

Graduate School of Tokyo University of Foreign Studies

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Master Thesis

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The effect to the economic growth by the labor migration  
: from the viewpoint of the stock of the human capital

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This paper aims to analyze the relationships between economic growth and migration focusing on the human capital especially in developing and emerging countries of Asia. The human capital has been considered as the major tool for keeping high productivity. Migration of skilled workers could contribute to the stock of the human capital through the practical experience with movement. And this contribution is often likely to have a positive effect on economic growth by increasing labor productivity and leading to a higher level of output.

On the other hand, it is said that movement of skilled labors has a negative effect to their own countries, because it may make the productivity low. Today, the study about the relationship between skilled migrants and economic effect has not been developed. Therefore, we analyze factors, which contribute to income and economic growth from the viewpoint of the migrant as the stock of human capital. We develop an economic model motivating the empirical work that takes a broader view on these issues than previous papers. This analysis will help understand how emigrant will give effect to economic condition in his/ her country.

## **I. Introduction : International migration trends**

Despite the ongoing effects of the global economic crisis, the total number of international migrants has increased in even recent years: in 2010, the total number of international migrants in the world was estimated at 214 million people up from 191 million in 2005 (Vargas-Silva, 2011). The main reason for migration could be explained in the wage differential such as the gap between developed and developing countries. Labors from developing countries, thus, tend to more move to developed countries in order to obtain the higher wage. This could contribute to raising the individual income of labor migrant or the social income of sending countries, mainly through the remittance. Remittances are likely to be seen by many governments as the dominant benefit to the origin country from labor migrant living abroad. In any case, international remittances to the developing regions are now the largest source of financial inflow after direct foreign investment, having surpassed both debt flows and official development assistance (Robert E. and B. Lucas, 2008). Remittances stimulate domestic investments, hence economic growth, is disputed (Chami et al, 2007). Some of the evidence points to substantial spending on housing and education investments out of remittance receipts (Edwards and Ureta 2003).

This paper mainly aims to analyze the relationships between the migration and economic growth in emergent countries of Asia areas which receives the immigrants and sends the emigrants as the human capital stock. This will be the key to explain whether the migration or emigration will contribute to forming the high human capital as the factor of the economic progress.

We have analyzed the factors, which contribute to economic growth from the quality and the stock side of human capital (Table 1); quality side -pupil/teacher ratio and education expenditure of government to GDP- and stock side-trade, distribution of income and population growth<sup>1</sup>.

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<sup>1</sup> This result was presented as our preliminary study at the annual meeting WRSA 51st in Poipu, Kauai, Hawaii on February 8-11 in 2012.

Table1. Statistics of Regressions to economic growth

	The quality of human capital		The stock of human capital		
explanatory variable	1a: pupil/teacher ratio 1b:education expenditure of government to GDP		Trade 2a: the share of export to GDP 2b:the rate of manufactured products to whole export	Distribution of Income 3a:the Gini coefficient (around 1990-94) 3b: the Gini coefficient (around 2000-10)	Population growth 4a:the rate of labor force 4b: the rate of population growth 4c: the growth rate of GDP
	All 14 countries	BRICs	12 countries*1	All 14 countries	All14 countries
R square	0.587835	0.963357	0.735515	(3a)0.594568 (3b)0.144448	0.42383
Constant term	1.064469	13.92031	2.25081	(3a)12.00544 (3b)7.938187	-6.24337
Partial regression coefficient	(1a)-1.3124 ** (1b) 0.001289	-2.02694* 0.04177*	(2a)- 0.05999* (2b) 0.114036	(3a )-0.01448** (3b)-0.08994	(4a) 0.22509 (4b) -0.65372 (4c) -0.06969
R square (Adjustment)	0.484794	0.890072	0.669394	(3a)0.557711 (3b)0.230445	0.175901

\* and \*\* represent P value under 0.05 and under 0.01 respectively.

Education is likely to have a positive effect on economic growth by increasing labor productivity and leading to a higher level of output. Therefore, developing countries tend to invest on the expansion of the quantitative education. However, in our study, we stressed that the quantitative education was not the only factor for the economic growth and there are several factors which lead to increasing the human capital. Especially, as a notable result, it was shown that the trade, which was one of three factors related to the human capital stocks, was positively correlated to the economic growth. Therefore, we concluded that economic openness can expect the economic growth more rapidly by enhancing the country's human capital. And to analyze the relationships more

precisely, it is needed to consider the migration as the factor related to the stock side of the human capital. From the viewpoint of the migration, according to, Robert E. B. Lucas (2008), open economy ought eventually to narrow the gaps in low-skilled workers' earnings, reducing the need to migrate. On the other hand, if the agglomeration of highly-skilled persons in the industrialized countries serves to make each such person more productive, then increased trade can exacerbate the pressures for a brain drain, even in the long run. We will thus focus, in this paper, on the economic effect by the migration in the emerging countries which we have taken as the object of study.

## **II . Empirical Literature**

### **Definition of migration**

To discuss the international migration, we need to clear the definition of migration. In this paper, we use the words related to the migration as following meanings;

- Sending country … Country whose someone move overseas and live there for short/ long period with the aim working.
- Receiving country … The opposite definition of sending one; the destination of someone leaving their native country.
- Migrant … We assume the international workers staying abroad to make their living; staying includes both of the short term during the validity of visa and the long term such as the permanent residence; immigrant means the labor as the migrant in the receiving country and emigrant is noted as the one in the sending country.

- High-skilled migrant ... Workers having experienced the upper level education (more than tertiary) including ones experienced the intelligence works.
- Low-skilled migrant ... Workers having only basic education such as elementary school. We assume that they work at the formal sectors such as the agricultural or manufacturing area.

As we mentioned, the focus on our study is to show whether the international migrant gives an effect to economic growth through heightening the productivity of a sending or receiving country. Then the insight emphasized in our study is the human capital theory: migrant workers as the stock contribute to the origin or destination country. The particularly strong focus concentrates in main two viewpoints since migrants began to move abroad heavily in 1990s. The former is the reasons for moving across countries. That is, the migration choice: economic theory focuses on the international labor mobility that descends from wage differentials of each country.

Latter is whether immigrants are displacements or substitutes of the native workers. Earlier approach estimating displacements or substitutes follows directly from the human capital theory. Borjas (2003) estimates how the labor market adjusts to the supply shock rather than simulate the impact, concerning the labor market impact of immigration in the U.S. economy. His paper claims that the immigration of workers in a particular skill group (e.g., high school dropouts) alters the opportunities of workers in other skill groups (e.g., college graduates). As the crucial point, he claims that a worker acquires skill both in school and on the job, and introduces not only educational attainment as the typical definition but also work experience.

On the other hand, Ottaviano and Peri (2010) assume that workers of migrants are substitutive to those of the natives in the U.S. economy even though both workers are in the similar education or experience levels. This study claims that even if increasing of migrants temporarily reduces the wage of workers in the native as the displacement effect, in the long run, these estimates imply an overall average positive effect of immigration on native wages with adjustment of the labor market.

As the conclusion of these studies, the two important points are proved. First, when the migrants and native workers are in the similar levels and one group is displaced to another, the native wage in the labor market becomes lower with increase of labor migrant supply. That is to say, the effects of displacement in the receiving countries depend on the amount of the labor supply, the adjustment between substitutes and displacements and adjustment speed of labor market. Second, when migrants can be substitutive to the native workers, it enables the native ones to concentrate to the high-skill works. This results in heightening their productivity. At the same time, the native wage becomes higher.

### **Impact of the receiving countries**

The effect to the receiving countries by the international migration depends on kinds of emigrants they receive: high-skilled or low-skilled workers. In the case of complement workers, the increase of immigrants will raise the wage because of the higher productivity in the accepted country.

As noted above, the important consideration in the receiving countries is the potential impact of immigration on income distribution. Other things being equal, inflows of immigrant workers into the labor market tend to reduce the income of natives who are competing with immigrants and to increase the incomes of users of immigrant services. The size of the redistribution depends primarily on how the wages of high-skilled and low-skilled workers respond to immigrant inflows.

On the other hand, even if the net effect of immigration in the receiving country results in being small, distributional effects in the country or for workers with certain skills can be substantial. Thus, many studies examine the effects of immigration on a specific location or country or type of occupation as the economic impact.

Migrants' skills and educational levels tend to be above the national average of the receiving country.

In addition, typical papers often argue the economic aspects on the individuals in the receiving countries: individuals may fear that immigrants burden public finances - either through using public services intensively or by contributing to social problems such as unemployment. These papers related to responses about individual attitudes to further immigration often rely on well-established economic theory, most prominently the Heckscher-Ohlin model (For example, O'Rourke and Sinnott, 2004 ). Dustmann and Preston (2006) point out that the coefficient analysis based on this theory never help explain about the real economy.

### **Impact of the sending countries**

Like the impact of receiving countries, the effect to the sending countries through the migration differs depending on who move: there are both of the negative and positive effects. In less developed countries (LDCs), as the negative effects, we can mainly include losing high-skilled labor and human capital to foreign labor markets, especially the "brain drain". The cost of losing the best educated workers is considered to be high for the sending countries. An immediate loss is the public investment in migrants' education and training, as well as the taxes that these skilled persons used to pay. More importantly, such loss of human capital implies that the sending country may have to rely more on the low-skilled workers, thereby lowering the prospects of attaining higher levels of growth. The significance of brain drain for development highlights in the literature which argues that the knowledge embodied in a person has a positive effect on the productivity of another person, whose knowledge, in turn, positively affects the productivity of the first person. The departure of highly educated

workers not only represents a loss of knowledge for the country, but also impairs the productivity of those left behind and, ultimately, of the country (UN, 2004).

However, in some emerging countries, it is shown that moving of skilled workers bring the positive effect because they in over population can replace them to other native workers<sup>2</sup>. Moreover, the positive effects attribute to the low-skilled emigrants. Migrants' skills and educational levels from the LDCs tend to be above the national average of the their origin country. In LDCs, moving of less skilled workers could give the possibility that the native workers can earn more income in their country with over workforce.

### **Who is the migrant?**

We can consider the two kinds of migrants; migration of highly-skilled workers and of low-skilled workers. Upon the situation of each countries, it could be explained which type of workers is more likely to move abroad as an international economic migrant. Therefore, the economic effect between sending and receiving countries will differ<sup>3</sup>. Based on this thesis, we take the assumption that these ability levels are not cost to the workers and potential employers, may be innate ability or schooling. Ability may have many dimensions, including ambition, intelligence, learning speed, entrepreneurial skills, aggressiveness, tenacity, etc. However, it is needed to consider the migration costs which in first period, occur: forgone incomes such as cost for living in the receiving country and missed cost by quit a job in the sending country ( $C_f$ ) and

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<sup>2</sup> Native workers are not migrants but just people working mainly at non-skilled sections.

<sup>3</sup> For example, if developed countries regulate receiving low-skilled migrants, their migrants will be composed by almost of the high-skilled workers.

out-of- pocket costs such as traveling ( $C_0$ ).

As the model to explain the tendency of migration, we employ “the Human Capital Migration Model” by Chiswick (1999). He gives the rate of return of migration as follow:

$$r = \frac{W_r - W_s}{C_f + C_d} \quad \dots (1)$$

where  $W_r$  is the wage of receiving country and  $W_s$  is one of sending. Migration occurs if the rate of return from the investment in migration ( $r$ ) is greater than or equal to the interest cost of funds for investment in human capital ( $i$ ). The interest costs of funds is lower, the greater the person's wealth and access to the capital market (Chiswick, 1999).

As next step, assume the low and high ability individuals have the same interest cost of funds. In both level, the person with the higher rate of return from migration will have the greater propensity to migrate. Let  $r_l$  be the rate of return from migration to a low ability person and let  $r_h$  be the rate of return to a high ability person. In the case that the ratio of wages in the receiving country depends on the level of ability, if the rate of return is  $r_l < r_h$ , the high-skilled persons will more move. In addition, also assume that the premium to the wage between the sending and receiving country is same ( $K_s = K_r$ ). We can then indicate the wage of the high-skilled person as  $W_{sh} = K_s W_{sl}$ ,  $W_{rh} = K_r W_{rl}$  and cost is affected on the rate of sending country as  $C_{fh} = K C_{fl}$ : the direct cost such as out-of- pocket costs ( $C_d$ ) is common between high-skilled and low-skilled workers but forgone incomes ( $C_f$ ) differ up on the premium.

On the wage depending on ability level, the return to the high-skilled person is higher and they go out their country more increasingly<sup>4</sup>.

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<sup>4</sup> The rate of return to the migrants abroad with high ability is given as follow:

$$r_h = \frac{W_{rl} - W_{sl}}{C_{fl} + C_d}$$

On the other hand, the opposite pattern, that is,  $r_h < r_l$ , could occur when the premium in the receiving country is much low ( $K_s > K_r$ )<sup>5</sup>.

Based on this model, we analysis which type of migrant is more likely to migrate in Asia countries in later section.

### **Migration Overview<sup>6</sup> in Asia Region**

Asia is a region of high migrant rate compared with other areas but in fact, the movement is not active. In 2013, the number of international migrants in Asia is 71million and the second largest, following 72 million in Europe. The third largest number is 53 million in Northern America followed by Africa (19 million), Latin America and the Caribbean (9 million), and Oceania (8 million)(UN, 2013). Europe, Asia and Northern America combined host nearly 80 % of the total global figure. However, the migration rate to total population is not so high (Sato, 2012). According to UN, 2013, in 2013(until Sep), the region of the highest rate compared to the net population is Oceania(20.7%) followed by Northern America (14.9%), Europe (9.8%). And Asia is only 1.6% although being second largest on the gross migrants. This share of migrants to total population remains small as well as Africa

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<sup>5</sup> For example, when  $W_{st} = 3$ ,  $W_{rt}=1$ ,  $C_t = C_f = 1$ ,  $K=4$ ,  $r_l$  is 1 and  $r_h$  is under 1 when  $K_r < 3$ .

<sup>6</sup> In this section, as the migrant, we don't include foreigners processing the nationality in their living country. According to IOM(2004), term migrants applies to persons, and family members, moving to another country or region to better their material or social conditions and improve the prospect for themselves or their family. In addition, we definite this term as about ten years as we use the estimated number by 2000 Census Round Data which has searched the migrant trend since 2000.

(1.7%), Latin America (1.4%) and the Caribbean (1.4%). In addition, the net migration for Asia decreased, at -0.3 per 1,000 of population between 2005 and 2010, while since 2000, this region added more international migrants than any other major area (IOM, 2010). These facts prove the common understanding that migrant is likely to move to the developed countries rather than to less developed.

In fact, the top destination country is the USA. And 53% of them are living in a country within their region of birth (UN, 2013 a): India as the main destination country is registering 6.1 million immigrants<sup>7</sup> from primarily Bangladesh and Pakistan. Four of the top ten migration corridors worldwide include Asian countries, led by Bangladesh–India (3.5 million migrants in 2005), and followed by India–United Arab Emirates (2.2 million), the Philippines–USA and Afghanistan–Iran (both 1.6 million) (IOM, 2013). Other main destinations include Pakistan (408 million), Thailand (372 million), Hong Kong (280 million), Iran (265 million), Malaysia (247million), Japan (240 million), Singapore (232 million), Korea (123 million)<sup>8</sup>. Moreover, considering that relatively low income countries are mainly bottom rank countries: Myanmar (103thousand), Cambodia (76 thousand), Bhutan (52 million), and Laos (21 thousand), Timor (12 thousand). It is clear that more immigrants seem to move higher income countries.

Asia countries are also the source of emigrant: in 2010, 5 of the top 10 emigration countries were in the Asian region – notably, Bangladesh, China, India, Pakistan and the Philippines (World Bank, 2011).

In Asia, unemployment rates rose in many countries throughout 2009. Where impacts were most severe, it was largely due to the effect of the downturn on exports as a result of the economic crisis on export-dependent economies. From the overview of the international migration in Asia area, we can explain that the emigrant moving to more developed countries for more income is not a little.

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<sup>7</sup> In a country's ranking, immigrant rate of 7.9% in the USA with 7.9 million emigrants recorded is top following India 6.1%

<sup>8</sup> Each number for the rank of these destinations is stock of migrant and data source is based on the UN (2013).

### Which type of migrants is more likely to move?

As we said in the above section, in Asia, migrants seem to move to a higher income country than their native one but 53% of them are living in a country within their region of birth. From this viewpoint, we can assume that the main type of the migrant in Asia region is the low skilled migrants going abroad for their living. Dumont et al (2010) help prove our assumption. Their study provides the detailed migrant data populations around the year 2000 based on the new global bilateral migration database DIOC-E . Employing their data, Figure 1 shows the characteristics of the emigrants by the different skill levels. The rate of tertiary-educated in emigration of Asia region is lower compared with that of other regions where less developed countries gather (Africa and Latin America), although the population of tertiary-educated is not so small against these regions. The rate of tertiary-educated -emigrant to OECD countries in Asia is as well. In addition, the immigrant rate of about 65% in primary and tertiary educated suggests that the main types of migrants in Asia are low and high skilled, especially low-skilled migrants move actively.

Table2 Immigration and Emigration rates by differential skill levels in population aged 15 and over (2000) (%)

Region	Primary-educated in global immigration	Tertiary-educated in global immigration	Tertiary-educated in global emigration	Emigration rates to OECD countries of tertiary educated	Emigration rates to non-OECD countries of tertiary educated
Africa	55.3	19.0	10.58	9.67	1.09
Asia	40.5	25.1	4.32	3.45	0.94
Latin America	55.4	13.5	8.79	7.88	1.07
North America	20.0	41.7	1.38	1.20	0.19
Europe	38.0	22.5	7.81	5.55	2.54

Source: Dumont et al (2010)

## Return for migrants among the major corridors

Moving from a poor country to a rich country to work is perhaps the single act most likely to succeed in dramatically increasing an individual's income, as well as that of remaining family members (Yang, 2008). In recognition of this fact, a number of developing countries have put in place policy measures to help their citizens work abroad. In order to provide a more accurate picture of movement, we analysis the characteristics of the investment in migration based on the human capital migration model (1) by Chiswick (1999). His study shows that the private return focusing on the individual income of migrants in the receiving countries compared with one in the sending countries. This model will be useful to detail the data in the limited area. On the other hand, our interest is the trend in a whole Asia region. Therefore, we develop his model and employ the average indexes of each country as the data set across Asia countries. The model referring the Mincerian earning function method is as follow:

$$\ln Y_i = \beta x_i \times \mu_i \dots (2)$$

Where:  $\ln Y$  is the wage differential between the receiving and sending countries as the log model. We assume that the wage is not same in the all skill levels and consider both patterns of high and low skilled workers ( $W_{rh} - W_{sh}$ ) and ( $W_{rl} - W_{sl}$ ).  $x$  includes the labor flow (unemployment rate and participate rate in the labor market) and education year and the work experience more than five years (as the percentage to a whole workers in the certain skill level). Duration is from 2000 to 2012.

As we said in the above section, the countries in Asia account for our of the top ten migration corridors worldwide: according to IOM 2012, from top 1 to 4 is Bangladesh–India, India–United Arab Emirates, the Philippines–USA and Afghanistan–Iran . Moreover, the major sending country to India as the main destination country in this region is Pakistan. Table2 shows the return rate of migration by each corridor.

Table3: Return rate by the immigration between the high and low skilled workers (%)

<b>Corridors in Asia (from to)</b>	<b>The rate of high-skilled migrants</b>	<b>The rate of low-skilled migrants</b>
Bangladesh- India	51	82
India –Arab	-30	Average income -6 20% of low income 45*
Pakistan-India	36	95
Philippines-USA	55	94
Afghanistan- Iran	8	58
India- USA	51	66
China-USA	52	85

\*Considering the large wage gap in India, we focus on 20% group of the poorest in the income groups.

From the result, we can understand that the rate of low-skilled migrants is higher one of high-skilled especially, the return for the low-skilled migrants among Bangladesh- India, Pakistan-India and Philippines- the USA is approximately 90%.

Historically, for Bangladeshi people, migration has been a common livelihood strategy since the 18th century, emigration from Bengal has had a direct correlation with colonialism. International migration plays a vital and indispensable role in the national economy of Bangladesh in two major ways. Firstly, it reduces unemployment. Secondly, migration results in remittance flows to the country which serves as an important but inexpensive source of much needed foreign exchange<sup>9</sup>. Since 1980s, It is estimated that one-third of the total working age population of Bangladesh is either unemployed or underemployed Migration, therefore, eased the pressure of

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<sup>9</sup>According to World Bank (2011), the remittance of Bangladesh (\$ 11.1 billion) is the 7<sup>th</sup> in the top-remittance receiving countries in 2010.

alternative employment creation on successive governments<sup>10</sup> (Tasneem, 2003).

The government of the Philippines keeps the forefront of promoting overseas temporary contract work and making emigration part of its national development strategy, and many other developing countries are now seeking to emulate the Philippines in this regard. The Philippines' bilateral labor contracts require workers to be paid the prevailing wage for their positions in the destination countries. As a result, the same market imperfection that is one reason that workers can so dramatically increase their incomes by working abroad shifts all the burden of adjustment to demand shocks onto quantities rather than wages. The Philippine Overseas Employment Administration (POEA) regulates the recruitment and employment of Filipinos for work abroad. Their rules and regulations dictate that there be "guaranteed wages for regular work hours and overtime pay, which shall not be lower than the prescribed minimum wage in the host country or not lower than the appropriate minimum wage standards set forth in a bilateral agreement<sup>11</sup> or international convention, if applicable, or not lower than the minimum wage in the Philippines, whichever is highest (McKenzie et al, 2012).

Concerning the study of the immigrant from Pakistan, Nisar et al (2008) revealed that the migration from Pakistan was found positively related with inflation and unemployment rate in the country and was negatively related with real wage rate. Thus inflation, unemployment and declining wage rate were the push factors for international migration from Pakistan.

The return rate of 85% for the low-skilled immigrants in the USA from China having achieved the most progressive growth of Asia, also suggests that they have succeeded in the assimilation with the natives. Wu (2012)

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<sup>10</sup> The government launched the Expatriate Bank in 2011 with 100 crore taka (\$13.6 million) to provide loans to migrants to cover pre-departure costs and provide loans to returned migrants to help them to establish businesses in Bangladesh (Martin et al, 2006).

<sup>11</sup> For example, Filipino workers in the United States, Canada and Korea are covered by minimum wage laws in those countries, whereas other destinations like Saudi Arabia, the United Arab Emirates, Qatar, Bahrain, Oman, and Malaysia do not have minimum wage laws.

brought the result that by 2011, Chinese immigrants 'earning exceed the natives' earning by about 4%, comparing earnings performance of Chinese immigrants with the natives that have similar educational attainment during 1994-2011. The return rate for the high-skilled immigrants shown by our analysis is only 52% but Wu (2012) says that Chinese immigrants could have higher levels of human capital because they have higher levels of formal education. This implies that in China, even for the holders of college degrees such as, from bachelor degrees or master, PhD degrees, the labor market is really competitive. Thus, they have a difficulty to earn the income to substitute for it in the origin country (China).

Compared with the sending countries among these four corridors, the return rates of India and Afghanistan (under 70%) indicate that the migrants are not able to obtain enough benefit in each receiving county. As we already mentioned, India is recognized as the destination country rather than as the origin country. Today, India dramatically has achieved the economic growth (average GDP growth rate (2000-12) is about 7%) with the plus effect to the wage in the native.

Thus, relatively high income to the surrounding countries attracts the immigrants from their countries. However, a number of the poor still remain no small: the unemployment issues<sup>12</sup> are left in India, especially for the workers earning the low income, it is difficult to make their living standard better.

The unstable employment circumstance can become the main reason for leaving the origin country (India), although the average wage in the labor market in Arab is not the higher than that of India. The return rate of the migrants moving from India to Arab, therefore, is calculated as the negative point (-6%). Nevertheless, considering the income gap between the agricultural and IT industries, we could improve the negative value in the low-skilled migrants to the positive one of 45%, while the negative rate in high-skilled migrants is unchangeable.

In addition, the return rates India-USA imply that the Indian migrants do not get the attractive return to bring the dramatic improvement to their living even from the rich country such as USA. According to Munshi and

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<sup>12</sup> One of the most serious issues is that the second industry is underdeveloped against the remarkable progress of IT technology: the workers including the migrants tend to gather in the agricultural industry.

Rosenzweig (2013), the scale of the return rate for the Indian migrants by the movement in the developed countries is connected with the duration of stay or whether a member of their family live with Thai is, Indian who willing to stay permanently as the labor in the US may consume more for the insurance program than they earn on average .

Compared with the return rate of unskilled workers, that of the skilled is about 50% on the average. This value is not so highly significant. Shiff (2005) notes that the return of the movement by the high-skilled workers is smaller than suggested in the previous reviews, because an increase in the stock of human capital may have a negative impact on welfare and growth. That is, if more skilled workers move abroad, the government comes to decrease the public investment for the formation of the human capital in their origin country or in the destination country, the labor market consequently become over-qualified.

## **Trade and Migration**

We introduced the human capital model as the way to explain the determinants of the international migration from the wage differential. Moreover, on the premise that labor migrants move to a country with the higher income, most studies use the simplified framework based on the Heckscher-Ohlin model: migrants bring the benefit to the receiving country which result in the equalization of the wage with the marginal productivity of labor and in fulfillment of more efficient productivity. Yet, this model does not consider the trade liberalization. From the positive correlation of the trade and the human capital in our previous study, we attempts to consider the migrants as a one of the productions in the trade.

As the study in the field of the migrants and the trade in Eastern and Western European countries, Iranzo and Peri (2007) notes that opening up to trade allows each country to specialize, as well as to increase the production of (and obtain access to) more varieties (compared with a country having no migrants and trades )of the

differentiated good. However, due to technological differences across countries trade does not equalize real wages. Thus, even under free trade, lifting the restrictions on the free movement of workers would induce migratory flows. The crucial feature of their model is that it develops the model which combines technological differences across countries, trade of differentiated good and heterogeneous workers to analyze the wage effects of migration and trade for workers based on different educational levels.

### **III. Model Qualification**

The aim of the regression analysis in this study is to determine the effect to economic growth through the immigration from Asia region from the viewpoint of the stock of the human capital. Our contributions are mainly two points. First, we employ the original model to compare the migrants as the human capital with other factors related to the formation or sock of human capital. As noted above, the studies concerning the migration and economic growth is likely to be interested in analyzing the effects of displacement or substitute by the immigrants. These studies will be really useful to explain about the economic impact in the receiving countries. Unfortunately, our focus is on the impact of the sending country and it is necessary to apply the model along with our purpose. Even the studies in the field whose previous literatures have been written set the model with fact-finding rather than based on the established theory. Thus, we expect that our model will be added to one of the established models.

Second, we will select the emerging and less developed countries in Asia region as the objectives for the analysis. Most existing studies exploit the geographic clustering of immigrants and use the differences across local labor markets to identify the impact of immigration. It is difficult to apply he results by these studies as the regional analysis in one country to other countries as the common recognition. As the criticism of the regional studies, Borjas (2003) notes that the geographic clustering ignores the strong currents that tend to equalize economic

conditions across cities and regions. The classified group based on the skill levels in his study is defined in terms of both schooling and labor market experience, not the regional one (See the literature review section: page.6). This classification helps following studies to bring the valuable results in the regression. However, his focus is mainly on the developed countries (as the receiving country) such as the USA. We try to find out the unrevealed common tendency in a whole Asia region (as the sending countries) whose studies are less developed.

### **Model & Data**

When we consider the migrants as the stock of the human capital, we assume moving by the high-skilled workers. However, in many Asian countries, we need to acknowledge that the main emigrants from Asia are the low-skilled. Then, we compare the differential level of workers on the presume that the effect to the economic growth through the international migrant depends on the income level or the amount of the stock of the human capital in a country.

As main reasons to move abroad, migrants often cite that higher income, better personal safety, short distance to the origin countries and established immigrant networks. In above section, it is shown that the return for the low-skilled emigrants from Asia is generally positive sorting, while one for the high-skilled is not necessarily. Considering this result, we specify the model to estimate the macroeconomic determinants of the international migration. As the model I , the functional form of the basic migration model is;

### Model I

$$Y^i = n_0 + n_1 Wage_{it} + n_2 Unemploy_{it} + n_3 Inf_{it} + e_t \dots\dots (3)$$

$Y$  is the number of labor immigrant with tertiary education attainment (the rate of all workers )

(a)  $Wage_{it}$  ... the wage rate (expressed as an hourly increment of pay)

(b)  $Unemploy_{it}$  ... Unemployment rate of tertiary education tin the sending country

(c)  $Inf_{it}$  ... Inflation rate in the sending county

$e_t$  shows error term and  $i$  is country,  $t$  is time of each rate.

The duration of data is (1990-2000) and (2001-10) with time lag, but on (b) because of lack of data, we adopted one of (1995-2000) and (2001-10). We try to explain the movement of high-skilled migrant from the viewpoint of economic condition because the positive effect from the wage in the destination is unidentified.

As the second model (model II), we analysis the relationship between the economic growth and the human capital stock. Economic studies are likely to support these reasons and compare with income and GDP levels between receiving and sending countries (Kerr and William, 2011).

On the other hand, our original model includes the immigrant as the human capital stock in the explanatory variables. Other variables are recognized as the factors to form the human capital. The functional form of the basic migration model is;

## Model II

$$Y^i = n_0 + n_1 \text{Attain}_{it} + n_2 \text{Work}_{it} + n_3 \text{Migl}_{it} + n_4 \text{Migh}_{it} + n_5 \text{Expo} + e_t \quad \dots (4)$$

$Y$  is Growth rate of GDP

(a)  $\text{Attain}_{it}$  ... Attain rate of tertiary education (to all population)

(b)  $\text{Work}_{it}$  ... Participation rate in labor market

(c)  $\text{Migl}_{it}$  ... immigration stock rate of unskilled workers (balanced emigrant from Immigrant stock)

(d)  $\text{Migh}_{it}$  ... immigration stock rate of skilled workers (balanced emigrant from Immigrant stock)

(e)  $\text{Expo}_{it}$  ... Rate of Export manufactured products

To compare with quality and stock (as quantity) of human capital, as the former factor, we use the attain rate to higher school and the participation rate in the labor market in the sending countries. If the balanced immigration rate of unskilled workers (as the variable c) is positive, it means that movement of unskilled workers gives the plus effect to economic growth of their countries. In other words, the over labor market offset the flow of the workers. In addition, variable (e) to explain the relationship between the migration and trade determines whether the migrant contributes to economic growth in their hometown. Otherwise, moving of the skilled people may have the negative effect such as brain drain. The table distinguishes between less educated (0 to 8 years of schooling), those with intermediate education (9 to 12 years of schooling) and the highly educated (13 years of schooling or more). The rates are mostly small and exhibit small changes during the last decade with no clear pattern across educational groups.

## IV. Result & Analysis

Regression results comparing with movement of high-skilled workers and economic condition in the sending country is given in Table.4.

Table 4.Regression Results in the comparison with movement of high-skilled workers and economic condition

Partial regression coefficient	All countries	Low income countries	Lower middle income countries	Upper middle income countries
(a) Wage rate	0.00317*	0.01045**	0.00151	-0.2525*
(b) Unemployment rate	-0.06755	-0.09101	-0.0149**	0.06176
(d) Inflation rate	0.04237*	0.03960*	0.02913*	0.02342*
R square	0.345612	0.583731	0.367786	0.488601
Constant term	1.005877	0.83375	0.62403	1.70416
R square (Adjustment)	0.22663	0.44497	0.18715	0.27720

\* and \*\* represent P value under 0.05 and under 0.01 respectively.

The result revealed that in all countries, especially in low income countries, the migration of high-skilled workers is positively related to the wage rate. On the other hand, in upper middle income countries, it has negative relation with the wage rate. This suggests that the migrants achieving the high education in low income countries could succeed in shifting to the upper income group in more developed countries than their native country.

In addition, it is the skilled migrants in upper middle income countries get the motivation to go abroad, in the case that their income level is down. Regression result concerning the wage proves the migration choice that the skilled migrants move abroad for the higher income.

In all income levels countries, the inflation rate is found positively related with the skilled migration. Therefore, people started to migrate abroad for fulfilling their basic needs through earned remittances. The workers from the

low income countries immigrate abroad due to high inflation, unemployment and abject poverty (Nisar et al, 2008).

The regression estimates of wage rate and the inflation rate apply to the push-pull theory<sup>13</sup> of the migration. Nevertheless, the unemployment rate is not significant result to determine the movement of the skilled workers except lower middle income countries. From this result, we can assume that the skilled workers are less likely to have a difficulty in being under employment.

Regression results comparing with economic growth and human capital are shown in Table 5.

Table 5. Regression Results in the comparison with economic growth and human capital

Partial regression coefficient	All countries	Low income countries	Lower middle Income countries	Upper middle income countries
(a) Attain rate of tertiary education	0.00348	0.00208	0.00752	0.00883
(b) Participation rate in labor market	-0.01441**	0.0089	0.07435	-0.08047
(c) Immigration rate of unskilled workers	0.04783*	0.03335*	0.00980	0.0610
(d) Immigration rate of skilled workers	0.00372	0.00656	0.06349	0.06656
(e) Rate of Export manufacturing	0.04275*	0.0194**	0.02633**	0.05814*
R square	0.70452	0.76033	0.56057	0.52655
Constant term	-0.22369	-0.8036	-2.14364	1.091315
R square (Adjustment)	0.6508	0.66447	0.41409	0.400295

\* and \*\* represent P value under 0.05 and under 0.01 respectively.

Economic growth is found positively related with immigration rate of unskilled workers in all countries, especially in low income countries. This proves our assumption that the emigrant from over labor market offset

<sup>13</sup> This theory was advocated by Everett Lee in “a Theory of Migration” in 1960s.

the flow of workers in their origin countries. That is, the movement in redundant worker is considered as the positive effect in the sending countries. As other viewpoint, there is the possibility that through the work experience or upper education attainment, the unskilled immigrants become to be above the average skill level in the destination country.

Moreover, in all levels countries, rate of export manufacturing indicates the positive relationship with the economic growth as well. In low income country, the significant determinant is highly shown at 0.01 percent probability level. We can, therefore, reach the conclusion that opening up to trade allows each country to specialize, increasing the varieties of production in the differentiated good. Or the immigrants may be able to have the opportunity to polish their potential skill in involving in the opened economic activities.

It is revealed that participate rate in labor market is negatively related with the economic growth in estimate of all countries. Its estimate is highly significant at -0.01 percent probability level. This result suggests that the labor supply including immigrant remain being overstock against the demand over the time.

On the other hand, attain rate of tertiary education and immigration rate of skilled workers do not show the significant relationship with the economic growth. Regression result of attain rate is applied to the human capital theory that the schooling does not necessarily bring the positive effect to the human capital formation. Insignificance of immigration rate of skilled workers means that each country in Asia yet to receive enough immigrants to contribute to its country.

## V. Concluding Remarks

This paper focused on how the immigrant as the stock of the human capital gives effect to economic development in Asia's emerging countries. We employed three models as the development of other model or original one.

First model calculated, based on the Mincerian earning function method, the return rate for both migrants of high and low skills among the major corridors in Asia regions. As the result, the return of the low-skilled workers showed high rate, while that of high-skilled does not.

Therefore, we developed the macroeconomic model of migration to determine the movement of the high-skilled workers in different income levels of countries. Regression results revealed that in countries of all income levels, the migration of high-skilled workers was positively related to the wage rate and inflation rate. While the regression estimates of wage rate and the inflation rate apply to the push-pull theory of the migration, the unemployment rate is not significant result to determine the movement of the skilled workers except lower middle income countries. From this result, we can assume that the skilled workers are less likely to have a difficulty in being under employment.

As the third model, we used the original model to explain the relationship between the economic growth and the human capital stock, including the immigrant as the human capital stock in the explanatory variables. Regression estimates indicated that economic growth is found positively related with immigration rate of unskilled workers and manufacturing indicates in all countries. These results support our assumption that the human capital is formed by the working experience with opening market rather than by upper schooling attainment.

As a final conclusion, the following hypothesis was assumed; skilled emigrants may cultivate their productivity and come to contribute to their countries as the capable stock of human capital in the future. As next viewpoint, we would like to adopt the concept of technology transfer.

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