ASEAN-3-Malaysia international migration and real wage convergence

Abstract
This paper attempts to investigate the effect of international migration from the ASEAN-3, namely, Indonesia, Thailand and the Philippines into Malaysia on the wage ratio between these countries and Malaysia. The analysis within OLS model uses data of 1990-2008 period collected from various sources. The analyses are carried out for the overall Malaysian economy and its three subsectors, namely manufacturing, construction and agriculture sectors. The dependent variable is the wage ratio, whereas the independent variables are the migration ratio, economic openness, years of schooling and time dummy. The results of modelling for each of the studied countries have been defined. The results for the Indonesia-Malaysia wage ratio model show that the migration ratio has negative and significant impacts on the wage ratio for the overall Malaysian economy, the construction sector and the agriculture sector. The results for the Philippines-Malaysia wage ratio model also show the negative effect of the migration ratio on the wage ratio for the overall economy and all its sectors. However, the results for the Indonesia-Malaysia wage ratio model demonstrate that the negative effects occur only for the overall economy and the manufacturing sector. This reflects that an increase in the international migration from the ASEAN-3 will make the wages more diverge between these countries and Malaysia respectively.

Keywords: International Migration; Wage Ratio; Migration Ratio; ASEAN-3; Malaysia

JEL Classification: J61; J31

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1. Introduction

One of the interesting phenomena in the South East Asia is a connection between Malaysia and its neighbouring countries through migrant workers. Malaysia is one of the main destinations of its neighbouring countries’ workers, in particular Indonesia, the Philippines and Thailand (ADB, 2009) [1]. Further, these three countries will be referred to as the ASEAN-3. Recent figures show that about 2.3 million foreign workers in Malaysia, which accounted for about 15% of its total employment. Of these, 1.0 million are legal and 1.3 million are illegal (Ministry of Home Affairs, 2011) [2].

According to labour market theory, the wage rate is determined by the labour demand and supply. An increase in the labour supply will pressure wage rates to decrease. With regards to international migration, the outflow of migrant workers will lower the supply of labour in the emigrating country and push the wage rate up, while the supply of labour in the host country will increase and lower the wage rate, provided the demand for labour is constant. This will change the wage ratio between the emigrating and the immigrating countries.

The theoretical aspect of labour market that looks into the effects of immigration is usually described by using a neo-classical competitive model of supply and demand in the market for labour services (Okkerse, 2008) [3]. In general, immigrants lower the price of factors with which they are perfect substitutes and raise the price of factors with which they are complements. Nevertheless, the impact of immigration on labour market still remains a mystery. Sizing up the enormous amount of research results produced in this field, the authors have concluded that immigration negatively affects wages of less skilled labourers and earlier immigrants. Researchers use different approaches to produce evidence for such a conclusion. The factor proportions approach, the computable general equilibrium model, the area analyses and the production theory approach are among them.

The purpose of this paper is to analyse the effect of international migration between the ASEAN-3 and Malaysia on the basis of real wage convergence for overall economy and by sectors in Malaysia accordingly. This study will focus on three countries in Southeast Asia which are greatly involved in sending their workers to Malaysia. They are Indonesia, Thailand and the Philippines. The paper is organised into five sections. Section 2 discusses the literature review followed by the theoretical framework and model specification in Section 3. Section 4 presents the results of the analysis; conclusions are provided in Section 5.

2. Brief Literature Review

Studies by Borjas (1989)[4] and Borjas (1994)[5] from the survey data show that foreign workers do not have a sizeable and significant effect on employment and wages of the natives in the same segment of the labour market, even when the foreign workers supply shock is large. A 10% increase in the number of immigrants reduces the native wage by at most one and a half per cent. Immigrants, however, do have a significant impact on their own wage. A 10% increase in the number of immigrants reduces the immigrant wage by at least 2-3%. The empirical evidence based on the neoclassical model of labor demand, therefore, does not support the claims that immigrants have been a major disruptive force in labor markets in the United States (Borjas, 1989) [4]. Cards (2001) uses the 1990 census data to study the effects of immigrant inflows on the United States (Borjas, 1989) [4]. Cards (2001) uses the 1990 census data to study the effects of immigrant inflows on the United States (Borjas, 1989) [4].

In their work based on the United States census data, Ottaviano and Peri (2008) extend the structural modeling approach of Borjas (2003) to assess the overall impact of immigration on wages while allowing for imperfect substitutability between native and immigrant workers [10]. They find evidence of imperfect substitution and conclude that the 1990-2006 immigration increase has only small negative effects on workers born in the United States in the short run and positive effects in the long run. Some economists argue that immigrants and natives are not close substitutes; therefore immigration does not reduce wages of native workers. However, Borjas et al. (2008) find that foreign-born and native workers are perfect substitutes and their simulations show immigrants lower wages of natives [11].

In another study, Borjas (2003) indicates that immigration lowers the wage of competing workers: a 10% increase in supply reduces wages by 3-4% [8]. Using German data for the 1975-1997 period, Bonin (2005) concludes that the direct impact of immigration on native wages is small as a 10% increase in labour supply stemming from immigration is predicted to reduce wages by less than 1%, with a stronger negative impact for low-skilled natives [9].

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the period of 1998-2005. The study discloses that a 10% increase in foreign workers will reduce the local wage rate in this sector by 0.6% [22]. Rahmah et al. (2001) show that the semi-skilled and unskilled foreign workers have significant and negative effect on the local firm’s wage rate, but the skilled foreign workers have no significant effect [23].

The influx of migrant workers will increase labour supply in the receiving country and lower the wage rate. On the contrary, the supply of labour in the emigrating country will be lower and increase its wage rate. Therefore, the wage ratio will become closer to unity, in other words, the wage will be more converge. However, findings from the past studies on this issue are still inconclusive. Therefore, this study will examine to what extent the immigration ratio affects the wage ratio in the case of Malaysia.

Methodology

Source of Data

The analysis in this paper is based on the secondary data collected from various sources. The data on GDP are gathered from UNCTAD Handbook of Statistics (2009) [24]. Data on wages and unemployment are collected from the International Labour Organisations, whereas the data on education are collected from Barro and Lee (2011) [25]. The data on Malaysian openness are from the Ministry of Finance of Malaysia and the data on migration are received from the Ministry of Home Affairs of Malaysia (2008) [26]. GDP and wages are taken at real value using the year 2005 as the base year. The data coverage for the regression analysis is from 1990 to 2008.

Model Specification

This section presents several estimation models used in this study. The study covers two analyses, which are ordinary least squares (OLS) using time series data and panel data analysis of fixed effects and random effects. Beside the migration ratio, other variables like economic openness, average years of schooling and time will also affect the wage ratio. Economic openness is one of the important determinants for international migration. An increase in the volume of export-import may raise foreign direct investment and bring together their expertise to the host country, which affects wages in the host country.

Educational attainment, measured by years of schooling, can be an approximate measurement for labour quality. Educational attainment of the population affects wages since more educated workers will receive higher wages. As Becker (1975) and Schultz (1963) through their human capital theory pointed out that there is a strong positive relationship between education and wages through productivity enhancement [27, 28]. In this study, the data available for the ASEAN-3 are the national average years of schooling (SCH). We add this variable to the wage ratio model using the average years of schooling of the emigrating country to see the effect of labour quality on the wage ratio. In addition, the economic crisis of 1998 might have changed the Malaysian wage rate due to a decline in entrepreneurs’ profit. Therefore, we add time dummy (TIME) into regression (2) to look at the result before and after the crisis.

The OLS model will be used for the overall and sectoral analyses and the model is written as:

\[ W_{ijt} = \beta_0 + \beta_1 MR_{ijt} + \beta_2 OPEM_{ij} + \beta_3 SCH_{ijt} + \beta_4 DUM_t + \epsilon_{ijt}, \]

where \( W_{ijt} \) is the monthly wage ratio between the country of origin \( (i) \) and Malaysia \( (j) \) at time \( t \) and \( MR_{ijt} \) is the ratio between the number of international migrant workers and the number of employment in Malaysia at time \( t \); \( OPEM \) is Malaysia’s economic openness which is measured by the ratio of total export plus import and total gross domestic product (GDP); \( SCH_{ijt} \) is the average years of schooling for the emigrating country; \( DUM_t \) is time dummy. 1998 and above is and before 1998 is 0, and \( \epsilon_{ijt} \) is the error term. For the time series data, the estimation of the wage ratio model will involve two steps. The first step is to regress the total wage ratio using pooled data. The other step is to estimate the wage ratio separately by individual emigrating countries.

Panel Data Analysis

In addition to the OLS, static panel data for Fixed Effects (FE) and Random Effects (RE) models will be used for the analysis. There are two advantages of panel data: it can control unobserved time-invariant heterogeneity in cross-sectional models, also it can disentangle components of variance and estimate transition probabilities, more generally, i.e., speaking generally, study the dynamics of cross-sectional populations (Arelano, 2003). The estimation of panel data uses only one independent variable due to the lack of sectoral data for other independent variables. The FE model assumes that the individual sectoral effect is fixed and not correlated with the explanatory variables. The FE model is as follows:

\[ W_{ijt} = \alpha_i + \lambda_i MR_{ijt} + \alpha_t + \epsilon_{ijt}, \]  

where \( \alpha_i \) is the individual specific effects that varies among individuals, \( \epsilon_{ijt} = \theta_i + \epsilon_{ijt} \) where \( \theta_i \) is the individual specific random element. The Hausman test is conducted to choose the best model between the FE and the RE models, whereby when the null hypothesis is rejected then the RE is better than the FE estimation.

Estimation Results

Before we estimate the models, we will conduct a test for stationary of data by using the augmented Dickey-Fuller (ADF) unit root test. The ADF tests show that all the series are non-stationary in level, but become stationary after taking the first differences. In other words, all series are said to be integrated of order one (see Table 1).

\[ W_{ijt} = \delta_i + \delta_t MR_{ijt} + \nu_{ijt}, \]  

where \( \delta_i \) is the individual specific effects that varies among individuals, \( \nu_{ijt} = \nu_t + \nu_{ijt} \) where \( \nu_t \) is the individual specific random element. The Hausman test is conducted to choose the best model between the FE and the RE models, whereby when the null hypothesis is rejected then the RE is better than the FE estimation.

![Table 1: \( \tau \) ratios from ADF unit root tests](image)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF tests including intercept and trend</th>
<th></th>
<th>Level</th>
<th>First Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRIM</td>
<td>-2.797611</td>
<td>-5.66284</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRPIM</td>
<td>-2.479468</td>
<td>-3.574963</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRTM</td>
<td>-2.987156</td>
<td>-6.612894</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRIM</td>
<td>-1.621951</td>
<td>-3.653410</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRPM</td>
<td>-3.183403</td>
<td>-5.468000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRTM</td>
<td>-2.987123</td>
<td>-4.618949</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPEM</td>
<td>-1.311184</td>
<td>-4.475421</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCH</td>
<td>-1.251466</td>
<td>-4.324948</td>
<td></td>
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</tr>
</tbody>
</table>

Notes: WRIM - real wage ratio of Indonesia-Malaysia; WRPIM - real wage ratio of the Philippines-Malaysia; WRTM - real wage ratio of Thailand-Malaysia; MRIM - Indonesian-Malaysia migration ratio; MRP - Philippine-Malaysia migration ratio; MRT - Thailand-Malaysia migration ratio.

Source: Authors’ estimation

Tables 2-4 report the estimation results for the wage ratio models. Serial correlation tests of the first order were carried out. The test indicated the absence of serial correlation in some equations, whereas the residuals showed strong evidence of serial correlation in other equations. Therefore, further estimation by using the Gauss-Newton procedures was performed to correct the problem. The results represent the equation without serial correlation.

Table 3 presents the estimation results for the wage ratio between Indonesia and Malaysia. The analysis for the overall
Malaysian economy shows that the migration ratio and economic openness of Malaysia have negatively affected the wage ratio. An increase in the migration ratio will decrease the wage ratio between Indonesia and Malaysia. This reflects that an increase in the migration out from Indonesia will make wages more divergent. The same argument is true for the economic openness, where an increase in the openness will increase the wage gap. Both findings are contrary to what the theory states. The explanation for this can be related to the wage growth, which envisages faster growth in Malaysia. Nevertheless, the number of migration from Indonesia increases as well as the Indonesian wage rises, but at the slower rate if compared to Malaysia. The economic openness, on the other hand, will require a higher quality of labour and may reduce the demand for unskilled workers, whereby the majority of the migrant workers from Indonesia are in this category. When we incorporate the education and time dummy variables, the results are not significant but the economic openness is still significant.

The analysis by sectors demonstrates that both variables are significant for the construction sector and the relationship is similar to the ones of the overall economy. The migration ratio also significantly reduces the wage ratio in the agriculture sector, which reflects the fact that agriculture wages between Indonesia and Malaysia become more divergent. The time dummy is significant only with regard to the manufacturing sector, reflecting the fact that after the year 1998, the wage ratio becomes more divergent as compared to the years before 1998. This is consistent with the result for the overall economy and reflects the great involvement of the manufacturing sector.

The results for the wage ratio estimation between the Philippines and Malaysia also demonstrate the same pattern as the one of Indonesia and Malaysia. The migration ratio is negative and significant for the overall Malaysia economy but the economic openness in Malaysia is not significant. The Average years of schooling are statistically significant in reducing the wage gap between these two countries. This reflects that the higher the schooling level of the Philippines is, the higher wages are gained by this country, which subsequently makes wages more convergent. The economic structural change in Malaysia approximately shown by the time dummy does not seem to significantly affect the wage ratio between these two countries. (see Table 3).

The analysis by sectors shows that the migration ratio negatively affects the real wage ratio between the Philippines and Malaysia in all sectors. This means an increase in the migration ratio will reduce the wage ratio, in other words, the real wage will diverge. The economic openness affects the wage ratio significantly and negatively for the manufacturing sector. However, since the agriculture wage ratio between the Philippines and Malaysia are more than unity, a decrease in the wage ratio reflects the convergence in wage. In this case, when the migration ratio increases, the agriculture wages will become more convergent between the Philippines and Malaysia. The economic structural change only affects the real wage ratio for the manufacturing sector where the wage ratio is lower after the year 1998, which reflects the divergence in wages between the manufacturing sectors of these two countries.

The estimation results for the wage ratio between Thailand and Malaysia for the overall economy are shown in Table 4. As shown by the estimation results for Indonesia and the Philippines, the migration ratio and openness are two significant variables that determine the wage ratio between two countries. However, the results are not robust, since adding up other variables will effect the significant level. Years of schooling is highly significant in determining the convergence of the real wage ratio. The higher the schooling attainment of the Thailand population is, the lower the wage gap will be. In this case, time dummy is not significant.

The estimation results by sectors shows that significant results are only found in the manufacturing sector where the manufacturing output significantly reduces the wage ratio for this sector. An increase in the Malaysian economic openness also reduces the wage ratio of the manufacturing sector, which reflects the fact that wages are more divergent. This finding does not correspond to the theory which postulates that economic openness will increase the inflow of international migration and wages become more convergent between the respective countries. Time dummies are not significant for all sectors.

Further, we utilise panel data for each country by multiplying the time dimension by all the three countries. The results are only found in the manufacturing sector for Hausman test to define whether the FE or the RE model is more appropriate.
outflow from the country of origin. This study shows that the effect of migration ratio on the real wage ratio is also significant and negative in most cases. This implies that an increase in the number of migration will make the wages more divergent and this contradicts to what the theory states. This reflects many other factors that contribute to wage convergence but not the migration ratio. One of the explanations for this is that the wage growth in Malaysia is higher than in the ASEAN-3 along with its higher economic growth and GDP per capita. Economic openness in any case is not a significant determinant of either the migration or the wage ratio. Workers quality measured by year of schooling is a very important determinant for the real wage ratio. Its positive effect implies the importance of education among the population to reduce the wage gap between the ASEAN-3 and Malaysia. This study proves that the migration from the ASEAN-3 contributes significantly to real wage divergence, which reflects a larger income disparity among the nations involved, thereby raising regional income disparity. 

Obviously, there are other determinants of wage convergence beside the migration ratio, which cannot be captured in this study due to a lack of data. Unmeasurable data like political stability and life environment are also important but this is beyond the scope of secondary data. These limitations could be resolved using primary data, which require higher cost to conduct a field survey.

References