THE UNEMPLOYMENT CHALLENGE IN JORDAN: THE ISSUE OF EMPLOYMENT ELASTICITY OF GROWTH

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Abstract

The objective of this paper is to examine the employment elasticity of growth in the Jordanian economy and for that purpose the paper uses time series analysis and annual data (1992–2019) for real gross domestic product (GDP), total employment, total female employment, and total male employment. The results indicate the existence of a long-run relationship between total employment and growth and total male employment and growth. For female employment, such a relationship does not exist. In addition, elasticities of total employment and total male employment are equal to +0.399 and +0.377 respectively. Our findings add to the existing literature which is still inconclusive, while some report either a positive or a negative relationship, others report no relationship in the first place.

Keywords: Jordan, Employment Elasticity, Johansen Co-Integration, Total Employment, Male Employment

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1. INTRODUCTION

Immediately after its emergence, the impact of COVID-19 has become noticeable. The virus has not spared advanced economies, hit both the supply and demand sides of economies, and has forced nations to respond, with varying degrees and measures (lockdowns and economic policies), to the economic fallout.

The implications of COVID-19 are still evolving. However, like for many countries, the implications for the Jordanian economy have become clear. For example, real gross domestic product (GDP) is expected to shrink by 3.7 percent in 2020. The unemployment rate has suddenly increased from 19.0% (2019) to 24.7% (4th quarter of 2020).

Within the context of the sudden increase in unemployment, it must be stated that years before the onslaught of the virus, the Jordanian economy has been suffering from a myriad of socio-economic challenges, including unemployment. Some of these challenges are modest real GDP growth rates and persistent budget deficits. As if these are not enough, the public debt to GDP ratio, which was equal to 96.7 percent in 2019, cannot but increase even further. COVID-19 will only exacerbate these challenges.

No one doubts that COVID-19 is a human, if not an economic, tragedy. The virus has had a huge impact on the global economy. Eventually, the virus will hopefully be contained. However, any government, together with the private sector, should look at the experience of COVID-19 as a "trigger point" for a positive change. Within the context of the socio-economic challenges Jordan is facing, all relevant Jordanian stakeholders should take the unemployment challenge a lot more seriously. Indeed, the sudden increase in unemployment to 24.7 percent should not be taken as a "new normal" in the economy. This new, and exceptionally high,

unemployment rate should encourage the public and private sectors in Jordan to consider it a trigger point.

Based on the above argument, this paper's main objective is to examine the employment elasticity of economic growth in Jordan. This will be done by attempting to answer whether the growth in real GDP affects the *total employment*, *male employment* and *female employment* in Jordan. And to what extent? Given the fact that employment elasticity refers to the percentage change in employment related to a 1 percent increase in GDP, it is useful to measure this concept and recommend some remedial measures to increase it.

The rest of the paper is composed of four sections. In Section 2, we briefly review the relevant literature. In Sections 3 and 4 we outline the data and methodology and present and comment on the empirically estimated results. Finally, we summarize and conclude the paper in Section 5.

2. LITERATURE REVIEW

The International Labor Organization (ILO) is the world leading source of labor statistics[1]. Indeed, the ILO maintains, for example, a database that contains various labor market indicators including an unemployment rate, a labor force participation rate, an employment-to-population ratio, employment in the informal economy, youth unemployment, long-term unemployment, labor productivity, and others. In addition to these indicators, the ILO publishes (annually) the total number of employed individuals as well as the numbers of employed females and males.

Basic economic sense asserts that as long as there is a labor surplus, employment growth is a desirable feature in any economy. Indeed, increases in employment numbers promote economic growth and reduce poverty and inequality. In other words, a high employment elasticity of growth is equally desirable.

The early literature that examines the relationship between employment and growth uses Okun's law. In his original paper, Okun (1962) outlined a simple relationship between unemployment and growth. In more specific terms, he states that in the USA, a 1 percent decrease in unemployment is accompanied by an increase in GDP of about 2 percent. Later on, much of the literature looks at the relationship between employment and economic growth and the determinants of employment-output elasticities.

Some of the papers that estimate employment elasticity include Balakrishnan, Das, and Kannan (2010), Kapsos (2006), Hanusch (2012), Asian Development Bank (2012), Mouelhi and Ghazali (2014), ILO, OECD, WBG, and IMF (2015), Slimane, (2015), Ball, Furceri, Leigh, and Loungani (2016), An, Ghazi, Prieto, and Ibourk (2017), Görg, Hornok, Montagna, and Onwordi (2018), Adegboye, Egharevba, and Edafe (2017), African Development Bank (2018), and Blázquez-Fernández, Cantarero-Prieto, and Pascual-Sáez (2018), Thuku, Omolo, and Muniu (2019), and Zhou (2020).

Thuku et al. (2019), for example, investigated the drivers of employment elasticities in Kenya and suggested that employment elasticity, average wage, inflation rate, labor force participation rate, labor force participation rate, population density and foreign direct investments to be the short run drivers of employment elasticities, while the exchange rate, population density and foreign direct investment were the long-run drivers of employment elasticity.

Zhou (2020) also examined the employment growth elasticity in the Chinese economy (1981–2019). Based on the econometric analysis (vector autoregression (VAR) model), Zhou (2020) outlined four main conclusions. First, economic growth and the proportion of secondary and tertiary industries are significant drivers of employment. Second, capital investment is not significant in generating increasing employment. Third, in the short term, while an increase in the proportion of secondary industries negatively impacts employment, the impact of the increasing proportion of tertiary industries is positive. Fourth, in the long run, the increasing proportions of the secondary and tertiary industries have a positive effect on employment growth.

In addition, some papers look at the determinants of employment elasticity across countries, they include Moosa (1997), Padalino and Vivarelli (1997), Freeman (2001), Perman and Tavera (2005), Gabrisch and Buscher (2005), Crivelli, Furceri, and Toujas-Bernaté (2012), Thioune and Kane (2018), and Malika (2020).

Crivelli et al. (2012), for example, estimate the employment-output elasticities for 167 economies during the period 1991–2009. In addition, they examine the determinants of the estimated elasticities. Based on their results, Crivelli et al. (2012) argue that to maximize employment output elasticity, governments should, among others, adopt macroeconomic policies that maintain macroeconomic stability.

Thioune and Kane (2018) study the relation between youth employment and economic growth in the West African Economic and Monetary Union (WAEMU) countries over the period 1991 to 2015. Their results indicate that the growth rate has a negative but insignificant impact on the youth employment ratio, while the current account balance and domestic investment are the most important determinants of job creation among young people. Similarly, using a panel of 44 economies and the period of 2000–2017, Malika (2020) argues that foreign direct investment and government size have a positive impact on employment elasticities. In addition, the results indicate that macroeconomic policies that promote macroeconomic stability increase employment elasticities.

Regarding the above-mentioned investigations, it is interesting to note that Behar (2015) estimates the elasticity of private-sector employment in the non-oil GDP of the Gulf Cooperation Council (GCC) for GCC nationals and expatriates. The results indicate that the elasticity for expatriates in the long run (about unity) is much higher than the elasticity for nationals (+0.15). Behar (2015) argues that the low nationals' elasticity is due to "labor market adjustment costs, which could include hiring and firing rigidities, skills mismatches, and reluctance to accept private sector jobs" (Behar, 2015, p. 1).

3. RESEARCH METHODOLOGY

To measure the employment-growth elasticity in the Jordanian economy and in general using the empirical literature that examines this issue, we estimate the following models:

[1] https://ilostat.ilo.org/

$$Temployment_t = \lambda + \beta GDP_t + \varepsilon_t \quad (1)$$

$$Femployment_t = \lambda + \beta GDP_t + \varepsilon_t \quad (2)$$

$$Memployment_t = \lambda + \beta GDP_t + \varepsilon_t \quad (3)$$

where, *Temployment*, *Femployment*, and *Memployment* are the natural logarithms of total employment, total female employment, and total male employment respectively. *GDP* is the natural logarithm of real GDP. ε is the error term, and t is the time period (1992–2019). The sources of the employment figures and real GDP are the ILO and the Central Bank of Jordan respectively.

To realize the objective of the paper, we first examine the behavior of the variables over time (1992–2019) in terms of their stationarity. Once this is done, we determine the optimal lag structure for the three models and then test the co-integrating relationships among the variables. For the co-integration tests, we use the Johansen-Masulius procedures (maximum eigenvalue/λ_{max} and the trace test/λ_{trace}) as follows:

$$\lambda_{max} = T\, log(1 - \lambda_{r+1}) \quad (4)$$

where, the null is $r = g$ co-integrating vectors with (g = 0, 1, 2, 3, …) against the alternative which is $r \leq g + 1$.

$$\lambda_{trace} = T \sum_{i=r+1}^{k} log(1 - \lambda_i) \quad (5)$$

where, the null is $r = g$ against the general specification $r \leq 1$.

Based on the co-integration tests, we either estimate a general autoregression model (VAR) or a vector error correction (VEC) model. The aim of the VEC model is to examine the long-run and short-run relationship between the variables in the models.

$$\Delta Temployment_t = \alpha + \lambda e_{t-1} + \sum_{i=1}^{n} b_i \Delta GDP_{t-i} + \varepsilon_t \quad (6)$$

$$\Delta Femployment_t = \alpha + \lambda e_{t-1} + \sum_{i=1}^{n} b_i \Delta GDP_{t-i} + \varepsilon_t \quad (7)$$

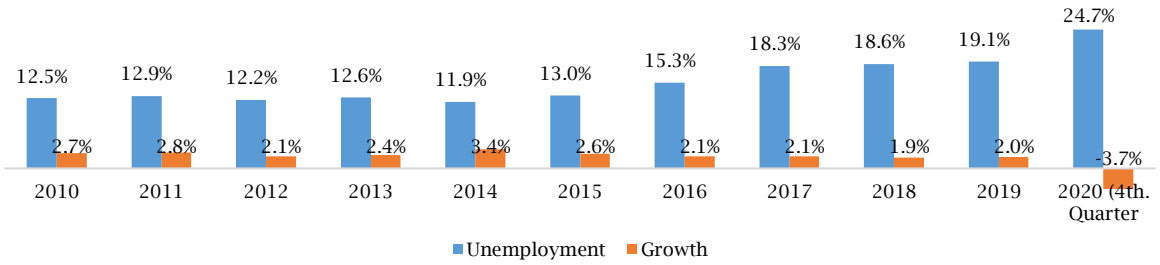
$$\Delta Memployment_t = \alpha + \lambda e_{t-1} + \sum_{i=1}^{n} b_i \Delta GDP_{t-i} + \varepsilon_t \quad (8)$$

4. RESULTS AND DISCUSSION

Before we present and discuss the empirical results, it is worth raising a few observations about unemployment in Jordan.

The growth performance of the Jordanian economy and unemployment have been quite weak before the surge of COVID-19. However, the virus would only make things worse (Figure 1).

Figure 1. Real GDP growth and unemployment rates



Source: IMF Database (https://data.imf.org/?sk=85b51b5a-b74f-473a-be16-49f1786949b3).

In 2019, Jordan had the 5th highest unemployment rate in the world (IMF Database). In addition, the unemployment rate in many countries, such as Malaysia, Poland, and the USA, are a lot lower.

Figure 2a. Top ten unemployment rates (2019)

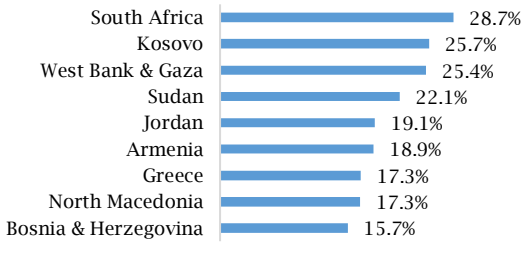
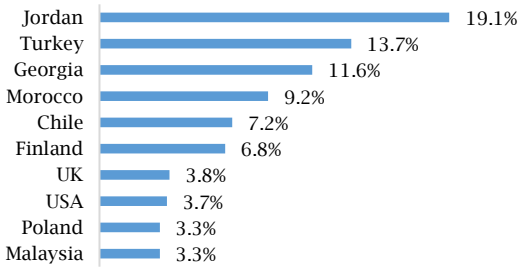


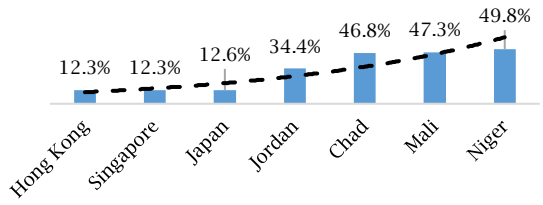
Figure 2b. Unemployment rates (2019)



Source: IMF Database (https://data.imf.org/?sk=85b51b5a-b74f-473a-be16-49f1786949b3).

As regards the preceding data, it is useful to note that in Jordan, the youth and children compose a significant share of the population. The difference between the top and bottom three countries in terms of their respective youth populations, across the globe, is huge. The Jordanian proportion is closer to the top three countries in the world. This demographic fact implies that the challenge of unemployment in Jordan is real.

Figure 3. Population ages 0–14 (% of total population)



As mentioned in the introduction, the primary objective of this paper is to estimate employment-growth elasticity for *total employment*, *female employment*, and *male employment*. Below, we present and discuss the empirical results.

First, all four variables are not stationary in their levels forms. However, when first differenced, they all become stationary (Table 1).

Table 1. Augmented Dickey-Fuller unit root test

Variables	*None*	*Constant*	*Constant & trend*	*None*	*Constant*	*Constant & trend*
Female employment	5.439	-1.447	-1.946	-1.674**	-4.128157*	-4.114559*
Male employment	1.490	-0.853	-1.724	-1.785**	-3.280*	-3.247184*
Total employment	1.688	-0.834	-2.546	-2.357*	-3.454840*	-3.421663*
Real GDP	7.671	-0.415	-2.273	-2.243*	-3.631163*	-3.564250*

*Notes: * significant at the 99 percent level, ** significant at the 95 percent level.*

Second, the results of the optimal lag length criteria are reported in Table 2. The results indicate that for *female employment* and *real GDP*, *male employment* and *real GDP*, and *total employment* and *real GDP*, the optimal lag lengths are 1, 2, and 1 respectively.

Table 2. VAR lag order criteria

Lag	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQC*
Endogenous variables: Female employment & Real GDP						
0	10.53871	NA	0.001778	-0.656824	-0.560047	-0.628956
1	88.23580	137.4641*	6.15e06*	-6.32583*	-6.03550*	-6.24222*
2	89.57826	2.168580	7.60e-06	-6.121404	-5.637521	-5.982063
Endogenous variables: Male employment & Real GDP						
0	27.12418	NA	0.000459	-2.009934	-1.912424	-1.982889
1	111.7852	149.0034	7.26e-07	-8.46281	-8.17028*	-8.381681
2	117.8317	9.674305*	6.21e-07*	-8.62653*	-8.138982	-8.49130*
3	121.5848	5.404491	6.46e-07	-8.60678	-7.924211	-8.417466
Endogenous variables: Total employment & Real GDP						
0	25.86835	NA	0.000547	-1.836027	-1.739250	-1.808159
1	117.3259	161.8095*	6.56e-07*	-8.563529*	-8.27319*	-8.47992*
2	120.4361	5.024244	7.08e-07	-8.495087	-8.011203	-8.355746

*Notes: * significant at the 99 percent level. LR — likelihood ratio test, FPE — final prediction error, AIC — Akaike information criterion, SC — Schwarz information criterion, HQC — Hannan-Quinn criterion.*

Third, using the +1 lag length criteria, the long-term co-integrating relationships between the variables in all four models are reported in Table 3. The results of both the trace statistic and the maximum eigenvalue statistic indicate that at least one co-integrating relationship exists between *male employment* and *real GDP*, and between *total employment* and *real GDP*. *Female employment* and *real GDP* are not co-integrated.

These results are not really surprising if one understands some "peculiarities" in Jordan's labor market. In Jordan, the female participation rate is equal to 14 percent only. In addition, most of the employed females work for three sectors only, and these are public administration, education, and health services. This fact (not being employed across almost all sectors) together with the low participation rate are behind the absence of co-integration.

Table 3. Johansen multivariate co-integration test

Hypothesized No. of CE(s)	*Eigenvalue*	*Trace statistic*	*0.05 critical value*	*P-value*	*Eigenvalue*	*Max-Eigen statistic*	*0.05 critical value*	*P-value*
Female employment & Real GDP								
None	0.338303	10.84196	15.49471	0.2214	0.338303	10.73665	14.26460	0.1679
At most 1	0.004042	0.105311	3.841466	0.7455	0.004042	0.105311	3.841466	0.7455
Male employment & Real GDP								
None*	0.470569	16.23011	15.49471	0.0387	0.470569	15.89882	14.26460	0.0273
At most 1	0.013164	0.331283	3.841466	0.5649	0.013164	0.331283	3.841466	0.5649
Total employment & Real GDP								
None*	0.572445	22.17859	15.49471	0.0042	0.572445	22.09146	14.26460	0.0024
At most 1	0.003346	0.087129	3.841466	0.7678	0.003346	0.087129	3.841466	0.7678

*Note: * at least one co-integration relationship.*

Fourth, the absence of co-integration between *female employment* and *real GDP*, the results of the unrestricted VAR for *female employment* and *real GDP*. The results indicate that in the short term *real GDP* impacts the *total female employment* (Table 4).

Table 4. The VAR results

Variables	*Coefficients*
Female employment (-1)	0.521*
Real GDP(-1)	0.275*
Constant	-0.475*

*Note: * significant at the 99 percent level.*

As for the VEC model for the relationship between *male employment* and *real GDP* and between *total employment* and *real GDP*, the results are reported in Tables 5 and 6. Based on these estimations, the following results can be outlined.

A long-run relationship between *male employment* and *real GDP* does exist, and this is based on the fact that the error correction term is negative and significant (Table 5). The long-run employment elasticity is equal to +0.377.

Long run relationship:

$$ln(male\ employment)_{t-1} = -5.289 + 0.377 \times real\ GDP \quad (9)$$

Table 5. Results of the VEC model for *male employment* and *real GDP*

Variables	*Δln (male employment)*
ECT (-1)	-0.479*
D (*male employment*) (-1)	0.359490*
D (*male employment*) (-2)	0.056650
D (*real GDP*) (-1)	-0.037417
D (*real GDP*) (-2)	-0.101712
Constant	0.029404*

*Note: * significant at the 99 percent level.*

A long-run relationship between *total employment* and *real GDP* does exist, and this is based on the fact that the error correction term is negative and significant (Table 6). The long-run employment-growth elasticity is equal to +0.399.

Long run relationship:

$$ln(total\ employment)_{t-1} = -4.913 + 0.399 \times real\ GDP \quad (10)$$

Table 6. Results of the VEC model for *total employment* and *real GDP*

Variables	*Δln(total employment)*
ECT (-1)	-0.499*
D (*total employment*) (-1)	0.235263*
D (*real GDP*) (-1)	-0.025705
Constant	0.031270*

*Note: * significant at the 99 percent level.*

It is interesting to note that the variance decomposition analysis results indicate that over time *real GDP* increases in strength in explaining the variability in both *male employment* and *total employment*.

Table 7a. Variance decomposition of durables for *male employment* and *real GDP*

Period	*Standard error*	*Male employment*	*Real GDP*
1	0.171677	100.0000	0.000000
1	0.012242	100.0000	0.000000
2	0.021069	89.00331	10.99669
3	0.027682	74.93498	25.06502
4	0.036765	55.70216	44.29784
5	0.047900	41.77891	58.22109
6	0.059763	33.87831	66.12169
7	0.071105	29.76048	70.23952
8	0.081355	27.64585	72.35415
9	0.090410	26.54554	73.45446
10	0.093455	25.94566	74.05434

Table 7b. Variance decomposition of durables for *total employment* and *real GDP*

Period	*Standard error*	*Total employment*	*Real GDP*
1	0.012816	100.0000	0.000000
2	0.021430	75.50019	24.49981
3	0.029037	56.10616	43.89384
4	0.040780	36.83392	63.16608
5	0.053984	25.87837	74.12163
6	0.067207	20.35264	79.64736
7	0.079581	17.50485	82.49515
8	0.090650	16.00719	83.99281
9	0.100503	15.17819	84.82181
10	0.109344	14.67587	85.32413

Finally, for the relationship between *male employment* and *real GDP* and *total employment* and *real GDP*, we perform two diagnostic tests (serial correlation and stability). The results shown in Tables 8a and 8b indicate that both models do not have serial correlation problems in their respective residuals. In addition, Figures 4a and 4b indicate that both models are dynamically stable.

Table 8a. Breusch-Godfrey serial correlation Lagrange multiplier test for *male employment* and *real GDP*

F-statistic	0.192141	Prob. F (2.17)	0.8651
Obs. × R-squared	0.552630	Prob. chi-square (2)	0.7231

Table 8b. Breusch-Godfrey serial correlation Lagrange multiplier test for *total employment* and *real GDP*

F-statistic	0.305346	Prob. F (1.18)	0.8476
Obs. × R-squared	0.417018	Prob. chi-square (1)	0.7405

Figure 4a. *Total employment & Real GDP*

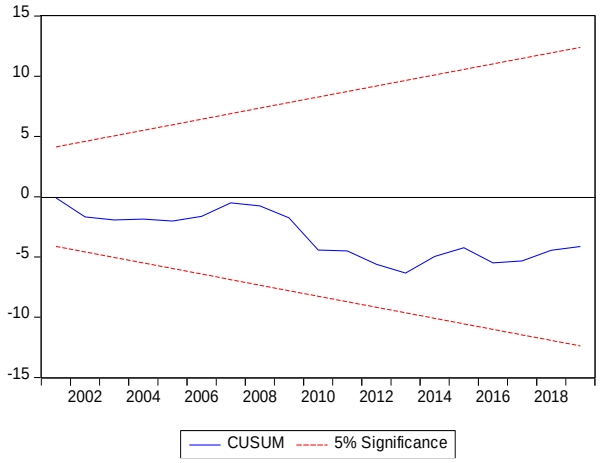
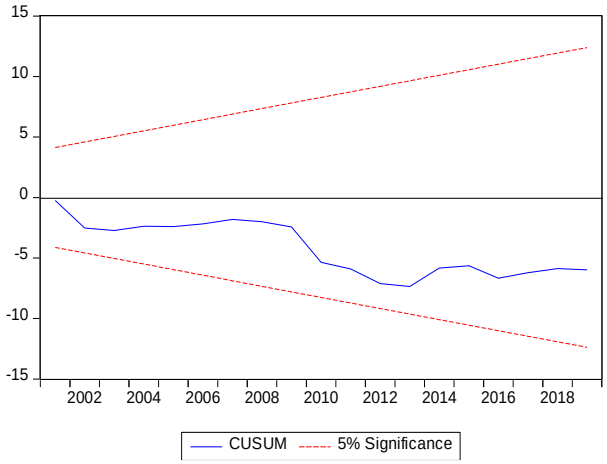


Figure 4b. *Male employment & Real GDP*



5. CONCLUSION

This paper has examined the employment growth elasticity in the Jordanian economy. As mentioned in Section 1, this issue is particularly important in Jordan. Indeed, the overall unemployment rate was high, and with COVID-19 it has become even higher. All relevant stakeholders in Jordan should not look at the new unemployment rate as the "new normal" after COVID-19. The public and private sectors should take the challenge of unemployment a lot more seriously than before.

One way to reduce the unemployment rate is to increase the employment-growth elasticity in the Jordanian economy. Based on the international evidence, a myriad of recommendations are worth taking into account. First, the government, through its fiscal policy, should maintain macroeconomic stability. The hitherto existing high public debt to GDP (around 11 percent) does not really encourage the private sector to invest in the local economy. Second, the government, as well as the private sector, should examine the underlying reasons behind the low female participation rate (14 percent) in the labor market. Moreover, females should be encouraged to work in other sectors of the economy. Third, the fact that public administration and the education sectors account for about 45 percent of the total net created jobs does not really help in advancing employment growth elasticity.

Finally, there are a few limitations in this study that should be noted. One limitation is that it has examined the employment growth elasticity for the Jordanian economy as a whole, rather than taking various sectors into account. Furthermore, there are other relevant variables that are worth examining such as the level of foreign direct investments, macroeconomic policies, and government size (Malika, 2020). This implies that further research could provide more significant results.

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