

# Migration Perspective and their Effect for the Origin Countries

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**Abstract:** *This study examines the impact of migration perspective on the human capital formation of the origin countries. We use the literature review to identify the main consequence of the brain drain in the origin countries. In this paper we use both the static panel data approach with the fixed effect (FE) and the random effect (RE) and the dynamic panel approach with the GMM in system. So, the empirical results prove that the brain drain has a positive impact for the human capital formation in the origin countries.*

**Keywords:** Migration, Brain drain, Static model, System GMM method, the origin countries

**JEL classification** F. F22 F24

## 1. Introduction

The migration of skilled person is a multidimensional phenomenon which affects both the origin and the destination countries. These skilled immigrants are named by the 'agents of change' by Samet (2014). These educated people have more the potential to positively affect the economic growth of the developing countries. The mobility of skilled people has been triggered especially with the development of knowledge-based economies and with the globalization. This mobility increases especially with the development of the technology and with the innovation sectors (Haddar 2008), with the tightening of the selective policy of the host countries. These policies are in favor of the most educated persons (Péridy 2007). This increases the flow of the qualified people from the developed to the developing countries (El Mouhoud 2005). So, the first consequence of the international mobility is related to the flight of competences. The shift from international migration in general to a more specific thing, which is the migration of skilled people, reflects the importance of the brain drain phenomenon in the developing countries.

Several other authors prove conversely that migration affects positively the economic growth of the developing countries through several channels such as remittances sent by emigrants. These funds increase the volumes of domestic investments in the developing countries (Ben Mim 1995). However, other studies show that the emigration of qualified elites to study or to work brings a lot for the developing countries. This skilled workforce helps to catch up the technologically advanced countries via two key options which are the return option and the Diasporas option (Samet 2014; Brown 2004). For the source country the loss of human capital can turn into a beneficial leak with the presence of qualified Diasporas abroad (Kapur 2001).

In addition, migration today becomes a source of hope for the qualified people and even for the unskilled people. For this, some people opt to educate themselves more to increase their probability of going out. However, raising the educational levels is beneficial for the developing countries even without a certain probability of exit. In this case, migrations prospects may increase the stock of human

capital accumulated and may positively affect the economic growth of some developing countries (Mountford 1997). It therefore seems that Brain drain studies for the developing countries are controversial studies and require an in-depth econometric study to understand the effect of this brain drain on the developing countries. For this, in this section we will determine in the first section the extent of the brain drain in the developing countries. Then we will see the benefits and the costs of the brain drain and finally we will carry out a detailed empirical analysis to see the effect of this international mobility on the accumulation of human capital. We will finally finish this work with a conclusion and some political implications.

## 2. Literature Review

The migration of skilled workers known as the "Brain drain" means the movement of skilled individuals from one country to another. These qualified individuals possess higher levels of qualifications acquired either in the developing countries or abroad. The Brain drain in our study refers to the emigration of people with tertiary education levels such as mentioned by Docquier, Rapoport (2007), Rapoport (2004) and Defoort (2007). The phenomenon of the flight of competences is not a new phenomenon and goes back to the 1950s. The expatriation of the skills generates several aspects sometimes negative and sometimes positive according to the economic situation of the host and the origin country.

Thus, the theoretical literature presents three waves of migration. The first wave of migration dates back to the 1960s was treated by Grubel, Scott (1966). This period leads to the neutrality of the migratory movements because they consider them as a marginal phenomenon with no great importance or a consequence for the origin countries. The second pessimistic traditional wave is caused by Jagdish Bhagwati (1970). The latter has shown that the migration of elite is a curse for the developing countries as it's a huge tax loss for these countries. In other words, these qualified people are those who receive the highest salaries and contribute more to the public finances. Thus, to compensate for the loss of this skilled flight Bhagwati (1970) proposed to tax the most qualified even in the developed countries to

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take advantage of the taxes received by the source countries. Thus, a high level of Brain drain decreases the economic growth of the origin countries and increases the poverty and the inequality there.

However, the 1990s leads to the emergence of a new beneficial wave. This latter is developed by Mountford (1997), Defoort, Docquier (2010) and others. This optimistic wave treats the positive sides of the qualified elite migration as an incentive phenomenon to the human capital formation. This migration facilitates the access to the international markets and increases the remittances, the transfer of knowledge and facilitates the presence of network etc. However, today the major challenge of the developing countries is to bring some effective policies to make the 'Brain drain' a positive phenomenon. Thus, to achieve these goals; the migration must be a part of the national and international development strategy. This leads to the appearance of a beneficial brain drain named by the "Brain gain phenomenon" (Beine, Docquier and Rapoport 2001).

The brain gain appears with the accumulation of the human capital formation in the origin countries. For that, the lost of human capital can reduce the development gap between the rich and the poor countries. This economic disparity between countries is decreasing especially with the technological diffusion. This phenomenon becomes easy with the presence of a qualified workforce able to assimilate the modern technologies of the advanced countries in the source country (Keller 2004).

However, the new technologies implemented lead to the variations in the productive capacity. This causes the huge gap between the "South-North" countries in terms of per capita income. Thus, this economic disparity in the levels of development between countries drives a significant number of people to think about migration. For this reason, the majority of individuals are moving towards education to increase their likelihood of going out to participate to the development process of their countries (Mayda 2008).

Thus, the huge gap in the GDP per capita and in the level of productivity between countries implicitly reflect the difference in research and the development policies and the difference in the education systems between them (Okacha 2014).

This is also well justified by Lucas (1988) who states that human capital can be accumulated by investing in the education system and by improving the health care. All of these factors lead to an improvement in the productive capacities of people in the labor market.

Similarly, the wage differential between the origin and the destination countries encourages people to increase their educational attainment in order to migrate. This is well justified by Batista, Lacuesta, Vicente (2010) who found that the intention to increase education in Cape Verde is relative to the migratory option. In other words, people are educating themselves in order to increase their incomes and their probabilities of working in the international labor market because the qualification returns are higher outside. This result is also endorsed by Rapoport (2004) who showed that the expected income for the postgraduate individual is equal

to 5000 \$ in the source country while it is equal to 30,000 \$ in the United States. This drives qualified individuals to emigrate to seek the best opportunities of working abroad.

However, the majority of studies deal with the relationship between the migration perspectives and the accumulation of human capital in a theoretical way, such as the studies of Vidal (1998), Dos Santos (2006), Postel Vinay (2000), Beine et al (2001, 2003) and others. This is mainly due to the unavailability of new data on the phenomenon of brain drain. Which makes the phenomenon more complex in terms of analysis? Indeed, according to Docquier, Rapoport (2007) the qualification becomes the main key of migration to the OECD countries. Thus, the migration prospects of some skilled workers have two effects. The first effect named the "the brain drain effect" following the presence of qualified fleeing and a second effect called "the brain gain effect" that increases the incentive of the less qualified people to educate themselves more and to increase their educational returns (Docquier, Rapoport, 2011).

For this reason, the level of education is changing very rapidly in the poor countries, especially during the 1960-2000 periods (Docquier 2015). However, since the 1990s, the brain drain can be conceived as a beneficial effect for the departure countries under certain conditions. In this regard, Stark et al (1997) have shown that if the numbers of individuals urged to continue their studies are higher than the numbers of individuals emigrated then the brain drain would be beneficial in this case. From the study by Stark, et al (1997) the debate on the impact of brain drain on education levels is revived. In this case, we are talking about "Brain gain or Brain Banks" following the exit of qualified people (Kapur 2001).

In the same vein, Faini (2002) also uses the Carrington Detragiache's (1998) database to detect the possible link between the "Brain drain" and the school enrollment rate. In this study, Faini chooses two groups; those with a secondary level and those with a higher level. Thus, he has shown that the migration of individuals with tertiary education level doesn't have a positive effect on the secondary enrollment rate. In other words, the increase in the numbers of emigrants with higher levels of education doesn't encourage people with lower levels to educate themselves to increase their probability of going out. The incentive effect exists if and only if; the probability of admission in the host countries is final. Only in this context Faini (2002) speaks about the beneficial brain drain.

However, according to the study of Mountford (1997), the phenomenon of "Brain gain" exists when there is a low rate of emigration and a high rate in the schooling levels. This theoretical work of Mountford is continued by Beine - al studies (2001-2003) by using the database of Carrington Detragiache (1998) empirically. They used a method of equalizing the skilled emigration rate to the unskilled emigration rate to compare the present, the ex-ante and the ex-post stock of human capital. According to these two authors, a brain drain is beneficial if the migration encourages a large number of people to educate themselves more.

However, the probability of going out must not exceed a certain threshold to be beneficial for the origin country. These two authors found a positive effect of the migration perspective on the human capital formation in 127 developing countries during the 1990-2000 years and a positive effect on the economic growth of the developing countries. In the same vein, the study of Vidal (1998) has shown that the emigration of skilled workers has a positive impact on the economic growth of the developing countries. This positive effect comes mainly to increase the intention to invest in the human capital formation of the source countries. However, according to Docquier and Marfouk (2006), the probability of migration increased especially when the level of education is higher than 12 years. This probability depends on the selective policies of the OECD countries. These restrictive policies are based on the qualification of migrants. These qualifications tend to improve people's productivity and to increase their income in the national and international labor market. However, since skills returns are paid more externally by the majority of the OECD countries, people will be more likely to increase their educational levels in order to emigrate (OECD 2002).

Similarly, Defoort and Docquier (2006) confirm the results of Beine-al (2003) but this time using the database of Docquier and Marfouk (2006). Similarly, the econometric study of Boughzala Kouni (2009) for 53 low-income countries, 46 middle-income countries and 28 high-income countries also proves using the D & M database (2006) that the migration of the qualified individuals persons encourage individuals to educate more in order to emigrate. This will lead to increase the accumulated human capital in the developing countries. However, in order to emigrate, some individuals choose some fields of study which are in high demand abroad to meet the international demand and to increase their probability of exit. As a result, according to the International Organization for Migration (IOM 2003), 30% of physicians show that the choice of medicine is related to the strong international demand of the OECD member countries in this area.

In addition, according to Gibson, McKenzie (2011), students with a secondary level in some African countries such as Tonga, for example, has taken additional studies to reach the most popular disciplines internationally. According to these two authors, the emigration rate of the skilled persons has significant effects on the human capital formation of the African countries. Similarly, the US need for a skilled workforce in some fields like the technology and information (IT). These specialties increase the numbers of individuals opting for this field of study simply to increase their chances of emigrating (Docquier, Rapoport, 2007). The job offers abroad push a large number of people to educate themselves more in order to increase their probability of migration and to increase their salary level which increases with the qualification. In this respect, the high income received by the Indian doctors when they immigrate to Britain has a major incentive effect on the training of doctors in India (Docquier and Rapoport, 2004).

Certainly, some poor economies can't afford the costs of education or can't invest in education to increase their

chances of emigrating (Ba 2012). However, following the approach of Docquier and Beine (2003), the problem of liquidity is binding in the origin countries especially when individuals want to educate themselves in order to emigrate. This financial obstacle can be solved through remittances sent by ex-expatriates to their native countries. The latter is an external means of financing used to overcome the financial problems.

In the same vein, Contreras (2013) also proves that the phenomenon of "Brain gain" appears in the source country through the accumulation of human capital and the probability of migration increases with the rising in the educational level.

### 3. Econometric Method and Data

#### Model specification

The literature review suggests a relationship between the brain drain and the human capital formation in the origin countries.

$$\Delta CH(10 - 80) = \ln(H_{moy10}) - \ln(H_{moy80}) \quad (1.1)$$

$$L(H_{moy10})_{it} = c_0 + c_1 L(H_{moy80})_{it} + c_2 L(MP_{80})_{it} + c_3 L(GDP_{80})_{it} + c_4 L(MS)_{it} + c_5 L(pop-D_{80})_{it} + c_7 L(RM_{80})_{it} + \epsilon_{it} \quad (1.2)$$

Where  $c_0$  is the individual specific effects,  $H_{moy10}$  is the human capital accumulated in 2010; it can be approximated by the percentage of individual aged 25 years and over,  $PM$  is the migratory perspective index approximated by the rates of skilled emigrants over 25 years with tertiary education levels,  $GDP$  is the GDP per capita,  $MS$ ; indicates on the migratory stock of a given country at a given time. Plus there are emigrants abroad plus people are encouraged to study more in order to increase their migratory probability's,  $pop-D$ ; is the population density as a proxy for the educational costs.  $RM$  represents the level of remittances as a percentage of GDP in current \$ of 2010. This variable is used to overcome the financial obstacles and to reduce the educational costs and  $\epsilon$  represents the error term.

#### Data Sources

According to the data of D & M (2006), there are around 20 million skilled people with tertiary education levels living in the OECD countries. This huge number will push us to detect the effect of the migration perspective on the process of human capital accumulation in 86 developing countries the most affected by the brain drain phenomenon. These countries are divided into four groups: the MENA countries, the Sub-Saharan African countries, the Latin American countries and the India. The majority of data are extracted from the World Development Indicator.

#### Estimation Procedure

In this study we use two panel techniques based on the static and the dynamic model to estimate the relationship between the migration perspective and the human capital formation in the origin countries from 1980 to 2010 by using the STATA 11 econometric software. The evaluation of the results obtained with the (FE, RE, and S-GMM) helps to identify the problems that bias the quality of our estimates. Also, the three specifications help us also to select the technique of



estimation which is consistent with the structure of our data in order to confirm the robustness of our results.

#### 4. Results and Discussions

To examine the relationship between the migration perspective and the human capital formation we will estimate our model by integrating the migration of skilled individual with a tertiary education level. To detect the relationship between the two variables we use the fixed effects models (FE) and the random effects models (RE). The choice between the two models is made with the Hausman test.

In other world, this econometric analysis is used to see the effect of Brain drain on the stock of the human capital accumulated. In other words, to see if the phenomenon of "Brain drain" can turn into "Brain gain" in this group the most affected by the brain drain phenomenon. In all these specification we see that the probabilities of the hausman tests are inferior to the 5%. This means that the fixed effects are more relevant in these various models. So the fixed effect models are preferable to the random effect models.

**Table 1:** Data description and Source

Variables	Definitions of variables	Sources
H <sub>moy10</sub>	The human capital accumulated in 2010; it can be approximated by the percentage of individual aged 25 years and over. So, we use this indicator based on the three levels, the primary, the secondary and the tertiary levels	Barro Lee (2016)
MP	The migratory perspective index is the migratory perspective index approximated by the rates of skilled emigrants over 25 years with tertiary education levels	OECD (RNM)
GDP	The GDP per capita used to understand the difference in wages between countries	WDI
Pop-D	The population density as a proxy for the educational costs. This variable implicitly indicates on the public spending on education	WDI
MS	The migratory stock indicates on the previous migrations	WDI
RM	the level of remittances as a percentage of GDP in current \$ of 2010	WDI

According to the result of the table 2 we find that the GDP per capita of the source country has a positive and statistically significant effect at the 1% threshold on the human capital formation of the developing countries. When the salary level increases, people will be more able to pay the registration fees and the fees of education. The higher the earnings, the more people in the source country spend a significant part of their budget on the schooling of their children and therefore the more the qualification of individuals increases over time. Thus, the high wage has a positive impact on the human capital formation of the developing countries.

In addition, the family resources increases especially if there is at least one member abroad. The funds repatriated by these emigrants support some families to overcome their credit constraints in the source country. These transferred funds can be an external source of income and can help the families of emigrants to continue their education by

increasing the expenditure on education. There is therefore a beneficial distribution of gain between the altruistic migrants and his family. For this reasons, the migration stocks has a positive sign in our model. This means that as the numbers of Diasporas abroad increase, the level of training in the source countries increase also. This migratory stock indicates on the social capital already installed abroad. These Diasporas facilitate the migration of the others by promoting the necessary information on some job offered and some conditions of working abroad. These Diasporas even guide the choice of individuals in certain fields of study required in the developed countries. For this reason, the human capital formation in the developing countries has improved with the Diaspora option in order to increase their chances of going abroad (Kapur, 2001).

In addition, it's obvious from this econometric study that the migratory perspective variable (approximated by the flight of qualified persons with higher education levels) is positive and statistically significant at the 1% level. This means that the migration of skilled people has a positive effect on the educational attainment in the areas the most affected by the migration phenomenon. In other words, people opt to educate themselves more to increase their probability of emigrating. So, people (ex-ante) educate themselves more in order to increase their possibility of migration which becomes easy thanks to the Diasporas already installed abroad. It's clear therefore that the flight of the qualified can turn into a beneficial escape or what is called by ' the Brain gain' in the source countries.

**Table 2:** Results of the fixed effects estimation of the dependent variable in our sample

Dependent Variable	Column The Fixed Effect
Log the Migration Perspectives (MP)	<b>0,0639***</b> (4,52)
Log the Migration stocks(MS)	<b>0,0217***</b> (3,00)
Log the Remittance(RM)	-0,00064 (-0,77)
Log the GDP per capita (GDP)	<b>0,15804***</b> (12,50)
Log the Population Density (pop-D)	<b>0,04425***</b> (3,51)
Constant	<b>2,3033***</b> (18,21)
Observations	602
Numbers of countries	86

The values in parenthesis are t-Student. \*\*\*Significance at 1%, \*\*significance at 5% and \*significance at 10%.

#### 5. Results of the Dynamic Panel Estimations

The results of the GMM in system regression are presented in the table 3. The effectiveness of the GMM estimates is based on the validation of two hypotheses namely the validity of instruments and the absence of autocorrelation of the errors. So, to test the validity of the instruments we will do the two following tests: the Hansen / Sargen test and the first order and the second order autocorrelation test. So, the following table represents the results of the dynamic models estimates (the GMM models in system) for 4 groups of countries the mostly affected by the brain drain

phenomenon. According to these results, we can conclude that both the Hansen and Arellano and Bond tests in second difference about the autocorrelation errors don't reject the validity of the lagged variables in difference as an instrument as well as the hypothesis of the absence of the error autocorrelation in the various studied. According to our results we find that one period lagged value of migration has a positive and significant effect on human capital formation in our model.

Otherwise, the results associated with the GMM approach confirms the theoretical hypothesis which validate that the migration of the skilled persons has a positive impact on the human capital formation of the origin countries. In fact the result shows that according to this econometric study, it is obvious that the migratory perspective variable (approximated by the flight of qualified persons with higher levels of education) is positive and statistically significant at the 5% level using the Generalized Method of Moments (GMM) in system. This means that the migration of skilled people has a positive effect on the educational attainment in some areas the mostly affected by the migration phenomenon. In other words, people opt to educate themselves more to increase their likelihood of emigrating. So, people (ex-ante) educate themselves more in order to increase their possibility of migration which becomes easy with the Diasporas already installed abroad. It's clear therefore that the flight of the qualified can turn into a beneficial escape or what is called 'the Brain gain phenomenon' in the source countries.

Admittedly, in our model the transfers of fund have a negative signs in the table 3.

So, the effect of remittances on the level of human capital formation is rejected at 1% significance. This means that remittances don't help to improve the level of education in these areas. This can be explained by two main reasons: the first reason is that the funds received are unproductive and are not devoted to improve the levels of training in the developing countries. They are used to increase the other household resources such as some consumer spending and some housing expenditures in the developing countries. Second, the absence of one of two parents can disrupt the social relationships in the family. These social disturbances have a negative impact on the average level of education in the developing countries. This result is also approved by McKenzie and Rapoport (2006) who have shown that the international migration has a negative effect on the educational attainment following a survey of the Mexican households. According to these two authors, the migratory perspective in Mexico increases only the future migration of children and subsequently decreases the incentive to invest in education. This negative effect is related to the emigration of one of the two parents. In addition, these transferred funds don't affect the level of education, especially in the poor and in the rural areas. These areas need this liquidity to overcome their problems of consumption as a first step rather than the schooling fees. So, the negative effects of brain drain are not solved by remittances. This result is also approved by the study of Faini (2002).

Next to the migratory stock variable, it's clear from this econometric study that the migratory perspective variable (approximated by the flight of qualified persons with higher levels of education) is positive and statistically significant at the 5% levels according to the Generalized Method of Moments (GMM). This determining variable drives many individuals to continue their studies. This means that the migration of skilled people has a positive effect on the educational attainment in some areas the mostly affected by the migration phenomenon. In other words, people opt to educate themselves more to increase their likelihood of emigrating. So, in this case the brain drain can turned into brain gain in the origin countries.

**Table 3:** Results of the regression with the dynamic panel data about Brain drain and brain gain

Dependent Variable	Column The Fixed Effect
Log the Human capital (-1)	<b>0,7766***</b> (44,55)
Log the Migration Perspectives (MP)	<b>0,0105**</b> (1,85)
Log the Migration stocks(MS)	<b>0,0017</b> (0,35)
Log the Remittance(RM)	<b>-0,00049***</b> (-3,63)
Log the GDP per capita (GDP)	<b>0,0357***</b> (0,02)
Log the Population Density (pop-D)	-0,0053 (-1,39)
Constant	<b>0, 6857***</b> (8,31)
Observations	516
No of countries	86
Sargan /Hansen test	27.65
Sargan /Hansen : p value	0.118
AR(1) : p value <sup>a</sup>	0,05
AR(2) : p value <sup>b</sup>	0,07

The values in parenthesis are t-Student. \*\*\*Significance at 1%, \*\*significance at 5%, and \*significance at 10

<sup>a</sup> the values reported in the table are the p values of the Hansen test.

<sup>b</sup> the values reported in the table are the p values of the Arellano and Bond AR (2) test.

## 6. Conclusions and Implications

To conclude, we can say that this paper focuses mainly to verify the robustness of the hypothesis cited in the previous theoretical studies on the existence of a beneficial brain drain in the developing countries. In other words to verify if the emigration of skilled people has a positive impact on the human capital formation of some developing countries.

To do this study we use two models, the Fixed Effect models and the GMM in system to control the endogeneity problems while integrating in our model the delayed variable of a single period. In fact, the result of the GMM system approach gives us the better result compared to the static model.

The main opportunity for the developing countries in general lies to the integration of the global knowledge market. This opportunity requires a level of qualification developed enough to increase the chance of leaving in the developing countries. The migratory perspective pushes individuals to educate themselves more in order to emigrate. This accumulated human capital is beneficial for the departure countries even without a final decision of departure.

Indeed, the exploration of the empirical data allows us to find a positive and statistically significant effect of the emigration of the qualified people on the average level of human capital in the developing countries. In other words, the migratory prospects push a large number of emigrants to continue their primary, secondary and tertiary studies in order to increase their possibility of going abroad. This migratory probability increases with the qualification because the migration policies of the developed countries condition the presence of the well-defined competences to enter their territories.

In addition, the rising in the educational attainment among individuals is beneficial for the source countries even if the probability of exit is not certain. The rising in the educational level positively affects the wage levels because according to Defoort (2007) the remuneration increases with the qualification which is more favorable in the developed countries. Thus, the increase in wages reduces the problem of liquidity which is binding in the source countries and pushes a large number of people to educate themselves in order to emigrate. Education is therefore a necessary condition to increase the migratory process.

## Appendix A

### List of Countries

- *The MENA countries:* Algeria, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Libya, Lebanon, Morocco, Palestine, Tunisia, Turkey, Syria, Mauritania, Yemen
- *The Sub-Saharan African countries:* Benin, Burkina Faso, Cameroon, Cape Verde, Chile, Cote d'Ivoire, Gabon, Ghana, Madagascar, Mali, Malta, Namibia, Nigeria, Sudan, Zambia, Comoros, Kenya, Mauritius, Burundi, Central Africa, Democratic Congo, Guinea, Lesotho, Malawi, Niger, Botswana, Congo Republic, Mali, Gambia, Liberia, Mozambique, South Africa, Rwanda, Senegal, Sudan, Swaziland, Mauritius, Sierra Leone, Zimbabwe, Togo, Uganda, Tanzania, Ghana, Chad
- *The North American countries:* Haiti, Mexico, Panama, Peru, Paraguay, Venezuela, Uruguay, Jamaica, Honduras, El Salvador, Dominican Republic, Dominica, Cuba, Equator, Costa Rica, Brazil, Bolivia, Barbados, Belize, Argentina, Chile, Colombia, Nicaragua, Trinidad Tobago, Guatemala, Guyana.
- India

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