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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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Міжнародна міграція та конвергенція показників реальної заробітної плати країн АСЕАН-3 та Малайзії

Анотація

У статті досліджується ефект міжнародної міграції з країн АСЕАН-3, зокрема з Індонезії, Таїланду й Філіппін, до Малайзії з точки зору різниці в показниках реальної заробітної плати. Для проведення дослідження було використано OLS-модель, а також дані з різних джерел за 1990-2008 роки. Аналіз охоплює економіку Малайзії в цілому та три її сектори зокрема: виробництво, машинобудування та сільське господарство. При створенні економетричної моделі залежною змінною була сукупність показників рівня заробітної плати, а незалежними змінними – показники рівня міграції, економічна відкритість, кількість років навчання та часова змінна. Результати дослідження засвідчили, що рівень міграції між країнами АСЕАН-3 та Малайзією має сильний зв'язок і негативну кореляцію з рівнем заробітної плати. Це підтверджує тезу про те, що зростання міжнародної міграції з країн АСЕАН-3 підвищує диференціацію показників рівня заробітної плати між цими країнами та Малайзією.

Ключові слова: міжнародна міграція; рівень заробітної плати; рівень міграції; АСЕАН-3; Малайзія.

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Международная миграция и конвергенция показателей заработной платы стран АСЕАН-3 и Малайзии

Аннотация

В статье исследуется эффект международной миграции из стран АСЕАН-3, в частности из Индонезии, Таиланда и Филиппин, в Малайзию с точки зрения разницы в показателях реальной заработной платы. Для проведения исследования была использована OLS-модель анализа, а также данные из разных источников за 1990-2008 годы. Анализ охватывает как экономику Малайзии в целом, так и три отдельных её сектора, а именно: производство, машиностроение и сельское хозяйство. При создании эконометрической модели зависимой переменной была совокупность показателей уровня заработной платы, а независимыми переменными – показатели уровня миграции, экономическая открытость, количество лет обучения, а также временная переменная. Результаты исследования показали, что уровень миграции между странами АСЕАН-3 и Малайзией имеет сильную связь и отрицательную корреляцию с уровнем заработной платы. Это подтверждает тезис о том, что рост международной миграции из стран АСЕАН-3 повышает дифференциацию показателей уровня заработной платы по отношению к названным странам и Малайзии.

Ключевые слова: международная миграция; уровень заработной платы; уровень миграции; АСЕАН-3; Малайзия.

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 outcomes of natives stays theoretically uncertain. 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 labour market [6]. He discovered that immigrant inflows over the 1980s reduced wages and employment rates of low-skilled natives in Miami and Los Angeles by 1-3%.

Gross (2002), using French data from the mid-1970s to the mid-1990s, found out that in the long-run both legal and amnestied immigrant workers and their families lower the unemployment rate permanently but in the short run the arrival of immigrants slightly increases unemployment with an impact effect similar to that of an increase in domestic labour force participation [7]. As in the case of wage effects of immigration, the composition of the immigration matters when assessing the effect on unemployment and labour force participation rates. Gross (2002) concludes that in the long run, immigrants create more jobs than they occupy and unemployment lowers permanently.

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].

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].

Peri and Sparber (2009) developed a general equilibrium model of comparative advantage in task performance to evaluate the effects of immigration on less educated natives [12]. They show that inflows of less educated immigrants have negative but very small effects on similarly educated natives. They argue that the increased specialisation might explain why many empirical analyses of the impact of foreign workers on wages and employment for less educated natives show small effects. They found out that foreign workers specialised in occupations that required manual and physical labour skills, whereas natives specialised in jobs more intensive in communication and language tasks.

Card (2009) also presents evidence that the imperfect substitution between equally skilled immigrants and natives and the perfect substitution between high school graduates and high school dropouts would then imply that the impact of immigration on the earnings of native-born workers was small, despite high immigration rates and downward labour demand curves [13]. While Mocetti and Porello (2010) showed that immigration in Italy had a displacement effect on low-educated natives (both for males and females) [14].

Lai (2010) and Lai (2013) estimates the impact of migrant workers on the wages of native workers using private sector data in the Taiwan manufacturing industry and considered workers aged between 20 and 60 [15; 16]. With regard to the occupation variables, an influx of migrant workers has a negative effect on supervisors, technical and non-technical workers. In particular, the results show that a higher ratio of foreign workers significantly reduces the wages of persons employed as supervisors (0.33% out of 0.34%). However, wages for technical workers and non-technical workers increased from 0.41% to 0.52% and from 0.66% to 1.18%, respectively. The study shows that, in general, the effect of foreign workers on wages is positive.

However, Shapiro and Vellucci (2010) state that immigration does have distributional wage effects, generally raising the average wage of highly-skilled Americans and reducing the wages or wage gains of some low-skilled Americans [17]. Devadason (2011) and Prema-Chandra and Devadason (2012) examined the impact of foreign workers on the manufacturing wages and found a statistically significant negative impact of foreign workers on real manufacturing wage, but the magnitude of the impact was small [18; 19]. Using micro data from the US Decennial Census 1960-2000 and the 2006 American Community Survey, Ottaviano and Peri (2011) discovered that immigration had a small effect on the wages of native workers with no high school degree, which was between 0.6% and 1.7% [20]. Manacorda et al. (2011) studied the impact of immigration on wage structure in the UK [21]. In accordance with pooled time series of British cross sectional micro data on male wages and employment from the mid-1970s to the mid-2000s, the study shows that immigration has primarily reduced the wages of their fellow immigrants.

Bratsberg and Raaum (2012) examined the impact of foreign workers on wage rate in Norway's construction sector for

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. (2014) 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 affect 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 only 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:

$$\frac{W_i}{W_j} = \beta_0 + \beta_1 MR_{ijt} + \beta_2 OPEM_{jt} + \beta_3 SCH_{it} + \beta_4 DUM_{jt} + \varepsilon_{it} \quad (1)$$

where $\frac{W_i}{W_j}$ 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*, $OPEM_{jt}$ is Malaysian economic openness which is measured by the ratio of total export plus import and total gross domestic product (GDP); SCH_{it} is the average years of schooling for the emigrating country; DUM_{jt} is time dummy, 1998 and above is and before 1998 is 0, and ε_{it} 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 assumes that the individual sectoral effect is fixed and not correlated with the explanatory variables. The FE model is as follows:

$$\frac{W_{it}}{W_{jt}} = \lambda_0 + \lambda_1 MR_{ijt} + \alpha_i + \varepsilon_{it} \quad (2)$$

Instead of considering individual sectoral effect as fixed and not correlated with the explanatory variables, the RE model assumes that intercepts are drawn from a common distribution and error terms consists of two components, error term unique to each observation and constant overtime (θ_i) and error term that represents the extent the intercept of cross sectional unit varies from the overall intercept (ε_{it}). The RE model is as follows:

$$\frac{W_{it}}{W_{jt}} = \delta_0 + \delta_1 MR_{ijt} + v_{it} \quad (3)$$

where α_i is the individual specific effects that varies among individuals, $v_{it} = \theta_i + \varepsilon_{it}$ where θ_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).

Tab. 1: τ ratios from ADF unit root tests

Variables	ADF tests including intercept and trend	
	Level	First Difference
WRIM	-2.797611	-5.66284***
WRPM	-2.479468	-3.974863**
WRTM	-2.987156	-6.612894***
MRIM	-1.621951	-3.653410*
MRPM	-3.183403	-5.468000***
MRTM	-2.987123	-4.641894***
OPEM	-1.311184	-4.475421**
SCH	-1.251466	-4.532498**

Notes: WRIM - real wage ratio of Indonesia-Malaysia; WRPM - real wage ratio of the Philippines-Malaysia; WRTM - real wage ratio of Thailand-Malaysia; OPEM - openness of Malaysian economy; MRIM - Indonesian-Malaysia migration ratio; MRP - Phillippinnes-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

Tab. 2: Regression Estimates of the Real Wage Ratio for Indonesia-Malaysia

Constant	MR	OPEM	SCH	DUM	R ²	LM test ¹ or DW
Overall Economy						
0.2583 (0.053)	-0.4090* (0.208)				0.4343	
1.1829 (0.189)	-0.3315** (0.145)	-0.5400*** (0.119)			0.7507	0.0015 (0.9687)
1.5659 (0.814)	-0.3164* (0.152)	-0.5111*** (0.136)	-0.4336 (0.895)		0.7545	
1.6456 (0.875)	-0.3841 (0.262)	-0.5414*** (0.169)	-0.4686 (0.929)	0.0314 (0.097)	0.7564	0.0006 (0.9808)
Manufacturing Sector						
0.1693 (0.025)	-0.5841 (0.367)				0.1299	
0.5593 (0.107)	-0.0467 (0.314)	-0.2518 (0.068)			0.53012	1.1656 (0.2803)
0.4037 (0.127)	0.5554 (0.423)	-0.1520* (0.081)		-0.0825 (0.042)	0.6252	2.2141
Construction Sector						
0.5398 (0.056)	-1.1297*** (0.382)				0.3394	1.3159 (0.2513)
1.4618 (0.312)	-0.6596* (0.352)	-0.5840*** (0.195)			0.5761	2.0593
1.1109 (0.371)	-0.2129 (0.439)	-0.3453 (0.240)		-0.1792 (0.113)	0.6371	2.4439 (0.118)
Agriculture Sector						
1.0326 (0.106)	-2.7849*** (0.831)				0.3979	0.4055 (0.5243)
1.0282 (0.724)	-2.7880** (0.997)	0.0028 (0.459)			0.3979	0.4049 (0.5246)
0.5841 (0.885)	-1.8276 (1.478)	0.2995 (0.571)		-0.2685 (0.303)	0.4278	0.0636 (0.8009)

Notes: Breusch-Godfrey Serial Correlation LM Test: (n-1)R². The figures in the parentheses below the estimated value of LM test are their probability of Chi-square (1). Figures in parentheses are standard errors *** - significant at 1%, ** - significant at 5%, * - significant at 10% Source: Authors' estimation

Tab. 3: Regression Estimates of the Real Wage Ratio for Philippines-Malaysia

Constant	MR	OPEM	SCH	DUM	R ²	LM test ¹ or DW
Overall Economy						
0.7286 (0.045)	-57.8600*** (11.337)				0.605086	1.617496
1.6452 (0.228)	-42.5093 (9.028)	-0.5758 (0.142)			0.8056	2.5723 (0.1087)
-0.8902 (0.694)	-34.2468*** (5.73)	-0.1435 (0.131)	1.9122*** (0.528)		0.8992	
-1.0803 (0.738)	-29.256*** (8.441)	-0.0644 (0.164)	1.984*** (0.539)	-0.0455 (0.055)	0.9045	
Manufacturing Sector						
0.3783** (0.148)	-11.0898 (11.714)				0.6696	
1.3870*** (1.173)	-22.5203*** (4.306)	-0.5192*** (0.110)			0.8612	2.0121
1.1462 (0.202)	-12.755* (6.401)	-0.3661** (0.129)		-0.1433* (0.074)	0.8892	2.2718
Construction Sector						
0.8170*** (0.094)	-67.6861* (37.164)				0.4089	
1.0126 (0.408)	-65.4667 (38.024)	-0.1164 (0.248)			0.5488	
1.0607 (0.448)	-78.665 (54.98)	-0.1464 (0.271)		0.0491 (0.137)	0.5616	
Agriculture Sector						
4.5399*** (0.388)	-1741.47*** (382.1)				0.6567	
2.8913 (1.797)	-1872.14*** (357.7)	0.9949 (1.152)			0.6720	0.6276 (0.5282)
3.1042 (2.28)	-1957.1*** (646.4)	0.8588 (1.462)		0.1455 (0.909)	0.6726	0.5029 (0.4782)

Notes: Breusch-Godfrey Serial Correlation LM Test: (n-1)R². The figures in the parentheses below the estimated value of LM test are their probability of Chi-square (1). Figures in parentheses are standard errors *** - significant at 1%, ** - significant at 5%, * - significant at 10% Source: Authors' estimation

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 envisage faster growth in Malaysia. Nevertheless, the number of migration from Indonesia increases as well as the Indonesian wage raises, 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 foreign workers in 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 Malaysian 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 be more convergent between the Philippines and Malaysia. The economic structural change only affect 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 show 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 Malaysia 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 sectors. We check for Hausman test to define whether the FE or the RE model is

Tab. 4: Regression Estimates of the Real Wage Ratio for Thailand-Malaysia

Constant	MR	OPEM	SCH	DUM	R ²	LM test ¹ or DW
Overall Economy						
0.4736 (0.088)	3.3381 (8.893)				0.0130	
0.3247 (0.142)	-0.3304 (2.825)	0.0819 (0.074)			0.3534	
-0.6386 (0.940)	-18.941** (6.448)	-0.2985* (0.155)	2.4863** (1.042)		0.7956	2.0825
-1.2451 (0.994)	-15.432 (10.26)	-0.2178 (0.210)	3.1762*** (1.022)	-0.0378 (0.078)	0.8516	1.8850
Manufacturing Sector						
0.2416 (0.007)	-0.1298 (1.116)			0.0019	2.058277	
1.3212 (0.140)	-15.250*** (4.583)	-0.5519*** (0.085)		0.7999	0.0260 (0.8720)	
Construction Sector						
0.5149 (0.054)	46.4459 (32.46)				0.2262	1.874913
0.2269 (0.674)	52.744 (37.53)	0.1573 (0.367)			0.2492	1.808893
-0.5159 (1.425)	35.325 (81.82)	0.7281 (0.767)		-0.1961 (0.237)	0.2834	1.9282
Agriculture Sector						
2.8812 (0.978)	-481.361 (655.6)				0.0715	0.1889 (0.6629)
-5.8093 (4.668)	786.62 (491.2)	3.6860 (2.672)			0.1338	
-0.9385 (3.778)	-36.2936 (526.2)	0.6184 (2.430)		1.9207 (1.119)	0.4661	0.1898 (0.6631)

Notes: Breusch-Godfrey Serial Correlation LM Test: (n-1)R². The figures in the parentheses below the estimated value of LM test are their probability of Chi-square (1). Figures in parentheses are standard errors *** - significant at 1%, ** - significant at 5%, * -significant at 10% Source: Authors' estimation

a better estimation. Our result shows that the RE estimations are more efficient and consistent as shown by the insignificant Hausman test (see Table 5). Table 6 demonstrates the result using panel data regression. It is shown that migration ratio is a significant determinant of the real wage ratio between Indonesia and Malaysia, Philippines and Malaysia but not for Thailand and Malaysia. The results maintain the negative relationship between the migration ratio and the wage ratio.

Conclusion

Theoretically, migration will bring the wage differences closer, in the sense that wages in the destination country and the emigrating country will be less different, because of changes in the supply of labour. This will subsequently reduce migration

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Tab. 5: Results of Hausman Test

Country	Chi-Sq Stat	Prob	Decision
Indonesia	1.3904	0.2383	RE estimates are efficient and consistent
Philippines	0.87518	0.3495	RE estimates are efficient and consistent
Thailand	0.7796	0.3773	RE estimates are efficient and consistent

Source: Authors' estimation

Tab. 6: Regression Estimates of the Real Wage Ratio Function Panel Data: Random Effect

Country	Constant	MR	Cross-section		
			Manufacturing	Construction	Agriculture
Indonesia	0.5856*** (0.187)	-1.6859*** (0.354)	-0.3480	0.0136	0.3344
Philippines	1.6265* (0.828)	-65.883* (34.78)	-0.8201	-0.7437	1.5638
Thailand	1.1436 (0.789)	-7.3849 (78.27)	-0.8290	-0.5287	1.3577

Notes: Figures in parentheses are standard errors *** - significant at 1%, ** - significant at 5%, * -significant at 10% Source: Authors' estimation

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 years 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 international 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.