IMMIGRATION AND LABOUR MARKET

THE RELATIONSHIP BETWEEN IMMIGRATION AND LABOUR MARKET PERFORMANCE IN SABAH’S OIL PALM PLANTATION SECTOR

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JEL CLASSIFICATIONS: J01, J43, J61

KEYWORDS: Immigration, wages, employment, labour market performance, Sabah plantation

ABSTRACT: The main objective of this paper is to analyze the relationship between immigration and labor market performance in Sabah region’s oil palm plantation industry. The labour market performance refers to the wages and employment of local workers in the oil palm plantation sector. The relationship of these variables can be in short run or/ and in the long run. This study uses Vector Error Correction Model (VECM) to examine the relationship between the immigration and labour market performance. In fulfilling this study, Johansen cointegration test is used to determine the relationship among the variables - immigration, employment and wages. The data are collected from the Department of Statistics Malaysia, Labour Department, Farmers’ Organization Authority Malaysia, National Archives of Malaysia and Sabah Agricultural Department over the past 31 years. The result shows that there is a relationship between immigration and employment of local workers in short run and long run. While, there is no relationship between immigration and wages either in short or long run.


Introduction

Malaysia is a multiracial country. The formation of a multiracial country is a result of migration of people from other countries to Malaysia during the British colonial period. Syarisa (2002) states that there were three general phases of migration flows from Indonesia. In first phase, starting from 1969 until 1979, the second phase from 1979 until 1989, and in the third phase started since 1980s (Syarisa Yanti Abubakar, 2002). The existence of job opportunities in many areas stimulated the rural-urban migration. Agriculture needed more labor, especially in oil palm plantations. To fill the gap in labor supply plantation companies began to recruit foreign workers. These workers were arriving to the country illegally, because on that time there were no legal provisions for the importation of unskilled or semi-skilled workers (Syarisa Yanti Abubakar, 2002). To overcome the surplus of foreign workers problem there was variety of further actions taken by the government.
As reported by Bank Negara Malaysia (1997), the immigrant flows into Malaysia started in the early 70s until the 90s. The increasing number of foreign workers in the two decades was estimated about 1.7 million people until 1997. In 1992 the total of labour force in Sabah was 524,300 which increased about 48 percent in 10 years. These include the foreign workers who came to Sabah. In 1992 the total labor force participation was 65.1 percent out of the total labor force in this state. In 2010 the total labor force was 1,370,900 compared to 1,345,300 in the previous year. The labor participation rate for both years made 74.6 percent and 76.9 percent respectively (Department of Statistics Malaysia, 2010).

Sabah Economic development depends on the export of primary commodities. Primary commodities exports such as palm oil, sawn timber, crude petroleum, palm kernel oil, plywood and other items. In agriculture oil palm, cocoa and rubber became major exports of Sabah region's economy.

Agriculture sector was one of the sectors that contributed large portion in Sabah’s GDP. According to the Department of Statistics Malaysia (2010), agriculture sector contributed RM 8,029 million in (2007) or 28.8 percent to the Sabah GDP (Department of Statistics Malaysia, 2010).

The objective of this research is to explore the impact of total foreign workers flows in oil palm plantation sector on the employment and wages of local workers in long and short term.

**Literature review**

There are many theories that explain about immigration and its impact on the economy. Immigration affects the employment in certain country. However, the immigration provides only small effect to the economy. And there is also a situation where a country with higher percentage of foreign workers does not influence the employment rates of local workers (Angrist and Kugler, 2003). Immigration could give positive and negative effects on the economy in terms of employment rates (Carrasco, Juan, and Ortega, 2008).

According to Bailey (2008), immigration and migration are closely linked and often interchangeable, but there are differences in these two activities (Bailey, 2008). Immigration means movement of people from one country to another with the intention of becoming permanent residents of the country to which there are reallocating. Countries have different immigration impacts on wages and employment rates (Carrasco et al., 2008). Jean, Causa, Jimenez, and Wanner (2007) show situations where the high immigration in a country exists with the low unemployment rate; and there was also a situation with both high immigration and unemployment rates. Thus, immigration does not have a certain impact on the labour market performance. Immigrants migrate to another country because of high wages in the host country compared to the home country (Jean et al., 2007).

In a particular country, immigrant has higher productivity than local workers. They also easily adapt to in the labour market of the host country (Borjas, 2006). Rowthorn (2004) states that existence of many unskilled workers migrating to a particular country will bring beneficial to the host country with cheap labour (Rowthorn, 2004). Usually they will work in plantation, and also services sector. Local workers will compete to immigrants. Larger number of immigrants in this country will bring less opportunity for local workers to get jobs in certain areas.
Longhi, Nijkamp, and Poot (2006) state that immigration not only influence the labour market performance, but it also can impact inflation, housing, social cohesion, and environment. Immigration can give more effects on employment opportunities compared to local wages (Longhi et al., 2006). In the short term, changes in wages and employment may not occur due to immigration. Immigration can affect wages and employment for local workers. Immigration will increase workers' wages if foreign workers were complementing (Dustmann, 2005).

In 1982 the general perception has concluded that immigrants take jobs from local workers. And this has increased unemployment rate to 8.3 percent in 1986 (Hugo, 1993). Based on Longhi et al. (2006), an increase of 1 percent of the total immigration will decrease around 0.024 percent of workers in the employment of locals (Longhi et al., 2006). Besides, Dustmann (2005) notes that, an increase of 1 percent of immigrant in population will reduce the employment rate by 0.07 percent of local workers (Dustmann, 2005).

The increase in labour demand in a country may be associated with growth of employment in labour intensive productions. Local workers who compete with foreign workers (substitute) will tend to earn lower wages, but this migration will increase the employment of complement workers to the skills possessed by foreign workers. This explains reducing wages when local and foreign workers are substituted and increasing wages when local and foreign workers are complement (Dustmann, 2005). According to Asadul Islam (2008), immigrant is the substitute to the local workers in certain occupations, and complementary in some jobs (Asadul, 2008).

Dustmann (2003) states that immigration does not worsen state of the local workers (Dustmann, 2003). However, Rowthorn (2004) finds that immigration causes demand for local workers to be low. Immigration causes a voluntary unemployment among local workers as wages fall (Rowthorn, 2004). Thus, they are more likely not to participate in labour market (Dustmann, 2005). But for local workers who were working and still continue working in the particular industry the wages will increase. This shows that there is difference between the wages of local workers and immigrants, even though they do the same job. Immigrant inflow in an area will increase the demand for housing and this will increase the cost of living. Rowthorn (2004) also states that to compensate their workforce many employers are likely to raise money wages. If the increasing in wages is less than the original increase in the cost of living, local workers will be worse off even though they are being paid more (Rowthorn, 2004). Thus, immigration leads to higher money wages, but it is not conclusive proof that immigration can gives benefit to native workers.


Methodology

Labour market performance refers to the wage, employment and unemployment rates (Borjas, 2006; Dustmann, 2005; Card, 2001; Goldiner, 2004; Asadul, 2007). In
this study there are two levels to see the relationship between immigration and labour market performance in Sabah; especially in the oil palm plantations industries. The first stage is the relationship between immigration and wages of local workers in the plantation industry. In this study it is assumed that there is relationship between immigration and wages of local workers. Based on previous studies obtained for other countries, the impact of this immigration should reduce the amount of wages received by local workers (Card, 2001). The second stage is to see the relationship between immigration and the employment. Based on previous studies the entry of foreign workers in a particular country should give a negative impact on employment (Borjas, 2006; Card, 2001). Where, an increase in the number of foreign workers will cause employment to fall. The variables used in this study include the number of immigrants, wage and employment (Borjas, 2006; Card, 2001; Bonin, 2005; Okkerse, 2008) from 1980 until 2010.

The immigration, employment and wage model is represent by the equations:

\[ EM = f (WG, IM) \] (1)

\[ WG = f (EM, IM) \] (2)

Based on the equation (1) and (2), the \( EM \) is number of employment, \( WG \) is wage of workers in the oil palm plantation and \( IM \) refers to number of immigration in Sabah.

\[ \log (EM) = a_0 + a_1 \log (IM) + a_2 \log (WG) + e_{er} \] (3)

\[ \log (WG) = b_0 + b_1 \log (IM) + b_2 \log (EM) + e_{w} \] (4)

In the equation (3) \( a_0, a_1 \) and \( a_2 \) are the coefficients to be estimated, while \( e \) represents stochastic error term. Based on the neoclassical economics theory, \( a_1<0 \) and \( a_2<0 \). In equation (4) \( b_0, b_1, b_2 \) are coefficients to be estimated and \( b_1<0 \) and \( b_2<0 \). Consider the model below:

\[ WG_t = \beta_{10} + \beta_{11} WG_{t-1} + \beta_{12} IM_{t-1} + v_{t wg} \] (5)

\[ IM_t = \beta_{20} + \beta_{21} WG_{t-1} + \beta_{22} IM_{t-1} + v_{t im} \] (6)

\[ ER_t = \beta_{30} + \beta_{31} ER_{t-1} + \beta_{32} IM_{t-1} + v_{t er} \] (7)

\[ IM_t = \beta_{20} + \beta_{21} ER_{t-1} + \beta_{22} IM_{t-1} + v_{t im} \] (8)

Equation (5), (6), (7) and (8) refers to systems where each variable becomes a function of their own lag, and lag of the other variables. In equation (5) wage rate \( WG_t \) is a function of its own lag \( WG_{t-1} \) and the lag of other variables in the equation.
While in the equation (6), immigration rate IMt is a function on its own lag IMt-1 and the lag of other variables in the system WGt-1. Similar relations for equations (7) and (8) which test relationships between the employment rate ERt and immigration rate IMt.

This study aims to examine the relationship between immigration and labor market performance at the oil palm plantation in Sabah, by using a sample of unskilled workers for the years 1980 to 2010. To examine the relationship between these variables, Augmented Dickey Fuller test (ADF) test should be conducted to see whether the data used are stationary or not. The data used must be stationary before the next test of Johansen Cointegration test. Johansen Cointegration test will show the long-term relationship between the variables used. Finally, the Vector Error Correction Model (VECM) examines the relationship between the variables in the short term and also in long term.

Data analysis

The analysis uses annual data during the period 1980-2010 for the variables such as number of immigrants, wage of local workers, and number of employment in Sabah’s oil palm plantations sector. The first thing to know is whether the time series stationary or non-stationary data. This study also uses the cointegration test to see the cointegrating equation between the variables. Augmented Dickey-Fuller (ADF) test is used because it is better than Dickey-Fuller Test. The critical value of Dickey-Fuller test is larger and sometimes it may cause to reject the correct null hypothesis (Brooks, 2002).

**Table 1. Augmented Dickey-Fuller Stationary Test for Unit Root**

<table>
<thead>
<tr>
<th>Level</th>
<th>First difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant without trend</td>
</tr>
<tr>
<td>Employment</td>
<td>-3.40(2)**</td>
</tr>
<tr>
<td>Wage</td>
<td>-3.21(13)**</td>
</tr>
<tr>
<td>Immigration</td>
<td>-1.35(2)</td>
</tr>
</tbody>
</table>

**Table 2. Phillips-Perron Stationary Test for Unit Root**

<table>
<thead>
<tr>
<th>Level</th>
<th>First difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant without trend</td>
</tr>
<tr>
<td>Employment</td>
<td>-3.47(6)**</td>
</tr>
<tr>
<td>Wage</td>
<td>-2.64(7)*</td>
</tr>
<tr>
<td>Immigration</td>
<td>-1.37(7)</td>
</tr>
</tbody>
</table>

Notes: Figures in parentheses indicate number of lag structures. *** indicates significance at 1% level; ** indicates significance at 5% level; * indicates significance at 10% level.
In the above Tables 1 and Table 2, the results show that all levels are integrated of order one I(1). After first differentiation all the variables are stationary at five percent level. Thus, these variables have the same order of integration.

In order to test the hypothesis, there is a null hypothesis, \( H_0 = r = 0 \), indicating no cointegration between the variables. While the alternative hypothesis is \( H_1 = r \leq 1, r \leq 2 \ldots (r - k) \) where it shows that there is cointegration for the variables used. The time series data are stationary in first difference, therefore, there is possibility for having a long-term relationship or cointegration between the variables.

**TABLE 3. THE JOHANSEN COINTEGRATION TEST (TRACE EIGENVALUE STATISTIC)**

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Trace statistics</th>
<th>5 percent critical value</th>
<th>Probability</th>
<th>Number of cointegrating equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.665595</td>
<td>41.49763</td>
<td>29.79707</td>
<td>0.0015</td>
<td>None</td>
</tr>
<tr>
<td>0.208862</td>
<td>9.730959</td>
<td>15.49471</td>
<td>0.3020</td>
<td>At most 1</td>
</tr>
<tr>
<td>0.096309</td>
<td>2.936759</td>
<td>3.841466</td>
<td>0.0866</td>
<td>At most 2</td>
</tr>
</tbody>
</table>

Notes: Trace test indicates 1 cointegrating equation at the 0.05 level. * - denotes rejection of the hypothesis at the 0.05 level. ** - MacKinnon-Haug-Michelis (1999) p-values.

Table 3 shows the Trace statistics and eigenvalues. When the vector \( r = 0 \) the alternative hypothesis is accepted because the value of t statistics is 41.49763; which is greater than the critical value (29.79707) at five percent significance level. While the vector \( r = 1 \), the null hypothesis is accepted because the t statistics is 9.730959; its smaller than five percent significance level which is 15.49471. When vector \( r = 2 \), the null hypothesis is accepted and the alternative hypothesis is rejected. The value of the t statistics (2.936759) is smaller than the 5 percent significance level which is 3.841466.

**TABLE 4. THE JOHANSEN COINTEGRATION TEST (MAXIMUM EIGENVALUE STATISTICS)**

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Max statistic</th>
<th>5 percent critical value</th>
<th>Probability</th>
<th>Number of cointegrating equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.665595</td>
<td>31.76667</td>
<td>21.13162</td>
<td>0.0011</td>
<td>None</td>
</tr>
<tr>
<td>0.208862</td>
<td>6.794200</td>
<td>14.26460</td>
<td>0.5138</td>
<td>At most 1</td>
</tr>
<tr>
<td>0.096309</td>
<td>2.936759</td>
<td>3.841466</td>
<td>0.0866</td>
<td>At most 2</td>
</tr>
</tbody>
</table>

Notes: Max-eigenvalue indicates 1 cointegrating equation at the 0.05 level. * - denotes rejection of the hypothesis at the 0.05 level. ** - MacKinnon-Haug-Michelis (1999) p-values.

Based on Table 4, the Maximum Eigenvalue test show there is a relationship between the variable which is immigration, employment and wage in the long term. It can be explained when the Maximum Eigenvalue test accept the alternative hypothesis and reject the null hypothesis at \( r = 0 \), where the value of maximum statistic is greater
than the critical value at five percent significance which is 31.76667 and the critical value is 21.13162.

When the vector \( r = 1 \), the Maximum Eigenvalue statistic is 6.794200 which is smaller than 14.26460, the critical value at significance level of five percent. This means that the null hypothesis will be accepted. Meanwhile, when the vector \( r = 2 \), the Maximum Eigenvalue statistic is 2.936759 smaller than five percent critical value of 3.841466. This means that both \( r = 1 \) and \( r = 2 \), the alternative hypothesis will be rejected and the null hypothesis will be accepted.

Johansen cointegration test indicates that these three studied have long run relationship; all these variables are cointegrated. Based on Johansen cointegration test, there is equilibrium between the variables in the long run and they are cointegrated in order one \( I(1) \). However, there may also disequilibrium between the variables in the short term. Therefore, the Error Correction Model (ECM) needs to be done, which is the final stage in the process of creating models for wages and employment.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ECT_{t-1} )</td>
<td>-0.673266</td>
<td>0.180004</td>
<td>-3.740275</td>
<td>0.0028</td>
</tr>
</tbody>
</table>

Table 5 shows the model for the employment. In this model the dependent variable is employment, while wage and immigration are independent variables. The estimated error correction model uses the maximum lag which is six. But because of the data used is 31 years, therefore the maximum lag that can be used for this test is only four. From the table, the \( p \)-value for the Error Correction Term \( (ECT_{t-1}) \) is 0.0028 which less than the value at five percent significance level. It explains that the data have long run relationship, where immigration in the long run will influence the employment of local workers. The cointegrated equation for employment model is the following:

\[
EM = -2.7576 - 0.1168 IM - 1.5203 WG, \tag{9}
\]

Equation (9) shows the cointegrated equation for employment model, where \( EM \) is employment, \( IM \) refers to immigration and \( WG \) is the wage of local workers. The equation explains that the relationship between immigration and employment is negative, where the increase in one percent of immigration will reduce the employment of local workers by 0.12 percent. The same goes to the wage, one percent increase in wage of local workers will decline the employment by 1.52 percent.

Table 6 is the result modified from the Wald Test to find the relationship in a short run. Based on the result, the \( p \)-value is 0.023 which is smaller than the value at five percent significance level; this rejects the null hypothesis. The rejection of null hypothesis indicates that the immigration can influence the employment of local workers in oil palm plantation sector in short run.
Table 6. Wald Test for Employment Model (Short Run Relationship)

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>df</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>2.140927</td>
<td>(9, 12)</td>
<td>0.1095</td>
</tr>
<tr>
<td>Chi-square</td>
<td>19.26834</td>
<td>9</td>
<td>0.0230</td>
</tr>
</tbody>
</table>

Table 7. Wage Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECT_{t-1}</td>
<td>-0.041771</td>
<td>0.315015</td>
<td>-0.132601</td>
<td>0.8967</td>
</tr>
</tbody>
</table>

Table 7 shows the wage model with four lags. In the formation of this model, wage serves as dependent variable while immigration and employment serves as an independent variable. Based on the table, there is no variable significance with five percent significance level. The Error Correction Term (ECT_{t-1}) with one lag shows that it is not significant. The p-value is 89.67 percent which is greater than value at five percent significance level. Therefore, the variable does not have any relationship in the long term. Change in the number of immigrant and employment will not give any effect to the wage of local workers at the plantation sector in Sabah. The cointegrated equation for wage model is shown in the equation (10).

\[
WG = 1.8138 + 0.0768IM - 0.6577EM, \tag{10}
\]

Equation (10) explains that change of the immigration (IM) by 0.08 percent will increase the wage (WG) by one percent. And increase in the number of employment (EM) by 0.658 percent will decline the wage by one percent. Immigration and wage have positive relationship, while employment and wage have negative relationship.

Table 8. Wald Test for Wage Model (Short Run Relationship)

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>df</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>0.496071</td>
<td>(9, 12)</td>
<td>0.8508</td>
</tr>
<tr>
<td>Chi-square</td>
<td>4.464636</td>
<td></td>
<td>0.8783</td>
</tr>
</tbody>
</table>

Wald test is conducted in the analysis to find the relationship between the variables in the short run. Based on the result in Table 8, the wages do not significantly have any relationship with the independent variables (immigration and employment). It’s
explained by the $p$-value given in the table. The $p$-value is greater than five percent significance level which is 87.83 percent. Therefore the null hypothesis will be accepted, where the immigration and employment cannot influence the wages of local workers at the oil palm plantation sector in Sabah.

Vector Error Correction model (VECM) by using four lags is performed to determine the relationship between the variables. It’s found that immigration has a relationship to the employment in the long run. Based on the Wald Test, immigration also will influence the employment of local workers in the short term. Therefore, it can be concluded that there is a relationship between immigration on employment either in the long term or short term. This relationship is negative: an increase of one percent of immigration cause a decrease by 0.12 percent of local workers employment. This shows that foreign workers are a substitute for local workers in the plantation sector. When there is an increase in immigration, total employment will decline, because the foreign workers will be replacing the local workers.

Apart from the employment model, the wage model also is developed to examine the relationship between immigration and labour market performance. Based on the VECM test, there is no significant relationship between immigration and wages. This explains that the total immigration will have no impact on wages of local workers in oil palm plantation sector. This is because the immigration becomes a substitute for local workers. Thus, the wage rates will not increase or decrease; even there are a lot of immigrants in this sector. If foreign workers are complementary, wages will tend to increase with the inclusion of foreign workers. In addition, employers will not increase the wages in the long period of time because the supply of labour more than demand.

**Conclusion**

This study examines the relationship between immigration and labour market performance which is measured by wage and employment at the oil palm plantation sector in Sabah. This study has answered the hypotheses developed: the entries of foreign workers in Sabah, especially oil palm plantations, are not related to the wage of local workers and foreign workers who were employed in this sector. But the number of entering immigrants gives negative effect to the employment of local workers in Sabah. Finally, the influx of immigrants is in no relationship to labour market performance in Sabah based on case studies at oil palm plantation sector.

However, this study has only covered limited scope and area which is only at Lahad Datu, Tawau and Sandakan places in Sabah region. Hopefully, future studies will use more data and other variables that could affect the labour market performance in a particular country and accomplish the analysis across all sectors, job types and areas in a particular country.

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