

The Plight of Human Capital Flight in OIC Countries



OIC Outlook Series
December 2014



ORGANISATION OF ISLAMIC COOPERATION
STATISTICAL, ECONOMIC AND SOCIAL RESEARCH AND TRAINING
CENTRE FOR ISLAMIC COUNTRIES

OIC Outlook Series

The Plight of Human Capital Flight
in OIC Countries

December 2014



SESRIC

Kudüs Cad. No: 9, Diplomatik Site, 06450 ORAN, Ankara, Turkey

Tel: +90-312-468 6172 (4 Lines) Fax: +90-312-467 3458

E-mail: oicankara@sesric.org Web: www.sesric.org

OIC OUTLOOK REPORT

The Plight of Human Capital Flight in OIC Countries

The objective of this report is to shed light on the plight of human capital flight or what is known as brain drain in OIC countries and determine its drivers. This report develops a data set containing brain drain rates and skill gap ratios (a measure of the relative skill level of emigrants compared to residents) for all 57 OIC countries and then utilizes descriptive statistics to explore the role that a country's income level, development level, population size and geographic location play in shaping brain drain rates and skill gap ratios. Furthermore, this report investigates correlations between the brain drain phenomenon and the socio-economic indicators of human capital accumulation, equality, R&D expenditure, state of health services and urbanization. The analysis reveals that brain drain rates are shaped by income level and geographic location while development level and population size bear no effect on shaping brain drain rates. Skilled gap ratios on the other hand are shaped by income level, development level and geographic location but not by population size. The correlation analysis shows that there is correlation between skill gap ratios and the socio-economic indicators of human capital accumulation, state of health services and urbanization while there is no statistical evidence to support the claim that there is any correlation between brain drain rates and the social-economic indicators of equality and R&D expenditure. The report concludes with policy recommendations to confront the brain drain problem in OIC countries.

Contents

Introduction

Data & Calculations

Analysis

Conclusion & Policy Recommendations

1. Introduction

OIC countries face multiple challenges in achieving their development goals and reducing the gap with developed countries; one of the main challenges is the plight of human capital flight or what is known as brain drain. Brain drain serves to divest OIC countries from one of their most important resources which is skilled human capital.

The mechanism by which brain drain prevents a country from achieving its development goals can be explained by the vicious cycle concept. De la Croix & Docquier (2012) point out that if real wages in the home country are low compared to the real wages abroad, then this provides impetus for highly skilled people to emigrate. Based on this we can describe the vicious cycle as follows: the development level in OIC countries is lower than developed countries; therefore, wages earned by skilled workers in OIC countries are less than the wages they can earn in developed countries thus driving many skilled workers to emigrate. The loss of skilled workers hinders the development and productivity of OIC countries thus exerting downward pressure on wages which in turn leads to more emigration of skilled workers and so on. The vicious cycle just described is not a pure intuitional one, but one that is supported by the work of Bénassy & Brezis (2013) who linked development traps to brain drain.

In recent times, brain drain has been exacerbated by globalization which has increased people mobility across country boundaries (see Iredale, 2001; Shenkar, 2001; Stalker, 2000). Furthermore, the internationalization of professions and professional labor market has led to an increase in the level of mobility and thus brain drain as documented in the works of Carr et al. (2005) and Iredale (2001)

The negative effects of brain drain are not limited to the economic sphere but extend to influence education and human capital accumulation as shown by Wong & Yip (1999). Moreover, the current trend towards predominantly skilled emigration from poor to rich countries may in the long run increase inequality and negatively affect income distribution at regional and global levels as demonstrated by Wong & Yip (1999) and Mountford & Rapoport (2013).

Cervantes & Guellec (2002) argue that brain drain reflects a loss of national investment in training because while being educated in their countries, skilled workers eventually work to the benefit of the recipient society which has not borne the cost of their training. The United Nations Commission for Trade and Development (UNCTAD) has attempted to estimate the economic loss of a single skilled emigrant origination from Africa taking into account the lost returns from the investment made in educating a doctor or an engineer, plus the amount that the expenditure on this training would have earned if it were invested in financial markets and the potential lost revenue from taxes that would have been paid by the emigrants were they had stayed in the country. UNCTAD estimated the economic loss for each professional emigrant originating from Africa at US\$184,000 (Pang et al., 2002)

Numerous articles, on the other hand, claim that brain drain has positive effects on sending countries such as: Commander et al. (2004), Docquier & Rapoport (2012), Gibson & McKenzie (2011), Mountford (1997), Stark (2004) and Beine et al. (2008). Part of the literature that claims that brain drain has positive effects or

what is termed “brain gain” on sending countries build those claims on the premises that brain drain is accompanied by remittance to the sending country that serves as a boost to the economy. The other part of the above mentioned literature claim positive effects such as: increased trade as a result of diaspora activities, expertise and know how brought by returning emigrants, and a positive effect on human capital accumulation due to people striving to achieve high educational levels and professionalism with the hope of emigrating. The above literature about brain gain can be described best as being theoretical, based on static partial equilibrium analysis or anecdotal. On the issue of remittance, Faini (2006) draws our attention to the fact that skilled emigrants families are likely to be well off in their home countries and thus do not need the financial support of the emigrant abroad. In addition, skilled workers are less likely to remit as they tend to be accompanied by their families and plan to stay longer in the destination country. As for the expertise and know how brought by returning emigrants, Ha (2009) suggests that those returning are the ones who were unsuccessful while abroad whereas the best and successful emigrants tend to stay. The claim that brain drain has positive benefits due to increased trade as a result of diaspora activity is refuted by surveys such as the one that found that less than 5% of skilled migrants from Tonga, Micronesia and Ghana have ever helped a company from their home country in a trade deal, and when they have, the values of these deals have been modest (Hadaś & Lang, 2014)

The factors behind brain drain can be explained by the “push-pull” model developed by Lewin (1951). This model has clear relevance for cross border movement (Baruch, 1995). In order to better understand the factors behind brain drain we propose extending this model to including facilitating factors, thus the extended model to explain the factors behind brain drain becomes the “push-pull-facilitation” model. Pull factors include: higher income, better working conditions, better employment prospects, higher living standards, intellectual freedom, political stability, better research facilities and funding for research. Push factors include: low wages, unemployment and underemployment, weak research facilities and funding for research, political instability, poor governance, lack of freedom, poor working conditions, and discrimination in appointments, corruption, and poverty. Facilitation factors include: globalization, internationalizations of professions and professional markets, availability of and easy access to information about employment opportunities abroad, and easy access to cheap communications.

Taking into account the affect brain drain has on hindering OIC countries from achieving their development goals, OIC countries must be ready to address the major challenges raised by brain drain, and as such, investigating the drivers behind brain drain becomes paramount. The objective of this report is to shed light on the phenomenon of brain drain in OIC countries by determining its drivers and to provide policy recommendations for confronting the brain drain problem in OIC countries.

2. Data & Calculations

OIC countries face multiple challenges in achieving their development goals and reducing the gap with developed countries; one of the main challenges is the plight of human capital flight or what is known as brain drain. Brain drain serves to divest OIC countries from one of their most important resource which is skilled human capital. In this report we build our data set for international migration originating from all

57 OIC countries by skill level in the year 2000 based on the estimates provided by Docquier & Marfouk (2006). Their method consists of collecting census and register data on the structure of immigration in all OECD countries. In a first step, aggregating these data allows to evaluate the stock of emigrants from all developing countries to the OECD area by level of schooling. In a second step, the number of migrants is compared to that of natives from the sending country belonging to the same education group. This comparison gives relative measures of emigration, henceforth labeled as "emigration rates" by educational attainment for 2000 (Docquier et al., 2007). Our data set for international emigration originating from all 57 OIC countries grouped under different categories is given in Table 1.

Table 1: Data Set for Emigration Originating from OIC Countries by Skill Level –Thousands (Year 2000)

		Unskilled resident	Skilled resident	Unskilled emigrants	Skilled emigrants
Country Group	OIC Countries	507,799	31,403	6,439	2,515
	Other Developing Countries	1,861,037	126,341	18,533	9,996
	Developed Countries	456,346	196,525	12,069	7,818
	World	2,825,436	354,282	37,047	20,332
OIC by Income Group*	Low Income OIC Countries	102,470	2,806	468	253
	Lower Middle Income OIC	282,120	15,699	2,222	1,121
	Upper Middle Income OIC	110,733	11,076	3,731	1,105
	High Income OIC Countries	12,477	1,821	19	35
OIC by Development	OIC Least Developed Countries	123,458	2,883	587	294
	OIC other than Least Developed	384,341	28,520	5,853	2,220
OIC by Population Size***	OIC Small Population Countries	46,731	4,440	1,366	576
	OIC Medium Population	133,970	9,396	2,059	696
	OIC Large Population Countries	180,701	17,567	3,425	1,242
OIC by Geographic Location	East & South Asia OIC Countries	223,394	9,565	955	615
	Europe & Central Asia OIC	56,632	8,187	2,185	278
	GCC ¹ OIC Countries	10,627	1,565	16	30
	MENA ² other than GCC OIC	108,246	9,675	2,496	1,105
	Sub Saharan OIC Countries	108,368	2,379	485	337
	Latin America OIC Countries	532	32	452	150

* World Bank Classification ** UN Classification *** Small population <10 million, Larger population >40 million

¹ Gulf Cooperation Council

² Middle East & North Africa

In Table 1 workforce is defined as the population who are of working age (25 and above), emigrants as OIC born individuals living in an OECD country, residents as OIC born individuals living in their home country, skilled workforce as those with post-secondary education and unskilled workforce as those who possess less than post-secondary education.

Using the developed data set for international emigration originating from OIC Countries by Skill Level that is shown in Table 1, we perform the following calculations: Defining R_i^s as the number of residents of working age in country i with skill level s , and defining E_i^s as the number of emigrants of working age originating from country i with skill level s , where s has two level which are: h for high skilled and l for low skilled, then the percentage of skilled among residents RS_i can be computed as:

$$RS_i = \frac{R_i^h}{\sum_s R_i^s} = \frac{R_i^h}{R_i^h + R_i^l} \quad (1)$$

The percentage of skilled among emigrants ES_i is given as follows:

$$ES_i = \frac{E_i^h}{\sum_s E_i^s} = \frac{E_i^h}{E_i^h + E_i^l} \quad (2)$$

The emigration rate of the total workforce ER_i is determined by the following equation:

$$ER_i = \frac{\sum_s E_i^s}{\sum_s E_i^s + \sum_s R_i^s} = \frac{E_i^h + E_i^l}{E_i^h + E_i^l + R_i^h + R_i^l} \quad (3)$$

Brain drain which is the emigration rate of skilled workers is calculated based on the following equation:

$$Brain\ Drain\ Rate = \frac{E_i^h}{E_i^h + R_i^h} \quad (4)$$

In OIC countries the skill level of emigrants is higher than the skill level of residents, thus we are interested in measuring the relative gap between the skill level of emigrants compared to residents. We shall call this relative gap “skill gap ratio”. In an ideal situation the skill level of emigrants is identical to that of residents and thus in this ideal situation the skill gap ratio is equal to one. Of course this ideal situation does not hold true for OIC countries in general and a higher value of skill gap ratio indicates a higher gap in skill levels between emigrants and residents. The skill gap ratio is given by the following equation:

$$Skill\ Gap\ Ratio = \frac{ES_i}{RS_i} \quad (5)$$

Calculations based on the above equations are summarized in Tables 2 to 6.

3. Analysis

3.1 Analysis Description

This report attempts to explore the driving factors behind the brain drain phenomenon in OIC countries. This report also investigates the correlation between the brain drain phenomenon in OIC countries and a number of socio-economic indicators. First, descriptive statics are used to compare the brain drain phenomenon in OIC countries with that in developed countries, other developing countries and the world as a whole. Second, by zooming in on OIC countries descriptive statistics are again utilized to explore whether factors such as income level, development level, population size and geographic location play a role in shaping brain drain rates and skill gap ratios in OIC countries. Finally, correlations are investigated between the brain drain phenomenon in OIC countries on one hand and human capital accumulation, state of health services, urbanization, and equality and R&D expenditure on the other hand.

3.2 Brain Drain in OIC vs. other Country Groups

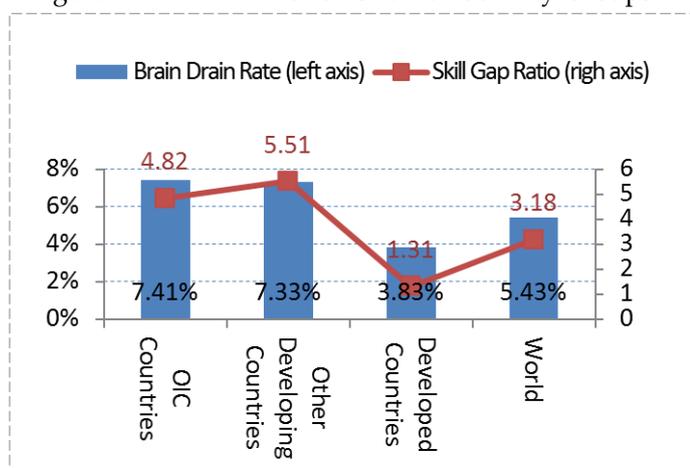
In OIC countries the emigration rate of skilled workers (brain drain) is 7.41% while the total emigration rate of workers (skilled and non-skilled) is 1.63% as shown in Table 2. This indicates that skilled workers are more than 4.4 times likely to emigrate than non-skilled workers

Table 2: Drain Brain OIC vs. other Country Groups

	% of skilled residents	% of skilled emigrants	Emigration rate	Brain drain rate	Skill gap ratio
OIC Countries	5.82%	28.08%	1.63%	7.41%	4.82
Other Developing Countries	6.63%	35.04%	1.42%	7.33%	5.51
Developed Countries	30.10%	39.31%	2.96%	3.83%	1.31
World	11.14%	35.43%	1.77%	5.43%	3.18

The percentage of skilled among emigrants is 28.08% while the percentage of skilled among residents is 5.82%. This results in a skill gap ratio of 4.82. The brain drain rate and skill gap ratio in OIC countries are considerably higher than those observed in developed countries and the world as illustrated in Figure 1. When comparing OIC countries with developing countries, it is observed that the brain drain rate is slightly higher and skill gap ratio is slightly lower in OIC countries.

Figure 1: Brain Drain OIC vs. Other Country Groups



3.3 Brain Drain in OIC Countries by Income Level

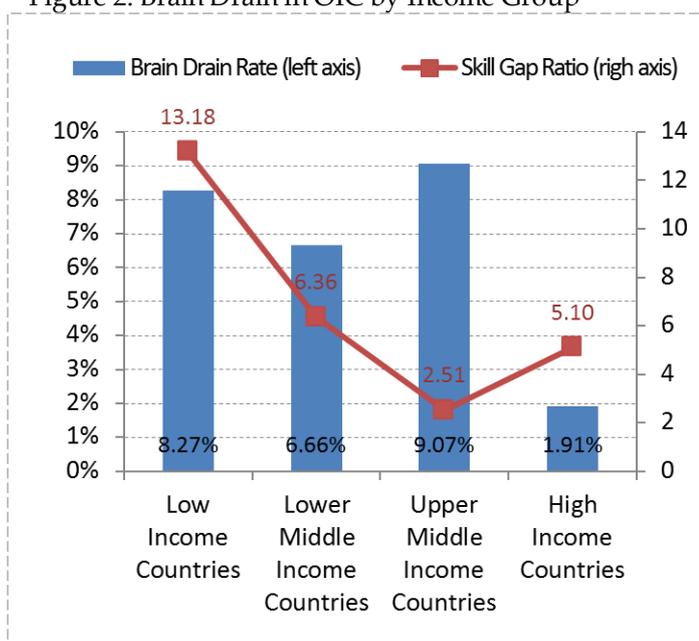
OIC countries are grouped into 4 sub-groups according to their income level which are: low income, lower middle income, upper middle income, and high income. This grouping is in accordance with the World Bank classification which is based economies based on estimates of gross national income (GNI) per capita. The results of the calculations presented in Section 2 are shown in Table 3.

Table3: Brain Drain in OIC Countries by Income Group

	% of skilled residents	% of skilled emigrants	Emigration rate	Brain drain	Skill gap ratio
Low Income Countries	2.67%	35.12%	0.68%	8.27%	13.18
Lower Middle Income	5.27%	33.53%	1.11%	6.66%	6.36
Upper Middle Income	9.09%	22.85%	3.82%	9.07%	2.51
High Income Countries	12.74%	64.97%	0.38%	1.91%	5.10

Figure 2 signifies that the level of income of OIC countries plays a role in shaping both brain drain rates and the skill gap ratios. Brain drain rate is lowest with a value of 1.91% in high income OIC countries, with countries such as Oman logging a brain drain rate as low as 0.37%, United Arab Emirates 0.74% and Saudi Arabia 0.93%. This result implies that push factors in high income OIC countries are minimal while pull factors have little appeal. The highest level of brain drain is observed in upper middle income OIC countries with a value of 9.07% followed by low income OIC countries (8.27%). The skill gap ratio in low income OIC countries is significantly higher than the rest of OIC

Figure 2: Brain Drain in OIC by Income Group



countries as shown in Figure 2. This highlights the devastating impact that brain drain has on low income OIC countries where the percentage of skilled among emigrants is more than 13 times that of residents. The lowest skill gap ratio is observed in the upper middle income OIC countries who registered a low skill gap ratio of 2.51. The low skill gap ratio in the upper middle income OIC countries can be explained by the strides these OIC countries have made in the educational field which has resulted in a better educated and skilled workforce in general. The interesting relationship between the skill gap ratio and human capital accumulation will be explored in detail in section 3.7.

3.4 Brain Drain in OIC by Development Level

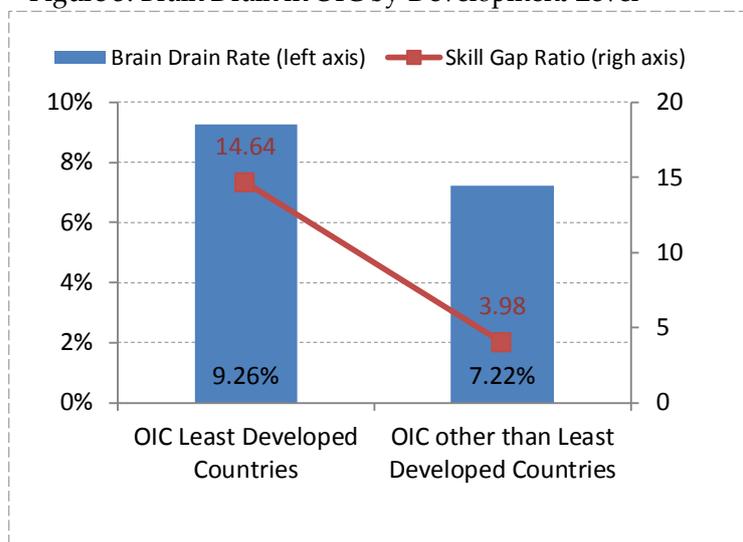
The UN list of least developed countries (UNCTAD, 2014) is used to identify OIC countries that are among the least developed. The results of the calculations presented in Section 2 are shown in Table 4.

Table 4: Brain Drain in OIC Countries by Development Level

	% of skilled residents	% of skilled emigrants	Emigration rate	Brain drain rate	Skill gap ratio
Least Developed Countries	2.28%	33.40%	0.69%	9.26%	14.64
Other than least developed countries	6.91%	27.50%	1.92%	7.22%	3.98

Brain drain in the least developed OIC countries is 9.26% while in OIC countries not classified as least developed the brain drain rate is 7.22%. The difference between these brain drain rates is not large, thus giving rise to suspicion that this difference does not hold any statistical significance. To test whether the difference is significant in brain drain rates between the least developed OIC countries and OIC countries not classified as least developed; advanced technical techniques are utilized. The result of these

Figure 3: Brain Drain in OIC by Development Level



advanced statistical techniques³ reveal that there is no statistical significance in the difference between the brain drain rate in the least developed OIC countries and brain drain rate in OIC countries not classified as least developed. In other words, OIC countries are suffering from the same level of brain drain regardless of development level. In contrast, the skill gap ratio in the least developed OIC countries is much higher than that observed in OIC countries not classified as least developed. The skill gap ratio in the least developed OIC countries is 14.64 while in OIC countries not classified as least developed the skill gap ratio is 3.98 as shown in Figure 3. This puts into perspective the plight of brain drain especially in the least developed OIC countries where the percentage of skilled among emigrants is almost 15 times higher than that observed in the resident population. This result also

³ Analysis of Variance, Welch’s Test. Equal variances were not assumed for the analysis. $\alpha = 0.05$. F-value = 1.83 and P-value = 0.18

proves we were justified in developing the skill gap ratio and not limiting ourselves to just looking at brain drain rates

3.5 Brain Drain in OIC by Population Size

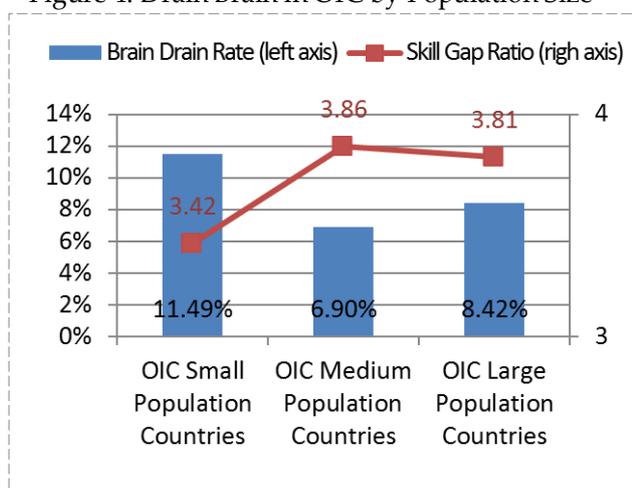
The population data in year 2000 for OIC countries are obtained from the UN World Population Prospects: The 2012 Revision (UN, 2012). OIC countries are grouped into three categories according to their population size. Small size population countries are countries with a population less than ten million whereas large size population countries are countries with a population exceeding forty million. The results of the calculations presented in Section 2 are shown in Table 5.

Table 5: Brain Drain in OIC Countries by Population Size

	% of skilled residents	% of skilled Emigrants	emigration rate	Brain drain rate	Skill gap ratio
Small Population Countries	8.68%	29.66%	3.66%	11.49%	3.42
Medium Population Countries	6.55%	25.27%	1.89%	6.90%	3.86
Large Population Countries	5.10%	29.19%	1.22%	6.60%	5.73

The brain drain rate in large population OIC countries is slightly more than one and a half percentage point higher than medium population OIC countries and is lower by almost three percentage points than small population OIC countries (see Figure 4). These differences in brain drain rates are not large and give rise to suspicion that these differences do not hold any statistical significance. To test whether the differences in brain drain rates across different population sizes are significant; advanced technical techniques are utilized. The result of these advanced statistical techniques⁴

Figure 4: Drain Brain in OIC by Population Size



reveal that there is no statistical significance in the difference between the brain drain rates across different population sizes in OIC countries. To rephrase, the population size in the OIC does not seem to play a role in shaping brain drain rates. This is a rather surprising finding as it is well documented in the literature that small size population countries suffer from higher brain drain rates (see for example Docquier et al., 2007). The reason behind this result can be explained by the fact that some of the small population OIC countries are well off economically and do not experience high brain drain

⁴ Analysis of Variance, Welch’s Test. Equal variances were not assumed for the analysis. $\alpha = 0.05$. F-value = 2.78 and P-value = 0.08. Repeating the analysis by redefining small population size as less than 5 million or 3 million does not change the results of the analysis.

rates. For example the brain drain rate for Qatar is 2.05% for Maldives 1.22% for Oman 0.37% for Turkmenistan 0.38% and for United Arab Emirates 0.74%.

The skill gap ratio is 3.42 in small population OIC countries, 3.86 in medium population OIC countries and 3.81 in large population OIC countries. These results are comparable to each other indicating that population size does not have an effect on skill gap ratios.

3.6 Brain Drain in OIC by Geographic Location

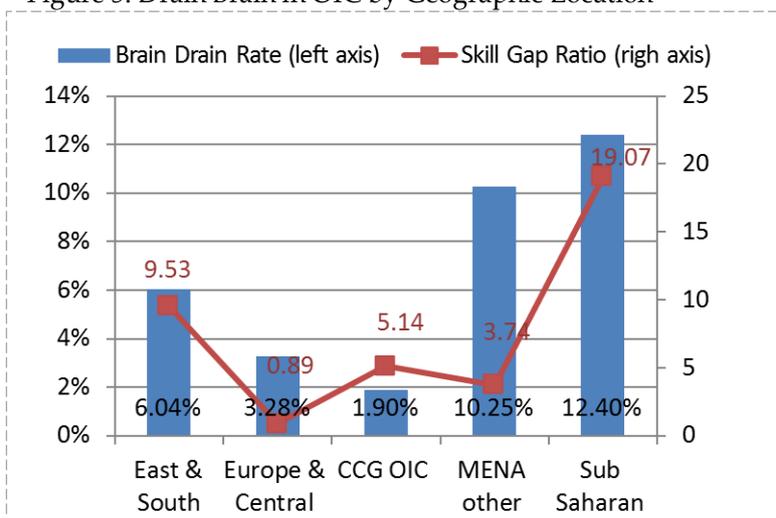
The results of the calculations presented in section two are summarized in Table 6. The highest observed brain drain rates are in the two OIC member countries located in Latin America (Guyana and Suriname) with an astronomically high value of 82.55%.

Table 6: Brain Drain by Geographic Location

	% of skilled among residents	% of skilled among Emigrants	Total emigration rate	Brain drain rate	Skill gap ratio
East Asia Countries	5.27%	40.79%	0.54%	4.07%	7.74
South Asia Countries	2.97%	38.05%	0.79%	9.26%	12.8
Europe & Central Asia	12.63%	11.28%	3.66%	3.28%	0.89
GCC Countries	10.92%	22.63%	1.81%	3.68%	2.07
MENA other than GCC	8.3%	31.92%	2.86%	10.18%	3.85
Sub Saharan Countries	2.15%	40.97%	0.74%	12.40%	19.07
Latin America Countries	5.63%	33.19%	44.52%	82.55%	5.89

To better visualize the brain drain phenomenon in OIC by geographic location Figure 5 in drawn without the two OIC countries located in Latin America. As Figure 5 illustrates brain drain rates are higher in OIC countries located in Sub Saharan Africa (12.40%) and in the Middle East and North Africa (MENA) countries excluding Gulf Cooperation Council (GCC) member countries (10.25%). The brain drain rate exceeds an

Figure 5: Drain Brain in OIC by Geographic Location

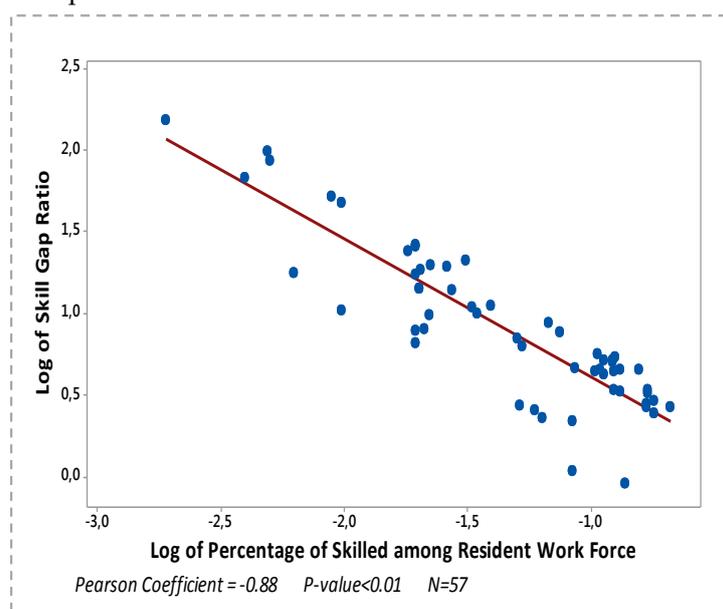


alarming value of 15% in almost half of OIC countries located in Sub Saharan Africa, namely: Cameron, Comoros, Gambia, Guinea-Bissau, Mozambique, Senegal, Sierra Leone, Somalia, Togo, and Uganda. As for OIC countries located in the MENA region, the highest levels of brain drain are observed in Lebanon (43.91%), Morocco (18.59%) and Iran (14.29%). The brain drain rate in member countries of the Gulf Cooperation Council (GCC) are the lowest seen in the world registering a very low value of 1.90% as shown in Figure 5. The value of the brain drain rate for the GCC countries is even lower than those observed in developed countries (3.83%, see Table 2). As for the skill gap ratio, OIC countries in Sub Saharan Africa register a high value of 19.07 while the opposite is observed in OIC countries located in Europe and Central Asia. A skill gap ratio of 0.89 for OIC countries in Europe and Central Asia indicates that the percentage of skilled among emigrants is less than the percentage of skilled among residents; also it indicates that these countries in general are sending emigrants that are generally unskilled compared to the resident population. The percentage of skilled among emigrants for OIC countries located in Europe and Central Asia is 11.28% and is the lowest for all country groups included in our calculations as shown in Table 2.

3.7 Relation between Skill Gap Ratio and Human Capital Accumulation

The percentage of skilled among resident workforce for an OIC country is used as a measure of the level of human capital accumulation achieved by that country. Figure 6 shows a strong negative correlation between skill gap ratio and human capital accumulation in OIC countries. As the level of human capital accumulation increases, the skill gap ratio decreases and vice versa, as the level of human capital accumulation decreases, the skill gap ratio increases. This is an interesting finding and can be explained by the fact that an increase in the level of human

Figure 6: Relation between Skill Gap Ratio and Human Capital Accumulation

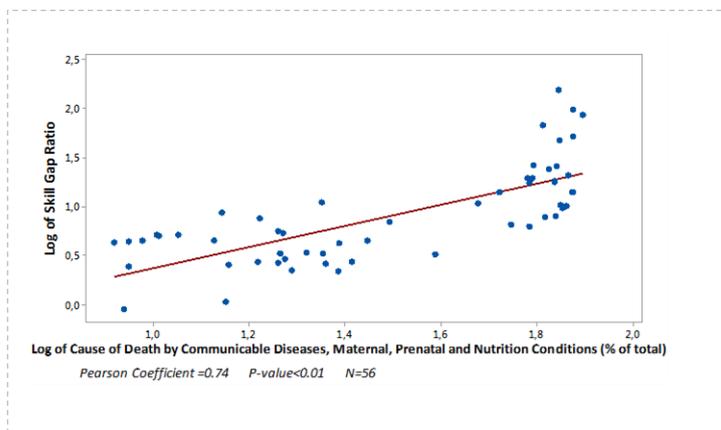


capital in a country generates less than proportional increase in the skill level among emigrants. OIC countries with the highest level of human capital accumulation as measured by the percentage of skilled among residents are: Jordan (20.96%), Azerbaijan (17.98%), Kazakhstan (17.93%), Tajikistan (16.92%), Uzbekistan (16.92), Turkmenistan (16.83%) and Kyrgyz Republic (16.82%). These countries that enjoy the highest level of human capital accumulation are located in Central Asia except for Jordan, and as it is shown in Section 3.5, OIC countries in Central Asia along with Turkey and Albania experience the lowest level of skill gap ratios.

3.8 Relation between Skill Gap Ratio and State of Health Services

The indicator “cause of death by communicable diseases, maternal, prenatal and nutrition condition” provided by the World Bank WDI data base is used as a measure of the state of health services in OIC countries. Figure 7 shows that as the level of health services deteriorates, the skill gap ratio increases, and as the level of health services improves, the skill gap ratio decreases. This

Figure 7: Relation between Skill Gap Ratio and State of Health Services

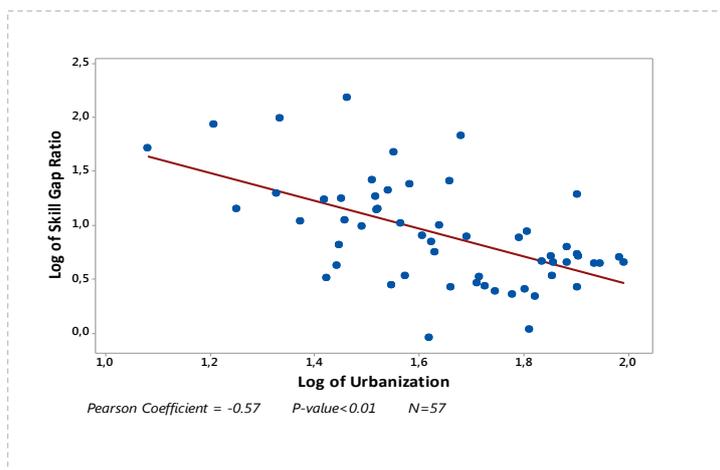


implies that OIC countries with low level of health services send a more than proportional percentage of skilled emigrants than that observed in the resident population, whereas OIC countries with better levels of health services send less than proportional percentage of skilled emigrants than that observed in the resident population.

3.9 Relation between Skill Gap Ratio and Urbanization

The indicator “urban population as a percentage of total population” is used as a measure of the level of urbanization. The data on urbanization is obtained from the World Bank WDI database. Figure 8 shows negative correlation between skill gap ratio and urbanization. As the level of urbanization increases, the skill gap ratio decreases. This can be explained by the fact that as a country become more urbanized it become more efficient to deliver education to the population, this in turn, translates into higher levels of human capital accumulation and as we have demonstrated in Section 3.6: an increase in the level of human capital in a country generates less than proportional increase in the skill level among emigrants thus the lower skill gap ratio.

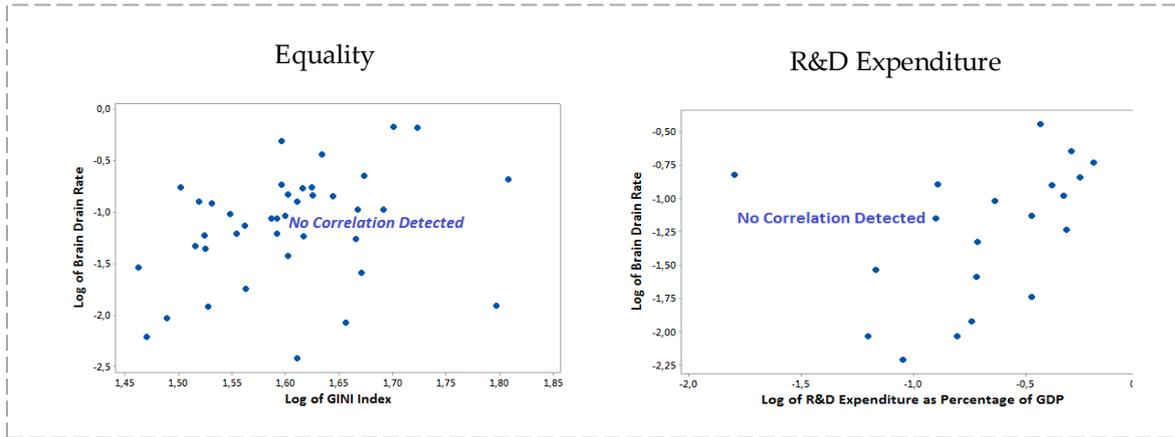
Figure 8: Relation between Skill Gap Ratio and Urbanization



3.10 Correlation between Brain Drain Rate and Equality and R&D Expenditure

The GINI index is used as a measure of equality. The data on the GINI index for OIC countries is obtained from the World Bank WDI database. The data on R&D expenditure as a percent of GDP is obtained from the same database. Our intuition might lead us to believe that equality and expenditure on R&D influence brain drain rates but as Figure 9 demonstrates there is no statistical evidence to support such intuitions.

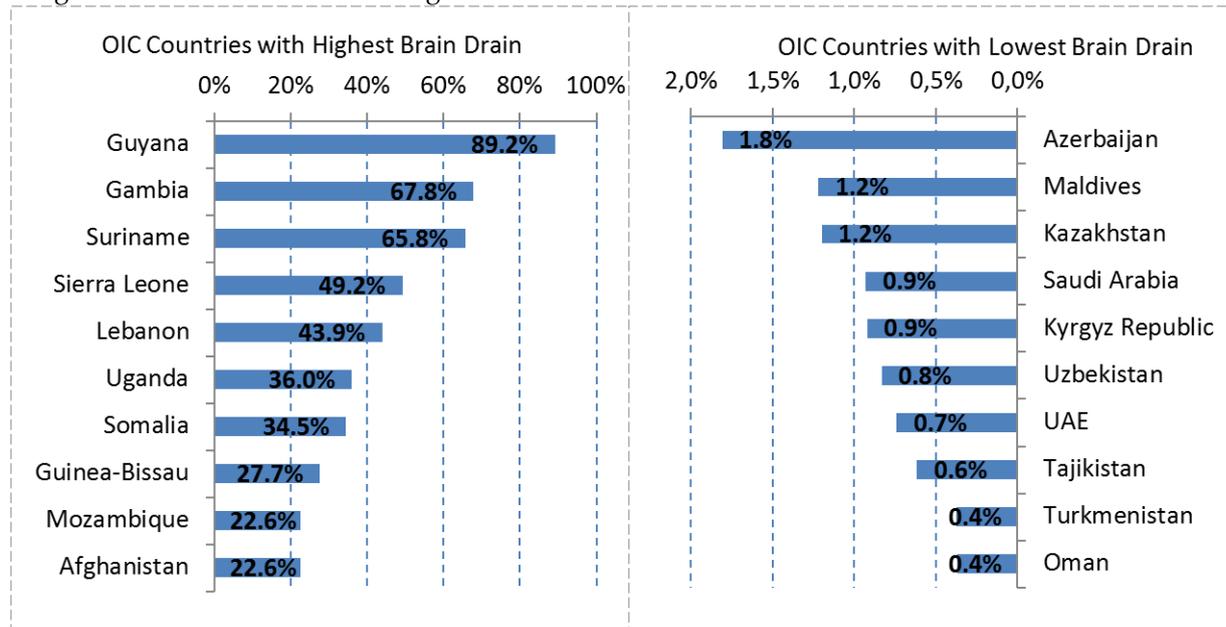
Figure 9: Correlation between Brain Drain Rate Equality and R&D Expenditure



3.11 OIC Countries with the Highest and Lowest Brain Drain Rates

Figure 10 shows the 10 OIC countries with the highest brain drain rates (left side) and the 10 OIC countries with the lowest brain drain rates (right side). All OIC countries with the highest brain drain rates shown in Figure 10 are located in Sub Saharan Africa except for Lebanon and Afghanistan. As for OIC countries with low brain rates, all the countries except for the Maldives, are either located in Central Asia or are members of the Gulf Cooperation Council (GCC).

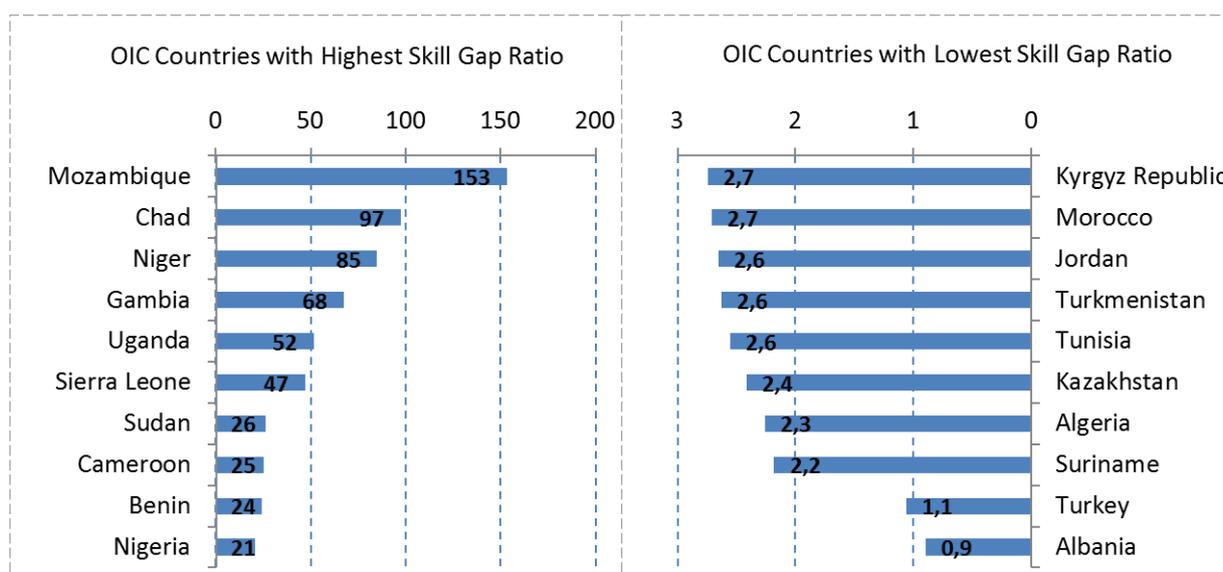
Figure 10: OIC Countries with Highest and Lowest Brain Drain Rate



3.12 OIC Countries with the Highest and Lowest Skill Gap Ratio

Figure 11 shows the 10 OIC countries with the highest skill gap ratios (left side) and the 10 OIC countries with the lowest skill gap ratios (right side). All OIC countries with the highest skill gap ratios shown in Figure 11 are located in Africa. As for OIC countries with low brain rates, all the countries that appear in Figure 11 are classified as “Upper Middle Income Countries” except for Kyrgyz Republic and Morocco whom are classified as “Low Middle Income Countries.”

Figure 11: OIC Countries with Highest and Lowest Skill Gap Ratio



4. Conclusion and Policy Recommendations

4.1 Conclusion

The relatively high level of brain drain in OIC countries limits the potential of these countries in achieving their development goals; therefore, investigating the driving factors behind brain drain in these countries becomes paramount. Using a data set on brain drain rates and skill gap ratios for all 57 OIC countries, this report attempts to explore the drivers behind the brain drain phenomenon in OIC countries.

The analysis reveals that OIC countries in general suffer from levels of brain drain that are higher than those of developed countries and the world average but that are on par with other developing countries. The income level was found to play a role in shaping brain drain rates and skill gap ratios in OIC countries, with brain drain rates lowest in high income OIC countries and skill gap ratios lowest in upper middle income OIC countries. While development level does not influence brain drain rates, they do have an influence on skill gap ratios with extremely high levels of skill gap ratios observed in the Least Developed OIC countries. In contrast to what is observed in the world, population size does not seem to play a role in the brain drain phenomenon in OIC countries with differences in brain drain rates and skill gap ratios across different population size countries carrying no statistical significance. Geographic location on the other hand affects both brain drain rates and

skill gap ratios. The highest levels of brain drain rates are observed in OIC countries in Sub Saharan Africa and in the MENA region excluding countries who are member of the Gulf Cooperation Council. The member countries of the Gulf Cooperation council experienced the lowest levels of brain drain rate even at the global level. Skill gap ratios in contrast are the lowest in OIC countries located in Europe and Central Asia.

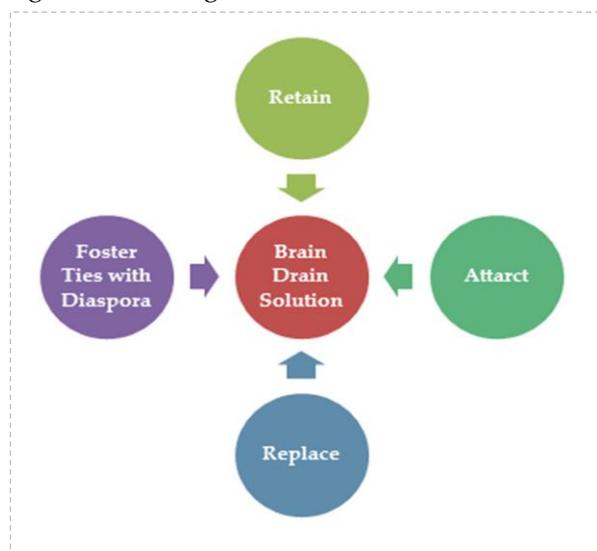
It has been also observed that there is a negative correlation between skill gap ratio on one hand and human capital accumulation, improved health services and urbanization on the other hand. Finally, the analysis showed that there is no statistical evidence to support the argument that brain drain rates are correlated with equality and R&D expenditure

4.2 Policy Recommendations

Solving the brain drain problem in OIC countries is not an impossible task. This report proposes the framework depicted in Figure 12 for solving the drain problem in OIC countries. Retaining potential skilled emigrants requires OIC countries to focus on addressing the push factors described in Section 1. Attracting the skilled workforce that has emigrated requires OIC countries to introduce incentive packages in order to entice skilled emigrants back home, in addition OIC countries need to create centers of excellence with the adequate infrastructure and quality working conditions in order to attract skilled emigrants back home. The Chinese experience in this regard is noteworthy and can be emulated by OIC countries. The Chinese government plans to have 200 business

start-up incubators by 2015, which are expected to house 15,000 startups/enterprises run by skilled Chinese returning from abroad. Replacing the skilled workforce that emigrates requires OIC countries to develop higher education policies, training programs, and capacity building programs that will enable them to replace the emigrating skilled workforce at a rate comparable to the brain drain rates. As for the skilled emigrants who can neither be retained nor attracted back home, OIC countries need to create modalities through which they can be involved in their country's development while they are abroad. In this regard three mechanism stand out: First, OIC countries need to establish intellectual and scientific diaspora networks with the objective of securing effective communications and exchange of ideas between skilled emigrants and their peers back home, this in turn, will ensure that emigrants contribute to the economic and social development of their home countries. Second, OIC countries need to encourage the transfer of knowledge and expertise possessed by emigrants. The UN's "Transfer of Knowledge through Expatriate Nationals (TOKTEN)" can serve as a model for the Organization of Islamic Cooperation. Third, OIC countries need to develop trade association with participation from emigrants and their counterparts in the home country. The objective of these trade associations is to maximize the benefits of having a well-connected diaspora on trade and business opportunities for the home country.

Figure 12: Solving the Brain Drain Problem



References

- Baruch, Y. (1995). Business globalization—the human resource management aspect. *Human System Management*, 14, 313-326.
- Beine, M., Docquier, F., & Rapoport, H. (2008). Brain drain and human capital formation in. *The Economic Journal*, 118, 631-652.
- Bénassy, J.-P., & Brezis, E. (2013). Brain drain and development traps. *Journal of Development Economics*, 15-22.
- Carr, S. C., Inkson, K., & Thorn, K. (2005). From global careers to talent flow: Reinterpreting 'brain drain'. *Journal of World Business*, 40, 386-398.
- Cervantes M, & Guellec D. (2002). The brain drain: old myths, new realities. Retrieved 11, 27, 2014, from OECD Observer: [http://www.oecdobserver.org/news/archivestory.php/aid/673/The brain drain: Old myths, newrealities.html#sthash.Dbm1chlV.dpuf](http://www.oecdobserver.org/news/archivestory.php/aid/673/The%20brain%20drain%20Old%20myths,%20newrealities.html#sthash.Dbm1chlV.dpuf)
- Commander, S., Kangasniemi, M., & Winters, L. (2004). The brain drain: a review of theory and facts. *Brussels Economic Review*, 47(1), 29-44.
- De la Croix, D., & Docquier, F. (2012). Do brain drain and poverty result from coordination failures. *Journal of Economic Growth*, 17, 1-26.
- Docquier, F., & A. Marfouk. (2006). "International migration by education attainment in (1990-2000)." In C. Ozden and M. Schiff (eds). In *International migration, remittances, and the brain* (pp. Chapter5: 151-199). New York: Palgrave Macmillan.
- Docquier, F., & Rapoport, H. (2012). Globalization, brain drain and development. *Journal of Economic Literature*, 50, 681-730.
- Docquier, F., Lohest, O., & Marfouk, A. (Discussion Paper 2007-4). *Brain Drain in Developing Countries*. Département des Sciences Economiques de l'Université Catholique de Louvain .
- Faini, R. (2006). *Remittances and the Brain Drain*. IZA Discussion Paper No. 2155.
- Gibson, J., & McKenzie, D. (2011). Eight questions on the brain drain. *Journal of Economic Perspectives*, 25, 107-128.
- Ha, W. J. (2009). *Brain Drain, Brain Gain, and Economic Growth in China*. United Nations Development Programme, Human Development Research Paper 2009/37.
- Iredale, R. (2001). The migration of professionals: Theories and. *International Migration*, 39(5), 7-26.
- Katarzyna Hadaś, & Annette Lang. (n.d.). *Brain Drain and Brain Gain: Problems, Paradoxes, and Trends in International Skill Flows*. Retrieved 10, 17, 2014, from <http://www.mundus.amu.edu.pl/EHEW2/book/Problems%20paradoxes%20and%20trends%20in%20skill%20flows.pdf>
- Lewin, K. (1951). *Field theory in social science*. NY: NY: Harper & Row.
- Mountford, A., & Rapoport, H. (2013). The brain drain and the world distribution of income. *Journal of Development Economics*, 95, 4-17.
- Mountford, Andrew . (1997). Can a brain drain be good for growth in the source economy. *Journal of Development Economics*, 53 (2), 287-303.
- Pang, T., Lansang, MA., & Haines, A. (2002). Brain drain and health professionals. *BMJ*, 324, 499-500.

Shenkar, O. (2001). Cultural distance revisited: Towards a more. *Journal of International Business Studies*, 32, 519-535.

Stalker, P. (2000). *Workers without frontiers: The impact of globalization*. Boulder: Lynne Reiner.

Stark, O. (2004). Rethinking the brain drain. *World Development*, 1, 15-22.

UN. (2012). *World Population Prospects: The 2012 Revision*. Retrieved 11 25, 2014, from United Nations Department of Economic and Social Affairs: <http://esa.un.org/unpd/wpp/Excel-Data/population.htm>

UNCTAD. (2014). UN list of Least Developed Countries. Retrieved 12 1, 2014, from UNCTAD: <http://unctad.org/en/pages/aldc/Least%20Developed%20Countries/UN-list-of-Least-Developed-Countries.aspx>

Wong, K.-y., & Yip, C. (1999). Education, economic growth, and brain drain. *Journal of Economic Dynamics and Control*, 23, 699-726.



SESRIC

Kudüs Cad. No: 9, Diplomatik Site, 06450 ORAN, Ankara, Turkey

Tel: +90-312-468 6172 (4 Lines) Fax: +90-312-467 3458

E-mail: oicankara@sesric.org Web: www.sesric.org
