

# **EAST ASIAN DEVELOPMENT NETWORK**



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## **ASEAN-3-Malaysia International Migration and Real Wage Convergence**

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### Abstract

International migration is one of the important issues in the development process. A common phenomenon is that workers will move from a less-developed nation to a more-developed nation to seek higher income and improve their welfare. The migration theory states several reasons for migration. These reasons can be categorized into two groups: the push factors and the pull factors. The push factors include the economic performance of the country of origin while the pull factors involve the performance of the destination country. These factors include gross domestic product (GDP) per capita, job creation, unemployment rate, and wage ratio. International migration has several implications on the country of origin as well as the destination country, one of the most crucial of which is wage convergence. It has been hypothesized that international migration will lower wages in the destination country and raise wages in the emigrating country. This is consistent with the labor market theory which stipulates that an increase in the supply of labor in the destination country due to international migration will cause wages to fall. On the other hand, the emigrating country will have less supply of labor, which will cause wages to rise. This study attempts to investigate this issue by focusing on international migration to Malaysia by people from the ASEAN-3; namely, Indonesia, Thailand, and the Philippines. Its two main objectives are to examine the determinants of international migration and to investigate whether international migration has a significant impact on real wage convergence between the ASEAN-3 and Malaysia. We hypothesize that factors such as GDP per capita in Malaysia and the unemployment rate in the country of origin will have positive and significant impacts on international migration while the wage ratio between the

emigrating countries and Malaysia will have a negative impact. In addition, the migration ratio in Malaysia will have a significant positive impact on wage ratio. In other words, wages will exhibit greater convergence.

Keywords: international migration, wage ratio, wage convergence, emigrating country, destination country

## **1. INTRODUCTION**

### **1.1 Background of the Study**

In domestic migration theory, the two-sector model of Arthur Lewis and the rural-urban migration model of Todaro point toward a strong conclusion: that wage differential drives workers to move from a lower-wage sector/place/country to a higher one (Todaro 2000). Krugman (2009) had the same finding on wage differential as an important factor in international migration. Krugman's simple model shows that the free movement of labor between a labor-abundant country and a labor-scarce country (but one with either abundant capital or land) will affect the redistribution of the labor force. This situation will lead to four conditions: (1) real wage convergence (i.e., real wages in the labor-abundant country will increase but those in the destination country will decrease); (2) world output, as a whole, will increase; (3) workers from the labor-abundant country will enjoy higher real wages while labor in the destination country will suffer from the decline of real wages; and (4) employers in the labor-abundant country will be worse off due to the scarcity of labor while employers in the destination country will be better off.

Southeast Asian migrant workers and the connection between Malaysia and its neighboring countries, in particular, are an interesting phenomenon. Malaysia is one of the main destinations of its neighboring countries' workers, Indonesia, the Philippines, and Thailand in particular (ADB 2009). These three countries will be referred to henceforth as the ASEAN-3. Additional data from the World Bank Study for Indonesia (2008) have shown that 17 percent of Malaysia's workforce is from overseas, more than 60 percent of which is from Indonesia. In addition, the study showed that around 1.3 million documented and 700,000 undocumented Indonesian migrants worked in Malaysia in 2006; 60 percent of the documented Indonesian

migrants in Malaysia at that time were women. More recent figures show that 2.3 million foreign workers in Malaysia have registered under the 6P amnesty program, which ended on August 31, 2011. Of these, 1 million are legal migrants and 1.3 million are illegal (Ministry of Home Affairs 2011).

The best way to describe the driving force of international migration, especially from the ASEAN-3 to Malaysia, comes from the basic principles of economics, that is, people respond to incentives. This principle states that when the incentives (benefit) offered by other countries exceed its disincentives (cost), people will move to those countries that offer hope for a better life. In short, migrant workers will move to other countries to improve their well-being.

To understand the differences between the economies of the ASEAN-3 and Malaysia, it would be better to show some important indicators at the aggregate level. From 1990 to 2009, Indonesia's economic growth was almost similar to that of Malaysia while Thailand and the Philippines experienced lower growth. The main differences were in the GDP per capita, total population, and population growth. Malaysia's GDP per capita was around 3 times that of Indonesian GDP per capita, 4 times that of the Philippines, and 2 times that of Thailand. The population of Malaysia in 2009 was only about 11 percent of Indonesia's population, 30 percent of the Philippines', and 41 percent of Thailand's. These differences (GDP per capita and population) could be the drivers of migration between the ASEAN-3 and Malaysia. In addition, one of the surprising indicators was that the average population growth of Malaysia was about 2 percent, which was much higher than Indonesia's 1 percent, according to the World Development Indicators published by the World Bank (various years).

Further differences between the ASEAN-3 and Malaysia are evident in the employment and migration data. From 1990 to 2009, the average unemployment rate in Indonesia and the Philippines was around 8 percent; in Thailand, around 2 percent; and in Malaysia, around 3 percent. In 2005, the international migration stock in Indonesia was 135,623; the Philippines, 374,786; and Thailand, 981,960 while Malaysia had 2,029,208. However, according to the World Development Indicators published by the World Bank in 2005, net migration in Indonesia accounted for around -1.2 million; the Philippines, -1.1 million; Thailand, 1.1 million; and Malaysia, 396,662.

These data provide some clues on the indicators or factors that probably influenced (and continue to influence) workers' movement from the ASEAN-3 to Malaysia. The first factor is income or GDP per capita differences. The second is the large population in the ASEAN-3. The third is the high unemployment rate, especially in Indonesia, which is higher than that in Malaysia, thus providing an ideal reason for Indonesian workers to move to Malaysia.

Unskilled and semiskilled workers (defined based on their jobs category) constitute the largest component of migrant workers in Malaysia. Unskilled workers are those who work as production operators, housemaids, general workers, and elementary workers while semiskilled workers are those who work as supervisors and sales workers. This definition is not based on education level; some workers in the unskilled category are actually highly educated (e.g., housemaids from the Philippines). As of 2006, there were 1,869,209 unskilled and semiskilled migrant workers in Malaysia from 23 countries, 62.8 percent of whom were from Indonesia (Kanapathy 2008). At the same time, Malaysia was facing an unemployment problem of its own. Its unemployment rate, even though considered low at about 3 percent on average, was around 20 percent among those who finished secondary education, a demographic that includes unskilled and semiskilled workers (Department of Statistics Malaysia 2009). Thus, unskilled and semiskilled migrant workers posed competition to this group of local workers in securing jobs. In addition, local workers have less bargaining power in demanding higher wages due to an increasing number of unskilled and semiskilled migrants. Employers have a broader choice in hiring workers, and they always find out that foreign workers are more willing to work harder for lower pay. A study published by the World Bank in 2011 shows that in Malaysia, wage growth does not reflect productivity growth. For the last 10 years, productivity growth has been about 6.7 percent but wages grew at about 2.5 percent. Furthermore, the introduction of the minimum wage in Malaysia in April 2012 (implemented in January 2013) largely benefited migrant workers since the majority of them are eligible for the minimum wage, which is set at MYR 900 per month.

It would be interesting to investigate whether or not international migration from the ASEAN-3 to Malaysia will have an implication for real wage convergence among these countries. According to the theory of international migration, when real wage converges, it will

reduce international migration and increase the number of job opportunities for locals. However, international migration also depends on other variables like the unemployment rate in the destination country, GDP per capita, and population growth. If real wage ratio is the main factor for international migration, wage convergence will reduce migration flow. However, if other factors are more important, then wage convergence just reduces the inequality in the different dimensions of well-being experienced by the populations of the participating countries. In the first scenario, the introduction of the minimum wage by the receiving country will create wage divergence that, in turn, will increase migration flow to Malaysia. However, Malaysia anticipates that the implementation of the minimum wage will subsequently reduce the hiring of foreign workers because employers will be more predisposed to hiring a more skilled local workforce for the sake of productivity, to enhance profits, and to cope with increasing wages. However, if wage divergence will attract more migrants, as the theory suggests, then the introduction of the minimum wage will result in a larger number of foreign migrants. Therefore, the main research questions to be addressed are:

- (1) Does wage ratio play a major role in determining international migration from the ASEAN-3 to Malaysia?*
- (2) Does international migration from the ASEAN-3 to Malaysia result in real wage convergence among the participating countries?*

Based on our knowledge, there is currently no study on wage convergence between the ASEAN-3 and Malaysia related to international migration. One of the benchmark studies from other regions on international migration was from Williamson (1995) who showed that the percentage increase in real wage (1870--1913) in the destination countries (i.e., Argentina, Australia, and the United States, excluding Canada) was lower than in the origin countries (i.e., Ireland, Italy, Norway, and Sweden). This means that real wage convergence occurred during the period studied.

This research has four objectives:

1. To discuss trends in international migration from the ASEAN-3 to Malaysia
2. To examine real wage convergence between the ASEAN-3 and Malaysia

3. To examine the effect of real wage ratio on international migration in Malaysia
4. To analyze the effect of international migrants ratio on real wage convergence by sectors in Malaysia

This study will focus on three countries in Southeast Asia that are greatly involved with sending their workers to Malaysia: Indonesia, Thailand, and the Philippines. The period of study is 1980—2008, depending on data availability. The study will cover all types of migrant workers in Malaysia, including expatriates, skilled, semiskilled, and unskilled workers. The sectoral analysis will focus on the manufacturing, construction, and agriculture sectors.

### 1.2 International Migration from the ASEAN-3 to Malaysia

Table 1 presents the number of migrant workers in Malaysia by country of origin. It shows Indonesia as being the source of the highest number of migrants in all the years under study followed by Bangladesh, the Philippines, Thailand, and Pakistan. The number of Indonesian migrants in Malaysia increased drastically from 269,194 in 1999 to about 1.2 million in 2006 before slightly dropping to 1.1 million in 2008. Indonesians make up more than half of the total number of migrants in Malaysia. International migration from the Philippines showed an increasing trend over time--from 7,299 to 26,713 migrants between 1990 and 2008. The number of migrants from Thailand fluctuated, starting from only 2,130 in 1999 and then increasing to 20,599 in 2002. It dipped down to 5,751 in 2005 and then rose to 21,065 in 2008. Migrants from the Philippines and Thailand make up less than 5 percent of all migrants in Malaysia. This percentage is quite low but it exerts a significant impact on the Malaysian economy. Due to their proximity to Malaysia, the mobility of migrants from these three countries to Malaysia is expected to increase in the future.

Table 1. Number of migrant workers in Malaysia (%)

Country of Origin	Year			
	1999	2002	2005	2008
Indonesia	269,194 (65.7)	788,221 (73.8)	1,211,584 (66.7)	1,085,658 (52.6)
Bangladesh	110,788	82,642	55,364	316,401

	(27.0)	(7.7)	(3.0)	(15.3)
Thailand	2,130 (0.5)	20,599 (1.9)	5,751 (0.3)	21,065 (1.0)
Philippines	7,299 (1.8)	21,234 (2.0)	21,735 (1.2)	26,713 (1.3)
Pakistan	2,605 (0.6)	2,000 (0.2)	13,297 (0.7)	21,278 (1.0)
Others	17,644 (4.3)	152,833 (14.3)	507,507 (28.0)	591,481 (28.7)
Total	409,660 (100.0)	1,067,529 (100.0)	1,815,238 (100.0)	2,062,596 (100.0)

Source: Ministry of Home Affairs, Malaysia, various years.

The majority of migrant workers are in the manufacturing sector. This group constitutes more than 30 percent of the total number of migrant workers in Malaysia. Domestic workers (i.e., maids) make up the second-largest number of migrant workers while the third-largest group is in the plantation sector. Foreign workers in the construction sector are the fourth-largest while those in the services sector make up about 10 percent of the total number of migrant workers.

Table 2. Number of migrant workers in Malaysia by sector (%)

Sector	Year			
	1999	2002	2005	2008
Domestic work (maids)	94,192 (23.0)	232,282 (22.0)	320,171 (17.6)	293,359 (14.2)
Manufacturing	155,277 (37.9)	323,299 (30.6)	581,379 (32.0)	728,867 (35.3)
Plantation	74,501 (18.2)	298,325 (28.2)	472,246 (26.0)	333,900 (16.2)
Construction	49,080 (12.0)	149,342 (14.1)	281,780 (15.5)	306,873 (14.9)
Services	36,610 (8.9)	64,281 (6.1)	159,662 (8.8)	211,630 (10.3)
Agriculture	na	na	na	186,967 (9.1)
Total	409,660 (100.0)	1,067,529 (100.0)	1,815,238 (100.0)	2,062,596 (100.0)

Source: Ministry of Home Affairs, Malaysia, various years.

Note: "na" means "not available"



## **2. THEORETICAL FRAMEWORK**

A variety of theoretical models have been proposed to explain why international migration begins, and although each ultimately seeks to explain the same thing, they employ radically different concepts, assumptions, and frames of reference (Massey et al. 1993). Indeed, there exists no single, coherent theory of migration but rather, a fragmented set of separate theories, many of which have developed in isolation from the rest. Theories that attempt to explain migration processes include the neoclassical theory of migration, human capital theory, new economics of labor migration theory, dual labor market theory, trade theory, and gravity model approaches (Paas and Scannell 2003) . In addition, there are several models that explain the migration process, including Ricardian models, the specific factors model, the Heckscher-Ohlin model, and the push and pull factors model.

### **2.1 Neoclassical Economics Theory**

Probably the seminal and best-known theory of international migration is the neoclassical economic theory, which holds that migration is caused by the supply of, and demand for, labor and the resulting wage differentiation based on a country's economic condition. According to Massey et al. (1993), the neoclassical theory states that countries with a large endowment of labor relative to capital have a low-equilibrium market wage while countries with a limited endowment of labor relative to capital are characterized by a high market wage as depicted graphically by the familiar interaction of labor supply and demand curves. The resulting differential in wages causes workers from the low-wage country to move to the high-wage country.

As a result of this movement, the supply of labor decreases and wages rise in the capital-poor country while the supply of labor increases and wages fall in the capital-rich country. This leads, at equilibrium, to an international wage differential that reflects only the costs of international movement, pecuniary and psychic. Mirroring the flow of workers from labor-abundant to labor-scarce countries is the flow of investment capital from capital-rich to capital-poor countries. The relative scarcity of capital in poor countries yields a rate of return that is high by international standards, thereby attracting investment. The movement of capital also includes

human capital, with highly skilled workers moving from capital-rich to capital-poor countries in order to reap high returns on their skills in a human capital-scarce environment. This leads to a parallel movement of managers, technicians, and other skilled workers.

Massey et al.'s (1993) neoclassical theory states that international immigration (legal and illegal) is a cost-benefit decision undertaken by an individual in order to maximize expected income. The net gain from movement is defined as the difference between expected income in the home and destination countries, summed and discounted for a time horizon and added to the negative cost of relocation. Individuals will be prompted to migrate when the net gain is positive. Thus, the main determinant for explaining international migration is the wage differential that exists between the home and destination countries.

International labor mobility is thought to be the key to the maintenance of a single, international-equilibrium real wage for all countries (Borjas 1989; Oberg 1997). Oberg mentioned that real wage differences between countries give rise to two flows where a new international equilibrium is created in which real wages are of the same level in all countries. The first is a flow of low-skilled labor from low-wage countries to high-wage countries. The second is a capital flow from high-wage countries to low-wage countries. This capital flow comprises mainly labor-intensive industrial capital and will be accompanied by high-skilled labor migration.

Massey et al. (1993) observed that the simple and compelling explanation of international migration offered by neoclassical macroeconomics has strongly shaped public thinking and has provided the intellectual basis for most immigration policy. This perspective contains several implicit propositions and assumptions:

1. The international migration of workers is caused by differences in wage rates between countries.
2. The elimination of wage differentials will end the movement of labor, and migration will not occur in the absence of such differentials.
3. International flows of human capital (i.e., highly skilled workers) respond to differences in the rate of return to human capital which may be different from the overall wage rate, yielding a distinct pattern of migration that may be opposite that of unskilled workers.

4. Labor markets are the primary mechanisms by which international flows of labor are induced; other kinds of markets do not have important effects on international migration.
5. Governments can control migration flows by regulating or influencing labor markets in sending and/or receiving countries.

## **2.2 Human Capital Theory**

Yorimitsu (1985) mentioned that most economists who study migration apply a labor-flow model, which posits that migration is a response to spatial differences in the returns to labor supply. Hence, international migration is conceptualized as a form of investment in human capital. People choose to move to where they can be most productive given their skills. However, before they can capture the higher wages associated with greater labor productivity, they must undertake certain investments, including the material costs of traveling, the costs of maintenance while moving and looking for work, the effort involved in learning a new language and culture, the difficulty experienced in adapting to a new labor market, and the psychological costs of cutting old ties and forging new ones (Massey et al. 1993).

Corresponding to the human capital model is a microeconomic model of individual choice. At the micro level, an individual's or migrant's goal is to maximize utility by choosing the destination that offers the highest net income. The connection between migration and investment in human capital was first made by Sjaastad (1962). According to human capital models, potential migrants compare the expected net benefits and costs of moving to each potential destination and select one destination where the benefits are expected to be optimum. The basic model of human capital considers three explanatory variables: net benefits in the current residence, the benefits at the destination, and the costs of moving (Yorimitsu 1985).

In the human capital model framework, migration occurs when the net present value of migration is positive. If more than one possible destination involves positive net benefit, the location that provides the highest net benefit is chosen. The money returns to migration are expressed in terms of positive increment of the individuals' earnings stream, and variables like occupation, age, sex, education, experience, and training affect earnings and influence the returns to migration. From the beginning of the model building, human capital models deal with the

costs and return of migration in economic and noneconomic terms (Yorimitsu 1985). The costs of migration can be divided into money and nonmoney costs: the first embodies the increase of expenditure for journeys, food, and lodging while nonmoney considerations involve opportunity costs such as the earnings forgone for travelling, searching for jobs, and learning (Cattaneo 2007).

The innovative contribution of this model is summarized in the crucial role that the heterogeneity of individuals assumes in a migration decision. Individuals, given the same average wage differentials, can display different propensities to migrate because of the different remunerations the human-capital characteristics have at the destination and the origin. Therefore, a person might move from location  $j$  to location  $i$  even though the average income in location  $i$  is lower than in location  $j$  because his personal skills provide a lifetime income increase (Cattaneo 2007). Borjas (1987, 1991) developed a closely correlated framework of a human-capital investment model of international migration. These models assume that individual migration is driven purely by comparing the present discounted value of lifetime earnings in alternative geographic locations, with migration occurring when there is a good chance of recouping human-capital investments.

Borjas (1987) presents a model in which the distribution of human capital among workers in the source and destination countries determine immigration flows in addition to the overall differences in labor returns. Borjas's approach reflects the observation that people in the source and destination countries differ in terms of their abilities, education, age, etc. He assumes that people in both economies are characterized by entire ranges of talents, skills, education levels, and other personal characteristics. The migration decision, therefore, depends on how a would-be migrant with a specific set of skills and talents perceives his or her gains from migrating from a labor market where the labor force has a certain distribution of worker characteristics to a country where the labor force has a different distribution of talents, skills, and education levels. The migration decision thus depends not just on the average difference in wages across countries but also on where the immigrant would fit into the destination country's labor market and how well the worker's abilities and other human-capital characteristics can be applied there.

### **2.3 New Economics of Labor Migration Theory**

The new economics of migration states that international migration occurs from “failures in other markets that threaten the material well-being of households and create barriers to their economic advancement.” This theory allows for markets to have imperfections. It recognizes that in developing countries, markets are not fully matured or well-functioning. In order to self-insure against risks to income, production, and property, or to gain access to scarce investment capital, households send one or more workers to foreign labor markets. Unlike individuals, households are in a position to control risks to their economic well-being by diversifying the allocation of household resources such as family labor. While some family members can be assigned economic activities in the local economy, others may be sent to work in foreign labor markets where wages and employment conditions are negatively correlated or weakly correlated with those in the local area. In the event that local economic conditions deteriorate and activities there fail to bring in sufficient income, the household can rely on migrant remittances for support (Massey et al. 1993).

### **2.4 Dual Labor Market Theory**

The dual labor market theory assumes (1) economic units (i.e., the individual or the household) to make the decision; (2) the entity being maximized or minimized (income or risk); (3) the economic context of decisionmaking (e.g., complete and well-functioning markets versus missing or imperfect markets), and (4) the extent to which the migration decision is socially contextualized (i.e., whether income is evaluated in absolute terms or relative to some reference group).

Piore (1979) stated that international migration is caused by a permanent demand for immigrant labor that is inherent to the economic structure of developed nations. According to Piore, immigration is not caused by push factors in sending countries (e.g., low wages or high unemployment) but by pull factors in receiving countries (e.g., a chronic and unavoidable need for foreign workers). This built-in demand for immigrant labor stems from four fundamental characteristics of advanced industrial societies and their economies. Piore posits three possible explanations for the demand for foreign workers in modern industrial societies: (1) general labor shortages; (2) the need to fill the bottom positions in the job hierarchy; and (3) labor shortages in

the secondary sector, which is characterized by a labor-intensive method of production and a predominantly low-skilled labor market.

According Massey et al. (1993), the dual labor market theory does carry implications and corollaries that are quite different from those emanating from the neoclassical economics theory:

1. International labor migration is largely demand-based and is initiated by recruitment on the part of employers in developed societies or by governments acting on their behalf.

2. Since the demand for immigrant workers grows out of the structural needs of the economy and is expressed through recruitment practices rather than wage offers, international wage differentials are neither a necessary nor a sufficient condition for labor migration to occur. Indeed, employers have incentives to recruit workers while holding wages constant.

3. Low-level wages in immigrant-receiving societies do not rise in response to a decrease in the supply of immigrant workers; they are held down by social and institutional mechanisms and are not free to respond to shifts in supply and demand.

4. Low-level wages may fall, however, as a result of an increase in the supply of immigrant workers since the social and institutional checks that keep low-level wages from rising do not prevent them from falling.

5. Governments are unlikely to influence international migration through policies that produce small changes in wages or employment rates; immigrants fill a demand for labor that is structurally built into modern, postindustrial economies, and influencing this demand requires major changes in economic organization.

The dual labor market theory explores the reasons for, and consequences of, international labor migration and stipulates that low- and high-skilled labor flows need to be analyzed independently (Paas and Scannell 2003) .

## **2.5 Trade Theory**

The relationship between trade and factor movements, especially labor, has been a topic for scholars on migration theories. The relationship between trade and factor movements are increasingly significant in a globalizing environment. There are two interesting questions in relation to mobility of labor. First, what are the effects on trade between two countries if there is an observable migration of labor? Second, is trade liberalization an option for decreasing labor

migration as traditional trade theory suggests? An overview of different trade models and their implications for the relationship between trade and factor movement is discussed in this section.

## ***2.6 The Ricardian Models***

In the Ricardian models, trade occurs because of technological differences as the source of international comparative advantage. A simple Ricardian model assumes two goods, two countries, and one input (i.e., labor), which is assumed to be mobile across the two sectors of the economy but immobile across countries. Ricardo proved that in free trade, each country will export goods that has an advantage in labor productivity (Appleyard et al. 2010).

In the case of the free movement of factors, there will be the factor inflow for the factor that is intensively used in the export sector due to the higher factor reward in the sector with higher productivity. The initial comparative advantage is enhanced through endowment differences and trade is augmented by factor movements (Bruder 2004). In the case of the ASEAN-3, it seems likely that advances in production technology in Malaysia will lead to immigration, especially from Indonesia and the Philippines.

## ***2.7 Specific-Factors Model***

The specific-factor (SF) model, a variant of the Ricardian model, was originally discussed by Jacob Viner. Hence, the model is sometimes referred to as the Ricardo-Viner model. This model accounts for the intersectoral immobility of factors, with factors specific to a particular industry. It assumes that an economy produces two goods using two inputs of production, capital, and labor, in a perfectly competitive market. In each sector or industry, one sector-specific factor of production is employed and can be interpreted as a particular type of labor. Heterogeneous labor is assumed to be specific to a particular industry, making it immobile. Some factors may be specifically designed (in the case of capital) or specifically trained (in the case of labor) for use in a particular production process. In these cases, it may be impossible, or at least difficult or costly, to move these factors across industries. A specific factor is one that is stuck in an industry or is immobile between industries despite changes in changes in market conditions. A factor may be immobile between industries for a number of reasons. Some factors may be specifically

designed for use in a particular production process as in the case of a highly educated person or a specifically trained laborer (Suranovic 2010).

Furthermore, there is a general factor (e.g., capital) with free, or less costly, mobile intersectoral movement (mobile factor). Because several forms of labor are immobile or inaccessible due perhaps to poor education or training, one could assume that the labor in the two industries are different, or differentiated, and thus are not substitutable in production. Under this interpretation, it makes sense to imagine that there are really three factors of production: capital, specific labor in Industry 1, and specific labor in Industry 2.

The specific-factor model is designed to demonstrate the effects of trade in an economy in which one factor of production is specific to an industry. The most interesting results pertain to the changes in the distribution of income that would arise as a country moves to free trade. In a dynamic model, the sector-specific model factors, perhaps particular types of labor, can be allowed to be mobile over time, thereby producing the Heckscher-Ohlin equilibrium in the long run.

## ***2.8 Heckscher-Ohlin Model***

Most simple models of the labor market effects of trade liberalization build upon three theorems: the Heckscher-Ohlin (HO) theorem, Stolper-Samuelson theorem, and the factor-price equalization theorem. The standard model in trade theory, due to Heckscher-Ohlin and Samuelson, begins by assuming that labor is immobile across countries.

HO theorem demonstrates that differences in relative factor endowments are sufficient to generate a basis for trade even if there are no country differences in technology or demand condition. The theorem claims that a country will export the commodity whose production requires intensive use of its relatively abundant and cheap factor input and will import commodities whose production requires the intensive use of the country's relatively scarce and expensive factor input. Stolper-Samuelson pointed out that the same relative factor-price movements would lead to an improvement in income distribution for the owners of the abundant factor and to a worsening position for the owners of the scarce factor (Appleyard et al. 2010).

Trade leads to a convergence in the prices of goods, which implies factor-price equalization. The factor-price equalization theorem states that free trade in goods will bring about an equalization of the relative and absolute returns to homogeneous factors of production



across countries. Trade between the two countries, therefore, drives relative factor prices into equality. This means that even in the absence of migration movements, the presence of international trade in goods will lead to the equalization of the wage rates of labor and the price of capital across countries. From this it follows that the incentives for cross-border migration should be reduced by trade liberalization.

Borjas (1989) stated that these theorems imply that since a labor-abundant country is exporting relatively labor-intensive goods, it is, in a sense, exporting labor. The export of labor-intensive goods leads to the equalization of wage rates across countries even if labor itself is immobile. In other words, the trading of goods substitutes for the trading of people. The introduction of immigration into the Heckscher-Ohlin-Samuelson framework, therefore, does not fundamentally alter the results of the analysis since the international immigration of income-maximizing persons is simply another way of ensuring that factor prices are equalized across countries. In addition, one of the advantages of the Heckscher-Ohlin-Samuelson framework is that it treats migration flows and goods flows symmetrically. Hence, it presents a systematic study of the “internationalization” of the world economy, whether this internationalization is caused by the trading of goods or by the trading of people. Unfortunately, the model becomes very complex when it is expanded beyond the simplest 2x2x2 framework (i.e., two countries, two goods, two factors of production). Hence, it becomes quite difficult to analyze questions such as the composition of the immigrant flow, the impact of changes in immigration policy, etc.

Therefore, under the standard Heckscher-Ohlin model, we can conclude that trade and migration are perfect substitutes (i.e., reductions in migration are parallel with trade liberalization). The flow of productive factors increases world income, and these income gains are allocated between the locals of both the sending and receiving countries. It embraces the fact that there are mutual gains from migration comparable to the conventional gains from free trade.

## **2.9 Push and Pull Factors Model**

Generally, the rationale for international migration can be divided into push and pull factors, depending on whether these factors characterize the source (home) or destination (host) country, respectively. Either factor can contribute to the promotion or restraint of migration. The main

pull factors include relatively favorable employment opportunities and high income potential in the host destination country.

Conversely, the main push factors are relatively high unemployment and low earnings in the home country. Distance is not only a determinant of the economic costs of migration but also denotes cultural proximity and the extent of historical relationships between the countries. For example, due to their historical and cultural associations as well as geographic proximity, the migration of the ASEAN-3 labor force will mainly be to other ASEAN-3 countries.

### **3 LITERATURE REVIEW**

The literature on the economics of international migration is concerned with three questions-- why migrate, who migrates, and what are the consequences for the source and destination countries? This section reviews the literature on the economic determinants and impacts of international migration. Migrant workers assisted in product design, supply of inputs and technology and the management of production and marketing in export-oriented firms, and played a critical role in the management of foreign enterprises. At the same time, “push” factors underlying the movement of professionals and business people from some countries have operated largely independently of international trade and investment flows within the Asia-Pacific region.

Migration of professionals was partly generated by imbalances in the supply of, and demand for, skilled manpower at home, and large differentials in the wages of professional and managerial workers across countries. Countries with a strong educational base but relatively limited opportunities for the employment of skilled and professional manpower, or which have experienced slow economic growth at home, have been among the major out-migration areas in the Asia-Pacific region. The Philippines and New Zealand are two classic cases.

#### **3.1 Determinants of migration**

Yorimitsu (1985) classified studies on the determinants of migration into four categories: (1) demographic characteristics of migrants, (2) socioeconomic characteristics of migrants, (3) socioeconomic characteristics of places of origin and destination, and (4) factors that

influence migration. Many studies discuss demographic characteristics of migrants such as age, sex, marital status, and size of household. Socioeconomic characteristics of migrants considered to have a direct influence on migration include factors such as: (1) whether they are employed or unemployed, (2) their occupation, (3) how long they have been working at their current job, (4) their income level, (5) their educational level, (6) how long they have been living in their current residence, (7) their ownership of their residence, (8) their location-specific assets, and (9) their previous experience with migration.

Although some of these factors are mutually connected to other factors and the demarcation is not clear cut, these factors affect an individual's satisfaction or dissatisfaction with living at his or her current location. Various socioeconomic characteristics of regions, discussed as inductive or restrictive factors of migration, are as follows: (1) size of the population, (2) ratio of urban population, (3) number of friends and relatives at the destination, (4) average income level, (5) growth rate of income, (6) rate of unemployment, (7) growth rate of employment, (8) amenities, (9) educational and cultural facilities, and (10) level of social security. Factors listed below are considered to influence the act of migration: (1) physical distance involved in migration, (2) direct costs of moving, (3) information about the destination, (4) costs of job search, (5) risks associated with changing residence, and (6) the psychological costs of leaving the current residence. It is apparent from this list that some of the factors are not directly measurable, and that the list includes a wide range of economic and noneconomic factors.

Increased international labor migration (ILM) was one important dimension of structural change and globalization in East Asia starting from the mid-1980s. From a theoretical perspective, ILM has been seen mainly as a response to differences in factor endowments and the levels and rates of economic progress aside from factors affecting the costs of migration, especially transport. These have contributed to large international differences in wage rates for unskilled labor. Manning (2001) mentioned that large international movements of mainly unskilled contract labor occurred in response to widening wage gaps between more- and less-developed countries in East Asia as the former experienced rapid structural progress. Besides unskilled workers, skilled and professional manpower migration was also an important part of the internationalization of labor markets in East Asia in the 1990s. While unskilled contract migration was more in response to general labor-market imbalances between the sending and

receiving countries, skilled movements were more closely tied to foreign direct investment (FDI) and associated trade flows. Although reliable data are not yet available, it is likely that the movement of skilled manpower has been more affected by the slowdown in the flow of FDI in several countries such as Indonesia and Thailand. At the same time, foreign takeovers and asset sales to overseas investors (despite strong nationalist opposition to “fire sales”) have almost certainly increased opportunities for foreign managers and professionals in South Korea and probably also in Thailand and Malaysia. The net effect has been only a slight change in the number of skilled foreign workers employed.

Jennissen (2003) estimated the influence of economic determinants on net international migration in Western Europe from 1960 to 1998. The economic determinants used were GDP per capita, unemployment, and educational level. Moreover, the effect of the migrant stock was also taken into account. Country-specific information was included, as well, to control for policy and other interventions. Not all the effects are significant but the country-specific and pooled analyses demonstrate that GDP per capita has a positive effect and unemployment a negative effect on net international migration.

### **3.2 Impact of Migrant Workers on Wage and other Labor Market Outcomes**

A traditional subject in the analysis of migration focuses on its impact on labor-market variables such as unemployment levels and real wages of native workers in host countries. The effects of foreign workers are traditionally viewed in terms of complementarity or substitutability with natives in the provision of household services. In the literature review, most of the simple theoretical models of labor supply suggest that an increase in the number of foreign workers in the local labor market may result in lower wages for, and/or higher unemployment of, natives if foreign workers are the perfect substitutes to natives. In addition, empirical studies typically conclude that immigration is economically irrelevant or has no effects on the wages and employment of natives. Borjas (1989,1994) argued that foreign workers do not have a sizeable and significant effect on the employment and wages of natives in the same segment of the labor market even when the foreign workers’ supply shock is large.

A 10 percent increase in the number of immigrants reduces local wages by, at most, one-half of 1 percentage point. Immigrants, however, do have a significant impact on their own wages. A

10 percent increase in the number of immigrants reduces immigrants' wages by at least 2 or 3 percent. 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). Cards (2001) used 1990 census data to study the effects of immigrant inflows on the labor market in the United States. He found that immigrant inflows in the 1980s reduced the wages and employment rates of low-skilled natives in Miami and Los Angeles by 1 to 3 percentage points.

Borjas's (2003) analysis indicated that immigration lowered the wages of competing workers: a 10 percent increase in supply reduced wages by 3 to 4 percent. Using German data for the period 1975--97, Bonin (2005) concluded that the direct impact of immigration on native wages was small since a 10 percent increase in labor supply due to immigration reduced wages by less than 1 percent, with a stronger negative impact for low-skilled natives.

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. They showed that inflows of less-educated immigrants have negative but very small effects on similarly educated natives. They argued that increased specialization might explain why many empirical analyses of the impact of foreign workers on wages and employment for less-educated natives have small effects. They found that foreign workers specialized in occupations that required manual and physical labor while natives tended to specialize in jobs that involved more communication and language skills.

In a work based on US census data, Ottaviano and Peri (2008) extended 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. They found evidence of imperfect substitution and concluded that the 1990--2006 immigration increase had only small, negative effects on native US-born workers in the short run and positive effects in the long run. Card (2009) also presented evidence that imperfect substitution between equally skilled immigrants and natives *and* 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-sloping labor demand curves. However, Borjas et al. (2008) found that foreign-born and native workers are perfect substitutes

and their simulations showed that immigrants lowered the wages of natives. Some economists argue that immigrants and natives are not close substitutes; therefore, immigration does not reduce the wages of native workers. Mocetti and Porello (2010) showed that immigration in Italy had a displacement effect on low-educated male and female natives.

According to Okkerse (2008), the theoretical aspects of the labor-market effects of immigration are usually described using a neoclassical competitive model of supply and demand. In general, immigrants lower the price of factors for which they are perfect substitutes and raise the price of factors for which they are complements. Nevertheless, the impact of immigration on labor-market outcomes of natives stays theoretically uncertain. Sizing up the enormous amount of research results produced in this field, the author concluded that immigration negatively affects the wages of less-skilled laborers and earlier immigrants. Many different studies using different approaches produced evidence for this conclusion. To name a few of these studies: the factor proportions approach of Jaeger (1995), the computable general equilibrium model of Sarris and Zografakis (1999), area analyses by Camarota (1997), De New and Zimmermann (1994) and Orrenius and Zavodny (2003), and the production theory approach of Greenwood et al. (as cited in Okkerse 2008).

Besides the impact on wages, another important question for policy is the impact on employment outcomes, specifically whether an influx of immigrant workers leads to an increase in the demand for labor in excess of the immigrant supply effect, or to a response in labor supply by the native born. This can be analyzed by looking at the effect on labor-force participation and unemployment rates. Okkerse (2008) surveyed available empirical evidence on the effects of immigration on the labor market. Many different approaches have been used to try and find out whether immigration hurts the opportunities of natives in the labor market. The author concluded that the probability that immigrants will increase unemployment is low in the short run and zero in the long run.

The difference between the short-run and the long-run impact is not always the same across countries. An example of research on the relationship between immigration and the short-run job prospects of unemployed residents is the one conducted by Chapman and Cobb-Clark in 1999. They developed a novel theoretical approach to illustrate the consequences of immigration using the probability of unemployed residents gaining a job by calibrating their data with data from the

first wave of the Longitudinal Survey of Immigrants to Australia. Through the use of the vacancies-to-unemployment ratio, they showed that immigration, in theory, can either increase or decrease the employment probabilities of unemployed residents but that contrary to populist rhetoric, an increase is more likely the more recessed is the labor market. They found that an increase in immigration *increases* the employment probabilities of unemployed residents in the short run. Even so, the analysis is very short run, and strong conclusions as to what might be happening over the longer term are not appropriate.

Using French data from the mid-1970s to the mid-1990s, Gross (2002) found that, in the long run, both legal and amnestied immigrant workers and their families permanently lower the unemployment rate but that in the short term, the arrival of immigrants slightly increases unemployment with an effect similar to that of an increase in domestic labor-force participation. As in the case of the wage effects of immigration, the composition of the immigration flows matters when assessing the effect on the rates of (un)employment and labor-force participation. Gross concluded that in the long run, immigrants create more jobs than they occupy, thus permanently reducing unemployment.

Most area analyses and time-series analyses failed to find a significant influence of immigration on (un)employment probabilities. See, for instance, the findings of Gang et al. (1999) and Shan et al. (1999) for the European Union and of Simon et al. (1993) and Marr and Siklos (1994) for the United States and Canada. Nevertheless, some studies do find an increase in unemployment rate (Winegarden and Khor 1991), unemployment frequency (Winkelmann and Zimmermann 1993), and unemployment duration (Winter-Ebmer and Zweimuller 1999). Both area analysis and time-series analysis produce reasons to believe that if there is an employment effect, it will especially hit the unemployed (Winter-Ebmer and Zweimuller 1999; Gross 2004 as cited in Okkerse 2008).

Islam (2007) examined the relationship between unemployment and immigration in Canada. The bidirectional causality test found no evidence of a significant effect of immigration on unemployment in Canada. Cointegration tests indicated no observed increase in aggregate unemployment due to immigration in the long run. The results from the causality test based on the vector error correction model confirmed that, in the short run, past unemployment does cause (less) immigration but not vice versa. There was also a long-run positive relationship among per-

capita GDP, immigration rate, and real wages. The results indicated that, in the short run, more immigration is positively associated with Canada's attractive immigration policies and, in the long run and as the labor market adjusts, Canadian-born workers are likely to benefit from increased migration.

#### **4. ECONOMIC SCENARIO OF THE ASEAN-3 AND MALAYSIA**

This section discusses the economic background of the ASEAN-3 and Malaysia, including GDP, employment, unemployment, educational attainment, and wage ratio. The discussion covers the overall economy, the sectors, and the job categories.

##### **4.1 Real GDP and GDP Per Capita**

Malaysia, Thailand, the Philippines, and Indonesia are among the fastest-growing economies in the Association of Southeast Asian Nations (ASEAN). These countries are sometimes referred to as the second-tier of newly industrializing countries (NICs) in Asia. Their economies exhibit considerably high GDP growth of more than 5 percent (except during periods of economic crises). Table 3 shows that in terms of value, Indonesia's real GDP was the highest among the four due to its larger economy. Thailand's was the second-highest while Malaysia had the smallest value. However, real GDP growth was higher for Malaysia compared to the ASEAN-3 throughout the period under study.



Table 3. Real gross domestic product\* and GDP growth for ASEAN-3 and Malaysia

Country	1990		1995		2000		2005		2010	
	Value (USD)	Growth ('85-'90)	Value (USD)	Growth ('90-'95)	Value (USD)	Growth ('95-'00)	Value (USD)	Growth ('00-'05)	Value (USD)	Growth ('05-'10)
Malaysia	55,084	6.6	86,608	9.5	109,442	4.8	137,954	4.7	171,826	4.5
Indonesia	150,322	7.0	219,182	7.8	227,227	0.7	285,869	4.7	377,282	5.7
Philippines	62,103	4.7	69,129	2.2	82,358	3.6	103,072	4.6	131,138	4.9
Thailand	88,907	10.3	134,468	8.6	137,515	0.4	176,352	5.5	210,077	3.6

Source: UNCTAD Handbook of Statistics, various years.

\*US\$ (millions) at constant prices (2005) and constant exchange rates (2005)

A better indicator for a country's well-being is GDP per capita. As shown in table 4, between 1990 and 2010, Malaysia's real GDP per capita was the highest and far larger than the ASEAN-3's. It was followed by Thailand, Indonesia, and the Philippines. The real GDP per capita of the Philippines was about five times lower than that of Malaysia; Indonesia, about three times lower; and Thailand, about two times lower. Overall, the real GDP per capita for all four countries was increasing but the magnitude of changes was faster for Malaysia compared to the ASEAN-3. Malaysia's higher economic growth coupled with its political stability and better infrastructure helped its economy prosper and grow faster.

Table 4. Real gross domestic product (GDP) per capita for ASEAN-3 and Malaysia (USD)

Country	Year				
	1990	1995	2000	2005	2010
Malaysia	3,025	4,180	4,674	5,286	6,050
Indonesia	812	1,095	1,061	1,258	1,573
Philippines	1,008	998	1,065	1,205	1,406
Thailand	1,558	2,254	2,177	2,644	3,039

Source: UNCTAD Handbook of Statistics, various years.

\*US\$ at constant prices (2005) and constant exchange rates (2005)

## 4.2 Employment and Unemployment

Employment rate and job creation can be other important dimensions to be observed as these variables act as push and pull factors for international migration. Some countries are experiencing jobless growth, a situation where high economic growth is not accompanied by a high rate of jobs creation. On the other hand, there are also countries with an abundance of jobs but scarce labor supply. Table 5 shows that between 1990 and 2005, all countries under study, except the Philippines, were experiencing decreasing job creation. Job creation in Malaysia seemed to be higher than that in the ASEAN-3 (except the Philippines). In 2010, however, the job creation rate in Malaysia was at its highest level compared to the ASEAN-3. Because Malaysia is a small country, its fast-growing demand for labor could not be met by the supply side, which made foreign workers crucial in fulfilling job vacancies. In addition, the reluctance of locals to take on certain jobs and the skills mismatch contributed significantly to the country's labor shortage for certain sectors and skills.

Table 5. Employment and rate of job creation in the ASEAN-3 and Malaysia

Country	1990		1995		2005		2010*	
	('000)	Rate	('000)	Rate	('000)	Rate	('000)	Rate
Malaysia	6,685	3.6	7,645	2.7	11,045	1.6	11,773	3.2
Indonesia	75,851	4.0	80,110	1.1	93,958	0.9	108,228	2.9
Philippines	22,532	2.1	25,698	2.7	32,313	3.3	36,060	2.2
Thailand	30,842	3.6	32,573	1.1	36,302	1.9	38,236	1.0

*Source:* International Labour Organization, various years.

\* Data for 2010 from the CIA World Factbook

Even though the Malaysian labor market is characterized by many job vacancies, its unemployment rate is considerably moderate. Between 1990 and 2010, the Philippines had been experiencing a higher rate of unemployment—more than 7 percent—compared to the other three countries. It was followed by Indonesia, which had a steadily increasing unemployment rate during this period. Even though Thailand's labor market exhibited a low and decreasing rate of unemployment, its out-migration rate was quite alarming. That phenomenon may have been due to other factors like economic and political instability and poor living conditions (refer to table 6).

Table 6: Unemployment in ASEAN- 3 and Malaysia

Country	1990		1996		2005		2010*	
	('000)	Rate	('000)	Rate	('000)	Rate	('000)	Rate
Malaysia	315.2	5.1	216.8	3.14	368.1	3.53	427	3.5
Indonesia	1,952	2.4	4,287	7.24	11,899	11.24	8,271.5	7.1
Philippines	1,993	8.4	2,195	9.53	2,748	11.35	2,839.7	7.3
Thailand	710	3.85	353.9	1.7	495.8	1.85	464.5	1.2

*Source:* International Labour Organization, various years.

\* Data for 2010 from CIA World Factbook, 2013.

### 4.3 Educational Attainment

Level of educational attainment can be used to measure the quality of the population. In terms of the number of years of schooling as shown in table 7, Malaysians had slightly more years of schooling compared to the populations of the ASEAN-3 for all the years under study. It was followed by the Philippines and Thailand while Indonesia had the least number of years of schooling. The number of years of schooling has been increasing over time for all countries, which indicate increasing awareness of the importance of education in improving quality of life.

Level of educational attainment can be divided into four groups: no schooling, primary, secondary, and tertiary schooling. Percentage of persons with no schooling are the highest in Indonesia and the lowest in the Philippines. Thailand has the highest percentage of people who have finished the primary level of education and Malaysia, the lowest. The percentage of the population with secondary and tertiary education is higher in the Philippines compared to the other two countries (refer to table 8).

Table 7. Average years of schooling attained

Year	Malaysia	Indonesia	Philippines	Thailand
1980	5.688	3.982	6.631	4.404
1985	6.884	4.040	6.956	4.881
1990	6.966	4.248	7.466	5.412
1995	8.413	4.661	7.925	5.896
2000	9.086	5.232	8.274	6.113
2005	9.678	5.726	8.622	6.827
2010	10.143	6.242	8.972	7.496

Source: Educational attainment data set of R. Barro and J.W. Lee (various years).

Table 8. Educational attainment for population age 15 and over, 1990--2010

Level of educational attainment	Malaysia (%)	Indonesia (%)	Philippines (%)	Thailand (%)
<u>No Schooling</u>				
1990	15.3	43.6	5.2	11.6
1995	13.4	32.7	5.3	12.2
2000	11.7	22.6	5.4	12.8
2005	9.8	19.6	4.7	12.9
2010	8.5	17.3	4.2	11.7
<u>Primary</u>				
1990	38.5	30.4	41.4	68.5
1995	26.4	44.4	36.7	64.1
2000	22.4	54.8	33.3	57.5
2005	18.1	54.6	29.0	52.8
2010	15.2	52.6	24.8	48.0
<u>Secondary</u>				
1990	28.5	24.4	34.2	15.1
1995	51.3	20.9	35.4	18.3
2000	56.0	20.4	35.5	23.9
2005	59.2	23.5	39.1	25.5
2010	61.4	27.6	42.1	27.9
<u>Tertiary</u>				

1990	7.6	1.8	18.8	4.8
1995	8.9	2.1	22.5	5.5
2000	10.0	2.1	25.8	5.7
2005	12.8	2.2	27.2	8.8
2010	14.9	2.5	29.0	12.3

*Source:* Educational attainment data set of R. Barro and J.W. Lee (various years).

#### 4.4 Wage Rate and Wage Ratio

Wage differential is the main driving force for workers to migrate from their respective countries. Many past studies have shown that wage gain is the most important determinant of international migration (Todaro 2009). As shown in table 9, the real wage rate in Malaysia is higher than the wage rate in the other ASEAN-3 countries for the entire economy. For example, in 2008, the wage rate for Thailand was only one-half of the Malaysian wage rate, one-third of the Philippine wage rate, and one-sixth of the Indonesian wage rate. This strongly explains why international migration occurs from the ASEAN-3 to Malaysia and not the reverse. The real wage rate in Malaysia increased over time from 1990 to 2008 but the trend for the overall wage rate for the ASEAN-3 was unstable.

Table 9: Monthly real wage for ASEAN-3 and Malaysia (USD)

Year	Malaysia	Indonesia	Philippines	Thailand
1990	159.20	104.44	154.76	161.26
1991	181.81	73.24	154.33	161.79
1992	224.73	86.02	198.49	187.89
1993	255.44	94.72	201.24	202.80
1994	320.69	117.98	224.31	188.12
1995	374.06	124.74	250.39	218.51
1996	465.27	97.08	251.58	233.16
1997	298.53	93.75	252.83	203.51
1998	291.29	23.71	149.35	156.09
1999	294.12	36.58	173.13	141.45
2000	282.50	54.13	167.59	135.85
2001	286.03	23.81	122.42	123.20
2002	302.92	31.37	127.82	149.00
2003	315.69	37.33	123.11	138.27
2004	331.84	38.73	118.25	167.30
2005	376.42	36.38	124.18	175.75
2006	453.40	46.50	144.12	225.22
2007	539.20	91.25	168.57	237.38

2008	528.45	80.03	172.71	253.67
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*Sources:* International Labour Organization  
National Statistical Office, Thailand

The real wage rate for four main sectors in Malaysia and the ASEAN-3 are shown in table 10. In 2008, the Malaysian manufacturing sector exhibited the highest wage rate; for Indonesia, it was the construction sector; for the Philippines and Thailand, the services sector. The wage differences between countries were largest in the manufacturing sector. For example, workers in the manufacturing sector in Indonesia were paid six times less than those in Malaysia and four times less in those the Philippines and Thailand. For the services sector, wage differences were about four times between Malaysia and Indonesia, two times between Malaysia and the Philippines, and one-and-a-half times between Malaysia and Thailand.

Table 10. Monthly real wage for ASEAN-3 and Malaysia by sector 2008 (USD)

Sector	Malaysia	Indonesia	Philippines	Thailand
Agriculture	242.90	47.86	92.53	128.07
Construction	563.93 <sup>1</sup>	164.54	181.26	178.73
Manufacturing	923.21	157.53	196.02	236.08
Services	491.33	100.38	253.82	351.81

*Sources:* International Labour Organization (various years).  
Department of Statistics, Malaysia.

<sup>1</sup> 2009

Exchange rate: MYR 3.464=USD 1; THB 33.313=USD 1; PHP 44.323=USD 1; IDR 11,120=USD 1.

Semiskilled and unskilled workers constitute the majority of migrant workers in Malaysia, which may affect wage differentials by virtue of the workers' skills. The influx of semiskilled and unskilled workers may result in local workers losing their bargaining power to get higher wages. Therefore, the wages for semiskilled and unskilled foreign workers are kept low, widening the gap between the skilled (i.e., professional and technical workers) and the semiskilled and unskilled wage ratio. This will subsequently contribute to wider income inequality in Malaysia. Another consequence of this phenomenon is a larger wage ratio between the semiskilled and unskilled workers from the emigrating countries and Malaysia, which implies that the wage rate for workers in the country of origin increases at a higher rate compared to wage rate in the destination country. In other words, the wages for skilled and unskilled workers will converge between participating countries.

Unfortunately, wage data according to job categories are currently not available for the ASEAN-3 but there are data for Malaysia (see table 11) that show that the real monthly wages are higher for the services sector compared to the manufacturing and agriculture sectors for all job categories. The differences are so obvious, especially where the wage rate for the services sector is almost double that of the wage rate for manufacturing sector for all types of jobs. On the other hand, the real monthly wage rate for the agriculture sector is about one-third that of the services sector. The percentage of migrants in the services sector in Malaysia, however, is small compared to that in the manufacturing sector. This may be due to fact that the services sector requires higher skills and better job quality, which can make it difficult for low-skilled foreign migrants to get in. This could also be a reason why the wage rate for the services sector can be kept higher.

Table11: Real monthly wage for Malaysia by occupation and sector, 2008 (USD)<sup>1</sup>

Category of workers	Manufacturing sector	Services sector	Agricultural sector
Managers, professionals, and executives	1,958.71	4,641	1,339.78
Technicians and associate professionals	856.84	1,529	441.40
Clerical and related occupations	555.67	1,303	376.15
Elementary workers	394.49	922	266.17
Plant and machine operators and assemblers	347.19	656	189.38

Source: Department of Statistics, Malaysia (various years).

<sup>1</sup> Exchange rate MYR 3.464=USD 1.00

Real wage convergence can be measured from various angles such as wage ratio and wage differentials. An increase in the wage ratio indicates convergence between the wage rate of two countries. The number of international migrants in Malaysia, majority of whom are in the manufacturing and plantation sectors, varies by sectors. The influx of foreign workers in these sectors may have a higher effect on the sectoral wage ratio. We anticipate that the wage ratio between the source/home countries and Malaysia will increase over time due to the increasing

supply of labor in Malaysia, which will surpass the wage rate. Table 12a shows that between 1990 and 2005, wages tended to diverge between Indonesia and Malaysia as shown by the decreasing ratio. After 2005, however, the ratios slightly increased but were still lower than that in the early 1990s. This indicates that there is no positive relationship between wage convergence and migration since the number of migrant workers coming to Malaysia from Indonesia has been increasing over time. This also reflects the fact that migration does not depend only on wages but also on other factors like GDP, job creation, and unemployment rate.

Even though the wage ratio between the Philippines and Thailand is much larger than that of Indonesia, the ratio shows just slight changes during the period under study. The wage ratio of these two countries and Malaysia has been decreasing over time, reflecting the divergence in the wage rate. Overall, the wage ratio between Thailand and Malaysia is larger than that between the Philippines and Malaysia and between Indonesia and Malaysia. The wage rate between Thailand and Malaysia is closer compared to the other two countries. Nevertheless, migration inflow to Malaysia from Thailand and the Philippines is still significant as it has been increasing over time even though the number of migrants from these two countries is not as high as that from Indonesia (refer Table 12a).

Table 12a. Monthly real wage ratio between ASEAN-3 and Malaysia (USD)

Sector: Overall			
Year	Indonesia /Malaysia	Philippines/Malaysia	Thailand/Malaysia
1990	0.6561	0.9721	1.0130
1991	0.4029	0.8489	0.8899
1992	0.3828	0.8832	0.8361
1993	0.3708	0.7878	0.7939
1994	0.3679	0.6995	0.5866
1995	0.3335	0.6694	0.5842
1996	0.2087	0.5407	0.5011
1997	0.3140	0.8469	0.6817
1998	0.0814	0.5127	0.5359
1999	0.1244	0.5886	0.4809
2000	0.1916	0.5932	0.4809
2001	0.0832	0.4280	0.4307
2002	0.1035	0.4220	0.4919
2003	0.1182	0.3900	0.4380
2004	0.1167	0.3564	0.5042
2005	0.0966	0.3299	0.4669



2006	0.1026	0.3179	0.4967
2007	0.1692	0.3126	0.4402
2008	0.1514	0.3268	0.4800

*Source:* Computed from data from the International Labour Organization (various years).

The wage ratios for the manufacturing sector are shown in table 12b. It demonstrates a similar pattern with the overall economy but the ratio is smaller, with the smallest ratio being between Indonesia and Malaysia. This reflects the fact that a larger wage gap occurs in the manufacturing sector in all countries under study despite a large proportion of migrant workers working in the manufacturing sector in Malaysia. This again shows a weak relationship between migration and wage convergence. In addition, the migrant workers do not necessarily come from the manufacturing sector in their countries of origin; therefore, their movement out of the manufacturing sector in their respective countries does not affect the labor supply in this sector.

Table 12b: Monthly real wage ratio between ASEAN-3 and Malaysia (USD)

Sector: Manufacturing			
Year	Indonesia /Malaysia	Philippines/Malaysia	Thailand/Malaysia
1990	0.22484	0.74616	0.72413
1991	0.18790	0.60146	0.55425
1992	0.15382	0.64604	0.50240
1993	0.18129	0.51800	0.42826
1994	0.22036	0.59291	0.43586
1995	0.19224	0.55508	0.43924
1996	0.20452	0.45448	0.39117
1997	0.23988	0.58332	0.44760
1998	0.04628	0.33414	0.33502
1999	0.05843	0.30325	0.28470
2000	0.11595	0.27824	0.25092
2001	0.05442	0.21667	0.22902
2002	0.06270	0.19450	0.23093
2003	0.09092	0.21540	0.25794
2004	0.08734	0.19649	0.24373
2005	0.07993	0.19737	0.23515
2006	0.07623	0.20266	0.23469
2007	0.17205	0.20326	0.22998
2008	0.16382	0.20473	0.25553

*Source:* Computed from data from the International Labour Organization (various years).

The monthly real wage ratios for the agriculture sector are shown in table 12c. Some wage data are not available for Thailand. Overall, the wage ratios in the agriculture sector are

larger than the ratio for the overall economy, especially between the Philippines and Thailand and Malaysia with the ratio of greater than unity. This reflects the higher wage rate in these two countries compared to wage rate in the Malaysian agriculture sector. For Indonesia, the ratios are less than unity but these are higher than the overall economy. It is interesting to note that the wage ratios for the agriculture sector between the Philippines and Malaysia and between Thailand and Malaysia have been decreasing over time, reflecting the convergence in wages between Malaysia and these two countries. The wage rate in the Malaysian agriculture sector is catching up despite the heavy inflow of migration, especially in the plantation sector. Perhaps the positive impact of migration on the wage ratio is best explained by the agriculture sector.

Table 12c. Monthly real wage ratio between ASEAN-3 and Malaysia (USD)

Sector: Agriculture			
Year	Indonesia /Malaysia	Philippines/Malaysia	Thailand/Malaysia
1990	0.6510	3.1420	NA
1991	0.7888	3.3393	NA
1992	0.9369	4.7429	NA
1993	0.9145	4.2071	NA
1994	1.0150	4.0841	NA
1995	1.7263	3.8212	NA
1996	0.9969	3.1930	NA
1997	1.3423	5.1879	NA
1998	0.6107	4.4819	NA
1999	0.8917	3.6182	NA
2000	0.9577	4.3798	4.1267
2001	0.5031	4.0507	3.1318
2002	0.3643	2.3313	4.9256
2003	0.3240	1.7789	1.6650
2004	0.3038	1.5200	1.6320
2005	0.3085	1.6404	1.9107
2006	0.3058	1.4270	1.5473
2007	0.6938	1.3465	1.5174
2008	0.9397	1.8246	NA

*Source:* Computed from data from the International Labour Organization (various years).

The wage ratios between the ASEAN-3 and Malaysia for the construction sector are declining, showing the divergence in wage rate. The wage ratio between the Philippines and Malaysia and between Indonesia and Malaysia also exhibit similar patterns but the Indonesian workers in the construction sector have been paid a much lower wage as demonstrated by a very low wage ratio. On the other hand, the Malaysian construction sector has demonstrated higher

wages, especially with the increasing number of skilled workers in this sector. Therefore, even though the majority of workers in the construction sector are migrants, their wages cannot be lower beyond a certain level due to stiff competition in getting labor. Labor shortages are a more prevalent phenomenon for the construction sector compared to other sectors (refer to table 12d).

Table 12d. Monthly real wage ratio between ASEAN-3 and Malaysia (USD)

Sector: Construction			
Year	Indonesia /Malaysia	Philippines/Malaysia	Thailand/Malaysia
1990	0.64161	1.43872	2.21909
1991	0.61060	1.06688	1.69142
1992	0.56121	1.02834	1.48166
1993	0.60251	0.83361	1.79354
1994	0.59949	0.81836	0.80364
1995	0.54487	0.72864	1.30971
1996	0.60246	0.60050	0.83984
1997	0.85572	0.91662	0.92173
1998	0.17122	0.66288	0.82156
1999	0.18753	0.83233	1.14831
2000	0.45192	0.78575	0.63695
2001	0.18825	0.59117	0.52377
2002	0.25871	0.61487	0.81272
2003	0.32074	0.59153	0.56423
2004	0.31296	0.56815	0.57532
2005	0.25978	0.51286	0.49695
2006	0.27866	0.55403	0.54311
2007	0.26289	0.50595	0.48495
2008	0.24725	0.55649	0.56865

Source: Computed from data from the International Labour Organization (various years).

Figures 1, 2, and 3 depict the growth rate of migrant workers in Malaysia from the ASEAN-3 and the percentage of wage ratio between the country of origin and Malaysia. The trend in the growth rate of international migration clearly demonstrates a large fluctuation in the number of migrants from Indonesia and Thailand to Malaysia. As depicted in figure 1, Indonesian migrants posted high growth in numbers in 1999 followed by a sharp drop in 2000 and then positive but unstable growth in the other years. The number of Filipino migrants grew the highest between 1999 and 2000 and between 2001 and 2003. The periods of 1999--2000 and 2005--2007 saw a high growth rate in the number of Thailand's migrants. The trend in the wage ratio is not very clear due to the small change in the percentage. However, the figures show that

there is no positive relationship between the growth of migration and the percentage of wage ratio.



Figure 1. Growth rate of migration and wage ratio between Indonesia and Malaysia

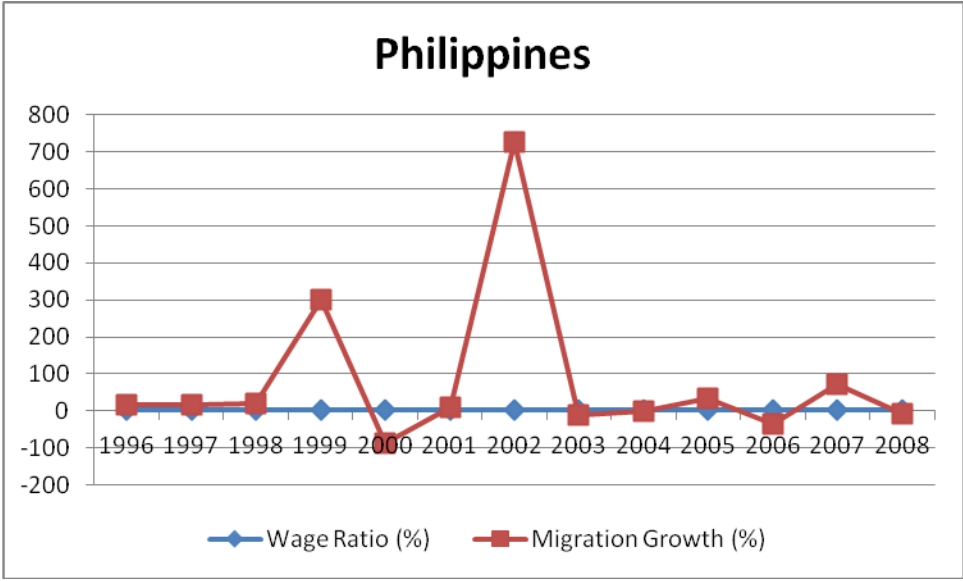
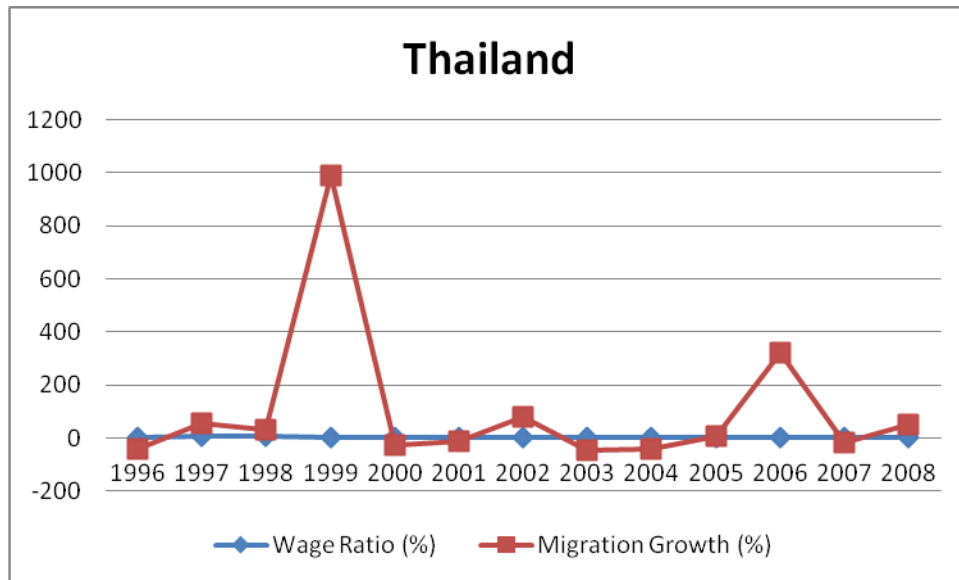


Figure 2. Growth rate of migration and wage ratio between the Philippines and Malaysia



**Figure 3. Growth rate of migration and wage ratio between Thailand and Malaysia**

## 5. REGRESSION MODELS ANALYSIS

This section attempts to estimate two models related to international migration and wage convergence. The migration models will be based on the development model. However, judging from the importance of the trade variable in determining international migration and wage ratio, we will incorporate economic openness into the models. This is also a way to test for the robustness of the explanatory variables that are commonly used in the migration and wage models. Wage convergence is measured from the wage ratio between the ASEAN-3 and Malaysia. The analysis will cover the overall economy and three sectors: manufacturing, construction, and agriculture.

### 5.1 International Migration Model

Based on the development model, the number of international migrants in the destination country is used as a dependent variable while the explanatory variables are wage ratio, GDP per capita, employment growth, unemployment rate, education level, and distance. In general, the migration model can be written as follows (Falaris 1979; Todaro 1997):

$$\ln M_{it} = \beta_0 + \beta_1 \sum_{i \neq j} \ln CGDP_{ijt} + \beta_2 \sum_{i \neq j} JCR_{ijt} + \beta_3 \sum_{i \neq j} UNRE_{ijt} + \beta_4 WR_{ijt} + \beta_5 \sum \ln EDU_{ijt} + \beta_6 \ln DIST_i + \beta_7 \sum_{i \neq j} POLS_{ijt} + \mu_1 \quad (1)$$

where M is the number of international migrants in the destination country from country i, CGDP is the GDP per capita, JCR is the rate of job creation, UNRE is the rate of unemployment, WR is the real wage ratio between the emigrating countries and the destination country, EDU is the education level that can be measured by years of schooling or level of education of the employee, DIST is the distance from the country of origin and the destination country, POLS is political stability,  $\mu$  is the error term, i is the country of origin of the migrants, and j is the country of destination. However, due to data limitation and based on the goodness of fit of the model, for the purpose of this study, the variables have been reduced, so the model now becomes

$$\ln M_{it} = \beta_0 + \beta_1 \ln CGDPM_{jt} + \beta_2 WR_{ijt} + \beta_3 UNRE_{it} + \beta_4 SCH_{it} + \mu_2 \quad (2)$$

where M is the number of international migrants, CGDPM is the real GDP per capita for Malaysia (RMmill), WR is the real wage ratio between the emigrating countries and Malaysia, UNRE is the unemployment rate in the emigrating countries, SCH is the average number of years of schooling in the emigrating country, i is country of origin, j is Malaysia, and t is time. The educational attainment of the population may affect labor mobility. In this context, improvement in education has two implications for international migration. International mobility might be easier for more educated workers because such workers are more skilled and in demand. On the other hand, more educated workers are offered higher wages, which might curb their moving out.

Educational attainment measured by years of schooling can be an approximate measurement for labor quality. Other measures include job categories and level of education. In some cases, people compute quality of labor using several formulas like multiplying years of schooling by number of workers for each level, multiplying returns to education by number of workers in each job category, or multiplying differences in wages by number of workers in each job category. In this study, the only data available for the ASEAN-3 and Malaysia was the national average years of schooling (SCH). We added this variable to the regression using

number of years of schooling in the emigrating countries to see the effect of labor quality on the number of international migrants.

Economic openness (OPEM) may result in an increase in the number of migrant workers needed by the economy. The expansion of the export sector will create more job opportunities and demand more workers. The import sector, on the other hand, will facilitate the growth of the export sector in terms of obtaining inputs that are not available locally. Therefore, economic openness, which is measured from the ratio of total export-import to GDP, is one of the determinants of migration and is added to equation (2) and the estimation equation becomes:

$$\ln M_{it} = \beta_0 + \beta_1 \ln CGDPM_{jt} + \beta_2 WR_{ijt} + \beta_3 UNRE_{it} + \beta_4 SCH_{it} + \beta_5 OPEM_{jt} + \mu_2 \quad (3)$$

Another important variable that may determine the number of international migrants is economic structural change. The government policy in Malaysia changed quite drastically after the financial crisis of 1998. This includes the labor market policy, which significantly affects the inflow and the status of foreign workers. Therefore, we added dummy time (DUM) in the regression to capture the effect of structural change. We considered the years after 1998 as 1 and 0 otherwise. After considering all the variables, the full model becomes:

$$\ln M_{it} = \alpha_0 + \alpha_1 \ln CGDPM_{jt} + \alpha_2 WR_{ijt} + \alpha_3 UNRE_{it} + \alpha_4 SCH_{it} + \alpha_5 OPEM_{jt} + \alpha_6 DUM_t + \mu_3 \quad (4)$$

This study estimated several migration models (e.g., migration models for Indonesia, the Philippines, and Thailand for the whole economy and by sectors). For the sectoral analysis, the value of sectoral outputs and wages replaced GDP and overall wages, respectively. Data on the number of international migrants in Malaysia were obtained from the country's Ministry of Home Affairs. Data on real monthly wage (in USD) and unemployment rates from 1990 to 2008 for Indonesia, Thailand, and the Philippines were obtained from the International Labour Organization (ILO). Monthly wage data for Malaysia was obtained from Department of Statistics. GDP and sectoral output data was compiled from the United Nations Conference on Trade and Development (UNCTAD) Handbook of Statistics. The data was measured in USD (millions) at constant prices (2005). Data on years of schooling were obtained from Barro and Lee (various years) and lastly, data for computing Malaysian economic openness was gathered from the the economic report of the Ministry of Finance.

## 5.2 Wage Convergence Model

Mobility of the labor force is usually considered as one of the key assumptions for wage convergence and economic growth. It is generally assumed that differences in real wage (or GDP per unit of labor force and GDP per capita, more generally) lead to the shift of labor from relatively poorer areas to relatively richer areas (if there are no other barriers) and such shift subsequently causes real wage (and GDP/capita) convergence through the labor-market mechanism. Under the assumption that migration is helping convergence among countries, the immigrating countries should grow slower than emigration country. Formally, this relation can be expressed in a linear model:

$$y = f(m) \tag{5}$$

where  $y$  stands for convergence characteristics – real GDP per capita growth or growth of nominal wage and  $m$  is migrants' ratio. The convergence characteristic is expressed in relation to its level in the emigrating country.

$$y_t = \frac{W_{it}}{W_{jt}} \tag{6}$$

where  $y_t$  is the convergence characteristic between the emigrating country and the destination country. In this study, monthly wage is used as the convergence characteristic and the estimation model is as follows:

$$\frac{W_{it}}{W_{jt}} = \gamma_0 + \gamma_1 M_{it} + \mu_4 \tag{7}$$

where  $\frac{W_{it}}{W_{jt}}$  is the wage ratio between the country of origin (i) and the destination country (j) at time  $t$  and  $M$  is the number of international migrants in the country of destination from country  $i$  and  $\mu$  is the error term. The educational attainment of the population affects wages since more educated workers will receive higher wages. As Becker (1975) and Schultz (1963) pointed out in their human capital theory, there is a strong positive relationship between education and wages through productivity enhancement. Since economic openness influences migration, it will also influence wage ratio. The influx of migrant workers will increase labor supply in the receiving country and lower the wage rate. In contrast, the supply of labor in the emigration country will



decrease and wages will increase. Therefore, the wage ratio will become closer to unity, that is, wages will be more convergent. In order to test this theoretical underpinning, the schooling and economic openness variables were added to the wage ratio equation (8). Using the same argument as in the case of migration model, time dummy was also added. The full model is thus now:

$$\frac{W_{it}}{W_{jt}} = \lambda_0 + \lambda_1 M_{it} + \lambda_2 SCH_{it} + \lambda_3 OPEM_{jt} + \lambda_4 DUM_t + \mu_5 \quad (8)$$

Data for the estimation was obtained from the same source as for the migration models.

### 5.3 The Methods of the Estimations

#### 5.3.1 Test for Data Stationary

Before we estimated the models, the test for data stationary was conducted to avoid spurious regressions. In order to do this, first, the augmented Dickey-Fuller (ADF) unit root test was conducted to examine whether each series of interest was stationary or not. The ADF tests showed that all the series were nonstationary in level but became they became stationary after the first differences were taken. In other words, all the series are said to be integrated of order one (refer to table 13).

Table 13.  $\tau$  ratios from ADF unit root tests

Variables	ADF tests including intercept and trend	
	Level*	First Difference**
LCGDPM	-2.300795	-3.619971**
SCHI	-1.251466	-4.532498**
SCHP	-2.225187	-3.57432**
SCHT	-1.65893	-3.32451**
OPEM	-1.311184	-4.475421**
MI	-2.203560	-4.336193**
MP	-1.916161	-4.541286**
MT	-2.455910	-4.223978
WRI	-2.797611	-5.66284***
WRP	-2.479468	-3.974863**
WRT	-2.987156	-6.612894***

UNREI	-1.766670	-3.928682**
UNREP	-1.665133	-4.493720**
UNRET	-3.209788	-5.198479***
MANOUT	-4.76321	-4.78312***
CONOUT	-2.56490	-3.64580**
AGROUT	-3.56287	-3.85136**

Notes: LCGDPM = Logarithm of Malaysia's GDP per capita; SCHI = average years of schooling in Indonesia; SCHP = average years of schooling in the Philippines; SCHK = average years of schooling in Thailand; OPEM = openness of the Malaysian economy; MI = number of Indonesian migrants; MPI = number of Philippine migrants; MT = number of Thai migrants; WRI = real wage ratio between Indonesia and Malaysia; WRP = real wage ratio between the Philippines and Malaysia; WRT = real wage ratio between Thailand and Malaysia; UNREI = Indonesia's rate of unemployment (%); UNREP = the Philippines' rate of unemployment (%); UNRET = Thailand's rate of unemployment; MANOUT = Malaysian manufacturing output; CONOUT = Malaysian construction output; AGROUT = Malaysian agriculture output.

The next step is to determine if the variables are cointegrated. The time series is said to be cointegrated if the residual is itself stationary. Hence, to test for cointegration between two or more nonstationary time series, the OLS regression is run, the residuals saved, and then something like the ADF test on the residual is run to determine if it is stationary. In effect, the nonstationary I(1) series cancelled each other out to produce a stationary I(0) residual. This is referred to as the Engle-Granger two-step method. The results are presented in table 14. The test results indicate that migration equations and wage ratio equations are cointegrated. However, the migration equations for the construction and agriculture sectors in the Philippines and the wage ratio equation for the agriculture sector in Thailand were found to be not cointegrated.

Table 14. Unit root test on the residuals of the implied long-run relationship

Migration Function		$\tau$ statistic	Null hypothesis of no cointegration
Indonesia	Overall	-3.431714	Rejected
	Manufacturing	-3.728243	Rejected
	Construction	-4.793991	Rejected
	Agriculture	-3.949469	Rejected
Philippines	Overall	-4.362916	Rejected
	Manufacturing	-4.167314	Rejected
	Construction	-3.053158	Not rejected
	Agriculture	-3.074236	Not rejected
Thailand	Overall	-3.246814	Rejected
	Manufacturing	-6.382429	Rejected

	Construction	-7.957074	Rejected
	Agriculture	-3.630318	Rejected
Wage Ratio Equation			
Indonesia	Overall	-4.167314	Rejected
	Manufacturing	-3.207002	Rejected
	Construction	-4.232404	Rejected
	Agriculture	-3.214513	Rejected
Philippines	Overall	-5.886157	Rejected
	Manufacturing	-4.129093	Rejected
	Construction	-4.453752	Rejected
	Agriculture	-3.245985	Rejected
Thailand	Overall	-3.808109	Rejected
	Manufacturing	-3.423301	Rejected
	Construction	-5.770880	Rejected
	Agriculture	-2.366901	Not rejected

### 5.3.2 Estimation Procedure

Based on equations (3) and (7), the models to be estimated are as follows:

$$\ln M_{it} = \delta_0 + \delta_1 \ln CGDPM_{jt} + \delta_2 UNRE_{it} + \delta_3 OPEM_{jt} + \delta_4 SCH_{it} + \delta_5 DUM_t + \nu_1 \quad (9)$$

$$WR_{it} = \phi_0 + \phi_1 \ln \hat{M}_{it} + \phi_2 OPEM_{jt} + \phi_3 SCH_{it} + \phi_4 DUM_t + \nu_2 \quad (10)$$

It turns that not all explanatory variables are exogenous. The regressor M is not the only determinant of WR but also of endogenous variables explained by WR and other variables such as CGDPM, OPEM, SCH, etc. Biased and inconsistent estimates will be obtained if the feedback between WR and M is not taken into account in estimating the parameters of equation (10) (see, for instance, Ramanathan 2002, pp. 544--6). The ordinary least squares (OLS) estimate method is not appropriate in a simultaneous equation model because one or more explanatory variables are correlated with the disturbance term in that equation and the estimators thus obtained are inconsistent. We write the estimation equations as equation (9) and equation (10). Wage ratio is dropped from the migration model because it violates the basis for conducting two-stage least squares (2SLS) as suggested by the reviewer.

By running an auxiliary regression of equation (9) with all of the available instruments included as explanatory variables, the predicted values of that regression,  $\hat{M}$ , will serve as the instrument for M. This auxiliary regression is the first stage of 2SLS. In the second stage, we used the IV estimator, making use of the generated instrument  $\hat{M}$  in the estimation of equation (10). In the estimation, we used sectoral analysis to replace the number of migrants and real GDP per capita with the sectoral number of migrants and sectoral output, respectively.

## 6. RESULTS OF ESTIMATION

### 6.1 Analysis of Results from Migration Models

Table 15 presents the results of the estimation of migration models for the ASEAN-3 migrants. This estimation covers the Malaysian economy overall. Results show that none of the incorporated variables significantly determines ASEAN-3 migration to Malaysia except the time dummy for the Indonesian and Thai migrants. This reflects a tremendous increase in migration inflow from these two countries to Malaysia after 1998 because of the foreign-labor policy introduced in Malaysia (e.g., amnesty programs that changed the status of illegal immigrants to legal). The absence of any significant variables in the case of the Philippines reflects that fact that the inflow of migrants from this country to Malaysia is determined by other variables that may not have been captured in the model (e.g., political stability and life environment).

**Table 15. Regression estimates of the migration model (overall)**

Variable	Indonesia	Philippines	Thailand
CONSTANT	4.3059 (5.535)	18.0213 (19.944)	-5.2659 (17.720)
LCGDPM	1.1084 (0.791)	-4.6614 (4.388)	1.6634 (2.681)
UNRE	0.0496 (0.037)	-0.1042 (0.129)	0.2512 (0.211)
OPEM	-0.6216 (0.403)	0.2683 (1.275)	-0.9808 (1.111)
SCH	-0.0624 (0.213)	3.8288 (2.408)	-0.0179 (0.809)
DUM	1.2351*** (0.160)	0.0959 (0.804)	2.0489*** (0.455)
R <sup>2</sup>	0.9807	0.6959	0.8808
LM test <sup>1</sup> or DW	2.4905	2.1607	1.8018

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test:  $(n-1)R^2$ . The figures in the parentheses below the estimated value of the L.M test are their probability of Chi-square(1).

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

Table 16 presents the results from the estimation of the migration model for the Indonesian migrants by economic sector (manufacturing, construction, and agriculture). Sectoral analysis is more important than the analysis for the overall economy because different determinants may apply for different sectors. Analysis by sectors shows that Malaysia's sectoral output significantly and positively affects the number of migrants for the manufacturing and agriculture sectors. Output elasticity is much higher in the manufacturing sector compared to the agriculture sector, which shows that a 1 percent increase in Malaysia's manufacturing output will increase the demand for foreign workers from Indonesia by 3.1452 percent. An increase in the sectoral output will create greater demand for workers, giving the latter the opportunity to fill job vacancies. Furthermore, the results demonstrate that rate of unemployment in Indonesia positively affects the inflow of its workers to Malaysia in all sectors. This result is also supported by the theory of migration which states an increase in the unemployment rate in the country of origin (Indonesia, in this case) will force people to move out of that country in hopes finding a better place to live/earn a livelihood in.

**Table 16: Regression estimates of the migration model – Indonesia (by sector)**

SECTOR	CONSTANT	LSECOUT	UNRE	OPEM	R <sup>2</sup>	LM test <sup>1</sup> or DW
MFG	-15.5403** (5.571)	3.1452*** (0.688)	0.0986** (0.040)	-0.1639 (0.503)	0.9271	2.1368
CON	-5.7881 (9.264)	1.9900 (1.161)	0.3466*** (0.084)	-1.4575 (0.894)	0.8813	1.9978
AGR	-10.855 (11.26)	2.6245* (1.305)	0.1992** (0.082)	-0.7082 (0.873)	0.8897	1.7548

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test:  $(n-1)R^2$ . The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector, LSECOUT=logarithm of sectoral output.

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

Table 17 presents the results for the Philippine migrants by sectors. The result shows that the sectoral output is positive and significantly affects the number of migrants from the

Philippines for all three sectors. It also demonstrates that output plays an important role in attracting foreign workers through jobs creation and increasing labor demand. The output elasticity for all three sectors are almost the same, which shows the equal capacity of these sectors to absorb foreign workers.

**Table 17: Regression estimates of the migration model – Philippines (by sector)**

SECTOR	CONSTANT	LSECOUT	UNRE	OPEM	R <sup>2</sup>	LM test <sup>1</sup> or DW
MFG	-37.425*** (9.325)	5.2747*** (1.075)	0.0910 (0.070)	0.7028 (0.749)	0.9062	2.0206
CON	-38.011*** (8.092)	5.0994*** (0.937)	0.0994 (0.065)	0.6765 (0.681)	0.9179	1.9996
AGR	-39.187*** (8.441)	5.1788*** (0.973)	0.0959 (0.063)	0.7359 (0.675)	0.9208	1.9472

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test:  $(n-1)R^2$ . The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector, LSECOUT=logarithm of sectoral output.

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

Table 18 presents the estimation results of the migration model for Thai migrants by economic sectors in Malaysia. The results show that the only significant determinant of migration from Thailand for all three sectors is sectoral output, which is positive. The output elasticity is quite large but slightly lower than that of the Philippines. The highest elasticity was observed in the construction sector, which shows that an increase of 1 percent in output will increase the demand for foreign workers from Thailand by 5.6627 percent.

**Table 18: Regression estimates of the migration model – Thailand (by sector)**

SECTOR	Constant	LSECOUT	UNRE	OPEM	R <sup>2</sup>	LM test <sup>1</sup> or DW
MFG	-31.7156 (18.065)	4.8078** (2.163)	0.0858 (0.259)	-0.3747 (1.467)	0.6759	1.7819
CON	-41.9112*** (13.095)	5.6627*** (1.691)	0.3599 (0.269)	-0.1801 (1.289)	0.6691	1.8067
AGR	-33.4708* (17.442)	4.8132** (2.086)	0.0657 (0.249)	-0.4463 (1.412)	0.6885	1.8094

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test:  $(n-1)R^2$ . The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector, LSECOUT=logarithm of sectoral output.

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

## 6.2 Analysis of Results from Wage Ratio Models

Table 19 presents the estimation results for the wage ratio between the ASEAN-3 and Malaysia for the Malaysian economy overall. The result shows that number of migrants does not affect the wage ratio between the ASEAN-3 countries and Malaysia. One of the significant variables is Malaysia's degree of openness, which negatively affects the wage ratio between Thailand and Malaysia. An increase in economic openness will decrease the wage ratio between Thailand and Malaysia. This means that an increase in openness will increase the wage gap between Thailand and Malaysia. Economic openness will spur the demand for more workers with higher skills and may reduce the demand for unskilled workers. The majority of migrant workers from Thailand are unskilled workers.

Another significant variable is years of schooling of the migrants from Indonesia and Thailand. The significant negative relationship between years of schooling in Indonesia and Thailand and the wage ratio implies that an increase in the years of schooling will increase the wage gap between these two countries and Malaysia. An increase in the number of years of schooling will contribute to larger labor supply in Indonesia and Thailand that may suppress wage levels. The economic structural change in Malaysia, which is approximately shown by the time dummy, was found to be insignificant in affecting the wage ratio between the ASEAN-3 and Malaysia.

**Table 19: Regression estimates of the real wage ratio model - overall**

Country	Constant	$\hat{M}$	OPEM	SCH	DUM	R <sup>2</sup>	LM test <sup>1</sup> or DW
Indonesia	-0.24741 (2.224)	0.1134 (0.179)	-0.0972 (0.206)	-0.0866* (0.043)	-0.1812 (0.251)	0.7910	2.4875
Philippines	4.2749*** (0.833)	-0.0738 (0.108)	-0.2082 (0.175)	-0.3333 (0.212)	0.0413 (0.081)	0.8971	2.5594
Thailand	2.8849** (1.304)	-0.0671 (0.159)	-0.6042*** (0.185)	-0.1301* (0.068)	0.1668 (0.356)	0.7869	1.8007

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test: (n-1)R<sup>2</sup>. The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

Analysis by sectors for the Indonesian migrants demonstrates insignificant results for most incorporated variables except for the time dummy for the manufacturing and construction sectors. As for the overall economy, the number of migrants does not significantly affect the wage ratio for all three sectors. The negative relationship between the time dummy and the wage ratio reflects fact that the wage ratio was envisaged to become more divergent after 1998 in contrast to the wage ratio in the previous years (refer to table 20). This reflects regional imbalances in the sectoral wages between the ASEAN-3 and Malaysia that subsequently may lead to income inequality and may encourage heavier migration to Malaysia.

**Table 20: Regression estimates of the real wage ratio model – Indonesia (by sector)**

Sector	Constant	$\hat{MI}$	OPEM	DUM	R <sup>2</sup>	LM test <sup>1</sup> or DW
MFG	0.0346 (0.319)	0.0410 (0.028)	-0.1911 (0.093)	-0.0831* (0.041)	0.5820	2.0538
CON	1.1183* (0.542)	-0.0046 (0.048)	-0.3251 (0.244)	-0.2072* (0.114)	0.6316	2.1677
AGR	0.9006 (1.965)	-0.0146 (0.167)	0.1918 (0.644)	-0.5083 (0.296)	0.4025	1.8009

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test:  $(n-1)R^2$ . The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector, MI=number of Indonesian migrants in the respective sectors.

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

Table 21 presents results of estimation of the wage ratio model by sector for the Philippine migrants. The result shows that the number of migrants negatively affects the real wage ratio between the Philippines and Malaysia for all sectors. The number of migrants from the Philippines seems to affect the wage ratio significantly for the manufacturing and construction sectors. The negative signs of the coefficients of this variable reflect the fact that an increase in the number of migrants will reduce the wage ratio (i.e., real wage will diverge). Economic structural change affects only the real wage ratio for the manufacturing sector where



the wage ratio is lower after 1998, which reflects the divergence in the manufacturing wage between the Philippines and Malaysia.

**Table 21: Regression estimates of the real wage ratio model – Philippines (by sector)**

Sector	Constant	$\hat{MP}$	OPEM	DUM	R <sup>2</sup>	LM test <sup>1</sup> or DW
MFG	1.3434*** (0.242)	-0.0771** (0.029)	-0.0995 (0.093)	-0.1999*** (0.042)	0.9114	2.4041
CON	2.3370*** (0.478)	-0.2279*** (0.072)	-0.0336 (0.222)	0.0812 (0.104)	0.6805	2.3833
AGR	9.8739* (4.702)	-1.0831 (0.751)	0.6364 (2.128)	-0.7685 (0.979)	0.7068	1.8845

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test: (n-1)R<sup>2</sup>. The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector, MP=number of Philippine migrants in the respective sectors.

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

The estimation results by sector for Thailand are shown in table 22. Again, the number of migrants from this country gives a significant and negative impact on the wage ratio between Thailand and Malaysia for the manufacturing and construction sectors, which shows the divergence in real wages. An increase in Malaysia's economic openness also reduces the wage ratio of the manufacturing sector, which reflects divergent wages. This finding is not in accordance with the theory, which postulates that economic openness will increase the inflow of international migration and wages will become more convergent between the countries. Time dummies are negatively significant for the manufacturing sector while being positively significant for the agriculture sector. The results imply that the wage ratio between the manufacturing sectors in Thailand and Malaysia has become more unequal after 1998. However, since the agriculture wage ratio between Thailand and Malaysia are more than unity, a positive sign of the time dummy also reflects the divergence in wages.

**Table 22: Regression estimates of the real wage ratio –Thailand (by sector)**

Sector	Constant	$\hat{MT}$	OPEM	DUM	R <sup>2</sup>	LM test <sup>1</sup> or DW
MFG	1.0756*** (0.179)	-0.0489** (0.019)	-0.1630** (0.068)	-0.1097*** (0.029)	0.9155	2.0960

CON	4.9870*** (0.775)	-0.4839*** (0.123)	-0.7034 (0.477)	0.1520 (0.199)	0.8070	2.2142
AGR	3.6902 (5.204)	-0.8659 (0.655)	0.09273 (2.325)	2.6754** (1.003)	0.5118	2.0737

Notes:

<sup>1</sup> Breusch-Godfrey Serial Correlation LM Test:  $(n-1)R^2$ . The figures in the parentheses below the estimated value of LM test are their probability of Chi-square(1).

MFG=manufacturing sector, CON=construction sector, AGR=agriculture sector, MT=number of Thai migrants in the respective sectors.

Figures in parentheses are standard errors

\*\*\*significant at 1%

\*\* significant at 5%

\* significant at 10%

From the results above, we can summarize that an increase in the number of migrants from the Philippines and Thailand will cause a divergence in the wage ratio between these countries and Malaysia, particularly in the manufacturing and construction sectors. This can be explained by the labor market structure in both countries. An increase in migration will only lower the wage rate of the natives if the migrants are perfect substitutes for them. However, if the natives and migrants are complements, then the presence of the latter will increase the wage rate of the natives and the migrants themselves. Okkerse (2008) argued that the theoretical aspects of the labor-market effects of immigration are usually described using a neoclassical competitive model of supply and demand in the market for labor services. In general, immigrants lower the price of factors for which they are perfect substitutes and raise the price of factors for which they are complements. Dustmann (2003) also suggested that in simple static models, migration increases with the wage differential between the host and the home country.

In this case, the findings reflect that foreign workers from the Philippines and Thailand are complements to local workers, specifically in the manufacturing and construction sectors. This confirms that foreign workers do not compete with but rather, complement local workers, a finding supported by Rahmah et al. (2003). Another possible explanation is that in labor-abundant countries like the Philippines and Thailand where unemployment rate is very high, the outflow of labor may not affect the wage rate because they may not actually be participating in the labor market in their country at the time of migration. However, from the perspective of a tight labor market like that being experienced in Malaysia, migration from these two countries will reinforce an increase in wages because Malaysian employers have to compete with one another to get workers. The reluctance of Malaysian workers to take on jobs in the construction

sector, for example, resulted in a labor shortage. Another plus factor that foreign workers have is that they are perceived to be hard, committed workers.

## **7. CONCLUSION**

International migration is a common phenomenon of the development process. People will move from poorer countries to wealthier countries to seek for better jobs and life environment. As far as Malaysia is concerned, migrant workers are vital in filling jobs that locals are not keen to take. Semiskilled and unskilled migrant workers largely work in the manufacturing and agriculture sectors. The vast majority of migrant workers in Malaysia come from Indonesia due to their similarity in culture and language. In addition, migrants from the Philippines and Thailand are also increasing, and their numbers are now considerably significant. Understanding the determinants of international migration is particularly important, especially for a country like Malaysia, which has a positive net migration. Theoretically, migration will bring the wage differences closer in the sense that the wages in the destination country and the emigrating country will be less different because of changes in the supply of labor. This subsequently will reduce migration outflow from the country of origin.

This study observes the determinants of migration from the ASEAN-3; namely, Indonesia, the Philippines, and Thailand, to Malaysia and finds that the strongest determinant is the time dummy, at least for the overall Malaysian economy. However, analysis by sectors demonstrates that real sectoral output is pertinent in influencing the number of migrants in the manufacturing, construction, and agriculture sectors, especially in the case of the Philippines and Thailand. The second important determinant is the unemployment rate, particularly in the case of Indonesia. Both sectoral output and unemployment rate positively affect the number of migrants from the ASEAN-3, a result in accordance with the theory.

The effect of the number of migrants on the real wage ratio is not significant in most cases except for the sectoral analysis. This variable affects the wage ratio between the Philippines and Thailand and Malaysia significantly and negatively for the manufacturing and construction sectors. This implies that an increase in the number of migrants from these countries will make the wages for these sectors more divergent, which is against what is predicted by the theory.

Economic openness, in any case, is not a significant determinant of the wage ratio except for Thailand's migrants in the overall Malaysian economy and the manufacturing sector, which are negatively significant. Workers' quality as measured by the number of years of schooling is a very important determinant for real wage ratio. Its negative effect implies that an increase in the population's education level will increase the wage gap between the ASEAN-3 and Malaysia. The result can be associated with an increase in the labor supply in the respective emigrating countries that may cause slower growth in wages.

The study finds that a higher number of migrants from Thailand and the Philippines will lead to wage divergence, particularly in the manufacturing and construction sectors. In order to have a more equitable wage ratio, these two countries should adjust the demand for labor. As suggested by the labor market theory, when supply is greater than demand, the wage rate will fall. Even though migration from Thailand and the Philippines to Malaysia does reduce the supply of labor in these two countries, it may not be enough for wages to increase or if it does, it increases at a very slow pace. Thailand and the Philippines should implement measures to increase labor demand such as creating new jobs by diversifying their economic activities. In addition, they should train their workforce to help them improve their skills and enable them to contribute significantly to productivity and wage increase.

Perhaps there are other determinants of wage convergence besides the number of migrants and other variables included in the model. These determinants cannot be captured in this study due to lack of data. Unmeasurable data like political stability and life environment are also important but these are beyond the scope of secondary data. All of these limitations might be overcome with the use of primary data, which requires a substantial amount of financial resources for the conduct of a field survey. Our future study will be looking into this issue deeper if we have the opportunity to do so and the financial support necessary to carry out the study. Another limitation of the present study is that it does not take into account the exchange rate. Since the study uses real wage rate, it is very much subject to the exchange rate. The stronger is the exchange rate against the US dollar, the higher will be the real wage rate and the strength of the exchange rate may differ from one country to another.

In conclusion, international migration from the ASEAN-3 to Malaysia is very much dependent on Malaysia's real sectoral output and the unemployment rate in the emigrating

countries. Therefore, as long as the real sectoral output keeps increasing, it will encourage people to migrate from the ASEAN-3 to Malaysia, at least for these three sectors covered in the analysis. Another significant variable is the unemployment rate in the emigrating countries. This variable has a positive relationship with the number of migrants to Malaysia from the ASEAN-3. Even though an increase in the number of migrants will lead to wage divergence, this is actually good for Malaysia because it denotes an increase in wages and productivity. However, this scenario also means an increase in regional imbalances. There is not much that the Malaysian economy can do to overcome this problem; the onus is more on the emigrating countries to restructure their economy and labor market.

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