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# **The macroeconomic impact of labour liberalization and policies in MENA countries**

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# Executive summary<sup>1</sup>

## Overview

Since the end of World War II, migration from the Middle East and North Africa (MENA) has been a widely discussed phenomenon. On the one hand, migration to Europe, driven by the hope of escaping poverty or unemployment, has been steadily increasing since then. Drawing back on the data of 2008, there is a growing tendency to migrate among the youth in several MENA countries. As of 2008, almost 8.2 million people headed towards the European Union, while some were also leaving to work in either other Arab countries (2.7 million) or other destinations abroad (1.7 million). Especially in the MENA countries, where unemployment rates have reached as high as 28% in the past (Nassar, 2005), mostly young, but also a rising number of educated labour market participants find themselves unable to obtain employment in their home country, thus increasing the need to seek jobs abroad.

Europe, on the other hand, faces the reverse trend: Its population is growing older and the dependency ratio is steadily increasing. Hence, it seems reasonable that both regions, the EU as labour-importing and MENA as labour-exporting, might benefit from relaxed restrictions on migration (Haas, 2010). Within that scope, the present paper investigates whether this benefit exists and how it can be quantified.

## Literature review

Numerous studies have been conducted to analyse the quantitative and qualitative impact migrants have on their host, as well as their home country. Most economists agree that migration has overall positive welfare effects on the labour-importing countries, while evidence for the labour-exporting countries is ambiguous. In general, migration is believed to increase growth in the host countries due to increased output effects. According to some authors, lifting restrictions on unskilled workers in developed countries generate widespread positive effects on production and hence on real GDP, whereas the benefits from skilled labour movements are primarily felt in specific service sectors (Coppel et al. (2001); Boeri and Brücker (2005)).

While most recent research has focused on lifting of international trade barriers, overall gains resulting from the elimination of trade barriers are not that impressive, when compared to the elimination of restrictions to labour mobility. In Clemens (2011) various studies were collected so to gauge the efficiency gain in GDP with removal of different barriers which can reach over 140% with labour liberalization compared to only 4.1% with trade liberalization. Taking into account studies with more

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reasonable assumptions on the scale of migration Clemens (2011) further reviews efficiency gains in GDP with lower rates of emigration out of origin population, the so called the net emigration rate of origin population. These gains range from over 50% to around 1% according to different rates of migration (positively correlated).

In order to investigate the effects several approaches have been used by scholars, which can be grouped as simulation based and econometric based. The first group consists of the factor proportions approach (partial equilibrium) and computable general equilibrium (CGE) approach. The second group comprise area analysis, production theory and time-series approaches.

There exist a number of different models that are aimed at studying the effects of labour migration on the overall economy. A complex open-economy CGE framework is used in Keuschnigg and Kohler (1999) to assess the EU enlargement on Austrian economy. The authors assume that the number of unskilled and skilled workers is scheduled to increase by 10.5%, and 2.1% respectively. At the same time, it is expected that wages of unskilled employees decline by 5%, whereas those of skilled workers increase by 2.7%. Muller (1997) describes the effects of migration in Switzerland. His exploratory study suggests mild positive results regarding labour market segmentation, capital mobility, and terms of trade in the native economy. A study conducted by Walmsley and Winters (2005) comes to the conclusion that an increase of mere 3% in the quota of temporary movement of skilled and unskilled workers results in a US\$156 billion (in 1997 constant prices) gain in global welfare. Their result confirms that restrictions on labour movement in developing countries are costly for all affected countries, especially due to a foregone decrease of costs for unskilled, domestic labour in the host country. Similarly, a dynamic recursive general equilibrium model, used in a World Bank study (2006), concludes that the global welfare gain is an impressive US\$ 674 billion in real income in comparison to the baseline scenario (in 2001 prices). Also, it suggests that liberalization in labour migration benefits developed economies through welfare changes, but generally leads to a fall in wages. The model of Boeri and Brucker (2005) shows that positive gains of labour migration are possible when two economies open their borders. When labour markets clear (baseline scenario), a 1% increase in the share of immigrants relative to native population leads to a 0.3% increase in GDP for the EU member states (total region), while the gains/losses are almost 0.7% in the host country and -0.7% in the source country. However, those gains happen at the expense of low-skilled native workers in the host country, who are most hit by comparable foreign workers with similar skills. Moreover, as Weizsäcker (2006) points out, low-skilled migration increases income inequality among the natives and increases wage prospects in the sending country. For high-skilled workers, the reverse holds. Another multiregional CGE model by Iregui (2003) argues similarly and evaluates the gains from an elimination of restrictions on workers' movements. In this model specification with 1990 data, average wages increase in the source countries, as restrictions for skilled and unskilled workers are lifted. This is driven by labour scarcity relative to capital, making the

return to capital lower. The remaining skilled workers in the source country receive wage increases because of raising demand. In the destination country, wages are lower for both types of labour and the return to capital increases. In case of only skilled labour migration, unskilled workers and capital owners are worse off in the home country. In the host economy, a larger number of skilled workers receive average lower wages. An important extension of the model refers to capital mobility along with skilled labour movement: workers move to countries and sectors with higher wages and higher returns to capital, thus in the home region unskilled workers and capital owners are worse off, whereas in the host country the trend is reversed. Additionally, welfare gains are substantially reduced when transaction costs are introduced in the model.

The effect of migrants on wages is analysed in more detail by Longhi et al. (2005a). They use the methodology of meta-analysis to review 18 papers with 348 estimates of immigrant inflows on wages of workers in the host country. Their findings suggest that an increase of the immigration population by 1% results in a decrease in wages of the native-born population of 0.1%. Other studies (Altonji and Card (1987); Bean et al. (1988); Borjas (1986), (1987); Grossman (1982); LaLonde and Topel (1987)) confirm that immigrants impact earnings and employment opportunities of natives only to a very small extent, while they do have a significant impact on their own and other immigrants' wages. A 10% increase in the number of immigrants leads to a reduction in immigrants' wages of 2% to 3%.

Judging from the evidence so far, it can be summarized that there are little or no negative effects of large scale migration on labour market outcomes in terms of wages and employment opportunities. This could be explained by the compensating growth in output and rise in productivity. Priore (1979) also argues that this is either due to the fact that immigrants perform jobs that most natives do not want to engage in, or to a general mismatch on the native labour market.

Basically, as shown in Poot and Cochrane (2005), there are three ways in which migration may contribute to greater economic growth. First, immigration may lead to the advance movement on the convergence to the long-run steady-state growth path; second, it may contribute to innovation and changes in total factor productivity; third, it may trigger incremental changes in efficiency, which boosts total factor productivity in the long run.

The standard open-economy model describes the steady state convergence mechanism, which assumes acceleration with greater population influx and comes to the steady state growth rate. A simple macro model by Kemnitz (2001) describes the importance of immigration coinciding with capital growth, which suggests that immigration will benefit a native if and only if the average immigrant arrives with more capital than the average native.

Employing the framework of CGE, Walmsley and Winters (2003) study the impact of freeing up of border controls on growth. Their estimation shows that a 3% increase in quotas of unskilled and skilled workers will translate into a global economic boon worth 150 billion USD.

The second way of increasing growth is through Schumpeterian innovation: as new immigrants tend to bring and exchange new ideas, open new businesses and new industries. They may even attract FDI from their home countries. Theoretical aspect of entrepreneurial activity of immigrants is largely overlooked, but empirical work exists. Ching and Chen (2000) find evidence that immigration may lead to greater international trade between countries, based upon the study of immigrant entrepreneurs of Taiwanese origin in Canada, while their another finding suggests that investor class (passive capitalists) immigration has a detrimental effect of trade. However, this economic aspect of immigration still remains under-researched.

The third venue of economic growth is through economic efficiency. Migrants may respond better to economic signals as they are younger on average, and may be better equipped to adjust to changing conditions. Borjas (2001) uses the model of “greasing the wheels” in order to explain the link between immigration and growth. His paper estimates how the migrants contribute to US growth by “greasing the wheels”.

Several studies of natural experiments describing workers movement from Cuba to Florida, Algeria to France, Angola and Mozambique to Portugal, the former USSR to Israel do not refute the hypothesis that local markets have the capacity to absorb great labour shocks in a relatively short time span.

The body of literature that examines the impact of migration on the host country remains much greater than that of dealing with the effects of outward migration on the sending countries. However, the scale of outward migration in the MENA region requires such research to be undertaken in order to estimate short and long-term economic outcomes. Nassar (2005) suggests that outward migration kept unemployment lower in the sending countries among the youth and women.

One of the features of the regional migration is that it tends to be temporary or circular. The case in point is Egyptian workers in the Gulf States, whose number depends on oil prices and political situation in the region. Other notable examples are Syrian workers in Lebanon, Egyptian farmers in Jordan and Libya (Fargues, 2009, p 28-31). The framework of circular migration is preferable for the EU countries, some of which have already signed bilateral agreements on temporary workers: Spain and Morocco, France and Tunisia, Italy and Egypt. The impact of this migration has yet been investigated.

A study by the scholars (Venturini, Fakhoury and Jouant ,2009) suggests that job creation in Tunisia, Morocco, Algeria and Egypt consistently lags behind so that the labour market creates annually excess supply which cannot be met by demand in the MENA market. Their outcome of the model, based solely

on the four countries, shows that close to half a million people become candidates for circular migration each year.

For completion purposes, it is also necessary to mention some more qualitative studies analysing some of the effects migration can have, but which are more difficult to quantify. One important aspect is the role of remittances. In the neoclassical context, remittances help to improve the income distribution, decrease inequality and increase overall welfare (Borjas, 1989). In the cumulative causation theory, remittances trigger inflation, thus increasing inequality and allowing for the 'Dutch disease' effect by leading to an appreciation of the currency and thus weakening the external competitiveness of that country. This is confirmed by some empirical studies (Myrdal, 1957). Also, the importance of 'brain drain', the emigration of mostly well-educated citizens, or 'brawn drain', the emigration of young, agricultural labourers, should not be underestimated, since it bears substantial costs to the source country which might not be fully compensated by the inflow of remittances. Nevertheless, evidence for 'brain drain' can only be found in rather small and very poor economies (Haas, 2010). Other effects might include socio-cultural effects in the home country (consumerism, non-productive, and remittance dependent attitude) or the host country (xenophobia and racism).

So far, the almost unanimous conclusion is that the gains in the labour market are positive, albeit negligible at best. There is a growing evidence that some of these gains are at the expense of previous migrants or low-skilled workers in the host community (Walmsley et al., 2007). Moreover, the probability that immigrants increase unemployment in the short run is low and in the long run is zero (Okkerse, 2008). However, overall welfare seems to increase when relaxing migration restrictions.

### **Descriptive statistics**

Due to recent developments in the MENA region, but also with regard to demographic changes in the EU, migration from the MENA countries to the EU has gained some renewed attention. Especially the turmoil in many Arab nations during the *Arab spring* is seen as a new turning point in migration relations with the EU. So far, the effects of the tremendous, institutional changes that have taken place cannot be clearly interpreted. Another important change within the EU will also have significant effects on the stream of non-EU migrants. As observed by Deutsche Bank Research group (2011), migration from the peripheral EU countries to the core countries increased due to the impact of the recent financial crisis. Nevertheless, current demographic trends might encourage migration and create a more positive perception of migrants. The aging population in Europe will need to find measures in the future to keep their workforce constant, if they are intending to retain their standard of living. Due to the very low fertility rates in the EU, a softening in migration policies could be the answer.

We chose to focus more extensively on Algeria, Morocco, Tunisia, Egypt, Turkey, since they account for the largest migration flows from the MENA region to the EU. Especially, Moroccan and Turkish citizens

make up large proportions of the foreign population in some EU countries. In Germany, one quarter of all foreigners is Turkish, whereas in Spain 13.1% are Moroccans. The Netherlands have a roughly equal share of Turkish and Moroccans, which sums up to 25% of the total foreign population (EUROSTAT, 2011). Egyptians actually play a minor role in the EU, but they account for a larger proportion of migrants in Italy and Greece (Zohry, 2005).

Egypt and Turkey are by far the largest MENA countries in terms of population with more than twice as many inhabitants than Algeria and Morocco. The proportion of the working age population is roughly the same for all the reported countries or regions. However, when looking at the annual growth rates, it becomes apparent that the ratio is at least three times higher in most MENA countries than in the EU. While in 2009 the EU-population grew by just 0.36%, the same figure accounted for roughly 1.87% in the MENA region. In terms of wealth as measured by GDP per capita, the average EU citizen earns 4 to 8 times more than the average MENA citizen.<sup>2</sup> Due to their relative low income in their origin countries, the wage differential based incentive to migrate is highest for Moroccans and Egyptians. Turkey<sup>3</sup> is by far the richest of these countries, but still way below the European average. A last observation can be made concerning the sectorial distribution of labour: Whereas only 5% of the EU labour force is employed in agriculture, the same figure is up to 41% in Morocco and 26% in Turkey.

While the labour participation rate is especially high in the EU and Algeria, it is surprisingly low in Turkey, Tunisia, and Egypt. Moreover, the rate of female labour market participation is as low as one quarter in most MENA countries (except Algeria) compared to almost 50% in the EU. In turn, male participation in all MENA countries is extremely high, whereas it only accounts for 65% in the EU. Another interesting observation can be made with regard to the educational status of the labour force. It appears shocking that more than 80% of Moroccans have either no or only primary education. This development seems, albeit less pronounced, to be shared by other MENA countries for which the corresponding data is available.

While overall unemployment in MENA is only a few percentage points above the EU average level, unemployment of workers with a university degree is up to four times higher in North Africa than it is in the European Union. Youth unemployment seems to be a similar problem in MENA and in the EU. This problem is especially acute in the EU, Morocco, Algeria, Turkey, and Tunisia, where unemployment among the youth is more than twice as large as the total unemployment rate. Within that scope, it is

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<sup>2</sup> It should be noted that the calculation of the EU average per-capita GDP of €18,943 also includes Eastern European countries, which usually rather export than import labor. Thus, the wage differential between the MENA countries and the labor-importing countries of the EU (mainly Western and Southern European countries) is actually larger than reported here.

<sup>3</sup> Strictly speaking, Turkey does not belong to the country group classified as MENA. This group only includes Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, and Saudi Arabia. However, broader definitions of MENA also include Armenia, Azerbaijan, Cyprus, Djibouti, Malta, Mauritania, Northern Cyprus, Somalia, Sudan, and Turkey.



worth noticing that the reported high GDP growth rates that were observed in some MENA countries in most recent years did not have significant effects on the labour market.

Net migration is positive in the EU while negative in the MENA region, which allows classifying the EU as a labour-importing and MENA as a labour-exporting region. Roughly every fifth foreigner in the EU (21.3%) is from one of the five listed MENA countries.

As was expected, North Africans tend to migrate mostly towards francophone countries, for example France and Belgium. In consequence of the common language, barriers of entry and transaction costs are significantly lower for citizens from Morocco, Tunisia, and Algeria. Due to colonial ties, already existing social networks ease the transition for migration and reduce transaction costs further. France alone accounts for 63% of the North African migrants with a stay of more than seven years in the EU. Spain is another large recipient of temporary North African migration in relative terms, which is usually explained by its high demand for seasonal, agricultural workers. In contrast, the case of migrants from the Near and Middle East is very different: The majority of the workers migrates to Sweden, Denmark or the UK and is rather evenly distributed among all other countries. It should be noted that some of the countries in the Near and Middle East classification do not officially belong to the MENA region (e.g. countries in Central Asia).

It seems clear that, on average, migrants are less likely to find employment in the EU than natives. Especially difficult is the situation for immigrants in Belgium, the Netherlands, Spain, and Sweden, where the unemployment rate among foreigners is up to 3.45 percentage points higher than its national counterpart. In contrast, the labour markets of Hungary, Greece, Ireland, Portugal, United Kingdom, and Italy demonstrate more favourable conditions to foreigners than to their own citizens.

Firstly, those MENA migrants who had difficulties in finding employment in countries with high unemployment rates among foreigners are mainly low-skilled. This is especially true for Spain, France, the Netherlands, Finland, and Italy. Secondly, in countries where foreigners exhibit lower unemployment rates than natives (e.g., Hungary, Poland or Luxembourg), hardly any unemployment among the unskilled is observable. The most likely explanation is that these countries do not attract as much unskilled labour (due to low wages or a very specialized labour market), thus giving more weight to more educated migrants. A last observation that can be made is the role of Egyptians. Only in this case, high skilled workers, on average, present higher unemployment rates than unskilled. This is no surprise with respect to the large unemployment rates of young, educated work seekers in Egypt. It does seem surprising in connection with the high demand for labour of the core EU countries. The high unemployment rate in the EU for skilled Egyptian labour might demonstrate another sign of the mismatch in the Egyptian labour market and the inferior quality of Egyptian tertiary education.

## **Model and Database**

In this study, the standard global applied general equilibrium GTAP model, a CGE model with bilateral labour migration, is used (Hertel, 1997). In the standard GTAP framework, conventional neoclassical behaviour (utility maximization, cost minimization) is assumed, with regional utility aggregated over private demands (non-homothetic), public demands, and savings (investment demand). Production is characterized by a perfectly competitive, constant returns-to-scale technology, and bilateral imports are differentiated by region of origin using the Armington specification. The model incorporates five factors of production. Skilled/unskilled labour and capital are perfectly mobile, whereas land and natural resources are both sector specific with the former moving “sluggishly” between productive sectors. In all factor markets, full employment is assumed (long-run equilibrium). However, the mobility of labour and capital can only occur within regions. GTAP allows divergences between regional investment and saving, but forces all existing capital within a region to move only across industries within that region. Finally, investment behaviour is characterized by a fictitious “global bank”, which collects investment funds (savings) from each region and allocates them across regions according to a rate of return or a fixed investment share mechanism.

The data used for the simulation is taken from the GTAP Data Base 7.1 which is a fully documented, publicly available global data base which contains complete bilateral trade information, transport, and protection linkages among regions for all GTAP commodities.

## **Simulations**

The first simulation examines the outcome of lifting the restrictions for skilled and unskilled migrants to the EU by 1% and estimates the impact on the main macroeconomic variables: growth, real investment, exports, imports, and welfare (decomposed into allocative efficiency, endowment, population, terms of trade, price of capital goods, remittances effect) in both labour-importing and exporting countries. Furthermore, the impact on wages is examined.

The second simulation tests for the separate effect of an increased number of skilled migrants from MENA to the EU. This allows to test the hypothesis whether allowing only skilled workers to migrate by issuing special visas is more profitable compared to a general relaxation of migration restrictions. Thus, the shock consists of a 1% increase in skilled migrants from MENA to the EU.

It should be noted that migration policy is a national matter in the European Union, which makes the simulation of migration liberalization across the board highly artificial.

At last, several sensitivity analyses examine how vulnerable the results are to different parameter changes.

## **Findings and conclusions**

Our main findings suggest that there is potential, but substantial income gain in the world GDP (as high as 56 Billion USD) if labour movement restrictions were further relaxed in the EU. However, this potential gain is realised largely at the expense of the MENA countries. This finding is in line with the recent literature review which predicts a boost in GDP through greater efficiency in factor allocation.

Throughout the research we have employed the CGE framework that enabled us to model labour flows with two different skills decomposition – high and low. We have also taken into account the remittances and trade flows, land, capital and natural resources. In our first empirical exercise an increase of 1% in the number of MENA labour migrants (both high and low skilled) was examined European workers are expected to experience small wage declines – both skilled and unskilled, while positive outcome is predicted by the model in the returns to land, capital and natural resources. These findings remain plausible in the context of the existing literature concerning native wages. The same holds reverse for MENA countries, while the wage increase for skilled workers (2.07%) is almost five times greater than that of unskilled workers (0.4%). The EU countries stand to gain in along multiple welfare components due to greater allocative and tax collection efficiency. MENA countries on the other hand are expected to gain from expanding terms of trade and remittances from the EU, while losing slightly in allocative efficiency, endowment, population effect and capital goods. Other macroeconomic variables (consumption, investment, government spending, exports and imports) in the EU 27 countries show around 0.5 % change, while consumption is growing in MENA by 0.24%, government spending increases by 0.3% and investment (0.43%) and trade (imports (0.16%) and exports (0.7%)) stand to decline. Overall, a 1% increase in migration from the MENA countries to the European Union leads to a decline in total GDP within the MENA region, whereas the EU as well as the whole world faces a rise in total output.

Our second scenario tested an asymmetric shock of 1% increase only in skilled migration from MENA to the EU 27. The gains in the input factors (land, capital and resources) in the EU countries were less pronounced and the same applies to losses for MENA. However, the wage effect was more dramatic: EU skilled workers would expect lower wages among stronger competition, while unskilled workers would enjoy a wage raise of 0.2%. In MENA the scarce skilled workers would receive more than 2% wage increase, while their unskilled counterparts would suffer a wage decrease of 0.11%. Welfare gains are expected to be lower than in previous estimation due to smaller labour flows (only more skilled workers move) and overall GDP welfare would be around 31 billion USD. All other economic measures retain their sign but dwindle in magnitude. GDP decomposition in the EU 27 shows smaller values as well and gains hover around 0.2%-0.3%, while in the MENA countries the effects are varied: greater consumption (0.2%) and government spending, less investment, exports and imports. Nevertheless it must be noted again that the numerical developments within the scope of simulation 2 are smaller than the ones caused by an increase in both skilled and unskilled migration to the EU.

Finally, further simulations were tested in order to determine how robust the results are under different parameters.

It appears that the EU labour market is able to absorb successfully even greater numbers of migrants without greatly worsening the welfare of residents than today which clearly coincides with the previous findings in the reviewed literature. Notably, the MENA countries are expected to lose in GDP, population, resource utilization, etc., while these losses are being only partially offset by remittances. These detrimental effects were not totally surprising and are present in literature. If it comes true, such scenario poses a serious challenge to the policy makers in the sending countries who are concerned with the state welfare. For example, a new policy might be aimed at encouraging return migration since it is supposed to mitigate the negative effects. Returnees would contribute to greater productivity through higher skills and know-how gained abroad.

Labour participation rates of women and young workers are very low compared to other regions in the world. Our study due to the limitations of the available data was not able to investigate the effects of migration on these particular groups. Further research could provide some insight into the matter.

The existing data refers to the EU and MENA countries before the on-going debt crisis that started in the end of 2007. While still in development the effects of the crisis are most likely to alter some of the conclusions in the study.

## **Résumé Exécutif**

### **Vue d'ensemble**

Depuis la fin de la deuxième guerre mondiale, la migration provenant du Moyen Orient et d'Afrique du Nord (MENA) a déjà été un thème largement débattu. Tout d'abord, la migration vers l'Europe, stimulée par l'espoir d'échapper à la pauvreté ou au chômage, n'a cessé de croître. Un retour sur les données de 2008 montre qu'il y a une tendance grandissante de la migration de la jeunesse dans plusieurs pays MENA. Depuis 2008, près de 8,2 millions de personnes se sont dirigées vers l'Union Européenne, certaines ont cependant choisi d'autres pays arabes pour trouver du travail (2.7 millions) ou d'autres destinations à l'étranger (1,7 millions). Particulièrement dans les pays MENA, où les taux de chômage ont augmenté jusqu'à 28% ces dernières années (Nassar 2005), les migrants sont essentiellement des jeunes, mais également un nombre croissant de personnes qualifiées du marché du travail qui ne trouvent pas d'emploi dans leur pays natal, augmentant ainsi le besoin de chercher un travail à l'étranger.

D'autre part en Europe, on trouve la tendance inverse : la population vieillit et le taux de dépendance augmente continuellement. Ainsi il semble raisonnable que les deux régions, l'UE en tant que région importatrice et MENA comme région exportatrice d'emploi, puissent bénéficier d'un allègement des restrictions sur la migration (Haas 2010). C'est dans ce cadre que ce papier étudie si ces avantages existent et comment ils peuvent être quantifiés.

### **Revue de littérature**

Nombre d'études mettent en évidence l'impact quantitatif et qualitatif des immigrés dans leur pays d'accueil ainsi que dans leur pays d'origine. La plupart des économistes s'accordent sur le fait que la migration présente en général des effets favorables sur les pays importateurs de travail, mais le bilan pour les pays exportateurs est plutôt équivoque. En général, la migration est censée stimuler la croissance en raison des effets sur la production dans le pays d'accueil. Toutefois selon certains auteurs, l'allègement des restrictions pour les ouvriers non-qualifiés dans les pays développés peut créer des effets positifs très importants sur la production et par conséquent sur le PIB réel, tandis que les bénéfices des déplacements de la main-d'oeuvre qualifiée se sont surtout fait sentir dans les secteurs de services spécifiques (Coppel et al. 2001; Boeri et al. 2005).

Alors que les études les plus récentes se sont concentrées sur l'allègement des barrières du commerce international, les gains nets résultants de l'élimination des barrières commerciales ne sont pas très

significatifs au regard des effets venant de l'élimination des restrictions sur la mobilité du travail. Plusieurs études ont montré (Clemens 2011) l'efficacité des gains de PIB venant de l'élimination de certaines barrières qui peuvent atteindre plus de 140% avec la libéralisation du travail, contre seulement 4,1% avec la libéralisation du commerce. Concernant l'amplitude de la migration, en prenant en considération des études avec des hypothèses plus réalistes, Clemens (2011) passe en revue les gains d'efficacité en terme de PIB avec des taux d'émigration plus bas par rapport à la population d'origine (« taux d'émigration nette de la population d'origine »). Ces gains vont de 50% à environ 1% selon les différents taux de migration (correlation positive).

Afin d'étudier les effets, plusieurs approches ont été utilisées par les chercheurs et peuvent être regroupées en deux catégories : l'approche basée sur des simulations et l'approche économétrique. Le premier groupe comprend des modèles de proportions des facteurs (d'équilibre partiel) et des modèles d'équilibre général calculable (EGC). Le deuxième groupe comprend une analyse par zone, la théorie de la production et une approche basée sur des séries temporelles.

Différents modèles envisagent d'étudier les effets de la migration du travail sur l'ensemble de l'économie. Un modèle complexe du type « économie ouverte » dans le cadre EGC, est utilisé par Keuschnigg et Kohler (1999) pour estimer les effets de l'élargissement de l'UE sur l'économie autrichienne. Les auteurs ont basé leur étude sur l'hypothèse selon laquelle le nombre des ouvriers non-qualifiés et qualifiés va augmenter respectivement de 10,5% et de 2,1%. Sur la même période on attend une baisse des salaires des ouvriers non-qualifiés de 5% et une augmentation des salaires des ouvriers qualifiés de 2,7%. Une autre étude, Muller (1997) décrit les effets de la migration en Suisse, et suggère des résultats relativement positifs mais peu significatifs à l'égard de la segmentation du marché de travail, à la mobilité du capital et aux termes de l'échange dans le pays d'origine. Dans l'étude de Walmsley et Winters (2005) on peut trouver en conclusion qu'une augmentation de seulement 3% du taux temporaire du mouvement de la main-d'oeuvre qualifiée et non-qualifiée a permis d'augmenter la richesse publique de 156 billions d'US\$ (aux prix constants de 1997). Ce résultat confirme que les restrictions sur les mouvements de la force de travail dans les pays en voie de développement sont coûteuses pour tous les pays concernés, surtout s'il y a une baisse antérieure des coûts de la main-d'oeuvre domestique non-qualifiée dans le pays d'accueil. De même, un modèle dynamique du type EGC, utilisé dans une étude de la Banque Mondiale (2006), arrive à la conclusion que le bien-être global s'accroîtra même de 674 billion d'US\$ (prix de 2001). Les résultats suggèrent que la libéralisation dans la migration du travail profitera aux économies développées au travers de changement sur le bien-être, mais conduit aussi à une baisse des salaires.

Le modèle de Boeri et Brucker (2005) montre que des gains positifs d'une migration du travail sont possibles si deux économies ouvrent leurs frontières. Dans le scénario de référence, une augmentation

de 1% de la part des immigrants par rapport à population locale conduit à une augmentation de 0,3% du PIB pour les Etats membres de l'UE tandis que les gains/pertes s'élèvent à presque 0,7% dans le pays d'accueil et -0,7% dans le pays d'origine. Toutefois, ces gains se font au détriment des travailleurs peu qualifiés locaux du pays d'accueil, qui sont les plus touchés par les travailleurs étrangers ayant des compétences similaires. De plus, du point de vue de Weizsäcker (2006), la migration des travailleurs peu-qualifiée contribue à l'inégalité des revenus parmi les locaux et augmente les perspectives de salaire dans le pays d'envoi. Pour les travailleurs hautement qualifiés, c'est le contraire. Un autre modèle multirégional CGE de Iregui (2003) avec des arguments comparables a évalué les gains d'une élimination des restrictions concernant les mouvements des travailleurs. Dans la spécification de ce modèle avec des données de 1990, les salaires moyens augmentent dans les pays d'origine avec l'abandon des restrictions pour les ouvriers qualifiés et non-qualifiés. Cela se justifie par la rareté relative du travail par rapport au capital, qui diminue le rendement du capital. Les travailleurs qualifiés qui restent dans le pays d'origine reçoivent des augmentations de salaire en raison de l'augmentation de la demande. Dans le pays de destination, les salaires sont plus faibles pour les deux types de main-d'œuvre et le rendement de capital augmente. Dans le cas concernant uniquement la migration de main-d'œuvre qualifiée, pour les travailleurs non qualifiés et les détenteurs de capitaux la situation est pire que dans le pays d'origine. Dans l'économie d'accueil, un plus grand nombre de travailleurs qualifiés reçoivent en moyenne des salaires inférieurs. Une extension importante du modèle se réfère à la mobilité des capitaux avec le mouvement de la main-d'œuvre qualifiée : les travailleurs se déplacent vers les pays et les secteurs ayant des salaires plus élevés et de plus forts rendements de capital, donc dans la région d'origine pour les travailleurs non qualifiés et les propriétaires de capitaux la situation est pire, alors que dans le pays d'accueil la tendance est inversée. En outre, les gains de bien-être sont sensiblement réduits lorsque les coûts de transaction sont introduits dans le modèle.

L'effet des migrants sur les salaires est analysé plus en détail par Longhi et al. (2005a). Ils utilisent la méthodologie de la méta-analyse pour examiner 18 articles avec 348 estimations d'entrées d'immigrants sur les salaires des travailleurs dans le pays d'accueil. Leurs résultats suggèrent qu'une augmentation de la population immigrante de 1% induit une baisse des salaires de la population native de 0,1%. D'autres études (Altonji et Card (1987); Bean et al (1988); Borjas (1986), (1987); Grossman (1982); LaLonde et Topel (1987)) confirment que l'impact sur les gains des immigrants et les opportunités d'emploi pour les locaux à une très faible mesure, alors qu'ils ont un impact significatif sur leur propres salaires et celui des autres immigrants. Une augmentation de 10% du nombre d'immigrants conduit à une réduction des salaires des migrants de 2% à 3%.

En résumé, les recherches montrent qu'il y a peu ou presque pas d'effets négatifs d'une migration à grande échelle sur les marchés du travail en ce qui concerne les salaires et les opportunités d'emploi. Cela peut s'expliquer par la compensation produite par l'augmentation de la production et de la

productivité. Priore (1999) fait également valoir que cela est dû au fait que les immigrants acceptent des emplois non populaires chez les locaux, sinon il note qu'il pourrait y avoir un déséquilibre général sur le marché du travail des locaux.

En effet, comme clarifié par Poot et Cochrane (2005), il y a trois possibilités pour que la migration puisse contribuer à une meilleure croissance économique. Tout d'abord, l'immigration peut accélérer la convergence vers une croissance d'équilibre de long terme; d'autre part, l'immigration peut stimuler l'innovation et des changements dans la productivité globale des facteurs; en troisième lieu, elle peut déclencher des changements progressifs de l'efficacité ce qui accroît la productivité globale des facteurs sur le long terme.

Le modèle standard d'économie ouverte décrit le mécanisme de convergence de l'état d'équilibre qui suppose une accélération avec une croissance de la population et l'obtention d'une croissance à l'état d'équilibre (steady state growth rate). Un modèle simple (Kemnitz 2001) décrit l'importance de l'interaction entre immigration et croissance du capital, qui suggère que l'immigration favorisera un travailleur indigène si et seulement si, l'immigrant moyen arrive équipé d'un capital plus élevé qu'un indigène moyen.

Dans le même cadre d'un modèle CGE, une étude de Walmsley et Winters (2003) sur l'impact d'un abandon des contrôles aux frontières montre qu'une augmentation de 3% du taux des travailleurs qualifiés et non-qualifiés peut se traduire par un boom économique d'environ 150 billion US\$.

Une deuxième source d'accélération de la croissance peut être réalisée par une innovation Schumpeterienne. Des nouveaux immigrants apportent et échangent de nouvelles idées, créent de nouvelles affaires et nouvelles industries. Ils peuvent même attirer des investissements directs de leurs pays d'origine. L'aspect théorique de l'activité entrepreneuriale des immigrants est souvent négligé, même s'il existe déjà des recherches empiriques. Une étude de Ching et Chen (2000), basée sur l'immigration des entrepreneurs venant de Taiwan au Canada, montre que l'immigration peut contribuer à la croissance du commerce international. Une autre étude montre que l'immigration de la classe des investisseurs (capitalistes passifs) sera plutôt au détriment du commerce international. Toutefois, cet aspect économique de l'immigration n'est toujours pas assez étudié.

Troisièmement, la croissance économique peut être stimulée par une augmentation de l'efficacité économique. Les migrants peuvent peut-être mieux s'adapter aux besoins économiques parce qu'ils sont, en moyenne plus jeunes, et s'adaptent mieux aux conditions changeantes de l'économie. Ainsi Borjas (2001) a utilisé son modèle « graissage des roues » qui explique le lien entre l'immigration et croissance. Son ouvrage donne des estimations sur la contribution de la migration à la croissance américaine par « graissage des roues ».



Plusieurs autres études sur les mouvements des ouvriers de Cuba en Floride, d'Algérie en France, d'Angola et du Mozambique au Portugal, de l'ancienne URSS en Israël ne sont pas en contradiction avec l'hypothèse selon laquelle les marchés du travail locaux ont la capacité d'absorber des chocs massifs dans un délai relativement court.

Mais il faut constater que les études sur l'impact des migrations pour les pays d'accueil sont beaucoup plus nombreuses que celles sur l'impact pour les pays d'origine. Pourtant, l'importance de la migration dans la région MENA exige une telle recherche pour estimer les effets économiques à court et long terme. Nassar (2005) trouve que cette migration des travailleurs a contribué à une diminution du taux de chômage dans les pays d'origine en ce qui concerne les jeunes et les femmes.

Une des caractéristiques de cette migration régionale est qu'elle a tendance à être temporaire ou circulaire, par exemple, le nombre des travailleurs égyptiens dans les pays du Golfe dépend du prix du pétrole et de la situation politique dans la région. D'autres exemples sont à noter pour les travailleurs syriens au Liban, ainsi que les paysans égyptiens en Jordanie et en Libye (Fargues 2009, p 28-31). Le cadre de la migration circulaire est plus adapté aux pays de l'UE, dont quelques-uns ont déjà signé des conventions bilatérales en ce qui concerne le travail temporaire : l'Espagne et le Maroc, la France et la Tunisie, l'Italie et l'Égypte. Les effets de cette migration circulaire ont déjà été étudiés.

Une étude de Venturini, Fakhoury et Jouant (2009) suggère que la création des emplois en Tunisie, au Maroc, en Algérie et en Égypte a toujours un certain retard, de sorte que le marché du travail crée chaque année une offre excédentaire qui ne peut pas être compensée par la demande des pays MENA. L'étude montre, que les quatre pays mentionnés, environ un demi-million d'emplois, peuvent être candidats à la migration circulaire chaque année.

Pour compléter ce tour d'horizon, il faut aussi mentionner encore quelques études qualitatives, qui analysent certains effets de la migration qui sont plus difficiles à quantifier.

Un aspect important est le rôle des envois de fonds qui peuvent, dans le contexte néoclassique, contribuer à une meilleure distribution de revenus, à réduire l'inégalité et à augmenter le bien-être général (Borjas 1989). Mais les transferts entre les pays de la migration peuvent aussi renforcer l'inflation et augmenter l'inégalité. Ils peuvent stimuler la réévaluation de la monnaie et ainsi affaiblir la compétitivité extérieure du pays (Myrdal 1957). Il ne faut également pas sous-estimer l'importance du 'brain-drain' (exode des cerveaux), l'émigration des citoyens souvent très bien éduqués, ou bien du brawn-drain, l'émigration des jeunes agriculteurs, parce que cette migration peut causer des coûts substantiels pour le pays 'fournisseur' des travailleurs qui ne seront probablement pas entièrement compensés par les envois de fonds pour le pays d'origine. Néanmoins, des cas de « brain-drain » ne sont observés que dans des économies relativement petites et très pauvres (Haas 2010). De plus, on a trouvé

des effets socio-culturels dans les pays d'origine (consommérisme, attitude non-productive et de dépendance) et dans les pays d'accueil (xénophobie et racisme).

En résumé, la conclusion presque unanime est que les gains sur le marché du travail sont positifs ou, au moins, négligables. Parfois, en effet, les gains se font aux dépens des anciens migrants ou des travailleurs peu-qualifiés dans le pays d'accueil (Walmsley et al. 2007). D'autre part, la probabilité, que l'immigration contribue au chômage à court terme, reste faible et est même nulle à long terme (Okkerse 2008). En tous cas, il apparaît que l'abandon des restrictions relatives à la migration augmente le bien-être global du pays.

### **Statistiques descriptives**

Vu les récentes évolutions dans la région MENA, mais aussi les changements démographiques dans l'UE, la migration des pays MENA pour l'UE a de nouveau attiré l'attention. Surtout depuis les événements dans certains pays arabes pendant le 'printemps arabe' considérés comme un tournant pour la migration en ce qui concerne les relations avec l'UE. Jusqu'à présent, les effets de ces grands changements institutionnels ne peuvent être clairement interprétés.

Un autre changement important à l'intérieur de l'UE aura également des effets significatifs sur les mouvements des immigrants hors-UE. Comme observé par le groupe de recherche de la Deutsche Bank (2011), la migration des pays périphériques de l'UE vers les pays plutôt centraux a augmenté en raison de l'impact de la récente crise financière. Les tendances actuelles de la démographie peuvent aussi encourager la migration et créer une perception plus positive des migrants. L'Europe aura besoin de mesures pour stabiliser le niveau de l'emploi si elle veut garder son niveau de vie. Étant donné les taux de natalité très bas dans l'UE, la réponse pourrait être un allègement des politiques migratoires.

Nous avons choisi de concentrer nos recherches sur l'Algérie, la Tunisie, l'Égypte et la Turquie, qui ont à l'origine des mouvements les plus forts de migration des pays MENA vers l'UE. En particulier les citoyens marocains et turcs qui représentent une grande proportion de la population étrangère dans certains pays de l'UE. En Allemagne, un quart de la population étrangère est turque, contre 13,1 % de marocains en Espagne. Aux Pays-Bas, les communautés turques et marocaines, représentent chacune environ 25% du total de la population étrangère (EUROSTAT 2011). Les Égyptiens jouent actuellement un rôle mineur dans l'UE, mais représentent une proportion des migrants plus importante en Italie et en Grèce (Zohry 2005).

L'Égypte et la Turquie sont de loin les plus grands pays MENA en terme de population avec plus du double de la population algérienne ou marocaine. Le taux de la population active est presque le même pour tous les pays ou régions considérés ici. Cependant, lorsqu'on compare les taux de croissance annuelle de la population active, ils sont au moins trois fois plus élevés dans la plupart des pays MENA que dans l'UE. En 2009, la population de l'UE a augmenté de seulement 0,36%, contre 1,87% dans la

région MENA. Sur la base de la richesse mesurée en PIB par habitant, le citoyen moyen de l'UE gagne 4 à 8 fois plus qu'un citoyen moyen de la région MENA.<sup>1</sup>

En raison des revenus relativement bas dans leur pays d'origine, l'incitation à l'émigration qui est fondée sur les différences de salaires est la plus forte pour les Marocains et les Egyptiens. Le plus riche de ce groupe de pays est la Turquie où les salaires restent encore beaucoup plus bas que ceux de l'UE. Ici il faut peut-être ajouter une remarque concernant la distribution sectorielle du travail : seulement 5% de la main d'oeuvre est employée dans l'agriculture pour l'UE, alors que ce nombre est de 41% pour le Maroc et de 26% pour la Turquie<sup>2</sup>

Alors que le taux de participation du travail est très élevé en Algérie et en UE, il est étonnement bas en Turquie, en Tunisie et en Égypte. De plus, le taux de participation des femmes est seulement de 25% dans la plupart des pays MENA (à l'exception de l'Algérie) alors qu'il est de presque 50% dans l'UE. La participation des hommes dans les pays MENA est très élevée, mais seulement de 65% dans l'UE. Une autre observation intéressante peut être faite concernant le niveau d'éducation de la main d'oeuvre : plus que 80% des marocains n'ont aucune éducation ou seulement une éducation primaire, une tendance que l'on observe aussi pour les autres pays MENA pour lesquelles les données correspondantes sont disponibles.

Alors qu'en général le chômage dans les pays MENA est seulement de quelques points supérieur au niveau moyen de celui de l'UE, le chômage des personnes ayant un diplôme universitaire est souvent quatre fois plus élevé en Afrique du Nord. Le chômage des jeunes ne diffère pas beaucoup dans les pays MENA de celui de l'UE. Ce problème est particulièrement grave pour l'UE, le Maroc, l'Algérie, la Turquie et la Tunisie, où le chômage des jeunes est deux fois plus élevé que le taux de chômage général. Dans ce contexte, il faut mentionner que les taux de croissance du PIB observés dans certains pays MENA pendant les dernières années n'ont pas eu d'effets significatifs sur le marché du travail.

L'effet net de la migration est positif dans l'UE et négatif dans la région MENA, on peut donc qualifier la CE de région d'importation du travail et la région MENA de région d'exportation du travail. Environ un cinquième (21,3%) des étrangers de l'UE viennent d'un des pays MENA mentionnés ici.

Comme attendu, les travailleurs d'Afrique du Nord ont plus tendance à émigrer vers les pays francophones comme la France et la Belgique. Le langage commun a des conséquences sur les coûts d'entrée et de transactions qui sont considérablement plus bas pour les citoyens marocains, tunisiens et algériens. En raison des liens coloniaux, les relations sociales qui sont déjà établies aident la transition

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<sup>1</sup> Il faut noter que dans le calcul du PIB par habitant pour l'UE (Euro 18943) les pays de l'Europe de l'Est, qui normalement exportent plus qu'ils n'importent, sont aussi pris en considération. Ainsi le différentiel de salaires entre les pays MENA et les pays surtout de l'ouest et du Sud de l'UE (les pays hôtes pour la migration) est en réalité plus grand qu'il n'y paraît dans ces chiffres.

<sup>2</sup> A proprement parlé, la Turquie n'est pas un pays MENA.

pour la migration et contribuent à réduire les coûts des transactions. La France à elle seule compte plus que 63% des migrants d'Afrique du Nord qui restent plus de 7 ans en UE.

L'Espagne en termes relatifs est aussi un pays d'accueil important pour la migration temporaire d'Afrique du Nord, ce qui s'explique par la demande élevée d'ouvriers saisonniers, surtout dans l'agriculture. La majorité des migrants du Proche ou Moyen Orient vont vers la Suède, le Danemark ou le Royaume-Uni et se répartissent régulièrement dans tous les autres pays. Il faut mentionner que quelques-uns de ces pays de la classification Proche ou Moyen Orient n'appartiennent pas officiellement à la région MENA (par exemple certains pays dans l'Asie Centrale).

Il semble donc qu'en moyenne, les migrants sont moins susceptibles de trouver un emploi dans l'UE que les locaux, spécialement en Belgique, Pays-Bas, Espagne et Suède, où les taux de chômage des étrangers sont quelquefois de presque 3,45 points plus élevé que pour les travailleurs locaux. En revanche, le marché du travail en Hongrie, Grèce, Irlande, Portugal, Royaume-Uni et en Italie montre des conditions plus favorables pour les étrangers que pour les locaux.

D'abord, les migrants des pays MENA qui avaient des difficultés pour trouver des emplois dans des pays avec des taux de chômage élevés sont, pour la plupart, d'une qualification relativement faible, surtout en Espagne, en France, aux Pays-Bas, en Finlande et en Italie. Par ailleurs, dans les pays où les étrangers ont des taux de chômage plus bas que les locaux (comme la Hongrie, la Pologne ou le Luxembourg), il n'y a presque pas de chômage chez les non-qualifiés. Il est probable que ces pays n'attirent pas autant de travail non-qualifié (soit en raison des salaires plus bas soit parce que le marché du travail est très spécialisé), et accordent la priorité aux migrants plus qualifiés. Seulement dans le cas des Egyptiens, les ouvriers très qualifiés présentent des taux de chômage en moyenne plus élevés que les ouvriers non-qualifiés. Ce n'est pas une surprise eu égard aux taux de chômage très élevés des jeunes travailleurs qualifiés à la recherche d'emploi en Egypte. Mais cela peut sembler surprenant vu la demande élevée de travail au centre de l'UE. Le taux de chômage très élevé de l'UE pour le travail qualifié venant d'Egypte peut montrer un autre signe d'inadéquation sur le marché du travail en Egypte et la qualité inférieure de son éducation dans le secteur tertiaire.

### **Modèle et Sources des Données**

Dans cette étude, on a utilisé le modèle GTAP, un modèle standard d'équilibre général calculable avec migration du travail bilatérale (Hertel1997). Dans le cadre du standard (GTAP), on assume un comportement « conventionnel néoclassique » (maximisation de l'utilité, minimisation des coûts), avec utilité régionale agrégée sur des demandes privées (non-homothétique), demandes publiques et épargnes (demande d'investissement). La production est caractérisée par un rendement d'échelles constants, une technologie parfaitement compétitive et des importations bilatérales différenciées par

région d'origine en utilisant la spécification Armington. Le modèle incorpore cinq facteurs de production : le travail qualifié et non-qualifié et le capital sont parfaitement mobiles, les ressources foncières et naturelles sont toutes deux spécifiques aux secteurs (les ressources foncières ont une mobilité réduite). Dans tous les facteurs des marchés, le plein emploi est assumé (équilibre à long terme). Toutefois, la mobilité du travail et du capital peut se passer seulement entre les régions. Le modèle GTAP permet des divergences entre épargne et investissement régional, mais oblige tout le capital dans une région à bouger seulement à travers des industries de cette région. Le comportement des investisseurs est caractérisé par une 'Global Bank' fictive qui accumule les épargnes (investment funds) de chaque région pour les redistribuer dans les régions en accord avec un certain « taux de rendement » ou un « mécanisme des parts d'investissement fixe ».

Les données utilisées pour la simulation proviennent des biens GTAP Data Base 7.1, une source documentée et disponible au public comme source globale de données pour le commerce bilatéral, le transport et les barrières commerciales à travers les régions pour tous les biens GTAP.

### **Simulations**

1. Baisse des restrictions pour la migration d'un pour-cent, et impact sur les variables macroéconomiques et les salaires
2. Augmentation de l'emploi qualifié d'un pour-cent (émigration de la région MENA pour l'UE), une augmentation totale de l'emploi aurait-elle les mêmes effets?

### **Résultats et conclusions**

L'étude montre qu'un gain potentiel, mais aussi substantiel du PIB mondial (dans cette simulation environ 56 millions USD) est possible en réduisant les restrictions pour la migration dans l'UE. Mais ce gain sera réalisé surtout aux dépens des pays MENA, un résultat en accord avec la recherche actuelle, qui prévoit une forte augmentation du PIB par une augmentation de l'efficacité de l'allocation des facteurs.

Tout au long de la recherche nous avons utilisé le cadre EGC qui nous a permis de modéliser les flux de main-d'œuvre avec différentes décompositions des compétences - haute et basse. Nous avons également pris en compte les transferts de fonds et les flux commerciaux, terre, capital et ressources naturelles. Dans notre premier exercice empirique, une augmentation de 1% du nombre de travailleurs migrants MENA (à la fois qualifiés et peu-qualifiés) a été étudiée, les travailleurs européens devraient connaître des faibles baisses de salaire - à la fois chez les qualifiés et non qualifiés, tandis que des

résultats positifs sont attendus pour les rendements sur la terre, le capital et les ressources naturelles. Ces résultats restent plausibles dans le contexte de la littérature existante concernant les salaires des locaux. Pour les pays MENA, on obtient des résultats inverses, alors que l'augmentation des salaires des travailleurs qualifiés (2,07%) est presque cinq fois plus élevée que pour les non-qualifiés (0,4%).

Les pays de l'UE pourraient bénéficier sur plusieurs éléments de bien-être grâce à une plus grande allocation des ressources et un meilleur système de collecte des impôts. D'autre part pour les pays de la région, on s'attend à des gains provenant de l'expansion des termes d'échanges et d'envois de fonds de l'UE, tout en perdant un peu de l'efficience allocative, de la dotation, de l'effet de la population et des biens d'équipement. D'autres variables macroéconomiques (consommation, investissement, les dépenses publiques, exportations et importations) dans les 27 pays de l'UE montrent une variation autour de 0,5%, tandis que la consommation augmente dans la région MENA de 0,24%, les dépenses gouvernementales de 0,3%, l'investissement (0,43%) et du commerce (les importations (0,16%) et les exportations (0,7%)) sont en déclin. Dans l'ensemble, une augmentation de 1% de la migration à partir des pays de la région à l'Union européenne conduit à une baisse du PIB total au sein de la région MENA, considérant que l'UE ainsi que le monde entier fait face à une augmentation de la production totale.

Dans le deuxième scénario de notre simulation (augmentation d'un pour-cent seulement de la migration « qualifiée » vers l'UE) les avantages pour l'UE sont moins prononcés et les pertes pour les pays MENA moins graves. Mais l'effet sur les salaires de la région MENA a été plus dramatique : les très rares travailleurs qualifiés dans ces pays peuvent attendre une augmentation salariale de 2%, et les autres à une faible diminution de salaire de 0.11%. Le gain de PIB sera un peu plus bas que dans la première estimation (environ 31 millions USD). Dans l'ensemble, les évolutions quantifiées de la simulation 2 sont moins impressionnantes que les évolutions causées par une augmentation de la migration vers l'UE du travail qualifié ainsi que du travail non-qualifié.

Enfin, d'autres simulations ont été testées afin de déterminer la robustesse des résultats avec des paramètres différents.

Il en résulte que le marché du travail de l'UE peut absorber avec succès même un nombre plus grand de migrants sans une détérioration du bien-être de la population actuelle, ce qui est conforme aux résultats des recherches antérieures. Mais il faut s'attendre à ce que les pays MENA enregistrent des pertes en ce qui concerne le PIB, la population, l'utilisation de ressources etc. alors que ces pertes ne seront compensées que partiellement par les envois de fonds des autres pays. Ces effets ce font au détriment de la région MENA et ne sont pas une grande surprise et déjà présents dans la littérature. En tous cas, un tel scénario peut représenter un défi pour les politiciens dans les pays d'origine, qui se préoccupent du bien-être de leur pays. Par exemple, une nouvelle politique peut être envisagée pour encourager le retour dans les pays d'origine pour diminuer les effets négatifs. Ceux qui retournent dans

leur pays, pourraient peut-être aussi contribuer à une productivité plus élevée grâce au savoir faire obtenu à l'étranger.

**Remarque finale:**

Les taux de participation au marché du travail sont très bas comparés aux autres régions du monde. En raison du manque de données disponibles, cette étude n'a pas pu étudier les effets de la migration sur ces groupes particuliers. D'autres études seront nécessaires pour obtenir plus de connaissances.

Les données utilisées sont encore des données de l'UE et de la région MENA avant la crise financière actuelle qui a commencé fin 2007. Il est très probable que cette crise assez importante puisse changer certaines conclusions de l'étude.

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## 1. Introduction<sup>1</sup>

Since the end of World War II, migration from the Middle East and North Africa (MENA) has been a widely discussed phenomenon. On the one hand, migration to Europe, driven by the hope of escaping poverty or unemployment, has been steadily increasing since then. Drawing back on the data of 2008, there is a growing tendency to migrate among the youth in several MENA countries. As of 2008, almost 8.2 million people headed towards the European Union, while some were also leaving to work in either other Arab countries (2.7 million) or other destinations abroad (1.7 million). Especially in the MENA countries, where unemployment rates have reached as high as 28% in the past (Nassar, 2005), mostly young, but also a rising number of educated labour market participants find themselves unable to obtain employment in their home country, thus increasing the need to seek jobs abroad. Due to changing demographic conditions, this group is projected to increase in coming years. This growing tendency appears in surveys taken from Tunisian youth with more than 70% reporting in 2005 their wish to emigrate (Fourati, 2008). An estimation made in 2005 foresees a rise of the working age population by 15.5 million at the end of 2020 (Schramm, 2006). This would transform the future domestic job market in those regions to an even more competitive environment (Glystos, 1999). Europe, on the other hand, faces the reverse trend: Its population is growing older and the dependency ratio is steadily increasing. Hence, it seems reasonable that both regions, the EU as labour-importing and MENA as labour-exporting, might benefit from relaxed restrictions on migration (Haas, 2010). Within that scope, the present paper investigates whether this benefit exists and how it can be quantified.

As a first step, a literature review summarizes previous studies on immigrants' impact on welfare and the labour market in terms of wages and (high-/low-skilled) employment. Afterwards, summary statistics on the MENA region and EU are given to allow for a better comparison of the working conditions and an explanation for possible motives for migration. Subsequently, the model and data which are used for this analysis are explained. Finally, the simulations and a sensitivity analysis help to draw a final conclusion concerning the effects of MENA migrants in the EU.

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**2. Literature Review**

Numerous studies have been conducted to analyse the quantitative and qualitative impact migrants have on their host, as well as their home country. Most economists agree that migration has overall positive welfare effects on the labour-importing countries, while evidence for the labour-exporting countries is ambiguous. In general, migration is believed to increase growth in the host countries due to increased output effects. According to some authors, lifting restrictions on unskilled workers in developed countries generate widespread positive effects on production and hence on real GDP, whereas the benefits from skilled labour movements are primarily felt in specific service sectors (Coppel et al. (2001); Boeri and Brücker (2005)).

While most recent research has focused on lifting of international trade barriers, overall gains resulting from the elimination of trade barriers are not that impressive, when compared to the elimination of restrictions to labour mobility. In Clemens (2011) various studies were collected so to gauge the efficiency gain in GDP with removal of different barriers which can reach over 140% with labour liberalization compared to only 4.1% with trade liberalization (See *Table 1*). Certainly, caution should be exercised when comparing and interpreting results across different studies with different methodologies, however, even without getting into much detail, the bottom line is clear: gains from migration outweigh the benefits from open trade by a wide margin. Still, these gains are possible only with large-scale migration and thus this particular outcome is difficult to imagine: at least half of population in poor countries would have to move to rich countries.

**Table 1: Efficiency gain in GDP from elimination of barriers**

Research Issue – Reduction of -	min	max	average
All policy barriers to merchandise trade	0.30%	4.10%	1.70%
All barriers to capital flows	0.10%	1.70%	0.90%
All barriers to labour mobility	67.00%	147.30%	108.20%

*Source:* based on (first row) Goldin, Knudsen and van der Mensbrugge (1993); Dessus, Fukasaku, and Safadi (1999); Anderson, Francois, Hertel, Hoekman and Martin (2000); World Bank (2001)(with positive effect on productivity), World Bank (2001); Anderson and Martin (2005); Hertel and Keeney (2006), *Table 2.9*; (second row) Gourinchas and Jeanne (2006); Caselli and Feyrer (2007) (third row) Hamilton and Whalley (1984), *Table 4, row 2*; Moses and Letnes (2004), *Table 5, row 4*; Iregui (2005), *Table 10.3*; Klein and Ventura (2007), *Table 3*.  
Cited in Clemens (2011)

Taking into account studies with more reasonable assumptions on the scale of migration Clemens (2011) further reviews efficiency gains in GDP with lower rates of emigration out of origin population, the so called the net emigration rate of origin population. These gains range from over 50% to around 1% according to different rates of migration (positively correlated) and are presented in *Table 2*, where the World GDP in 2001 is taken to be \$32 trillion, doubling (in 2001 dollars) to \$64 trillion by

2025. The data are based on the following studies: Hamilton and Whalley (1984) [HW], Moses and Letnes (2004, 2005) [ML], Iregui (2005) [I], Klein and Ventura (2007) [KV], Walmsley and Winters (2005) [WW], and van der Mensbrugghe and Roland-Holst (2009) [VR] with different methodologies which range from a static partial equilibrium model (HW and ML), to a static computable general equilibrium model (I, WW, VR), to a dynamic growth model (KV). Some studies use two factors: labour and immobile capital (HW, ML, I) and some allow mobile capital plus third factors and international differences in total factor productivity (KV, WW, VR). Other studies differentiate between skilled and unskilled labour (KV, I, WW, VR). The conclusions of the studies crucially depend on the effects of skilled emigration, on the parameters of the production function and assumptions on international productivity of labour.

**Table 2: Efficiency gain in world GDP from partial elimination of barriers to labour mobility**

Study	Net emigration rate of origin population	Efficiency gain in world GDP
<b>Moses and Letnes (2004, 2005)</b>	29.30%	54.80%
	10.30%	22.00%
<b>Iregui (2005)</b>	24.00%	31.00%
	14.80%	20.00%
<b>Klein and Ventura (2007)</b>	7.30%	10.00%
	0.80%	0.60%
<b>Walmsley and Winters (2005)</b>	1.60%	1.20%
	0.80%	0.90%
<b>van der Mensbrugghe and Roland-Holst (2009)</b>	2.00%	2.30%

Source: Clemens (2011)

Basically<sup>2</sup>, there are three ways in which migration may contribute to greater economic growth. First, immigration may lead to the advance movement on the convergence to the long-run steady-state growth path; second, it may contribute to innovation and changes in total factor productivity; third, it may trigger incremental changes in efficiency, which boosts total factor productivity in the long run.

Short-run micro outcomes include the effects on home and host wages as well as employment, the duration of job search, saving behaviour, consumption patterns, and migrants’ human capital investment in the host country. Long-run micro effects evaluate the remittances and establishment of international networks, social mobility, immigrants’ catch-up with the local population, innovation, and business practices. Besides, macro effects consider the following issues in the short run: size and composition of population, national accounts, international balance of payments, budget

<sup>2</sup> This passage is based on Poot and Cochrane (2005).

expenditure on social policies, aggregate wage level, unemployment, inflation, interest rates, inequality, and income distribution. Long-term macro effects include population ageing, long-run growth rates, international trade, technological change, total factor productivity, foreign and public debt, public and private infrastructure, sectorial composition of the economy, and environment.

In order to investigate the effects several approaches have been used by scholars, which can be grouped as simulation based and econometric based. The first group consists of the factor proportions approach (partial equilibrium) and computable general equilibrium approach. The second group comprise area analysis, production theory and time-series approaches. In a nutshell, the factor proportions approach draws from the general equilibrium model which is built on the assumptions certain labour market and production function. This approach evaluates the simulated labour force shocks to the local labour markets and their effect on other variables via the interconnected system of equations. Both factor proportions and computable general equilibrium approaches have a lot in common and in both the results rely heavily on initial assumptions. The area approach exploits the fact that most migrant flock to specific geographic areas rather than disperse evenly across the host country. If empirical testing reveals that in an area rife with immigrants the wages are lower and unemployment is higher than in other parts of the country then it may support the hypothesis that migrants have a depressing effect on the labour market. The drawback of this approach is that it is rarely built on theoretical foundations (see Card (2001) for micro foundations). Production theory approach is used mainly to examine the substitution possibilities among labour inputs defined by race, immigrant state or cohort. The results of the approach rely on the estimation of production function with different labour and non-labour inputs, which give an opportunity to gauge the substitutability or complementarity between the various production factors. The method is based on cross-sectional data on factor prices and relative proportions of inputs. Estimation of coefficients in the production function is used to determine the elasticities of complementarity between native and immigrant workers. The research based on the production theory approach is mainly US based, while only two existing studies by Bauer (1997) for Germany and Kohli (1999) for Switzerland both show small negative or negligible wage effects.

Starting with the simulation-based approach, several simulations have been attempted to estimate the effects of a possible increase in migration quota on some main macroeconomic variables and welfare. One powerful tool which can be used in the analysis of the effects of international labour market liberalization is a computable general equilibrium (CGE) model. A CGE model is a theoretical construct which assumes an endogenous clearing of markets (prices and quantities) in the equilibrium state. CGE models employ calibrated data in order to make economy-wide predictions according to equations that describe the behaviour of all economic agents and market-clearing

conditions in the model. Most studies use the method of comparison between the baseline (benchmark) scenario and an alternative outcome which simulates policy implementation.

There exist a number of different models that are aimed at studying the effects of labour migration on the overall economy. A complex open-economy framework is used in Keuschnigg and Kohler (1999) to assess the EU enlargement on Austrian economy. The authors assume that the number of unskilled and skilled workers is scheduled to increase by 10.5%, and 2.1% respectively. At the same time, it is expected that wages of unskilled employees decline by 5%, whereas those of skilled workers increase by 2.7%. Muller (1997) describes the effects of migration in Switzerland. His exploratory study suggests mild positive results regarding labour market segmentation, capital mobility, and terms of trade in the native economy.

A study conducted by Walmsley and Winters (2005) comes to the conclusion that an increase of mere 3% in the quota of temporary movement of skilled and unskilled workers results in a US\$156 billion (in 1997 constant prices) gain in global welfare. As in this study, they employ the Global Migration Model (GMig) for their calculations.<sup>3</sup> However, due to the lack and inconsistency of migration data, some approximations in specific areas are necessary. Their result confirms that restrictions on labour movement in developing countries are costly for all affected countries, especially due to a foregone decrease of costs for unskilled, domestic labour in the host country.

Similarly, a dynamic recursive general equilibrium model, used in a World Bank study (2006), concludes that the global welfare gain is an impressive US\$ 674 billion in real income in comparison to the baseline scenario (in 2001 prices). The simulation also models an increase in the global flow of working immigrants by 3% (a movement of 14.2 million workers from developing to developed high-income countries by the year 2025). However, the income gain shrinks to US\$ 356 billion when adjusted for increased cost of living. It should also be noted that this World Bank simulation reports welfare losses for old immigrants. Thus, it suggests that liberalization in labour migration benefits developed economies through welfare changes, but generally leads to a fall in wages.

While other models cannot distinguish between different households, CGE models give the opportunity to separate the effects on high- and low-skilled workers. The model of Boeri and Brucker (2005) shows that positive gains of labour migration are possible when two economies open their borders. The study assumes two closed economies, which produce one good. Factors of production include skilled and unskilled labour, and physical capital. The model simulations assess the impact of migration on income and employment under different assumptions regarding wage flexibility and the level of unemployment benefits. When labour markets clear (baseline scenario), a 1% increase in the

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<sup>3</sup> For more information on the GMig Model see the Methodology.

share of immigrants relative to native population leads to a 0.3% increase in GDP for the EU member states (total region), while the gains/losses are almost 0.7% in the host country and -0.7% in the source country. However, those gains happen at the expense of low-skilled native workers in the host country, who are most hit by comparable foreign workers with similar skills. Moreover, as Weizsäcker (2006) points out, low-skilled migration increases income inequality among the natives and increases wage prospects in the sending country. For high-skilled workers, the reverse holds.

Another multiregional CGE model by Iregui (2003) argues similarly and evaluates the gains from an elimination of restrictions on workers' movements. In this model specification with 1990 data, average wages increase in the source countries, as restrictions for skilled and unskilled workers are lifted. This is driven by labour scarcity relative to capital, making the return to capital lower. The remaining skilled workers in the source country receive wage increases because of raising demand. In the destination country, wages are lower for both types of labour and the return to capital increases. In case of only skilled labour migration, unskilled workers and capital owners are worse off in the home country. In the host economy, a larger number of skilled workers receive average lower wages. An important extension of the model refers to capital mobility along with skilled labour movement: workers move to countries and sectors with higher wages and higher returns to capital, thus in the home region unskilled workers and capital owners are worse off, whereas in the host country the trend is reversed. Additionally, welfare gains are substantially reduced when transaction costs are introduced in the model.

The effect of migrants on wages is analysed in more detail by Longhi et al. (2005a). They use the methodology of meta-analysis to review 18 papers with 348 estimates of immigrant inflows on wages of workers in the host country. Their findings suggest that an increase of the immigration population by 1% results in a decrease in wages of the native-born population of 0.1%. Other studies (Altonji and Card (1987); Bean et al. (1988); Borjas (1986), (1987); Grossman (1982); LaLonde and Topel (1987)) confirm that immigrants impact earnings and employment opportunities of natives only to a very small extent, while they do have a significant impact on their own and other immigrants' wages. A 10% increase in the number of immigrants leads to a reduction in immigrants' wages of 2% to 3%.

Judging from the evidence so far, it can be summarized that there are little or no negative effects of large scale migration on labour market outcomes in terms of wages and employment opportunities. This could be explained by the compensating growth in output and rise in productivity. Priore (1979) also argues that this is either due to the fact that immigrants perform jobs that most natives do not want to engage in, or to a general mismatch on the native labour market.

The standard open-economy model describes the steady state convergence mechanism, which assumes acceleration with greater population influx and comes to the steady state growth rate. A simple macro model by Kemnitz (2001) describes the importance of immigration coinciding with capital growth, which suggests that immigration will benefit a native if and only if the average immigrant arrives with more capital than the average native.

Employing the framework of CGE, Walmsley and Winters (2003) study the impact of freeing up of border controls on growth. Their estimation shows that a 3% increase in quotas of unskilled and skilled workers will translate into a global economic boon worth 150 billion USD.

The second way of increasing growth is through Schumpeterian innovation: as new immigrants tend to bring and exchange new ideas, open new businesses and new industries. They may even attract FDI from their home countries. Theoretical aspect of entrepreneurial activity of immigrants is largely overlooked, but empirical work exists. Ching and Chen (2000) find evidence that immigration may lead to greater international trade between countries, based upon the study of immigrant entrepreneurs of Taiwanese origin in Canada, while their another finding suggests that investor class (passive capitalists) immigration has a detrimental effect of trade. However, this economic aspect of immigration still remains under-researched.

The third venue of economic growth is through economic efficiency. Migrants may respond better to economic signals as they are younger on average, and may be better equipped to adjust to changing conditions. Borjas (2001) uses the model of “greasing the wheels” in order to explain the link between immigration and growth. His paper estimates how the migrants contribute to US growth by “greasing the wheels”.

One of the drawbacks of in the studies on immigrants’ inflow on wage is the endogeneity bias, since it is believed that immigrant workers are most attracted to areas with high wage growth and high employment. Some immigrant flows were caused by political factors and not triggered by economy. These occurrences are interesting natural experiments, which could be modelled as a truly exogenous immigration shocks in local labour markets.

One such example is the “Mariel boatlift” of 1980, when scores of Cuban immigrants, who wished to emigrate, were allowed by Fidel Castro. In a few months about 125,000 low-skilled Cuban immigrants left the port of Mariel to Miami, Fl., where half of them settled, being about 7% of the work force. Card (1990) reports the effects of the boatlift, focusing on wage rates and unemployment rates of low-skilled workers.

His study compared wage rates and unemployment rates of whites, blacks, Cubans and Hispanics in Miami in 1979-85 along with data on other four cities with comparable economic growth rates. The data analysis shows that the difference between the actual and predicted wages (fitted on the basis of regression) on non-Cuban workers is negligible. Similarly, the effect on wages on other Cubans was also insignificant.

Algerian independence of 1962 led to the repatriation of 900,000 skilled workers of European origin back to Europe, especially, France. Hunt (1992) investigated the impact of this migration (1.6% of total French labour force) on labour outcomes. Although they suffered from high unemployment rate themselves, their presence influenced little the unemployment by the locals. The study, based on the area analysis, suggests that a 1% increase in the proportion of repatriates resulted in an increase of 0.2% in the unemployment rate of the locals, while the impact on wages is the 0.8% decrease. The limitation of the study is that the average wage rate given in a certain locality without decomposition into the native and repatriate population. Thus the results may be biased because of the composition problem.

Similar natural experiment occurred when 'retornados' migrated to Portugal from newly independent Angola and Mozambique in the mid-70s, as researched by Carrington and de Lima (1996). The working population increased by 10% during 1974-76. Comparisons with Spain and France suggest that the immigrants caused some unemployment in Portugal, but when the increase in unemployment compared with other economies in Europe in the same period, it is insignificant. When the comparison is conducted on the level of different districts in Portugal, it seems that the wage growth was stalled in the regions with immigrant workers, but other factors may have influenced the outcome. The conclusion of the authors is that the immigration does not have significant adverse effects on the local labour market.

Lastly, another "natural experiment" took place in Israel, when during the breakup of the former Soviet Union scores of Russian born immigrants chose to leave. During the early 1990s the Israel's working population increased by 8%. Friedberg (2001) examines the impact of immigration across occupations with higher levels of immigrants on the labour market. The estimations with least squares show that the growth of earnings of the native-born workers was lower during 1989-94. However, research shows that immigrants enter workforce with lower wages and low wage growth, rather than having a downward impact on the labour market.

These studies of natural experiments describing workers movement from Cuba to Florida, Algeria to France, Angola and Mozambique to Portugal, the former USSR to Israel do not refute the hypothesis that local markets have the capacity to absorb great labour shocks in a relatively short time span.



This section presents some of the conclusions from the body of literature that examines the impact of migration on the sending countries, rather than host countries. Tremendous amount of research has been undertaken in order to estimate short and long-term economic outcomes of outward migration in the MENA region. Nassar (2005) suggests that outward migration kept unemployment lower in the sending countries among the youth and women. Based on the existing research and economic analysis EU commissioned study of 2010 issued an overview (European Commission, 2010, p. 67) that summarizes the first order effects of several stages of migration on the sending countries in the MENA region. This overview is presented in *Table 3*. Among the effects on labour market dimension supply and demand effects are examined, branching into factor endowments and behaviour, consumption and investment effects respectively. The stages of migration include – prospects to migrate which lower labour supply and contribute to brain gain (through attainment of skills), result in higher reservation wages demanded by workers. Reservation wages are positively affected by all stages of migration. Actual migration also lowers the labour supply, while augmenting the demand for labour and lowering for capital. It does not produce conclusive effect on capital supply, education and labour participation. Remittances sent over to the residing population have a positive effect on all variables but labour supply and participation. Return migration is correlated positively with all the variables in labour supply and demand. Informal employment is largely unaffected by migration, with the exception of remittances that increase it.

**Table 3: First order effects of outward migration on MENA countries' economy**

Effects on labour markets		Migration stages	Prospects to migrate	Actual migration	Remittances	Return migration
Supply side	Factor endowments	Labour supply (L)	-	-	-	+
		Brain drain/gain (H)	+	-	+	+
		Capital supply (K)	=	=	+	+
	Behaviour	Education (H)	+	=	+	+
		Labour participation (L)	-	=	-	+
		Reservation wages	+	+	+	+
Demand side	Consumption patterns	Labour demand	-	+	+	+
	Investments	Labour demand (K)	-	-	+	+
Structure		Informal employment	=	=	+	=

*L - labour supply, K - capital, H - human capital*

Source: EC (2010)

One of the features of the regional migration is that it tends to be temporary or circular. The case in point is Egyptian workers in the Gulf States, whose number depends on oil prices and political situation in the region. Other notable examples are Syrian workers in Lebanon, Egyptian farmers in Jordan and Libya (Fargues, 2009, p 28-31). The framework of circular migration is preferable for the EU countries, some of which have already signed bilateral agreements on temporary workers: Spain

and Morocco, France and Tunisia, Italy and Egypt. The impact of this migration has yet been investigated.

However, the actual numbers of immigrants issued entry on the basis of the treaties remain relatively low- in mere thousands - if compared to the expected MENA migration. A study by the scholars (Venturini, Fakhoury and Jouant ,2009) suggests that job creation in Tunisia, Morocco, Algeria and Egypt consistently lags behind so that the labour market creates annually excess supply which cannot be met by demand in the MENA market. Their outcome of the model, based solely on the four countries, shows that close to half a million people become candidates for circular migration each year.

For completion purposes, it is also necessary to mention some more qualitative studies analysing some of the effects migration can have, but which are more difficult to quantify. One important aspect is the role of remittances. In the neoclassical context, remittances help to improve the income distribution, decrease inequality and increase overall welfare (Borjas, 1989). In the cumulative causation theory, remittances trigger inflation, thus increasing inequality and allowing for the 'Dutch disease' effect by leading to an appreciation of the currency and thus weakening the external competitiveness of that country. This is confirmed by some empirical studies (Myrdal, 1957). Also, the importance of 'brain drain', the emigration of mostly well-educated citizens, or 'brawn drain', the emigration of young, agricultural labourers, should not be underestimated, since it bears substantial costs to the source country which might not be fully compensated by the inflow of remittances. Nevertheless, evidence for 'brain drain' can only be found in rather small and very poor economies (Haas, 2010). Other effects might include socio-cultural effects in the home country (consumerism, non-productive, and remittance dependent attitude) or the host country (xenophobia and racism).

So far, the almost unanimous conclusion is that the gains in the labour market are positive, albeit negligible at best. There is a growing evidence that some of these gains are at the expense of previous migrants or low-skilled workers in the host community (Walmsley et al., 2007). Moreover, the probability that immigrants increase unemployment in the short run is low and in the long run is zero (Okkerse, 2008). However, overall welfare seems to increase when relaxing migration restrictions.

### 3. Descriptive Statistics about MENA and the EU

Due to recent developments in the MENA region, but also with regard to demographic changes in the EU, migration from the MENA countries to the EU has gained some renewed attention. Especially the turmoil in many Arab nations during the *Arab spring* is seen as a new turning point in migration relations with the EU. So far, the effects of the tremendous, institutional changes that have taken place cannot be clearly interpreted. On the one hand, many European based politicians fear being overrun by new waves of immigrants that might flee from their politically unstable home countries to the EU. This not only triggered countries like Italy to seek help from international institutions, but also countries in Central and North Europe to tighten the Schengen agreement in terms of harsher border controls to avoid an uncontrollable influx of migrants to their countries. On the other hand, there is hope that the new institutions installed in some MENA countries might lead to economic prosperity, the abolition of nepotism, and diminishment of corruption, thus improving the business and labour environment. While the first case gained attention in the media showing how thousands of Libyans flee their country and land on Italian islands, the second case will need a more long-term perspective to be fully evaluated.

Another important change within the EU will also have significant effects on the stream of non-EU migrants. As observed by Deutsche Bank Research group (2011), migration from the peripheral EU countries to the core countries increased due to the impact of the recent financial crisis. This worsens the situation of non-EU migrants in two ways: First, the sectors that were most affected by the crisis were manufacturing, construction or tourism, which are also the sectors in which most unskilled migrants are concentrated. Hence, unemployment increased among these groups of migrants in peripheral Europe. Second, a crowding out effect of non-EU migrants through peripheral EU citizens could be possible in the core EU, since transaction costs of employing EU citizens are significantly lower and education standards better than for migrants from the MENA region.

Nevertheless, current demographic trends might encourage migration and create a more positive perception of migrants. The aging population in Europe will need to find measures in the future to keep their workforce constant, if they are intending to retain their standard of living. Due to the very low fertility rates in the EU, a softening in migration policies could be the answer. It should be noted at this point that, next to an increase of migrants, Sanderson and Scherbov (2008) express alternative solutions. Their measures include an increase in the working age due to a general improvement in the overall health condition among the elderly, which allows them to work more productively than people of similar age decades ago. However, migration is still seen as a possible way out of the demographic problem and first attempts have been undertaken with a special focus on skilled

labour, which is especially demanded by core European states by issuing so-called ‘Blue Cards’.<sup>4</sup> This would be extremely beneficial for the MENA region, since an increasing proportion of their unemployed is reported to be young and educated. Thus, a relaxing of existing migration policies could not only help the EU to reduce its dependency ratio, but also the MENA countries to take pressure off their very competitive labour market.

### 3.1 General Trends and Statistics

In order to be fully able to evaluate the situation, a closer look at some countries in the MENA region as well as a comparison with the EU is necessary. *Table 4* reports some main macroeconomic variables for the EU, Algeria, Morocco, Tunisia, Egypt, Turkey, and MENA. We chose to focus more extensively on these countries, since they account for the largest migration flows from the MENA region to the EU. Especially, Moroccan and Turkish citizens make up large proportions of the foreign population in some EU countries. In Germany, one quarter of all foreigners is Turkish, whereas in Spain 13.1% are Moroccans. The Netherlands have a roughly equal share of Turkish and Moroccans, which sums up to 25% of the total foreign population (EUROSTAT, 2011). Egyptians actually play a minor role in the EU, but they account for a larger proportion of migrants in Italy and Greece (Zohry, 2005). Unfortunately, data on other countries (e.g., Syria or Libya) are either insufficient or not available, so it cannot be accounted for at this stage.

**Table 4: Descriptive Statistics in 2009**

	EU	Algeria	Morocco	Tunisia	Egypt	Turkey	MENA
<b>Population</b> (in million)	500.57	34.90	31.99	10.43	83.00	74.82	376.58
<b>Population ages 15-64</b> (% of total)	67.14	68.07	66.26	70.05	63.13	67.30	64.74
<b>Population growth</b> (annual %)	0.36	1.51	1.22	1.01	1.79	1.21	1.87
<b>GDP per capita</b> (constant 2000 US\$)	18,943.25	2,189.71	1,780.85	2,805.16	1,879.66	4,771.37	3,559.18
<b>GDP growth</b> (annual %)	-4.30	2.10	4.95	3.13	7.16	-4.83	2.61
<b>Employment in agriculture</b> (% of total employment)	5.07	n.a.	40.90	n.a.	n.a.	26.20	n.a.
<b>Employment in industry</b> (% of total employment)	25.88	n.a.	21.70	n.a.	n.a.	25.70	n.a.
<b>Employment in services</b> (% of total employment)	68.48	n.a.	36.60	n.a.	n.a.	48.10	n.a.

Source: World Bank (2011)

<sup>4</sup> The Council of the European Union (2009) defines the ‘Blue Cards’ as follows: EU Blue Cards are “[...] aimed at facilitating conditions of entry and residence in the EU of third-country citizens for the purpose of highly qualified employment [...] The Blue Card will facilitate access to the labor market to their holders and will entitle them to a series of socio-economic rights and favorable conditions for family reunification and movement across the EU. [...]The period of validity of the EU Blue Card will be comprised between one and four years, with possibility of renewal. A Blue Card may also be issued or renewed for smaller periods in order to cover the work contract period plus three months. [...]”

As can be seen from *Table 4*, Egypt and Turkey are by far the largest MENA countries in terms of population with more than twice as many inhabitants than Algeria and Morocco. The proportion of the working age population is roughly the same for all the reported countries or regions. However, when looking at the annual growth rates, it becomes apparent that the ratio is at least three times higher in most MENA countries than in the EU. While in 2009 the EU-population grew by just 0.36%, the same figure accounted for roughly 1.87% in the MENA region. In terms of wealth as measured by GDP per capita, the average EU citizen earns 4 to 8 times more than the average MENA citizen.<sup>5</sup> Due to their relative low income in their origin countries, the wage differential based incentive to migrate is highest for Moroccans and Egyptians. Turkey<sup>6</sup> is by far the richest of these countries, but still way below the European average. A last observation can be made concerning the sectorial distribution of labour: Whereas only 5% of the EU labour force is employed in agriculture, the same figure is up to 41% in Morocco and 26% in Turkey. The Turkish economy seems to be more developed than the Moroccan one, which might also serve as an explanation for Turkey's higher GDP. However, both are still below the EU level, where more than two thirds of the workforce is employed in the service sector.

*Table 5* provides information about the labour market of the mentioned regions. While the labour participation rate is especially high in the EU and Algeria, it is surprisingly low in Turkey, Tunisia, and Egypt. Moreover, the rate of female labour market participation is as low as one quarter in most MENA countries (except Algeria) compared to almost 50% in the EU. Common reasons for this low participation rate in the MENA region usually include personal and family responsibilities, which are relatively less important for most European women. Instead, education or vocational training is considered to be more essential within the EU (EIE, 2008). In turn, male participation in all MENA countries is extremely high, whereas it only accounts for 65% in the EU. Another interesting observation can be made with regard to the educational status of the labour force. It appears shocking that more than 80% of Moroccans have either no or only primary education. This development seems, albeit less pronounced, to be shared by other MENA countries for which the corresponding data is available. In contrast, only 50% of the EU labour force have no secondary degree. Naturally, this educational distribution is connected to the sectorial employment pattern.

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<sup>5</sup> It should be noted that the calculation of the EU average per-capita GDP of €18,943 also includes Eastern European countries, which usually rather export than import labor. Thus, the wage differential between the MENA countries and the labor-importing countries of the EU (mainly Western and Southern European countries) is actually larger than reported here.

<sup>6</sup> Strictly speaking, Turkey does not belong to the country group classified as MENA. This group only includes Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, and Saudi Arabia. However, broader definitions of MENA also include Armenia, Azerbaijan, Cyprus, Djibouti, Malta, Mauritania, Northern Cyprus, Somalia, Sudan, and Turkey.

Since most people in Morocco work in the agricultural sector, a tertiary education is unnecessary and would render them overqualified.

Moreover, *Table 5* reports some interesting unemployment statistics. While overall unemployment in MENA is only a few percentage points above the EU average level, unemployment of workers with a university degree is up to four times higher in North Africa than it is in the European Union. Except for Turkey, most MENA countries exhibit lower unemployment with lower education; a remarkable trend, which is strongly in opposition of what can be observed in Europe. Youth unemployment seems to be a similar problem in MENA and in the EU. This problem is especially acute in the EU, Morocco, Algeria, Turkey, and Tunisia, where unemployment among the youth is more than twice as large as the total unemployment rate. Within that scope, it is worth noticing that the reported high GDP growth rates that were observed in some MENA countries in most recent years did not have significant effects on the labour market. This can be explained by the fact that the speed at which the economies grew was not sufficient enough to keep up with the population growth, especially with the growth of the working age population (Lawrence, 2006). It is apparent that especially the young and well educated are unable to find employment in the MENA region. One of the main explanations given by experts is the mismatch of skills demanded and skills supplied by the labour market (Nassar, 2008). This mismatch is caused by the deteriorating quality of education and the incapacity of the domestic labour market to absorb all the educated first time jobseekers. Due to the lack of export diversification and the strong focus on fuel and petroleum industries, only small amounts of labour are needed in the industrial and service sectors, hence high-skilled workers are rendered redundant.

**Table 5: Labour Statistics**

	EU	Algeria	Morocco	Tunisia	Egypt	Turkey
<b>Labour participation rate, total</b> (% of total population ages 15+)	57.3	58.5	52.3	48.0	48.8	46.8
<b>Labour participation rate, female</b> (% of female population ages 15+)	49.7	37.2	26.2	25.6	22.4	24.0
<b>Labour participation rate, male</b> (% of male population ages 15+)	65.3	79.6	80.1	70.6	75.3	69.6
<b>% of Labour force with no education</b> (% of total labour force)	n.a.	n.a.	40.4	11.6	28.9	n.a.
<b>% of Labour force with primary education</b> (% of total labour force)	23.9	n.a.	40.9	36.7	14.2	62.7
<b>% of Labour force with secondary education</b> (% of total labour force)	48.9	n.a.	10.2	36.7	33.0	21.8
<b>% of Labour force with university education</b> (% of total labour force)	26.9	n.a.	8.5	15.0	18.9	15.6
<b>Unemployment, total</b> (% of total labour force)	8.9	13.8	10.0	14.1	9.4	14.0
<b>Unemployment, no education</b> (% of total labour force)	n.a.	4.2	2.4	5.9	0.9	n.a.
<b>Unemployment, primary education</b> (% of total labour force)	15.4	14.6	12.0	13.5	2.0	11.2

<b>Unemployment, secondary education</b> (% of total labour force)	8.7	14.7	19.8	15.4	13.8	15.0
<b>Unemployment, university</b> (% of total labour force)	5.4	17.0	21.8	19.0	14.4	11.3
<b>Unemployment, youth total</b> (% of total labour force ages 15-24)	20.7	27.4	21.9	31.4	14.6	25.3

Source: Martin (2009); World Bank (2011)

Economic theory would suggest that migrants should leave a country where the supply of people with similar skills is abundant, and move towards a country where their skills are perceived as a scarce resource. It seems contradictory to established migration theory that most migrants that leave the MENA region possess little skills (see *Figure 3*), even though they are more demanded in their home country than in the country they are migrating to. On the contrary, skilled workers who seem to be highly demanded in core EU states, remain unemployed in their native country without the intention to migrate. This development might be caused by the possible mismatch of skills described before: The tertiary education that skilled workers receive in MENA does not qualify them to work in the highly specialized IT and engineering sector, in which workers are mostly demanded by EU member states. Moreover, the relatively high wages for unskilled workers in the EU might also be an incentive for uneducated people to leave their country despite possibly lower chances of finding a job in Europe.

### 3.2 Statistics about MENA migration to the EU

As *Table 6* reports, roughly 10% of people living in the EU are foreigners, whereas less than 1% are foreigners in North Africa and less than 2% in Turkey. In addition, net migration is positive in the EU while negative in the MENA region, which allows classifying the EU as a labour-importing and MENA as a labour-exporting region. As can be seen from the table, roughly every fifth foreigner in the EU (21.3%) is from one of the five listed MENA countries. However, the proportion of MENA migrants relative to total EU population is merely 1.4%, with Turkish and Moroccan migrants alone accounting for 1%.

**Table 6: Migration Statistics**

	EU	Algeria	Morocco	Tunisia	Egypt	Turkey	MENA
<b>International migrant stock</b> (% of population)	9.34	0.68	0.15	0.32	0.29	1.86	0.66
<b>Net migration</b> (in thousands)	7,888	-140	-425	-20	-340	-44	-969
<b>Outward legal migration to Europe</b> (in thousands)	32,493	992	2,838	874	106	2,100	6,910
<b>Total Foreigners in EU</b> (% of EU population)	6.5	3.1	8.7	2.7	0.3	6.5*	21.3

<b>Total Population in EU</b> (% of EU population)	-	0.2	0.6	0.2	0.02	0.4	1.4
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Source: Worldbank, EC (2008), EUROSTAT, own calculations

\*excluding Turkish migrants in France and the UK.

Regarding the destination countries, a distinction between immigrants who live less (temporary) and more (permanently) than seven years in the EU can be made. *Figure 1* reports the main destination countries of migrants from North Africa<sup>7</sup> as well as the Near and Middle East<sup>8</sup>. Unfortunately, data for Germany and Ireland is not available, while the small sample size in Austria renders some of the data uncertain, so that not all percentages add up to 100%. However, these countries only play a minor role as destination for migrants from the countries presented in *Figure 1*, thus their impact is negligible.

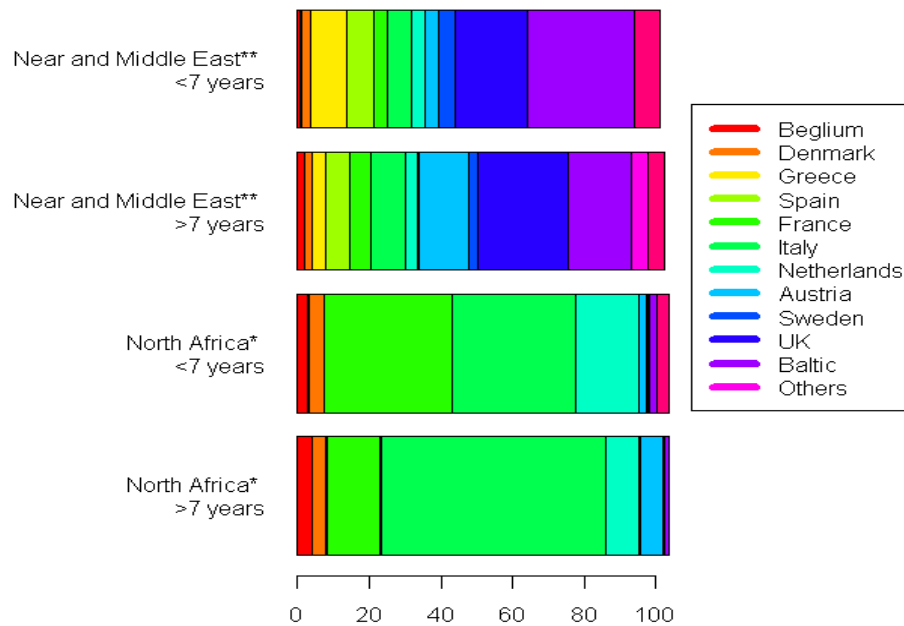
As was expected, North Africans tend to migrate mostly towards francophone countries, for example France and Belgium. In consequence of the common language, barriers of entry and transaction costs are significantly lower for citizens from Morocco, Tunisia, and Algeria. Due to colonial ties, already existing social networks ease the transition for migration and reduce transaction costs further. France alone accounts for 63% of the North African migrants with a stay of more than seven years in the EU. Spain is another large recipient of temporary North African migration in relative terms, which is usually explained by its high demand for seasonal, agricultural workers. In contrast, the case of migrants from the Near and Middle East is very different: The majority of the workers migrates to Sweden, Denmark or the UK and is rather evenly distributed among all other countries. It should be noted that some of the countries in the Near and Middle East classification do not officially belong to the MENA region (e.g. countries in Central Asia). The reason for these differences in destination countries for the Middle East and North Africa will be explained within the scope of *Figure 3*.

**Figure 1: Migrants according to origin and destination countries**

<sup>7</sup> Algeria, Morocco, Tunisia, Libya, Egypt, Other undetermined (\*)

<sup>8</sup> United Arab Emirates, Armenia, Azerbaijan, Bahrain, Georgia, Israel, Iraq, Iran, Jordan, Kyrgyzstan, Kuwait, Kazakhstan, Lebanon, Oman, Palestinian Territory, Qatar, Saudi Arabia, Syria, Tajikistan, Turkmenistan, Uzbekistan, Yemen, other undetermined (\*\*)

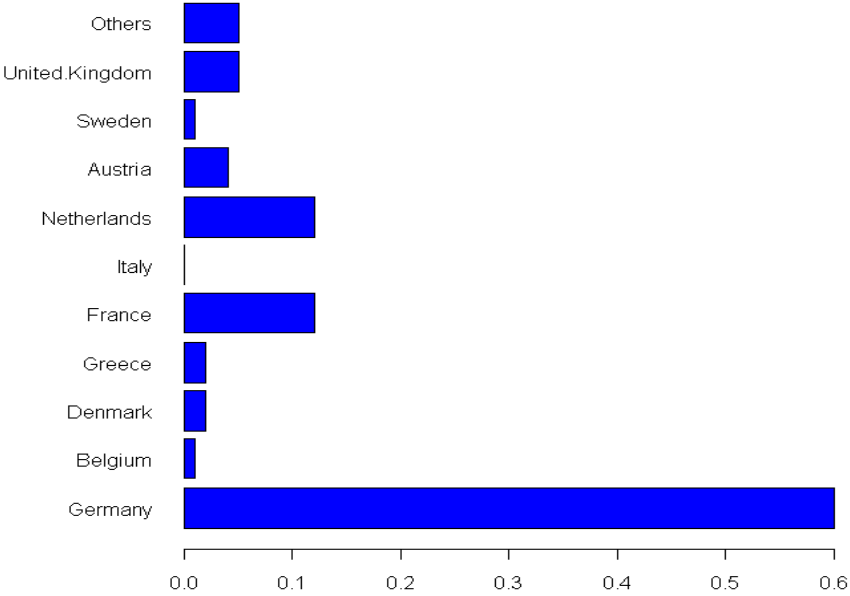




Source: European Commission (2008)

Figure 2 reports the Turkish migration behaviour (bars represent shares of Turkish migrants out of 100%). Fortunately, data on Turkish migrants in Germany is available and quite significant in this case, since more than half of Turkish migrants in the EU live in Germany. The second and third largest group of Turks migrates to France and the Netherlands. The strong Turkish migration is partially due to the German ‘Gastarbeiter’ policy in the 1960s. After World War II, temporary workers from Turkey and Italy were encouraged to come to Germany, since a massive labour force for reconstruction was required. Since then, however, a large fraction of these ‘host workers’ remained in Germany, which led to the establishment of a strong Turkish speaking community in most major cities. Nowadays, family reunions play the most important role when immigrants from Turkey come to the EU and, in particular, to Germany.

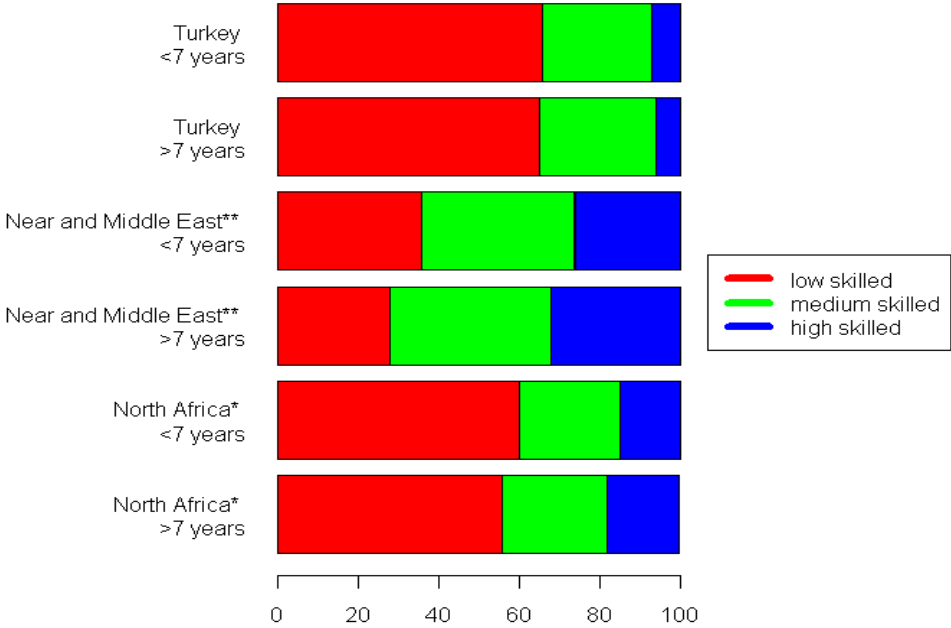
**Figure 2: Migrants from Turkey according to their destination country (%%)**



Source: World Bank (2011), Turkish Ministry of Labour (2011)

As already pointed out, the skill level of migrants is crucial to interpret migration movements to individual EU countries. As can be seen from *Figure 3*, the two groups that are represented strongest in the EU (i.e. North Africans (of which the majority originates from Morocco) and Turks) have the lowest share of highly educated migrants. Roughly two thirds of those coming to the EU have no or only primary education. Especially Turkey exhibits an extremely low proportion of highly qualified workers. This again supports the notion that these types of migrants are less driven by the prospect to find employment, since employment chances for low-skilled workers in their home country are generally higher than in the EU, but are rather determined by family and personal motivation. The Near and Middle East exhibits a more harmonious pattern, since the skills are roughly evenly distributed. A possible explanation for this is the inclusion of some highly developed countries, for example Israel, which also demonstrate a very high level of education. *Figure 3* also allows separating temporary or recent migration from permanent, long-term migration. It is apparent that slightly more low-skilled migrants are included in the first group. The most obvious explanation is, as mentioned before, the demand of the peripheral EU member states for seasonal, agricultural workers, who are included in this indicator due to their short, temporary stay in the EU. According to *The Economist* (2011) only 5.7% of all employed immigrants in Greece and 12.5% in Spain are high-skilled, which coincides with the large low-skilled migration influx from North Africa to Spain and Turkey to Greece (mainly due to geographical proximity) and the high percentage of unskilled labour from these country groups in the EU.

**Figure 3: Migrants according to their skill level and origin country**



Source: European Commission (2008)

Not surprisingly, unemployment statistics are not too favourable for migrants from North Africa and Turkey. *Table 7* displays a decomposition of unemployment rates. The first column reports the average rate of unemployment in individual EU countries, whereas the second column shows the unemployment rate of all foreign workers. It seems clear that, on average, migrants are less likely to find employment in the EU than natives. Especially difficult is the situation for immigrants in Belgium, the Netherlands, Spain, and Sweden, where the unemployment rate among foreigners is up to 3.45 percentage points higher than its national counterpart. In contrast, the labour markets of Hungary, Greece, Ireland, Portugal, United Kingdom, and Italy demonstrate more favourable conditions to foreigners than to their own citizens<sup>9</sup>.

The individual country statistics show the percentage of migrants from a certain country being unemployed. As can be deduced from *Table 7*, almost 30 % of all Moroccans in France and Algerians in Italy are unable to find employment. On the other hand, most Egyptians (except those based in Italy) display lower unemployment rates, not only in comparison to their MENA counterparts, but in some countries also compared to the native population. An explanation for this can be found in the skill level of Egyptian migrants, which is on average considerably higher than for most other North African migrants (Nassar, 2005). Also, in countries like Spain, Portugal, Ireland, Poland, and Hungary,

<sup>9</sup> However, this should be interpreted with caution, since this data were recorded in 2008 and recent years have brought tremendous change to the labour markets of these countries.

MENA migrants seem to have better chances on the job market than natives.

**Table 7: Unemployment rate among Foreigners in the EU and origin countries in 2008 (as % of total foreign unemployment)**

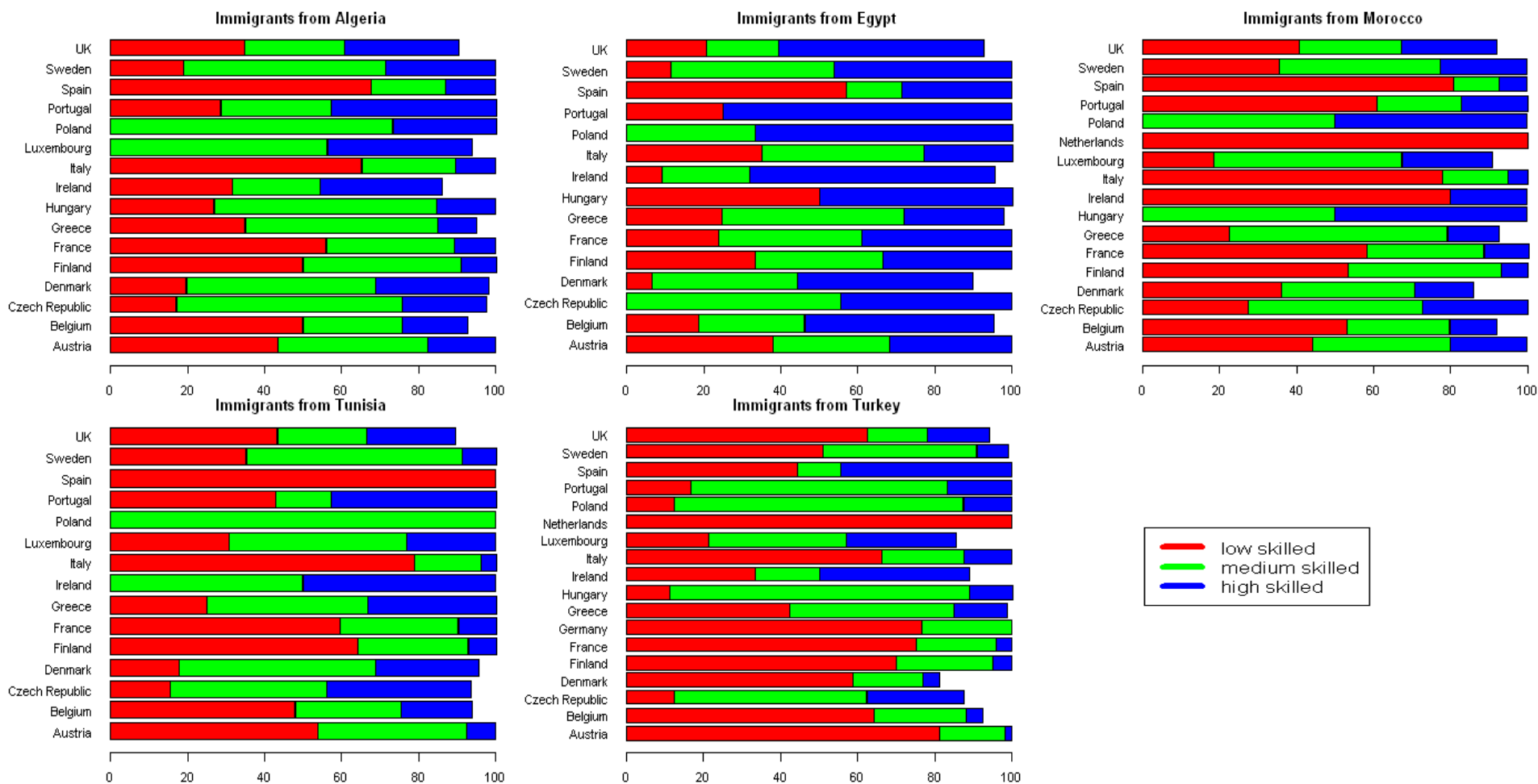
	National Rate	Foreign Rate	Algeria	Egypt	Morocco	Tunisia	Turkey
<b>Austria</b>	3.8	5.2	15.8	12.0	11.9	12.5	11.7
<b>Belgium</b>	7	8.8	16.2	10.3	16.7	14.9	17.1
<b>Czech Republic</b>	4.4	5.1	13.2	6.1	10.9	21.6	3.9
<b>Denmark</b>	3.3	4.7	7.1	6.3	6.7	6.4	8.7
<b>France</b>	7.8	8.0	26.2	20.6	28.9	23.7	20.9
<b>Germany</b>	7.5	n.a.	11.5	12.5	15.2	12.7	19.6
<b>Greece</b>	7.7	5.3	n.a.	n.a.	0.0	n.a.	12.6
<b>Hungary</b>	7.8	4.2	6.6	3.3	6.8	4.2	1.5
<b>Ireland</b>	6.3	5.2	7.0	0.8	4.3	n.a.	1.5
<b>Italy</b>	6.7	6.2	29.6	12.2	5.9	11.8	10.7
<b>Luxembourg</b>	4.9	4.3	10.0	4.9	8.9	7.2	5.2
<b>Netherlands</b>	3.1	4.6	4.9	1.9	7.9	5.7	5.2
<b>Poland</b>	7.1	n.a.	n.a.	n.a.	2.3	n.a.	3.1
<b>Portugal</b>	8.5	7.1	11.3	5.2	4.4	7.5	5.9
<b>Spain</b>	11.3	12.9	4.1	4.7	4.9	13.5	6.6
<b>Sweden</b>	6.2	9.7	13.0	14.4	11.6	6.0	16.1
<b>United Kingdom</b>	5.6	4.8	5.9	5.9	6.2	5.9	5.4

*Source: OECD, own calculations*

Figure 4 gives some additional information on this topic. It shows the decomposition of the unemployment rate by educational attainment of the migrant, the country of origin, and country of destination. Several conclusions can be drawn from the figure: firstly, those MENA migrants who had difficulties in finding employment in countries with high unemployment rates among foreigners are mainly low-skilled. This is especially true for Spain, France, the Netherlands, Finland, and Italy. Secondly, in countries where foreigners exhibit lower unemployment rates than natives (e.g., Hungary, Poland or Luxembourg), hardly any unemployment among the unskilled is observable. The most likely explanation is that these countries do not attract as much unskilled labour (due to low wages or a very specialized labour market), thus giving more weight to more educated migrants. A last observation that can be made is the role of Egyptians. Only in this case, high skilled workers, on average, present higher unemployment rates than unskilled. This is no surprise with respect to the large unemployment rates of young, educated work seekers in Egypt. It does seem surprising in connection with the high demand for labour of the core EU countries. The high unemployment rate

in the EU for skilled Egyptian labour might demonstrate another sign of the mismatch in the Egyptian labour market and the inferior quality of Egyptian tertiary education.

**Figure 4: Migrants according to their skill level, origin, and destination country**



Source: European Commission (2008)

### 3.3. Intensities

Lastly, this empirical research investigates the propensity of the selected MENA countries to export/import workers of either high or low skill level, based on the methodology of Drysdale and Garnaut (1982) applied to labour rather than trade flows. In their study three indices were developed and applied to international trade: the intensity index and two decompositions (the complimentary and the bias effect). The following measures will indicate at a preliminary stage the bias toward a particular skill group. Decompositions are useful in order to determine the possible origin of the bias (if present). In the model the workers are tagged according to the country of origin – “home” ( $h$ ) country or the country where they work/reside – so-called “host”( $c$ ) country.

The intensity index is defined by the following equation:

$$I_{s,f,h} = \frac{L_{s,h,c}}{R_{s,h}X_hL_{s,c}/T_{s,nc}}$$

Where  $L_{s,h,c}$ - temporary labour workers of skill  $s = t$  (*high*),  $l$ (*low*) from country  $h$  working in a country  $c$ ;  $R_{s,h} = \frac{Q_{s,h}}{Q_h}$  is the ratio of permanent skilled workers to all workers in  $h$  home country;  $X_h$  - are the exports of labour from home country  $h$ ;  $L_{s,c}$  - are the imports of  $s$ -skilled workers by the  $c$  country;  $T_{s,nc}$ - are total imports of migrant workers in all countries but  $c$ .

This index measures the ratio of actual labour migration of a certain skill  $s$  relative to expected migration in a host country  $h$ . Intensity may provide a useful indication of whether labour migration with skill  $s$  is at the expected level.

Having checked the overall intensity of the host and home countries in MENA and EU region we moved to investigate further using three additional measures: regional bias, selection skill bias and region-skill bias.

We may explain intensity owing to geographical proximity of the host and home countries or their mutual historical ties. This will be clear using a regional bias index which is computed as follows:

$$RB_{h,c} = \frac{L_{h,c}}{\sum_s X_s L_{s,c}/T_{s,h}}$$

As implied, this measure is the ratio of actual to expected migration between home and host countries and does not depend on skill ratio.

The next ratio is region-skill bias index which is computed according to the following equation:

$$RS_{s,h,c} = \frac{\frac{L_{s,h,c}}{X_{s,h}L_{s,c}/T_{s,h}}}{\frac{L_{h,c}}{\sum_s X_s L_{s,c}/T_{s,h}}} = \frac{L_{s,h,c}}{X_{s,h}L_{s,c}/T_{s,h}} \cdot \frac{\sum_s X_s L_{s,c}/T_{s,h}}{L_{h,c}}$$

That is the regional skill bias index is a ratio of  $s$ -skill workers relative to regional intensity and indicates whether the  $h$  and  $c$  countries trade in  $s$ -skill workers more than expected. Greater than 1 values suggest that migration of this skill level is more intense than the regional bias.

Selection-skill bias index compares the share of exported labour by home country with the home skill share:

$$SB_{s,h} = \frac{X_{s,h} / \sum_s X_{s,h}}{Q_{s,h} / \sum_s Q_{s,h}}$$

Here we present the intensity indices and its decompositions for the selected MENA countries with some additional data.

**Table 8. Egypt's intensity indices and decompositions**

Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Shared border (1=yes, 0=no)	Weighted distance between capitals	Share of host country imports
Austria	0.34	1.49	0.46	0.77	2.74	0.95	1.17	0	2400.53	0.54
Belgium	0.04	0.18	0.06	0.68	2.63	0.95	1.17	0	3200.35	0.07
Cyprus	2.11	2.03	2.02	1.1	0.86	0.95	1.17	0	574.18	2.31
Czech Rep.	0.01	0.13	0.02	0.45	5.29	0.95	1.17	0	2557.49	0.02
Germany	0.12	0.21	0.13	0.91	1.34	0.95	1.17	0	2941.48	0.15
Denmark	0.19	0.4	0.22	0.88	1.54	0.95	1.17	0	3251.53	0.26
Spain	0.06	0.1	0.07	0.94	1.29	0.95	1.17	0	3245.44	0.08
Estonia	0	0	0	0.72	1.65	0.95	1.17	0	3253.92	0
Finland	0.15	0.31	0.18	0.85	1.48	0.95	1.17	0	3483.74	0.21
France	0.04	0.12	0.06	0.72	1.82	0.95	1.17	0	3025.11	0.06
UK	0.32	0.53	0.38	0.89	1.21	0.95	1.17	0	3624.71	0.43
Greece	0.56	1.31	0.67	0.88	1.67	0.95	1.17	0	1130.07	0.78
Hungary	0.24	0	0.23	1.09	0	0.95	1.17	0	2166.88	0.27
Ireland	0.06	0.2	0.11	0.59	1.62	0.95	1.17	0	3991.39	0.12
Italy	1.21	2.91	1.45	0.88	1.72	0.95	1.17	0	2165.33	1.68
Lithuania	0	0	0	1.25	0	0.95	1.17	0	2847.07	0
Luxembourg	0.03	0.14	0.05	0.62	2.31	0.95	1.17	0	3017.38	0.06
Latvia	0	0	0	0.77	2.04	0.95	1.17	0	3019.77	0
Malta	0.14	0.17	0.15	1	1	0.95	1.17	0	1675.69	0.17
Netherlands	0.39	0.46	0.41	1.01	0.96	0.95	1.17	0	3239.53	0.47
Poland	0.02	0	0.02	1.15	0	0.95	1.17	0	2591.18	0.02
Portugal	0	0	0	0.34	4.7	0.95	1.17	0	3799.36	0
Slovakia	0.01	0.04	0.01	0.45	2.5	0.95	1.17	0	2300.61	0.02
Slovenia	0.02	0	0.02	1.11	0	0.95	1.17	0	2274.24	0.03
Sweden	0.09	0.35	0.14	0.64	2.07	0.95	1.17	0	3401.36	0.17

Source: GMig2 database

The data for Egypt paired with each of 25 EU countries show both the most favourable and least sought for destinations: in the first category (with total intensity greater than 1) Cyprus, Austria, Greece and Italy, while in the second –mostly countries of Eastern Europe – Lithuania, Latvia, Estonia, etc. According to total intensities, the obvious slant is toward skilled migration, which is true for almost all destinations, but Cyprus, Hungary, Poland and Slovenia. Regional bias accounts for unskilled migration, especially for less distant countries. The other two decompositions - selection-



skill and regional-selection biases- point out the importance of skilled migration (with only some exceptions).

**Table 9. Morocco's intensity indices and decompositions**

Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Shared border (1=yes, 0=no)	Weighted distance between capitals	Share of host country imports
Austria	0.07	0.19	0.08	0.86	3.42	1.08	0.7	0	2414.95	0.07
Belgium	13.37	11.5	12.71	0.97	1.3	1.08	0.7	0	2117.8	11
Cyprus	0.01	0.1	0.04	0.27	3.18	1.08	0.7	0	3659.3	0.03
Czech Rep.	0.02	0.07	0.02	0.78	4.76	1.08	0.7	0	2567.4	0.02
Germany	1.02	2.12	1.16	0.81	2.62	1.08	0.7	0	2377.6	0.98
Denmark	1.31	0.94	1.23	0.99	1.1	1.08	0.7	0	2835.14	1.05
Spain	15.7	10.74	14.6	0.99	1.05	1.08	0.7	0	768.64	12.54
Estonia	0	0	0	0	6.07	1.08	0.7	0	3698.9	0
Finland	0.74	0.48	0.69	1	0.99	1.08	0.7	0	3804	0.57
France	4.74	2.9	4.36	1.01	0.96	1.08	0.7	0	1663.42	3.56
UK	0.36	0.69	0.47	0.72	2.13	1.08	0.7	0	2146.71	0.35
Greece	0.06	0.14	0.07	0.85	2.86	1.08	0.7	0	2759.05	0.06
Hungary	0.05	0	0.04	1.04	0	1.08	0.7	0	2649.51	0.04
Ireland	0.06	0.14	0.09	0.6	2.32	1.08	0.7	0	2170.97	0.06
Italy	14.7	7.8	13.42	1.01	0.83	1.08	0.7	0	1927.3	11.75
Lithuania	0	0	0	1.12	0	1.08	0.7	0	3368.3	0
Luxembourg	0.34	0.73	0.4	0.79	2.6	1.08	0.7	0	2061.55	0.33
Latvia	0	0	0	1.1	0	1.08	0.7	0	3487.42	0
Malta	0.05	0	0.03	1.32	0	1.08	0.7	0	1944.44	0.02
Netherlands	10.93	3.24	9.54	1.06	0.49	1.08	0.7	0	2263.91	8.04
Poland	0.02	0	0.02	1.07	0	1.08	0.7	0	2907.51	0.02
Portugal	0.14	0.27	0.15	0.88	2.54	1.08	0.7	0	675.68	0.13
Slovakia	0	0.03	0.01	0.19	5.85	1.08	0.7	0	2695.37	0.01
Slovenia	0	0	0	1.05	0	1.08	0.7	0	2287.52	0
Sweden	0.46	0.52	0.46	0.91	1.6	1.08	0.7	0	3248.31	0.38

Source: GMig2 database

The pattern of migration according to overall intensity for Morocco is somewhat different: intensities for select destinations are more pronounced (more than 10 for Belgium, Spain, Italy and Netherlands) and the shift for skilled-workers migration is less clear, especially for the abovementioned destinations. Other notable destinations (with intensities over 1) are Germany, Denmark and France. According to low intensity scores, most Eastern European countries (Estonia, Hungary, Lithuania, Latvia and Slovenia) do not seem to play a significant part in migration patterns. Regional bias accounts for most of the migration intensity. Selection-skill bias points to unskilled workers.

Tunisia's migration intensities are presented in Table 10. The total intensity measure shows that only two EU-25 countries are the preferred destination: France and Italy with values over 10 with a slant

to unskilled migration, other notable countries are Belgium with the intensities of 1.25 for unskilled and 1.65 for skilled workers and Germany with values of 0.93 and 1.44 respectively. Eastern European countries (Estonia, Hungary, Lithuania, Latvia and Poland) score low in intensities. Similarly to Morocco, migration intensities are not predominantly for skilled workers as with Egypt. Selection-skill bias is for unskilled workers.

**Table 10. Tunisia's intensity indices and decompositions**

Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Shared border (1=yes, 0=no)	Weighted distance between capitals	Share of host country imports
Austria	0.53	0.38	0.49	1	1.05	1.09	0.75	0	1387.2	0.16
Belgium	1.25	1.65	1.27	0.91	1.74	1.09	0.75	0	1718.95	0.41
Cyprus	0.03	0.12	0.07	0.37	2.3	1.09	0.75	0	2089.73	0.02
Czech Republic	0.06	0.34	0.09	0.65	5.17	1.09	0.75	0	1608.73	0.03
Germany	0.93	1.44	1.01	0.85	1.9	1.09	0.75	0	1700.19	0.32
Denmark	0.58	0.5	0.55	0.97	1.22	1.09	0.75	0	2205.75	0.18
Spain	0.17	0.19	0.17	0.93	1.51	1.09	0.75	0	1204.4	0.05
Estonia	0	0	0	1.28	0	1.09	0.75	0	2803.45	0
Finland	0.7	0.21	0.58	1.11	0.48	1.09	0.75	0	2980.29	0.18
France	17.41	7.42	14.86	1.07	0.67	1.09	0.75	0	1270.42	4.61
United Kingdom	0.52	0.76	0.62	0.77	1.64	1.09	0.75	0	2040.65	0.18
Greece	0.09	0.12	0.09	0.9	1.87	1.09	0.75	0	1212.83	0.03
Hungary	0.14	0	0.12	1.06	0	1.09	0.75	0	1459.86	0.04
Ireland	0.08	0.12	0.1	0.73	1.61	1.09	0.75	0	2328.52	0.03
Italy	12.24	2.95	10.49	1.07	0.38	1.09	0.75	0	722.61	3.4
Lithuania	0	0	0	1.17	0	1.09	0.75	0	2377.18	0
Luxembourg	0.44	0.73	0.49	0.82	1.96	1.09	0.75	0	1546.94	0.16
Latvia	0	0	0	1.15	0	1.09	0.75	0	2544.36	0
Malta	0.11	0.04	0.09	1.17	0.64	1.09	0.75	0	396.38	0.03
Netherlands	0.71	0.71	0.7	0.94	1.36	1.09	0.75	0	1834.34	0.22
Poland	0.05	0	0.05	1.1	0	1.09	0.75	0	1894.53	0.01
Portugal	0	0	0	0.62	4.26	1.09	0.75	0	1759.68	0
Slovakia	0.03	0.05	0.04	0.77	1.94	1.09	0.75	0	1570.09	0.01
Slovenia	0.01	0	0.01	1.07	0	1.09	0.75	0	1186.11	0
Sweden	0.88	0.63	0.81	0.99	1.03	1.09	0.75	0	2557.83	0.25

Source: GMig2 database

The migration intensities of Turkish workers are presented in Table 11. According to the figures, the ultimate destination for workers is Germany, apparently utilising the existing migration base. A distant second is Austria. Other countries with relatively high intensities are Belgium, Denmark, the Netherlands and Sweden. Eastern Europe has lowest scores on the total intensity scale. Unskilled workers' intensities for popular destinations are higher than those of skilled workers. The trend is reversed for other less frequented countries. Regional bias explains most of the intensity score. Selection-skill bias is for unskilled workers.

**Table 11. Turkey's intensity indices and decompositions**

Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Shared border (1=yes, 0=no)	Weighted distance between capitals	Share of host country imports
Austria	7.6	4.73	7.37	1.01	0.81	1.03	0.79	0	1573.43	19.66
Belgium	2.95	2.53	2.89	0.99	1.11	1.03	0.79	0	2443	7.4
Cyprus	0.22	0.17	0.21	0.99	1.03	1.03	0.79	0	558.89	0.42
Czech Republic	0.01	0.11	0.02	0.78	8.14	1.03	0.79	0	1677.85	0.05
Germany	12.31	10.09	12.05	1	1.06	1.03	0.79	0	2111.05	29.68
Denmark	3.42	1.83	3.28	1.02	0.71	1.03	0.79	0	2329.61	8.28
Spain	0.01	0.1	0.02	0.71	6.55	1.03	0.79	0	2888.48	0.05
Estonia	0	0	0	0.55	5.21	1.03	0.79	0	2222.28	0
Finland	0.63	0.62	0.63	0.98	1.26	1.03	0.79	0	2449.74	1.49
France	0.59	0.35	0.56	1.02	0.78	1.03	0.79	0	2413.32	1.32
United Kingdom	0.1	0.31	0.13	0.73	3.03	1.03	0.79	0	2874.08	0.28
Greece	0.41	0.96	0.43	0.92	2.78	1.03	0.79	1	654.66	1.12
Hungary	0.15	0	0.15	1.02	0	1.03	0.79	0	1279.26	0.41
Ireland	0.05	0.2	0.08	0.65	3.17	1.03	0.79	0	3259.31	0.16
Italy	0.19	0.41	0.19	0.93	2.69	1.03	0.79	0	1633.86	0.51
Lithuania	0.01	0.02	0.01	0.87	3.03	1.03	0.79	0	1829.73	0.02
Luxembourg	0.06	0.48	0.09	0.6	6.63	1.03	0.79	0	2277	0.22
Latvia	0	0.01	0	0.77	5.11	1.03	0.79	0	1997.31	0
Malta	0.2	1.13	0.38	0.53	3.78	1.03	0.79	0	1536.86	0.76
Netherlands	5.07	2.86	4.86	1.02	0.74	1.03	0.79	0	2444.7	11.97
Poland	0.02	0.13	0.02	0.76	7.33	1.03	0.79	0	1631.68	0.06
Portugal	0	0	0	0.79	5.78	1.03	0.79	0	3475.74	0
Slovakia	0.01	0.02	0.01	0.87	2.44	1.03	0.79	0	1392.15	0.02
Slovenia	0.01	0	0	1.03	0	1.03	0.79	0	1514.06	0.01
Sweden	1.46	1.52	1.46	0.97	1.32	1.03	0.79	0	2421.33	3.44

Source: GMig2 database

Intensities for Algerian workers are presented in Table 12. According to the table, the only notable destination is France with the total intensity as high as 22.81 for unskilled and 9.53 for skilled workers. Next destination is Malta. Other destinations are Belgium, Spain and Italy. Least favourable are countries of Eastern Europe. Regional bias explains most of the intensity score. Selection-skill bias is for unskilled workers.

So far several generalizations may be concluded on the basis of the intensities on the migration patterns from MENA countries. Most destinations with relatively high intensities appear to share common cultural ties or existing migrant communities (Algeria-France, Turkey-Germany). On the one hand, several countries feature prominently with MENA migrants, like Italy, Belgium and France. It should be noted that those same top European countries share close trade ties with MENA countries judging by the imports reported for every pair. On the other hand, the region of Eastern Europe is low on the list of top destinations for migration. Popular destinations are likely to draw unskilled

workforce, while the propensity for skilled migration is higher for less frequented destinations. It suggests that skilled workers are less constrained by geographical distance and cultural differences than their less skilled counterparts. Overall, skilled migration seems to be more mobile and more spread over several countries.

Regional bias has great explanatory power as one of the decompositions of total intensity, especially for unskilled migration. However, most MENA countries, but Egypt, have higher selection-skill bias toward unskilled workers.

**Table 12. Algeria's intensity indices and decompositions**

Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Shared border (1=yes, 0=no)	Share of host country imports
Austria	0.08	0.28	0.1	0.79	3.97	1.08	0.73	0	0.07
Belgium	1.07	1.21	1.05	0.94	1.57	1.08	0.73	0	0.77
Cyprus	0.09	0.36	0.2	0.43	2.44	1.08	0.73	0	0.13
Czech Republic	0.07	0.39	0.09	0.66	5.91	1.08	0.73	0	0.07
Germany	0.29	0.54	0.33	0.82	2.27	1.08	0.73	0	0.23
Denmark	0.32	0.37	0.32	0.93	1.57	1.08	0.73	0	0.23
Spain	1.65	1.33	1.56	0.98	1.17	1.08	0.73	0	1.12
Estonia	0	0	0	1.04	0.82	1.08	0.73	0	0
Finland	0.4	0.47	0.41	0.9	1.59	1.08	0.73	0	0.28
France	22.81	9.53	19.84	1.06	0.66	1.08	0.73	0	13.73
United Kingdom	0.8	1.42	1.01	0.73	1.92	1.08	0.73	0	0.66
Greece	0.05	0.21	0.07	0.68	4.25	1.08	0.73	0	0.05
Hungary	0.53	0	0.47	1.05	0	1.08	0.73	0	0.35
Ireland	0.36	0.68	0.49	0.68	1.89	1.08	0.73	0	0.31
Italy	1.07	1.04	1.02	0.96	1.39	1.08	0.73	0	0.75
Lithuania	0	0	0	0.95	1.37	1.08	0.73	0	0
Luxembourg	0.24	0.57	0.29	0.74	2.65	1.08	0.73	0	0.21
Latvia	0	0	0	1.12	0	1.08	0.73	0	0
Malta	4.25	5.32	4.85	0.81	1.51	1.08	0.73	0	3.06
Netherlands	0.31	0.36	0.31	0.91	1.61	1.08	0.73	0	0.22
Poland	0.09	0.25	0.1	0.8	3.38	1.08	0.73	0	0.07
Portugal	0	0	0	0.34	7.93	1.08	0.73	0	0
Slovakia	0.02	0.09	0.04	0.54	3.36	1.08	0.73	0	0.03
Slovenia	0.03	0	0.03	1.06	0	1.08	0.73	0	0.02
Sweden	0.22	0.31	0.24	0.85	1.79	1.08	0.73	0	0.16

Source: GMig2 database

Additionally, reciprocal intensities for EU-25 countries with regard to MENA are reported in Appendix III.

## 4. Simulation model

### 4.1. Model and Data

In this study, the standard global applied general equilibrium GTAP model, a CGE model with bilateral labour migration, is used (Hertel, 1997). In the standard GTAP framework, conventional neoclassical behaviour (utility maximization, cost minimization) is assumed, with regional utility aggregated over private demands (non-homothetic), public demands, and savings (investment demand). Production is characterized by a perfectly competitive, constant returns-to-scale technology, and bilateral imports are differentiated by region of origin using the Armington specification. The model incorporates five factors of production. Skilled/unskilled labour and capital are perfectly mobile, whereas land and natural resources are both sector specific with the former moving “sluggishly” between productive sectors. In all factor markets, full employment is assumed (long-run equilibrium). However, the mobility of labour and capital can only occur within regions. GTAP allows divergences between regional investment and saving, but forces all existing capital within a region to move only across industries within that region. Finally, investment behaviour is characterized by a fictitious “global bank”, which collects investment funds (savings) from each region and allocates them across regions according to a rate of return or a fixed investment share mechanism.

The original GTAP model is modified in order to account for migration flows. Several alterations are made: First, labour productivity is included to account for differences in sending and receiving countries. Second, remittances are included into the income composition of labour exporting countries. Third, sectors are divided into categories specifying whether they mainly employ high or low-skilled workers. Next to those alterations, a few assumptions have to be made to ensure the validity of the model: Migrant labour participation is assumed to be equivalent to the domestic participation rate for migrants who moved with their entire family abroad. Remittances are paid as a constant ratio to income and all other income (i.e., capital and land) belongs exclusively to permanent citizens. Moreover, foreign and domestic labour is assumed to be perfect substitutes. The quantity of skilled and unskilled labour is fixed and there is excess demand for quota spaces. Wages in the host country are identical to the home country of a migrant plus a proportion of the difference between home and host wages ( $\beta$ ), which (in most applications) is expected to be 0.75.

The data used for the simulation is taken from the GTAP Data Base 7.1 which is a fully documented, publicly available global data base which contains complete bilateral trade information, transport, and protection linkages among regions for all GTAP commodities. The database is used and accessed via several specially written software packages, which are required in order to carry out a meaningful study. This database is being replenished with other migration-related variables.

The standard GTAP model is based on the GTAP 7.1 database containing the data on 112 countries/regions and 57 sectors (for details see Appendix I and II). Among others, it includes also the data on the following non-European Mediterranean countries: Turkey, Egypt, Morocco, Algeria, and Tunisia. The initial database has to be completed and improved upon incorporating the recent data mostly from the World Bank, the IMF, and ILO. These data include the bilateral migration database developed by Parsons, Skeldon, Winters, and Walmsley (2005) and remittance data from the World Bank (Ratha, 2003).

#### **4.2. Scenarios**

The study investigates the macroeconomic impact of the labour market liberalization by examining the differences between the baseline equilibrium and the equilibria resulting from various simulations of the CGE model. Lifting restrictions on migration are modelled by a shock in the number of migrants. It should be noted that migration policy is a national matter in the European Union, which makes the simulation of migration liberalization across the board highly artificial. The results obtained are comparative static under each of the scenarios.

1. The first simulation examines the outcome of lifting the restrictions for skilled and unskilled migrants to the EU by 1% and estimates the impact on the main macroeconomic variables: growth, real investment, exports, imports, and welfare (decomposed into allocative efficiency, endowment, population, terms of trade, price of capital goods, remittances effect) in both labour-importing and exporting countries. Furthermore, the impact on wages is examined.
2. The second simulation tests for the separate effect of an increased number of skilled migrants from MENA to the EU. This allows to test the hypothesis whether allowing only skilled workers to migrate by issuing special visas is more profitable compared to a general relaxation of migration restrictions. Thus, the shock consists of a 1% increase in skilled migrants from MENA to the EU.
3. At last, several sensitivity analyses examine how vulnerable the results are to different parameter changes.

## 5. Simulation results

### 5.1. Simulation 1: 1% increase in total migration from MENA to the EU

After simulating a 1% increase in the number of migrants from the MENA region to the EU, the impact of this action on some main macroeconomic variables can be analysed. In this context, *Table 8* initially presents the development of wages for both skilled and unskilled labour as well as the returns to land, capital, and natural resources.

As can be seen, wages for both skilled and unskilled workers decrease in the EU. At the same time, returns to land, capital, and natural resources increase. This development is due to the fact that a rise in the number of migrants leads to an increase in labour supply, thus raising the number of workers competing on the EU-job market. As a result, both wages for skilled and unskilled workers decrease by 0.50%, and 0.13% respectively. On the other hand, a higher total number of employees cause firms to use more of all input factors, leading to an increase in the returns to land, capital, and natural resources. The exact reverse scenario is applicable to the MENA countries: Since the number of workers and hence the competition on the regional labour market decreases, corresponding wages increase. At the same time, emigration and thus a decline in population causes companies to use less of all resources, which results in a decrease of returns to land, capital, and natural resources.

**Table 13: Real wages and real returns to input factors (percentage change)**

	EU 27	MENA	Rest of the world
<b>Skilled labour</b>	-0.50	2.07	-0.01
<b>Unskilled labour</b>	-0.13	0.43	-0.01
<b>Land</b>	0.85	-1.02	0.14
<b>Capital</b>	0.37	-0.28	0.00
<b>Natural resources</b>	0.85	-1.02	0.14

The next macroeconomic impact of an increase in the number of migrants from the MENA region to the European Union is described by changes in total welfare in both labour-exporting and importing countries. In this context, *Table 14* presents the development of six different welfare components, namely the allocative efficiency, endowment, population, terms of trade, capital goods, and remittances effect.

**Table 14: Welfare decomposition (in millions of US-Dollars)**

	Allocative efficiency	Endowment effect	Population effect	Terms of trade effect	Capital goods effect	Remittances effect	Total
<b>EU 27</b>	12,924.06	3,999.12	46,889.15	-513.17	40.76	-5,874.61	57,354.32
<b>MENA</b>	-646.45	-885.24	-6,021.97	1,093.90	-220.94	5,872.69	-808.01
<b>Rest of the world</b>	-107.75	0.00	0.00	-582.78	180.59	28.59	-481.35
<b>Total</b>	12,169.86	3,002.88	40,867.18	-2.04	0.42	26.67	56,064.97

The first effect, the allocative efficiency, expresses the welfare gain or loss in terms of a re-allocation of resources. *Ceteris paribus*, a more efficient allocation of available resources results in a welfare gain, while a less efficient allocation of resources leads to a welfare loss. According to Huff and Hertel (2000), “[...] it is welfare-improving to increase the level of a relatively highly taxed activity, since this involves the re-allocation of a commodity or endowment from a low value use into a relatively high social marginal value usage.” Walmsley et al. (2007) also note that an increase in allocative efficiency usually results from an increase in (taxed) production or the use of taxed items. As can be seen from *Table 9*, MENA and the rest of the world lose in terms of allocative efficiency, while the EU as well as the whole world gain. This indicates that an increase in migrants from the MENA region to the European Union helps to distribute resources more efficiently within the EU, while the reverse case applies to all other countries outside the EU. However, the improvement in allocative efficiency within the European Union outweighs the losses in the rest of the world, leading to a more efficient allocation of resources in the world as a whole. The gain in allocative efficiency within the EU is primarily due to an increase in the supply of (taxed) input factors (i.e., skilled and unskilled labour) as well as an increase in total (taxed) production. The reverse scenario is applicable to the MENA region. The second welfare effect, endowment, measures the welfare gain or loss due to changes in the supply of endowments (land, (unskilled and skilled) labour, capital, natural resources). Here, a similar trend as for the allocative efficiency effect is observable, with MENA losing, and both the EU as well as the whole world gaining. The improvement within the European Union mainly derives from an increase in the endowment of unskilled and skilled labour, whereas the endowment effect reduction in the MENA region results from emigration of high and low educated workforce to the EU. The third welfare effect (also in millions USD), described by changes in population, is most straightforward. The number of inhabitants decreases in MENA due to an increase in emigration, whereas the population growth in the EU is positive. The highly significant numerical difference between the two changes in the population effect might be caused by higher wages paid to workers in the EU compared to the MENA region, which are accounted for by the population effect. The terms of trade effect, the ratio of relative prices of exports to relative prices of imports, is negative in the EU and positive in the MENA region. This development is strongly correlated to changes in labour supply, and therefore also to wage adjustments. As has been mentioned within the scope of *Table 13*, wages of skilled and unskilled workers increase in the labour-exporting countries while they decrease in the labour-importing region. These developments can help to explain the changes of the terms of trade effect: *Ceteris paribus*, a rise in wages in MENA results in an increase in export prices. Due to the fact that MENA’s exports represent imports of other countries, import prices increase for the respective regions, including the European Union. Due to a decrease in wages, export prices of the EU shrink at the same time. This leads to lower import prices for countries



outside the European Union, including MENA. Within the EU, the combination of lower export prices and higher import prices results in a decrease of the terms of trade effect. Analogously, higher export prices and lower import prices lead to an increase in the terms of trade effect for the MENA region.

Closely related to the terms of trade effect is the capital goods effect. It describes the welfare gain or loss which is caused by changes in relative prices of savings to the cost of investment goods. As can be seen from *Table 14*, this effect is rather small. A change in welfare due to the investment-savings component depends on the price of savings and investment and whether a region is either a net supplier or a net receiver of savings. Countries that are net suppliers of savings benefit from an increase in the price of savings relative to capital goods, while net receivers lose. According to the GMig simulation, the European Union is a net receiver of savings, while the reverse case is applicable to the MENA region. Within the EU, a 1% increase in immigration from MENA leads to a decrease in both prices of savings and investments. This development might be due to the fact that an increase of the number of workforce results in a rise in total savings, and hence a reduction in interest rates. Since, according to the GMig simulation, the price of savings declines slightly more than the price of investment goods, the corresponding relation also decreases. However, the European Union is a net receiver of savings, so it benefits from this development, leading to an increase in the capital goods effect. The reverse scenario is applicable to the MENA region: Due to a reduction in total savings, both the price of savings and the cost of capital goods increase. Since the price of savings increases slightly less than the cost of investment, the ratio of the two parameters declines. However, the MENA region is a net supplier of savings, so it loses in terms of the capital goods effect.

The last welfare effect that needs to be discussed is the so called remittances effect. As can be seen from *Table 9*, this effect is positive in the MENA countries and negative in the European Union. Migrants from the MENA region receive relatively higher wages in the EU, so a share of the earned money can be send to family and relatives back home. Hence, the remittances effect is negative in the EU while positive in the MENA countries.

Overall, a 1% increase in the number of migrants from the MENA region to the EU has a positive welfare effect for the European Union, while negative for the MENA countries and the rest of the world. However, these negative effects are rather small compared to the large gain of the EU, thus leading to a total gain of roughly 56 billion US-Dollars in welfare worldwide.

*Table 15* finally reports some additional macroeconomic variables that will be affected by an increase in migration from the MENA countries to the EU. As can be seen, total GDP as measured by the expenditure side decomposition increases in the European Union by roughly 0.46%, while it decreases in the MENA region by 0.14%. A closer look at the different GDP components can help to identify the reasons behind these developments.

**Table 15: GDP decomposition and other macroeconomic variables (percentage change)**

	EU 27	MENA	Rest of the world	Total
<b>Consumption</b>	0.48	0.24	-0.03	0.13
<b>Investment</b>	0.66	-0.43	-0.20	0.04
<b>Government spending</b>	0.48	0.30	-0.03	0.18
<b>Exports</b>	0.32	-0.70	0.12	0.15
<b>Imports</b>	0.47	-0.16	-0.05	0.15
<b>Total GDP</b>	0.46	-0.14	-0.03	0.12
<b>Regional population</b>	0.41	-0.47	0.00	n.a.
<b>Regional household income</b>	0.48	0.26	-0.03	n.a.

First of all, it must be noted that an increase in the number of migrants from the MENA countries to the European Union leads to a rise in total consumption in both labour-exporting and labour-importing regions. As for the EU, it is clear that an increase in (regional) population and thus in total (regional household) income results in higher consumption. Although the MENA region faces a decrease in its (regional) population, total consumption increases by roughly 0.24%. Two effects can explain this development: On the one hand, as has been shown within the scope of *Table 13*, wages for both the remaining skilled and unskilled workers in the MENA countries increase. Besides, remittances payments lead to an additional rise in (regional household) income, resulting in an increase in total consumption.

The second GDP component that needs to be analysed is the development of investments. As can be seen from *Table 15*, this parameter increases in the European Union by 0.66%, whereas it decreases in the MENA region by roughly 0.43%. This development can be explained with the change in national savings. As total savings rise with an increase in population and regional income, interest rates decline, thus encouraging investment within the European Union. The reverse scenario is applicable to the MENA region: Although wages rise and remittances are received, total regional savings decrease due to a decline in population. Less savings result in a rise in interest rates, thus discouraging investment.

As can be seen from *Table 15*, total government spending rises in both the European Union and the MENA countries. As for the EU, it is clear that a population increase induces the regional governments to spend more funds. Regarding MENA, it can only be supposed that, as total output of the region declines, local governments are trying to counteract against this development by increasing their spending.

In the European Union, a 1% increase in the number of migrants results in a rise in total exports of roughly 0.32%, whereas the same parameter decreases in the MENA region by 0.70%. As wages for both skilled and unskilled workers decline within the EU, the labour-importing region *ceteris paribus*

increases its international competitiveness. At the same time, it is likely that the real exchange rate depreciates due to lower wages, which finally results in an increase in total exports. Reversely, a decrease in the number of local workers leads to a rise in wages paid in the MENA region. A resulting loss in international competitiveness as well as an appreciation in the real exchange rate leads to a decline in exports.

Total imports develop in the same direction as exports. As can be seen from *Table 15*, imports rise in the EU whereas they decline in the MENA countries. Within the European Union, it can be said that an increase in total production also requires more imports, such as different commodities or resources. The reverse scenario is applicable to the MENA region: Since national consumption, investment, and exports decline due to an emigration of workers, fewer imports are needed.

Overall, a 1% increase in migration from the MENA countries to the European Union leads to a decline in total GDP within the MENA region, whereas the EU as well as the whole world faces a rise in total output.

## **5.2. Simulation 2: 1% increase in skilled migration from MENA to the EU**

The next simulation implies an asymmetric shock in which only skilled migration is increased, whereas unskilled migration remains the same. According to the GTAP database, 5.9% of the EU population was foreign born in 2004. Of these 5.9%, roughly one third accounted for skilled migrants while the other two thirds didn't have a higher educational background. These proportions are roughly identical for migration from the MENA region which summed up to 1.94% of total EU population in 2004. The largest population groups were by far Turkish (2.35 million) and Moroccans (1.8 million), followed by smaller groups of Algerians (0.6 million) and Tunisians (below 0.4 million). A more recent study by EUROSTAT estimates the amount of foreign born people to be 6.5% of total EU population in 2010, but the proportional distribution of skilled and unskilled labour is also found to be 1:2 with strong differences among the individual member countries (The Economist, 2011). As discussed before, especially the Southern European countries attract more unskilled workers due to the strong agricultural sector in those regions, while more skilled migrants are required in the UK and Eastern Europe. The effect of skilled and unskilled migration is tested by specifically increasing only the number of skilled workers by 1% and determining which welfare effects this shock has in the EU and the MENA region.

*Table 16* shows the impact of an increase in the number of skilled migrants from the MENA region to the EU on wages and returns to input factors. As can be seen, wages of skilled workers increase in the labour-exporting countries while they decrease in the labour-importing region. This development is due to the fact that the skilled labour supply in the MENA region decreases, thus reducing the

number of highly educated workers competing on the job market. The reverse scenario is applicable to the European Union: Since the number of skilled employees and hence the competition on the labour market for educated workers increases, the corresponding wages decrease.

The table also shows that all other (real) returns to primary factors (unskilled labour, land, capital, and natural resources) increase in the European Union while they decrease in the MENA countries. As for the European Union, it can be concluded that this development is due to the fact that employers demand more of all input factors as total output (GDP) rises with an increase in the number of skilled migrants. An associated increase in the demand of unskilled labour, land, capital, and natural resources ultimately leads to a rise in corresponding wages and returns.

**Table 16: Real wages and real returns to input factors (percentage change)**

	EU 27	MENA	Rest of the world
<b>Skilled labour</b>	-0.67	2.11	-0.01
<b>Unskilled labour</b>	0.20	-0.11	0.00
<b>Land</b>	0.45	-0.64	0.09
<b>Capital</b>	0.20	-0.16	0.00
<b>Natural resources</b>	0.45	-0.64	0.09

The exact reverse development applies to the MENA region, where wages of unskilled workers as well as returns to land, capital, and natural resources decrease. This is due to the fact that emigration and thus a decline in population cause companies to use less of all input factors, leading to a decrease in returns to unskilled labour, land, capital, and natural resources.

Next, *Table 17* shows that an increase in the number of skilled migrants from the MENA region to the EU leads to a total welfare gain of roughly 31 billion US-Dollars. Although the direction of this development can be compared to the cumulative welfare effect within the scope of simulation 1 (see *Table 14* on page 33), the total welfare gain caused by a single increase in skilled migrants is about 25 billion US-Dollars lower.

**Table 17: Welfare decomposition (in millions of US-Dollar)**

	allocative efficiency	endowment	population	terms of trade	capital goods	remittances	Total
<b>EU 27</b>	8,618.7	3,981.2	23,442.2	-552.1	25.4	-3,948.9	31,566.5
<b>MENA</b>	-679.1	-1,284.9	-3,007.9	773.3	-172.0	3,927.9	-442.7
<b>Rest of the world</b>	-50.3	0.0	0.0	-222.4	146.9	29.5	-96.3
<b>Total</b>	7,889.3	2,696.4	20,434.3	-1.2	0.2	8.5	31,027.6

A closer look at the sum of each welfare component indicates that, except for the total terms of trade effect, all parameters reach lower levels than the corresponding figures in simulation 1. However, it must also be noted that the negative welfare effect which was determined in simulation 1 for MENA and the rest of the world is less pronounced in both regions if only the number of skilled migrants increases. At the same time, the total welfare gain in the EU declines disproportionately, so

that the welfare effect for the whole world accounts for only 31 billion US-Dollars compared to 56 billion US-Dollars in simulation 1. Due to the fact that just the numerical values but not the algebraic signs of the welfare results vary between simulation 1 and 2, the following lines will only discuss those welfare components which constitute the main differences. As can be seen from a comparison of *Tables 14* and *17*, the welfare variations are especially due to the developments of the allocative efficiency, population, and remittances effects.

While the total welfare gain based on allocative efficiency accounts for roughly 12 billion US-Dollars in simulation 1, the same figure amounts to just 8 billion US-Dollars if only the restrictions for skilled migrants from the MENA region to the EU are lowered. This divergence mainly derives from the fact that the welfare gain in the EU, attributable to a more efficient allocation of resources, constitutes to only 8.6 billion US-Dollars compared to 12.9 US-Dollars in simulation 1. A similar, but numerically smaller development can be observed in the MENA region, where the welfare loss due to a less efficient allocation of available resources accounts for roughly 679 million US-Dollars, whereas it only amounts to 647 million US-Dollars if the number of both skilled and less skilled migrants to the EU increases. These variations are evident taking into account that the allocative efficiency effect increases with a rise in (taxed) production, and/or the use of taxed input factors. Hence, it can be concluded that, if restrictions on migration to the EU are lowered, resources in the MENA region, the EU, and also in the whole world are allocated more efficiently if the number of both skilled and less skilled migrants increases.

A comparison of the population effect in *Tables 14* and *17* implies that within the scope of simulation 2 less people move from the MENA region to the EU. It is obvious that, if only the restrictions for skilled migrants are lowered, fewer workforce is attracted to migrate to the European Union. As already mentioned within the scope of simulation 1, the significant difference between the population decrease in MENA and the increase in the EU might be caused by relatively higher wages paid to workers in the EU.

Strongly correlated to the population effect is the development of the payment of remittances. Since only the number of skilled migrants to the EU increases, fewer remittances can be paid than this is the case if restrictions for both high and less educated workers are lowered.

All in all it can be summarized that, compared to simulation 1, both MENA and the rest of the world, although losing welfare, are better off if only the restrictions for skilled migration to the EU are lowered. At the same time, the welfare gain in the European Union as well as the whole world is higher if the number of both skilled and unskilled migrants from the MENA region to the EU increases.

Finally, *Table 18* shows some more variables which will be affected by an increase of the number of skilled migrants from the MENA region to the EU. A comparison with *Table 15* (see page 36)

illustrates that the direction of the reported developments is exactly the same as recorded within the scope of simulation 1, just the numerical values are less pronounced. Whereas an increase in both skilled and less skilled workforce in the EU causes a growth in total GDP by roughly 0.12 percent (49 billion US-Dollars), the same figure accounts for only 0.07 percent (27 billion US-Dollars) in simulation 2. A closer look at the different regions in table 10 shows that a higher number of skilled migrants leads to an increase in total EU-GDP by 0.24 percent or 31 billion US-Dollars (simulation 1: increase of 0.46 percent or 60 billion US-Dollars). At the same time, total economic production in the MENA region decreases by only 0.05 percent or 744 million US-Dollars (simulation 1: decrease of 0.14 percent or 2 billion US-Dollars).

**Table 18: GDP decomposition and other macroeconomic variables (percentage change)**

	<b>EU 27</b>	<b>MENA</b>	<b>Rest of the world</b>	<b>Total</b>
<b>Consumption</b>	0.24	0.20	-0.01	0.07
<b>Investment</b>	0.34	-0.19	-0.10	0.02
<b>Government spending</b>	0.24	0.24	-0.01	0.10
<b>Exports</b>	0.19	-0.46	0.07	0.09
<b>Imports</b>	0.25	-0.07	-0.02	0.09
<b>Total GDP</b>	0.24	-0.05	-0.01	0.07
<b>Regional population</b>	0.21	-0.24	0.00	-
<b>Regional household income</b>	0.24	0.22	-0.01	-

As for the regional population it can be recorded that, naturally, the population increases in the EU due to the immigration of skilled workforce whereas it declines associated in the MENA region. In terms of regional household income it can be registered that both the European Union as well as the MENA countries gain from an increased migration of skilled workers. Nevertheless it must be noted again that the numerical developments within the scope of simulation 2 are smaller than the ones caused by an increase in both skilled and unskilled migration to the EU.

### 5.3. Sensitivity Analysis

In the following, several sensitivity analyses are conducted in order to show how robust the above described results are to parameter changes. Four cases are examined: In the first scenario, the shock on the number of migrants is increased by 3%. In the second,  $\beta$ , hence the proportion of the wage (or productivity) gained by migrants while working in the European Union, is altered. The third scenario indicates how robust the model is to elasticity of substitution. Finally, the ratio of remittances to income is increased to explore the effect on the source country's welfare.

For each sensitivity analysis, just a brief summary of the main macroeconomic variables is listed rather than including all the results which have been reported within the scope of simulation 1, 2, and 3. However, simulation 1 (i.e., a 1% increase in the number of migrants from the MENA region to the EU) operates as a 'base scenario', which is needed in order to allow for different comparisons. The associated summary of the results of simulation 1 is reported in *Table 19*.

**Table 19: Macroeconomic impact of 1% increase in migration from MENA to the EU**  
(unless stated otherwise, all figures are quoted as percentage changes)

	EU 27	MENA	Rest of the world	Total
<b>Regional population</b>	0.41	-0.47	0.00	n.a.
<b>Real wages for skilled labour</b>	-0.50	2.07	-0.01	n.a.
<b>Real wages for unskilled labour</b>	-0.13	0.43	-0.01	n.a.
<b>Total GDP</b>	0.46	-0.14	-0.03	0.12
<b>Welfare</b> (in millions of US-Dollars)	57,354.32	-808.01	-481.35	56,064.97

In order to be able to compare the different sensitivity analyses with the results listed in *Table 19*, most sensitivity analyses consist of a 1% increase in the number of migrants from MENA to the EU *and* a change of the respective parameter.

Initially, a summary of the macroeconomic impact of a 3% increase in total migration from MENA to the EU is presented in *Table 20*. As can be seen, regional population in the European Union increases by roughly 1.23%, compared to just 0.47% in simulation 1. The population decrease in MENA accounts for 1.41%, whereas an increase in migration to the EU by 1% only leads to a decline of 0.47%.

**Table 20: Macroeconomic impact of 3% increase in migration from MENA to the EU**  
(unless stated otherwise, all figures are quoted as percentage changes)

	EU 27	MENA	Rest of the world	Total
<b>Regional population</b>	1.23	-1.41	0.00	n.a.
<b>Real wages for skilled labour</b>	-1.48	6.51	-0.03	n.a.
<b>Real wages for unskilled labour</b>	-0.39	1.28	-0.02	n.a.
<b>Total GDP</b>	1.38	-0.45	-0.09	0.36
<b>Welfare</b> (in millions of US-Dollars)	171,555.00	-3,026.00	-1,354.10	167,174.90

Compared to simulation 1 (1% increase in migration from MENA to the EU), it can be recorded that tripling the number of the migration-quota (3% increase in migration from MENA to the EU) roughly leads to a tripling of all variables listed in *Table 19*. Thus, it can be concluded that the parameters are positively linearly correlated to changes in the number of migrants.

As can be seen from *Table 21*, a 1% increase in migration from MENA to the EU in combination with a 10% increase in  $\beta$ , that is the proportion of the wage (or productivity) gained by migrants while working in the European Union, leads to different parameter changes. First of all, it is evident that an alternation of  $\beta$  doesn't lead to any changes in regional population compared to simulation 1 (see *Table 19* on page 41) However, welfare increases in both the MENA countries as well as the European Union. As for the EU, it can be stated that, as  $\beta$  increases, immigrants are more productive when they enter the region. As a result, total production (GDP) is higher, leading to a gain in welfare, mainly due to a rise in the allocative efficiency and endowment effect. In MENA, the difference in welfare compared to simulation 1 is mainly accounted for by an increase in the remittances effect. In addition, higher remittances payments lead to a less marked decline in MENA-GDP in relation to simulation 1. This is primarily based on an increase in consumption and government spending.

Compared to simulation 1, a 1% increase in total migration combined with a 10% rise in  $\beta$  results in a greater decrease in real wages for both skilled and unskilled labour within the EU, as well as a larger increase in real wages in the MENA countries.

**Table 21: Macroeconomic impact of 1% increase in migration from MENA to the EU and 10% increase in  $\beta$**  (unless stated otherwise, all figures are quoted as percentage changes)

	EU 27	MENA	Rest of the world	Total
<b>Regional population</b>	0.41	-0.47	0.00	n.a.
<b>Real wages for skilled labour</b>	-0.53	2.13	-0.01	n.a.
<b>Real wages for unskilled labour</b>	-0.23	0.46	-0.01	n.a.
<b>Total GDP</b>	0.59	-0.10	-0.04	0.16
<b>Welfare (in millions of US-Dollars)</b>	71,831.45	682.69	-642.04	71,872.09

Within the scope of the last sensitivity analysis, the remittances which migrants send to their friends and family back home are increased by 10%. Additionally, total migration to the European Union is once again raised by 1%. As can be seen from a comparison between the results listed in *Table 19* and *Table 22*, the number of regional population is not affected by an alternation of remittances. The same holds true for real wages in MENA and the EU. Compared to simulation 1, both wages for skilled and unskilled labour almost don't change, so this effect is virtually negligible. The slightly larger increase in real wages within the MENA region (compared to simulation 1) might be due to the fact that, as remittances receipts increase, the MENA population's incentive to work decreases. Hence, local companies must pay higher wages for both skilled and unskilled labour.



In comparison to simulation 1, no changes in total GDP can be recorded for the European Union, whereas output in the MENA region declines slightly less than within the scope of the first simulation. This effect is especially due to an increase in consumption and government spending, since remittances receipts as well as local wages in the MENA countries rise.

The last parameter that needs to be analysed is the welfare effect. It is evident that, as remittances from the European Union to the MENA region increase, total welfare in the EU is less pronounced than within the scope of simulation 1. The exact reverse is true for the MENA countries.

**Table 22: Macroeconomic impact of 1% increase in migration from MENA to the EU and 10% increase in remittances**  
(unless stated otherwise, all figures are quoted as percentage changes)

	<b>EU 27</b>	<b>MENA</b>	<b>Rest of the world</b>	<b>Total</b>
<b>Regional population</b>	0.41	-0.47	0.00	n.a.
<b>Real wages for skilled labour</b>	-0.51	2.13	-0.01	n.a.
<b>Real wages for unskilled labour</b>	-0.13	0.46	-0.01	n.a.
<b>Total GDP</b>	0.46	-0.10	-0.03	0.12
<b>Welfare (in millions of US-Dollars)</b>	55,781.35	676.62	-453.26	56,004.72

## 6. Conclusion

The issue of labour migration has come to the centre stage of European politics during the recent period, while the Arab awakening makes the issue even more pertinent. This study empirically evaluates the impact of greater labour migration from MENA countries (Turkey, Egypt, Morocco, Algeria, and Tunisia in our sample) to the European Union (EU 27). We have analysed several macroeconomic variables on the basis of CGE framework and GTAP 7.1 database. This is actually one of the few papers that focus both on the receiving and the sending countries' economies in order to assess the impact of outward migration on the EU and MENA countries.

Our main findings suggest that there is potential, but substantial income gain in the world GDP (as high as 56 Billion USD) if labour movement restrictions were further relaxed in the EU. However, this potential gain is realised largely at the expense of the MENA countries. This finding is in line with the recent literature review which predicts a boost in GDP through greater efficiency in factor allocation.

Throughout the research we have employed the CGE framework that enabled us to model labour flows with two different skills decomposition – high and low. We have also taken into account the remittances and trade flows, land, capital and natural resources. The simulations of greater labour flows (1%) were modelled as an outside shock to labour supply with different skill levels. In our first empirical exercise an increase of 1% in the number of MENA labour migrants (both high and low skilled) was examined European workers are expected to experience small wage declines – both skilled and unskilled, while positive outcome is predicted by the model in the returns to land, capital and natural resources. These findings remain plausible in the context of the existing literature concerning native wages. The same holds reverse for MENA countries, while the wage increase for skilled workers (2.07%) is almost five times greater than that of unskilled workers (0.4%). The EU countries stand to gain in along multiple welfare components due to greater allocative and tax collection efficiency. MENA countries on the other hand are expected to gain from expanding terms of trade and remittances from the EU, while losing slightly in allocative efficiency, endowment, population effect and capital goods. Other macroeconomic variables (consumption, investment, government spending, exports and imports) in the EU 27 countries show around 0.5 % change, while consumption is growing in MENA by 0.24%, government spending increases by 0.3% and investment (0.43%) and trade (imports (0.16%) and exports (0.7%)) stand to decline. Overall, a 1% increase in migration from the MENA countries to the European Union leads to a decline in total GDP within the MENA region, whereas the EU as well as the whole world faces a rise in total output.

Our second scenario tested an asymmetric shock of 1% increase only in skilled migration from MENA to the EU 27. The gains in the input factors (land, capital and resources) in the EU countries were less pronounced and the same applies to losses for MENA. However, the wage effect was more dramatic:

EU skilled workers would expect lower wages among stronger competition, while unskilled workers would enjoy a wage raise of 0.2%. In MENA the scarce skilled workers would receive more than 2% wage increase, while their unskilled counterparts would suffer a wage decrease of 0.11%. Welfare gains are expected to be lower than in previous estimation due to smaller labour flows (only more skilled workers move) and overall GDP welfare would be around 31 million USD. All other economic measures retain their sign but dwindle in magnitude. GDP decomposition in the EU 27 shows smaller values as well and gains hover around 0.2%-0.3%, while in the MENA countries the effects are varied: greater consumption (0.2%) and government spending, less investment, exports and imports. Nevertheless it must be noted again that the numerical developments within the scope of simulation 2 are smaller than the ones caused by an increase in both skilled and unskilled migration to the EU.

Finally, further simulations were tested in order to determine how robust the results are under different parameters.

It appears that the EU labour market is able to absorb successfully even greater numbers of migrants without greatly worsening the welfare of residents than today which clearly coincides with the previous findings in the reviewed literature. Notably, the MENA countries are expected to lose in GDP, population, resource utilization, etc., while these losses are being only partially offset by remittances. These detrimental effects were not totally surprising and are present in literature. If it comes true, such scenario poses a serious challenge to the policy makers in the sending countries who are concerned with the state welfare. For example, a new policy might be aimed at encouraging return migration since it is supposed to mitigate the negative effects. Returnees would contribute to greater productivity through higher skills and know-how gained abroad.

Labour participation rates of women and young workers are very low compared to other regions in the world. Our study, due to the limitations of the available data, was not able to investigate the effects of migration on these particular groups. Further research could provide some insight into the matter.

The existing data refers to the EU and MENA countries before the on-going debt crisis that started in the end of 2007. While still in development the effects of the crisis are most likely to alter some of the conclusions in the study.

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## Appendix I

### GTAP Data Bases: GTAP 7 Data Base, Sectors Listing

Number	Code	Description
1	PDR	Paddy rice
2	WHT	Wheat
3	GRO	Cereal grains nec
4	V_F	Vegetables, fruit, nuts
5	OSD	Oil seeds
6	C_B	Sugar cane, sugar beet
7	PFB	Plant-based fibers
8	OCR	Crops nec
9	CTL	Bovine cattle, sheep and goats, horses
10	OAP	Animal products nec
11	RMK	Raw milk
12	WOL	Wool, silk-worm cocoons
13	FRS	Forestry
14	FSH	Fishing
15	COA	Coal
16	OIL	Oil
17	GAS	Gas
18	OMN	Minerals nec
19	CMT	Bovine meat products
20	OMT	Meat products nec
21	VOL	Vegetable oils and fats
22	MIL	Dairy products
23	PCR	Processed rice
24	SGR	Sugar
25	OFD	Food products nec
26	B_T	Beverages and tobacco products
27	TEX	Textiles
28	WAP	Wearing apparel
29	LEA	Leather products
30	LUM	Wood products
31	PPP	Paper products, publishing
32	P_C	Petroleum, coal products
33	CRP	Chemical, rubber, plastic products
34	NMM	Mineral products nec
35	I_S	Ferrous metals
36	NFM	Metals nec
37	FMP	Metal products
38	MVH	Motor vehicles and parts
39	OTN	Transport equipment nec
40	ELE	Electronic equipment
41	OME	Machinery and equipment nec

42	<b>OMF</b>	Manufactures nec
43	<b>ELY</b>	Electricity
44	<b>GDT</b>	Gas manufacture, distribution
45	<b>WTR</b>	Water
46	<b>CNS</b>	Construction
47	<b>TRD</b>	Trade
48	<b>OTP</b>	Transport nec
49	<b>WTP</b>	Water transport
50	<b>ATP</b>	Air transport
51	<b>CMN</b>	Communication
52	<b>OFI</b>	Financial services nec
53	<b>ISR</b>	Insurance
54	<b>OBS</b>	Business services nec
55	<b>ROS</b>	Recreational and other services
56	<b>OSG</b>	Public Administration, Defense, Education, Health
57	<b>DWE</b>	Dwellings

Source:  
[https://www.gtap.agecon.purdue.edu/databases/v7/v7\\_sectors.asp](https://www.gtap.agecon.purdue.edu/databases/v7/v7_sectors.asp)

## Appendix II

### GTAP Data Bases: GTAP 7 Data Base Final Release, Region Listing

Number	Code	Description
1	aus	Australia
2	nzl	New Zealand
3	xoc	Rest of Oceania
4	chn	China
5	hkg	Hong Kong
6	jpn	Japan
7	kor	SouthKorea
8	twm	Taiwan
9	xea	Rest of East Asia
10	khm	Cambodia
11	idn	Indonesia
12	lao	Laos
13	mys	Malaysia
14	phl	Philippines
15	sgp	Singapore
16	tha	Thailand
17	vnm	Vietnam
18	xse	Rest of Southeast Asia
19	bgd	Bangladesh
20	ind	India
21	pak	Pakistan
22	lka	Sri Lanka
23	xsa	Rest of South Asia
24	can	Canada
25	usa	United States of America
26	mex	Mexico
27	xna	Rest of North America
28	arg	Argentina
29	bol	Bolivia
30	bra	Brazil
31	chl	Chile
32	col	Colombia
33	ecu	Ecuador
34	pry	Paraguay
35	per	Peru
36	ury	Uruguay
37	ven	Venezuela
38	xsm	Rest of South America
39	cri	Costa Rica
40	gtm	Guatemala
41	nic	Nicaragua

42	<b>pan</b>	Panama
43	<b>xca</b>	Rest of Central America
44	<b>xcb</b>	Rest of the Caribbean
45	<b>aut</b>	Austria
46	<b>bel</b>	Belgium
47	<b>cyp</b>	Cyprus
48	<b>cze</b>	Czech Republic
49	<b>dnk</b>	Denmark
50	<b>est</b>	Estonia
51	<b>fin</b>	Finland
52	<b>fra</b>	France
53	<b>deu</b>	Germany
54	<b>grc</b>	Greece
55	<b>hun</b>	Hungary
56	<b>irl</b>	Ireland
57	<b>ita</b>	Italy
58	<b>lva</b>	Latvia
59	<b>ltu</b>	Lithuania
60	<b>lux</b>	Luxembourg
61	<b>mlt</b>	Malta
62	<b>nld</b>	Netherlands
63	<b>pol</b>	Poland
64	<b>prt</b>	Portugal
65	<b>svk</b>	Slovakia
66	<b>svn</b>	Slovenia
67	<b>esp</b>	Spain
68	<b>swe</b>	Sweden
69	<b>gbr</b>	United Kingdom
70	<b>che</b>	Switzerland
71	<b>nor</b>	Norway
72	<b>xef</b>	Rest of EFTA
73	<b>alb</b>	Albania
74	<b>bgr</b>	Bulgaria
75	<b>blr</b>	Belarus
76	<b>hrv</b>	Croatia
77	<b>rou</b>	Roumania
78	<b>rus</b>	Russian Federation
79	<b>ukr</b>	Ukraine
80	<b>xee</b>	Rest of Eastern Europe
81	<b>xer</b>	Rest of Europe
82	<b>kaz</b>	Kazakhstan
83	<b>kgz</b>	Kyrgyzstan
84	<b>xsu</b>	Rest of Former Soviet Union
85	<b>arm</b>	Armenia
86	<b>aze</b>	Azerbaijan
87	<b>geo</b>	Georgia
88	<b>irn</b>	Iran

89	<b>tur</b>	Turkey
90	<b>xws</b>	Rest of Western Asia
91	<b>egy</b>	Egypt
92	<b>mar</b>	Morocco
93	<b>tun</b>	Tunisia
94	<b>xnf</b>	Algeria
95	<b>nga</b>	Nigeria
96	<b>sen</b>	Senegal
97	<b>xwf</b>	Rest of Western Africa
98	<b>xcf</b>	Central Africa
99	<b>xac</b>	South Central Africa
100	<b>eth</b>	Ethiopia
101	<b>mdg</b>	Madagascar
102	<b>mwi</b>	Malawi
103	<b>mus</b>	Mauritius
104	<b>moz</b>	Mozambique
105	<b>tza</b>	Tanzania
106	<b>uga</b>	Uganda
107	<b>zmb</b>	Zambia
108	<b>zwe</b>	Zimbabwe
109	<b>xec</b>	Rest of Eastern Africa
110	<b>bwa</b>	Botswana
111	<b>zaf</b>	South Africa
112	<b>xsc</b>	Rest of SACU

Source

<https://www.gtap.agecon.purdue.edu/databases/regions.asp?Version=7.211>

## Appendix III

EU-25 and select MENA countries intensity indices and decompositions

Home (origin) country	Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Share of host country imports
Austria	Egypt	1.55	0.99	1.29	1.21	0.76	0.99	1.01	0.44
Austria	Morocco	0.02	0	0.01	1.99	0	0.99	1.01	0
Austria	Tunisia	0.29	0.21	0.26	1.14	0.82	0.99	1.01	0.09
Austria	Turkey	2.94	3.74	3.21	0.92	1.15	0.99	1.01	1.06
Austria	Algeria	0.04	0.02	0.03	1.26	0.73	0.99	1.01	0.01
Belgium	Egypt	2.44	1.58	1.99	1.18	0.84	1.04	0.95	0.38
Belgium	Morocco	0.03	0.02	0.03	1.27	0.79	1.04	0.95	0
Belgium	Tunisia	0.62	0.46	0.54	1.1	0.89	1.04	0.95	0.1
Belgium	Turkey	3.56	2.96	3.31	1.04	0.94	1.04	0.95	0.59
Belgium	Algeria	0.09	0.05	0.07	1.24	0.8	1.04	0.95	0.01
Cyprus	Egypt	0.55	0.64	0.53	1.37	0.7	0.77	1.71	0.07
Cyprus	Morocco	0.02	0	0.01	2.39	0	0.77	1.71	0
Cyprus	Tunisia	0.18	0.24	0.19	1.27	0.75	0.77	1.71	0.02
Cyprus	Turkey	3.42	18.35	7.07	0.63	1.52	0.77	1.71	0.86
Cyprus	Algeria	0.01	0.02	0.01	1.43	0.68	0.77	1.71	0
Czech Rep.	Egypt	0.56	0.52	0.52	1.24	0.74	0.87	1.37	0.19
Czech Rep.	Morocco	0.02	0	0.01	2.02	0	0.87	1.37	0
Czech Rep.	Tunisia	0.18	0.2	0.18	1.17	0.79	0.87	1.37	0.07
Czech Rep.	Turkey	0.35	0	0.26	1.53	0	0.87	1.37	0.09
Czech Rep.	Algeria	0.4	0.35	0.36	1.29	0.7	0.87	1.37	0.13
Germany	Egypt	3.1	2.22	2.59	1.27	0.79	0.94	1.09	6.45
Germany	Morocco	0.03	0.02	0.02	1.37	0.74	0.94	1.09	0.06
Germany	Tunisia	0.54	0.44	0.48	1.18	0.83	0.94	1.09	1.18
Germany	Turkey	9.93	8.91	9.55	1.11	0.86	0.94	1.09	21.87
Germany	Algeria	0.07	0.04	0.05	1.34	0.76	0.94	1.09	0.14
Denmark	Egypt	1.62	0.97	1.26	1.31	0.75	0.98	1.03	0.2
Denmark	Morocco	0.01	0	0.01	2.4	0	0.98	1.03	0
Denmark	Tunisia	0.16	0.11	0.14	1.22	0.79	0.98	1.03	0.02
Denmark	Turkey	1.88	2.12	1.98	0.97	1.04	0.98	1.03	0.3
Denmark	Algeria	0.01	0.01	0.01	1.38	0.72	0.98	1.03	0
Spain	Egypt	0.84	0.95	0.91	0.85	1.27	1.07	0.82	0.58
Spain	Morocco	37.82	37.85	39.31	0.9	1.17	1.07	0.82	24.67
Spain	Tunisia	8.31	10.78	9.45	0.82	1.39	1.07	0.82	6.01
Spain	Turkey	0.19	0	0.14	1.31	0	1.07	0.82	0.09
Spain	Algeria	0.65	0.68	0.69	0.88	1.2	1.07	0.82	0.43

EU-25 and select MENA countries intensity indices and decompositions (continued)

Home (origin) country	Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Share of host country imports
Estonia	Egypt	0.08	0.11	0.08	1.09	0.87	0.87	1.55	0.01
Estonia	Morocco	0	0	0	1.83	0	0.87	1.55	0
Estonia	Tunisia	0.01	0.01	0.01	1.04	0.94	0.87	1.55	0
Estonia	Turkey	0.1	0	0.08	1.43	0	0.87	1.55	0.01
Estonia	Algeria	0	0	0	1.14	0.83	0.87	1.55	0
Finland	Egypt	0.55	0.23	0.4	1.35	0.59	1.01	0.99	0.1
Finland	Morocco	0.01	0	0	1.98	0	1.01	0.99	0
Finland	Tunisia	0.09	0.05	0.07	1.28	0.63	1.01	0.99	0.02
Finland	Turkey	0.39	0.97	0.59	0.66	1.67	1.01	0.99	0.14
Finland	Algeria	0.01	0	0.01	1.41	0.56	1.01	0.99	0
France	Egypt	3.15	2.69	2.86	1.18	0.84	0.93	1.12	3.24
France	Morocco	48.49	36.4	41.1	1.26	0.79	0.93	1.12	47.24
France	Tunisia	10.42	10.14	10.12	1.1	0.89	0.93	1.12	11.26
France	Turkey	0.72	1.84	1.11	0.69	1.48	0.93	1.12	1.18
France	Algeria	8.26	6.46	7.16	1.24	0.8	0.93	1.12	8.19
UK	Egypt	0.85	0.62	0.7	1.45	0.72	0.84	1.24	2.08
UK	Morocco	0.02	0.01	0.01	1.57	0.69	0.84	1.24	0.04
UK	Tunisia	0.3	0.25	0.26	1.34	0.76	0.84	1.24	0.77
UK	Turkey	0.42	0.81	0.57	0.87	1.14	0.84	1.24	1.53
UK	Algeria	0.02	0.02	0.02	1.53	0.7	0.84	1.24	0.06
Greece	Egypt	1.97	0.84	1.58	1.13	0.71	1.1	0.75	1
Greece	Morocco	0.46	0	0.27	1.53	0	1.1	0.75	0.17
Greece	Tunisia	6.65	3.24	5.54	1.09	0.78	1.1	0.75	3.54
Greece	Turkey	8.44	2.41	6.71	1.14	0.48	1.1	0.75	4.42
Greece	Algeria	0.52	0.2	0.41	1.16	0.67	1.1	0.75	0.25
Hungary	Egypt	0.3	0.46	0.32	1.23	0.78	0.78	1.85	0.08
Hungary	Morocco	0.01	0	0	2.2	0	0.78	1.85	0
Hungary	Tunisia	0.07	0.12	0.08	1.15	0.83	0.78	1.85	0.02
Hungary	Turkey	0.22	0	0.17	1.62	0	0.78	1.85	0.04
Hungary	Algeria	0.16	0.23	0.16	1.29	0.75	0.78	1.85	0.04
Ireland	Egypt	0.14	0.07	0.1	1.31	0.68	1	1	0.07
Ireland	Morocco	0	0	0	2.11	0	1	1	0
Ireland	Tunisia	0.02	0.01	0.01	1.23	0.73	1	1	0.01
Ireland	Turkey	0.1	0	0.06	1.57	0	1	1	0.04
Ireland	Algeria	0	0	0	1.37	0.65	1	1	0

EU-25 and select MENA countries intensity indices and decompositions (continued)

Home (origin) country	Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Share of host country imports
Italy	Egypt	1.65	1.77	1.85	0.74	1.78	1.21	0.54	3.14
Italy	Morocco	1.93	1.84	2.1	0.76	1.62	1.21	0.54	3.5
Italy	Tunisia	2.27	2.8	2.63	0.71	1.97	1.21	0.54	4.57
Italy	Turkey	0.07	0.2	0.11	0.53	3.38	1.21	0.54	0.2
Italy	Algeria	0.32	0.31	0.35	0.75	1.67	1.21	0.54	0.59
Lithuania	Egypt	0.08	0.05	0.07	1.22	0.64	0.94	1.19	0.02
Lithuania	Morocco	0	0	0	1.7	0	0.94	1.19	0
Lithuania	Tunisia	0.01	0.01	0.01	1.16	0.7	0.94	1.19	0
Lithuania	Turkey	0.11	0	0.09	1.36	0	0.94	1.19	0.02
Lithuania	Algeria	0	0	0	1.26	0.61	0.94	1.19	0
Luxembourg	Egypt	0.25	0.09	0.18	1.13	0.8	1.25	0.65	0
Luxembourg	Morocco	0.03	0	0.01	1.72	0	1.25	0.65	0
Luxembourg	Tunisia	0.05	0.02	0.04	1.07	0.87	1.25	0.65	0
Luxembourg	Turkey	0.4	0	0.24	1.37	0	1.25	0.65	0
Luxembourg	Algeria	0.01	0	0	1.17	0.76	1.25	0.65	0
Latvia	Egypt	0	0.01	0.01	1.04	0.96	0.83	1.53	0
Latvia	Morocco	0	0	0	2.11	0	0.83	1.53	0
Latvia	Tunisia	0	0	0	0.98	1.02	0.83	1.53	0
Latvia	Turkey	0.03	0	0.02	1.57	0	0.83	1.53	0
Latvia	Algeria	0	0	0	1.09	0.92	0.83	1.53	0
Malta	Egypt	0.98	0.56	0.86	1.06	0.85	1.08	0.77	0.04
Malta	Morocco	0.01	0	0.01	1.46	0	1.08	0.77	0
Malta	Tunisia	0.14	0.09	0.12	1.02	0.93	1.08	0.77	0.01
Malta	Turkey	0.11	0	0.08	1.24	0	1.08	0.77	0
Malta	Algeria	0.01	0.01	0.01	1.09	0.8	1.08	0.77	0
Netherlands	Egypt	1.54	1.2	1.34	1.24	0.8	0.93	1.12	0.68
Netherlands	Morocco	0.03	0	0.01	2.36	0	0.93	1.12	0.01
Netherlands	Tunisia	0.29	0.25	0.27	1.16	0.85	0.93	1.12	0.13
Netherlands	Turkey	3.05	4.39	3.54	0.93	1.1	0.93	1.12	1.67
Netherlands	Algeria	0.04	0.03	0.03	1.3	0.77	0.93	1.12	0.02
Poland	Egypt	0.12	0.16	0.13	1.06	0.92	0.9	1.36	0.29
Poland	Morocco	0	0	0	1.82	0	0.9	1.36	0
Poland	Tunisia	0.03	0.04	0.03	1.01	0.99	0.9	1.36	0.06
Poland	Turkey	0.1	0.26	0.13	0.81	1.45	0.9	1.36	0.29
Poland	Algeria	0.06	0.07	0.06	1.1	0.87	0.9	1.36	0.13



EU-25 and select MENA countries intensity indices and decompositions (continued)

Home (origin) country	Host country	Total intensity, Unskilled workers	Total intensity, Skilled workers	Regional Bias	Region-Skill Bias, Unskilled Workers	Region-Skill Bias, Skilled Workers	Selection-Skill Bias, Unskilled Workers	Selection-Skill Bias, Skilled Workers	Share of host country imports
Portugal	Egypt	0.07	0.02	0.06	1.13	0.54	1.09	0.68	0.05
Portugal	Morocco	2.48	0	1.72	1.32	0	1.09	0.68	1.35
Portugal	Tunisia	0.48	0.16	0.4	1.1	0.6	1.09	0.68	0.33
Portugal	Turkey	0.03	0	0.02	1.17	0	1.09	0.68	0.02
Portugal	Algeria	0.04	0.01	0.03	1.16	0.5	1.09	0.68	0.02
Slovakia	Egypt	0.24	0.09	0.19	1.14	0.65	1.1	0.72	0.05
Slovakia	Morocco	0	0	0	1.44	0	1.1	0.72	0
Slovakia	Tunisia	0.04	0.02	0.03	1.1	0.72	1.1	0.72	0.01
Slovakia	Turkey	0.13	0	0.1	1.23	0	1.1	0.72	0.03
Slovakia	Algeria	0.07	0.02	0.05	1.16	0.61	1.1	0.72	0.01
Slovenia	Egypt	0.09	0.03	0.07	1.16	0.67	1.12	0.74	0
Slovenia	Morocco	0.01	0	0	1.56	0	1.12	0.74	0
Slovenia	Tunisia	0.02	0.01	0.02	1.12	0.73	1.12	0.74	0
Slovenia	Turkey	0.3	0	0.21	1.29	0	1.12	0.74	0.01
Slovenia	Algeria	0	0	0	1.2	0.63	1.12	0.74	0
Sweden	Egypt	1.54	1.13	1.29	1.29	0.8	0.93	1.1	0.27
Sweden	Morocco	0.02	0	0.01	2.63	0	0.93	1.1	0
Sweden	Tunisia	0.23	0.19	0.21	1.19	0.85	0.93	1.1	0.04
Sweden	Turkey	2.46	2.66	2.54	1.04	0.95	0.93	1.1	0.47
Sweden	Algeria	0.02	0.01	0.01	1.36	0.77	0.93	1.1	0

Source: GMig2 database