The impact of economic growth on unemployment in Syria during the period (2000-2021)

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Abstract: The study aimed to know the impact of economic growth on unemployment in Syria during the period (2000-2021). To achieve this goal, the study used the Angel granger cointegration test, and reached the following results:

There is a cointegration relationship between economic growth and unemployment over the period (2000-2021). -

- A decline in the economic growth rate will lead to an increase in unemployment rates in the short term.

- Every 1% increase in the economic growth rate will lead to a reduction in the unemployment rate by approximately 2% in the long term.

Based on the results reached, the researcher recommended the necessity of increasing the competitiveness of the economy and improving the conditions of the labor market in Syria, which would contribute to reducing unemployment rates, creating sustainable job opportunities that are compatible with the workforce, and increasing participation rates in the labor force, which would increase the gross domestic product. This, in turn, stimulates economic growth, focuses on labor-intensive productive projects, and encourages small and medium enterprises to reduce the unemployment problem.

Keywords: Unemployment, economic growth, GDP.

أثر النمو الاقتصادي على البطالة في سورية خلال الفترة (2000-2021)

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المستخلص: هدفت الدراسة إلى معرفة تأثير النمو الاقتصادي على البطالة في سورية في الفترة من (2000-2021)، وقد استعملت الدراسة لتحقيق هذا الهدف اختبار انجل جرانجر للتكامل المشترك، وقد توصلت للنتائج التالية:

- توجد علاقة تكامل مشترك بين النمو الاقتصادي والبطالة خلال الفترة (2000-2021).

- إن الانخفاض في معدل النمو الاقتصادي سوف يؤدي إلى زيادة في معدلات البطالة في الأجل القصير.

- كل زيادة بنسبة1% في معدل النمو الاقتصادي سوف يؤدي إلى تخفيض معدل البطالة بنسبة2% تقريباً في المدى الطويل.

واستناداً للنتائج التي تم التوصل إليها أوصت الباحثة بضرورة زيادة تنافسية الاقتصاد وتحسين ظروف سوق العمل في سورية بما يسهم في تخفيض معدلات البطالة وخلق فرص عمل مستدامة تتناسب مع القوى العاملة وزيادة معدلات المشاركة في قوة العمل بما يزيد من الناتج المحلي الإجمالي مما يؤدي بدوره إلى تحفيز النمو الاقتصادي والتركيز على المشروعات الإنتاجية ذات الكثافة العمالية وتشجيع المؤسسات الصغيرة والمتوسطة للحد من مشكلة البطالة.

الكلمات المفتاحية: البطالة، النمو الاقتصادي، الناتج المحلي الإجمالي.

1. Introduction:

Economic growth is considered one of the goals that governments pursue and people aspire to, because it represents an indicator of their prosperity. Many economic theories have focused on economic growth and defined it with a group of factors, including: foreign trade, the extent of the economy's openness to foreign economic transactions, levels of foreign direct investment flow, and political and health aspects. Human capital is also one of the most important factors affecting economic growth, which reflects positively on the country's economy. The problem of unemployment is one of the most economic and social problems facing the world's economies, whether developed or developing alike. It is a gap between economic activity and employment, that is, when the number of job seekers increases with the lack of available jobs. Okun's law is the logical and theoretical basis for the relationship between economic growth and unemployment.

2. Methodological framework of the research:

2.1 Research problem:

A serious dilemma facing all countries of the world, both developed and developing, in the latter's quest for a sustainable and stable economy. The problem of unemployment is one of the most important and dangerous problems facing economic systems in the world, and it negatively affects all areas, economic and social. Governments seek to reduce its rates and mitigate its effects. Many studies have shown that economic growth rates have a significant impact on unemployment rates. While others denied this relationship, Syria, as one of the Arab and developing countries, suffers from unemployment due to various economic and social causes and variables. The average unemployment rate in Syria during this period, according to statistics from the Central Bureau of Statistics, reached 38%, due to the difficult circumstances that the country went through. A study by(Al-Musabbah,2011) confirmed that every 1% reduction in the unemployment rate requires a growth rate in the gross domestic product of 4.5%. Based on the above, the research problem was defined as follows:

What is the impact of economic growth on unemployment in Syria during the period (2000-2021)?

2.2 The importance of the research:

The importance of this study stems from its focus on examining the relationship between economic growth and unemployment in Syria during the period 2000-2021, measuring and interpreting this relationship. It seeks to provide useful information to researchers and practitioners on the subject, and to assist decision-makers in formulating appropriate policies and solutions to reduce unemployment.

2.3 Research objective :

The main objective of this study is to measure the impact of economic growth on unemployment rates in Syria during the period 2000-2021.

2.4 Research variables:

Independent variable: economic growth, and dependent variable: unemployment

2.5 Research hypothesis:

There is no statistically significant relationship at the significance level $(0.05 \geq \alpha)$ between the level of economic growth and the unemployment rate in Syria during the period 2000-2021.

2.6 **Research limitations:** The limitations of the study are evident in the following: Spatial boundaries: represented by the Syrian Arab Republic, temporal boundaries: 2000-2021

2.7 **Research methodology**: The descriptive approach was relied upon to cover the theoretical framework based on a group of references and previous studies. The standard approach was also used to analyze the relationship by relying on statistical data from the relevant official authorities for the purpose of obtaining significant outputs to test the relationship under study.

2.8 Research terminologies :

2.8.1   **Unemployment:** a group of people of working age who want and are looking for work but cannot find it at the required level and type during a certain period of time.

2.8.2   **Economic Growth:** Economic growth is limited; As a quantitative concept of changes occurring in the gross domestic product, which is limited to making changes in economic areas only without focusing on other areas.

2.8.3   **Gross Domestic Product:** The sum of goods and services that are produced by the elements and factors of production available within the country only during a certain period of time, regardless of the nature of the individuals who own these elements (nationals or foreigners residing in the country)

3.   Previous studies:

Arab studies:

Study (Al-Shall, 2021) ,the study aimed to measure and analyze the impact of economic growth on unemployment during the period (1990-2018). The study used the descriptive analytical method. Relying on a number of data and figures issued by official sources, the researcher used the standard approach to prove the hypotheses. This study reached results, the most important of which are: the existence of a bidirectional causal relationship between economic growth and unemployment in Egypt.

A study (Al-Waeli and Shadhan, 2021).the study aimed to determine the impact of some macroeconomic variables on the unemployment rate in Iraq during the period (2004-2017). The study used the descriptive approach to describe and analyze the components of the subject, in addition to the multiple linear regression method to understand the nature and extent of the relationships between the variables. The study concluded with several results, the most notable of which are: the insignificance of macroeconomic variables (such as investment spending, current spending, and GDP growth) and their weak impact on the unemployment rate.

A study (Omar, 2021) , the study aimed to study the relationship between unemployment and economic growth in Algeria. The study used the descriptive analytical approach in addition to the standard approach, and adopted statistical and quantitative methods. This study reached results, the most important of which is: the existence of a mutual inverse relationship between unemployment and economic growth.

A study (Miloud, 2014) , the study aimed to identify the modern determinants of economic growth in the Arab countries (Algeria, Egypt, Saudi Arabia) and ways to activate them. The study used the descriptive analytical approach in addition to the historical approach, and relied on some statistical and quantitative methods in the applied aspect. This study reached several results, the most important of which are: trade openness, foreign direct investment, human capital, and good governance are among the most prominent modern determinants of economic growth in the mentioned countries.

Foreign studies:

A study (Onaran & Neslihan, 2022), the study aimed to find out the relationship between economic growth, health, research and development expenditures, and unemployment in Turkey. The study used the descriptive analytical approach with standard statistical estimates, regression models, and cointegration tests to prove the relationship. The study reached several results, the most important of which are: - There is an inverse relationship between the level of unemployment and economic growth, and that the positive change in the levels of spending on health and research and development in Turkey has made a positive contribution to economic growth.

Study (Mustafa & Misini, 2022) ,the study aimed to determine the relationship between economic growth and unemployment in Kosovo. The study used the descriptive approach with standard statistical estimates, regression models, and cointegration tests. The study reached several results, the most important of which are: Economic growth has an impact on unemployment and poverty rates in Kosovo, but it is a small impact that does not contribute significantly to the actual reduction of poverty rates.

Study (Kreishan, 2011) , the study aimed to find out the nature of the relationship between economic growth and unemployment in Jordan. The study used the descriptive analytical approach with standard statistical estimates, regression models, and cointegration tests to prove the relationship. The study reached several results, the most important of which are: - There is a long-term cointegration relationship between unemployment and economic growth in Jordan during the period (1970-2008).

A study (Pravesh, 2011) , the study aimed to study the relationship between spending on education and economic growth in India. The study used the descriptive analytical approach with standard statistics estimates, regression models, and cointegration tests to prove the relationship. The study reached several results, the most important of which are: - There is a long-term cointegration relationship between spending on education and economic growth in India during the period (1980-2008).

What is new that this study presents: There are many previous studies that dealt with the relationship between economic growth and unemployment, and we have presented some of them, as this study agrees with previous studies in the nature and purpose of the research topic, and it is similar to the studies of (Kreishan, (2011) and (Omar, 2021) in the methodology followed and the result reached, while this study differs from all previous studies in the place and time of application, the contribution that we would like to add to the research that dealt with the same topic revolves around applying this study to know the nature of the relationship between unemployment and economic growth in Syria during the period (2000-2021).

4. Theoretical framework:

4.1 Economic growth:

What is economic growth: Economic growth is defined as an increase in gross domestic product and gross national product; Which results in increasing national wealth; Including production capacity and structural changes to the economy, which is known in its narrow sense as increasing the per capita share of national income (in quantitative terms).(Haller,2016).

4.1.1 Economic determinants of economic growth:

We will limit ourselves to the internal economic determinants of economic growth:

4.1.1.1 **Human capital**: It is considered the most important productive element that can contribute to achieving development, and this depends on the quality of education capable of improving and developing human resources to raise efficiency and mental ability to raise the productivity of the various sectors of the economy.(Al-Musabeh,2005).

4.1.1.2 **Inflation**: It is an important indicator that expresses internal economic stability and is closely linked to macroeconomic variables such as saving, investment, unemployment, growth, etc. This interconnection results in results that differ from one economy to another.(Al-Jaafrawi,2020)

4.1.1.3 **Final consumption**: It has a major role in economic growth, as increasing consumption means increasing demand, which requires an increase in production to meet demand, which leads to economic growth.

4.1.1.4 **Raw accumulation of fixed assets**: This is the value of the increase in processing goods and services loaded for these goods. It also includes the accumulation on land and buildings, which contributes to determining the raw internal product.

4.1.1.5 **Unemployment:** It means the presence of a large number of unemployed people in any society, which results in many effects, including a decrease in the level of individual income and a decrease in purchasing power. Consequently, consumer spending decreases, as does the volume of saving. All of these effects negatively affect the growth rates of productive sectors that affect economic growth.(Maalala and Darwish,2015).

4.2 Unemployment:

The concept of unemployment: the forced or sometimes voluntary unemployment or cessation of part of the workforce in a society, despite the workforce's ability and desire to work and produce.(Al-Wazani and Al-Rifai,2006)

4.2.1 Measuring unemployment: The unemployment rate is one of the most important macroeconomic indicators. The unemployment rate is usually measured by official bodies as the ratio of the number of unemployed to the labor force in society (active category) at a certain point, using the following formula: Unemployment rate = number of unemployed / active category * 100, as the labor force or active category consists of individuals who are of working age who are able and willing to do so, whether they are working or not working. (Ali,2011).

4.2.2 Types of unemployment:

Among them is frictional unemployment: which is cessation of work due to changing from one job to another, or cessation to search for another profession, or due to study, and it has two types, seasonal and voluntary. Among them is structural unemployment: it occurs due to changes that occur in the productive structure of the national economy. Periodic unemployment: occurs during periods of recession to which the economy is exposed from one period to another. Disguised unemployment: means the presence of excess labor whose withdrawal does not affect the volume of production, such as labor in the government sector.

As for involuntary unemployment: it is the situation that forces the worker to leave his job even though he is willing and able to do it and meets the prevailing wage level.(Najat and Mabrouka,2019).

4.3 The relationship between unemployment and economic growth:

Unemployment, according to the International Labor Organization, means all people of working age who want and are looking for work but cannot find it of the required type or level during a certain period of time.(Qanawi ,2023). It is assumed that reducing unemployment rates and increasing the volume of employment will lead to increased economic growth.

Okun's law (1962) is considered the theoretical basis for the relationship between economic growth and unemployment. This law is an inverse, reciprocal relationship between the GDP growth rate and the unemployment rate. Okun proposed two models for this relationship (the gap model and the difference model):(Khamraj&Mardick&Semmler,2016).

The gap model: It takes the following form: $-\mathbf{B}(\boldsymbol{u_t} - \boldsymbol{u_t})^* = \boldsymbol{y_t} - \boldsymbol{y_{t^*}}$

Difference model:

$$A\boldsymbol{y_t} = B_0 - A\boldsymbol{u_t} + \boldsymbol{e_t}$$

Where: e error term, B Okin's coefficient, U^T the natural rate of unemployment

Y: actual real GDP, U: actual unemployment rate

Y*Possible real gross domestic product. Many studies confirm the importance of this relationship. The study (Jawda and Issa, 2010) found that unemployment has a negative impact on economic growth. The presence of an increasing amount of unemployment will certainly lead to waste and depletion of available resources, especially in the case of rentier economies in which growth is not real. While other studies have confirmed that a high growth rate does not always correspond with a decrease in the unemployment rate Rather, in special cases, an increase in the unemployment rate is observed despite achieving positive growth rates. For example, the Canadian economy achieved a growth rate of 1.8% in 2009 with an unemployment rate of 7.2%, and 3.4% with an unemployment rate of 7.7% in the year 2017. (I M F ,2018). This difference in the unemployment rate and its relationship to economic growth may be due to economic policies that failed to reduce the unemployment rate. It may be due to the error of linking the unemployment rate with increased growth, which means increased productivity in which the economy may not be able to absorb a new workforce. This is what we will try to find out in the case of the Syrian economy

After examining the methodological and theoretical framework of the research, the research presented the standard statistical study:

Measuring economic growth: Economic growth as a quantitative concept is limited to changes in gross domestic product, which is limited to bringing about changes in economic areas only without focusing on other areas. The researcher relied on the gross domestic product to calculate the economic growth rate.

Measuring unemployment: Unemployment is measured by dividing the number of unemployed by the total labor force and multiplying the result by one hundred. The labor force is the number of workers in addition to the number of unemployed, and as a result of the growing phenomenon of the hidden economy in developing countries, the unemployment rate cannot be determined accurately.(Zerbo,2008).

5. The statistical study:

Table No. (1) shows the results of the descriptive analysis of the economic growth and unemployment series during the period extending between the years (2000-2021). It is clear from the table that the average annual growth during the mentioned period was slightly negative and amounted to (-0.008), and reached its peak in 2002 when it reached (7.9%), while its negative rates were evident during the years of war, and were lowest in 2012 and 2013 when it reached below The (-26%). In contrast to economic growth, the average unemployment rates during the period were positive, reaching (20.7). The highest was in 2015, when it reached more than (48%), and the lowest was in 2005, when it reached (8%). The high unemployment rates since 2011 and what followed also reflects the conditions of war during which the country went through, and its negative repercussions on the national economy and the entire production process.

What was mentioned above is confirmed by the high value of the standard deviation for the growth rates series, as well as for the unemployment rates series, reaching (0.094) for the first series, and (0.13) for the second series, respectively, which indicates a large discrepancy in the values of the variables. Negative skewness of the growth series also indicates that most of the data falls on the positive side   The occurrence of some of them on the negative side during the years that witnessed a significant decline in the pace of economic growth, and in the opposite way, shows the positive skewness of the unemployment rate series, where the skewness coefficient was positive and reached (0.7).

Table No. (1): Some descriptive statistics for the economic growth rate and unemployment rate series in Syria during the period (2000-2021):

	UN	GRO
Mean	0.207390	-0.008291
Median	0.135953	0.013462
Maximum	0.483434	0.078586
Minimum	0.080852	-0.263390
Std. Dev.	0.133496	0.094018
Skewness	0.704950	-1.841063
Kurtosis	2.098318	5.574977
Jarque-Bera	2.567444	18.50618
Probability	0.277004	0.000096
Sum	4.562584	-0.182392
Sum Sq. Dev.	0.374246	0.185625
Observations	22	22

Source: The table was prepared by the researcher, based on the outputs of (Eviews 10).

The (Jarque-Bera) test also indicates that the distribution is not normal for the economic growth series, as the probability value of the test reached (0.000096), which is much less than the probability value (0.05), which means rejecting the hypothesis of a normal distribution. As for the result of applying this test to unemployment rates, it confirmed that these rates follow a normal distribution to a large extent, as the probability value of the test reached (0.277), which is higher than the probability value (0.05), which means accepting the hypothesis of a normal distribution.
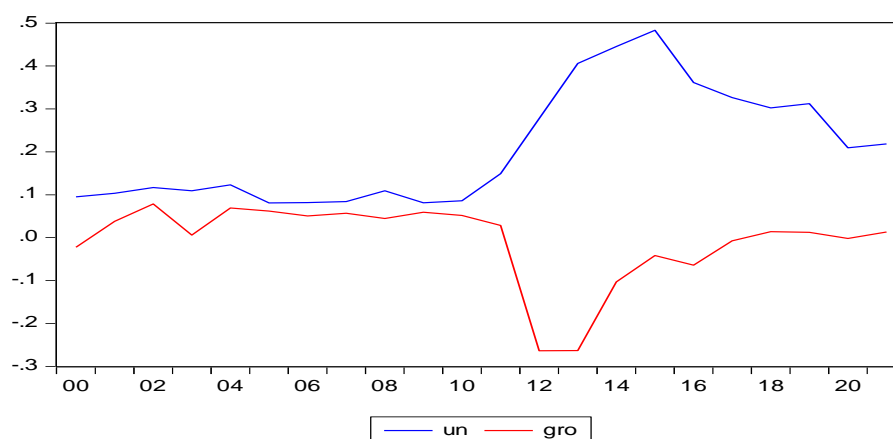
Cointegration is used in econometrics to understand and test long-term relationships between economic variables, and to predict the future trends of those relationships. The idea of cointegration is based on the economic concept of the statistical characteristics of time series. The model stipulates that there is a long-term equilibrium relationship between economic variables. This equilibrium relationship is assumed by economic theory by correcting the divergence in this relationship   Due to economic forces that work to restore balance between variables to move towards balance in the long term. In other words, if there is a cointegration relationship between two variables, this indicates that the two variables move together in the long term even though they may diverge in the short term. The lack of a cointegration relationship between the variables indicates that these variables are independent of each other in the long run.

The degree of stability of time series is one of the most important determinants of choosing the most appropriate standard model to test the cointegration relationship between two or more variables. The stability of time series indicates that its characteristics, such as the mean and variance, do not change over time, and therefore do not show major trends and fluctuations in the long term, which facilitates the process of predicting the future of the relationship between variables through the outputs of the model used.

Table No. (1) shows that the economic growth rate series is stable in level in only one case, which is the absence of a categorical and a trend, and it is unstable for the rest of the cases (the presence of a categorical) and (the presence of a categorical and a trend). As for the unemployment rate series, it is unstable in level in all three cases, but it becomes stable after the first difference in the case of the absence of a categorical and a trend. It remains unstable after the first difference in the cases of (the presence of a categorical) and (the presence of a categorical and a direction), while the growth rate series stabilizes after the first difference in the three cases. Then, the stability of the economic growth series at the level in the case of (the absence of a categorical and a trend), as well as the stability of the unemployment rate series after taking the first difference also in the absence of a categorical and a trend, means that we are faced with two complementary variables with two different degrees (0) and (1), and thus it becomes the most appropriate model for such a case It is the use of the ARDL model, as it does not require converting the data into a fixed form and single degrees of integration, as is the case in traditional cointegration models such as the Angell-Granger model and the Johansson cointegration model.

Table No. (2): Results of the unit root test (UNIT ROOT) for time series (economic growth rate and unemployment rate):

NULL: UNIT ROOT Agmented Diky Fuller				
Methods	variables*	Model (3)	model (2)	model (1)
Level	Gro	-2.05085 (0.2647)	-2.14668 (0.4924)	-2.1035 (0.0368)
	Un	-1.6182 (0.4553)	-3.02796 (0.1535)	-0.60314 (0.4433)
First difference	Δ gro	-4.08961 (0.0058)	-4.02058 (0.0264)	-4.21261 (0.0003)
	Δ un	-2.80197 (0.6758)	-2.76979 (0.2227)	-2.85935 (0.0066)

Source: The table was prepared by the researcher, based on the outputs of (Eviews 10).

5.1 Determine the degree of deceleration:

Before conducting the testing and estimation process, we determined the degree of deceleration of the path (var), based on the criteria: Hannan Quinn, Schwarz, Akaike, and the results were as shown in Table (3).

Table No. (3): Determining the optimal number of deceleration periods according to (VAR) analysis:

VAR Lag Order Selection Criteria

Endogenous variables: GRO

Exogenous variables: C

Date: 06/02/24 Time: 23:25

Sample: 2000 2021

Included observations: 12

Lag	LogL	LR	FPE	AIC	SC	HQ
0	10.28426	NA*	0.012465	-1.547377	-1.506968	-1.562338
1	12.37461	3.483915	0.010422	-1.729102	-1.648284	-1.759024
2	13.73541	2.041196	0.009889*	-1.789235*	-1.668008*	-1.834117
3	13.76931	0.045200	0.011800	-1.628218	-1.466583	-1.688061
4	14.24472	0.554641	0.013238	-1.540786	-1.338742	-1.615590
5	14.78917	0.544454	0.014934	-1.464862	-1.222408	-1.554627
6	14.78935	0.000152	0.018916	-1.298225	-1.015363	-1.402951

Lag	LogL	LR	FPE	AIC	SC	HQ
7	15.68984	0.600328	0.021420	-1.281641	-0.958370	-1.401327
8	15.70801	0.009084	0.029898	-1.118002	-0.754322	-1.252649
9	15.88029	0.057425	0.045653	-0.980048	-0.575959	-1.129656
10	21.66831	0.964671	0.036379	-1.778052	-1.333555	-1.942621*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

<p align="center">Table No.(4):</p>

VAR Lag Order Selection Criteria

Endogenous variables: UN

Exogenous variables: C

Date: 06/02/24   Time: 23:30

Sample: 2000 2021

Included observations: 12

Lag	LogL	LR	FPE	AIC	SC	HQ
0	9.085775	NA	0.015220	-1.347629	-1.307220	-1.362590
1	15.65823	10.95409	0.006029	-2.276371	-2.195554	-2.306293
2	18.23988	3.872471*	0.004668*	-2.539979	-2.418753*	-2.584862
3	18.88706	0.862918	0.005029	-2.481177	-2.319542	-2.541021
4	19.07094	0.214525	0.005922	-2.345157	-2.143113	-2.419961
5	20.09297	1.022031	0.006170	-2.348829	-2.106376	-2.438594
6	20.09578	0.002337	0.007811	-2.182630	-1.899767	-2.287355
7	20.31569	0.146606	0.009908	-2.052614	-1.729343	-2.172301
8	20.31672	0.000519	0.013869	-1.886121	-1.522441	-2.020768
9	24.85880	1.514026	0.010223	-2.476467	-2.072378	-2.626075
10	26.82977	0.328494	0.015390	-2.638294*	-2.193796	-2.802863*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

<p align="center">**Source: The table was prepared by the researcher, based on the outputs of (Eviews10).**</p>

We conclude from the previous table that the appropriate lag period (SC, AIC) is P = 2 for the growth rate series (gro), while the degree of slowdown chosen for the unemployment rate series was P = 10 according to the (AIC) criterion and P = 2 according to the (SC) criterion.

Results of the ARDL Model Table No. (4) shows the statistical results of the relationship between the economic growth rate and the unemployment rate in Syria during the period extending between the years (2000-2021), and the following appears from the table:

UN(-1) = 0.06675 indicates that the effect of unemployment in the previous time period is very small and is not statistically significant, as the P-Value reached 0.798, which is higher than the significance level of 0.05.

UN(-2) = 0.3356 indicates that the effect of unemployment in the second slowdown period is more pronounced on current unemployment, and the probability value reached 0.08, which is statistically significant at the 10% significance level.

GRO(-0.5449) represents the coefficient of the instantaneous impact of economic growth on the unemployment rate. It means that with every 1% increase in the economic growth rate there will be an immediate decrease in the unemployment rate in the same period by 0.54%. Considering the P-Value of 0.0006, we can say that we are confident that economic growth has an impact on unemployment.

GRO(-1)(-0.269901) represents the coefficient of the impact of economic growth on unemployment with one lag period. This means that every 1% increase in economic growth in the previous period will lead to a decline in the unemployment rate in the current period by approximately 0.27%. The P-Value was 0.0649, which is not statistically significant at the 5% significance level, but statistically significant at the 10% significance level.

GRO(-2) =-0.38888 represents the coefficient of the effect of economic growth on unemployment for two periods of slowdown. It indicates that with every increase in economic growth by 1%, there will be a decrease in the current unemployment rate by 0.388%. This effect is statistically significant, as the probability value reached 0.022, which is less than the significance level of 5%.

Table No. (5): ARDL model

Dependent Variable: UN

Method: ARDL

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Sample (adjusted): 2002 2021

Included observations: 20 after adjustments

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (2 lags, automatic): GRO

Fixed regressors: C

Number of models evalulated: 6

Selected Model: ARDL(2, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UN(-1)	0.066759	0.256338	0.260432	0.7983
UN(-2)	0.335680	0.181714	1.847305	0.0859
GRO	-0.544966	0.123460	-4.414114	0.0006
GRO(-1)	-0.269901	0.134739	-2.003144	0.0649
GRO(-2)	-0.388899	0.151324	-2.569969	0.0222
C	0.123125	0.023622	5.212401	0.0001
R-squared	0.958489	Mean dependent var		0.218205
Adjusted R-squared	0.943663	S.D. dependent var		0.135429
S.E. of regression	0.032145	Akaike info criterion		-3.793821
Sum squared resid	0.014466	Schwarz criterion		-3.495101
Log likelihood	43.93821	Hannan-Quinn criter.		-3.735507
F-statistic	64.65141	Durbin-Watson stat		2.563938
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model				
selection.				

Source: The table was prepared by the researcher, based on the outputs of (Eviews10).

We conclude from the above that, in general, all coefficients indicate the existence of an inverse relationship between economic growth and unemployment, as every increase in economic growth rates is matched by a decrease in current and future

unemployment rates, and this result is consistent with economic theory which indicates that economic growth leads to the creation of job opportunities that reduce unemployment rates

5.2 Model quality indicators

An R-squared of 0.958 indicates that 95.85% of the variance in the unemployment rate can be explained by economic growth.

5.3 Adjusted R-squared: indicates that the adjusted interpretation rate is also high, reaching more than 94%.

5.4 Bounds test: Table No. (6) shows the results of the limits test through which we can reach the equation of the long-term relationship between economic growth and unemployment, as well as the short-run equation for this relationship and the speed of adjustment to return to the balanced relationship in the long run.

Table No. (6): Boundary testing

ARDL Long Run Form and Bounds Test

Dependent Variable: D(UN)

Selected Model: ARDL(2, 2)

Case 2: Restricted Constant and No Trend

Date: 06/02/24   Time: 23:41

Sample: 2000 2021

Included observations: 20

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.123125	0.023622	5.212401	0.0001
UN(-1)*	-0.597561	0.112157	-5.327896	0.0001
GRO(-1)	-1.203767	0.228343	-5.271740	0.0001
D(UN(-1))	-0.335680	0.181714	-1.847305	0.0859
D(GRO)	-0.544966	0.123460	-4.414114	0.0006
D(GRO(-1))	0.388899	0.151324	2.569969	0.0222
* p-value incompatible with t-Bounds distribution.				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GRO	-2.014466	0.207780	-9.695197	0.0000
C	0.206047	0.012186	16.90889	0.0000
EC = UN - (-2.0145*GRO + 0.2060)				
F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	10.23624	10%	3.02	3.51
K	1	5%	3.62	4.16
		2.5%	4.18	4.79
		1%	4.94	5.58
Actual Sample Size	20		Finite Sample: n=30	
		10%	3.303	3.797
		5%	4.09	4.663
		1%	6.027	6.76

Source: The table was prepared by the researcher, based on the outputs of (Eviews 10).

5.5 Long-term equation:

The following formula represents the long-term relationship between economic growth and unemployment in Syria during the period (2000-2021). $EC = UN - (-2.0145*GRO + 0.2060)$

This equation explains that the unemployment rate is about 20.6% when the gross domestic product is constant or non-existent, i.e. the value of the equation constant B0, and that every 1% increase in economic growth will lead to a reduction in the unemployment rate in the long run by approximately 2%.

5.6 Short-run equation:

The constant C (0.123) reflects the effect of fixed or independent factors on other variables.

D(UN(-1))(-0.335680) represents the instantaneous effect of the change in unemployment from the previous period, and it appears that this effect does not bear statistical significance, as the probability value reached 0.085, which is higher than the significance level of 0.05.

D(GRO) (-0.544966) represents the instantaneous effect of the change in economic growth in the current period, and the P-value of 0.0006 indicates that this effect is statistically significant.

D (GRO (-1)) (0.388899) represents the instantaneous effect of the change in economic growth in the previous period, and it is clear that this effect is statistically significant, as the P-value reached 0.0222, which is less than the significance level of 0.05.

The ECM (-0.597561) reflects the speed of adjustment towards the long-term equilibrium relationship after any deviation from this relationship occurs, meaning that approximately 59.76% of the deviations in unemployment rates are corrected in each time period.

So we can say that through the short-term relationship that shows the instantaneous and immediate effects of the change in the economic growth rate on the unemployment rate, that a decrease in economic growth will lead to an increase in unemployment rates in the short term, but the immediate effects and time delays indicate that this relationship is complex and intertwined, and the error correction factor also indicates that this relationship tends to return to equilibrium after any shock or deviation occurs in the short term.

We remain to point out that the value of the Fisher statistic (F-statistic) of 10.23624 is higher than all the critical values at the different levels of confidence, which confirms the existence of a cointegration relationship between economic growth and unemployment in Syria during the period studied.

6. Results and recommendations:

Results :

Test results showed:

- There is a short- and long-term relationship between economic growth and unemployment, which is consistent with previous studies mentioned in the above research.
- A decline in economic growth rates will lead to an increase in unemployment rates in the short term.
- Every 1% increase in the economic growth rate will reduce the unemployment rate by approximately 2% in the long term..
- There is a cointegration relationship between economic growth and unemployment in Syria during the period studied (2000-2021).

Recommendations :

Based on the findings of this research paper, we propose the following recommendations:

1- Increase economic competitiveness and improve labor market conditions in Syria, which would contribute to reducing unemployment rates.
2- Create sustainable job opportunities commensurate with the workforce and increase labor force participation rates, which would increase GDP, which in turn would stimulate economic growth.

3- Focusing on labor-intensive productive projects and encouraging small and medium enterprises to reduce the unemployment problem..

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