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**BRAIN DRAIN IN MIDDLE EAST & NORTH AFRICA –
THE PATTERNS UNDER THE SURFACE ***

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*The views expressed in the paper do not imply the expression of any opinion on the part of the United Nations Secretariat.

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1. INTRODUCTION

Global economic integration is not only about the increased movement of goods, services and capital across international borders, but also involves the greater mobility of people. However, unlike the patterns we observed during the second half of the 19th Century, migration flows have not accompanied the big surge of in international flow of goods and capital that defined the current wave of global integration in the post-WWII era.

There are strong indications that the tide will turn around in the 21st Century. It is estimated that around 200 million people – 3 percent of the world’s population – are living in countries in which they were not born. These numbers are expected to increase rapidly in the following decades. Diverging demographic trends between the North and the South, rapidly declining transportation and telecommunications costs are making it increasingly difficult to restrain migration flows through government policies. As a result, migration flows will be among the most important factors shaping our economic, social and cultural profile in the near future.

Among the most hotly debated issues is the migration of the highly-skilled and educated people, the so-called brain drain, especially from developing countries to developed countries. Most developing countries already suffer from low levels of human capital which has been increasingly identified as among the main determinants of economic growth and development. Although there has been extensive analysis of the impact of migration on the receiving countries’ economies, the links between migration and economic development, particularly as far as empirical research in concerned, have been somewhat neglected. This has been especially true in the case of brain drain, which, ironically, has been the subject of extensive theoretical analysis. The main reason for this oversight has been the absence of systematic and reliable data on international migration patterns and migrants’ characteristics, both at the aggregate and the household level. Fortunately such data are finally becoming available. For instance, Docquier & Marfouk (2005) dataset presents the most-comprehensive data on bilateral migration numbers to date.

In this paper, we present the extent of the brain-drain from Middle East and North Africa countries and focus on several often-ignored issues. Among these issues are the following: (i) the choice of destination country, (ii) the labor market performance of migrants in their destination countries and (iii) the actual location where the education is obtained. Unlike migrants from Latin America who overwhelmingly choose North America as their final destination, the migrants from Middle East and North Africa have many choices. The current data indicate that a large portion chooses European Union

member countries, but the United States, Canada and Australia are also important destinations, especially for the highly educated migrants. Furthermore, there is indication that even among seemingly similar migrants, there is a selection effect present and the migrants to the “New World” are more professionally qualified when compared to the migrants choosing the “Old World.”

The labor market performance is a very good indicator of the “relative quality” of migrants from a given country when compared to migrants from other countries. This is critical since it has large implications for the assimilation of the migrants in the destination countries as well as other issues related to migration such as efficiency/quality of the education systems of the sending countries and their long-term economic competitiveness in the global markets.

Finally, the location of education is one of the most important issues within the brain drain debate. Most destination countries, especially European countries, designate an individual as a migrant if he carries the citizenship of another country even if he had never lived there. As a result, in the new migration datasets, that individual, if he has a college degree, would appear as an example of “brain drain.” However, economically and socially he is not a “loss” for the country of which he is a citizen, especially if there is strong indication that he might have never received that education if his family had chosen to stay in the source country instead of migrating. Thus, brain drain analysis and debate have to pay close attention to migrants who migrated at young ages and obtained their degrees in the destination countries.

First, the extent of the migration of workers with at least a college degree is extremely high for many countries in the region. This is especially true for some of the poorer countries that fail to establish adequate labor market opportunities for educated workers. As a consequence, college educated workers are also overrepresented among the migrants from these countries, compared to their overall share in the native population.

The second important observation is that majority of the college educated migrants from Middle East/North African countries to France actually complete their education there. Most of them either migrated as children with their families or came as young adults to obtain Bachelor’s or further graduate degrees and started to work. This observation will have important implications on the brain-drain debate since it is not clear whether they should be treated as part of the brain-drain flows. Furthermore, if we assume that education opportunities and quality are superior in the destination country compared what would have been available at home, then such migration is undoubtedly beneficial for both the migrants

and, in most likelihood, their home countries. We explore the implications in more detail in the following sections.

The final observation is on the performance of migrants in the US labor market, specifically on the quality of jobs they obtain. We find that, on most cases, migrants who completed their education in their home countries fail to obtain skilled jobs, especially when compared to migrants from other parts of the world such as East and South Asia. We present some reasons why this might be the case. Among them are the quality of the education and various selection effects.

In the next section, we explain the data sources which is followed by the presentation of our findings. We explore several policy implications and end with conclusions.

2. DATA

Empirical research on issues linked to "brain drain" has been constrained by the scarcity of data.. One exceptional source of dataset is the one assembled by Frederic Docquier which is explained in detail in Docquier & Marfouk (2005). This is dataset of bilateral migration stocks for 1990 and 2000 by education level to OECD countries. The dataset has 192 source countries for 2000 and 174 countries for 1990. There has been special effort towards homogeneity and comparability of data from different destination countries since their definitions of a migrant differ considerably. They also constructed a new unpublished dataset to compare the migrants' educational composition to those of the native populations. These are the main sources we use in this paper and their underlying data sources are the national censuses.

Even though it is among the most comprehensive dataset to date on this issue, there are several shortcomings. First, it is based on the OECD countries as the destination countries and, as such, ignores several major destinations such as the Persian Gulf countries, Singapore, South Africa etc. Especially the Persian Gulf countries are important destinations for the purposes for this paper, but until these countries make their data public, there is not much can be done. Nevertheless, Docquier and Marfouk dataset captures over 90% of global brain drain. Second, the dataset only includes employed migrants and overlooks current students. The current students, especially in post-graduate programs, are a major element of current and future brain drain and they are not present in the analysis.

Some of the analysis in this paper is based on the US Census which includes detailed information on the social and economic status of foreign-born people in the United States. The data in this paper are from the 1% sample of the 2000 Census¹. We restrict our analysis to foreign-born people who are between 25-65 years old and employed at the time of the census.² Each individual observation in the census has a population weight attached to it which is that representative observation's proportion in the overall US population. Each individual in the census declares an education level and a profession. The education levels are: (1) less than 4 years, (2) 5-9 years, (3) 9-12 years, (4) high-school, (5) some college, (6) bachelors degree, (7) graduate degrees which can be a master's degree, professional degree³ or a doctorate degree.

There are over 500 separate occupations in the census and we group them into three main categories, based on the job description and the average educational attainment⁴:

- (i) Skilled - average education is at least 16 years; includes managers, accountants, engineers, social workers and teachers, medical and legal professionals, scientists.
- (ii) Semi-skilled - the average education is between 12-16 years; includes engineering technicians, police, secretaries and administrative assistants.
- (vi) Unskilled - the average education is below 12 years; includes waiters, salespersons, cashiers, construction laborers, automotive mechanics and drivers.

3. BRAIN DRAIN FROM MIDDLE EAST & NORTH AFRICA

i. Overall Migration Patterns

The aggregate migration numbers from the Middle East and North Africa to the OECD countries is dominated by several countries. Figure 1 presents the number of migrants in OECD labor markets from the countries in the region. The largest source countries are Turkey (close to 2m workers in the OECD labor force as of 2000), Morocco (slightly over 1m), Algeria, Iran (both around 500 thousand), Egypt,

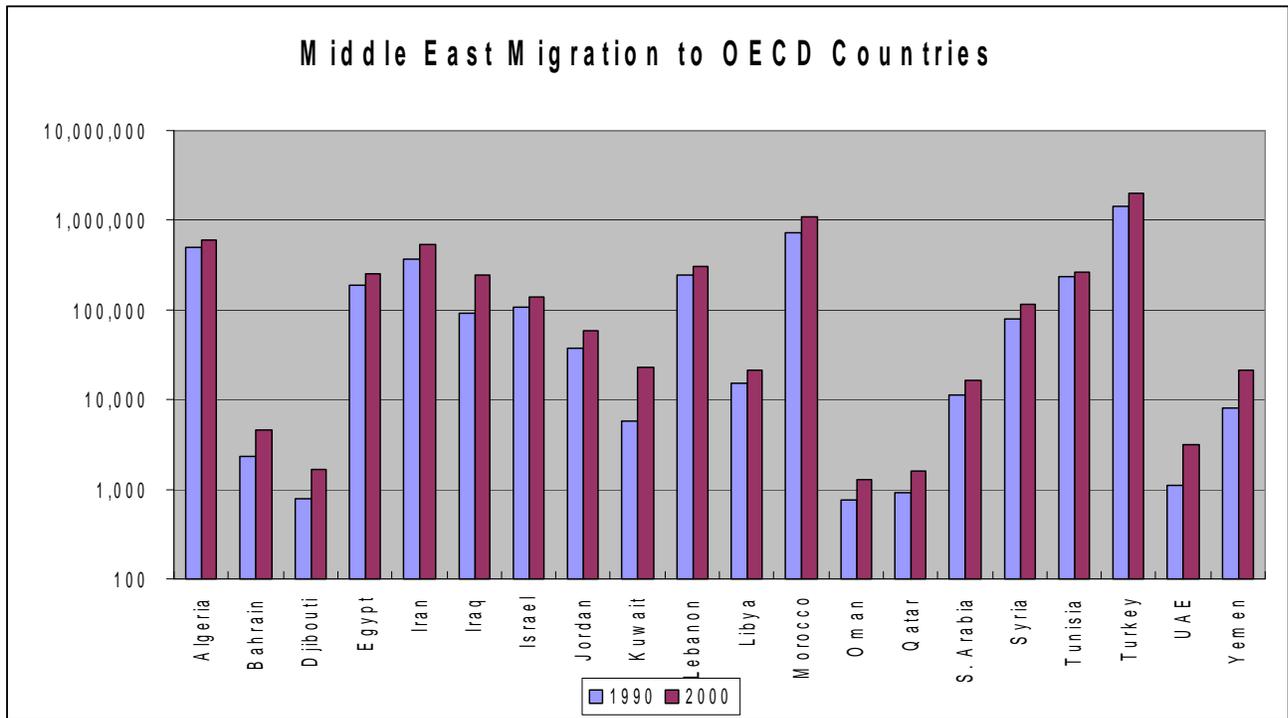
¹ Extracts from the Census samples were made through IPUMS (Integrated Public Use Microdata Series), which is a database maintained by Minnesota Population Center at University of Minnesota (<http://beta.ipums.org/usa/index.html>).

² The census asks the respondents their level of education, but not where they obtained it. However, we know the age at which the immigrant entered the United States. So based on this information, we can designate a person "US educated" if they arrived in the US before they would have normally finished their declared education level. For example, if a university graduate arrived at the age of 23 or older, then he is considered "foreign educated."

³ According to census, these are medical, law, optometry, dentistry, pharmacy and veterinary degrees.

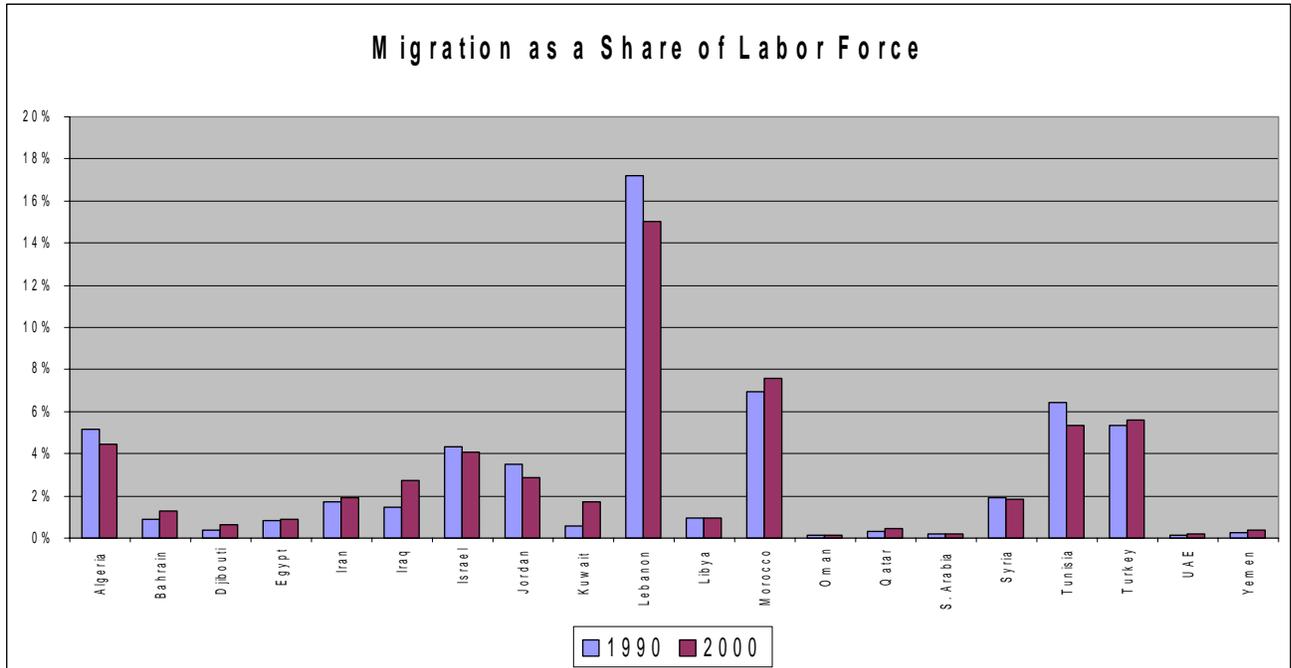
⁴ Educational attainments were obtained by computing the average years of education in each profession, with all US-born and foreign-born people (males and females) included.

Iraq, Lebanon and Tunisia (each around 250 thousand). It should be emphasized that the figure is on a logarithmic scale – otherwise these large source countries would visually dwarf the smaller countries. Figure 1 has data for both 1990 and 2000 and all countries have experienced increased emigration during the decade. The overall number of migrants has increased by 40% - but this naturally includes the children of the migrants who were born in the destination countries and who are considered migrants in most of the EU countries. Smaller countries have experienced more rapid increases in their migration. Among the larger source countries, the exception is Iraq due to the political instability.

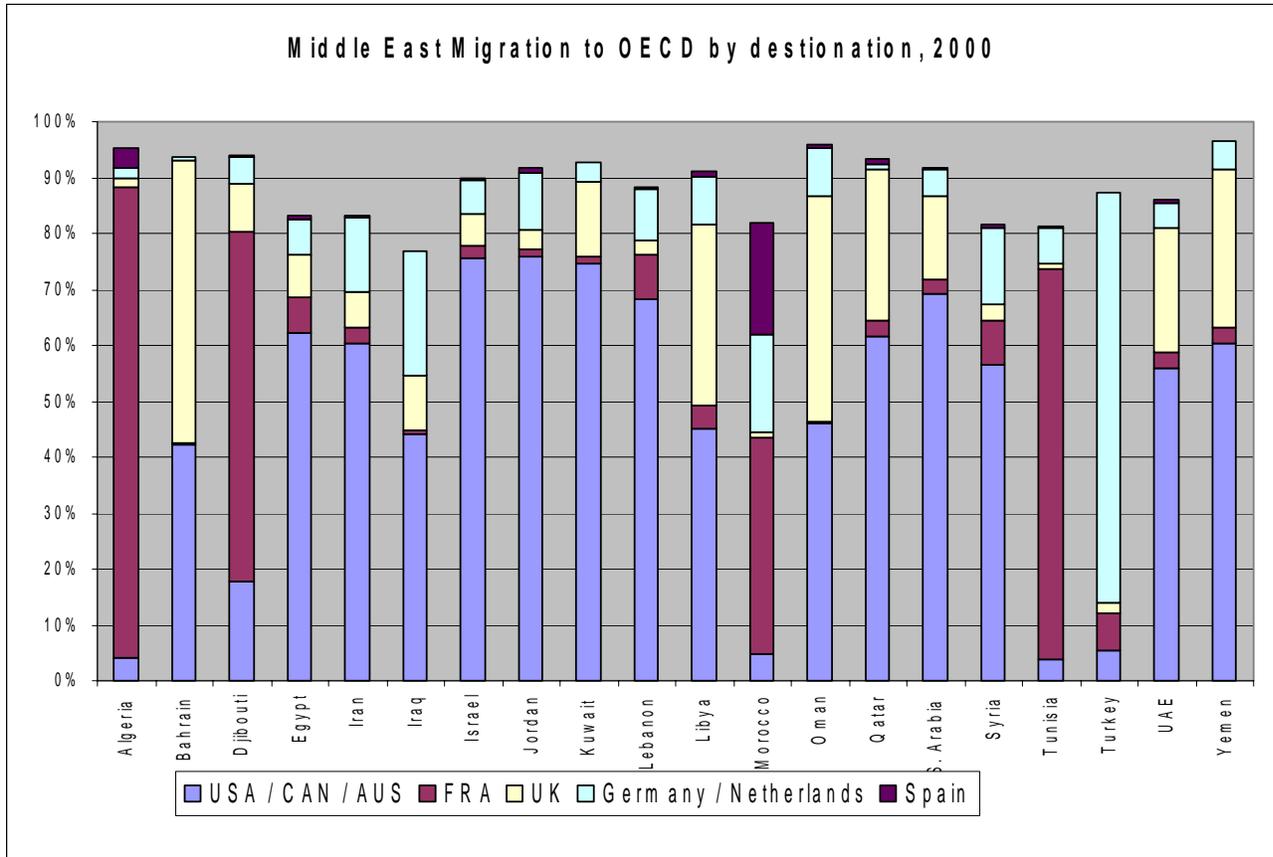


As expected, countries with larger populations have also large number of migrants. Another measure of migration is the migration level as a ratio of the native labor force which is presented in the next figure. The situation is somewhat different in this figure where Lebanon and Morocco stand out. The Lebanese migration is clearly linked to decades of political instability as well as the historical integration of the native population with economic centers of Europe. This makes migration relatively easy for Lebanese citizens compared to other countries from the region. Moroccan migration is also linked to the relatively low cost of migration to France and Spain due to historical links and geographic proximity. The next group of high emigration countries is composed of Turkey, Tunisia and Algeria – countries with also high absolute level of migration. Thus, migration is an economic issue for the large, oil-poor countries with rapidly growing populations. It should once again be noted that, there is significant migration to the

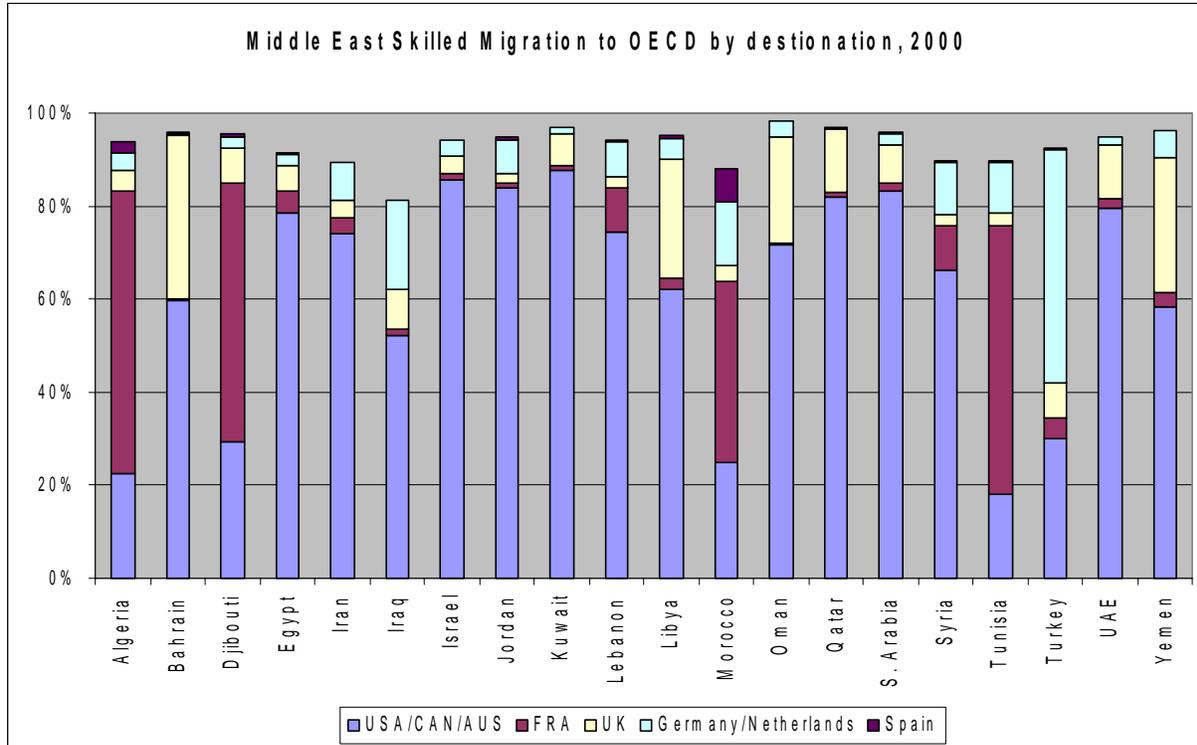
oil-rich Persian Gulf countries from other countries such as Egypt and Jordan which are not captured in these two figures due to data limitations.



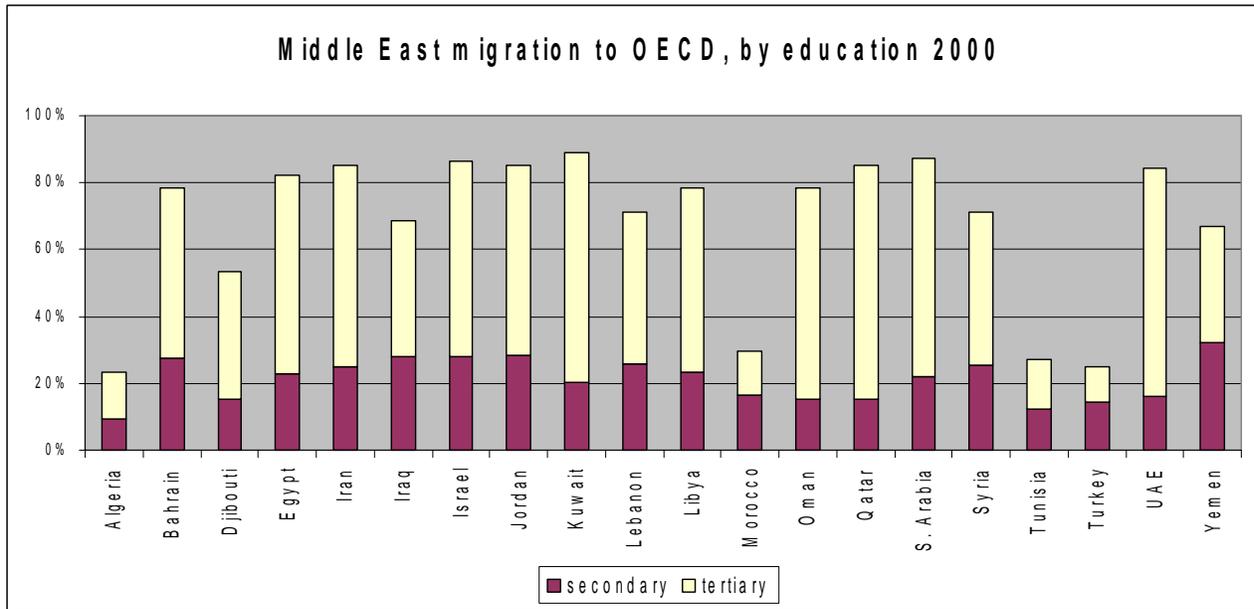
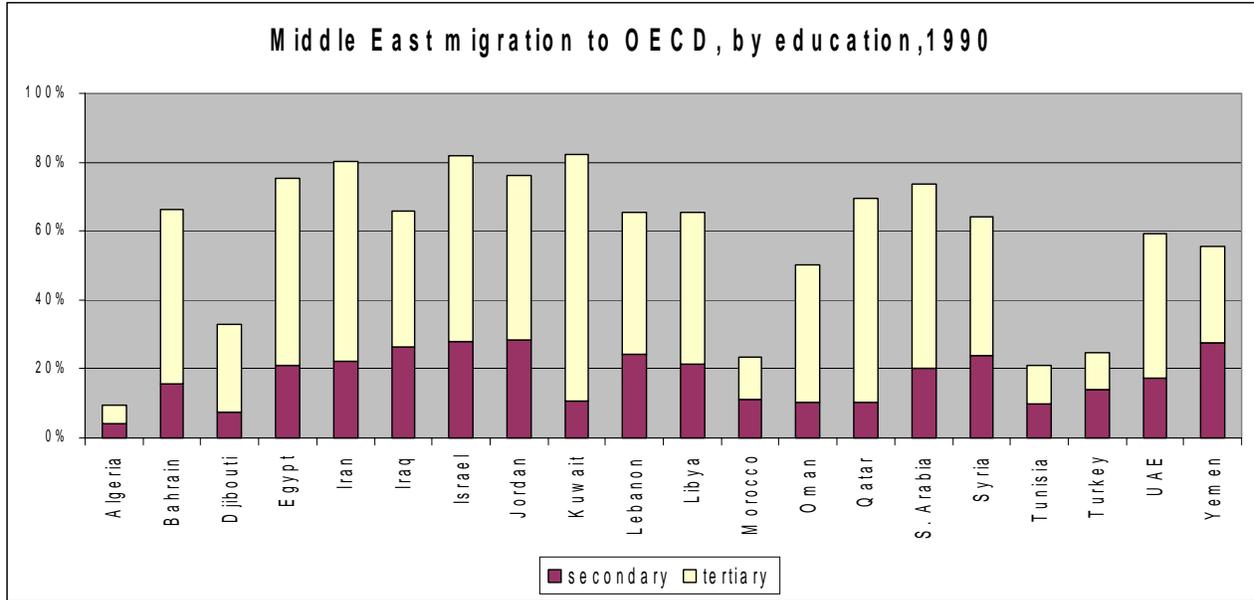
The next natural question is about the destinations of these migrants which is presented in the next figure. In this case, there is significant variation which is partially due to geography and partially due to historical linkages. For example, vast majority of migrants from Algeria, Morocco and Tunisia go to France while the Turkish migrants prefer Germany, the Netherlands and Belgium. Migrants from ex-British colonies such as Egypt, Iraq and Jordan migrate to the UK as well as the other English speaking “new world” countries such as the US, Canada and Australia. There is also significant migration to Spain from Morocco and to the UK from the oil-rich countries Gulf countries. Finally, there are a significant number of migrants from Iraq, Iran and Syria in Turkey - this is the missing portions in the figure. This migration is due to geographic proximity and as a transit stop en route to Europe.



The geographic destination choices for the educated migrants from the region are presented in the next figure. The patterns for the educated migrants are similar to those of overall migration. For example, majority of educated Turkish migrants are in Germany and North African migrants are in France. The most important distinction is that the share of US/Canada/Australia is much higher among tertiary educated migrants for every country. For example, while only 5% of Turks and Moroccans go to these countries, close 30% of educated Turks and 25% of educated Moroccans migrate to the “New World.” There are various reasons for this distinction – the most important being that the educated migrants might perform better in these labor markets compared to the European countries. Also, it might be easier to legally and socially be accepted.

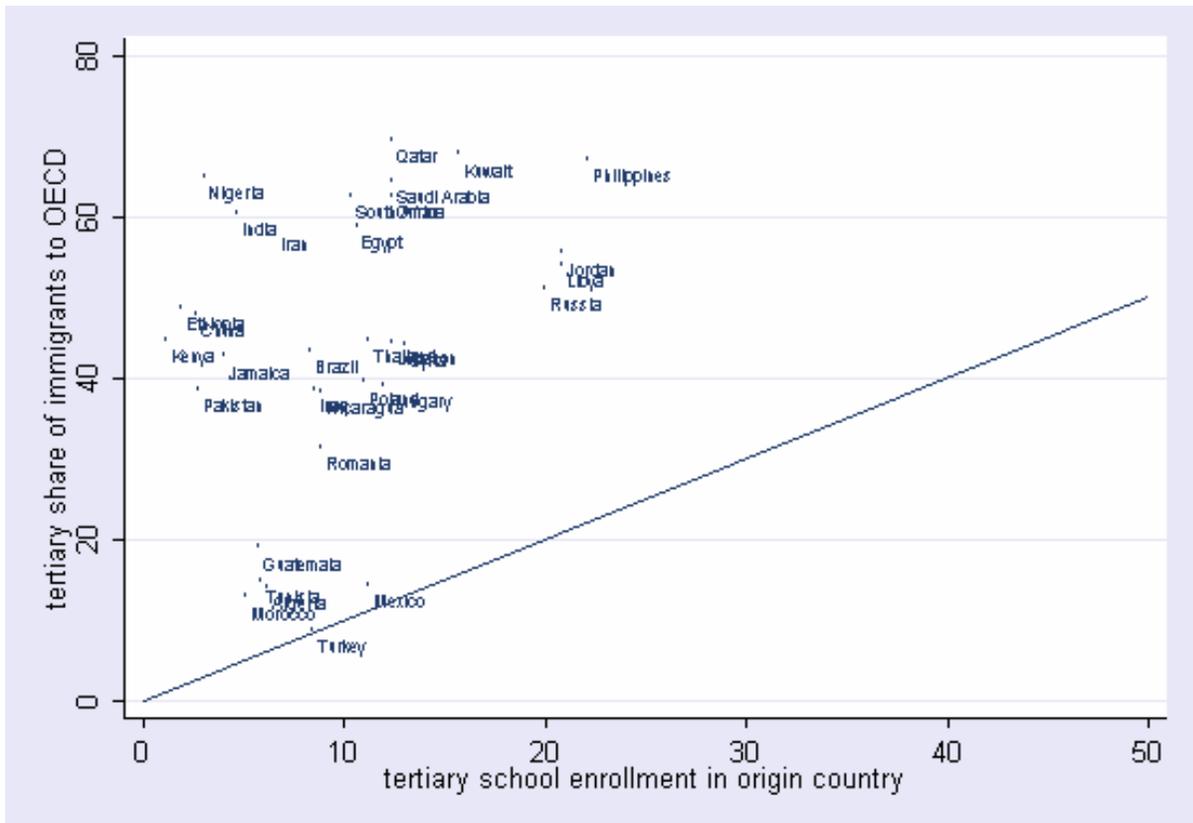


In the brain drain debate, one of the key figures used is the ratio of the educated migrants within the migrant population. The next two figures present educational distribution of migrants – the missing portions are the migrants with only primary education. One striking fact is that the tertiary educated migrants are a small portion of the overall migrant population – especially in large migrant sending countries such as Turkey, Algeria, Morocco and Tunisia. For example, between 10-15% of migrants have tertiary education in Turkey, Tunisia, Morocco and Algeria as of year 2000. On the other hand, more than 50% of migrants to OCED countries from other countries, including Egypt, Iran, Iraq, Lebanon and Jordan have tertiary education. There are several reasons for this difference. First, migrants with low levels of education from many of the smaller and wealthier countries, such as Kuwait, have no reason to migrate since there are plenty of employment opportunities in their own countries. Second, unskilled migrants from other larger countries (Egypt, Lebanon, Jordan) migrate to the Persian Gulf countries. As a result, the figures capture high levels of educated migrants from some countries to the OECD (Persian Gulf countries, as well as Egypt, Jordan, Lebanon) and relatively high levels of unskilled migration from the other countries (Turkey and North Africa). Finally, the figures reveal that the share of educated migrants increased from 1990 to 2000.



Brain Drain

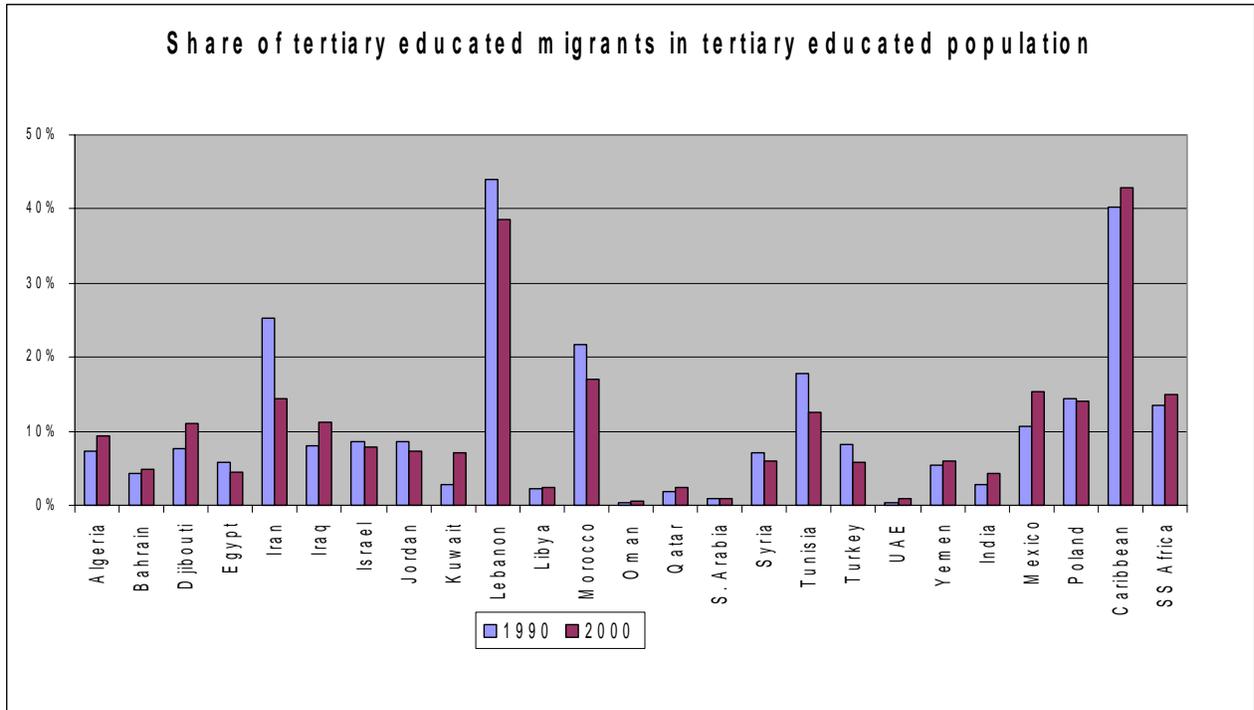
One of the main reasons why the portion of the highly educated migrants from Maghreb countries and Turkey is so low in the overall migrant population is the rather low level of education among the native population. The next figure presents the portion of the migrants who have tertiary education in vertical axis and portion of the native population with tertiary education in the horizontal axis for all countries in the database. Countries above the 45 degree line have migrants who are more educated than the natives.



The figure above reveals that the migrants from almost every developing country are more educated than the native population. There are many reasons for this selection effect – the migration policies of the receiving countries are biased towards educated migrants, they face fewer constraints in terms of financial and social costs when they migrate, the returns to migration are higher etc. The selection effect is stronger for some countries compared to others. For example, among the countries in the region, Turkish migrants are the most similar to native population in terms of education profile – around 10% of natives and migrants have tertiary education. Similarly, the bias is relatively small for North African countries such as Morocco and Tunisia. On the other hand, the bias is largest for the Persian Gulf countries and Egypt – over 60% of migrants have tertiary education as opposed to 15% of the native population.

The most important question in the brain drain debate is what percent of the educated population migrate. It is possible that educated migrants form a large portion of the migrant population. However, if the underlying native population is also highly educated, then the economic impact of migration is not likely to be negative on the sending country. For example, this is the case in India and China. Even

though majority of Indian migrants, especially to the US, have college degrees, they still present a small portion of the educated labor force in India. The next figure presents the tertiary educated migrants share in the overall tertiary educated labor force from the sending country.



The figure above reveals wide variation among the countries in the region. A significant portion of the college educated migrants from poorer countries have migrated. Lebanon and Iran are at the extreme, especially as of 1990, mainly due to political instability. Educated migrants have better prospects in the destination countries, have more resources and face fewer constraints to migrate in times of chaos. The next group is Morocco, Tunisia, Iraq and Algeria – with around 10-15% of educated workforce migrating. The middle range includes Jordan, Syria, Turkey and Egypt with 5-8% migration rate among the educated. The migration rate of the educated is lower in the Gulf countries reflecting the high demand for their services in their native labor markets.

The data reveal that large migrant countries – with the exception of Turkey - and politically unstable countries are the main victims of brain drain in the Middle East and North Africa. The main reason of brain drain in the first group is the low levels of education, rather than specific migration of the educated – as the vast majority of the migrants are unskilled. Poorer countries, such as the ones in North Africa, also have lower shares of college educated workers in the labor force. A very large portion of their

population tends to migrate if given the chance since the economic opportunities seem to be rather limited for everyone, not just for the highly educated. As a result, highly educated migrants make up a smaller portion of the migrant population but they form a large portion of the overall educated labor force. On the other hand, for the wealthier countries, the total number of migrants relative to the population is much smaller and a smaller portion of the highly educated chooses to migrate – hence the lower levels in the figure for these countries. But the highly educated form a large portion of the overall migration as in the earlier figures.

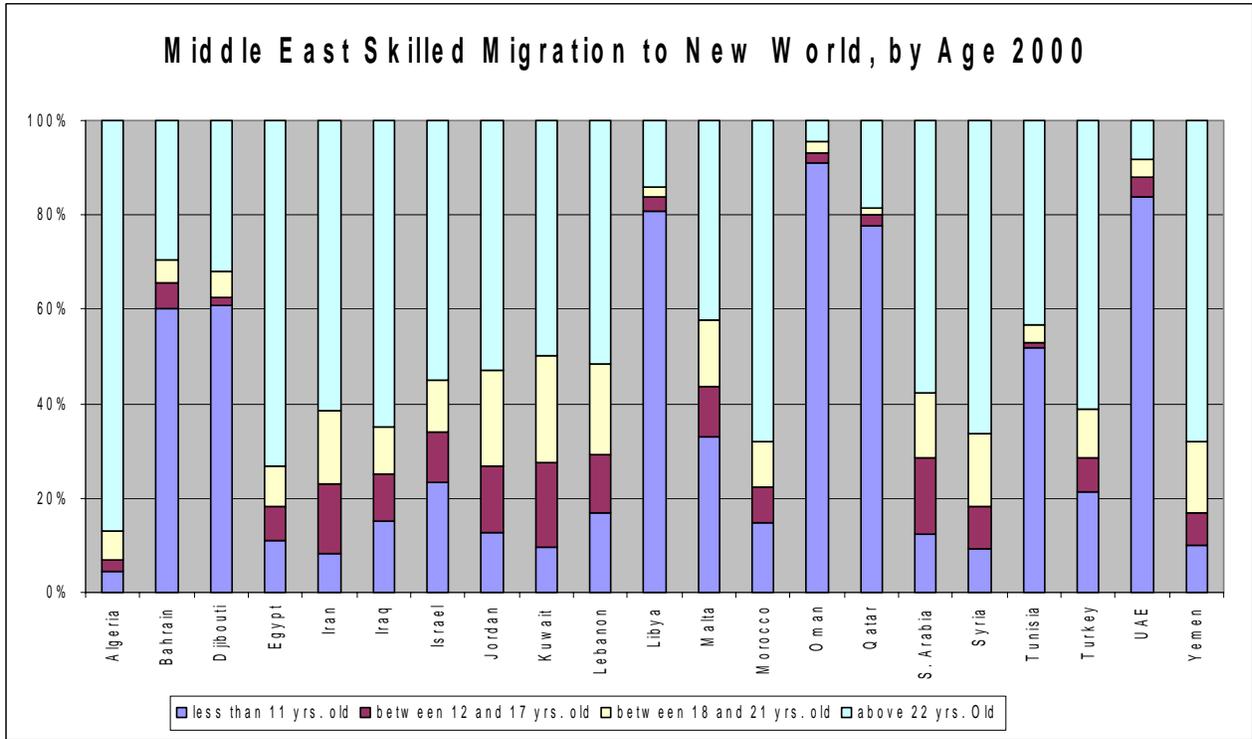
Second observation is that in many of these victims, the situation has improved in the 1990s as the level of brain drain is lower in 2000 compared to 1990. Finally, several large migrant countries and regions are included as comparison at the end of the figure on the right. The brain drain levels are around 15% for Mexico and Poland and 6% for India. On the other hand, it is staggering 43% for the Caribbean and 15% for sub-Saharan Africa (however, the rate is above 50% for many countries in the region). These rates indicate that the problem is not much worse for the Middle east and North Africa compared to other regions of the world.

Location of Education

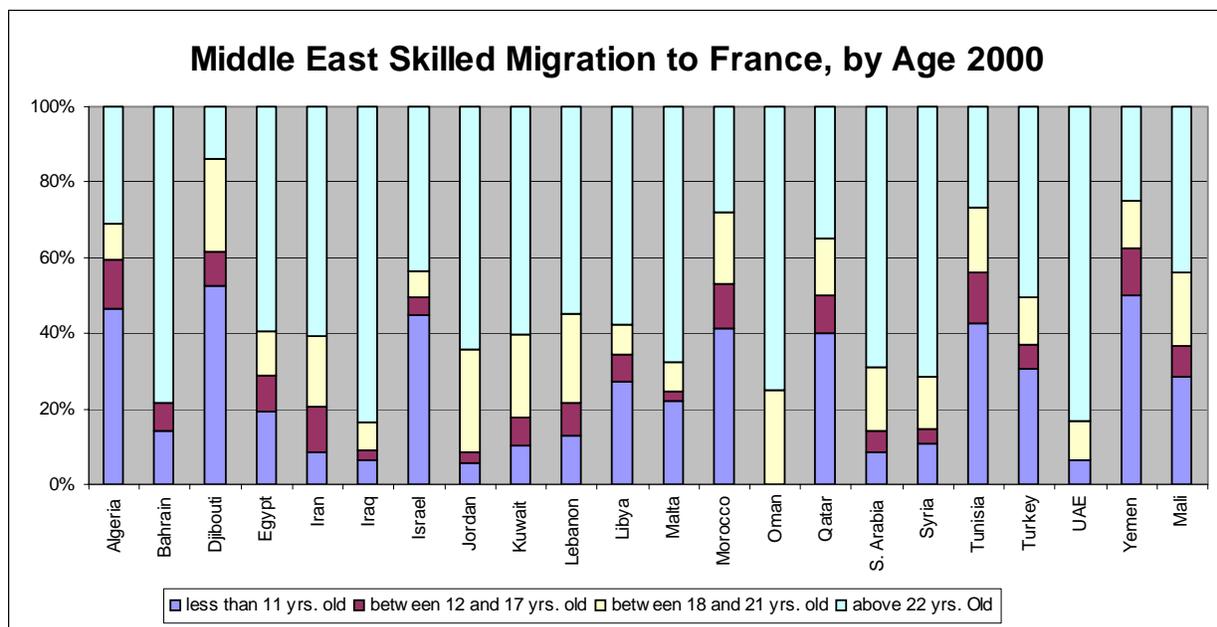
An overlooked issue is where the migrants obtain their education. In the previous section, we established that, in many countries, a large portion of the college educated people born there have migrated to the United States. The key fact we are going to present in the section is that a large portion of those people have actually received or completed their education in the destination countries since they migrated either as children with their families or migrated as young adults to complete their education and stayed to work.

The next figure presents the age-of-arrival distribution of educated migrants to the “New World” countries – the United States, Canada, Australia and New Zealand – for 2000. Majority of the educated migrants to these countries migrate as adults - after age 22. For example, 87% of Algerians, 73% of Egyptians, 68% of Moroccans and 60% of Turks migrated after completing their college education in their home countries. It is possible that some of these migrants obtained post-graduate degrees in their destination countries, but nevertheless, they can be considered brain drain for their home countries. On average, another 10% of the migrants arrived between the ages 18-22, indicating they migrated to complete their college education. The countries that defy this pattern are the small Persian Gulf countries where majority of educated migrants have arrived as children. Given that these countries send a large

number of students abroad to complete their education, these data imply that these students return home upon graduation.



The next figure presents the parallel data for France and the pattern is rather different, especially for large migrant-sending countries in North Africa. For example, only around 30% of Moroccan, Tunisian and Algerian educated migrants arrived after the age of 22. Actually, around 60% have arrived France *before* age 18 which indicates they came as children and grew up there. Similarly 40% of Turkish and Lebanese migrants – the other two large groups – also arrived as children. There are several reasons for this pattern. Migration to France is a much older phenomenon and the migrant communities from Middle east and north Africa are more established. Thus, majority of educated migrants in France are actually the children of the previous generation, not recent migrants who consumed the resources of their native countries for their education.

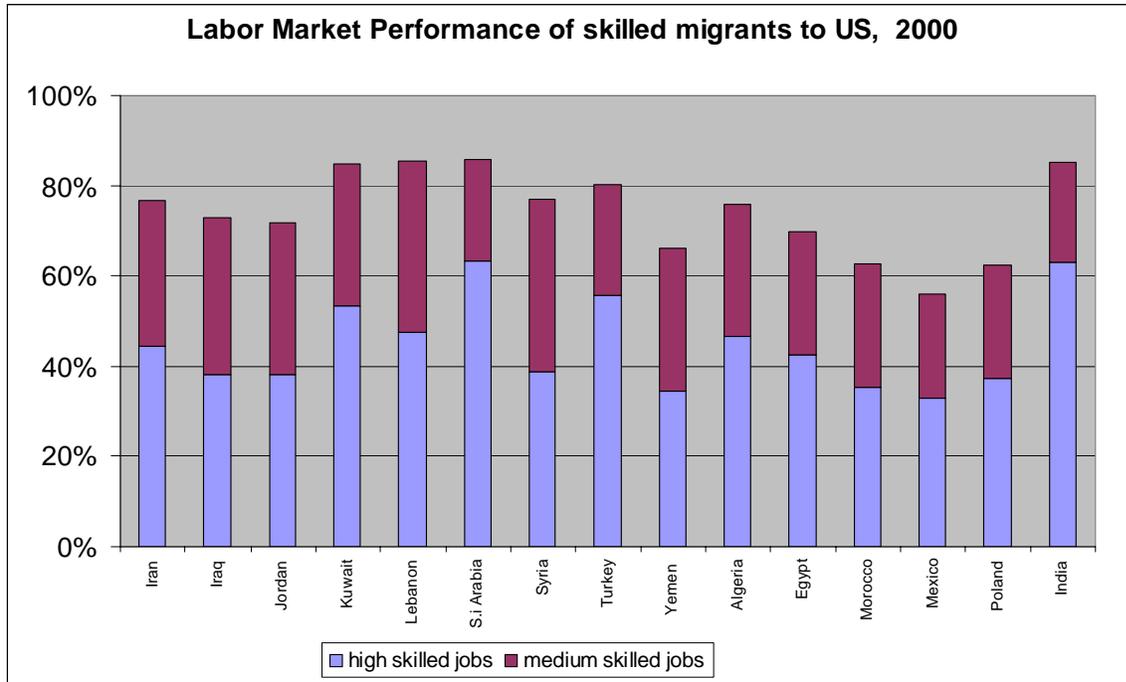


The data we present in this section is likely to have strong implications on the debate on brain drain. It is generally assumed that brain drain is harmful for developing countries since they lose one of their most scarce economic resources. Furthermore, most of that education is likely to be financed by public resources. The migration of the educated people without any returns to the society that paid for it might impose fiscal problems. However, it is not clear whether the same can be said if their citizens are educated abroad and that presumably higher quality education is financed by private sources or by the destination country. In addition, there might be capacity constraints in the education sector in the home country of the migrant such that he might not be able to obtain the higher education if he were to stay at home. Obviously, this is a very complicated issue that can not be fully addressed and analyzed in this paper. Our aim is to point it out and emphasize that it should be part of all debates in brain drain.

Brain Waste

The final point we would like to emphasize is the labor market performance of migrants in the destination country. We analyzed this issue in great detail for the migrants to the US elsewhere (Mattoo, Neagu and Ozden, 2005) and we would like to point out the implications for the Middle East and North African countries. First, this data is only available for the US and we hope to be able to carry out for the EU in the future.

The main point is that majority of the highly educated migrants who completed their education in their home countries end up with jobs that are not commensurate with their education levels. This is especially severe in the case of migrants from Latin America and Eastern Europe to the US. For example, among the Latin American migrants who arrived in the 1990s and have at least a college degree obtained at home, only 36% obtains a skilled job and another 26% has a semi-skilled job. In other words, close to 40% of Latin American migrants with college degrees have unskilled jobs in the US labor market.



The patterns for the Middle East and North African countries are better than Latin American migrants but worse than Asian migrants. For example, 56% of Turkish migrants, 47% of Tunisian and 43% of Egyptian migrants obtain skilled jobs. Migrants from other countries in the region have similar statistics. The natural question is what factors can explain this divergence between different countries. We find that a large part of this country-level variation can be explained by certain country attributes. Some of these attributes affect the *quality* of human capital accumulated at home, such as expenditure on tertiary education and the use of English as a medium of education. Other attributes lead to a *selection* effect, i.e. variation in the abilities of migrants because they are drawn from different sections of the skill distribution of their home countries, and include the GDP per capita, the distance to the US, and the openness of US immigration policies to residents of a given country. For example, because of proximity and the presence of a large migrant network, it is much easier for people from Mexico and Central America to migrate to the United States. As a result, even among the college graduates, it is possible for

people with lower levels of human capital to migrate. However, in the case of Turks or Egyptians, the main path to enter the US is through employment authorization which requires higher levels of human capital. As a result, they have superior labor market performance. The key parameter will be the comparison with migrants in Europe which hopefully will be possible soon.

CONCLUSION

The aim of this paper is to present certain patterns among the highly educated migrants from Middle East and North African countries.. There are several points we would like to emphasize:

- 1 – There are large variations among different these countries. It is difficult and dangerous to draw conclusions without detailed analysis.
- 2 – We see large migration flows from poorer countries and these are the ones who are losing a large portion of their highly educated citizens.
- 3 – In the case of wealthier countries, a smaller portion of the educated people migrates. But they form a larger portion of the migration flow since the overall migration is much smaller.
- 4 – Majority of the college educated migrants to France (who are considered migrants even if they were born in France) actually completed their education there. This is not the case with the migrants to the US/Canada/Australia The evidence suggests that they migrated specifically to complete their education and there are reasons to believe they would not obtain the same level or quality of education if they were to stay at home. This fact needs to be taken into account in the brain drain debate.
- 5 – Large portion of migrants who completed their education at home fail to obtain jobs commensurate with their education levels. This is partially due to lower quality of education and this also needs to be taken into in the policy debates.

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