriate and direct method of investigating the relationship between unemployment and economic growth. However, this does not mean the Okun's Law should be rejected, because it can help establish guidelines for evaluating the effects of unemployment on economic growth.

The findings also shows that there exists a long-run relationship between economic growth, unemployment and foreign direct investment it indicates unemployment is negatively related to growth only at first difference, while, foreign direct investment is positively related to growth. This result is in line with the study done by Enih and Seraj (2021) for the case of Turkey, indicated that there is a negative relationship for unemployment on the economic growth of the country. To reduce unemployment, training and education is a long-term method for making the labour force more marketable and increasing productivity growth. Demand stimulation from both the public and private sectors in attempting to keep aggregate demand strong in order to drive job creation. In order to solve the Okun Law situation, legislators or companies must be dynamic in increasing employment that matches job seekers talents and abilities. Incentives must be provided to promote a balanced mix of labor-intensive production and high-tech production capabilities. This will focus on ensuring that less skilled workers can still find work.

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