

# **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 will analyze factors, which contribute to income and economic growth from the viewpoint of the migrant as the stock of human capital. And this analysis will help understand how emigrant will give effect to economic condition in his/her country.

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## **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 income of individual labor migrant or whole one in sending countries<sup>2</sup>. In addition, remittances are likely to be seen by many governments as the dominant benefit to the home country from labor migration 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 (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 sending or receiving countries<sup>3</sup> in emergent countries especially in Asia's areas. This will be the key to explain whether the migration or emigration will

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<sup>2</sup> In this paper, we definite the sending country as one whose someone move overseas and live there for short/ long period with the aim working.

<sup>3</sup> The receiving country is the opposite definition to the sending country: the destination of someone leaving their native country.

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; quality side - pupil/teacher ratio and education expenditure of government to GDP - and stock side-trade, distribution of income and population growth<sup>4</sup>.

<sup>4</sup> You can see the result of our study below. Our research was presented in “The contribution to economic growth by human capital: The comparison among BRICs”, WRSA 51<sup>st</sup> Annual meeting, Poipu, Kawai, Hawaii, February 8-11, 2012.

Statistics of Regressions to economic growth

explanatory variable	The quality of human capital	The stock of human capital		
	(1a)(1b) All 14 countries BRICs	Trade (2a)(2b) 12 countries <sup>iii)</sup>	Distribution of Income (3a)(3b) All 14 countries	Population growth (4a)(4b)(4c) All 14 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 ** -2.02694* (1b) 0.001289 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

i) In this analysis, the selected countries are the following 14 countries with rate of GDP (net): Brazil, Russia, India, China (BRICs), Hong Kong, Malaysia, Singapore, South Korea, Taiwan, Thailand (The countries in NICs), Indonesia, Philippines, Turkey and Vietnam (Next11).

ii) (1) of explanatory variable is quality side of human capital: (1a) pupil/teacher ratio and (1b) education expenditure of government to GDP.

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 is 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 is one of three factors related to the human capital stocks, is 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,

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And from (2) to (4) are stock side, (2) is trade: (2a) the share of export to GDP and (2b) the rate of manufactured products to whole export. (3) is Distribution of income: (3a) the Gini coefficient (around 1990-94) and (3b) the Gini coefficient (around 2000-10). (4) is Population growth: (4a) the rate of labor force, (4b) the rate of population growth and (4c) the growth rate of GDP.

iii) The shares of export to GDP (2a) in Singapore and Hong Kong are over 150% because intermediate goods are often counted doubly. Therefore, these two countries are not included.

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

in this paper, on the economic effect by the migration in the emerging countries which we have taken as the object of study.

### **Definition of Migration: Who is the Migrant?**

We can consider the two kinds of migrants; migration of highly-skilled workers and of low-skilled workers. The former means people who have experienced the upper level education (more than tertiary). The latter is ones who have only basic education such as elementary school. 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>5</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 ( $C_f$ ) and out-of-pocket costs ( $C_d$ )<sup>6</sup>.

As a first step to explain the tendency of migration, assume the low and high ability individuals have the same interest cost of funds. As a result, 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

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<sup>5</sup> For example, if developed countries regulate receiving low-skilled migrants, their migrants will be composed by almost of the high-skilled workers.

<sup>6</sup> Then, the rate of return of migration is given as follow:

$$r = (W_r \cdot W_s) / (C_f + C_d)$$

$W_r$  is the wage of receiving country and  $W_s$  is one of sending.

the rate of return to a high ability person (Chiswick, 1999). 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:  $C_{fh} = K C_{fl}$ .

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>7</sup>. 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>8</sup>.

### Impact of the Receiving Countries

As we mentioned in “Definition of migration, the effect to the receiving countries by the international migration depends on they receive which kind of emigrants: high-skilled workers or low-skilled workers. According to Borjas (2003) analyzing the migration in the US, while basically, the receiving country can replace immigrants by the native workers, similarly educated workers who have different levels of experience are not perfect substitutes. A negative correlation (i.e., native wages are lower in those markets penetrated by immigrants) would indicate that immigrants worsen the employment opportunities of competing native workers: a 10 percent

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<sup>7</sup> The rate of return to the migrants abroad with high ability is given as follow:

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

<sup>8</sup> For example, when  $W_{sl} = 3$ ,  $W_{rl} = 1$ ,  $C_t = C_f = 1$ ,  $K = 4$ ,  $r_l$  is 1 and  $r_h$  is under 1 when  $K_r < 3$ .

increase in supply reduces wages by 3 to 4 percent. On the other hand, Ottaviano and Peri (2006) indicate that immigrants are imperfect substitutes for U.S-born workers even within the same education-experience-gender group because they choose different occupations and have different skills. Even if immigrants can replace the native workers temporarily, accounting for a reasonable speed of adjustment of physical capital, most of the wage effects of immigration will accrue to native workers within a decade. As a result of these controversies, if the immigrants of same levels and experiences with native workers are substitute for them perfectly, more immigrants will low the wage in the receiving countries. In the case of complement workers, the increase of immigrants will raise the wage because of the higher productivity in the accepted country.

### **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”. 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>9</sup>. Moreover, the positive effects attribute to the low-skilled emigrants. 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.

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<sup>9</sup> Native workers are not migrants but just people working mainly at non-skilled sections.

## Migration Overview<sup>10</sup> in Asia Region

Asia is a region of high 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)<sup>11</sup>. On the other hand, in 2008, in this region, the main receiving countries as the emerging ones following Japan as top country are Singapore (1.84 million), Malaysia (1.64 million), Thailand (1.05 million), China (0.59 million), Korea (0.55 million) and India (0.54 million). Considering that relatively low income countries are mainly bottom rank countries: Cambodia (30 thousand), Myanmar (11 thousand), and Laos (0.25 thousand), it is clear that more immigrants seem to move higher income countries. In addition, we can say that Singapore is also sending country, because 5.3% of total population lives overseas<sup>12</sup>.

Then, which area do emigrants from Asian countries go to? According to International Organization for Migration (IOM) (2011), the USA is the main destination (24% in 2000)<sup>13</sup>, with 7.9 million emigrants recorded there. However, countries within Asia are also

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<sup>10</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.

<sup>11</sup> The top emigration countries were also among the top remittance-receiving countries (with China and India, for example, receiving USD 53.1 billion and USD 51.3 billion, respectively).

<sup>12</sup> In Asia region, the rate of Singaporean living overseas is the third highest.

<sup>13</sup> In a country's ranking, immigrant rate of 7.9% in the USA is top following India 6.1%.

important destinations (42% in 2000) for migrants from the region, such as India registering 6.1 million immigrants from Asian countries (primarily Bangladesh and Pakistan)<sup>14</sup>. 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). Moreover, we can explain the trend of migrants in Asia area by classifying this area into three regions: East Asia, South-East Asia and South Asia. In East Asian countries hosting nearly 6.5 million migrants, Hong Kong is the main destination of international migrants followed by Japan, China and Republic Korea. Nearly 6 million of around 10 million emigrants<sup>15</sup> are Chinese and their main destination is the USA. In South-East Asia, Malaysia and Singapore are the main destinations for international migrants with about 2.4 million and almost 2 million migrants, respectively, in 2010. When migrants are considered as a proportion of the total population, however, Singapore is the top country of destination. Like East-Asia, the main country of destination is the USA. In South Asia, 14.3 million international migrants in 2010 were estimated. India remains the main country of destination. India is also a country of origin; the Indian diaspora numbers almost 25 million, 10 % of whom can be found in the USA. Other major destinations include Singapore, Malaysia and the Gulf States.

In Asia, unemployment rates rose in many countries throughout

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<sup>14</sup> Undocumented migration is increasingly an issue within the region. It is estimated that some of Asia's largest undocumented migration flows may be among the largest overall contemporary flows, with the Bangladesh–India corridor alone involving up to 17 million people.

<sup>15</sup> This estimate is based on the 2000 Census Round Data. Therefore, this trend has lasted for about ten years and other estimations are as well.

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.

### **Empirical Literature**

As we mentioned, the focus on our study is to show whether the international migrant will give an effect to economic growth through heighten the productivity of a sending country. In the theory regarding the migrant as the positive effect in the sending country, Mountford (1997) and Stark & Yang (2002) indicate that they will invest more on education to their income, and ,as a result, their individual education level will be improved, at same time their country's productivity will be. On the other hand, it is shown not only the higher human capital income but also remittance is the important element for more income.

### **Model Qualification**

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 will compare the differential level of workers on the presume that the effect to the economic growth through the international migrant will depends on the income level or the amount of the stock of the human capital in a country.

## II. MODEL & DATA

We will analyze the effect to economic growth through the migration from the viewpoint of the stock of the human capital. The explained variable is the growth rate of net GDP (2001-2010) and explanatory variables are the following factors:

Model I

$$Y^i = n_o + n_1 Attain_{it} + n_2 Mig_{it} + n_3 Unemploy_{it} + n_4 Move_{it} \dots \dots (1)$$

- (a) *Attain<sub>it</sub>* ... Attain rate of higher education (to all population)
- (b) *Mig<sub>it</sub>* ... Emigration rate of tertiary educated.
- (c) *Unemploy<sub>it</sub>* ... Unemployment rate of sending country
- (d) *Move<sub>it</sub>* ... Movement rate to developed country

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 tried to explain the factor from the viewpoint of income. If it is proved that movement rate of tertiary educated labor has the positive effect to per GDP rate, we can say that they will go out their country more increasingly to earn higher income. And return to skilled workers depends on how many of them move to developed countries (as explanatory variable “d”).

Model II

$$Y^i = n_o + n_1 Attain_{it} + n_2 Work_{it} + n_3 Mig_{it} + n_4 Expo_{it} \dots \dots (2)$$

*Y<sup>i</sup>* ... Growth rate of GDP, *i* is country and *t* is time of each rate

- (a) *Attain<sub>it</sub>* ... Attain rate of tertiary education (to all population)
- (b) *Work<sub>it</sub>* ... Participation rate to labor market
- (c) *Mig<sub>it</sub>* ... Emigration rate of unskilled workers
- (d) *Expo<sub>it</sub>* ... Rate of Export manufactured products

To compare with quality and stock (as quantity) of human capital, we will use the attain rate to higher school as the former factor and the participation rate workers in the sending countries. If emigration rate of unskilled workers (as factor c) is positive, it means that movement of unskilled workers gives the plus effect to economic growth of their countries. In addition, by the development level of sending country (as factor d), it could be explained whether emigrant will contribute to economic growth in their hometown. Otherwise, moving of the skilled people may have the negative effect such as brain drain.

### III. ANALYSIS

The result of Table 1 shows that except low income countries, movement and income have no significant relationship. However, movement rate to developed country indicated the consistent correlation with economic growth at all levels of countries. Moreover, in low income countries, attain rate of tertiary education strongly has the positive effect to developing their countries. On the other hand, in lower middle income countries, unemployment rate of their countries has the obvious negative effect.

Table 2 is the result of Model II. Opposite to the result of Model I, the relationship between economic growth and human capital is clearly proved at all levels. Especially, they among low income countries and all countries are higher. According to the numerical value of R square, lower income countries have positive effect more strongly in all factors than upper income countries. The consistent correlation at all levels is shown in Export rate of manufacturing. And in upper middle countries, participation rate to labor market has minus effect to economic development. It at all levels does as well but has stronger correlation.

Table 1. Statistics of Regressions in the comparison with movement and income

	All countries	Low income countries	Lower middle income countries	Upper middle income countries
R square	0.345612	0.583731	0.367786	0.488601
Constant term	1.005877	0.83375	0.62403	1.70416
Partial regression coefficient				
(a) Attain rate	0.00317*	0.01045**	0.00511	-0.02525*
(b) Emigration rate	0.00372	0.00656	0.06349	0.06656
(c) Unemployment rate	-0.06755	-0.09101	-0.01419**	0.06176
(d) Movement rate	0.04237*	0.03960*	0.02913*	0.02342*
R square (Adjustment)	0.22663	0.44497	0.18715	0.27720

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

Table 2. Statistics of Regressions in the comparison with economic growth and human capital

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

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

#### IV. CONCLUDING REMARKS

This paper has focused on how emigrant gives effect to economic development in emergent ones as sending countries from the viewpoint of the human capital. First, to explain the factor causing emigrants, the results of the regression analysis based on the relationships between the income and the migration have been shown as variable parameters of Table 1. These results proved that only in low income countries, movement and income have slight relationship. This suggests that average productivity of labors in less developed countries prevents from heightening their income, therefore the higher educated than average level tend to move to the country keeping higher wage level. Movement seeking for more money is likely to be common factor at all level countries including emergent countries. Our analysis shows that movement rate to developed country has the consistent correlation with income. However, movements by skilled workers seem to have no significant effect. In other words, these movements will not directly have a bad influence to the income level of sending countries, like the statement of empirical literature.

Based on the result of Table 2, we have stated that the relationship between economic growth and migrants human capital was clearly proved at all levels. Especially, Export rate of manufacturing shows the consistent correlation compared with attain rate of tertiary education as the quantitative human capital. This could be the evidence that the improved skill of labor at work could lead to the change such as technical revolution, on the other hand, schooling is not always the way to improve the productivity even in less developed countries. In addition, movement of skilled workers has negative effect to economic condition of their countries. And considering the result of Table 1, we can say that migrant have the

significant effect not to income at individual level but to economic growth at social level. As a 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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