# WORKING PAPER

## Employment Intensity and Sectoral Output Growth: A Comparative Analysis for MENA Economies[1]

### Chahir Zaki, Nooh Alshyab, Mohamed Goaied and Nesreen Seleem

Abstract

The purpose of this article is to assess the relationship between employment intensity and sectoral output growth, in order to examine whether an economic sector was jobless or created more jobs. Using panel data for 10 sectors over the period 1983–2010 for three Middle Eastern (Egypt and Jordan) and North African countries (Tunisia), we estimate employment value-added elasticities at the sectoral level, using a random coefficient estimation technique. Our main findings show that while manufacturing is the most important sector for creating jobs in Egypt, services are more important in Jordan and Tunisia. For all countries, the mining sector is insignificant. Indeed, this shows to what extent this sector is capital intensive, does not have a significant value-added and thus does not create jobs. A more detailed look at the decomposition analysis shows that the contribution of employment growth to value-added was higher than that of labour productivity. Yet, Tunisia's growth of value-added was chiefly explained by labour productivity growth. As per Jordan, its growth was mainly attributed to growth in employment, whilst its productivity growth was negative.

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## 1. Introduction

Economic growth should foster employment. Indeed, the higher the growth level, the larger the amount of investment being undertaken, leading to a higher level of employment. This, in turn, should raise economic growth. This is why, while targeting low and single digit inflation is important for macroeconomic stability and credibility, a pro-employment macroeconomic framework implies that monetary authorities can no longer focus exclusively on the attainment of an inflation target. The link between growth and labour markets has been underlined by the global financial crisis, where different countries experienced a "jobless recovery". The latter term shows how output recovered relatively quickly in the wake of the global financial crisis but unemployment did not. Therefore, while some economists highlighted the importance of using fiscal policy to address the problem of unemployment, others proposed that policy makers should focus on monetary policy, as the financial crisis dramatically reduced credit flows to the real economy. A third group tackled the issue of structural change where developing economies should focus on the manufacturing sector that creates jobs and that has a high value added compared to agriculture and services.

While the literature on this topic is quite abundant, few studies have been applied to the Middle East and North Africa region. Furthermore, most of the studies were undertaken at the macroeconomic level. Hence, the purpose of this article is to assess the relationship between employment intensity and sectoral output growth, in order to examine whether economic growth was jobless or created more jobs. Its contribution is threefold. First, we provide a comparative analysis for three countries in the Middle East (Egypt and Jordan) and North Africa (Tunisia) regions. Second, we take into consideration sectoral heterogeneity, in order to see which sector is more likely to generate jobs. Third, we decompose value-added growth into two components: employment growth and productivity growth. Hence, using panel data for 10 sectors over the period 1983–2010 for three countries[1], we estimate employment value-added elasticities at the sectoral level using a random coefficient estimation technique. From a policy perspective, this empirical exercise is important as it helps identify which sectors are more likely to generate jobs and, hence, to reduce unemployment in these countries, characterised by a high level of youth unemployment.

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[1] Because of data constraints and comparability, we only focus on this period. Even though it might be relatively outdated, it can give an evidence on employment elasticities in the MENA region.

Our main findings show that, whilst manufacturing is the most important sector in terms of job creation in Egypt, services are more important in Jordan and Tunisia. For all countries, the mining sector is insignificant. Indeed, this shows to what extent this sector is capital intensive, does not have a significant value-added and, thus, does not create jobs. A more detailed look at the decomposition analysis shows that the contribution of employment growth to value-added was higher than that of labour productivity. Yet, Tunisia's growth of value-added was chiefly explained by labour productivity growth. By contrast, Jordan's growth was mainly attributed to growth in employment, whilst its productivity growth was negative. In fact, in Jordan, the services sector employs the vast majority of the workforce. Hereby, despite a significant downsizing in the framework of the economic reform process, public administration, defence, and social services remain a highly employment intensive sector, followed by trade. Trade also registered the most sustained average employment growth over the period under consideration.

This paper is organised as follows: Section 2 presents a general overview of the region. Section 3 shows the main labour reforms that took place in these countries. Section 4 is dedicated to the methodology and data. Section 5 shows the empirical findings and Section 6 is the conclusion.

## 2. General Overview

The GDP structure shows some similarities among the southern Mediterranean countries. All countries are service-based economies, which account for 48-66 percent of GDP in 2010. Jordan surpassed Tunisia and Morocco, which has initially the highest service sector share. The contribution of agriculture to GDP has declined for all countries during the period 1980-2010, but has remained important, except for Jordan, where it represents 3 percent of GDP[2].

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[2] This paper focuses only on Egypt, Jordan and Tunisia. We include Morocco in this part for the sake of comparison.

**Figure 1. Sectoral value added (percentage of GDP)**
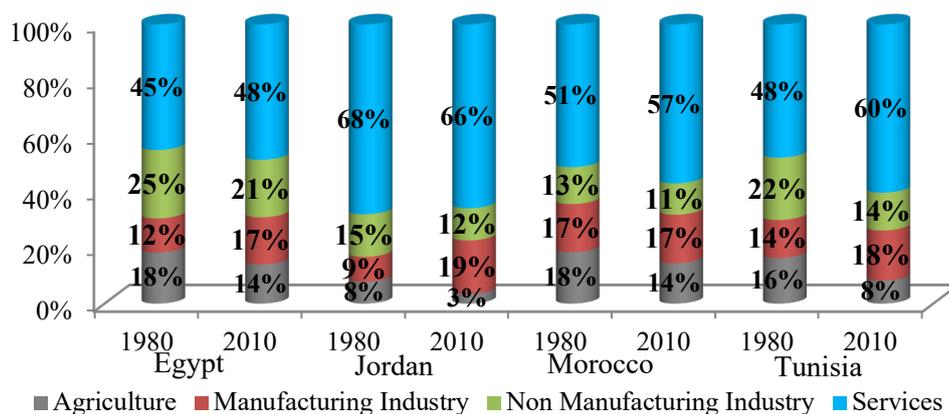


**Source**: World Development Indicators.

We note disparities in the sectoral employment structure among the southern Mediterranean countries. Service activities are the primary employer in these countries, except for Morocco, where the share of agricultural workers is almost 40%, followed by 22% industrial workers. Jordan has the largest services sector, which employs 80 percent of workers, while employment in agriculture does not exceed 2 percent of the total workforce.

**Figure 2. Sectoral Employment 2011 (percentage of total employment)**
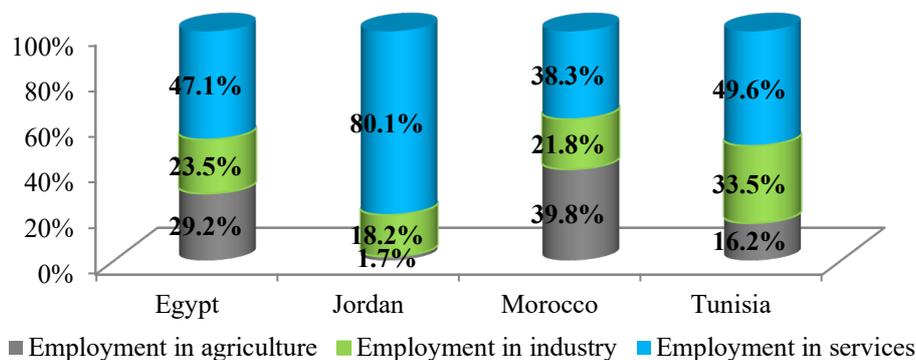


**Source**: World Development Indicators.

a.  Egypt

In the sixties, Egypt adopted a central planning system in which the state dominated most aspects of the economy, whilst the contribution of the private sector in economic activity was fairly low (Dobronogov and Iqbal 2005). Despite initial success, the system reached its limits by the end of the decade and could not sustain the high levels of economic growth - with annual

GDP growth rates declining from a peak of 6.8 percent in 1969 to an annual average of 2.9 percent between 1970 and 1973 (Bolbola *et al.* 2005).

In spite of the declining levels of economic growth, unemployment was negligible -below 2.5 percent annually - throughout this period, as the state played a central role in job creation through large investments in infrastructure, agriculture, and import substitution industries. The government also followed an employment guarantee policy whereby university and high institute graduates were offered jobs in the expanding government and public sector (El-Ehwany and Metwally 2001; Radwan 1997).

In an attempt to accelerate economic growth, the government initiated a new "open-door" policy in 1974, with the ultimate aim of encouraging the private sector and foreign investors to engage in economic activity. To serve that purpose, the government provided tax exemptions, allowed for the repatriation of profits, and guaranteed immunity from confiscation (Bolbola *et al.* 2005). In addition to the policy reform, this period was also characterised by a drastic rise in foreign earnings from the Suez Canal, petroleum exports, as well as worker remittances from abroad (Dobronogov and Iqbal 2005). As a result, high rates of GDP growth were maintained throughout the 1975-1985 period, with an annual average of 8.4 percent.

Despite these remarkable growth rates, this period marks the beginning of the unemployment problem in Egypt. This period is usually referred to as the "jobless growth decade" since the high levels of economic growth were accompanied by increasing unemployment rates, ranging around 4.6 percent per year, despite the fact that this period witnessed a peak in Gulf States' demand for Egyptian migrant workers, on the back of the increase in oil prices (Radwan 1997). This can be explained in light of the industrial policies that were implemented during this period, in which the artificially low costs of capital and energy subsidies raised the rate of return on investments in the capital-intensive sectors relative to the labour-intensive sectors, making capital-intensive industries relatively more attractive to investors. In addition to that, the government was facing fiscal difficulties in securing sufficient funds to finance the growing public sector employment. (WB 2014).

The growth path was then interrupted in 1986 when oil prices collapsed. As a result, Egypt's main sources of foreign currency - mainly oil exports, the Suez Canal, and worker remittances - were undermined with the economy's growth rate declining to an annual average of 3.9 percent until the end of the 1980s (Bolbola *et al.* 2005).

In 1991, Egypt launched the Economic Reform and Structural Adjustment Programme (ERSAP) with the support of the World Bank and International Monetary Fund (IMF), with several goals in mind: to stabilize

the economy, reduce inflation and stimulate medium and long term growth. The reform programme promoted liberal market policies. These involved the privatisation of state owned enterprises (Fadel, 2011). The reform efforts succeeded in maintaining a moderate level of GDP growth rates, with an annual average of 4.6 percent until the end of the 1990s. Nevertheless, these reforms were not sufficient to reduce unemployment, which increased gradually over the following three years – also affected by net return migration after the Gulf War in 1990/1991- and peaking in 1995 at an annual rate of 11 percent (Radwan 1997). The 1991 reforms were interrupted by a series of negative external shocks, starting with the Luxor terrorist attack, followed by the Asian financial crisis and, later, the events of September 11 which collectively worsened the economic situation in Egypt (Nassar 2011). During the period 2000-2003, investments slowed down and economic activity decelerated to an average growth rate of around 3.6 percent per year.

The reform path was then accelerated once again, as the government implemented an economic reform programme in 2004 that resulted in a sharp rise in foreign direct investment (FDI) inflows. Thanks to this reform, the stagnation in growth since 2000 was broken in 2004, as shown in figure 3, where the real GDP growth rate reached 4.1 percent, compared to 3.2 percent in the previous year. Real GDP continued to grow, achieving 4.5 percent and 6.9 percent in 2005 and 2006 respectively and recording about 7.2 percent in 2008. This surge in economic growth resulted in a rise in overall employment and the unemployment rate declined slightly from 11.2 percent in 2005 to 8.5 percent in 2008.

## Figure 3 GDP Growth rate (Percent)
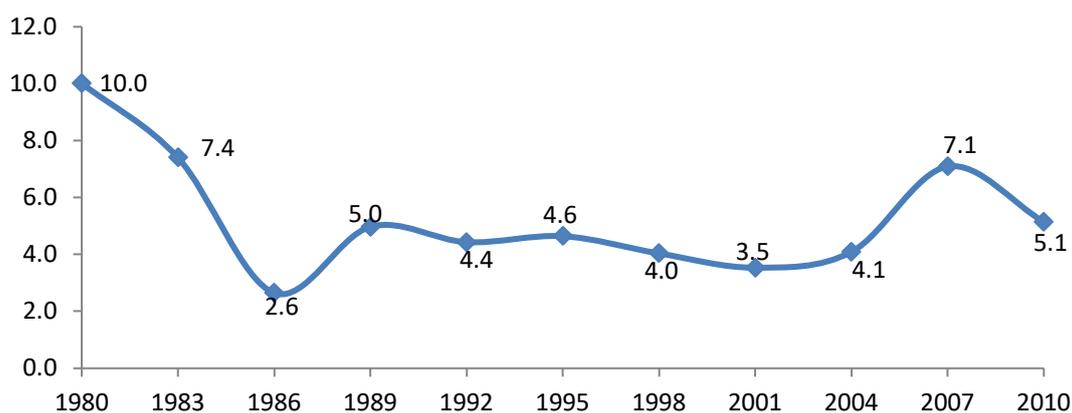


**Source**: World Development Indicators.

As can be noted from the above analysis, the Egyptian economy has not been growing evenly over the past five decades. However, even during periods of high GDP growth, this growth has not been matched with significant employment growth. Instead, employment creation has been rather limited.

Unemployment has remained at persistently high levels, despite the significant economic growth that was achieved at various periods (Hassan and Kandil 2011). Focusing on the two decades that witnessed two periods of economic reforms and vast economic progress (1990-2010), figure 4 shows that unemployment has been increasing between 1991 and 1995, reaching a peak of 11 percent in 1995 and again between 1997 and 2006 reaching 10.5 percent in 2006. The rate then declined to 8.5 percent in 2008, before increasing once again as result of the financial crisis.

**Figure 4. Unemployment rate (Percent)**
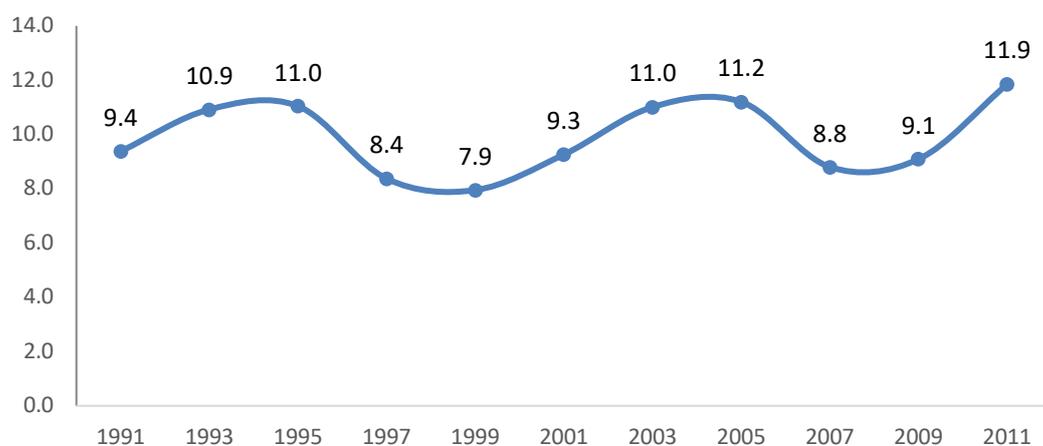


**Source**: World Development Indicators.

This persistent unemployment problem can be attributed to the demographic characteristics of Egypt (Nassar, 2011). Indeed, a potential explanation for the relatively high unemployment rates over the past two decades, despite the favourable economic policies implemented, is the large increase in the size of the labour force (WB 2014). Over the 1990-2010 period, the Egyptian population increased by almost 47 percent from 57.4 million in 1990 to 84.1 million in 2010, with an annual average population increase of 2.2 percent. The labour force, on the other hand, increased by 78 percent over the same period from 15.8 million in 1990 to 28.2 million in 2010 with an annual average growth rate of 3.7 percent. The faster growth rate of the labour force indicates that a large proportion of the Egyptian population is young with a large number of young people entering the labour force each year searching for their first jobs. However, the rate as well as the composition of economic growth, were insufficient to create the required employment opportunities and this constitutes the second reason behind the persistent unemployment problem in Egypt (Hassan and Sassanpour 2008; Nassar 2011).

Combining the growth and employment figures, between 1985/86 and 2005/06, GDP has grown by more than 90 percent. Employment, on the other hand, has grown by only 67 percent over the same period, during which around 7.9 million jobs were created, suggesting that the employment intensity of growth was not sufficient to create enough job opportunities and to ease the unemployment problem.

Hence, against this background economic growth is a necessary but not sufficient condition for employment creation. The composition of growth or, in other words, the employment intensity of growth and its ability to generate jobs, is equally important (El-Ehwany, and Metwally 2001; Radwan 1997).

Figures 5 and 6 reflect the distribution of GDP and total employment by economic activity, respectively. As displayed by the two figures, the share of agriculture, forestry, and the fishing sector - a labour-intensive sector - in both output and employment has been declining over time. With regard to output, after contributing with 18.5 percent of total GDP in 1985/86, this share declined to 14 percent in 2005/06. As for employment, the share of total employment in the agriculture sector decreased by almost 10 percent from 36.7 percent in 1985/86 to 27.3 percent in 2005/06. This decline suggests that employment has shifted away from the agriculture sector, either due to workers' migration to the Gulf States or due to urban migration and joining the manufacturing sector (El-Ehwany and Metwally 2001).

In contrast, the contribution of the manufacturing industry sector - another labour-intensive sector - in both output and employment has been increasing over the selected time period. However, the increase in the sector's share of GDP has been larger than the increase in its share of total employment. This can be attributed to the expanding practice of using capital intensive techniques in manufacturing (El-Ehwany and Metwally 2001). The share of manufacturing in GDP rose from 15.3 percent in 1985/86 to 17 percent in 2005/06 - with a peak of 19 percent of GDP in 2000/01- at the same time attracting a larger share of total employment, which rose from 11 percent in 1985/86 to 13 percent in 2005/06.

Unlike the agriculture and manufacturing industry sectors, where the changes in both output and employment were moving in the same direction, construction and building each displayed a distinctive pattern. Overall, whilst the sector's share of GDP has been gradually decreasing over time, from 5.5 percent in 1985/86 to 4.1 percent in 2005/06, the sector's share in total employment has been steadily increasing from 4.6 percent in 1985/86 to 7.8 percent in 2005/06. And finally for the transportation, communication, and information sector, the share of both output and employment has been relatively stagnant over time, on average ranging at around 6.6 percent of total GDP and 4.3 percent of total employment.

**Figure 5: GDP distribution by economic activity**
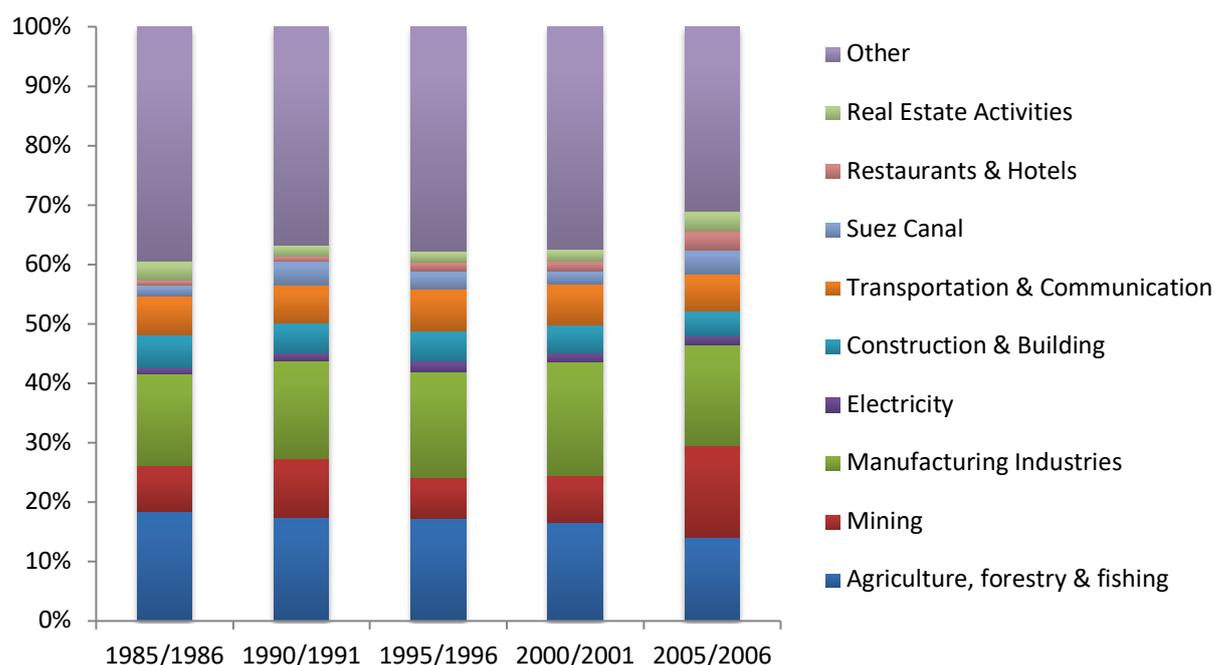


Source: Authors' calculations based on data from Ministry of Planning and Ministry of Economic Development.

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**Figure 6: Employment distribution by economic activity**
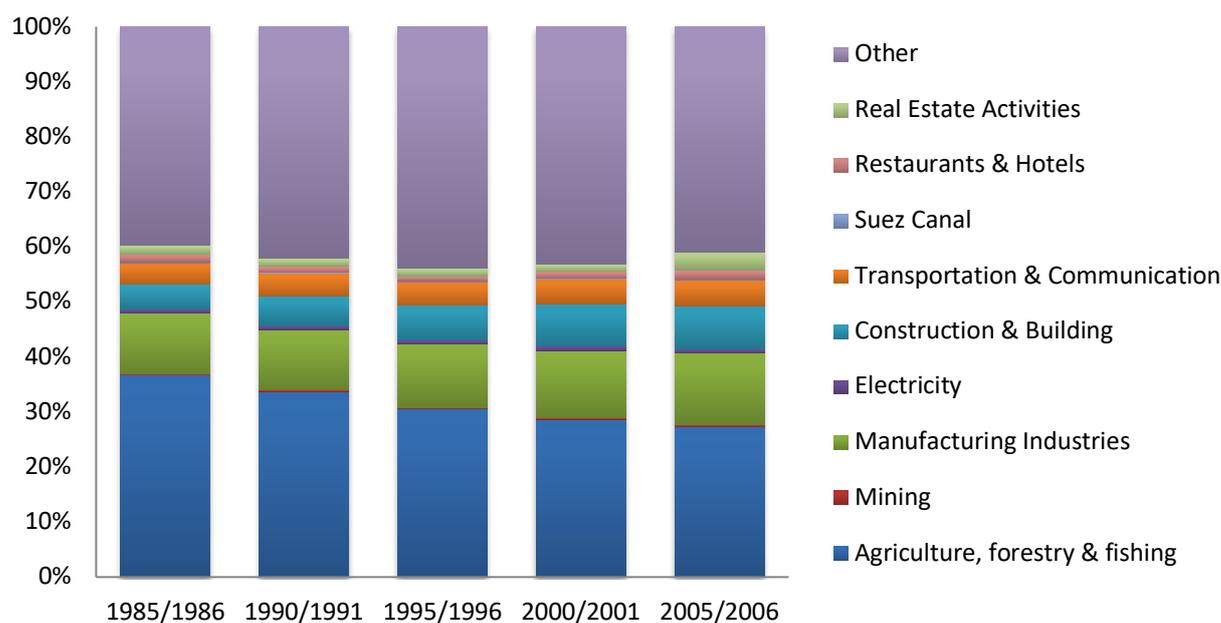


Source: Authors' calculations based on data from Ministry of Planning and Ministry of Economic Development.

b.  Jordan

With a surface area of 89,318 square kilometres, Jordan is a small country within the Middle East. Jordan is poor in natural resources, almost 79% of its area is semi-desert, and it is the third water-poorest country in the world (UN, 2014). According to the 2016 census, the population is 9.5 million and consists of 6.6 million Jordanians and 2.9 million non-Jordanian residents. In 2017, GDP was JD 28.5bn, i.e. roughly US$ 40bn. Jordan is classified as an upper middle-income country and, in 2017, per capita GDP was JD 2,830, i.e. US$ 3,990.

The oil boom of the 1970s led to an increase both in the international aid accruing to Jordan from the oil exporting Arab countries and in the remittances from Jordanians working in the Arab Gulf. Between 1975 and 1981, Jordan perceived aid and remittances accounted for an average of 47.6% of GDP. As Figure 7 shows, the massive inflow of external rents induced average real economic growth between 1977 and 1982 of almost 8.5%. This economic boom enabled the state to tighten its control on the economy, to expand its apparatus, and to pursue a generous employment policy (Alshyab, 2012).

**Figure 7: GDP growth in Jordan at constant market prices (%)**
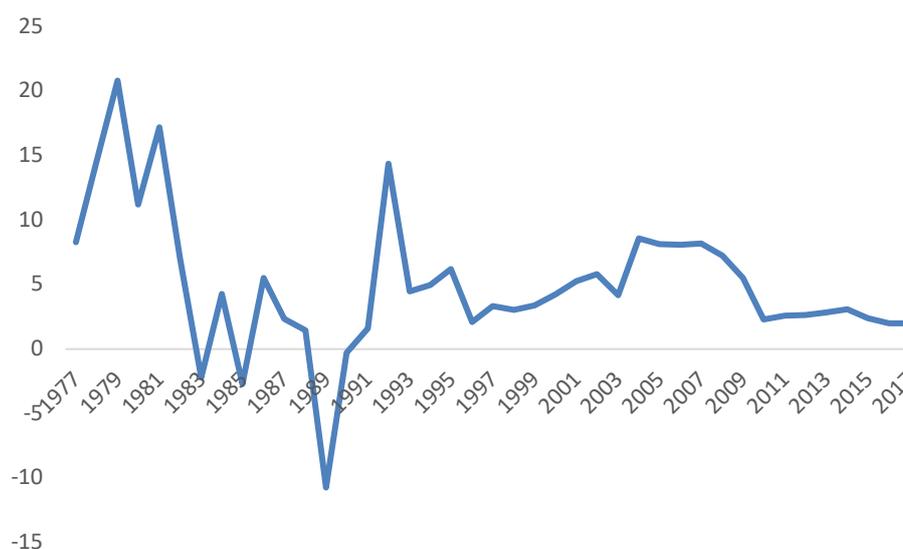


**Source**: Central Bank of Jordan.

Economic growth started to slow down at the beginning of the 1980s as a result of the sharp decline in oil prices which, in turn, resulted in a decline in the remittances of Jordanian workers, as well as in the reduction of financial assistance from Arab countries. In 1989, these developments culminated in a deep financial crisis, which saw a drastic devaluation of the Jordanian Dinar, a large deficit in the balance of payments, and the exhaustion of external reserves. In addition, public debt jumped to 225.1% of GDP and in 1988 debt services reached a debt service ratio of 37.9 % (Central Bank of Jordan, 1991).

The rise in unemployment over this period can be attributed to several factors. The decline in economic activity, as a result of the economic crisis, curtailed the economy's ability to create new job opportunities. The problem was further aggravated as about 300,000 Jordanian workers returned from the Gulf States after the outbreak of the Gulf War in 1990, in addition to the large inflows of foreign workers, which together substantially increased the number of entrants to the labour market and, consequently, the unemployment rate (Amerah and Khasawneh, 1993, and Alshyab, 2012).

To overcome the crisis, in 1990 Jordan started to implement a comprehensive economic reform programme under the umbrella of the IMF. The programme was inspired by the principles of the Washington Consensus and targeted macroeconomic stabilisation, fiscal discipline, privatisation, trade liberalisation and integration into the global economy. As a result, economic growth between 1993 and 2009 was on average 5.5% (authors'

calculations based on data by the Central Bank of Jordan). Despite the big efforts and progress, Jordan made in implementing reforms, unemployment, public debt and a chronic budget deficit remain among the most serious challenges for the country.

Since the financial crisis of 1989, unemployment has not decreased below 10% (see Figure 8). In 2017, it increased from 15.3% in 2016 to 18.3%. The age group that is most affected by unemployment is the young; namely, the unemployment rate amongst people aged 20-24 is almost 40%. The unemployment rate for young females is even higher. There is, thus, an urgent need to create new jobs in the country, particularly considering the massive inflow of refugees and a young and steadily growing population. The present analysis is, thus, extremely policy relevant, as it should enable a greater understanding of how to increase the job element of economic growth.

**Figure 8: Unemployment rate in Jordan (%)**
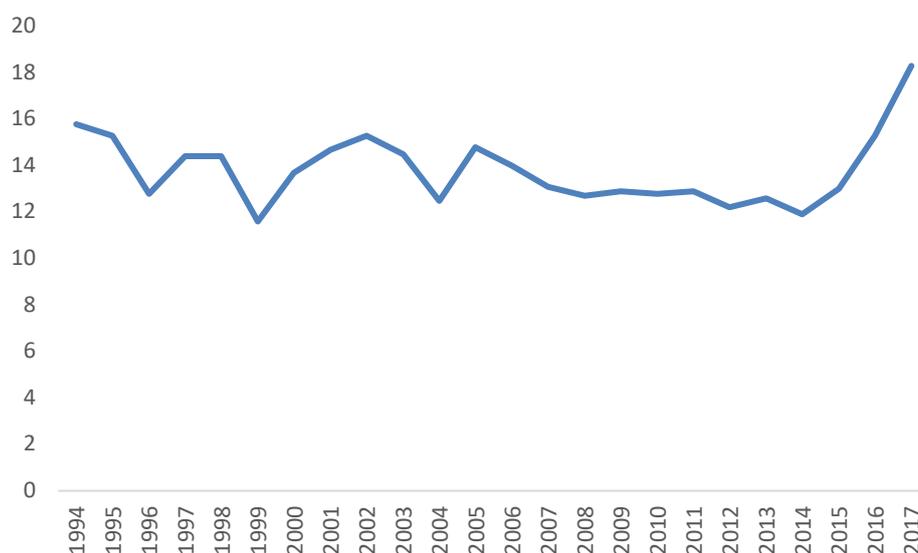


**Source**: ILO.

As in the figures above (Fig. 1 and 2), despite the steady increase in growth rates as a result of economic reforms, the unemployment rate has not decreased markedly and has remained persistently high. This signals that economic growth alone is not sufficient in resolving the unemployment problem.

In particular, several factors need to be taken into consideration in regard to unemployment in Jordan: the disdain towards manual jobs persists and can partly explain the large number of foreign workers, who are mostly employed in construction, agriculture, and domestic services. Currently, it can

be estimated that there are more than 320,000 migrant workers in Jordan holding a regular working permit. However, unofficial estimates report a total number of 750,000 foreign workers. On the one hand, economic growth in Jordan has failed to create enough jobs and, on the other hand, skills mismatch is hampering economic growth. In general, "there is a gap between the skills offered by job seekers and the skills required by the labour market. In particular, the Jordanian labour market seems to be both characterised by a sort of over-education and by under-skilling. Over-education is revealed by the high unemployment rate among graduates, while under-skilling is revealed by the high unemployment rate among individuals with less than secondary education (notwithstanding a large number of foreign workers, that are mostly active in manual and non-qualified jobs)" (Alshyab et al., 2018).

Another factor that has contributed to high unemployment rates is the structure and composition of economic growth. Economic liberalisation and the export-promotion strategy that was implemented in Jordan has focused on improving the competitiveness of Jordanian exports. This has resulted in lower wages and poor working conditions, making the newly-created job opportunities less attractive to Jordanian workers. These low-paid jobs are often filled by migrants, making them an attractive option for most employers, whilst leaving many Jordanians unemployed. In addition, the high educational attainment of most Jordanians has raised their expectations about appropriate job opportunities, making them even less employable (Taghdisi-Rad 2012).

Figures 9 and 10 present the evolution of GDP distribution by economic activity vis a vis the respective employment contribution in Jordan. It emerges that, as a result of privatisation and public administration reform, public administration (including defence, public education, and public health) has reduced its contribution to GDP, as well as its share of employment. Still, the public sector in Jordan remains one of the most employment-intensive sectors. Over 38% of Jordanian employees work in the public sector. Wholesale and retail trade can be further characterised as a labour intensive sector, as although its GDP contribution has not considerably increased, its employment share is increasing over time surpassing its GDP contribution. Thus, employment in these two sectors reveals that services are a very important part of employment in Jordan.

Manufacturing has increased its value added position, but its employment share has not risen, due to automation and technological progress. The growth in the manufacturing sector, where FDI, among other factors, is mostly directed, has not resulted in job creation. Financial services and intermediation have increased their contribution to GDP to circa 11%, vis a vis an employment share of less than 2%. This sector has experienced sharp

growth, but can be definitely characterised as capital intensive. As a general note, the agricultural sector is not included in the employment statistics by the Jordan Department of Statistics. However, both GDP contribution and employment creation by the agricultural sector in Jordan are negligible; according to the Central Bank of Jordan, the GDP contribution of agriculture was in 2017, less than 4%, and employment was 1.9%. It should be further considered that the agricultural sector mostly employs foreign workers.

**Figure 9: GDP distribution by economic activity in Jordan**
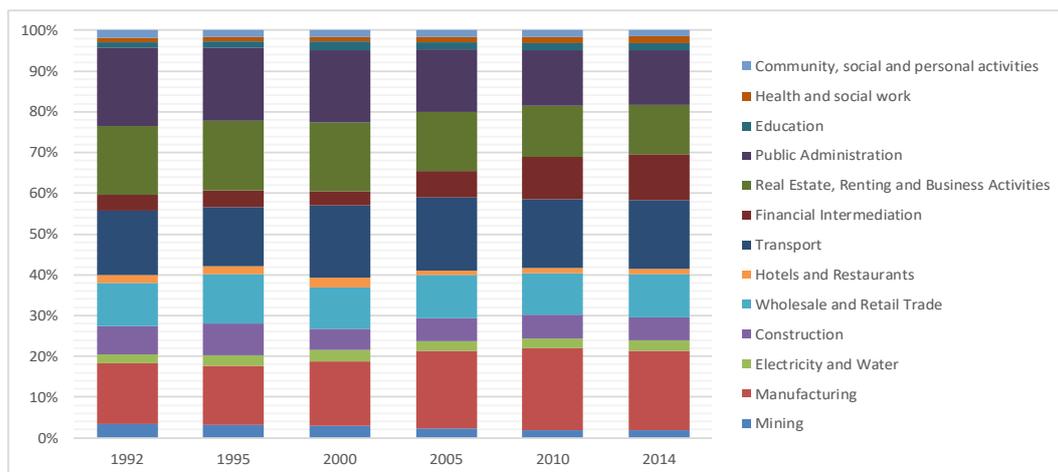


Authors' calculation based on Jordan Department of Statistics, DoS.

**Figure 10: Employment distribution by economic activity in Jordan**
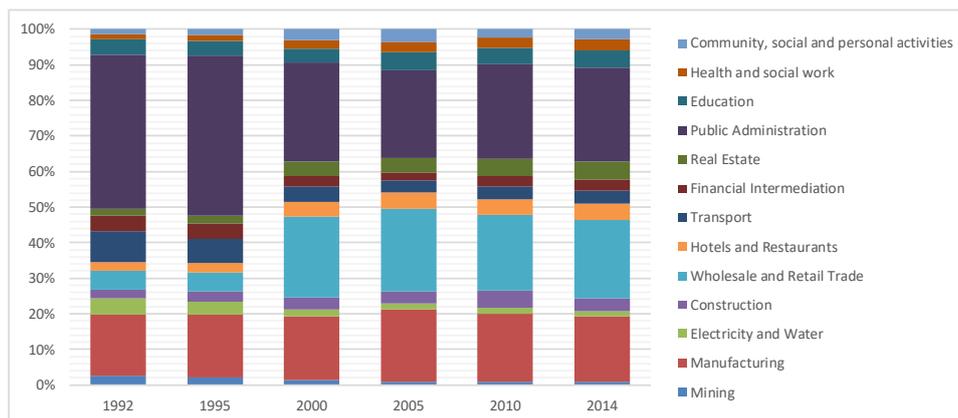


Authors' calculation based on Jordan Department of Statistics, DoS.

c. Tunisia

Before the Jasmin revolution of January 2011, Tunisia achieved impressive economic growth for nearly five decades, based on a sustainable export-led growth model. The average real growth was around 5% over the period 1961-2010, quadrupling the real income GDP per-capita (see Figure 11). This economic performance has helped drive improvements in certain dimensions of economic development, namely poverty alleviation, health, nutrition and education. However, this economic model was not inclusive and failed to reduce high rates of unemployment, especially amongst university graduates.

**Figure 11: Economic Growth 1965-2010**
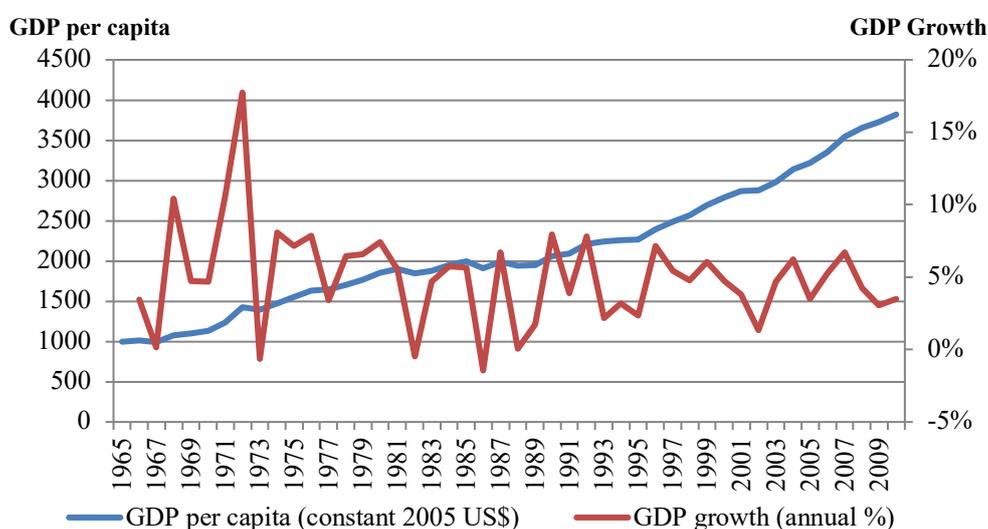


**Source**: WDI, World Bank.

The GDP structure shows an important transformation over three decades. The contribution of industry to GDP remains consistent over three decades, with a share of around 30%. However, the share attributed to manufacturing industry increased from 13.6% to 18%, while non-manufacturing industry declined during this period from 22.3% to 13.6%. Figure 12 emphasises that the Tunisian economy shifted to a service-based economy over the period 1980-2010, with a share of GDP expanding from 47.7% to 60.2%. By 2010, agriculture only contributed 8% of GDP, half the rate of 1980.

**Figure 12: Contribution to GDP by sector 1978-2014**

Except South Africa, which showed a substantial decrease in the share of industry in GDP (from 48% to 30% over the period 1980-2010), all other countries (Tunisia, Mexico, Korea and Turkey) preserved the industrial share above a 25% cut-off, with the exception of Korea and Mexico which sustained higher levels (see Figure 13).

**Figure 13: Contribution of industrial sector to GDP 1978-2014**

The change in GDP structure induced a reallocation of labour from agriculture to services. The employment share in agriculture declined from 33% in 1980 to 18% in 2010. Two main reasons explain this issue:   first,

conventional agriculture is based on intensive crops, such as wheat production, that is not labour intensive. Second, the development of the tourism industry in the littoral area which, depending on weather conditions, induced a rural migration because of the irregularity of agricultural revenues. Despite the low employment intensity of the agriculture sector, agriculture and food production must be on the agenda of policy decision- makers as a strategy for achieving food security. On the other hand, employment in the industrial sector has grown significantly in absolute terms, but its share of total employment remained constant during the period 1980-2010. Finally, employment in services grew rapidly, both in absolute and relative terms; the share of workers in the services sector increased from 29% to 49%, becoming the main employer of the Tunisian economy (Figure 14).

**Figure 14. Sectoral Employment (% of total employment)**
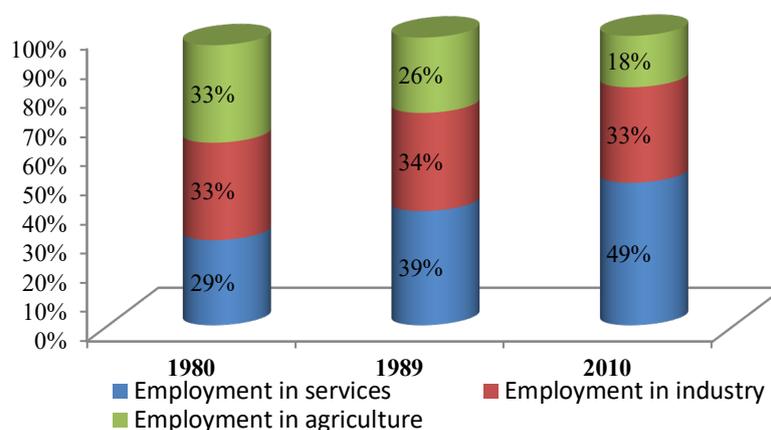


**Source**: INS.

Table 1 confirms that service activities are the most labour intensive sectors, where non-market services (Education and Health) account for around 20%, construction and building 13.3% and trade 12%.

## Table 1: Sectoral employment (% of total employment)

|  | 1983 | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| *Non-Market Services* | 17,2% | 18,8% | 19,7% | 19,2% |
| *Agriculture & Fishing* | 27,7% | 24,5% | 19,6% | 17,3% |
| *Construction and Buildings* | 13,7% | 11,8% | 12,5% | 13,3% |
| *Trade* | 7,0% | 8,4% | 9,9% | 11,9% |
| *Miscellaneous Services* | 5,2% | 6,8% | 7,6% | 9,2% |
| *Textiles, Clothing & Leather* | 11,3% | 9,9% | 10,1% | 7,5% |
| *Transport and Telecommunications* | 5,1% | 5,1% | 5,6% | 5,9% |
| *Hotels, Bars, Restaurants* | 2,1% | 2,7% | 3,4% | 4,0% |
| *Mechanical & Electrical Industries* | 1,7% | 2,2% | 2,5% | 3,5% |
| *Miscellaneous Manufacturing Industries* | 2,5% | 2,9% | 3,1% | 2,8% |
| *Agricultural & Food Industries* | 1,5% | 2,2% | 2,2% | 2,1% |
| *Building Materials Ceramics & Glass* | 1,6% | 1,7% | 1,5% | 1,2% |
| *Refining & Chemicals* | 0,7% | 0,7% | 0,8% | 0,9% |
| *Electricity* | 0,5% | 0,4% | 0,4% | 0,4% |
| *Hydrocarbons* | 0,3% | 0,3% | 0,2% | 0,3% |
| *Mining* | 1,5% | 1,1% | 0,6% | 0,3% |
| *Water* | 0,4% | 0,5% | 0,3% | 0,2% |

**Source**: INS.

After the revolution, the share of employment in the agriculture and fishing sector declined from 18% to 15% in favour of manufacturing industries and services (Figure 15).

**Figure 15. Sectoral Employment (% of Total Employment)**
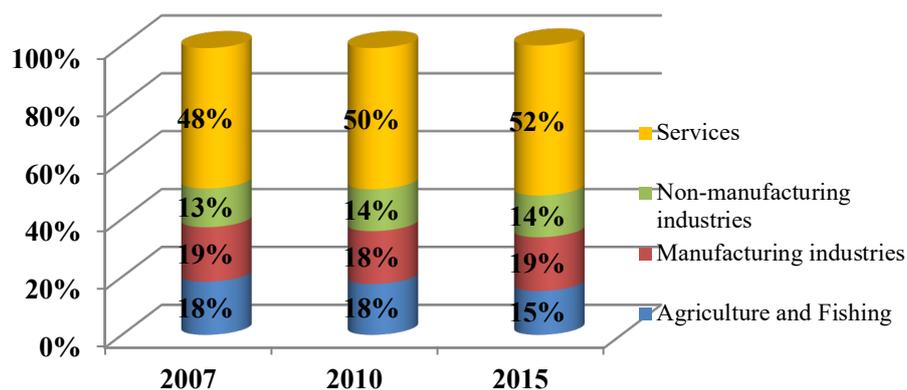


**Source**: INS.

Economy-wide labour productivity grew 1.6% per year from 1983-2010, though at an accelerating rate. Average labour productivity in each sector has grown since the early 1980s, but not always uniformly (Table 2). By 2010, labour productivity in agriculture was 5 times greater than in 1983. Value-added per worker producing electrical and mechanical products is nearly double that of Trade, while value-added per worker in textiles and apparel is only half that of the manufacturing average – indeed, it is barely higher than that of agriculture. Even larger contrasts exist in non-manufacturing industry, where labour productivity in hydrocarbons, a small employer, is more than 60 times that of construction and buildings, a large employer where productivity is, again, only slightly above that in agriculture. Similarly, though less dramatic contrasts appear in services, where the fast-growing transport and telecommunications subsector exhibits nearly triple the average productivity of that in trade. Calculations show that 39 percent of the overall growth of labor productivity in Tunisia between 2000 and 2010 reflected rising productivity in services. Another 18 percent came from rising productivity in manufacturing, especially in electrical and mechanical industries and chemicals. For many services and manufacturing industries, we observe a decline in labour productivity reaching historic low levels (Trade, Miscellaneous services, Transport, Tourism, Textile, Clothing and Leather, Mechanical and Electrical Industries, etc. This fact, and a drop in the level of investment, is the cause of lower growth, 2% below than what was recorded in the pre-revolution years. The downturn, in conjunction with forces that weakened technological innovation and diffusion, has amplified the phenomenon of lower productivity (Figure 16).

## Table 2: Labour Productivity by Sector

|  | 1983 | 1990 | 2000 | 2010 |
|---|---|---|---|---|
| *Non-Market Services* | 3.3 | 4.5 | 8.8 | 14.8 |
| *Agriculture & Fishing* | 1.6 | 3.4 | 5.8 | 7.7 |
| *Miscellaneous Services* | 8.7 | 10.4 | 15.7 | 24.3 |
| *Construction And Buildings* | 1.4 | 1.7 | 4.0 | 5.9 |
| *Trade* | 3.4 | 4.4 | 8.4 | 12.1 |
| *Water* | 4.4 | 5.8 | 17.3 | 23.7 |
| *Electricity* | 13.1 | 22.3 | 30.5 | 46.1 |
| *Hotels, Bars, Restaurants* | 7.0 | 9.4 | 19.3 | 23.0 |
| *Hydrocarbons* | 120.4 | 84.6 | 85.2 | 224.9 |
| *Agricultural & Food Industries* | 5.4 | 6.7 | 14.6 | 23.9 |
| *Chemicals* | 10.6 | 22.7 | 24.7 | 49.8 |
| *Miscellaneous Manufacturing Industries* | 2.9 | 4.7 | 7.6 | 11.2 |
| *Mechanical & Electrical Industries* | 5.8 | 7.6 | 13.0 | 26.5 |
| *Building Materials Ceramics & Glass* | 4.3 | 5.7 | 12.4 | 22.0 |
| *Mining* | 2.9 | 5.2 | 16.7 | 45.3 |
| *Textiles, Clothing & Leather* | 0.8 | 2.3 | 5.5 | 8.3 |
| *Transport & Telecommunications* | 6.0 | 10.0 | 20.8 | 39.8 |

**Source**: INS.

**Figure 16: Labour productivity in 2015 (Index base 100 = 2010)**

| Sector | Value |
|---|---|
| Telecommunications | 156.7 |
| Agriculture & Fishing | 142.1 |
| Public administration | 112.2 |
| Construction and Buildings | 104.5 |
| Banking & Insurance | 103.8 |
| Electricity | 103.7 |
| Agricultural & Food Industries | 100.7 |
| Trade | 98.8 |
| Miscellaneous Services | 97.6 |
| Building Materials Ceramics & Glass | 97.3 |
| Miscellaneous Manufacturing Industries | 96.5 |
| Textiles, Clothing & Leather | 91.3 |
| Mechanical & Electrical Industries | 88.9 |
| Water | 85.2 |
| Transport | 80.5 |
| Hotels, Bars, Restaurants | 76.6 |
| Refining & Chemicals | 63.4 |
| hydrocarbons | 57.6 |
| Mining | 30.2 |

**Source**: INS.

As reported by the Intellectual Property Organisation, published by Cornell University and INSEAD, Tunisia is not investing enough in innovation, compared to other developing countries. According to the Global Innovation Index, 2017, Tunisia scored 32.30 % and ranked 74 out of 127 countries, after Morocco and GCC countries, except Oman (Figure 17).

**Figure 17: Ranking of Arab Countries according to the Global innovation Index, 2017.**

| Country | Rank |
|---|---|
| UAE | 35 |
| Qatar | 49 |
| Saoudia Arabia | 55 |
| Koweit | 56 |
| Bahrein | 66 |
| Morocco | 72 |
| Tunisia | 74 |
| Oman | 77 |
| Jordan | 83 |
| Egypt | 105 |
| Algeria | 108 |
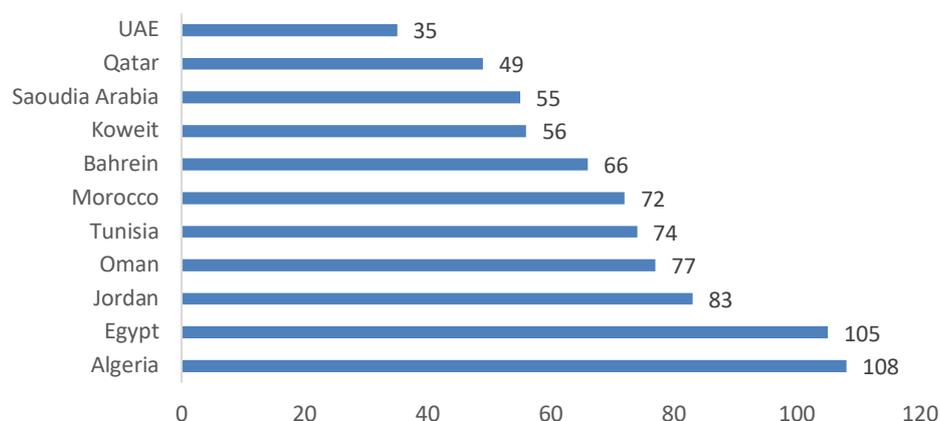
**Source**: Global Competitiveness Index.

## 3. Labour Reforms in the Region

### a. Egypt

In an attempt to promote job creation, the Egyptian government has pursued active labour market policies over the years, by setting up several training and employment programmes. Yet, their effect was rather limited, as it will be explained below.

The Mubarak-Kohl training initiative was launched in the early nineties to reform the secondary technical education system and match the needs of the labour market. The Ministry of Industry also organises vocational training programmes through its productivity and vocational training department (PVTD).

As for the employment programmes, the social fund for development (SFD) was created in 1991 as a joint initiative between the Egyptian government, the World Bank and the UNDP, to alleviate the negative pressures of the structural reform programme on the most vulnerable groups of the population and to promote job creation. The fund runs several programmes; among which is the public work programme (PWP) which provides funds to small labour-intensive infrastructure projects in rural and deprived urban areas, with the ultimate aim of improving the business environment and attracting private investment to the local communities. The programme managed to create more than 6,000 permanent jobs and about 111,000 temporary positions over the 1994-2000 period. In 2017, it became the SMEs Promotion Agency, in order to boost entrepreneurship and to help micro and SME expansion.

The sunrise (Shorouk) programme is another employment programme launched by the government to promote job creation in rural areas. Over the same period, the programme has created 59,000 and 123,000 permanent and temporary jobs, respectively (De Gobbi and Nesporova 2005).

Labour laws and regulations are also an important factor affecting the performance of the labour market. These laws can either worsen or lessen the rigidity of the labour market (El-Ehwany and Metwally 2001). In an attempt to promote employment and job creation in the private sector, the Egyptian government introduced a new unified labour law "Law No. 12 for the year 2003" to address the issues that were viewed by both employers and employees as major shortcomings of the previous law "No. 137 for the year 1981". Immense criticism has been directed towards the former labour law, especially with regard to three central issues, namely: prohibiting employers from terminating workers' contracts after the end of the probation period, overlooking workers' rights to strike against deteriorating working conditions,

and restricting trade unions' ability to efficiently negotiate in favour of workers' rights (El-Ehwany and Metwally 2001; Guirguis 2011).

Though the 2003 law has addressed all the aforementioned criticism - in terms of granting private sector employers a higher degree of flexibility in the hiring and firing procedures[3] while, at the same time, improving workers' rights including their right to organise peaceful strikes and permitting collective bargaining between labour unions and private sector employers - it is still facing criticism by both parties within the employment relationship. On one hand, workers and the labour unions see that the law needs to be reformed again to emphasise workers' rights in a more decisive manner. On the other hand, investors and employers perceive the law as being biased toward workers, with several ambiguities in its articles that can ultimately hinder employment (Guirguis 2011; Lacey and Abdel Aziz 2015; U.S. Department of State 2014).

These ambiguities are particularly evident in the articles regulating the termination of employees, the dispute settlement mechanism, and the financial entitlements of workers (Lacey and Abdel Aziz 2015). Some ambiguities are still present in the new law with regard to workers compensation due to early termination. In the case of early termination of indefinite contracts, the law states that workers are entitled to a termination compensation of a minimum two months of their last gross salary for each year of service that is to be decided by a competent judge, based on the evidence submitted by each party. The law, however, has not specified any compensation criteria for the early termination of definite term contracts and has left it entirely to the judge's discretion (Lacey and Abdel Aziz 2015).

The second source of criticism towards the new law is its dispute settlement mechanism. A complex and prolonged settlement mechanism is outlined in the law. First, a three-member committee has to be formed within 10 days from submitting the settlement application; comprising of representatives of the Ministry of Manpower or labour office, the labour union, and the employer's organisation. If the committee is not able to reach any accepted settlement within 21 days from the submission date, then the dispute shall be transferred to the labour court, based on the request from either the employer or the employee, with no specified time limit for resolution (Lacey and Abdel Aziz 2015).

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[3] The 2003 Law has entitled private sector employers the right to terminate workers with definite term contracts once the contract expires without any warning or prior notice. As for indefinite employment contracts, employers cannot dismiss workers, except for a cause with a 60 days dismissal notice. The Law has listed an exhaustive list of justified termination causes including poor performance (Guirguis 2011; ILO 2006; Lacey and Abdel Aziz 2015). Furthermore, the law allows employers to renew the contracts of temporary employees without any obligation to convert them into permanent staff, as was postulated by the former law (Guirguis 2011; Sharkawy and Sarhan 2017).

The last source of criticism is from private sector employers with regard to the financial rights entitled to employees under the new law. The law broadly defines "gross salary" as "everything the employee receives from the employer in consideration of his work, whether it is basic or variable, cash or in kind" without any exhaustive list of the items that can be considered part of the employee's salary. This means that any additional benefit offered by the employer in a general, continuous and consistent manner, even if not stipulated by law or stated in the contact, will become an acquired right for the employee and an obligation that the employer has to fulfill. The lack of any article, determining the time length after which any additional benefit can be considered an acquired right, opens the door for disputes between the two parties in the employment contract (Lacey and Abdel Aziz 2015; Sharkawy and Sarhan 2017).

### b. Jordan

The main goal of the National Agenda for 2006 to 2015 was to improve the quality of life of the Jordanian citizen through "improving standards of living, providing social welfare and social security, and providing new job opportunities." (National Agenda 2005-2015). The agenda prescribed the creation of the Employment, Technical and Vocational Education and Training (E-TVET) Council, which was seen as an umbrella under which all the bodies involved in training, vocational, and technical education should act. Important further steps were the establishment of the Centre for Accreditation and Quality Assurance (CAQA) and the launch of the Employment-Technical and Vocational Education and Training E-TVET Strategy 2008-2013, followed by a new strategy for the time frame of 2014-2020.

The focus on employment is confirmed by the formulation of the specific National Employment Strategy (NES) 2011-2020, which derives its vision from the National Agenda. The NES vision consists of "improving standards of living for Jordanians, through increased employment, wages and benefits, and productivity improvements" (NES, 2011). The key public institutions related to the labour market are the Ministry of Labour, the E-TVET Council and Fund, the Vocational Training Corporation, the Civil Service Bureau, and the Social Security Corporation.

Labour market reforms, together with its strategic orientation, have been partly designed in close cooperation with international institutions and agencies, such as the World Bank, the European Union, the US Agency for International Development (USAID), and the International Labour Organization (ILO).

The Jordan National E-TVET Strategy (2014), however, points out that there are "too many academically qualified Jordanians while the market asks for lower skilled labour and technicians." This mismatch is aggravated by the fact that the profile of university graduates is not providing the practical skills required by the labour market: "their education does not match with the demands of the industry even in the corresponding professions as the skills learned are too academic and not sufficiently practical" (Jordan National E-TVET Strategy, 2014).

Vocational education and training has failed to become a coordinated and effective field under a single umbrella. Furthermore, an underlying problem with vocational training in Jordan is that it is still associated with "the stigma of academic failure" (NES, 2011) and, thus, relates to the unproductive bias, culture of shame, and widespread aversion to manual jobs (Alshyab, 2012). In addition, or, better, as a corollary, vocational training has so far failed to systematically reach females and it has been predominantly attended by foreign workers. In addition, training is mostly administered in a pretty academic way, thus putting much emphasis on exams and on school-like skills, rather than on practical skills and competencies. In general, VET is organised, promoted, and administered by public bodies, with only a marginal role played by private entities (NES, 2011).

c.  Tunisia

Tunisian policymakers have always chosen to develop active employment policies rather than passive strategies. Tunisia spent on average 1.5percent of its GDP over the period 2000-2010 on active labour market programmes that can be classified into three categories.

The first category includes programmes directed toward the promotion of micro-enterprises and SMEs. These programmes aim at increasing the labour demand. Thanks to the intermediation of Tunisian Solidarity Bank (BTS), the Tunisian government provides loans for the promotion of self-employment and the establishment of micro-enterprises. Credits vary from 10.000 TD for graduates with professional training to 50.000 TD for higher education graduates. Furthermore, the Tunisian government established some funds for specific sectors, namely: FONAPRAM for artisans and small professions; FOSDA for farmers and fishermen; and FOPRODI for industrial SMEs. The main objectives of these programmes are to indirectly tackle the unemployment problem and to encourage regional decentralisation. The number of projects financed annually ranged between 5,000 and 11500 for the period 2000-2011.

The second category includes training and employment integration programmes, among which is the initiation training to professional life

programme, which targets graduates with upper secondary and tertiary levels seeking jobs for the first time. This programme facilitates internships lasting between 6 months and two years, which can take place in public administrations or private companies. Companies benefit from lower labour costs and trainees receive a complementary pay. The number of beneficiaries grew from 7,464 in 2001 to 45,245 in 2010.

The contract of adaptation and professional integration programme - established in 1990 - also aims at assisting the integration of non-graduate jobseekers, by providing monthly allowance for trainers and companies over the course of a year. The host company, professional centres and associations or chambers of commerce and industry, can provide training. This training allows beneficiaries to acquire required skills and professional qualifications and to be recruited by the host company after completion of the training. The number of beneficiaries expanded from 7,299 in 2001 to 34,954 in 2010.

The last programme within this category is the employment solidarity contract, which promotes the integration of all kinds of jobseekers, mainly those experiencing difficulties in accessing the workplace, such as low-skilled young people, the long-term unemployed and disabled people. The specificity of this contract is that it can last up to three years, during which beneficiaries receive a monthly allowance and costs to cover all expenses related to the training, such us transport.

The last category of active labour market programmes includes the professional Training and Lifelong Learning programme, which aims at reducing the mismatch between demand and supply in the labour market, by upgrading market-oriented professional training and lifelong learning. After the free trade agreement, the Tunisian government has adopted an upgrading strategy to facilitate the integration of enterprises with less than 100 workers into the world economy. Companies have benefitted from these programmes by reimbursing staff training fees,  or by making use of the services of the National Centre for Continuing Training and Professional Promotion.

Despite these developments, there are still some challenges that limit the economy's ability reap the full benefits of these employment policies, amongst which are: the unequal distribution of grants within the target population in terms of age, region and educational level; the inadequate access of small and medium-sized enterprises to these programmes; the lack of passive policies, such as a national unemployment benefit scheme, that are needed following the displacement in the labour market, induced by technological innovation and the free trade agreement; and finally, the fact that active labour market schemes in Tunisia do not deal with some structural problems associated with the labour market, such as mobility constraints.

## 4. Model and Data

To provide a measure of the employment intensity of growth for the different sectors in Tunisia, Egypt, Morocco and Jordan, we use the methodology adopted by Goaied and Sassi (2015). We estimate the employment intensity of sectoral output growth using a linear demand model, where the number of employees in each sector is regressed on its value added, according to the following equation:

$$(1) \qquad EMP_{it} = \alpha_i + \beta_i VA_{it} + \varepsilon_{it} \qquad i=1....N \ \text{ and } T= 1....T$$

To prevent any problems of non-stationarity in the variables included in the equation (1), we use a first-difference Model, defined as follows:

$$(2) \qquad \Delta EMP_{it} = \beta_i \Delta VA_{it} + \Delta \varepsilon_{it} \qquad i=1....N \ \text{ and } T= 1....T$$

Since the variables are expressed in logarithmic form, the coefficient $\beta_i$ measures the employment intensity of output growth for sector i. $\varepsilon_{it}$ are residuals supposed to be independent and identically distributed as normal, with mean 0 and variance $\sigma^2_i$. To allow for the heterogeneity of the sectors, we use a random coefficient Model, where the coefficient $\beta_i$ is treated as random with mean $\overline{\beta}$. Swamy (1970) supposes that:

$$(3) \qquad \begin{aligned} &\beta_i = \overline{\beta} + \delta_i \\ &E(\delta_i) = 0 \\ &E(\delta_i \delta_i{}') = \begin{cases} \Omega \ if & i = j \\ 0 \ if & i \neq j \end{cases} \\ &E(VA_{it}\delta_i) = 0 \end{aligned}$$

Since we are interested in the individual coefficient $\beta_i$ because it provides information on the behavior of each sector, Hsiao (2014) proposed to predict $\beta_i$ by the Best Linear predictor, suggested by Lee and Griffiths (1979), defined as follows:

$$(4) \qquad \hat{\beta}_i^* = \hat{\overline{\beta}}_{GLS} + (\Omega X_i{}'(X_i\Omega X_i{}' + \sigma_i^2 I_T)(Y_i - X_i\hat{\overline{\beta}}_{GLS})$$

We note that $Y_i = \left[ \Delta EMP_{it} \right]$ and $X_i = \left[ \Delta VA_{it} \right]$

Data on employment and added value is annual and expressed at constant prices.

## 5.  Empirical Findings

The interest of this empirical analysis is to highlight the structural evolution of the contribution of different sectors of activity to the creation of employment, by understanding the links with the productivity of work. We will chiefly analyse the RCM column, as it is the most econometrically robust.

In general, it is worth noting that the manufacturing sector is one of the most important sectors to create jobs in the MENA region, especially for Egypt (see Table 4) and Tunisia (see Table 6). Indeed, the manufacturing sector boosts productivity growth faster than services and generates well-paid jobs with various skills and professions. Second, the manufacturing sector also uses many service inputs. Third, manufacturing also drives technological change and, consequently, can increase the demand for skilled labour. As per services, tourism is also ranked among the first sectors that create jobs, as most of these economies rely on tourism as a source of foreign currency. In general, the elasticity of employment intensity and added value ranges from 0.67 to 0.4 for service activities, namely: financial, insurance and real estate activities (0.67) and employment activities, hotels and restaurants, as well as buildings and public works (0.45-0.43). For all countries, the mining sector is insignificant. Indeed, this shows to what extent this sector is capital intensive, does not have a significant value-added and, thus, does not create jobs.

## Table 3: Summary of Findings

|  | Tunisia | Egypt | Jordan |
|---|---|---|---|
| 1 | Other Services | Manufacturing | Administration |
| 2 | Manufacturing | Construction & Building | Hotels and Rest. |
| 3 | Mechanical and Electrical Industries | Electricity | Real Estate |
| 4 | Tourism | Transportation, Storage, Communication and Information | Construction |
| 5 | Administration | Other | Community, Social and Personal activities |
| 6 | Transports | Real Estate Activities | Education |
| *Not sig.* | Mining | Mining | Mining |

**Source**: Authors' own elaboration.

For the Egyptian case, Table 4 shows that manufacturing industries are the most likely sector to create jobs, followed by construction and building. Surprisingly, the tourism sector is not significant in Egypt, as it is still facing several impediments that hinder its competitiveness.

## Table 4: The employment intensity of sectoral output growth in Egypt

| Sectors | | OLS (1) | | RCM (2) | | Rank (3) |
|---|---|---|---|---|---|---|
| 1. | Agriculture, forestry & fishing | 0.432 | (0.033) | 0.066 ** | (0.033) | 7 |
| 2. | Mining | 0.566*** | (0.089) | 0.075 | (0.052) | - |
| 3. | Manufacturing Industries | 0.771*** | (0.037) | 0.317*** | (0.059) | 1 |
| 4. | Electricity | 0.511*** | (0.033) | 0.217*** | (0.043) | 3 |
| 5. | Construction & Building | 1.819*** | (0.184) | 0.242*** | (0.075) | 2 |
| 6. | Transportation, Storage, Com. and Inf. | 0.896*** | (0.064) | 0.216*** | (0.062) | 4 |
| 7. | Suez Canal | -0.040** | (0.023) | -0.002 | (0.031) | - |
| 8. | Restaurants & Hotels | 0.374*** | (0.061) | 0.082 | (0.064) | - |

| | | | | | |
|---|---|---|---|---|---|
| *9.* | Real Estate Activities | 1.095*** | (0.124) | 0.160*** | (0.067) | 6 |
| *10.* | Other | 0.884*** | (0.075) | 0.185*** | (0.064) | 5 |

**Notes**: (i) OLS: ordinary least squares; RCM: random coefficient models.
(ii) Standard errors are in parenthesis.
(iii) ***, **and * indicate significance levels at 1%, 5% and 10%, respectively.

A more detailed look at each country shows that services play a more important role in Jordan compared to Egypt and Tunisia (see Table 5). Indeed, Jordan is much more competitive than other MENA countries in the services sectors, as shown in Figure 18. Moreover, Jordan is the country that has the highest number of commitments at the WTO, which makes its services sector the most liberalised in the MENA region and, hence, the most competitive (Figure 19). Indeed, according to the GATS agreement, when making a commitment, a government therefore binds the specified level of market access and national treatment and undertakes not to impose any new measures that would restrict entry into the market or the operation of the service.

## Table 5: The employment intensity of sectoral output growth in Jordan

| *Sectors* | | OLS (1) | RCM (2) | Rank (3) |
|---|---|---|---|---|
| *1.* | Mining and Quarrying | 0.08 | 0.04 | - |
| *2.* | Manufacturing | 0.90*** | 0.42** | 7 |
| *3.* | Electricity and Water Supply | 0.137*** | 0.06 | - |
| *4.* | Construction | 1.63*** | 0.655*** | 4 |
| *5.* | Wholesale and Retail Trade, Repair of Motor V. | 2.32*** | 0.41* | 8 |
| *6.* | Hotels and Restaurants | 1.42*** | 0.78*** | 2 |
| *7.* | Transport, Storage and Communications | 0.304*** | 0.288 | - |
| *8.* | Financial Intermediation | 0.35** | 0.16 | - |
| *9.* | Real Estate, Renting and Business Activities | 2.95*** | 0.68** | 3 |
| *10.* | Public Adm., Defense, and Social Security[1] | 0.95*** | 0.91*** | 1 |
| *11.* | Education[2] | 1.08*** | 0.53*** | 6 |
| *12.* | Health and Social Work[2] | 1.12*** | 0.39 | - |
| *13.* | Community, Social and Personal activities | 1.95*** | 0.61** | 5 |

**Notes**: (i) OLS: ordinary least squares; RCM: random coefficient models.
(ii) Standard errors are in parenthesis.
(iii) ***, **and * indicate significance levels at 1%, 5% and 10%, respectively.
[1] including public education and health.
[2] private sector.

**Figure 18: Revealed Comparative Advantage index for selected MENA countries**
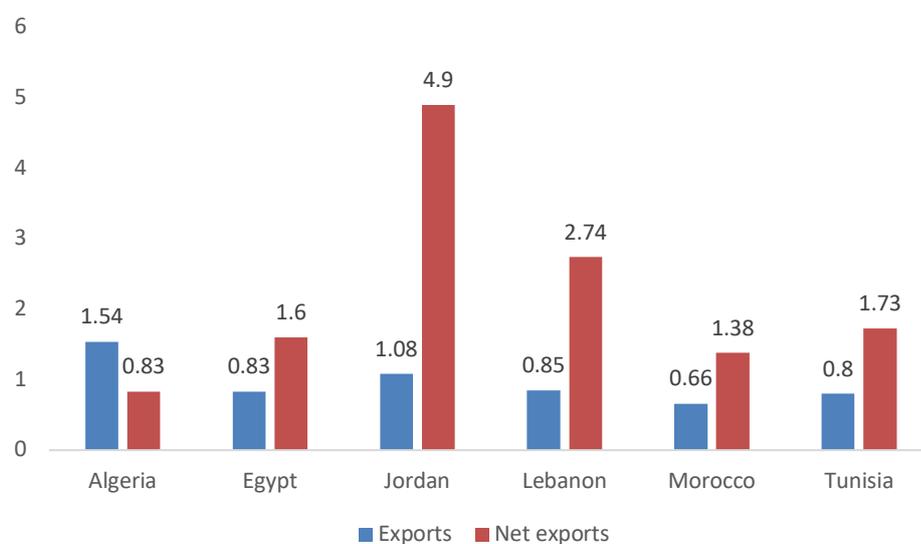


**Source**: Authors' own elaboration using the International Trade Centre dataset.
Notes: Exports shows the RCA calculated using exports data and net exports using the net exports data.

**Figure 19: Number of Commitments by Country**
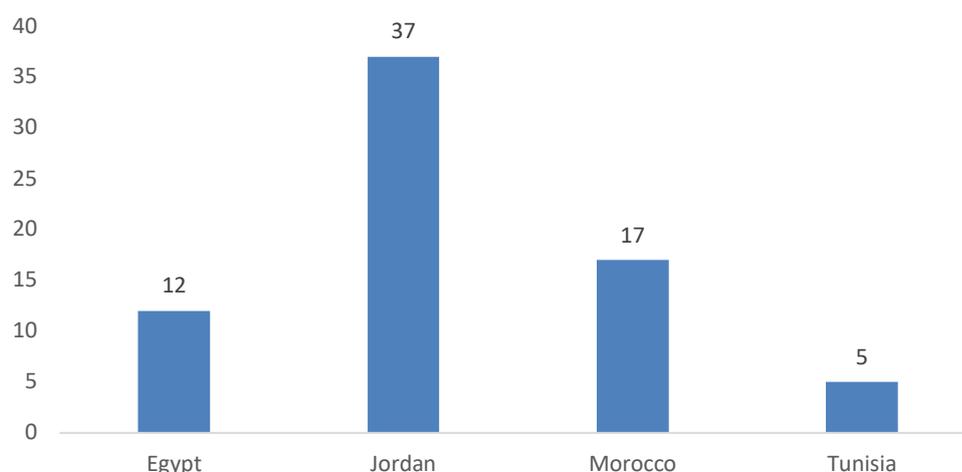


**Source**: Authors' own elaboration using the WTO online dataset.

As per Tunisia, while other services are ranked first, manufacturing industries follow (Table 6). Two particular industrial sectors are worth investigating: electrical and mechanical industries and textiles. While the former is ranked third, the latter is seventh. Indeed, with increasing competition coming from Eastern European and Asian countries, textiles and ready-made garments in Tunisia and in Egypt experienced a significant decline which generated less employment. According to the Foreign Investment Promotion Agency «FIPA-Tunisia», electrical and machine industries witnessed several reforms that improved its performance, such as

sound infrastructure meeting international standards, developing a competitiveness cluster (similar to the one in Sousse), a training centre for aerospace trades in El Mghira, constructing engineering schools specialising in mechatronics and electronics, with several training centres in 14 governorates.

## Table 6. The employment intensity of sectoral output growth in Tunisia

| Sectors | | OLS (1) | | RCM (2) | | Rank (3) |
|---|---|---|---|---|---|---|
| 1. | Agriculture and Fishing | 0.21*** | (0.04) | NS | NS | - |
| 2. | Agricultural and Food Industries | 0.73*** | (0.07) | 0.23*** | (0.1) | 14 |
| 3. | Building Mat., Ceramics and Glass | 0.23*** | (0.02) | 0.34*** | (0.11) | 9 |
| 4. | Mechanical and Electrical Industries | 0.71*** | (0.02) | 0.55*** | (0.08) | 3 |
| 5. | Refining and Chemicals | 0.26*** | (0.04) | NS | NS | - |
| 6. | Textiles, Clothing and Leather | 0.44*** | (0.01) | 0.35*** | (0.06) | 7 |
| 7. | Misc. Manufacturing Industries | 0.66*** | (0.01) | 0.57*** | (0.07) | 2 |
| 8. | Mining | -0.9*** | (0.17) | NS | NS | - |
| 9. | Hydrocarbons | N.S | N.S | N.S | N.S | - |
| 10. | Electricity | 0.35*** | (0.03) | 0.34*** | (0.12) | 9 |
| 11. | Water | -0.49*** | (0.09) | NS | NS | - |
| 12. | Buildings and Public Works | 0.53*** | (0.02) | 0.32*** | (0.11) | 11 |
| 13. | Trade | 1.12*** | (0.07) | 0.35*** | (0.11) | 7 |
| 14. | Transports | 0.65*** | (0.015) | 0.39*** | (0.08) | 6 |
| 15. | Telecommunications | 0.35*** | (0.01) | 0.30*** | (0.04) | 12 |
| 16. | Tourism: Hotels, Bars, Restaurants | 1.11*** | (0.05) | 0.50*** | (0.09) | 4 |
| 17. | Fin. sector: Banks and Insurances | 0.55*** | (0.05) | 0.26*** | (0.1) | 13 |
| 18. | Other Services | 1.02*** | (0.05) | 0.62*** | (0.12) | 1 |
| 19. | Administration | 0.53*** | (0.01) | 0.46*** | (0.05) | 5 |

**Notes**: (i) OLS: ordinary least squares; RCM: random coefficient models.
(ii) Standard errors are in parenthesis.
(iii) ***,**and * indicate significance levels at 1%, 5% and 10%, respectively.

Regarding the decomposition analysis, Table 7 shows that, generally, in Egypt employment growth has been the major source of value-added growth. On average, while productivity growth explains 30% of growth in value-added, employment growth explains 70% of this. At the sectoral level, more heterogeneity can be observed; six sectors experienced higher employment growth (mining, manufacturing, construction, transport, real-estate and other services) and 4 sectors productivity growth (agriculture, electricity, Suez

Canal and tourism). Indeed, while construction and real estate experienced negative productivity growth, tourism and the Suez Canal had the highest growth in labour productivity over the period 1980-2010.

**Table 7. Decomposition of output growth by sector in Egypt**

| | Sectors | Average employment growth | Average value-added growth | Average labour productivity growth |
|---|---|---|---|---|
| 1 | Agriculture, forestry & fishing | 1.17% | 2.90% | 1.73% |
| 2 | Mining | 6.96% | 10.42% | 3.46% |
| 3 | Manufacturing Industries | 3.72% | 5.52% | 1.80% |
| 4 | Electricity | 3.52% | 8.13% | 4.61% |
| 5 | Construction & Building | 5.39% | 3.73% | -1.66% |
| 6 | Transportation, Storage, Com. and Inf. | 3.87% | 5.02% | 1.15% |
| 7 | Suez Canal | -0.23% | 8.07% | 8.30% |
| 8 | Restaurants & Hotels | 4.23% | 14.40% | 10.17% |
| 9 | Real Estate Activities | 7.89% | 4.71% | -3.18% |
| 10 | Other | 2.79% | 4.04% | 1.25% |

**Source**: Authors' own elaboration.

As per Jordan, employment growth was sustained in trade, hotel and restaurant, real estate, construction, and other services. Whereas labour productivity growth was, in general lagging, the sector with the highest labour productivity growth was financial intermediation. This sector registered a steady increase in its contribution to GDP growth, not supported by an increase in employment. Furthermore, despite privatisation and public administration reform, the public sector in Jordan remains one of the most employment-intensive sectors (see Table 8).

## Table 8: Decomposition of output growth by sector in Jordan

| Sectors | | Average employment growth | Average value added growth | Average productivity growth |
|---|---|---|---|---|
| 1 | Mining and Quarrying | 1.0% | 3.7% | 2.7% |
| 2 | Manufacturing | 6.8% | 6.7% | -0.2% |
| 3 | Electricity and Water Supply | 1.0% | 5.7% | 4.7% |
| 4 | Construction | 10.0% | 4.7% | -5.2% |
| 5 | Wholesale and Retail Trade, Repair of Motor Vehicles | 24.3% | 5.4% | -18.9% |
| 6 | Hotels and Restaurants | 11.0% | 3.7% | -7.3% |
| 7 | Transport, Storage and Communications | 2.5% | 5.5% | 3.1% |
| 8 | Financial Intermediation | 4.5% | 11.2% | 6.7% |
| 9 | Real Estate, Renting and Business Activities | 13.1% | 3.6% | -9.4% |
| 10 | Public Administration, Defence, and Social Security | 3.7% | 3.4% | -0.3% |
| 11 | Education (private sector) | 7.2% | 6.9% | -0.2% |
| 12 | Health and Social Work (private sector) | 9.9% | 7.4% | -2.5% |
| 13 | Community, Social and Personal activities and Service Activities | 12.4% | 4.4% | -8.0% |

**Source**: Authors' own elaboration.

Goaied and Sassi (2015) have done this exercise for the Tunisian case and showed that labour productivity growth has been the major source of value-added growth for all the sectors, especially after the free trade agreement era (1996-2010). However, before this period, employment growth was greater than labour productivity growth in agri-food industries, mechanical and electrical industries, petroleum and tourism.

## 6. Conclusion

The purpose of this article is to assess the relationship between employment intensity and sectoral output growth, in order to examine whether an economic sector was jobless or created more jobs. Using panel data for 10 sectors over the period 1983–2010 for three Middle Eastern (Egypt and Jordan) and North African (Tunisia) countries, we estimate employment value-added elasticities at the sectoral level using a random coefficient estimation technique. Our main findings show that, whilst manufacturing is the most important sector that creates jobs in Egypt, services are more important in Jordan and Tunisia. A more detailed look at the decomposition analysis shows that the contribution of employment

growth to value-added was higher than that of labour productivity. Yet, Tunisia's growth of value-added was chiefly explained by labour productivity growth, especially after 1996. As per Jordan, employment growth was sustained in trade, hotel and restaurant, real estate, construction, and other services. While labour productivity growth was in general lagging, the sector with the highest labour productivity growth was financial intermediation. This sector registered a steady increase in its contribution to GDP growth, not supported by an increase in employment. Furthermore, despite privatisation and public administration reform, the public sector in Jordan remains one of the most employment- intensive sectors.

From a policy standpoint, this paper shows that MENA countries are currently facing two main problems: first, employment growth is still modest; second, labour productivity is also low. Hence, we identify two sets of policies that should be put in place. On one hand, in order to increase employment, more efforts are needed to promote investments in high-value added manufacturing sectors. Second, to increase investments that are labour intensive, incentives are an important determinant of industrial sector performance. As argued by El Haddad (2016), incentives should be performance-based, finite, pre-announced and enforced along with constant independent monitoring and evaluation. Third, as also suggested by El Haddad (2016), it is crucial to improve the economy's competitive environment and accentuate equality of opportunity between all market players. On the other hand, in order to increase labour productivity, MENA countries are in a dire need of improving the alignment between the education system and labour market requirements and, hence, to provide a more skilled labour force.

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