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The Impact of Economic Growth and Inflation on Unemployment: An Empirical Study in ESCWA Region

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ABSTRACT:
High unemployment is a major economic problem. In Escwa region, the high unemployment rate has many causes that differed between member countries. Most governments' policies usually aim to increase growth rates without reducing unemployment. This study studies the impact of economic growth on unemployment in 16 countries belonging to the ESCWA region for the period 1991-2017. The difference method, the gap method and the dynamic approach were employed to study the relationship between economic growth and unemployment levels. Results showed that the dynamic model was the most suitable. The panel unit root tests were used to assess whether series were stationary at level. Results showed that the total unemployment rate was non-stationary at the level, while the other economic growth variable was not. In contrast, all differenced terms of both variables were stationary at 5% significant level. The EGLS (Cross-section SUR) techniques were used because of their robustness to contemporary heteroscedasticity and cross-section dependence. The fixed effect (Panel EGLS/Cross-section SUR) was used. Explanatory variables explained the level of unemployment that was about 48.3%. GDP had a 0.4% decrease and a significant effect on unemployment. Previous periods also affected unemployment (lag variables). The Okun's coefficient was 0.4%; this explained how a 1% increase in GDP growth caused a 0.4% decrease in the unemployment rate, whereas 0.06% was the intercept term which can be defined as the unemployment rate associated with zero GDP growth.

Keywords: *Okun's law, unemployment, GDP growth, inflation, EGLS (Cross-section SUR), difference method, gap method, dynamic approach*

INTRODUCTION

Unemployment is a problem experienced by all countries. It affects the population and the entire economy in different dimensions and directions. Governments policies aim to solve this problem by creating new roles symmetric with the sustainability of economic growth.

Understanding the mutual effect of growth and unemployment rates is the major factor in assessing how unemployment is affected. Economic policies are designed to increase growth rates and not to reduce unemployment.

Arthur Okun focused in his research in 1962 on studying the changes in the Gross Domestic Product (GDP) with unemployment. He found a negative relationship between changes in unemployment rates around the normal rates and changes in real GDP around the potential average. Potential output is the maximum output produced in the economy when all factors are fully utilized, without acceleration of inflation. On the contrary, real output is defined as "the national output produced when some factor units remain virtually idle". Thus, the gap between the potential GDP and real GDP

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stabilizes the change in unemployment which is in turn negatively related to changes in output.

The relationship between growth, low unemployment rates, and economic policies may be correct in developed countries because of the nature of unemployment as well as the source and nature of growth achieved in these countries. Economic studies show that growth must be at a specific rate, with unemployment starting to decline gradually with rates that may have an impact on growth itself. Perhaps the most striking fact about the economies of the Arab countries is the extraordinary rise in unemployment rates from world averages, which is puzzling for some countries with economic resources. But why does the growth rate not affect unemployment significantly? Perhaps the reason lies in the nature of the growth achieved in these countries or the structure of the economy. High unemployment among individuals, and youth, in particular, is a serious burden not only on people themselves but also on their societies. There are many causes behind the high unemployment in the Escwa region which are different between countries.

Economic growth is a major factor that impacts unemployment. This study deals with the impact of economic growth on unemployment in 16 ESCWA countries[1] for the period 1991-2017. It is organized as follows: Section 2 contains the literature review, Section 3 provides specifications, panel data tests and, empirical findings through econometric analysis, and Section 4 discusses the concluding remarks.

Literature Review

In this section, we will highlight the most important studies that dealt with the relationship between economic growth and unemployment, and discuss whether Okun's law still holds as a rule or – is already broken down when considering new data or new variables inside the model.

Studies that attempted to explain the relationship between unemployment and economic growth are divided into two groups. The first group found a symmetrical relationship between economic growth and unemployment and the second found asymmetrical relationship between unemployment and economic growth.

Many studies have mostly proposed evidence that is parallel to Okun's study while others didn't. In this section, we will highlight the most important studies that dealt with the relationship between economic growth and unemployment, and discuss whether Okun's law still holds as a rule or – is already broken down when considering new data or new variables inside the model.

Empirical Studies Parallel to Okun's Study

Arshad (2010) examined the presence of Okun's relationship in the Swedish economy, using the gap equation and Hodrick-Prescott filter (HP) technique for short run analysis. For the purpose of testing the relationship between unemployment and GDP in the short and long runs, the co-integration and the error correction models were used. The study confirmed the existence of a negative relationship between unemployment and economic growth in the Swedish economy from the first quarter of 1993 to the second quarter of 2009, and found that the Okun's coefficient was equal to -2.22%. This also confirmed the existence of a long and short run relationships between unemployment and GDP.

Bartolucci (2011) studied the effect of financial crisis passing through of a declining GDP, on the unemployment rate. He found that the Okun's coefficient for Peru was 0.13, but the details of his calculations were not provided. He also found that uncertainty in financial crises had an extra effect on the unemployment rate.

Khan, Khattak and Hussain (2012) applied an empirical approach to studying the inter-relationship of Gross Domestic Product Growth and Unemployment in Pakistan and used the time series data for the1960 to 2005 period. The Augmented Dickey-Fuller (ADF) test, was applied to check the stationarity of variables and showed that the variables were stationary on first difference. They applied the Johansen co-integration test to assess the long-run association. The empirical evidence indicated that 1%

1- Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Mauritania, Oman, Qatar, Saudi Arabia, Sudan, Tunisia, United Arab Emirates and Yemen.

increase reduced unemployment by 0.63%, while a 1% decrease in unemployment increased the GDP growth by 7.25%. It was found that GDP growth had a negative relationship with unemployment in long run.

Empirical Studies Not Parallel to Okun's Study

Emirgena Nikolli (2014) examined the relationship between the economic growth and the unemployment rate for the case of Albania. A simple regression model was applied, where the economic growth was taken as a dependent variable and the unemployment rate as independent. The result did not confirm that Okun's law held for Albania. This was due to the current crisis that prevented the improvement of economic conditions.

Alamro and Al-dalaien (2014), investigated the validity of Okun's law in Jordan's economy. They measured the impact of economic growth on unemployment in the Jordanian economy in the short and long runs during the 1980 to 2011period. The gap model with Hodrick-Prescott filter (HP filter) to calculate the potential gross domestic product were used to measure the relationship. For long term relationship, an Autoregressive Distributed Lag (ARDL) approach to co-integration was employed. While for the short term, the Error Correction Model (ECM) was used. The empirical results did not confirm the validity of Okun's law in Jordon, showing that the economic growth had weak significant negative short and long-run effects on unemployment.

Ibrahim Khrais and Mahmoud Al-Wadi (2016) used a Simple linear regression to study the relationship between GDP growth and unemployment in MENA countries over the period (1990-2016). The results suggested, that there was no significant influence for gross GDP on Unemployment in all the countries[2] involved in the study. The impact was considered to be very small with a value (-0.009) suggesting that the existence of other factors affecting unemployment.

Empirical Studies in the ESCWA Region

To our knowledge, there were no studies on the impact of economic growth on unemployment or even studies on the impact of both economic growth and inflation on unemployment for the ESCWA countries.

Mohammed Abu Rumman et al. (2012), studied the relationship between economic growth and change of unemployment rates in some Arab countries[3]. They found that the high rates of economic growth and the decline in unemployment rate did not confirm the existence of a strong relationship between growth and unemployment because Arab countries like Algeria relied heavily on growth in the hydrocarbon sector, which does require creation of jobs in large numbers. In conclusion, they recommended to separate policies of growth support and policies of unemployment rates reduction.

Shatha Abdul-Khaliq et al. (2014), applied the Pooled EGLS (Cross-section SUR), to test the relationship between unemployment and GDP growth in 9 Arab countries between 1994 and 2010. They found that the economic growth had negative and significant impact upon the unemployment rate suggesting that 1% increase in economic Growth decreased the unemployment rate by 0.16%.

RESEARCH METHOD

The aim of this study was to investigate the impact of economic growth on total unemployment covering the period 1991-2017 belonging to 16 selected countries from the ESCWA region. All data needed were available and collected from the World Bank Database. In order to test the impact of economic growth on unemployment, we needed data on GDP and unemployment.

Okun's used the difference method, the gap method and the dynamic approach to study the relationship between economic growth and unemployment levels. This section highlights the results of the three approaches detailed above using all panel models with the aim of choosing the most suitable one.

2- Algeria, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, Turkey, Emirates, Yemen.

3- Algeria, Egypt, Jordon, Kuwait, Morocco, KSA, Sudan, Syria, Tunisia.

Panel Data Models

Three main types of panel data were formulated below:

Pooled OLS Model (Ordinary Least Square)

The first type ignored the fact that data had time and individual dimensions and deals with datasets like any other cross-sectional data. Therefore, the assumptions are similar to ordinary linear regression.

Fixed Effects Model

The second type went beyond OLS model and took into consideration the differences between individual entities (countries in our case).

Random Effects Model

The above model controlled the differences between individual countries but didn't account for variables that changed overtime? This third type considered both individual variation and time dependent variables and eliminated biases that occur because of variables that were unobserved and changed over time. Panel data methods as stated in Baltagi (2004) were conducted by pooled, fixed and random effects.

The study used various statistical tests to select among the estimation models. Since all the variables in the models changed among countries and periods, the basic question was whether the data could be combined among countries and periods.

RESULTS AND FINDINGS

In this part, we analyzed empirically the impact of economic growth on unemployment for 16 countries belonging to the ESCWA region and discuss the findings. Firstly, the stationary properties of variables were tested, and the empirical results were discussed. Secondly, the results of the three approaches detailed above using all panel models were highlighted and the most suitable approach was chosen.

Panel Unit Root Tests

In this section the stationary properties of variables were tested, and the empirical results were discussed. For this purpose, Levin test, Lin and Chu's test (2002), Im, Pesaran and Shin's test (2003), generalized Dickey- Fuller unit root test method (ADF) (1979) were used to determine whether the data are stationary or not. Tests were performed under the null hypothesis that all panels contain a unit root against the alternative hypothesis that data were stationary.

Panel Unit Root Tests for Unemployment Rate

Table 1: Root Tests for Unemployment rate

Series: TUN

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.08579	0.1388	16	400
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	0.28890	0.6137	16	400
ADF - Fisher Chi-square	36.5495	0.2656	16	400
PP - Fisher Chi-square	22.2119	0.9016	16	416

Series: D(TUN)

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.46245	0.0000	16	384
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.06051	0.0000	16	384
ADF - Fisher Chi-square	102.170	0.0000	16	384
PP - Fisher Chi-square	22.2119	0.0000	16	400

Tables 1 and 2 show that the total unemployment rate is non-stationary at the level, while economic growth is stationary. However, both differenced variables are stationary at 5 % significant level, suggesting that these variables are integrated of order one I (1).

Panel Unit Root Tests for Economic Growth Rate

Table 2: Root Tests for economic growth rate

Series: EG

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.52410	0.0000	16	400
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.49456	0.0000	16	400
ADF - Fisher Chi-square	151.112	0.0000	16	400
PP - Fisher Chi-square	263.785	0.0000	16	416

The Influence of Economic Growth on Unemployment Using Pooled Model First Difference Version Approach Results

Table 3: The impact of economic growth rate on Unemployment rate using first difference version approach

Dependent Variable: DTUN
Method: Panel Least Squares
Sample (adjusted): 1992 2017
Total panel (balanced) observations: 416

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008820	0.027582	0.319771	0.7493
DEG	-0.000390	0.001670	-0.233317	0.8156
R-squared	0.000131			
Adjusted R-squared	-0.002284			
S.E. of regression	0.562552			
Sum squared resid	131.0162			
Log likelihood	-349.9626			
F-statistic	0.054437	Durbin-Watson stat		1.666868
Prob(F-statistic)	0.815631			

The Gap Version Approach Results

Table 4: The impact of economic growth rate on Unemployment rate using age gap version approach

Dependent Variable: GUN
Method: Panel Least Squares
Sample: 1991 2017
Total panel (balanced) observations: 432

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEG	0.001681	0.002548	0.659784	0.5097
R-squared	0.001009			
Adjusted R-squared	0.001009			
S.E. of regression	0.544171			
Sum squared resid	127.6287			
Log likelihood	-349.6125			
Durbin-Watson stat	0.899121			

The Dynamic Version Approach Results

Table 5: The impact of economic growth rate on Unemployment rate using dynamic version approach

Dependent Variable: DTUN
Method: Panel Least Squares
Sample (adjusted): 1994 2017
Total panel (balanced) observations: 384

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.067975	0.038959	1.744769	0.0818
EG	-0.004073	0.003097	-1.314954	0.1893
LAG1EG	-0.003340	0.003071	-1.087552	0.2775
LAG2EG	-0.006694	0.002754	-2.430254	0.0156
DLAG1TUN	0.179849	0.051377	3.500541	0.0005
DLAG2TUN	-0.025758	0.052394	-0.491623	0.6233
R-squared	0.053748			
Adjusted R-squared	0.041231			
S.E. of regression	0.562213			
Sum squared resid	119.4796			
Log likelihood	-320.7130			
F-statistic	4.294110	Durbin-Watson stat		1.980093
Prob (F-statistic)	0.000822			

It was clear from the results in Tables (3, 4, and 5) that the dynamic version of Okun's law was the most appropriate to predict the impact of economic growth on unemployment. Table 3 shows a negative relationship between variables but not significant. Table 4 shows a positive relationship between variables and also not significant. In the third panel Table 5, most variables were found to be negative and not significant. The goodness of fit of the equation was very weak 0.05 meaning that the model was not powerful.

The Pooled EGLS (Cross-section SUR) results

Panel data models can have heteroscedasticity and correlation between errors both contemporaneously and over time. In our case, we recommended using the White cross-section estimators because they were robust to contemporary hetercross-section and cross section dependence. For this purpose, we used the Pooled EGLS (Cross-section SUR) techniques as shown in Table 6.

In Table (6), most variables were found to be negative and significant. The corrected goodness of the equation was equal to 0.33, meaning that the model was useful.

Cross-section fixed effects test was used in order to identify common significance of country specific effects and time specific effects. While effective estimator under null hypothesis was pool OLS, effective estimator under alternative hypothesis was fixed effects model.

Table 6: The impact of economic growth rate on unemployment rate using panel EGLS

Dependent Variable: DTUN
Method: Panel EGLS (Cross-section SUR) Sample (adjusted): 1994 2017
Total panel (balanced) observations: 384
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.052988	0.005874	9.020383	0.0000
EG	-0.003376	0.000572	-5.902013	0.0000
LAG1EG	-0.003152	0.000602	-5.236653	0.0000
LAG2EG	-0.003684	0.000588	-6.266155	0.0000
DLAG1TUN	0.258474	0.048176	5.365161	0.0000
DLAG2TUN	0.015001	0.046835	0.320304	0.7489

Weighted Statistics

R-squared	0.331147	Mean dependent var	0.172049
Adjusted R-squared	0.322300		
S.E. of regression	0.962131		
F-statistic	37.42930	Durbin-Watson stat	1.977415
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.042452	Mean dependent var	0.001901
Sum squared resid	120.9059	Durbin-Watson stat	2.103212

Redundant Fixed Effects Test

The Cross-section fixed effects test in Table 7 show that null hypothesis was rejected since the p<5% (p=0), therefore the fixed effect model was used.

In Table 8 the fixed effect (Panel EGLS/Cross-section SUR) was used. Explanatory variables explained the level of unemployment about 48.3%. The GDP has 0.4% decrease and a significant effect on unemployment.

Second step includes the decision between random effects model and fixed effects model. This study used the Hausman test to choose between them. For this test, Ho: There are random effects and H1: There are no random effects that can be stated.

Table 7: The impact of economic growth rate on unemployment rate using panel EGLS

Equation: Untitled
Test cross-section fixed effects

Effects Test	**Statistic**	**d.f.**	**Prob.**
Cross-section F	4.616910	(15,363)	0.0000

Cross-section fixed effects test equation:
Dependent Variable: DTUN
Method: Panel EGLS (Cross-section SUR)
Sample (adjusted): 1994 2017
Total panel (balanced) observations: 384
Use pre-specified GLS weights

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.071582	0.005808	12.32423	0.0000
EG	-0.004159	0.000556	-7.485785	0.0000
LAG1EG	-0.003848	0.000570	-6.744832	0.0000
LAG2EG	-0.003669	0.000562	-6.524530	0.0000
DLAG1TUN	0.289975	0.045406	6.386203	0.0000
DLAG2TUN	0.046897	0.043638	1.074663	0.2832

Weighted Statistics

R-squared	0.384782	Mean dependent var	0.207039
Adjusted R-squared	0.376645		
S.E. of regression	1.044603		
F-statistic	47.28336	Durbin-Watson stat	1.869183
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.030935	Mean dependent var	0.001901
Sum squared resid	122.3601	Durbin-Watson stat	2.145209

The influence of Economic Growth on Unemployment Using Fixed Effect Model

Table 8: The impact of economic growth rate on unemployment rate using Panel EGLS (cross-section SUR)

Dependent Variable: DTUN
Method: Panel EGLS (Cross-section SUR) Sample (adjusted): 1994 2017
Total panel (balanced) observations: 384
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.062383	0.005886	10.59847	0.0000
EG	**-0.004063**	0.000579	-7.021901	0.0000
LAG1EG	-0.004434	0.000597	-7.428931	0.0000
LAG2EG	-0.004586	0.000583	-7.860383	0.0000
DLAG1TUN	0.180486	0.047566	3.794457	0.0002
DLAG2TUN	-0.030713	0.045307	-0.677895	0.4983

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.483350	Mean dependent var	0.207039
Adjusted R-squared	0.454884		
S.E. of regression	0.976850		
F-statistic	16.98015	Durbin-Watson stat	1.986003
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.077995	Mean dependent var	0.001901
Sum squared resid	116.4180	Durbin-Watson stat	2.024143

Table 9: Hausman Test results

Correlated Random Effects - Hausman Test Test cross-section and period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random Period random	0.000000	5	1.0000
Cross-section and period random	45.942261	5	0.0000
	48.726031	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
EG	-0.005441	-0.004073	0.000001	0.0617
LAG1EG	-0.004956	-0.003340	0.000001	0.0627
LAG2EG	-0.007788	-0.006694	0.000000	0.0933
DLAG1TUN	0.156786	0.179849	0.000022	0.0000
DLAG2TUN	-0.050298	-0.025758	0.000047	0.0003

Cross-section random effects test equation: Dependent Variable: DTUN
Method: Panel EGLS (Period random effects) Sample (adjusted): 1994 2017
Total panel (balanced) observations: 384
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.087042	0.040328	2.158348	0.0316
EG	-0.005441	0.003183	-1.709515	0.0882
LAG1EG	-0.004956	0.003192	-1.552625	0.1214
LAG2EG	-0.007788	0.002831	-2.751388	0.0062
DLAG1TUN	0.156786	0.051589	3.039109	0.0025
DLAG2TUN	-0.050298	0.052841	-0.951884	0.3418

Effects Specification	S.D.	Rho
Cross-section fixed (dummy variables) Period random		
Idiosyncratic random	0.000000	0.000
	0.558102	0
		1.000
		0

Weighted Statistics

R-squared	0.08232 4	Mean dependent var	0.001901
Adjusted R-squared	0.031763		
S.E. of regression	0.564982		

F-statistic	1.628212	Durbin-Watson stat	2.003353
Prob(F-statistic)	0.043842		

Unweighted Statistics

R-squared	0.082324	Mean dependent var	0.001901
Sum squared resid	115.8714	Durbin-Watson stat	2.003353

Period random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
EG	-0.000616	-0.004073	0.000001	0.0005
LAG1EG	-0.002248	-0.003340	0.000001	0.2641
LAG2EG	-0.004674	-0.006694	0.000001	0.0163
DLAG1TUN	0.182697	0.179849	0.000258	0.8593
DLAG2TUN	-0.027651	-0.025758	0.000281	0.9102

Period random effects test equation: Dependent Variable:
DTUN
Method: Panel EGLS (Cross-section random effects) Sample (adjusted):
1994 2017
Periods included: 24
Cross-sections included: 16
Total panel (balanced) observations: 384
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.037589	0.040049	0.938594	0.3486
EG	-0.000616	0.003251	-0.189451	0.8498
LAG1EG	-0.002248	0.003223	-0.697509	0.4859
LAG2EG	-0.004674	0.002880	-1.623003	0.1055
DLAG1TUN	0.182697	0.053831	3.393873	0.0008
DLAG2TUN	-0.027651	0.055013	-0.502623	0.6155

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Period fixed (dummy variables)		
Idiosyncratic random	0.558102	1.0000

Weighted Statistics			
R-squared	0.135712	Mean dependent var	0.001901
Adjusted R-squared	0.067543		
S.E. of regression	0.554445		
F-statistic	1.990808	Durbin-Watson stat	1.969275
Prob(F-statistic)	0.002471		

Unweighted Statistics			
R-squared	0.135712	Mean dependent var	0.001901
Sum squared resid	109.1303	Durbin-Watson stat	1.969275

Cross-section and period random effects test comparisons:

Variable	Fixed	Random	Var (Diff.)	Prob.
EG	-0.001822	-0.004073	0.000002	0.1041
LAG1EG	-0.003607	-0.003340	0.000002	0.8567
LAG2EG	-0.005501	-0.006694	0.000001	0.3200
DLAG1TUN	0.157684	0.179849	0.000333	0.2248
DLAG2TUN	-0.055819	-0.025758	0.000393	0.1296

Cross-section and period random effects test equation: Dependent Variable: DTUN
Method: Panel Least Squares
Total panel (balanced) observations: 384

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.053437	0.042243	1.264989	0.2067
EG	-0.001822	0.003393	-0.536884	0.5917
LAG1EG	-0.003607	0.003408	-1.058376	0.2906
LAG2EG	-0.005501	0.003004	-1.830921	0.0680
DLAG1TUN	0.157684	0.054526	2.891877	0.0041
DLAG2TUN	-0.055819	0.056023	-0.996358	0.3198

Effects Specification
Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.161275	Mean dependent var	0.001901
Adjusted R-squared	0.055201		
S.E. of regression	0.558102		

Sum squared resid	105.9026		
Log likelihood	-297.5528		
F-statistic	1.520397	Durbin-Watson stat	1.986271
Prob (F-statistic)	0.023470		

As can be seen from Table 9, *P* was less than 5% and therefore *H*1 was accepted and fixed effect (Panel EGLS/Cross-section SUR) was used. Explanatory variables explained the level of unemployment about 48.3%. The GDP has 0.4% decrease and a significant effect on unemployment. It also showed that other previous periods also affected unemployment (lag variables). The Okun's coefficient was 0.4% which explained why a 1% increase in GDP growth caused 0.4% decrease in the unemployment rate and an intercept term of 0.06% which was the unemployment rate associated with zero GDP growth. Furthermore, the Durbin-Watson statistic was 1.97 and it was between 1.5 and 2.5 meaning there was no autocorrelation in the model.

CONCLUSION

Unemployment is a major problem experienced by all countries. It affects the population and the entire economy in different dimensions and directions. Governments' policies aim to solve this problem by creating new jobs symmetric with the sustainability of economic growth. There are a huge number of attempts to study the relationship between unemployment and economic growth. Several studies showed a positive relationship (Moses (2008), Driouche (2013), Alamro (2014)), while others showed a negative relationship (Alhdiy et al. (2015), Lee (2000), Fuad (2011), Geidenhuys and Marinkov (2007)). A study of Moses (2008) showed that Okun's law is not valid on many Arab countries, where high economic growth does not seek to reduce unemployment rate such as the case of Algeria, Egypt, Morocco and Tunisia. This study analyzed empirically the impact of economic growth on total unemployment for 16 countries belonging to the ESCWA region for the period from 1991 to 2017 using data collected from the world bank data base. In order to estimate the impact of economic growth on unemployment, the growth model, the gap model and the dynamic model of Okun's law were used. Results of the three above models using all panel model showed that the dynamic model is the suitable one. The panel unit root tests were applied to assess whether series were stationary at level. Results showed that total unemployment rate is non-stationary at the level, while economic growth it is. However, all differenced term of both variables were stationary at 5% significant level. Panel data models can have heteroscedasticity and correlation between errors both contemporaneously and over time. The EGLS (Cross-section SUR) techniques were used because they are robust to contemporary heteroscedasticity and cross section dependence. It should be noted that this technique was used to estimate the first four relationships, while the impact of inflation and economic growth on youth unemployment was estimated using different model and approach. The fixed effect (Panel EGLS/Cross-section SUR) was used. Explanatory variables explained the level of unemployment about 48.3%. GDP had 0.4% decreasing and significant effect over unemployment. This approach showed also the effect of lag on unemployment. The Okun's coefficient was 0.4% which explained why a 1% increase in GDP growth caused a 0.4% decrease in the unemployment rate, whereas 0.06% was the intercept term which can be defined as the unemployment rate associated with zero GDP growth.

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