Développement et Sociétés

The Labour Mobility-Employment Nexus: a Comparative Analysis of Jordan and Tunisia

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Abstract

Jordan and Tunisia are two non-oil exporting MENA countries characterized by high unemployment rates and significant migrant populations. A comparative analysis of the impact of international mobility in the two countries allows us to shed light on the mechanisms through which emigration affects labour market outcomes and reciprocally. Developing GATS Mode 4 type of exports improves the labour market situation, mainly for high skilled workers. As a consequence, migration and brain-drain would be reduced. Furthermore, an increase in foreign wages has higher benefits in Jordan despite a higher induced migration increase in Tunisia. When the rise is limited to high-skilled migrants' wages, low and medium skilled workers are positively affected in Tunisia and negatively in Jordan.

Keywords: International migration, Remittances, labour supply, CGE model, Tunisia and Jordan
JEL codes: C68, D58, F22, F24, J21

Résumé

La Jordanie et la Tunisie sont deux pays non exportateurs de pétrole de la région MENA, caractérisés par des taux de chômage élevés et des populations migrantes importantes. Une analyse comparative de l'impact de la mobilité internationale dans les deux pays nous permet de mettre en lumière les mécanismes par lesquels l'émigration affecte les performances sur le marché du travail et réciproquement. Le développement des exportations du mode 4 de l'AGCS améliore la situation du marché du travail, principalement pour les travailleurs hautement qualifiés. Par conséquent, la migration et la fuite des cerveaux seraient réduites. En outre, une hausse des salaires étrangers a des avantages plus élevés en Jordanie, en dépit d'une augmentation plus forte de la migration induite en Tunisie. Lorsque la hausse est limitée aux salaires des travailleurs hautement qualifiés, les travailleurs faiblement et moyennement qualifiés sont positivement affectés en Tunisie et négativement en Jordanie.

Mots-clés : Migration internationale, transferts des migrants, offre de travail, modèle EGC, Tunisie et Jordanie

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1 Introduction

Increased labour mobility can have a dual pay-off: fighting unemployment in sending countries and enhancing growth through a more efficient use of the available resources, especially human capital. As some countries are labour abundant and other labour importers, a greater cooperation to smooth labour movements can be beneficial for all (**?**). However, the receptivity of governments to facilitate labour mobility is usually lower than for capital mobility, as witnessed by the much larger number of bilateral investment treaties and by countries' reluctance to include labour mobility provisions in trade agreements (**?**). This disfavours labour abundant developing countries.

Given that public opinion tends to be less anti trade than anti migration (**?**), labour mobility through trade in services agreements[1] has been thought of as a potential substitute to migration (**?**). This substitution effect, however, concerns mainly the linkages between migration and trade in services, and less the one between migration and trade in general, for which **?** and **?** highlight a complementarity rather than a substitution. According to **?** self-employed service suppliers regulation is easier to harmonise than that of labour markets in the case of migration. **?** uses a theoretical model to show how labour mobility under Mode 4 agreements is a better solution for fighting illegal migration, compared to temporary migration. **?** and **?** find significant welfare gains associated with the increase of mobility through Mode 4 agreements, using the GTAP model[2].

Our paper aims at tackling the issue of the compared efficiency (in terms of economic and social benefits) of these two types of mobility, as well as their interactions. We adopt here the perspective of origin countries[3]. These countries generally suffer from high unemployment rates, thus we focus our analysis on the labour market impact of mobility. How does a variation in mobility, either through migration or Mode 4, affects unemployment, wages and the participation rate in sending countries? Will services exports involving temporary labour mobility alleviate migration pressures and brain drain? In return, how do domestic employment imbalances affect migration behaviour? Finally, what is the impact of selective migration policies that are being pushed forward in destination countries?

A general equilibrium framework seems well suited for such an analysis due to second round and feed-back effects which can not be captured through a partial equilibrium model. For ex-

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[1]GATS defines four modes of supply, amongst which, one refers to labour mobility. The four modes are: 1) Mode 1: Cross-border supply; 2) Mode 2: Consumption abroad; 3) Mode 3: Commercial presence; 4) Mode 4: Movement of natural persons.

[2]General equilibrium model developed under the Global Trade Analysis Project by the Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University.

[3]For the perspective of destination countries see for instance **??** and**?**.

ample, an increase in exports induces a currency appreciation which can have a negative impact on remittances. Lower transfers can lead to a higher domestic activity rate which can offset the initial positive effect of the shock on labour demand. We develop an original model intended to take into account these multiple interactions through the endogenisation of emigration flows and the remittance rate, as well as the activity rate and human capital accumulation. Our model takes into account labour market segmentation by sector, skill and age and allows for an endogenous determination of unemployment.

This framework is applied to the MENA region, which is a particularly interesting case given its very large migrant flows and high potential in terms of service exports (**??**).

We focus on two countries within the MENA region, Jordan and Tunisia, which are both labour abundant, migrant sending countries. Jordan and Tunisia followed almost the same path of economic liberalization in the past two decades and suffer from high unemployment rates despite relatively high and sustained growth paths. Tunisia is characterized by a higher stock of migrants, while Jordan is characterized by higher flows and a higher share of remittances to GDP. Tunisians emigrate mainly to Europe while Jordanians seek jobs mainly in the Gulf. The comparison is intended to capture the different effects of a same shock of mobility on countries with different migration profiles and Mode 4 potential.

The increase of services exports involving professionals mobility has a positive impact in both countries. We find evidence of substitution of migration by services' exports, particularly for high skilled workers. Higher Mode 4 exports opportunities could thus reduce brain drain. However, there is a substitution of labour by capital in both countries, which given the capital-skill complementarity induces higher wage inequality among skills. The scenario benefits more the youth in Tunisia than in Jordan.

Moreover, an increase in foreign wages has higher benefits in Jordan despite a higher induced migration increase in Tunisia. When the increase in foreign wages is limited to high skilled emigrants, the effects are positive on local highly educated workers, particularly in Jordan. The impact on low and medium skilled local workers depends on the weight of migrants flows in the working age population. In Jordan where migrants flows represent a higher share, the effects on low and medium skilled workers are negative, while the impact is positive in Tunisia on the same categories.

The rest of the article is organised as follows. Section 2 offers a brief description of the model, highlighting the innovative aspects, while section 3 presents the main features of the Tunisian and Jordanian labour markets and migration profiles. In section 4 we conduct the counterfactual experiments and section 5 concludes.

2 Description of the model

In order to analyse the impact of mobility, we use a novel computable general equilibrium model with a focus on migration and labour market issues. We will present the model here very briefly and a complete description can be found in (**?**).

Our model is based on four representative agents, three of which are modelled endogenously and have an optimizing behaviour (households, which get divided between local individuals and migrants, and producers) and one which was modelled exogenously, the Government. Households are composed of six categories according to age[4] and skill[5] and the first decision they make is whether they migrate or not, following a constant elasticity of transformation function, for which the first-order condition gives the following:

$$
EMIGA_{f,a} = am_{f,a} \cdot LSTA_{f,a} \left(\frac{\overline{W_{EMIGf,a}}}{W_{LSf,a}} \right)^{sig1}
\tag{1}
$$

where $LSTA_{f,a}$ is the total skill and age specific working age population, $EMIGA_{f,a}$ the migrant population and $\overline{W_{EMIGf,a}}$[6] and $W_{LSf,a}$ the foreign and local wages. The share parameter $am_{f,a}$ was calibrated for base year values of the main variables. The elasticity $sig1$ captures individual preferences, but also migration costs and opportunities.

For the representative agents who chose not to migrate, we endogenise the labour market participation decision. Thus, the local labour supply is determined by the trade-off between consumption and leisure modelled through a Stone-Geary utility function (**?**), as follows:

$$
LS_{f,a} = (1 - \mu_0) \cdot LSLA_{f,a} - \frac{\mu_0}{W_{LSf,a}} (HC - \sum_{i=1}^{N} p_i \overline{c_i})
\tag{2}
$$

where LS is the labor force participation, $LSLA$ is the working age population, μ_0 is the share of leisure in total consumption, W_{LS} is the local wage, HC is total household consumption and $\overline{c_i}$ is the consumption of good i with price p_i.

This type of modelling also allows us to take into account the impact of remittances on the activity rate since remittances will impact the household consumption and thus the quantity of labour supply. For the agents who chose to migrate, we assume that their wages abroad are exogenous and the remittance rate is endogenous. Along the lines of **?**, we consider that each

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[4]Two categories: *youth* and *non-youth*.

[5]Three categories: *low-*, *medium-* and *high-skill*.

[6]All variables exogenous variables are identified with an over line.

migrant's remittance rate depends on their foreign wage and their origin household disposable income, following an altruism coefficient, dynamically calibrated. The total amount of remittances received will be the sum of each remittance rate multiplied by the stock of migrants abroad for each generation (we assume there are only three generation), discounted by a factor reflecting that the more time migrants spend abroad the less they remit. Finally, households' incomes are composed of wages, capital revenues, exogenous social security benefits, public transfers, net interests and, of course, remittances. Their expenditures are composed of consumption of goods and services, social security contributions, interest payments and transfers. The composition of their basket of goods and services is determined through the maximization of a linear expenditure system (LES) function under their budget constraint.

On the producers' side, we chose a nested production function allowing for differentiated elasticities of substitution between factors. While at the top level, we assume that production is a Leontief function of total intermediate consumption and value added, at the second level we consider the value added to be a nested constant elasticity of substitution (CES) function of low-skill labour (LS), medium-skill labour (MS) and a bundle of capital and high-skill labour (which have been modelled as relatively complementary and are denoted (KHS)).

$$VA_{ac} = A_1[a_{KHS} \cdot KHS_{ac}^{(\frac{\sigma_1-1}{\sigma_1})} + a_{MS} \cdot MS_{ac}^{(\frac{\sigma_1-1}{\sigma_1})} + a_{LS} \cdot LS_{ac}^{(\frac{\sigma_1-1}{\sigma_1})}]^{\frac{1}{\frac{\sigma_1-1}{\sigma_1}}} \qquad (3)$$

with A_1 the shift parameter of production function, a the share parameters for each bundle and σ_1 the elasticity of substitution for the first level of the production function.

Labour demands by skill are determined through the first-order conditions of the previous equation. Finally, the third level models the allocation of labour demand between youth and non-youth using a CES function[7].

Labour market is cleared using an extended wage curve (along the lines of **?**) that allows both wages and unemployment by skill and age to be endogenous. At the sectoral level, wages are are determined by linking macroeconomic wages to exogenous wage differential reflecting different productivity levels.

Finally, the government, as mentioned, has an exogenous behaviour and its revenues consists of collected taxes, capital revenues and received transfers. Its expenditures consist of government consumption (mainly civil servants wages), social transfers and interest payments on public debt. In order to reach equilibrium, we chose to fix the tax rates (we increase the government spending by 5 percent annually, following the historical trends) and to leave the government budget balance endogenous.

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[7]Not presented given the similarity with the previous level.

The model is developed using sequential dynamics and it is savings driven. The tax rates are fixed and, following historical trends, the government spending is exogenously increased by 5 percent annually. As foreign balance closure, we chose to fix the current account balance at its observed level.

3 Country context and model validation

3.1 Jordan

High population growth rates and massive immigration are the main characteristics of the Jordanian labour market. Projections show a rapid increase in population, but a stagnation of the labour force participation rate (a stable average of 38.9% between 2000 and 2020 according to the DoS projections). As a matter of fact, the Jordanian labour force participation rate is one of the lowest in the world (**?**).

The labour force is also increasingly educated, with the share of university graduates moving from 8% to 13% over the last decade and that of those with no education declining from 18% to 12% over the same period.

Despite this, unemployment represents a significant challenge, with rates averaging 13.8% between 2003 and 2007. Moreover, high unemployment rates increasingly concern the youth (more than the double of the national average) and the highly educated as their unemployment rate went from 12.1% in 1995 to 15.5% in 2007 for those holding a university diploma.

In terms of migration, the most striking fact is the outflow of high skilled labour to GCC countries and the immigration of low-skilled foreign workers. The major destination for Jordanian migrants are the GCC countries, with an estimated stock of 141 202 Jordanian workers in 2008 (Ministry of labour). The direct consequence is the temporary nature of Jordanian migration and **?** shows that 38% of Jordanian migrants have left in the last two years. The World Bank ranked Jordan as 10th in terms of remittance receiving country proportionally to GDP. Remittances' share of GDP went from 16 percent in 2008 to 23 percent in 2009.

3.2 Tunisia

The working age population represents 75% of the population in Tunisia and its growth rate is the double of the total population's growth rate. The labour participation rate was estimated to be 47% in 2010, but important disparities are to be found concerning women (whose participation rate is 25%) and youth. Indeed, for those aged between 15 and 29 years, the participation rate falls to 34% and this can be partly explained by the high enrollment rates and the lack of job opportunities. Tunisians are becoming increasingly qualified and this is reflected by the share of

the highly educated labour force that went from 6.5% of the total labour force in 1994 to 20% of the total labour force in 2011.

The unemployment rate slightly decreased, from 15.6% in 1994 to 13.3% in 2010, but surged to 18.9% in 2011. The share of medium and highly-educated unemployed increased significantly during the same period with the noticeable rise of highly-educated which went from 2% in 1994 to 32% in 2011. In other words, unemployed individuals with a university diploma represent one third of total unemployment. Furthermore, there seems to be a correlation between age and unemployment, with high unemployment rates for the young (28.7% for those between 15-19 years old and 29.7% for those being 20 to 24 years old) that decline with age, reaching 3% for those aged 45 years and above.

In terms of stock, the number of Tunisians residing outside their home country amounts to slightly more than 1 million, with the majority (almost 83%) living in Europe. The most popular destination is France, receiving around 40% of all Tunisian migrants, followed by Italy with 25%. Tunisian migration to France goes a long way back, with the first labour agreements signed in the sixties. The most important share of Tunisian migrants (48.1%) has a secondary education, while university graduates represent 14.1% of migrants. Finally, remittances play an important role in the Tunisian economy. In 2010, they amounted to 1.970 million US$, representing 4.4% of GDP and 30 to 40% of the trade deficit.

3.3 Data

In order to calibrate the model, we constructed social accounting matrices for the both countries. For Tunisia, the Social Accounting Matrix (SAM) was built based on an Input-Output table for 2005 from the *Institut National des Statistiques* (INS) and complementary data from the Central Bank and the Ministry of Finance. The Jordanian SAM was developed using available data of 2006 from the Jordanian Department of Statistics, the Central Bank of Jordan, the Jordanian Ministry of Finance, the IMF and the World Bank. These same sources were used for the baseline figures on GDP growth rates projections, investment, debts and foreign savings. Data on employment, wages and labour market outcomes was inferred from the 2010 Jordanian labour Market Panel Survey made available by the Economic Research Forum and from the 2010 Tunisian labour Force Survey. Despite the importance of the immigration phenomenon in Jordan, we chose not to include it in our study for two main reasons. First of all, immigrants are not included in most of the official statistics, therefore including them could create a data inconsistency. Secondly, our study is mainly focused on outmigration and its impact on the labour market.

Education data, specifically the number of enrolled by cycle and efficiency rates, were com-

piled with the help of the ITCEQ (*Institut Tunisien de Compétitivité et d'Etudes Quantitatives*), as well as data from the Education Ministry of each country, the OECD, UNESCO, UNICEF and the World Bank.

For both Tunisia and Jordan, data on migration rates and wage differentials was computed from CARIM databases, INSEE and various reports (EU2010). In order to compute migrant stocks by category and by skill, we used data from DIOC-E, the data set built by Docquier and Marfouk on skilled migration to OECD countries [8], as well as **?** database on migrants stocks and DIOC-E data set (**?**) and "Bilateral Migration and Remittances 2010" from the World Bank, an update of the data set provided by **?**.

3.4 Calibration

The derivation of the scale and share parameters of the functions follows the usual procedure. Based on the initial values of the variables, the scale and share parameters are computed endogenously.

Table 1: Main elasticities of the model

Elasticity of substitution	
Of the capital (K) and high-skilled demand (HSK) bundle	0.3
Of the medium-small bundle	0.9
Of the low-skilled bundle	0.9
Of the youth-non-youth bundle	0.5
Elasticity of the wage curve	-0.22
Elasticity of transformation of total labour supply	1.2
Elasticity of substitution between imports and local products	3
Elasticity of transformation between local products and exports	3

The main elasticities used in the model (see table 1) have been calibrated dynamically to replicate the observed path of the economies modelled. Since the base year is 2005 for Tunisia and 2006 for Jordan, and data is available through 2012, a dynamic calibration of the model was possible. The result from this exercise is that the reference scenario is reasonably in line with the labour force survey figures and the evolution of the main variables at the macro and sector levels, as shown in Figure 1.

Figure 1: Comparison between baseline and actual trends for unemployment

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[8]for details see **?**

4 Experiments

This section discusses the impact of various shocks on labour supply and demand, unemployment, emigration (level and duration), remittances and the other variables mentioned above. For each simulation, the results presented in the tables are in comparison to the baseline or reference scenario. Three experiments are run: Simulation (A): What would be the impact of service exports increase? Simulation (B): What are the effects of an increase in foreign wages? Simulation (C): What happens if the increase in foreign wages is limited to skilled workers?

4.1 The impact of a Mode 4 agreement

The General Agreement on Trade in Services (GATS) emerged from the Uruguay Round covers all types of trade in services except for public services and those related to traffic rights in air transport services.

Under Mode 4 movements of service suppliers are contract-based while under temporary migration there is an employer-employee relationship.

In order to estimate the potential Mode 4 flows, the literature suggests looking at the balance of payments components such as exports in services and compensation of employees or migration and tourism statistics (**??**). However, the balance of payments does not distinguish between Mode 1, Mode 2 and Mode 4 exports. Isolating the value of Mode 4 services in total exports might prove to be difficult, but, as **?** point it out mobility under Mode 4 exports is an important component in service sectors such as accounting, construction, engineering, information technology, or legal services. Therefore, we simulated an increase of 20%[9] per year in exports potentially intensive in mode 4 transactions.

The impact of the shock on GDP is similar in both countries (Table [2]). However, we notice a higher impact on investment (1.1% versus 0.5%) due to higher capital gains in Tunisia. Given that service exports represent a higher share in total exports in Tunisia the currency appreciation is higher (-0.9% versus -0.5%), resulting in lower migration[10] (-2.9% versus -1.1%) and remittances (-3.1% versus -1.6%) than in Jordan. While the activity rate increases slightly (0.1 percentage point) in Jordan due to the remittances reduction, it decreases in Tunisia (-0.1 percentage point) reflecting the higher impact of capital gains on households' income. Thus the unemployment reduction is higher in Tunisia (-0.8 percentage point versus -0.2 in Jordan). Our results thus show that, as predicted by **?**, Mode 4 trade in services can be an alternative to migration.

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[9]This corresponds to a high average of the growth in service exports over the period 2005-2010 according to the Balance of payments.

[10]We remind that the migration decision and the remittance rate vary positively with the local currency depreciation.

Table 2: Macro results

	Tunisia	**Jordan**
GDP Growth (p.p.)	0.1%	0.1%
Emigration	-2.9%	-1.1%
Total investment	1.1%	0.5%
Local labour demand	0.3%	0.5%
Total potential active population	-0.5%	0.1%
Total Unemployment (p.p.)	-0.8%	-0.2%
Total activity rate (p.p.)	-0.1%	0.1%
Remittances	-3.1%	-1.6%
Exchange rate	-0.9%	-0.5%

Table 3: Results by skill

	Tunisia	**Jordan**
Number of unemployed		
Low skilled	-2.5%	-0.7%
Medium skilled	-5.4%	-1.4%
High skilled	-7.3%	-1.9%
Emigration		
Low skilled	-2.0%	-0.8%
Medium skilled	-2.9%	-1.2%
High skilled	-4.2%	-1.6%
Activity rate (p.p.)		
Low skilled	-0.1%	0.1%
Medium skilled	-0.1%	0.2%
High skilled	-0.1%	0.3%
Transition rates		
Secondary education	11.2%	1.7%
Higher education	1.1%	0.5%

Table 4: Simulation results by skill and age

	Tunisia	Jordan		Tunisia	Jordan
Number of unemployed			**Equilibrium Formal Wage**		
Low skilled			*Low skilled*		
Youth	-2.2%	-1.0%	Youth	0.4%	0.2%
Non youth	-3.9%	-0.6%	Non youth	0.9%	0.2%
Medium skilled			*Medium skilled*		
Youth	-4.4%	-1.1%	Youth	0.9%	0.3%
Non youth	-5.6%	-1.6%	Non youth	1.1%	0.4%
High skilled			*High skilled*		
Youth	-7.4%	-1.3%	Youth	0.8%	0.4%
Non youth	-7.4%	-4.4%	Non youth	1.5%	1.1%

We find evidence of a skill bias regarding unemployment reduction for the two countries, slightly higher in Tunisia due higher investment growth, given the capital-skill complementarity. This bias translated in migration by skill, with high skilled migration intentions decreasing the most (-4.2% in Tunisia and -1.6% in Jordan in Table 3).

Activity rates decrease in the same proportions for all categories in Tunisia, while they increase with the education level in Jordan. As we explained above, the Tunisian outcome is explained by the high increase in capital gains that offsets the positive impact of lower remittances and higher skilled wages on skilled labour supply.

Furthermore, non youth benefit more than youth in terms of wages and unemployment reduction (Table 4). In Tunisia, highly educated youth reap the same benefits as high skilled non youth, while in Jordan highly educated non youth benefit more in terms of both wages and unemployment. The reason lies in a higher skilled youth intensity of labour demand in service sectors in Tunisia. Thus increasing mode 4 exports would be more efficient in terms of youth inclusiveness in Tunisia.

The skill bias mentioned above entails a significantly higher incentive to pursue secondary education in Tunisia (11.2% versus 1.7% in Jordan). It also has a positive impact on transition rates to tertiary education in both countries (1.1% in Tunisia and 0.5% in Jordan).

4.2 The impact of an increase in foreign wages

This scenario analyses the impact of an increase in foreign wages (by 3% per year[11]) on domestic labour markets. Symmetrically, it could be to infer the impact of a negative shock affecting host

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[11]We simulated a shock of this amplitude based on the ILO's estimation that the maximum world wage growth rate for the period 2006-2009 was of 2.9%.

countries. Given that the migration decision is endogenous in our model, we cannot apply an exogenous shock on the number of migrants. We therefore proxy the increase in emigration flows by an increase in foreign wages. As **?** observe, migration patterns are shaped by wage differentials.

Table 5: Macro results

	Tunisia	Jordan
GDP Growth (p.p.)	0.0%	0.2%
Emigration	6.5%	2.7%
Total investment	1.3%	3.5%
Local labour demand	-0.1%	-0.3%
Total potential active population	0.0%	-0.2%
Total unemployment (p.p.)	-0.4%	-1.0%
Total activity rate (p.p.)	-0.3%	-0.5%
Remittances	15.3%	10.4%
Exchange rate	-0.6%	-1.7%

The shock induces a significant increase in remittances (15.3% in Tunisia and 10.4% in Jordan in Table 5). The rise is lower in Jordan because remittances represent a higher share of GDP, thus affecting relatively more the exchange rate and households revenues, which by feed-back[12] exert a downward pressure on the remittance rate. Another reason for the lower rise of remittances in Jordan is the higher currency appreciation (-1.7% versus -0.6% in Tunisia). Furthermore, given that remittances have a higher impact on the Jordanian economy, they lead to a higher increase in investment (3.5% versus 1.3% in Tunisia) and in GDP (0.2% versus 0% in Tunisia). The rise in remittances and the higher increase in investment result in a higher impact on the activity rate in Jordan (-0.5 percentage point versus -0.3 percentage point in Tunisia).

The higher decrease of the activity rate in Jordan is reflected in a more significant unemployment reduction (-1 percentage point versus 0.4 percentage point in Tunisia). Still, the fall in unemployment in Jordan is also due to the decline of the working age population induced by the increase in emigration. Indeed, migrant outflows represent a higher share of the total labour force in Jordan, therefore their increase reduces the working age population, whereas there is no such effect in Tunisia.

In terms of emigration, the initial positive effect induced by the increase in foreign wages is limited in Jordan by the feedback effects resulting from the fall in unemployment and the rise in local wages. Moreover, this increase in wages induces a fall in labour demand, which, coupled with the investment increase, indicates evidence of substitution of labour by capital.

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[12]The domestic household feed-back effect acts through the altruism mechanism.

Table 6: Results by skill

	Tunisia	Jordan
Number of unemployed		
Low skilled	-4.3%	-11.8%
Medium skilled	-3.4%	-10.2%
High skilled	-1.2%	-6.9%
Activity rate (p.p.)		
Low skilled	-0.2%	-0.5%
Medium skilled	-0.3%	-0.6%
High skilled	-0.1%	-0.5%

Table 7: Macro results

	Tunisia	Jordan
GDP Growth (p.p.)	0.0%	0.1%
Emigration	2.3%	1.2%
Total investment	0.6%	1.9%
Local labour demand	0.1%	0.0%
Total potential active population	0.0%	-0.2%
Total unemployment (p.p.)	-0.1%	-0.3%
Total activity rate (p.p.)	0.0%	-0.1%
Remittances	6.4%	5.6%
Exchange rate	-0.2%	-1.0%

High skilled unemployment decreases the least of all skill categories because their initial unemployment was the highest. In Tunisia, the difference is more important with regard to the other skill levels because the high skill activity rates decrease only slightly thus limiting the unemployment reduction (see Table 8).

4.3 Increase in high skilled wages

The scenario consists in increasing high skilled foreign wages by 6% (the double of the growth rate from the previous simulation) per year above the baseline scenario. The wages of the other categories continue to grow at the reference scenario rate. The aim of this simulation is to analyse the impact of a high skilled biased shock on the labour market and in particular the indirect effects on the other categories.

The results at the macro level are similar to the ones observed in the previous scenario, but of lower intensity (Table 7). The main differences are that remittances variations in both countries

Table 8: Unemployment by skill and education

	Tunisia	Jordan
Number of unemployed		
Low skilled	-0.6%	1.1%
Medium skilled	-0.4%	0.1%
High skilled	-2.1%	-14.1%
Activity rate (p.p.)		
Low skilled	0.0%	0.2%
Medium skilled	0.0%	0.2%
High skilled	-0.2%	-0.9%
Emigration		
Low skilled	-0.5%	-0.8%
Medium skilled	-0.5%	-1.2%
High skilled	16.9%	8.2%
Transition rates		
Secondary education	-0.6%	0.7%
Higher education	0.4%	5.3%

are much closer in this simulation. Despite this similarity, the impact on investment and the exchange rate is higher in Jordan due to a larger share of remittances in GDP. Moreover, the total activity rate does not vary anymore in Tunisia, while it slightly decreases in Jordan (-0.1%).

The shock benefits high skilled workers in terms of unemployment reduction in both countries, but the magnitude is very different (-2.1% in Tunisia versus -14.1% in Jordan as Table 8 shows). The unemployment outcomes of the other categories are also dissimilar with an increase of unemployment for low and medium skilled in Jordan and a decrease in Tunisia. The higher decrease of unemployment in Jordan is due to a higher decline of activity rates (-0.9% versus -0.2% in Tunisia) despite a lower increase in emigration (8.2% versus 16.9% in Tunisia). The negative impact on low and medium skilled workers is due to an increase of their activity rates in Jordan, while these rates do not vary in Tunisia. These two results reflect the significant impact of remittances on households' incomes in Jordan.

The outcomes observed in terms of unemployment (Teable 9) are also reflected in terms of wage variations with a significant increase of high skilled wages in Jordan (2% for the youth and 4.9% for the non youth), versus a limited rise for Tunisian high skilled workers (0.3 and 0.4%). The increase for the non youth is higher than for the youth in Jordan because their unemployment rate is initially much lower, thus putting additional upward pressure on their wages when unemployment decrease. The consequences of these wage variations are a slightly stable labour demand in Tunisia versus a decrease in Jordan, more marked for elderly workers.

Wage distribution effects are limited in Tunisia with a slight increase of high skilled wages vis a vis low and medium skilled ones. In Jordan wage inequality increases across skills and among age categories. High skilled see their wages increase significantly vis a vis the two other skill levels. If we consider the age dimension across skills, the low and medium skilled non youth are more affected, while the high skilled non youth are the main beneficiaries of the shock.

Higher skilled migrants' wages are a very strong incentive for tertiary education in Jordan (the transition rate increases by 5.3%) but have a limited impact on transitions to secondary education (0.7%). In Tunisia the positive effects on higher education are much lower (0.4%) and the effect on secondary education are negative (-0.6%).

Table 9: Simulation results by skill and age

	Tunisia	Jordan		Tunisia	Jordan
Number of unemployed			**Equilibrium Formal Wage**		
Low skilled			*Low skilled*		
Youth	-0.4%	0.6%	Youth	0.1%	0.0%
Non youth	-1.0%	1.2%	Non youth	0.3%	-0.2%
Medium skilled			*Medium skilled*		
Youth	-0.4%	-1.0%	Youth	0.1%	0.3%
Non youth	-0.4%	0.9%	Non youth	0.1%	-0.1%
High skilled			*High skilled*		
Youth	-2.7%	-12.5%	Youth	0.3%	2.0%
Non youth	-1.9%	-22.0%	Non youth	0.4%	4.9%

5 Conclusion

There is a dynamism within Arab labour markets that brings both opportunity and challenge for economic development. The Arab world is unusually young, with about one third of the MENA population under the age of fourteen. Due to strong investments in public education, those entering the job market for the first time are more highly educated than a generation ago. These factors combine to create an educated Arab workforce that is growing rapidly. For a variety of reasons, domestic markets have not been able to absorb the availability of talent.

Traditionally, attractive wages in oil-exporting Arab countries, the EU and elsewhere has spurred emigration. Remittances have become an important source of external finance in the MENA region, representing over 2 percent of GDP. While some MENA nations are among the top recipients globally of immigration (Saudi Arabia, UAE) others are significant sending nations.

Bilateral negotiations are taking place between host and sending countries involving an increase in temporary migration quotas as an incentive for the latter to better cooperate with the former on illegal migration (for example the agreement between Tunisia and France and the two labour agreements between Egypt and Italy). Moreover, MENA countries involved in the Euro-Mediterranean process started negotiating services liberalization with the EU and their main objective is to obtain the highest concessions for Mode 4 to increase services exports and also to alleviate high unemployment for skilled workers, which is increasing in the region for new graduates (**?**).

This article develops a framework allowing an in-depth analysis of the circular linkages between workers' international mobility and labour market outcomes in home countries. We built upon the recent microeconomic literature dealing with the migration decision, its duration and the remittance behaviour and develop a dynamic general equilibrium model integrating these mechanisms as well as a detailed treatment of labour supply, demand and education. The model is applied to two MENA countries, Jordan and Tunisia, sharing many similarities, but with different migration profiles.

The simulation of the increase of services exports potentially involving professionals mobility has a positive impact on economic and labour outcomes in both countries. As suggested in the literature we find evidence of substitution of migration by services' exports, particularly for high skilled workers. Higher Mode 4 exports opportunities could thus reduce brain drain. However, we notice a substitution of labour by capital in both countries, which given the capital-skill complementarity induces higher wage inequality among skills. Furthermore, the scenario benefits more the youth in Tunisia, being potentially more youth inclusive than in Jordan.

An increase in foreign wages has higher benefits in Jordan despite a higher induced migration increase in Tunisia. The simulation results show a lower impact on high skilled employment outcomes, due to labour market structural patterns. When the increase in foreign wages only concerns high skilled emigrants, the effects are positive on local highly educated workers, particularly in Jordan. However, the impact on low and medium skilled local workers, ambiguous at first sight, depends on the weight of migrants flows in the working age population. In Jordan where migrants flows represent a higher share, the effects on low and medium skilled workers are negative, while the impact is positive in Tunisia on the same categories.

Mode 4 and high skilled wage increases have clear positive effects on transition rates to tertiary education, while the other shocks have variable effects, depending on labour market structural parameters in the two countries. Our results are in line with the empirical literature that finds a positive impact of high skill migration on the skill composition of the labour force (**??**).

Among the limits of the current research we can cite the reliance on the altruism hypothesis as the sole determinant of transfers, while there could be other reasons such as investment,

savings or reimbursement. If these various reasons had been taken into account, the remittance rate would have depended also on the interest rate in the origin countries, but we believe that the results would not have changed much. Moreover, we did not have data on the mapping by skill between senders and recipients of remittances. Finally the absence of data on Mode 4 transactions is a limitation to the analysis of its economic implications.

An extension of this research could consist in setting surveys in Tunisia and Jordan allowing to capture the determinants of migration and remittance behaviour. These surveys would allow us to improve the accuracy of the macroeconomic analysis, but also to a perform microsimulations in a general equilibrium framework. Another step would be taking into account migrants' skill acquisition during their time abroad, therefore adding another dimension to the human capital accumulation modelling.

Bibliography