



BRAIN DRAIN IN SOUTHERN MEDITERRANEAN COUNTRIES: EVIDENCE, CHALLENGES & POLICIES

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This paper is a result of a participatory process in which EMNES researchers worked together in groups at two policy workshops held in Brussels in July 2018 and in Piran in October 2018 to integrate the findings of the research produced into formulating policy options and recommendations.

DISCLAIMER:

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ABSTRACT

A review of the literature and the available data support the evidence that an increasing share of population outflows from the South Med region to the EU is individuals with tertiary education. In recent years, this has gone hand in hand with increasing educational attainments amongst the regional population.

The latter is a predictor of both further migration and reduced concern about brain drain. The share of highly educated individuals amongst those who stay is still increasing and, in most countries, is more than those who choose to leave.

Lack of job opportunities is the main driver of migration across the population. The impact of migration on the sending countries is not necessarily negative, as remittances - both financial and cultural - are large in the region and, de facto, migration works as a safety valve for mounting pressure, led by high unemployment, especially amongst youths.

The key question is not about brain drain but about how to restore a positive dynamic between human capital creation and potential growth leading to job creation. This requires more targeted education policies but, above all, improvement in the quality of public and market institutions.

INTRODUCTION

The international transfer of resources, in the form of human capital, is usually defined as ‘brain drain’ in migration literature (Beine et al., 2008) and it is mainly considered in the context of highly skilled migration from developing countries. The exodus of educated young people, especially engineers and doctors, towards Europe and the Gulf countries is making the newspaper headlines in Algeria, Tunisia.

The risk of losing the most educated, and in principle, the most productive part of the population, has always attracted a lot of attention in economic literature and, lately, has entered the domestic political debate in some Southern Mediterranean countries (or South Med) region. Yet, a clear overview of the magnitude of the problem in the region is missing. This is important, both from the perspective of the region being able to assess potential growth developments, as well as from that of the EU, which represents the main destination of emigrants from the Southern shore of the Mediterranean.

To close this gap, this policy brief attempts to assess the extent of the brain drain phenomenon in the Southern Mediterranean countries, namely Algeria, Morocco, Tunisia, Egypt, Lebanon and Jordan, and discusses the policy challenges that this raises.

Combining existing evidence from the migration and brain drain literature in developing countries with empirical analysis based on recent data sources, this paper highlights several patterns. First, there is a general increase in educational attainment – particularly at the higher level and amongst females – of the labour force in the Southern Mediterranean countries. Second, in some countries, existing evidence points to a rise in the unemployment of highly skilled individuals. Third, the share of highly skilled individuals amongst the migrant population appears to be increasing. These patterns seem to suggest that brain drain exists. Nevertheless, evidence from the literature indicates that the brain drain phenomenon in the South Med region might be less alarming, at least for the time being, compared to that in other developing countries, such as in Sub-Saharan Africa.

The plan of the brief is as follows: we start by providing a brief review of the literature on brain drain from developing countries, to put the issue in the general context (Section 2). In Section 3, we then provide an overview of the general emigration patterns (e.g. composition, duration, destinations, size) from the South Med region and link it to educational development in the country of origin. This section also provides a closer look into the cases of Tunisia and Egypt. Section 4 provides a descriptive analysis of educational attainment patterns and scrutinises brain drain indicators in the South Med region. Finally, in Section 5, we discuss the potential evolution of existing patterns and the policy challenges they raise.

AN OVERVIEW OF THE LITERATURE

The emigration of highly skilled and educated individuals - mainly beyond secondary level - is generally known as brain drain in migration literature (Özden, 2006; Docquier et al., 2007). Brain drain is a particularly hotly debated issue in developing countries, as it can deprive countries of human capital, which is usually a scarce resource in such countries (Docquier et al., 2007). However, accurate empirical evidence is often lacking, due to the absence of systematic and reliable data on international migration patterns and on migrant characteristics. (Özden, 2006). Paucity of data limits the possibility of conducting comprehensive analysis to quantify the magnitude and impact of brain drain on the source countries (Capuano and Marfouk, 2013). Docquier and Marfouk (2006) are amongst the first to tackle the issue by collecting data on bilateral migration stocks in OECD countries, based on national censuses and registry data covering the years 1990 and 2000.

Docquier and Rapoport (2011) provide a global review of economic research on brain drain, particularly from the developing country perspective. They show that highly skilled migration is becoming the main pattern of international migration. Beine et al. (2008) assert that more than one third of total immigration to the OECD is characterised by highly skilled immigrants, who mainly come from developing countries. They explain these patterns by considering both supply and demand factors. On the supply side, increasing globalisation leads to the agglomeration of human capital in regions where it is already abundant, and contributes to a positive self-selection amongst international migrants. On the demand side, destination countries (e.g. Australia, Canada, and New Zealand) have been implementing selective immigration policies to attract highly skilled individuals.

Stylised facts on brain drain

Docquier et al. (2007) identify four stylised facts related to the emigration of skilled workers:

- (i) *Average migration rates and schooling gaps are negatively correlated.* This means that no developing country has both strong openness (measured by total emigration rate) and a high schooling gap (measured by the relative education level of emigrants compared to native-born).
- (ii) *Average emigration rates decrease with country size.* Whilst the population size of the sending country and the number of migrants are directly linked, emigration increases less than proportionally when the population size increases at origin.

- (iii) *Schooling gaps decrease with rising human capital of native-born.* When the general level of educational attainment at origin increases, it naturally increases the proportion of educated emigrants.
- (iv) *Schooling gaps depend on the destination choice.* The size of the brain drain is influenced by the destination; for example, the large majority of skilled immigrants from developing countries live in countries with selective immigration policies (e.g. Australia, Canada and the United States).

These regularities in migration patterns point to two main and multiplicative components of brain drain: firstly, the degree of openness of sending countries (i.e. average emigration rate) and the education gap between the education of emigrants and native-born individuals. In addition, findings from Docquier et al. (2007) suggest that brain drain is stronger in small countries that are geographically closer to OECD countries, or that have a colonial history with the latter. It is also found that brain drain is positively associated with political instability and the degree of religious fractionalisation at origin, suggested by Alesina et al. (2003).

The number of skilled workers in OECD countries increased by 64% between 1990 and 2000 and the rise was higher for immigrants from developing countries (up by 93%, as reported in Docquier et al., 2007). For example, immigration from Africa and from Latin America and the Caribbean increased by 113% and 97%, respectively. Despite these patterns in developing countries, the overall emigration rates across skill levels decreased slightly in the same period. Moreover, there is also a general rise in educational attainment in many developing countries over the latter years. Similar to Docquier et al. (2007) and others, Gibson and McKenzie (2011) report that skilled migration is increasing in parallel to skill levels in developing countries; therefore, brain drain rate appears to be stable, or even falling slightly, during the last decade (2000-2010). Sub-Saharan Africa is an exception to this trend: tertiary education growth remained low, whilst skilled emigration increasingly continued (Gibson and McKenzie, 2011). Docquier et al. (2007) report that, measured by the emigration rate of post-secondary educated workers, Sub-Saharan Africa, Latin America and the Caribbean, and the Middle East and North Africa display the highest average brain drain rates (13%, 11% and 10%, respectively).¹ We note that the latter figures are regional averages and country-specific calculations might be different.

It is also worth mentioning that, whilst most of the debate focusses on the (absolute or relative) size of highly skilled leavers from the sending countries, the sectorial composition of the emigration is also

¹ For more details and a critical discussion about different estimations of brain drain in these regions using previous datasets, see Docquier et al. (2007), page 202.

important in the brain drain context. This is particularly true when emigration is more prevalent in some specific sectors (or professions), such as health and engineering, since the latter might provide the productive potential of non-migrants at origin (Beine et al., 2008). However, also in this case, data limitations are constraining the conduct of more detailed analysis beyond anecdotal evidence.

The impact of brain drain

Labour outflows can have an impact on growth, both actual and potential. The traditional channel through which emigration negatively affects output growth is seen in outflows reducing labour supply and, if emigration mostly concerns skilled labour, it can result in brain drain, thereby reducing productivity and long-term potential growth.² This is a widespread concern, especially for less developing economies, which have fostered a considerable amount of academic research, despite the constraints arising from data limitations.

Whilst most discussion focusses on the negative effects of brain drain, Docquier and Rapoport (2011) argue that emigration of highly skilled people does not lead exclusively to the possible depletion of human capital from the countries of origin, but it can also have positive impacts. For instance, remittances can stimulate consumption and impact economic activity, business investment and labour market outcomes in the origin country. Bollard et al. (2011) show that remittances increase with the educational attainment of migrants, leading to a beneficial outcome for the sending countries. This is directly linked to the higher incomes earned by highly skilled migrants, compared to low skilled migrants, allowing the former to send more money back to origin.

Last but not least, brain drain can also have a positive impact on human capital formation in the sending countries. Beine et al. (2008) argue that, as the return to education is usually higher abroad than at origin, the prospect of migration can raise the expected return from human capital and give people the incentive to invest in education at origin, which is called 'brain gain' by some scholars (e.g. Stark et al., 1997).³ Since not all of those who invest in further educational attainment eventually end up migrating, this process induces an increase in educational attainment at origin (Gibson and McKenzie, 2011). For example, Beine et al. (2008) estimate that doubling the emigration rate amongst

² In cases where emigration is large relative to the remaining population, remittances sent by emigrants can contribute to rising wages, through higher consumption and higher proportion of wages that go into savings. The latter can lead to real exchange rate appreciation and a loss of competitiveness.

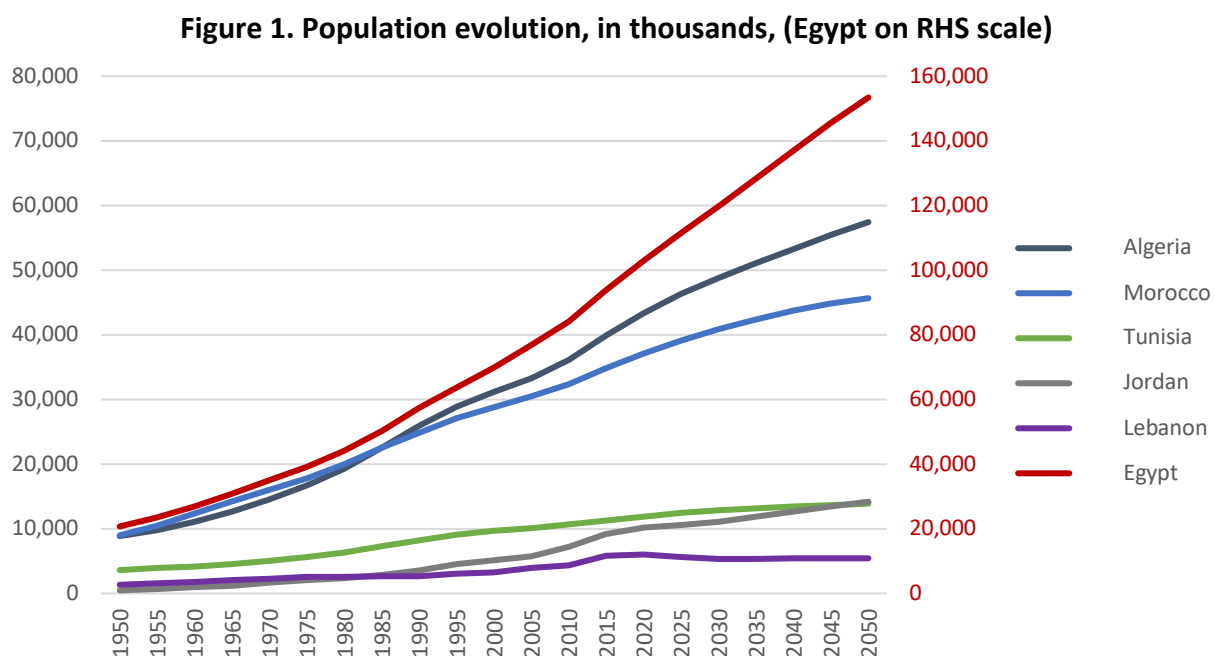
³ This point presupposes that education increases the chances of migration, which may or may not be true in some contexts where it is difficult for legal migration channels to lead to highly skilled jobs.

highly skilled individuals leads to a 5% increase in human capital formation amongst the native-born population.

MIGRATION PATTERNS FROM THE SOUTH MED REGION

Given the various dimensions of heterogeneity in population structures (e.g. size, migrant share, educational attainment) amongst the countries in the South Med region, we inspect recent population trends and prospects, before discussing migration patterns.

Figure 1 illustrates population evolution over 100 years, until 2050, based on UN data from 2017. It clearly shows not only large differences in the size of the countries in the South Med region, but also very different patterns for the next three decades. Population growth is expected to continue in Morocco, and even more in Algeria and Egypt, which appear to be on an explosive path. By contrast, the smaller countries, Tunisia and Lebanon, are expected to experience relatively low population growth. Jordan is an exception, as population dynamics have been severely affected by the large inflow of migrants, especially refugees from Syria. As illustrated below, emigrant shares from these countries are not always aligned with population size.



Source: UN, world population prospects 2017

The large-scale emigration from Mediterranean Arab countries started since 1950 (Fargues and Fandrich, 2012). By the time of the Arab Spring, there were already nearly 7.5 million first-generation immigrants from the region residing mostly in European countries (62%), followed by other Arab states in the Gulf (20%) and other parts of the world (11%) (see **Table 1**). Amongst the European countries, the main destinations are France, Spain and Italy (these are also the closest neighbours to the other side of the Mediterranean Sea), followed by Belgium, the Netherlands and Germany.

Whilst most of the countries in the South Med region were above average sending countries of international migrants, Libya has been a major receiver of international migrants, due to its oil producing sector. Jordan has also been host to international migrants (i.e. refugees or illegal) mainly from neighbouring countries (Iraq and Syria). More recently, Algeria, Morocco and Tunisia have also received migrants from Sub-Saharan Africa, including undocumented workers, unrecognised refugees and transit migrants (Fargues and Fandrich, 2012).

**Table 1. Migrants originating from Arab Mediterranean countries
by region of residence, 2011 census**

Country of origin	Country of residence					Total	In percentage of total population
	EU	Gulf	Libya	Other Arab Countries	Other Countries		
Morocco	2,390,174	46,544	19,839	26,279	92,522	2,575,358	8.1%
Algeria	1,475,662	19,595	4,593	21,850	56,310	1,578,010	4.4%
Tunisia	516,440	15,985	14,124	11,311	20,308	578,168	5.5%
Egypt	199,153	1,132,091	164,348	121,082	226,661	1,843,335	2.3%
Jordan	25,745	168,668	2,053	48,990	78,195	323,651	5.2%
Lebanon	153,196	52,543	966	6,635	296,065	509,405	12.0%
Total	4,760,370	1,435,426	205,923	236,147	770,061	7,407,927	

Source: Based on Fargues and Fandrich (2012), based on national census data compiled for CARIM project and using the most recent available 2011 data.

According to **Table 1**, Morocco is at the top of the list in terms of migration size in absolute numbers (2.6 million emigrants), whilst Lebanon ranks first when considering the relative population size of migrants (0.5 million Lebanese emigrants make up 12% of the total population of Lebanon). Egypt and Algeria follow Morocco, in terms of the size of their population residing abroad (with 1.8 and 1.6 million, respectively). Tunisia and Jordan have similar percentages of migrants amongst their total population, which is slightly above 5%.

Musette (2016), with a focus on the Maghreb region, reports that, as of 2015, there are nearly 5 million immigrants in the World from Maghreb countries (Algeria, Morocco and Tunisia), of which nearly 90% live in Europe. In particular, the Maghrebi immigration has been mainly permanent, particularly to France due to colonial links, even though Belgium, Germany, the Netherlands and Spain have also been amongst the lists of preferred destinations.

As described by Talani (2014), emigration from Egypt over the last decades can be characterised by several phases, but it has been mainly of a temporary nature – with an important amount of return migration – and to Arab oil-producing countries in the Gulf. Nevertheless, there has been a significant increase in permanent migration to the more developed countries since mid-1990s (Talani, 2014).

Education, unemployment and emigration

There is significant literature on determinants of migration flows.⁴ Wage gap between origin and destination country, cultural and geographical proximity, as well networks at destination, are amongst the main factors affecting migration decisions.

Cross-country wage gaps and unemployment rate differentials have always been considered as two key pull/push factors in explaining both skilled and unskilled migration patterns from the South Med. Fargues and Fandrich (2012) highlight that the economic reasons, including unemployment and under-employment, wage differentials between the North and South, as well as the attraction of Europe for gaining skills and access to education, have been amongst the main drivers of migration from the South Med countries in the post-2000 period up until the Arab Spring. The authors also argue that the reasons for migration have not changed substantially since the Arab Spring of 2011, possibly slightly intensifying due to increased political instability and uncertainty. Except for the temporary movement from Tunisia, migration patterns to Europe have not been accelerated by the Arab Spring in the immediate term, rather they have continued along previous trends to 2012.⁵ This proposition, that the political situation in the region did not result in a significant change from the former trends of legal migration to Europe, is also supported by other research (De Haas and Sigona, 2012; Talani, 2014). However, irregular and undocumented migration, as well as intra-regional migration (e.g. from Libya to Tunisia) in the South Med region, have increased since the political turmoil (see Alcidi et al., 2019).

⁴ See e.g. Beine et al. (2016)

⁵ Given the year it was written, the paper of Fargues and Fandrich (2012) does not include the recent refugee migration in subsequent years.

However, as David and Marouani (2016) highlighted, the general uncertainty about the future amongst the young (further fuelled by the political developments of the post-Arab Spring) contributed as another push factor from the region- and continues to do so. This is likely to be particularly relevant amongst the highly educated.

Besides wage and unemployment differentials and political instability, there is a growing interest within economic literature and amongst policy makers in understanding the role other factors play as to why people decide to move. Atoyán et al. (2016) find that emigrants leave countries with weak institutions and travel to countries those with strong institutions. This is not unrelated to political instability, but it is a broader factor that also holds true amongst more developed countries and appears to particularly matter for skilled migrants. Quality of institutions, economic prospects and opportunities, including for children, may heavily influence intentions about moving to another country.⁶ This hypothesis seems to be highly relevant in the current context of Algeria and Tunisia, where high youth unemployment and lack of future prospects are fuelling widespread protest movements and social discontent, which are likely to lead to additional emigration.

The following sections look more in depth at specific features of Tunisia and Egypt. The two countries represent the heterogeneity of the region, but they are also the two countries for which data, despite being limited, is available. In terms of size, Egypt is the largest in the region and its population is expected to increase by more than 50% in the next 30 years. Tunisia, meanwhile, is amongst the smallest countries, with about one tenth of the population of Egypt, with demographic developments that are expected to remain broadly stable. In terms of educational attainment, both countries experienced a substantial increase in the share of highly educated citizens over the last two decades. Yet, in Tunisia, where the increase has been more marked, market outcomes are poorer. Lastly, in terms of destination, Tunisians have always favoured the EU, whilst Gulf countries have represented the main destination of emigrants from Egypt.

⁶ In theory, brain drain can also happen in developed countries and, indeed, there has been emigration amongst highly skilled individuals in rich countries over the last decades, e.g. European scientists migrating to the US or Canada; however, the extent – both in absolute and relative numbers – of such flows is much smaller compared to that of developing countries. Moreover, the emigration of highly skilled individuals from developed countries does not substantially decrease the stock of existing highly skilled individuals in those countries so as to create concern for the level of general human capital and economic development.

Education, unemployment and emigration

Migration patterns in Tunisia have mainly been characterised by extra-regional population movements, with the EU being the main destination. Amongst European countries, France has been the preferred choice, followed by Italy and Germany. By 2009, around 80% of Tunisian migrants were residing in Europe (Talani, 2014). As reported in Alcidi et al. (2019), more than 0.5 million residence permits have been issued to Tunisians by EU member states between 2008 and 2017 (for a population of 11 million).⁷

Given the high propensity to emigrate, the Tunisian government has traditionally prioritised emigration policies along two main axes: the first one promotes legal migration through agreements with European and non-European countries (e.g. Canada and Australia)⁸, and the second one has focussed on strengthening the links with Tunisian diaspora abroad, in order to encourage investment in the origin country. However, Talani (2014) asserts that these policies have not worked effectively and have not prevented or even reduced irregular migration.

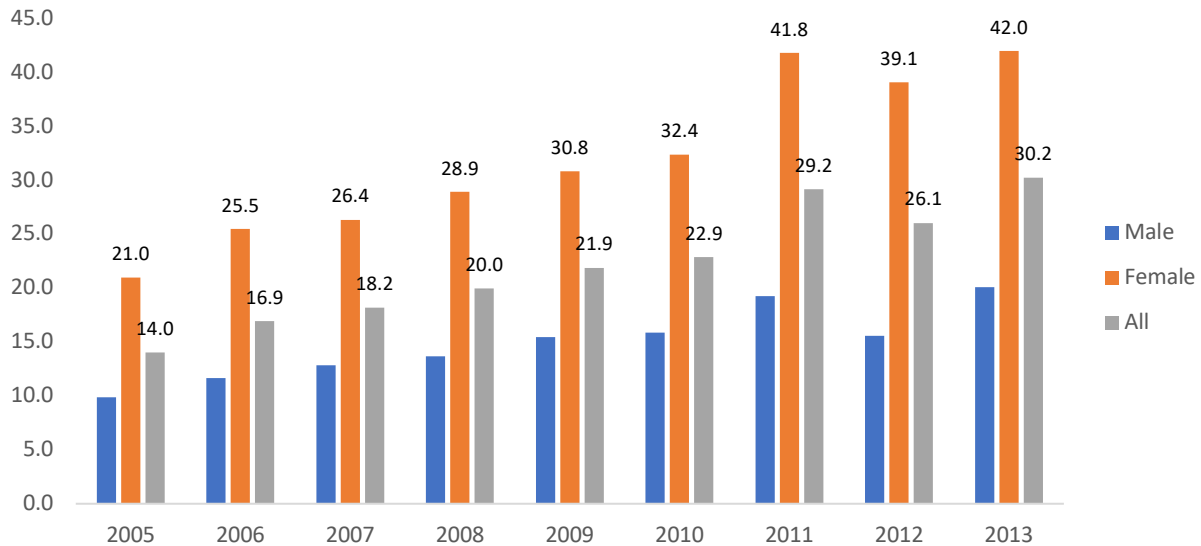
The marginalisation of Tunisia from the global economy, perceived as a lack of economic opportunities for skilled workers, has been considered the main push factor for emigration of highly educated Tunisians. The evolution of the unemployment rate by the level of education in Tunisia, up to 2009, suggests that the unemployment rate amongst higher educated Tunisians increased nearly 10 fold in 25 years, from 2.3% in 1984 to 21.6% in 2009.

At the same time, the number of highly educated migrants abroad increased by more than 30% in 2007 and 2008 compared to the average for the period between 2001 and 2007. This seems to point to a brain drain issue from Tunisia. In more recent years, unemployment of the highly educated has actually increased, reaching close to 30% in 2013. Detailed data illustrates that such a high percentage is mostly driven by women with tertiary education, amongst which the unemployment rate is above 40% (See **Figure 2**).

⁷ One of the most important aspects of Tunisian migration relates to the size and importance of remittances sent by Tunisians back home. It is estimated that remittances represent more than 4% (it was above 5% in 2015) of GDP, mainly come from Tunisians living in Europe.

⁸ For more information and discussion on legal migration pathways from Southern Mediterranean to Europe, see Alcidi et al. (2019).

Figure 2. Tunisia - Unemployment rates of the highly educated, by sex



Source: World Bank, World development indicators

A World Bank report (2014) provides more detailed evidence about education and unemployment, based on a survey focussing on urban areas. It finds that unemployment rates are especially high amongst individuals with tertiary education in urban areas, in the interior and southern regions, where the (total) unemployment rate amongst university graduates reaches levels approaching 40%.

Such a large labour market failure seems to be explained by a combination of factors and not only by the lack of opportunities, which usually are increased by the presence of educated people. Despite high enrolment rates, educational outcomes are poor across Tunisia. The 2011 TIMSS survey indicates that 75 % of eighth graders in Tunisia perform “low” and “below low” in mathematics, despite marginal improvements over time. Like other North African countries, Tunisia performs much lower than similar middle-income countries in other regions (Mullis et al., 2012). Overall, secondary schools do not seem to provide students with the basic competences necessary to competitively perform in a globalised economy (World Bank, 2014). Poor educational outcome could also explain why migrants with high education may end up unemployed or in low skilled jobs, as their qualifications are not sufficiently competitive in the destination countries.

Moreover, there appears to be a preference for public sector employment, due to the secure nature of such jobs and other benefits attached to them (e.g. retirement and health insurance coverage) compared to more limited private sector jobs in these countries (ILO, 2017). However, job vacancies

in the public sector are limited and, hence, the lack of vacant public sector jobs and limited initiative to create new business, results in highly educated individuals seeking work abroad. The quality of jobs, as much as their availability, also matters. In most countries in the region, informality, nepotism and vulnerable employment are part of the reality for youths (Arslan et al. 2014; ILO, 2017), who then prefer to look for opportunities abroad rather than to create new opportunities in the origin country. In this negative circle, it makes it increasingly more difficult for highly educated individuals to find appropriate jobs at home. Consistently, anecdotal evidence also appears to suggest that migration decisions were largely driven by lack of appropriate job opportunities in the home country, more than political repression (Talani, 2014).

Egypt: Unemployment and intentions to migrate

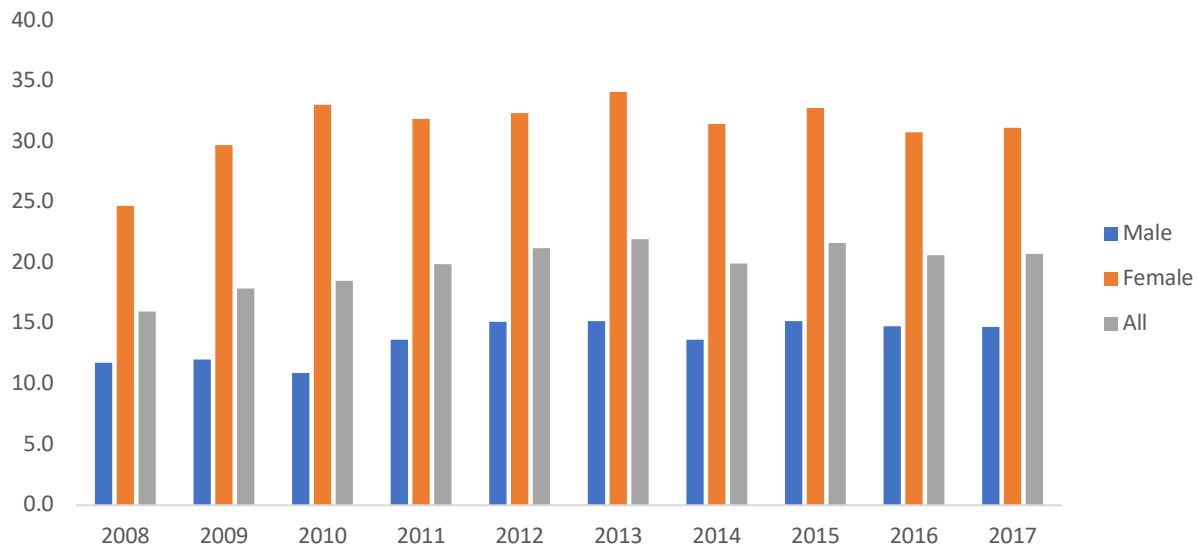
Migration in Egypt is rather different from Tunisia and other Maghreb countries considered in this study. As already mentioned earlier, Gulf countries have been the main destination of the Egyptian workforce, mostly composed of low skilled workers.

Talani (2014) analyses the permanent migrants from Egypt by educational attainment between 2000 and 2007. She finds that the peak of Egyptian migrating with a university degree was in 2001, after which numbers dropped substantially. Since 2010 (the only period for which some data is available, see **Figure 5** in the next section) educational attainment has increased substantially in Egypt.⁹ For young cohorts (20-39), by 2020, the share of individuals with post-secondary education is expected to be above 20% with more than 50% of those having upper secondary education.

Despite such a good record in educational attainment, the level of unemployment is high in the country including amongst the higher educated (see **Figure 3**). Unemployment rates of the highly educated are lower than in Tunisia, but still at around 20%. Similar to Tunisia, the female population is the most hit by unemployment, with rates which are double that of the male population, at above 30%.

⁹ See also Biltagy (2018)

Figure 3. Egypt - Unemployment rates of highly educated, by sex, (20-64)



Source: World Bank, World Development Indicators

When looking at the youth sector, which is a key segment of the population for a country growing at a fast rate, unemployment is very high and education does not necessarily seem to be a solution, especially for women. According to Dimova et al. (2016), the unemployment rate is dramatic amongst women with secondary vocational degrees (59.1 per cent) and with university degrees (57.8 per cent). However, the trend is counter to that for young males, for whom the unemployment rate of secondary vocational graduates is lower than for university graduates (12.7 and 21.9% respectively). Although the literature suggests an overall poor quality of vocational training in Egypt (Krafft, 2013) the facts point to the existence of a market for young men graduating with vocational skills in the country. The same cannot be said for young Egyptian women. To fully understand the differences in unemployment trends across educational categories and by sex would require a much more rigorous analysis of demand, supply-side constraints and also social norms.

In this context, migration is often seen as a safety valve. The results from an IOM survey, talking to Egyptians in 2011 about the motivations for migration, point to economic reasons such as the low chance of employment, low wages and salaries, followed by corruption, security, education and health, as being amongst the main push factors of migration from Egypt (for more details, see the Box 1).

BOX 1: Emigration intentions of youth: case study of Egypt in 2009 and 2014

Using the Panel Survey Data of Young Egyptian Adults (HSYPE),¹⁰ this box studies emigration intentions of Egyptian youths in 2009 and 2014. We examine the main destinations, reasons for migration, and sources of information, as well as comparing how migration intentions vary across education levels.

Intention to migrate. This is proxied by the following question: “Do you intend to travel to any country to work, live, or study?” Whilst not all intentions will eventually lead to actual migration, they serve as a good predictor for future migration decisions (see e.g. Creighton, 2013) and have been widely used in migration literature. Amongst the surveyed Egyptian youths (17-35 years old), 14% wanted to migrate in 2009, whilst only 8% intended to do so in 2014.

Migration destinations. The majority of young Egyptians intended to migrate to other countries in the MENA region, whilst only 16% named Europe as the preferred destination in 2009 and 9.5% in 2014. This reflects the existing distribution of Egyptian migrants abroad: most of them remain in the region, whilst only 8.5% reside in EU member states (UN Migration Matrix data from 2017). There is also a decrease in the number of would-be migrants choosing Europe as a destination between 2009 and 2014, which is consistent with the actual decrease in migration flows between Egypt and the EU during this period, mainly due to the economic downturn in Italy – the main destination for Egyptian migrants in the EU.

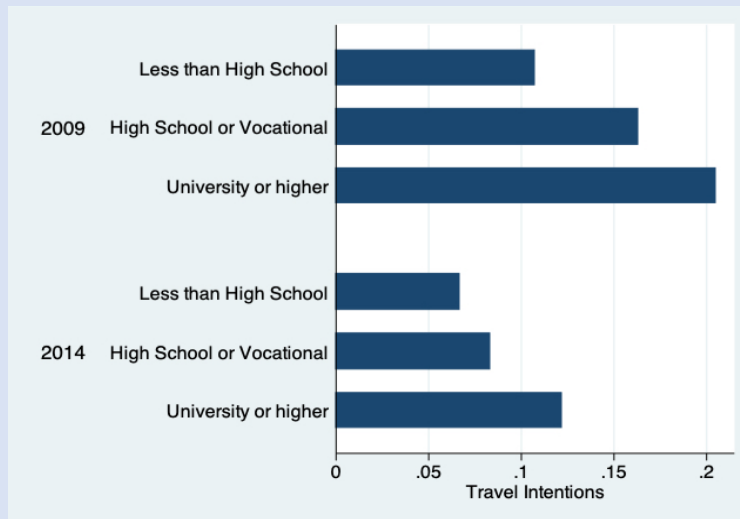
Reasons for migration. Economic reasons remain the core incentive for migration amongst youths. For those, who chose Europe as their destination in 2009, 60% mentioned economic reasons, whilst less than 1% referred to family reunification; in 2014, these numbers were 22% and 1.7%, respectively. The share of those who want to migrate to Europe for study reasons increased drastically from 4.2% in 2009 to 30.5% in 2014. These figures, however, appear at odds with the actual data on issued residency permits to Egyptian nationals by EU member states. For instance, from 2008-17, permits for family reunification accounted for 39% of all residency permits issued to Egyptians by EU member states (based on Eurostat data). This could indicate that, in the absence of effective pathways for work or studies, migrants from Egypt resort to more accessible family channels for migration.

Information sources used by would-be migrants. Close to 80% of potential migrants in both 2009 and 2014 reported relying on the information passed on by friends and relatives, which is representative of most developing countries. Nevertheless, with the growing availability of the Internet, its usage for obtaining migration-relevant information has risen from 2% in 2009 to 7.6% in 2014.

Migration intentions by education. By looking at simple averages, intentions to migrate increase with the level of education (Figures below). Whilst other factors correlated with education can play a part, and can even be conditional on observable characteristics (e.g. gender, age, marital status, disposable income, place of residence, year of the survey), young people with tertiary education are 7.2% more likely to have migration aspirations than those without a high school degree, according to econometric analysis. One of the explanations is the high unemployment rate amongst young skilled Egyptians – about 20% of individuals with at least a tertiary degree reported to be unemployed in 2014. Amongst those with primary education, unemployment constituted only 7% (Roushdy and Sieverding, 2015).

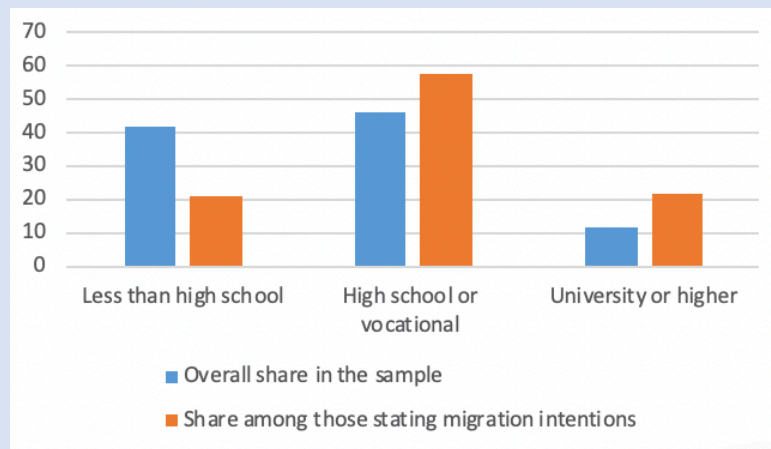
¹⁰ <http://www.erfdataportal.com/index.php/catalog/131>

Migration intentions by education



Source: Panel Survey Data of Young Egyptian Adults (HSYPE).

Education composition of the overall sample vs. would-be migrants



Source: Panel Survey Data of Young Egyptian Adults (HSYPE).

The effect of the Arab Spring. The survey asks directly if the events of January 25, 2011 affected the decision to migrate. Although one might expect a positive association due to the increased political instability, 91% of the respondents state that the revolution had not changed their migration decision. One explanation is that labour demand in traditional destination countries of Egyptian migrants also decreased between 2009 and 2014, e.g. due to the political instability in Libya or the economic downturn in Italy. Another possibility is that, individuals whose migration intentions had been affected, had already left the country prior to 2014 and are thus not captured in the survey.

BRAIN DRAIN IN SOUTH MED COUNTRIES: A NUANCED EVIDENCE

Assessing the issue of brain drain in the Southern Mediterranean is a difficult exercise due to data limitations, but also because of the important country heterogeneity generating between different migration patterns in the region. As illustrated by the cases of Tunisia and Egypt, countries in the region are quite different in terms of size, composition of human capital,¹¹ historical and cultural links with the destination countries and existing policies at origin towards emigration (i.e. openness to migration). Each of these dimensions and their interactions lead to different directions when assessing the extent of brain drain.

Despite some overlaps, there are historical differences in the destination choices of these migrants and their composition: those who migrate to Europe tend to be more highly skilled, whilst those who migrate to the Gulf countries tend to be lower skilled, hence brain drain is not necessarily a concern in the latter case. This clearly affects the extent and the effects of the brain drain phenomenon in South Med countries.

Özden (2006) argues that the important element to ascertain the existence and relevance of the brain drain debate is to know what percentage of the educated population eventually migrates. If the educated labour force in the sending country is large enough so that educated migrants only form a small group of those leaving, then the economic impact of migration is not necessarily negative for the sending country. The brain drain concern arises when highly educated migrants form a large share of the overall educated labour force, as usually happens in poorer countries.

Looking at data for 1990 and 2000, Özden (2006) highlights that there is a slight decrease in the share of tertiary educated migrants amongst the tertiary educated population in the South Med countries over time. Looking at the actual shares in 2000, Lebanon had the highest share of tertiary educated migrants amongst tertiary educated natives (nearly 40% in 2000), whilst for Morocco, Tunisia and Algeria, the corresponding shares are around 18%, 12% and 10%, respectively, in 2000. The figures are much smaller in Egypt (both less than 5%).

Looking at data in 2010, Musette (2016) focuses on the brain drain phenomenon in Algeria, Morocco and Tunisia. He reports that there were about 800,000 highly skilled Maghrebi immigrants in OECD countries, which is nearly twice the share in 1990. He also points to the different rates of increase in

¹¹ The next section describes the evolution of the educational attainment in the South Med countries.

this share across the three countries, whereby Algeria has seen the largest increase: from only 5% of highly skilled migrants in 1990 to 21% in 2010, corresponding to a four-fold increase in the share of highly skilled migrants. The corresponding increases in the share of highly skilled migrants from Tunisia and Morocco are 2 and 1.5, respectively. More than 300,000 active and highly educated Maghrebi migrants reside in France, which is the favourite destination country. He also highlights that whilst these migrants are highly educated, there appears to be a brain waste at destination, where these migrants are often underpaid and/or overqualified for their jobs (Musette, 2016). The author supports this point by using the French Labour Force Survey from 2012, analysing the earnings of skilled migrants from Maghreb in France. Looking at the labour market outcomes of immigrants in France, Akgüç and Ferrer (2015) also show that migrants from Maghreb countries are underpaid, compared to their native-born counterparts allowing for a number of background characteristics. One explanation for this gap, they argue, is the place of education: those migrants who come at a younger age and receive their education at destination do not suffer from lower wages, hinting to the difficulties of qualification recognition between origin and destination (France in this case). As discussed above, the latter issue is likely to be related to the quality of human capital accumulated at origin (see also Özden, 2006). Overall, whilst emigrating educated individuals create a brain drain concern at origin, they might actually not be used most productively at destination, thus leading to brain waste rather than gain.

Recent empirical evidence

In this section, we attempt to provide evidence and discuss the extent of brain drain in South Med countries after 2010, combining data from the OECD, the World Bank and Eurostat.¹²

Our empirical analysis consists of three parts: first, we look at the composition of the education level of the population at origin, broken down by gender in 2010, 2015 and 2020 (with projections for the latter year). This allows one to observe the general patterns in the evolution of educational attainment for the current decade and gives insights about the pool of potential migrants.

Next, we plot the share of highly educated amongst the resident population at origin (i.e. stayers) against the share of highly educated amongst the migrants from these countries, in 2010 and 2015.¹³ The last plot allows one to assess the brain drain phenomenon, by looking at whether there are

¹² See Annex I for more details on the data sources used in this section.

¹³ We have also plotted the parallel figures for low and medium skill levels; these figures are displayed in the Annex II.

significant changes in the shares of highly skilled migrant compared to the highly skilled population at origin, following the recent political developments (e.g. Arab Spring) in the relevant countries.

Finally, we inspect the evolution of the share of the highly educated migrant population from North Africa (namely, Algeria, Egypt, Libya, Morocco and Tunisia) by employment status, from 2007-2017 in the EU28 countries. This shows how the labour market status of highly skilled migrants from these countries evolved at the destination in recent years.

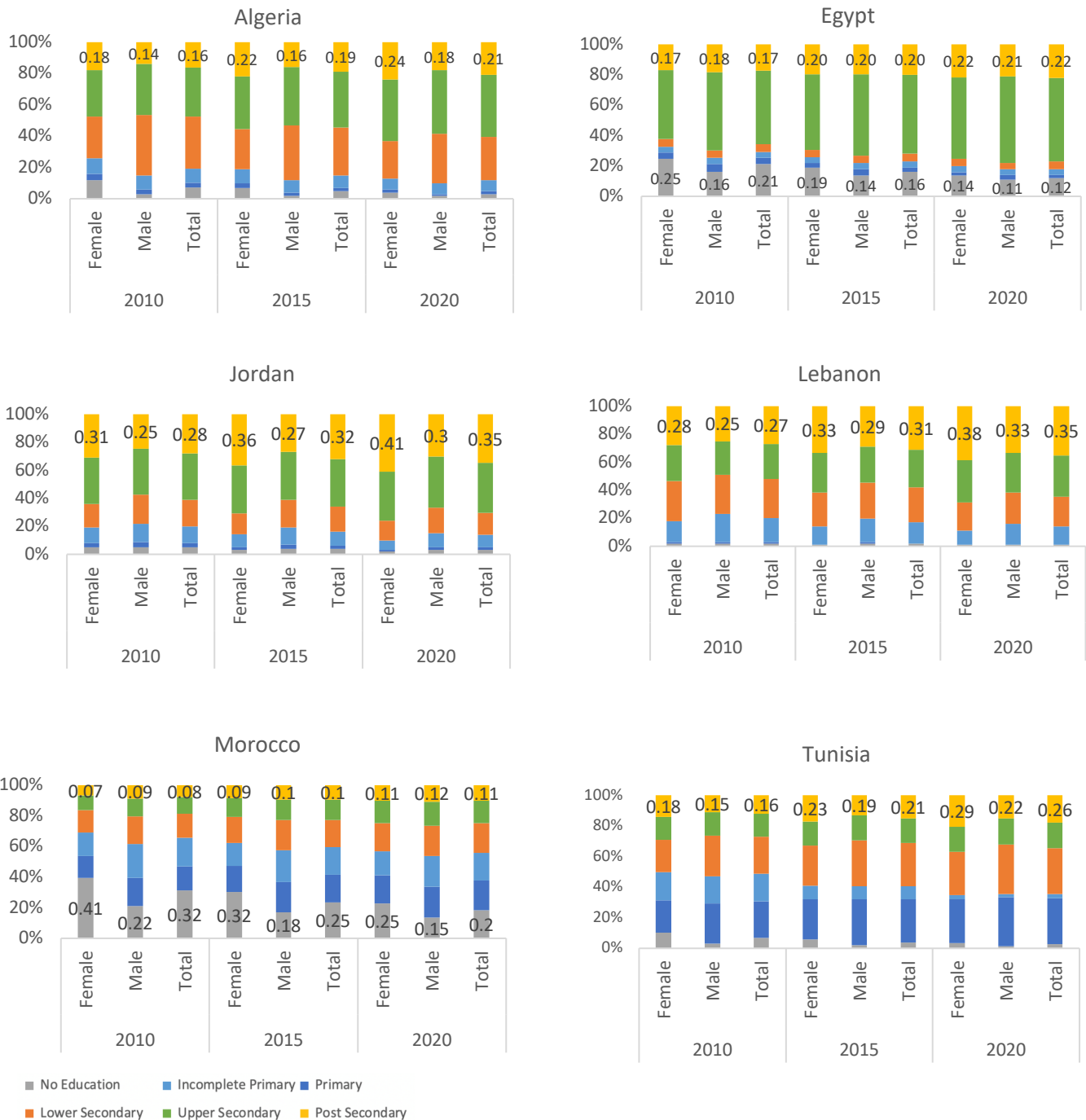
Educational attainments

Data on educational attainments of individuals, aged between 20 and 39, in South Med countries (Algeria, Egypt, Jordan, Lebanon, Morocco and Tunisia) from 2010, 2015 and 2020 (with projections) suggest a continued progression in education for each of the six countries (See **Figure 4**).

On closer inspection of the data, three elements stand out. Despite growing improvements, in Morocco and Egypt the share of the population with no education, whilst declining, is still high (above 20%). This is especially true for women. Second, tertiary education of younger cohorts is largely a female phenomenon, in the sense that the share of the population with tertiary education will be systematically higher for women than for men by 2020 (in every country, except Morocco). This means that women are affected at the two extremes of the educational range.

Third, Lebanon and Jordan are different from the other countries, when it comes to education. The share of population with tertiary education is much higher than in the other four countries and this was already the case in 2010.

Figure 4. Educational attainment (20-39) by level and gender in South Med countries (2010-2020)



Source: World Bank Development Indicators,

Notes: The figures refer to youth population aged between 20 and 39.

Against such a general improvement in the education of population, especially amongst the young, a follow up question would relate to their market outcomes in the home country. Unfortunately, data availability about employment by education is very poor. The World Bank only provides data for Egypt and Tunisia, which were commented on earlier. If the experience of these two countries is of any guide for Morocco and Algeria (Jordan and Lebanon seem different), a higher share of highly educated individuals in the population will not automatically lead to higher levels of unemployment. What is even more surprising is that unemployment seems to particularly affect those with tertiary education (especially the case in Tunisia) and women.¹⁴

In Jordan and Lebanon, unemployment rates amongst university graduates are not significantly higher than those of graduates with lower levels of educational achievement. These countries also differ in that the female youth unemployment rates for university graduates are lower than those of young women with primary education and post-secondary vocational training.

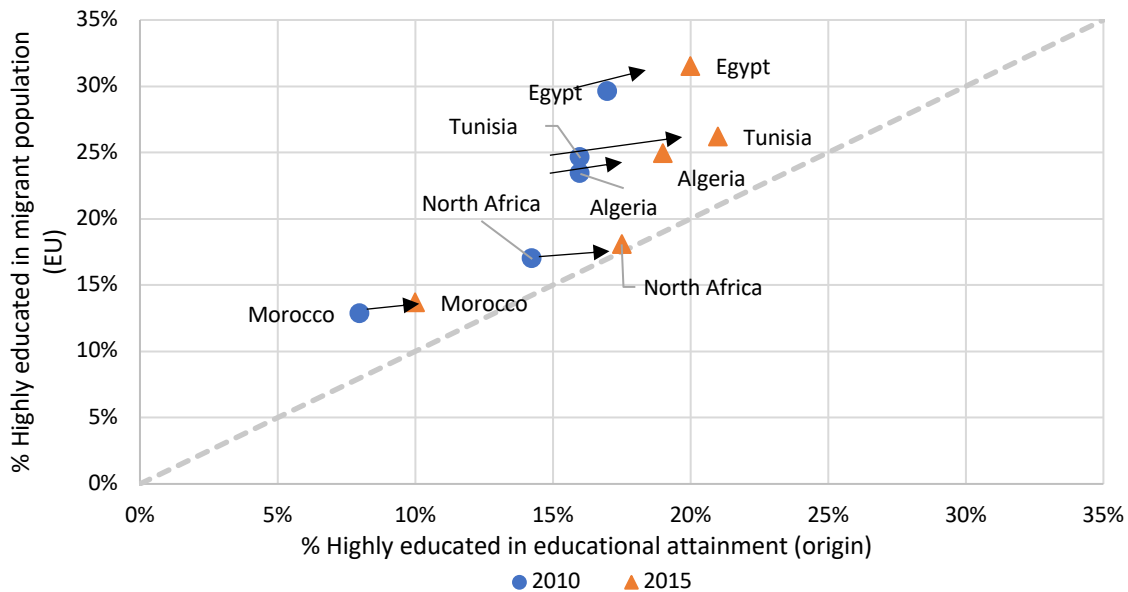
Whilst there are many potential explanations for such outcomes, as far as the situation remains unchanged, a key consequence of this is that the outflow of people from countries with high unemployment amongst the highly educated is likely to increase. This is simply due to the fact that highly educated individuals are more mobile and have a higher probability of finding a job with better pay.

Education and migration

In order to investigate how improved educational qualification of the population translates into migration of the highly educated and potentially brain drain, **Figure 5** plots the share of highly educated migrants at the EU destination (vertical axis) against those of the native-born population at the origin country (horizontal axis) in the years 2010 and 2015 for individual countries (Algeria, Egypt, Morocco and Tunisia) and a regional aggregate (North Africa).

¹⁴ See Ayadi and Mouelhi (2018) on education, labour force participation and entrepreneurship of women in the MENA region.

Figure 5. Shares of high educational attainment amongst migrants vs. non-migrants at origin



Source: Authors' own elaboration based on World Bank Development Indicators and Eurostat LFS

As all the data points are strictly above the 45° line for every country, this suggests that there are more highly educated migrants than amongst the population at origin. This could be interpreted as evidence of brain drain in the region. However, the distance from the line is rather limited and the change between 2010 and 2015 does not signal any amplification of the phenomenon. A general increase in share of highly educated individuals appears in all countries from 2010 to 2015 (i.e. looking at the horizontal axis, all triangles are to the right of circles), but the increase in the share of highly skilled emigrants is less strong (i.e. looking at the vertical axis, all triangles are either at the same level as – or slightly above – the circles).

The second observation makes the brain drain evidence less acute; it could even be aligned with the brain gain phenomenon, in the sense that highly educated migrants may contribute to an increase in educational attainment at home. Brain drain is shown to be associated with increased levels of overall educational attainment at origin (e.g. Beine et al, 2008; Gibson and McKenzie, 2011), as education increases the chances of successful emigration. Thus, the prospect of migration results in an increase in the educational level not only for leavers, but also stayers, who at some point would perhaps migrate. Musette (2016) refers to this phenomenon in his analysis of skilled migration in Maghrebi countries.

Labour market outcomes of highly educated migrants

Between 2007 and 2017, the number of young (18-34) migrants with tertiary education from North Africa (Algeria, Egypt, Morocco and Tunisia) to the EU increased from about 140,000 to almost 225,000 (**Figure 6**). This is equivalent to an increase in the highly educated share within the total number of young migrants from 14.6% to 21.4% (Figure 7).

Figure 6. Share of highly educated emigrants (18-34) by employment status (from North-Africa to EU28) as % of total emigrants

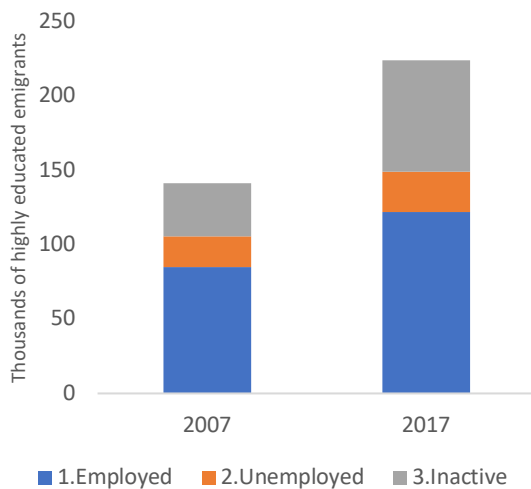
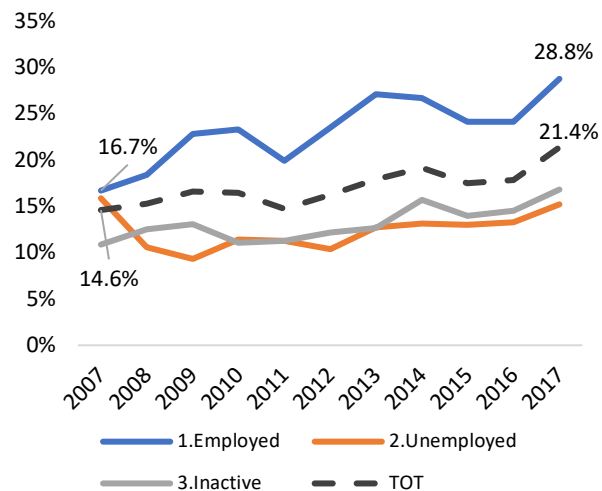


Figure 7. Highly educated emigrants (from North-Africa to EU28) as % of employment status classes



Source: Own elaboration, based on European Labour Force Surveys provided by Eurostat

Note: Here we do not consider Jordan and Lebanon because of the Eurostat country grouping. The Near-Middle East group, which includes Lebanon and Jordan, considers several additional countries which have very different features than North Africa.

Over the same period, within the total number of young migrants with higher education, the share of those employed declined from 60.2% to 54.4% and the share of those unemployed declined by a similar proportion; however, the share of those who were inactive increased substantially from around 25% to 33.4% (**Figure 6**). It should be noticed that, between 2007 and 2017, when considering all levels of education, the total number of young migrants did not increase much, but the rate of employment

declined by about 12 percentage points and the one relating to inactivity increased by 8 percentage points.

In this negative framework, the performance of the highly educated is better than for the other categories. The share of highly educated amongst total young emigrants with a job (employed in **Figure 7**) increased significantly, from 16.7% in 2007 to 28.8% in 2017. However, given the substantial increase in the flows of those with higher education, the share of those unemployed and inactive also increased, making up more than 30% within the two groups. There are several possible explanations for this finding, but the economic crisis in the euro area and the increase in unemployment, which is very strong in certain countries which are the natural destination of those migrants, certainly played an important role. The effect of the crisis is likely to have hit migrants irrespective of their education level.

This finding hints at a possible brain waste of young highly educated migrants, who struggle to find jobs in destination countries. These findings confirm the evidence also highlighted by other researchers (Özden, 2006; Akgüç and Ferrer, 2015; Musette, 2016, among others). We also note that the figures above only show the average shares at the European level; the country-specific share of unemployed or inactives could be different (and even higher) depending on the destination country.

What is the impact in the sending countries?

A crucial question pertains as to what the impact is of such phenomenon on the sending countries. There are two sets of effects with a potentially opposing impact, which have to be considered. The first one is the traditional brain drain effect, with loss of human capital and lower potential growth rates, built on the evidence that an increasing number of migrants have a higher education. However, as illustrated above, in a context of demographic expansion and a growing share of the native population with tertiary educational attainment, the risk seems limited. Furthermore, and more importantly, the high rate of unemployment at home, also amongst those with tertiary education, points to migration more as a safety valve in response to domestic labour market failure, than loss of human capital.

As matter of fact, the emigration of highly skilled individuals is sometimes seen as a relief for policymakers in the origin country, since the departure of skilled and unemployed people is expected to decrease the tension in local labour markets and decrease unemployment (IOM, 2004), given the incapacity of local economies to generate jobs.

In addition, and as mentioned above, there can also be positive externalities related to skilled emigration. Remittances increase when the senders are more educated and this provides further income transfers to the origin country. Most countries in the South Med region are net beneficiaries of remittances. These findings are in line with what is found in general in developing countries (e.g. McKenzie and Rapoport, 2011; Bollard et al., 2011, among others).

Educated immigrants can also send cultural and knowledge remittances, which are not measurable financial benefits, but take the form of ideas and values that migrants adopt from destination countries and transfer to origin countries.¹⁵ Since highly educated migrants are more open to learn and adapt to the values of where they migrate, the support that emigrants showed towards manifestations for democracy in Tunisia and Egypt (De Haas and Sigona, 2012) could contribute to cultural remittances.

POLICY CONCLUSIONS

Both the review of literature and the evidence presented support the fact that a substantial share of outflows from the South Med region to the EU are of individuals with tertiary education (more than 20%, amongst youths, in 2017). However, dynamics and patterns of migration vary amongst the countries of the region, which implies that the extent and impact of such outflows hint towards important heterogeneities amongst the countries under consideration. Second, even when looking at the most vulnerable countries, the extent of brain drain in the South Med region is not as strong as in Sub-Saharan Africa. Third, and most importantly, there is strong evidence that educational attainment in the population is increasing in the region. This is, on the one hand, a strong predictor of migration. The highly educated are more mobile. On the other hand, the scale of the phenomenon reduces concern about brain drain. The share of highly educated individuals amongst those who stay is still increasing, more so in most countries than those who choose to leave. When the overall increase in educational attainment at home is ignored, one can mistakenly exaggerate the extent of brain drain.

Whilst factors like political instability and migrant networks can play an important role in fostering outflows, economic considerations are the dominant push factor in the region. As long as differences in wages between origin and destination exist but, more than anything, job opportunities in the origin country are lacking, there will be a tendency towards migration of educated individuals. However, provided that this out-migration process does not disrupt the functioning of the origin economies, the

¹⁵ See Venturini (2017) for an overview of cultural remittances.

migration of educated individuals is not necessarily affecting the long term growth perspective and may even have a positive impact.

This is the case, for a number of reasons. The main one relates to remittances (both financial and cultural) through migrants. Both seem important for the region. The second reason is related to the effect of potential migration on the willingness to increase educational attainment (the brain gain phenomenon). In practice, this is likely to result in a larger share of highly educated individuals amongst the young cohorts. The third reason is that, according to current data, educated people remaining in the home country have a high probability of remaining unemployed. This is costly for the state and typically contributes to political instability, as no hope for a better future can easily lead to protest movements. It is for these reasons that some governments in the region have favoured emigration, which works as a safety valve. Whilst this can be a temporary solution, it signals a fundamental contradiction in policy, between investing in education and losing the return on it.

In terms of policy, the key question is not about brain drain, which is a symptom, but rather it is about how to restore a positive dynamic between the creation of human capital and potential growth. Growth policies across the world are inspired by the idea that human capital is, and will increasingly be, the main driver of growth. Therefore, the question is: why is the increase in the share of population with secondary and tertiary education not leading to economic development and job creation?

The analysis points to issues in several areas, like non-targeted education policies, the general preference for the public sector as the employer and the lack of an environment suitable for private sector development. Policies should, and can, address these issues.

In relation to education, three main points should be considered. First, quality is more important than quantity. Improvements in education quality would lead to better labour market outcomes, both for those who stay and those who leave. Second, university degrees should prepare people for private sector jobs and not only for the public sector. This may be a particularly important issue for women, who are expected to be more educated than men by 2020 in all countries of the region and tend to be employed in the public sector. Third, opportunities linked to technological development need to be better exploited in universities, both by increased development of STEM disciplines and better knowledge of digital technologies across all disciplines.

In relation to the business environment, the development of a successful business requires the capacity to access funds, but the quality of both public and market institutions is also of crucial importance. Corruption and nepotism, together with obstacles to doing business, are extremely detrimental to new business initiatives and to potential growth. This is a fact across all countries, not

only in this region. Change requires a fundamental transformation, which is usually very slow, but can result in a dramatic shift away from the status quo, which is keeping these countries in a trap.

In addition, migration policies and partnerships with destination countries remain very important, as the migration outflow will continue and will increasingly concern educated individuals. Partnerships with EU member states could be pursued to encourage legal migration channels which lead to employment (also see Alcidi et al., 2019, on such policies). This could help to reduce brain waste, which can happen when educated individuals migrate and end up in lower-end jobs with lower salaries compared to their native-born counterparts. If the reason for brain waste is due to problems surrounding diploma recognition, origin countries could take steps to negotiate with destination countries to find solutions for this friction. In addition, such programmes could help redefine specific training and qualification that could serve both the local and destination market, thus also increasing the employability of those remaining at home (e.g. see Global Skills Partnership scheme, described by Clemens, 2017). Overeducated and low paid skilled migrants are not a desired outcome for the sending country. Moreover, the connections with diaspora should also be strengthened in order to develop further economic linkages with origin.

Finally, in order to design appropriate policies, further research is needed in this area. This requires improvement in the collection of data, which should be systematic and in a comparable format across countries. This would allow the keeping of accurate accounts of educational attainment for stayers and leavers by age group, gender, labour market status, sector of activity and occupation, so that there is a better understanding of the brain drain issues.

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ANNEX I: DATA SOURCES

Education level data by country with future projections:

Projections are based on collected census and survey data for the base year (around 2010) and the Medium Shared Socioeconomic Pathways projection (SSP2) model. The SSP2 is a middle-of-the-road scenario that combines medium fertility with medium mortality, medium migration, and the Global Education Trend (GET) education scenario. For more information and other projection models, consult the Wittgenstein Centre for Demography and Global Human Capital's website: <http://www.oeaw.ac.at/vid/dataexplorer/>

Scatter plots of education level amongst migrants and general population at origin

The three scatter plots, instead, report the share of the three categories of education in the population of the origin country on the x-axis and in the migrant population in the EU on the y-axis. In order to have more data points, in terms of both single countries and years, for what concern the share in migrant population, two different data sources have been used (the EULFS and the OECD-DIOC database) applying some estimation. From the LFS it was possible to observe the share along the time dimension, but not the country one, whilst the opposite is true for the DIOC, for which the latest data available goes back to 2010. The first step has been comparing the share given for North Africa (i.e. Algeria, Egypt, Libya, Morocco and Tunisia) by the LFS and the one obtained that sums up values of migrants from each single North African country residing in the EU in 2010. Estimates are very much comparable for this year, even though age and destination categories slightly differ.¹⁶ Hence, estimates for the migrant population of single countries in 2015 have been calculated applying the North-Africa wide percentage change, observable from the LFS data for each education category to the DIOC data for 2010. Finally, concerning the x-axis, the data used is the Wittgenstein Projection of the percentage of the population by highest level of educational attainment, also with 2010 as base year.

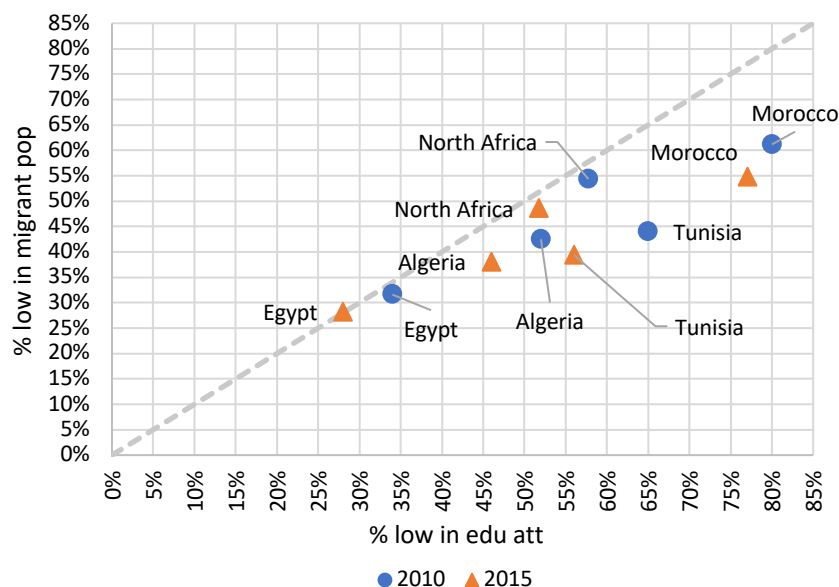
¹⁶ The LFS covers people aged between 18-34 in the EU28, while the DIOC those aged between 15-34 and living in 22 EU countries available: AUT, BEL, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, HUN, IRL, ITA, LUX, MLT, NLD, POL, PRT, SVK, SVN and SWE

ANNEX II: EDUCATION LEVELS OF POPULATIONS AT ORIGIN AND MIGRANTS IN THE EU

The following figures display the scatter plots of the share of low and middle level education amongst the general population (horizontal axis) at the origin, as opposed to the share of the corresponding education level amongst the migrant population in the EU (vertical axis) in the years 2010 and 2015 for individual countries (Algeria, Egypt, Morocco and Tunisia) and a regional aggregate (North Africa). We plot these additional figures to achieve a global picture of the compositional dynamics amongst the migrant populations.

The first plot (Figure 6) focusses on lower educational attainment amongst migrants and population at the origin country in 2010 (noted in circles) and 2015 (noted in triangles). All countries have experienced a decrease in the share of low educated populations at home (i.e. looking at the horizontal axis, all triangles are to the left of circles for each country). As a consequence of this trend, all countries have seen the share of low educated migrants decrease from 2010 to 2015 (i.e. looking at the vertical axis, all triangles are below the circles for each country). Because of these trends, almost all data points fall below the 45° line, suggesting a decrease in low-skilled migration to Europe from 2010-2015.

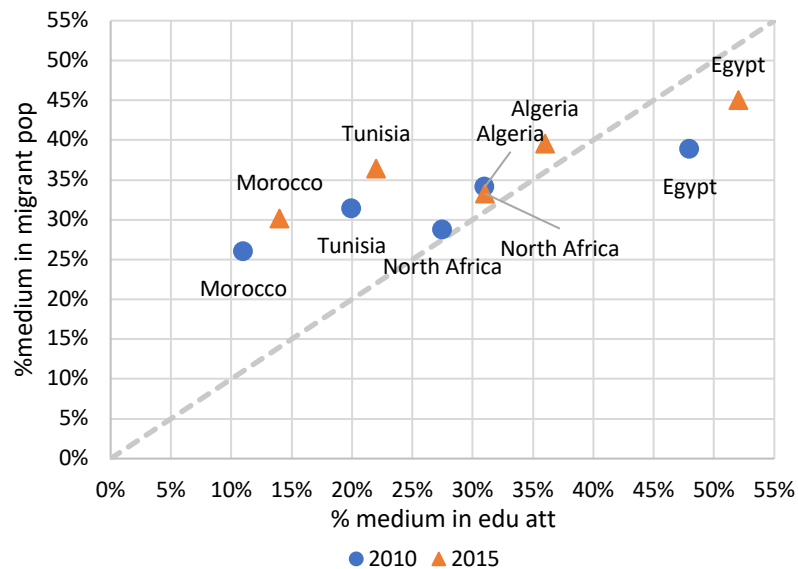
Figure 6. Shares of low educational attainment amongst migrants vs. non-migrants at origin



Source: Authors' own elaboration based on World Bank Development Indicators and Eurostat LFS

Below, Figure 7 plots the medium level educational attainment amongst migrants and population at the origin country in 2010 (noted in circles) and 2015 (noted in triangles), as previously. Immediately, we observe that most of the data points are slightly above the 45° line (except for Egypt), suggesting that the share of medium level educational attainment amongst migrants is higher than amongst the population at origin. Moreover, this pattern is becoming slightly stronger as years pass (from 2010 to 2015). Nevertheless, the average of North Africa is just on the 45° line, which means that the share of medium level educational attainment is equal for emigrants and the native-born and it is not a strong sign of brain drain (for medium educational level) from the region.

Figure 7. Shares of medium educational attainment amongst migrants vs. non-migrants at origin



Source: Authors' own elaboration based on World Bank Development Indicators and Eurostat LFS



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The Euro-Mediterranean Network for Economic Studies - EMNES is a network of partners and associates research institutions and think tanks working on the Mediterranean region. EMNES aims to provide a renewed vision for socio-economic development in the Mediterranean region, mainly focusing on employment creation, social inclusion, and sustainable development.

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