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Economic Growth, Employment Elasticity and Poverty: A Case of Malaysia

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ABSTRACT

This paper investigates the relationship of economic growth, employment elasticity, and poverty in Malaysia. Poverty is a challenging and controversial issue in Malaysia. In this study, investigation is made through the lens of employment elasticity. In that, it investigates the significance of economic growth and employment in poverty reduction. Employment elasticity is the measurement of responsiveness of employment to the changes of economic growth. This study examines the association at the level of each sector individually and all sectors as a whole. Several methods were employed to measure the employment elasticity such as simple and descriptive method and Ordinary Least Square (OLS) regression method. This study utilises data from 1970 to 2009 involving annual time series data of 40 years. While there are limitations in this study involving data and model, careful measures have be taken to ensure that these shortcomings do not affect the consistency, reliability and accuracy of the findings. Results of this study show that, if the supply side (e.g. labour force participation rate) is ignored in estimating the employment elasticity, an increase in the agriculture output leads to an increase in the employment in the sector; and that an increase in the total output leads to a decrease in the employment in agriculture sector. This study also demonstrates that an increase in the output for mining and quarrying sector tends to decrease the employment in the sector, and conversely an increase in the total output increases the employment in the said sector. For manufacturing sector and construction sector, both sectoral output and total output were found having comparable responses that suggest employment for both sectors tends to increase in line with the output. On the contrary, if the labour force participation rate is taken into consideration and not ignored, the result of the Malaysian case shows that both demand and supply side are positively related with the employment. In other words, an increase in the economic growth and labour force participation rate increases the employment rate in Malaysia. Thus, the findings of this study demonstrate that an effective and efficient approach to reduce poverty in Malaysia is not something impossible.

Keywords: Economic Growth, Employment Elasticity, Poverty.

INTRODUCTION

This study focuses on the relationship of economic growth, employment elasticity and poverty in Malaysia. Poverty is a controversial issue in Malaysia. Government has started various poverty eradication programmes since 1970s through the implementation of New Economic Policy (NEP). Poverty eradication projects have been included in national policies such as NEP (1970-1990), National Development Policy (1991-2000) and Vision 2020. They are implemented to reduce the poverty rate in Malaysia i.e. from around 52.4% in year 1970 to less than 5.1% of poverty rate and that has been achieved in the year 2002 (Chamhuri Siwar, 2005:60; PKamalanathan: 01 February 2008). The poverty eradication programmes emphasising the hardcore poverty has started at the end of NEP in 1985. Hardcore poverty is a concept developed by the Malaysian government in order to identify those poor households with income that is less than half of the poverty line income (UNDP, 2005:35).

World Bank claims that economic growth alone is not an efficient tool in eradicating poverty, it suggests that it is to be complemented with other possible potentials such as additional employment available in a country (World Bank 2010:22 July). In line with this concern, this study investigates the

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relationship between the economic growth and employment creation. Thus, it provides us the information on the level of contribution of an increase in the economic growth to generate the employment opportunities. In addition, we are able to measure the percentage of increases in employment creation when there is an increase in the economic growth by using employment elasticity model. It also provides us the number of additional jobs created from the employment elasticity in due respect to the overall economic growth. From the approach, we identify the relationship between economic growth and employment creation whether they are positively related or negatively related. Furthermore, we can identify which sectoral growth generates higher employment opportunities for nation and vice versa. Thus, with sufficient jobs created, it would helps to reduce poverty. In other words, some sectors may create more employment opportunities for nation than other sectors. A country with full employment will less likely to confront with high poverty rate and therefore, the poverty is reduced. However, there are incidents where overall economic growth is less significant than sectoral growth. Therefore, from this study, we will get to know which sectoral growth is contributes to the economy activities in the employment creation. We are also able to recognise the circumstances or when the overall economic growth is not contributed to the economy activities in increasing employment for nation but decreasing it. Thus, the relationship of employment elasticity and poverty is explored.

Scholars such as Islam & Nazara (2000:5) and Suryadarma et al. (2007:19), have some criticisms for the study of employment elasticity. One of the main criticisms is the studies on the topic of employment elasticity mostly ignore the supply side of labour market and mainly focused on the demand side of labour market in measuring the employment elasticity with respect to GDP growth. But it is not always the case in reality. For example, Choi (2007:3) claims that employment is not determined by the labour demand alone but also the labour supply. Intersection of labour demand and labour supply in the labour market indicates the employment equilibrium in the employment elasticity model. In other words, the employment elasticity with respect to growth is determined by both preference (labour supply) and technology (labour demand). Hence, this study includes investigation that involved both demand and supply side of the labour market.

LITERATURE REVIEW

World Bank defines poverty as lack of food, shelter, access to healthcare services, basic education, employment opportunity, clean water and social exclusion (World Bank 2005:19 April). It elaborates that individual is considered as poor if their consumption or income level falls below the minimum level of human basic needs. People in poverty cannot afford their basic needs such as safe drinking water, nutrition, healthcare, education, clothing and shelter as a result of persistent lack of income. According to Islam & Nazara (2000:4), employment elasticity is one of the indicators that measure the responsiveness of the labour market to changes in macroeconomic conditions such as GDP growth. It is a model that measures the impact of economic growth on employment. Employment elasticity measures the percentage change in the employment when there is one percentage increase in the GDP growth. In Malaysia, Department of Statistics Malaysia (2007:224) defined employment as people in the age 15 to 64 years age group who, at any time during the reference week worked at least one hour for pay, profit or family gain. As Gross Domestic Product (GDP) is a surrogate indicator for economic growth, GDP is defined as the total value of goods and services produced within a given time period after deducting the cost of goods and services used up in the process of production but before deducting allowances for the consumption of fixed capital. GDP can be valued at purchasers' values and at factor cost (Department of Statistics Malaysia, 2007:3).

Indeed, there are many factors contribute in reducing poverty such as economic growth, employment, education, welfare, information and communication technology (ICT), growth with equity, public policy, trade, development, and migration (UNDP, 2005:47). However, for the purpose of this study, it focuses on economic growth and employment for their contribution to poverty reduction as recommended by the World Bank (World Bank 2010:22 July).

Economic growth is capable to reduce poverty. For example, Agrawal (2008:100) claimed that it is one of the effective ways to reduce poverty. According to Roemer and Gugerty (1997:3), the relationship between economic growth and poverty reduction is positively related. It means the higher rate of economic growth contributes to higher rate of poverty reduction. Moreover, not only overall economic growth helps to reduce the poverty, but growth in different sectors would also tend to reduce poverty (Montalvo and Ravallion, 2010:10). They suggested that growth in one sector may contribute to poverty reduction but it doesn't mean overall economic growth is significant in reducing poverty. This explained that, the growth in overall GDP may not help to reduce poverty but growth in certain

sector such as agriculture sector or informal sector may help to reduce poverty. This situation is due to the fact that most of the poor are working in the agriculture sector or informal sector. The results of employment elasticity for sectoral growth and overall economic growth are different. Some sectoral growth proved to be more significant in generating employment than economic growth do. For example, in the study of Islam & Nazara (2000:18), one of their outcomes for the employment elasticity with respect to the GDP growth for agriculture sector is negative, which explains that higher growth in economic growth in such sector leads to lower employment in agriculture sector due to reallocation of labours' services. And as for the positive employment elasticity of the sectoral growth, it means the growth in agriculture sector leads to higher employment in agriculture sector due to expansion of that sector.

As stated in the Millennium Development Goals 1 (UNDP, 2005:50), economic growth, employment creation and poverty reduction is interrelated. The relationship between economic growth, employment opportunities and poverty reduction is significant. Poverty is reduced when many people get jobs in the labour market. As the employment opportunities in the labour market increase, unemployment is reduced and thus reduces poverty. This is especially significant for those poor that are due to employment challenges they faced. As poverty is reduced, it leads to further development and economic growth of a country. It shows that the relationship of economic growth and employment is cyclical. This inter related cycle shows that economic growth tends to increase the employment opportunities in the labour market and such increase in employment of the labour market further promotes economic growth. The increased employment opportunity for poor that has helped to reduce the poverty from the growth is called 'pro-poor growth'[2]. It demonstrates that growth in GDP that did not deliver employment opportunities for poor households is less significant in poverty reduction. Economic growth can lead to increase in employment opportunities where it increases demand for labours (Suryadarma et al., 2007:1). With the increase in demand for labours, income and real wages of labours increase, and thereafter increase their standard of living and purchasing power that in turn contributes to poverty reduction.

Generally, economic growth leads to an increase of employment in the labour market (positive value of employment elasticity). However, for some reasons, economic growth might reduce the employment in an economy (negative value of employment elasticity). The reduction in the employment might caused by the increase in the productivity of labours or it might be the impact of the increase in the unemployment. The approach of employment elasticity helps to interpret GDP growth of a country whether such growth in GDP creates more jobs for the nation or more focus on labour productivity improvement. Countries with large population are expected to have large labour force. Therefore, an economic growth that helps to create sufficient jobs for its nation is needed. For countries with abundant labour force but focus on improvement of labour productivity, rapid economic growth is still needed to generate more employment opportunities for its nation. It is because without sufficient jobs for its nation, there will be unemployment and difficult to create jobs in the future. And thus, poverty will not be reduced.

DATA AND METHODOLOGY

Data

This study of "the relationship of employment elasticity and poverty" is focusing on Malaysia. It does not only examining the responsiveness of employment to changes in GDP for economy as a whole, it also examine the responsiveness of sectoral employment to changes in sectoral GDP and GDP for economy as a whole. It used annual data of 40 years ranging from 1970 to 2009. The data include time series data for total employment, employment by sectors, total gross domestic product (GDP), GDP by sectors, labour participation rate and poverty rate. These data are obtained from official website of the Department of Statistics, Malaysia, official website of World Development Bank, official website of Economic Planning Unit, official Website of International Labour Organisation (ILO), and other sources. For some data that are not available even after all possible attempts, estimated values generated using STATA software are used.

There are several limitations in the study. One of the limitations is the inconsistency in the frequency of data collection for the poverty rate in Malaysia. The survey on the poverty rate in Malaysia is first conducted on 1980. The survey is conducted once in five years until 1995. However,

[2] Pro-poor growth is the growth that is good for the poor and they are focusing on the group of poor than other income groups (Balisacan at al. 2003:1).

the survey is conducted more frequently after 1995. The total employment data also faced similar limitation i.e. data prior to 1980 is not available because there is no survey conducted for employment.

Methodology

This section discusses on the careful measures have been taken to minimise its shortcomings estimation of the employment elasticity which will later on contributes to the poverty reduction and compares models used by Islam and Nazara (2000:7) and Suryadarma et al. (2007:19).

In this study the main method use in the estimation is the Ordinary Least Square (OLS) regression method. OLS regression is a best linear unbiased estimator or BLUE (Gujarati, 2006:168). Now, we proceed to the discussions concerning models that are used in this study to explain the relationship of employment elasticity and poverty in Malaysia. As mentioned earlier, employment elasticity is calculating the impact of economic growth on employment. The most simple and descriptive method of employment elasticity model is as follow.

$$\epsilon = \frac{\Delta L/L}{\Delta Y/Y} \quad (1)$$

where ϵ is the employment elasticity, L is employment and Y is GDP for economy as a whole. The employment elasticity model is interpreted as changes in the percentage of the employment when there is a one percent increase in the GDP for economy as a whole (see section 1.0). However, this model computes elasticity for two different time periods rather than point elasticity. Point elasticity is a measurement of elasticity to the change in employment when the change in GDP is close to zero (Islam and Nazara, 2000:8). It is an alternative estimation method from descriptive method that uses Ordinary Least Square (OLS) regression method. OLS regression method is found to be more reliable and stable than descriptive method in measuring the employment elasticity (Islam and Nazara, 2000:12). It is an econometric model that involves double-log linear. The model in OLS regression is as follow.

$$\ln L = \beta_0 + \beta_1 \ln Y + \varepsilon \quad (2)$$

Variable L and Y are employment and total GDP respectively. ε is the residual, random, or error term for the model. Error term refers to other factors that affect the dependent variable (L) that well omitted from the model. From the double log-linear model, the coefficient of β_1 in the equation is a measurement for the employment elasticity of L with respect to Y, that is, the percentage change in employment for a given percentage change in GDP for economy as a whole. β_0 is a constant in the equation (2). As mentioned above, this study is not only investigating the responsiveness of employment to changes in GDP as a whole, but it also offers explanation on the responsiveness of sectoral employment to changes in sectoral GDP and total GDP. Therefore an equation from Islam and Nazara (2000:17) is developed as below.

$$\ln L_i = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y \quad (3)$$

where i denote sector. L_i is employment by sector, Y_i is GDP by sector, and Y is GDP of the economy. This equation indicates that both sectoral GDP and total GDP determine the employment elasticity simultaneously.

However, several researchers (see Suryadarma et al., 2007:19; Islam & Nazara, 2000:7) have criticise employment elasticity model for often ignores supply side of labour in their estimation. In other words, it is criticised for only focusing on labour demand side. Therefore, in the study of Suryadarma et al. (2007:19), they had developed a new model which includes labour supply side (e.g. labour participation rate) in their model.

$$\dot{E} = \beta \dot{Y} + \gamma \Delta PR + \varepsilon \quad (4)$$

where $\dot{E}$ is the growth of employment, $\dot{Y}$ is overall GDP growth, ΔPR is change in the labour force participation rate, ε is residual, and β is the growth of employment elasticity.

The model that used in the study of Suryadarma et al. (2007:21) is not as simple as equation (4) where they had expanded the model to include the geographical locations (i.e. rural areas and urban areas) and factors[3]. Factors include migration of population from one province to another province had been

[3] The model that used in the study of Suryadarma et al. (2007:21) is as followed.
$\dot{E}_j = \beta^u_{a_j}\left(H^u_a y^u_{a_j}\right) + \beta^u_{ij}\left(H^u_i y^u_{ij}\right) + \beta^u_{s_j}\left(H^u_s y^u_{s_j}\right) + \beta^r_{a_j}\left(H^r_a y^r_{a_j}\right) + \beta^r_{ij}\left(H^r_i y^r_{ij}\right) + \beta^r_{s_j}\left(H^r_s \gamma^r_{s_j}\right) + \phi dS_j + \gamma \Delta PR_j + \varepsilon$

taking into consideration to avoid underestimation of employment elasticity. However, in this study, equation (4) is used instead of the model that employed in the study of Suryadarma.

The advantage of using this model is that, we can compare models that ignored the supply side of labour (see equation (3)), with model that includes both supply side and demand side of labour as shown in equation (4). It shows us the differences and effects of ignoring the supply side of labour and the significance of supply side to the estimation of employment elasticity. In this study, geographical locations (Suryadarma et al, 2007:19) are negligible because the division of rural areas and urban areas has not been employed in the model of this investigation. Instead of using provincial data, this study focuses on whole Malaysia. Hence, migration between provinces is less significant in the model.

All the equations from equation (1) to (4) are used in this study to measure the employment elasticity. There are some comparisons between the result from the equation (1) and (2) to examine which method is more accurate and reliable in measuring employment elasticity for the Malaysian case from year 1970 to 2009. This study examines three (3) types of comparisons between the equation (1) and (2): i) employment elasticity for each year, ii) employment elasticity for each sector, and iii) each sector's employment elasticity for each year by using descriptive method and OLS regression method.

Besides, equation (3) is used to distinguish between the sectoral employment effects of growth in sectoral GDP and total GDP. The hypothesis for equation (3) is that, an increase in the sectoral GDP leads to either an increase or decrease in the employment for each sector; or increase in total GDP leads to an increase or decrease in the employment for each sector; or both increase in sectoral GDP and total GDP lead to increase or decrease in the employment for each sector. From the result of equation (3), useful solutions, improvements and guides (e.g. policy) can be established to minimise and solve the problems or increase the well being of society as a whole. Equation (4) is another model used to measure the employment elasticity which is different from the model in equation (1) to (3). This is because the equation (4) taken both demand (e.g. GDP) and supply shifter (e.g. labour participation rate) in measuring the employment elasticity while equation (1) to (3) are ignore the supply shifter which only focused on demand shifter.

Although there are some limitations for the models above, the equation (3) and equation (4) complement to each other. For example, equation (3) ignores labour supply shifter but it shows us the employment effect of sectoral GDP and total GDP. On the other hand, equation (4) includes both labour demand and labour supply in measuring the employment elasticity but it does not show us the employment effect of GDP for economy as a whole. Hence, the shortcoming for equation (3) is explained by equation (4), and vice versa.

RESULTS

In this section, we discuss the analysis systematically. First, the most simple and descriptive method, however it is useful in this study. It is then followed by the OLS regression method, that is, econometric models as stated in equation (2), (3), and (4).

Employment elasticity: Simple and descriptive method

Employment elasticity for simple and descriptive model is referring to employment equation (1) in section 3.2. The results from using the simple and descriptive model are showed in Figure 4.1. Figure 4.1 illustrate the employment elasticity of major sectors within period 1970 to 2009. It also shows the total employment elasticity for economy as a whole. In other words, Figure 4.1 is the results of the combination of total and sectoral employment elasticity. It is observed that the trends of total and sectoral employment elasticity fluctuates from the year 1970 to 2009. It shows that the estimation using simple and descriptive method is more likely to have an unstable result. Moreover, the estimation of employment elasticity for year 1970 is not available using this method.

The total employment elasticity is illustrated in Figure 4.1.1. Some of the employment elasticity has negative values (e.g. in 1985, the value of total employment elasticity is -1.52). Despite the employment elasticity has positive values, however, some of the positive values are far apart from other values especially in the year 1975 (i.e. 7.24). From Figure 4.1.1, we know that the total employment elasticity fluctuates in between -1.52 and 7.24. This can be explained as an increase in the

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Where E_j is the growth rate of employment, y is GDP growth for sectors at different location. ΔPR_j is the changes in the labour force participation rate in a province. H indicates the share of each sector to total output. dS_j is the change in population share of a province due to the migration problem.

total GDP will lead to the total employment opportunities in Malaysia to be reduced or increase in between -1.52 and 7.24.

Besides from total employment elasticity, in Figure 4.1.1, it is also showing the employment elasticity for sectors. All the sectors show great fluctuation from year to year. The results of sectoral employment elasticity are showing in the Figure 4.1.2, Figure 4.1.3, Figure 4.1.4, and Figure 4.1.5 in order to have a clearer view for the sectoral employment elasticity. Figure 4.1.2 is showing the employment elasticity for agriculture sector, while figure 4.1.3 is showing the employment elasticity for construction sector. The employment elasticity for manufacturing sector is showed in figure 4.1.4, and mining and quarrying sector's employment elasticity is showed in figure 4.1.5. These figures are showing that there are great variations of the sectoral employment elasticity compared to the variation of the total employment elasticity. These sectors include agriculture sector, construction sector, manufacturing sector, and mining and quarrying sector.

From the Figure 4.1.2, it shows that the employment elasticity for agriculture sector fluctuates and/or not stable, and there were some great variations especially in 1991 (i.e. the employment elasticity is -29.63). The employment elasticity for agriculture sector is ranging between -29.63 and 14.78. This finding implies that an increase in agriculture output will lead to the employment opportunities in agriculture sector fluctuate in between -29.63 and 14.78.

Moreover, from the Figure 4.1.2, it shows that the agriculture sector is the most responsive and stable sector to the financial crisis in 1997 and economic crisis in 2007. During the financial crisis 1997, the employment elasticity is -6.72, a negative value. It can be explained that an increase in agriculture output did not lead to an increase in agriculture employment opportunities; instead, there was a drop in the employment of agriculture sector. In other words, the financial crisis deteriorated the economic growth i.e. lower economic growth (Wearden and Stanway, 2008:21 October). The slow economic growth would in fact tend to increase the employment opportunities provided in agriculture sector. On the contrary, the employment elasticity during the economic crisis in 2007 shows an opposite results. In 2007, the employment elasticity for agriculture sector is 2.62. It illustrates that an increase in agriculture output will lead to an increase in agriculture employment opportunities by 2.62. However, the employment elasticity had dropped in 2008 and 2009. It indicates that the increase in agriculture output is no longer increasing the employment opportunities in agriculture sector due to the fact that the effect of economic crisis can only be observed after year 2007.

From the employment elasticity of construction sector which illustrated in Figure 4.1.3, it shows that there was a great disparity in 1975 as compared to other years where the employment was as high as 64.05. This implies that as the output of construction sector grows, it tends to increase the construction employment opportunities by 64.05. The employment elasticity for construction sector is ranging in between -7.25 and 64.05. During the period financial crisis 1997 and economic crisis 2007, the employment elasticity in this sector showing positive value. It means that an increase in output of construction sector will increase the employment opportunities in construction sector.

In Figure 4.1.4, the employment elasticity for manufacturing sector had shown a big difference for year 1972 and 1973. The employment elasticity increased from -17.81 in 1972 to 9.91 in 1973. The variations of employment elasticity for manufacturing sector were between -17.81 and 13.79. This explained that an increase in the manufacturing output had the tendency to affect the manufacturing sector's employment opportunities within -17.81 to 13.79. During the financial crisis 1997, it has not much effect on the employment opportunities for manufacturing sector. However, during the economic crisis in 2007, the employment opportunities in the sector is tend to decline as there is an increase in the sectoral output.

Among these four sectors, mining and quarrying sector experience highest fluctuation in its employment elasticity. It is illustrated in Figure 4.1.5. The employment elasticity is ranging from -100 and 50.18. This means that an increase in the sector's output will affect the employment opportunities of the sector within -100 and 50.18. During the financial crisis 1997, the employment opportunities in the mining and quarrying sector declined where there was an increase in that sector's output. However, during the economic crisis 2007, the employment elasticity is in negative value. It means the increase in the output will lead to decrease in employment opportunities for that sector. And yet, it drops even more in 2008.

The estimation method that employed the simple and descriptive method to estimate the employment elasticity is less appropriate to use in policy formulation and monitoring process but it is useful as a simple overview. This is due to the fact that the great variations in employment elasticity could misinterpret the results of analysis. Hence, the distorted analysis could affect the effective and efficiency of the formulated and implemented policy in reducing and eradicating poverty.

Employment elasticity: OLS regression method

In this section, the estimation method employed is Ordinary Least Square (OLS) regression method. The result from using the econometric model as shown in Figure 4.2 is the employment elasticity of major sectors using OLS regression method for time period 1970 to 2009. The econometric model that employed OLS regression method is equation (2) in section 3.2. The equation (2) which involving the double log-linear model produce results that are more accurate, stable and reliable than using the simple and descriptive method. This is because it is able to estimate the employment elasticity when the changes of GDP are close to zero as showed in Figure 4.2. Thus, it is relatively more appropriate to use the results of this model in formulating policies to eradicate poverty.

The results in figure 4.2 are including the total and sectoral employment elasticity which using OLS regression method for period 1970 to 2009. Furthermore, the employment elasticity in Figure 4.2 is positive value instead of negative value. This is because economic growth is unlikely to reduce the number of employment opportunities available in the labour market, except the economic growth help to improve the productivity of labour rather than increase in the employment opportunities.

In order to estimate the employment elasticity for different sectors, the same equation is used with the employment, L changed to L_i where i denotes the different sectors and total GDP, Y changed toY_i. The equation is showed below.

The equation of employment elasticity for different sectors is:

$$\ln L_i = \beta_0 + \beta_1 \ln Y_i + \varepsilon$$

where i denotes sectors. $i =$ agriculture sector, construction sector, manufacturing sector, and mining and quarrying sector.

Before we proceed to the explanation on the result in Figure 4.2, a stationary test had been done to avoid the problem of spurious regression. Spurious regression will affect the reliability of the results produced. Therefore, a unit root test had been taken to test for the stationary of variables. The unit root test was based on the standard Augmented Dickey Fuller (ADF) test.

From the ADF test, it shows that log employment is stationary at 1%, 5% and 10% significance levels where the computed value from ADF is -3.97 which is smaller than the critical value of 1% significance level (-3.62), 5% significance level (-2.94) and 10% significance level (-2.61). However, the log GDP is nonstationary. It is because the computed value (-1.91) is larger than the critical value at 1%, 5% and 10% significance level. It is only stationary in the ADF first difference at 5% and 10% significance level where the computed value (-2.36) is smaller than 5%(-1.95) and 10% significance level (-1.61) and it is larger than the critical value of 1% significance level (-2.63). Therefore, it is only stationary at 5% and 10% significance level and nonstationary at 1% significance level.

Moreover, cointegration test is also used to test the stationary of residuals. If the residuals appeared to be stationary, the dependent variable and independent variable is said to be cointegrated or otherwise it is not cointegrated. If the residuals are not cointegrated, the regression might appear to be spurious. The equation of residuals test for stationarity is:

$$\varepsilon_t = y_t - b_2 x_t - b_1$$

From the cointegration test, it shows that the variables in the equation (2) is cointegrated at 5% and 10% significance level where the computed value (-2.26) is smaller than critical level at 5% significance level (-1.95) and 10% significance level (-1.61). However, it is nonstationary at 1% significance level where the computed value (-2.26) is larger than the critical value at 1% significance level (-2.63). As a result, we observed that the variables in this study are stationary which means no presence of spurious regression.

The overall findings in Figure 4.2 show that the estimation for employment elasticity using OLS method produces a more stable result as compared to employment elasticity measure using simple and descriptive method. By using the double-log model, we are able to estimate the employment elasticity for the year 1970 as the data for total and sectoral employment elasticity in 1970 is not obtainable by using the simple and descriptive method. The overall employment elasticity for Malaysia is stable during the period 1970 to 2009 i.e. about 0.54% and 0.56%. In other words, a one percent increases in the total GDP cause a 0.54% to 0.56% increase in the employment. As compared to the results produced using the simple and descriptive method, this model is found to be more stable and reliable.

In agriculture sector, the employment elasticity is stable. It is between the range 0.09 and 0.13. It means that a one percent increase in the agriculture output will lead to increase in the employment

opportunities by 0.09% to 0.13%. In construction sector, it shows that a one percent increase in the construction's output will lead to an increase of 1.19% to 1.39% of employment opportunities. It demonstrates that the employment in construction sector is higher than the output produced in this sector. It fluctuates within the range 1.19 to 1.39. In manufacturing sector, its employment elasticity is ranging from 0.60 to 0.90. It means employment in this sector increase in the range between of 0.60% and 0.90% with a one percent increase in its output. Among the four (4) sectors, mining and quarrying sector have the greatest fluctuation for the employment elasticity where it is in the range of 0.17 to 0.38. As such, an one percent change in the mining and quarrying output is tends to increase in between 0.17% and 0.38% of its employment.

From the Figure 4.2, agriculture sector has the lowest employment elasticity among the four sectors. In other words, agriculture sector generates less employment opportunities among the four sectors. Meanwhile, construction sector has the higher employment elasticity. It implies that construction sector generates large additional numbers of jobs opportunities for labours. As the construction sector's output increase, it creates more employment opportunities in construction sector. The second highest is the manufacturing sector where the sector itself able to generate employment opportunities as the output of the sector increase. The sector that ranked third according to the employment elasticity is the mining and quarrying sector. This sector generates more employment opportunity in the sector itself when there is an increase in the output of mining and quarrying sector.

Table 4.1 above, it shows the total and sectoral employment elasticity. They are results produced by using EViews. From the Table 4.1, the employment elasticity for the country as a whole is 0.55. It implies that a one percent increase in the total GDP tends to increase the employment opportunity by 0.55% for the country. For agriculture sector, the employment elasticity is 0.11. This means that the changes in agriculture output by 1% is tends to increase the agriculture sector's employment opportunity by 0.11%. The employment elasticity for construction sector is 1.34. The changes in construction output by one percent will affect the employment opportunity in construction sector by 1.34%. The generation of employment opportunities is 0.34% higher than the changes in the sectoral output. For the manufacturing sector, the change in manufacturing sector's output by one percent increases the employment opportunities by 0.84%. It represents the employment elasticity for manufacturing sector is 0.84. For the mining and quarrying sector, its employment elasticity is 0.30. The response of employment opportunities in mining and quarrying sector to the one percent changes in the mining and quarrying sector's output is 0.30%. The employment elasticity using OLS regression method appears to be more suitable and appropriate to use in policy formulation and monitoring process where its estimation of employment elasticity is more stable and reliable than using the simple and descriptive method. Therefore, in this study, OLS regression method is used to estimate the employment elasticity.

Employment elasticity: differentiate between the employment effects of growth in sectoral GDP and total GDP

In this section, we are differentiate the employment effects of growth in sectoral GDP and employment effect of growth in total GDP from the sectoral employment elasticity. In other words, the determination of sectoral employment elasticity is the sectoral GDP and total GDP. These components determined the sectoral employment elasticity. It can be explained as the employment elasticity is measured by both the changes in the employment due to the changes in the sectoral GDP and the changes in the employment due to the changes in the GDP for the economy as a whole. The equation (3) is used. β_1 is the sectoral employment elasticity for the changes in employment due to the changes in the sectoral GDP and β_2 is the sectoral employment elasticity for the changes in the employment due to the changes in the total GDP. Hence, the sectoral employment elasticity contains both the sectoral GDP and total GDP instead total GDP or sectoral GDP alone (see section 4.2 above). The estimated employment elasticity which employed the equation (3), is as shown in the Table 4.2.

Table 4.2 shows the sectoral employment elasticity that differentiated the employment effects of growth in sectoral GDP and total GDP. The agriculture sector's employment elasticity is 1.19 and -0.56 for the sectoral GDP and total GDP respectively. It implies that the one percent increase in the agriculture output increased the employment opportunity for agriculture sector by 1.19%. However, the one percent increase in the total GDP reduced the employment opportunity in agriculture sector by 0.56%. For the mining and quarrying sector, the employment elasticity that corresponding to the sectoral GDP and total GDP is -0.83 and 0.74. It explained that a one percent increase in the sectoral output reduced the employment opportunity in that sector by 0.83% while a one percent increase in the total GDP increased the sectoral employment opportunity by 0.74%.

The sectoral employment elasticity in manufacturing sector is 0.43 and 0.59 with corresponding to the sectoral GDP and total GDP. The increase in the sectoral GDP and total GDP tends to increase the employment elasticity in the manufacturing sector. This is shows in the Table 4.2 where a one percent increase in the sectoral output increases the employment opportunity in the manufacturing sector by 0.43%. On the other hands, the total GDP will also increase the employment elasticity in manufacturing sector by 0.56%. For the construction sector, the employment elasticity is 1.05 and 0.26 with corresponding to the construction's output and total GDP. It is illustrated in Table 4.2. It explains that a one percent increase in the sectoral output will increase the employment opportunity in construction sector by 1.05% and a one percent increase in the total GDP will increase the construction sector's employment opportunity by 0.26%. The increase in the sectoral output tends to increase the sectoral employment opportunity more than the total GDP do.

Overall, from Table 4.2, we are able to estimate that the increase in total GDP will reduce the employment opportunity in agriculture sector, but it will increase the employment opportunity in mining and quarrying sector, construction sector, and manufacturing sector. It demonstrates that the reduction in the employment opportunities in agriculture sector shifts to other sectors. It is observed that the increase in the sectoral output tends to increase the sectoral employment opportunity for agriculture sector, manufacturing sector, and construction sector. However, it was not the case for mining and quarrying sector i.e. an increase in its sector output reduced the employment opportunity in that sector. Hence, the sectors with higher employment elasticity tend to provide more employment opportunities than other sectors which have lower employment elasticity. However, lower employment elasticity does not mean the employment in that sector is reducing, but they are more focused on the improvement in labour productivity. Therefore, the poverty reduction policies will be more effective with focusing the poverty reduction in specific sector than the economy as a whole.

Employment elasticity: Involving both demand and supply side of labour market

The models in the previous sections are those models ignoring the supply side of labour, which means only demand side is included in the model. Supply side of labour is referred to the labour force participation rate while demand side of labour refers to the economic growth. In this section, the model involves both the demand side and supply side of labour market to estimate the employment elasticity. The model used in estimating the employment elasticity is equation (4) in section 3.2. The results of the employment elasticity are showed in Table 4.3.

The equation (4) shows that the β is the employment elasticity with corresponding to the GDP growth rate while γ is the employment elasticity with corresponding to the changes in the labour force participation rate as illustrated in Table 4.3. From the Table 4.3, the one percent changes in the GDP growth rate leads to an increase of 0.31% in the employment opportunities rate. Moreover, the one percent changes in the labour force participation rate will cause only 0.02% increase in the changes of employment opportunities rate. Hence, this table demonstrates that the employment elasticity involved both demand and supply side of labour market can be used although the employment elasticity for the responsiveness of employment effect to the changes in the supply side is only 0.02%.

CONCLUSION

This study of employment elasticity offer several interesting findings. The Malaysian employment elasticity as a whole concludes that the decreasing trend of employment elasticity is due to the improvement in the labour productivity (Taylor, 2004:522). From sector-based employment elasticity analysis, the results suggest that construction sector achieves the highest employment elasticity among the four sectors, follow by manufacturing sector, then the mining and quarrying sector and agriculture sector.

The results in section 4.3 from further investigations imply that an expansion in the agriculture sector has led to an increase in the employment of the sector itself, but the expansion in the output of economy as a whole lead to a decrease in the employment on the contrary. It is due to the movement of labours from agriculture sector to non-agriculture sector, i.e. mining and quarrying sector. In fact, the employment elasticity of mining and quarrying sector indirectly responded to the decrease in the employment in agriculture sector for an expansion in the total output. It explains that an expansion in the output of an economy tends to increase the employment of the said sector. However, expansion in the mining and quarrying sector caused the employment in the said sector to decrease. The decrease in the employment of the mining and quarrying sector when there is an expansion in the output of the sector is due to the movement of labours to the other sectors (include agriculture sector, construction

sector and manufacturing sector). It has been proven as and when the output in the three mentioned-sectors increased, there is an increase of employment in the respective sector. For construction and manufacturing sectors, both sectoral output and total output expansion tend to increase in line with the output of both sectors. Hence, sectors with higher employment elasticity tend to provide more employment opportunities than other sectors that have lower employment elasticity. However, lower employment elasticity does not always mean the employment in that particular sector is reducing. It may well an indication that the sector have experienced more improvement in its labour productivity. This suggests that poverty reduction policies are likely to be more effective if they are sector-specific rather than general approach i.e. the economy as a whole.

From its relatively 'complete' model of employment elasticity that involves labour supply side (e.g. labour force participation rate) and labour demand side (e.g. economic growth), it shows that both demand and supply sides of labour are positively related with the employment in Malaysian case. In other words, an increase in the economic growth and labour force participation rate increases the employment rate in Malaysia. Thus, the findings of this study demonstrate that an effective and efficient approach to reduce poverty in Malaysia is not something impossible through the model of employment elasticity. In brief, GDP growth is found essential for poverty reduction, but it is by itself not sufficient to eradicate poverty. However, this study recognises that suitable emphasis on sectoral growth is useful to enhance the employment responsiveness that in turn reduces poverty more effectively.

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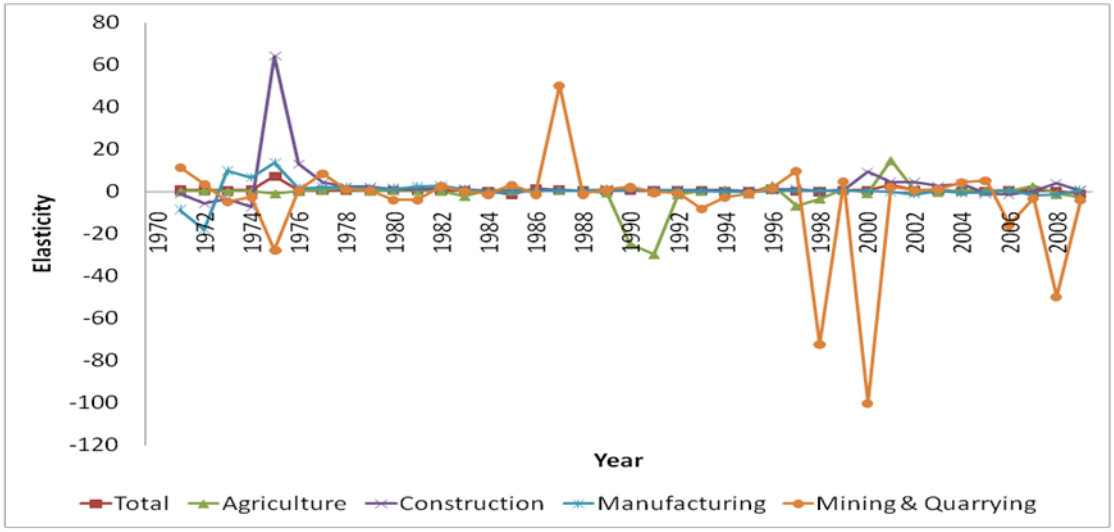

FIGURE 4.1 Employment elasticity of major sectors using simple and descriptive method, 1970-2009

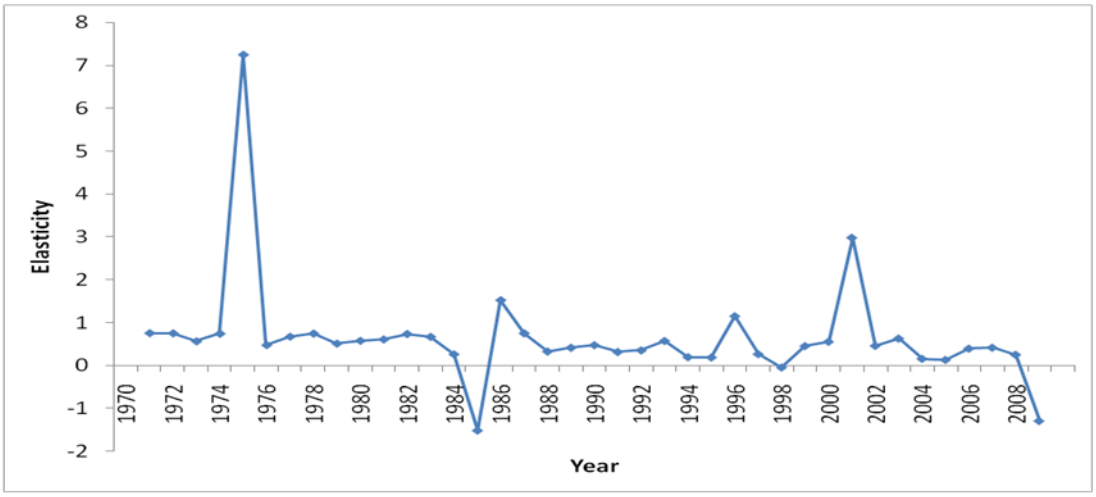

FIGURE 4.1.1Total employment elasticity using simple and descriptive method, 1970-2009

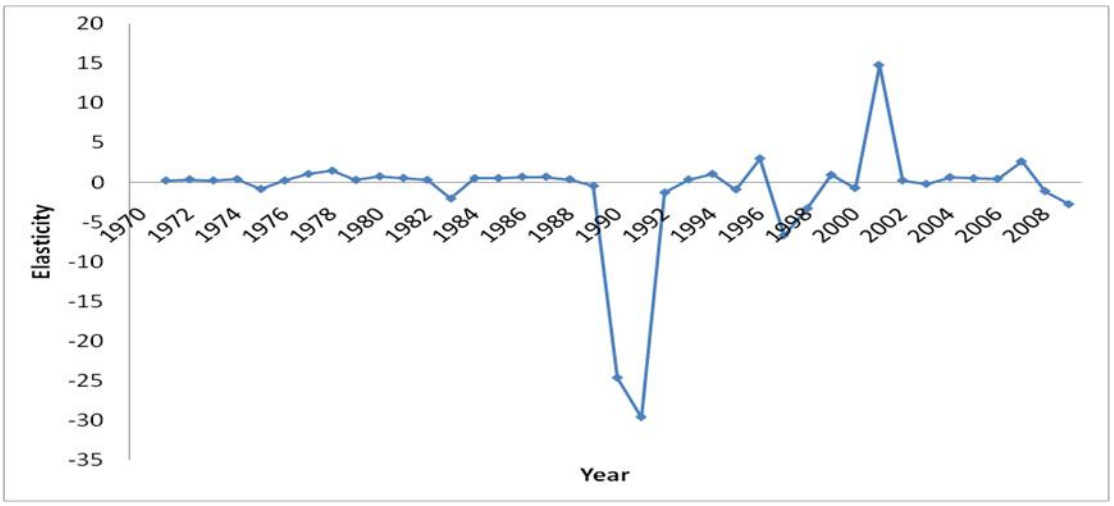

FIGURE 4.1.2 Employment elasticity of Agriculture sector using simple and descriptive method, 1970-2009

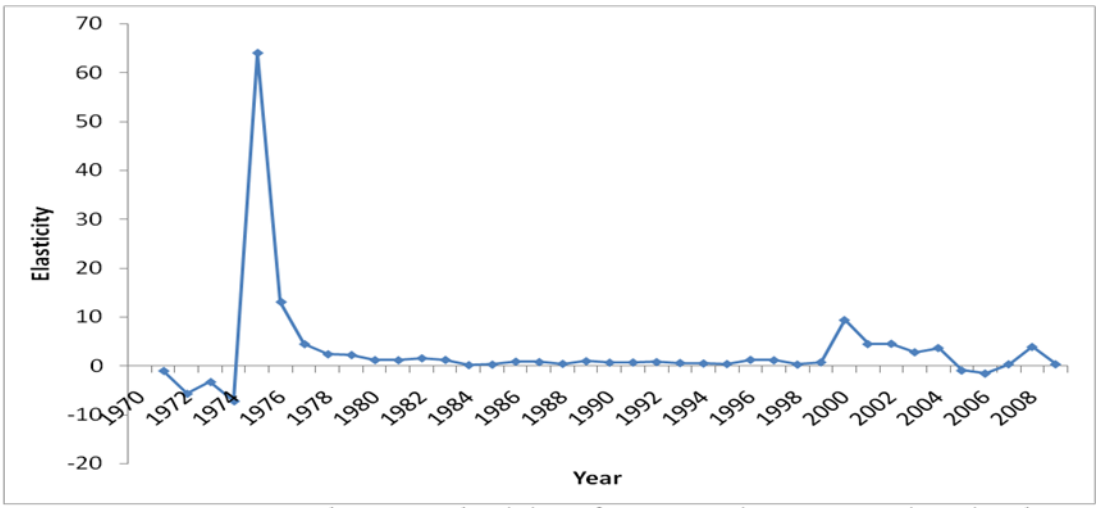

FIGURE 4.1.3 Employment elasticity of Construction sector using simple and descriptive method, 1970-2009

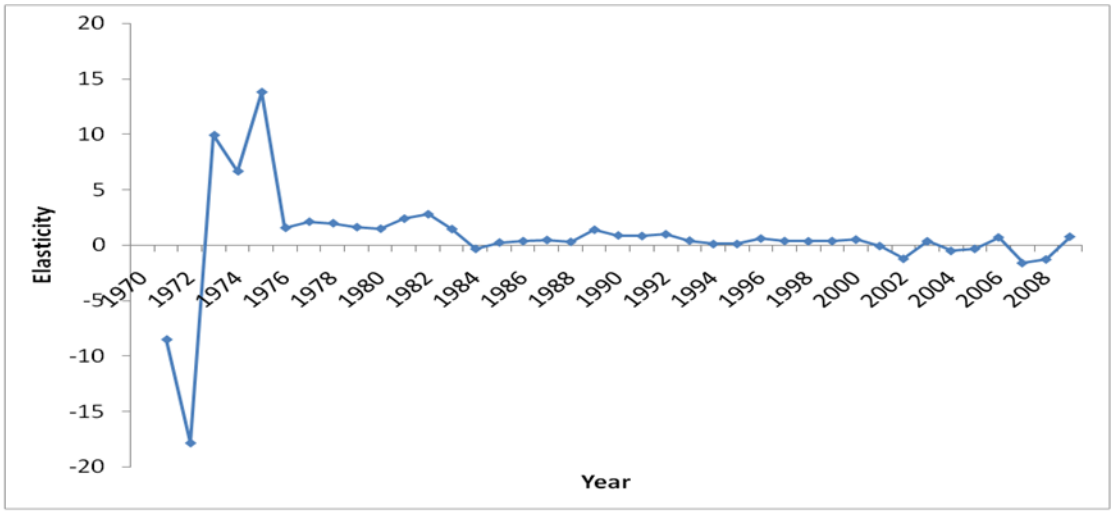

FIGURE 4.1.4 Employment elasticity of Manufacturing sector using simple and descriptive method, 1970-2009

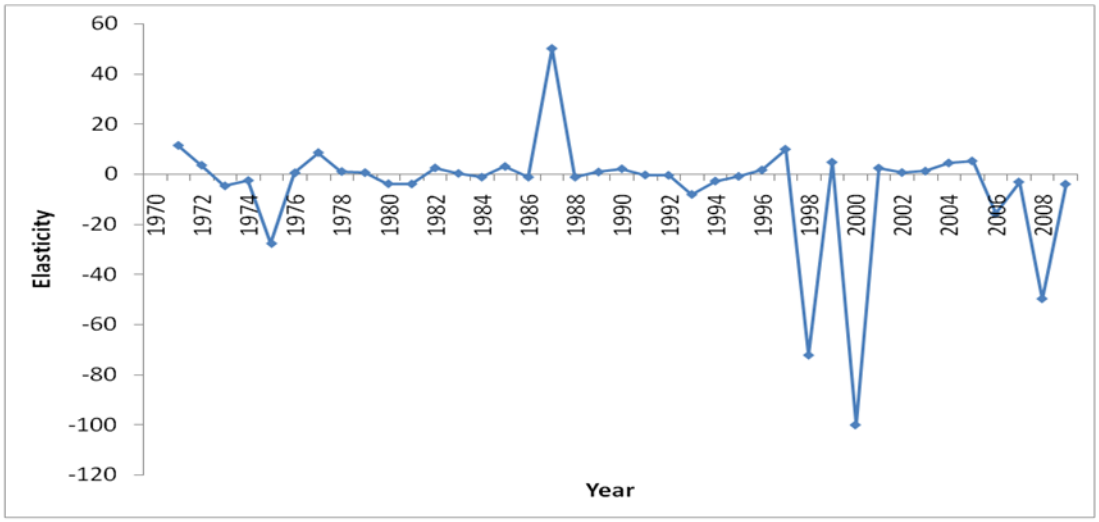

FIGURE 4.1.5 Employment elasticity of Mining and Quarrying sector using simple and descriptive method, 1970-2009

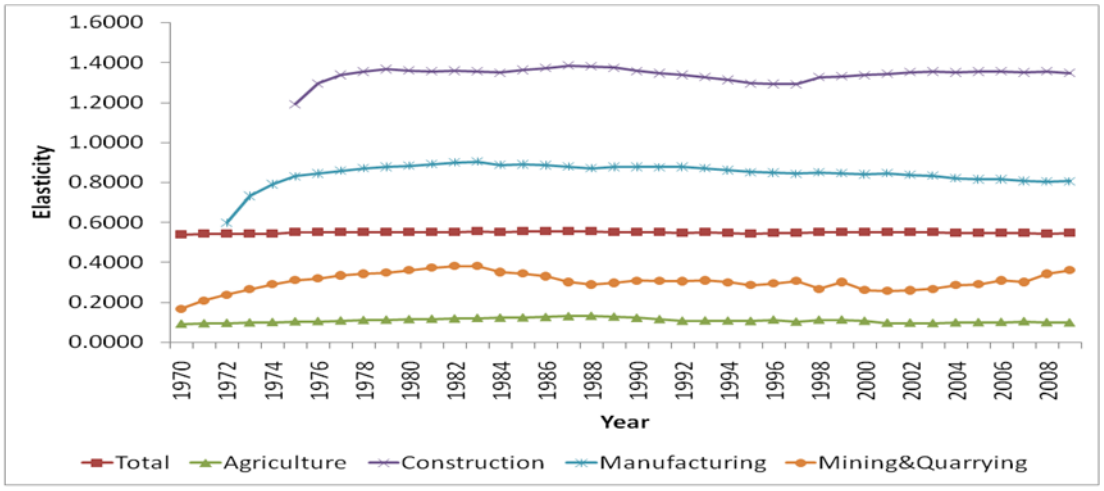

FIGURE 4.2 Employment elasticity of major sector OLS regression method, 1970-2009

TABLE 4.1: Total and sectoral employment elasticity: OLS regression method

	Total	Sector	Agriculture	Mining and Quarrying	Manufacturing	Construction
Constant	2.8636	Constant	6.3513	1.2527	-1.0073	-4.0301
total GDP	0.5497	sectoral GDP	0.1093	0.3044	0.8447	1.3420

TABLE 4.2: Sectoral employment elasticity: differentiate between the employment effects of growth in sectoral GDP and total GDP (1970–2009).

Sector	Agriculture	Mining and Quarrying	Manufacturing	Construction
sectoral GDP	1.185304	-0.829641	0.432345	1.048415
total GDP	-0.564972	0.743577	0.591699	0.257586

TABLE 4.3: Employment elasticity: demand and supply side of labour

Employment Rate	
GDP growth rate	0.3112
Labour Force Participation Rate	0.0250