

## The Relationship between Output and Unemployment in Malaysia: Does Okun's Law exist?

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### ABSTRACT

Unemployment is an important issue in developing economies. High unemployment means that labour resources are not being used efficiently. In the macroeconomic framework there is a well known relationship called Okun's Law, which states that the negative relationship between movements of unemployment rate and real GDP can be determined. This paper examines whether there exist an Okun-type relationship between output and unemployment in the Malaysian economy. The empirical results show that the negative relationship between output and unemployment is present. Some policy implications are discussed at the end of the paper.

**Keywords:** GDP Growth, Unemployment Rate, Okun's Law, Causal Relationship.

### INTRODUCTION

Unemployment is an important issue in developing economies. High unemployment means that labour resources are not being used efficiently. Hence, full employment should be a major macroeconomic goal of any government because it maximises output.

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In macroeconomic framework, Okun's Law is a well known relationship, which states that there is a negative relationship between unemployment rate and real GDP. For a period of over thirty years, several economists found strong empirical regularity in this prevalent relationship. It has attracted the attention of many, not only because of the robust empirical regularity but more importantly its role as a macroeconomic building block. The empirical estimates of Okun's coefficient, which is a measure of the responsiveness of unemployment to output growth, are crucial as they indicate the cost of unemployment in terms of output.

The objective of this paper is to examine whether an Okun-type relationship between output and unemployment is present in the Malaysian economy. We are keen to find the level of GDP growth rate needed to achieve full employment. Hence, from this analysis we will be able to determine the causal relationship between output and unemployment.

First, we will discuss unemployment trends in Malaysia, followed by a review of literature and the theoretical framework related to Okun's law. In the last section, we will discuss our results and its implications for the Malaysian labour market.

## UNEMPLOYMENT IN MALAYSIA

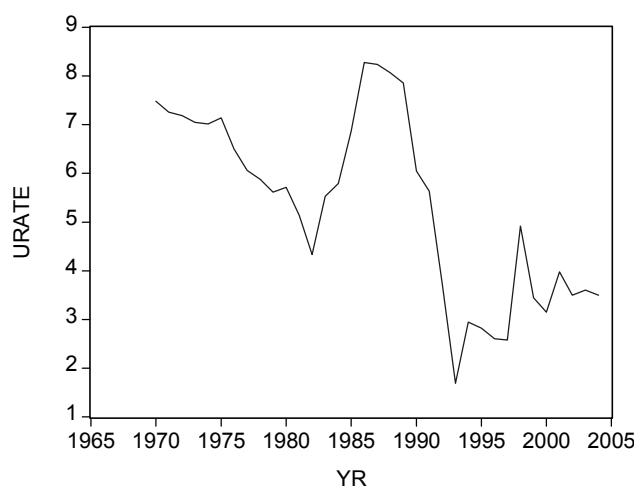
It is essential to look at unemployment trends in Malaysia for the period ranging from 1970 to 2004 (Figure 1). By observing these figures, we can clearly distinguish four distinct phases. In the first phase, unemployment rates declined steadily from 1970 to 1983. This was attributed to the economic transformation that had taken place, where we saw the secondary sector (manufacturing) replacing the primary sector (agriculture) as a major source of employment in the economy.

The second phase is the period 1983 to 1988, when unemployment rates soared from 5.5 to 8.6 percent. This development was due to the world-wide recession, where we saw the domestic manufacturing sector being severely affected. During this period Malaysia was experiencing relatively low internal and external demand and this was prevalent in the manufacturing sector.

The third phase (1989 to 1997) saw the economy recovering from the recession. The unemployment rate declined from 7.8 percent in 1989 to 2.5 percent in 1997, which obviously indicates rapid economic growth accompanied by a shift in labour utilization. By and large the manufacturing sector has profusely replaced the

agricultural sector in providing job opportunities. During this period too, the labour market experienced shortage of labour, and the country was forced to allow the influx of foreign labour.

Nevertheless, the fourth and last phase is seen to be the most challenging period. This is when the outbreak of the Asian Financial crisis in 1998 led to an increase in unemployment rates to 4.9 percent, with rampant retrenchment of workers and restructuring of firms taking place. However, many of the efforts taken by the government showed positive results and, immediately after 1999, the economy slowly began to recover, and the unemployment rate decreased to 3.1 percent. It is a matter of interest to find out whether the unemployment rate can be further reduced, and what suitable GDP rate is needed to achieve this is.



**Figure 1 Unemployment Trends in Malaysia**

## LITERATURE REVIEW

Okun's (1962) original work states that a one percent point reduction in unemployment rate would increase output by approximately 3 percent. Therefore to avoid the waste of unemployment, the economy must continually expand.

Freeman (2001) uses new developments in trend/cycle decomposition to test Okun's Law for a panel of ten industrial countries. He found that Okun's original

estimate for the U.S. of three points of real GDP growth for each one percent reduction in the unemployment rate now averages at just under two points of real GDP growth for the sample countries. Pooled estimates for Europe are smaller than estimates for the rest of the sample. Further, this article finds that omission of capital and labor inputs may have biased previous estimates. Freeman concluded that the law is still capable of providing estimates of the effects of unemployment on GDP

Dornbusch *et al* (2001) also supported Okun's view. They argue that forgone output is the major cost of unemployment, and if the loss is very high it could lead to recession. An empirical study by Watts and Mitchell (1991) also supported Okun's law. According to their study, the long-term relationship between unemployment and capacity utilization is not stable. Factors such as increasing labour resource utilization weaken the estimations of Okun's law.

Prachowny (1993) found that changes in output will result in changes in efficiency of production. Other important determinants of output include the amount of time worked and exploitation of facility space. For him, Okun's law gives only a partial measure of the relationship between unemployment and GDP.

Several studies have highlighted the limitations of Okun's law. Such study includes those by Altig, *et al* (1997), Blinder (1997) and Lee (2000). These studies concluded that Okun's framework does not take into consideration factors that are also important in influencing changes in output and unemployment, such as labour force participation, productivity and production functions.

## THEORETICAL FRAMEWORK

Macroeconomic theory provides us with relatively few models linking the unemployment rate to GDP growth. It was Okun (1962) who focused the discussion on the empirical relationship between unemployment and GDP variations. The explanation of Okun's law is very simple; due to changes in aggregate demand, firms alter their output plans and this leads to changes in labour demand and therefore affects the unemployment rates.

Two methods have been used to estimate the Okun coefficient, the output-gap method and the second alternative is to use the GDP growth and a first difference measure of unemployment.

In Okun's original paper, the estimation is done using the gap method, as in Equation (1), where unemployment is related to deviations of output from potential GDP.

$$\Delta U = a + b(\text{gap}) \quad (1)$$

The equation was further simplified into

$$\Delta U = a - b(\Delta Y / Y) \quad (2)$$

where  $U$  is the unemployment rate and  $Y$  is output (GDP)

The second alternative is to use Okun's first-difference method, as shown in (3) which will test the relative sensitivity of output to unemployment changes.

$$(\Delta Y / Y)_t = a - b\Delta U_t + \varepsilon_t \quad (3)$$

or

$$\log Y_t = a - b \log U_t + \varepsilon_t \quad (4)$$

Estimation of  $b$  will give the Okun coefficient. Equation (4) states that there is a negative relationship between output growth and unemployment rate, but it does not give the causal relationship between the two. Thus we will have to carry out a Granger causality test to determine this.

## Methodology and Results

This paper examines the relationship between unemployment and economic growth using time series data. Annual time series data was used in our empirical analysis. The data was from 1970 to 2004. The GDP data was in real terms, with 1985 as the base year.

Most macroeconomic time-series are non-stationary, i.e. having unit roots. The variables tend to show similar increasing or decreasing patterns over time. Hence, before proceeding with further analysis, the data must be tested for the existence of time series problems using the stationary stochastic process.

In this study the Augmented Dickey Fuller test (ADF) which was proposed by Said and Dickey (1984) and the Phillips-Perron Unit Root Test, Phillips-Perron (1988) were applied to both variables to detect if these variable are stationary or non stationary. The results proved that both variables are non-stationary and so the

regression test was applied to the first difference. Since unemployment is expressed in percentages, and GDP is presented in billions of Ringgit Malaysia, we regressed first difference of logarithm of GDP on first difference of logarithm of unemployment rate to standardize the scales. Table 1 displays the regression test results.

**Table 1 Results of Regression Analysis**

(Dependent variable:  $\Delta \log Y$ )

Dep. Variables	Coefficient	T-Stat	P-value
Constant	14.271	28.317	0.000
D log U	-1.748	-5.796	0.000

$R^2 = 0.51216$     DW Stat = 1.6500    F-Stat = 33.500

The absolute value of the t-statistic for the coefficient (5.796) is greater than the critical t-value at the ninety five percent confidence level (1.96). This provides support for our assumption that GDP strongly depends on unemployment, and that although there are many factors that affect GDP, unemployment is one of the main mechanisms for applying changes to output.

The results also confirmed that there is a negative relationship between unemployment and output growth. The Okun Coefficient is -1.75, and it is significant at 1 percent level. This suggests that a one percent decline in unemployment will increase output by 1.75 percent. This is much less than the coefficient found in Okun's original work (3 percent). This finding provides support for the argument that the slope coefficient in Okun's model is unstable and tends to vary across countries and periods.

Next, the Granger Causality test was applied to our data. The summary of the results is displayed in Table 2.

**Table 2 Results of Granger Causality Test**

Null hypothesis	No of lags	F-stat	P-value	Conclusion
U does not cause Y	2	3.899	0.030	Reject Null
Y does not cause U	2	3.44	0.046	Reject Null

From Table 2, we can conclude that there is two-way causality between the unemployment rate and output growth in Malaysia. A reduction in unemployment rate will cause the economy to expand. At the same time any increase in economic activities will cause employment to increase, and thus unemployment to decrease. These findings have significant implications for development programmes and policies introduced by the government.

To determine the GDP growth rate for full employment level in Malaysia, the following Equation (3) has been estimated.

$$(\Delta Y / Y)_t = a - b\Delta U_t + \varepsilon_t \quad (3)$$

From Table 1, the estimated value of  $a$  is 14.27 and  $b$  is  $-1.748$ . In Malaysia the economy registered full employment with unemployment rate at 3.5% in 2005. Given this information the calculated rate of GDP growth ( $\Delta Y/Y$ ) is;

$$(\Delta Y/Y) = 14.27 - (1.748) 3.5 = 8.152$$

Thus, full employment level in Malaysia can be achieved if the economic growth is at 8.15% per annum.

## Conclusions

We can now answer the question "Does Okun's Law exist?" Yes, Okun's Law can be applied to explain the Malaysian condition. Any attempts to reduce unemployment will result in increasing the growth rate of the GDP. But knowing the existence of these relationships alone will not solve the problem of unemployment in the country. The problem must be tackled from both sides of the labour market, from the job seekers' point of view as well as from the employers' point of view.

First of all the policymakers must be creative in creating new jobs, so as to ensure that these jobs match jobseekers talents and skills. Incentives must be given to encourage a balanced blend between the usage of labour intensive techniques of production as well as high tech production capabilities. This will ensure that less skilled labour can still find suitable jobs.

How can we be sure that low skilled workers would get a chance to be employed? This can be done through more attractive earned income tax credits, or

by removing tax burdens for hiring low skilled workers. Nevertheless, these incentives must guarantee that employers are not being burdened with extra costs by hiring the low skilled workers. In reality firms are subject to the cost of training low skilled workers to ensure that workers are equipped with the necessary skills to serve the industry. Such problems have been addressed via the Malaysian Income Tax Act (ITA) 1969 by providing double taxation relief for all expenditure incurred in providing industrial training.

The lessons from developed countries like the US and European Union show that this problem is more structural than cyclical, and that unemployment cannot be cured by merely having an expansionary fiscal and monetary policy. Governments must ensure, at the same time, that new investments into the country use production techniques that are suited to the skills that our labour has to offer.

The analysis has also shown that for Malaysia to achieve its full potential, the economy has to grow at around 8 percent per year. This is a tall order, since currently the economy is growing at a rate of less than 8 percent. Nevertheless, with careful planning, and continuous efforts towards achieving Malaysia's Vision 2020, this target can be achieved. We have indeed experienced double digit economic growth before the financial crisis in 1997, and it is possible to repeat this remarkable record with concerted efforts from the nation as a whole.

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