

The Impact of Selected Economic Variables on Unemployment Rates in Algeria: An Empirical Study

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Received: 15-03-2025

Accepted:08-06-2025

Abstract: This study looks at how key economic factors affected Algeria's unemployment rate from 1991 to 2023 using the ARDL model, the dynamic cumulative multiplier was employed to ensure the reliability of the analysis. Results show that unemployment is not impacted in the short run by economic growth. Long-term unemployment is likewise unaffected by governmental spending and inflation. On the other hand, long-term unemployment is adversely impacted by oil prices, GDP, FDI, and domestic credit to the private sector. These factors are essential for lowering unemployment through increased output, assistance from the private sector, and the growth of SMEs through funding, improved infrastructure, and diversification away from hydrocarbons. By improving labor market absorption and successfully lowering unemployment, this dynamic interaction creates a climate for sustainable growth.

Keywords:

economic variables;
Unemployment Rates;
DARDL model.

JEL Classification Codes:O47 ; E24; C32

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1. INTRODUCTION

Unemployment is a pervasive global economic challenge, characterized by a fundamental imbalance between labor supply and demand. Its severity varies widely across nations, heavily influenced by their unique economic landscapes and political structures. Contributing factors range from ineffective economic policies and insufficient productive investments to the disruptive impact of technological advancement, economic stagnation, and a critical mismatch between educational outputs and labor market needs. Countries typically implement multifaceted strategies to counter this, including enhancing education and vocational training, deploying sound fiscal policies to stimulate job creation, and fostering flexible work environments alongside robust labor laws.

Like many resource-rich countries, Algeria faces a significant unemployment challenge, largely attributable to the inherent characteristics of its rentier economy. This economic model, heavily reliant on hydrocarbon revenues, leaves the country acutely vulnerable to global energy market fluctuations. The 2014 oil crisis starkly illustrated this vulnerability, triggering severe economic imbalances and substantial budget deficits. In response to this fiscal strain, the Algerian government implemented a Public Expenditure Governance Policy. A key measure under this policy was a freeze on public sector hiring. This decision, while aimed at fiscal consolidation, inevitably exacerbated the unemployment rate, particularly given the historical reliance on state employment as a primary job creation engine. Furthermore, Algeria's private sector has historically struggled to play a significant role in absorbing the unemployed workforce. This limited capacity of the private sector to generate sufficient jobs is a critical structural weakness. It stems from a combination of factors, including a challenging business environment, bureaucratic hurdles, and often, a lack of diversification away from the hydrocarbon sector.

Research Question

Based on the above, the following research question is posed as follows: What were the main variables that affected the unemployment rate in Algeria during the period (1991-2023)?

Study hypothesis

- Selected economic variables contribute to reducing unemployment rates.

Previous studies

- Boudani Benskarane, Mohamed Amine Boumediene (2023), *The Determinants of Unemployment in the Maghreb Countries 1996-2022*, Journal of Economic Researcher: This study aimed to analyze the determinants of unemployment in Maghreb countries using PANEL models and the co-integration test, the study found a negative impact of population size, GDP, and population size on unemployment, while trade opening had a positive impact on unemployment.
- Chukwuebuka Bernard Azolibe (2022), *The Determinants of Unemployment Rate in Developing Economies: Does Banking System Credit Matter?* African Governance and Development Institute Journal: This study aimed to determine the main variables that influence unemployment, as well as to compare South Africa and Nigeria during the period 1991-2018 using the VECM and VAR models. This study concluded that bank credit, inflation, government expenditure, interest rate, and population growth are among the major variables that contributed to reduce unemployment in South Africa compared to Nigeria. On the other hand, foreign direct investment has been considered an important factor in fighting against unemployment in Nigeria more than in South Africa.

- Zainul Hasan and Hadi Sasana (2020), in their study titled "Determinants of Youth Unemployment Rate in ASEAN," published in the JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH, Volume 9, Issue 03, they analyzed the factors influencing the growth of youth unemployment in ASEAN countries between 2001 and 2017. The study employed a range of economic and social variables, including GDP, FDI, trade openness, the Human Development Index, and the population aged 0-14, using the Least Square Dummy Variable (LSDV) estimator for panel data analysis, the research found that GDP, FDI , and inflation exerted a significant negative impact on youth unemployment rates. Conversely, trade openness, the Human Development Index, and the population aged 0-14 significantly impact youth unemployment.

Study Objectives

This study aims to:

- Recognize unemployment and its types;
- Measure the impact of certain selected variables on unemployment in Algeria.

2. Theoretical framework

Unemployment rates are one of the most important economic indicators, because they determine the percentage of individuals who are able and willing to work, but who are unable to find a job. They also assess the economic performance of all countries. This rate is linked to the level of economic growth, where recession leads to an increase in unemployment, while economic recovery contributes to its reduction.

Unemployment definition, its types, and the evolution of unemployment in Algeria are presented as follows.

2.1 Definition of unemployment

Jean-Baptiste Say defined unemployment as: "An obstruction in the circulation of goods due to the absence of buyers for the quantity produced, leading to the stoppage of many machines and the unemployment of many workers." There are two essential conditions for defining an unemployed person: (ZERBOUT, KARA, & BOUAKEL, 2023, p. 697)

- The person must be able and willing to work.
- The person must be actively seeking employment.

Based on this, economists, as recommended by the International Labor Organization, have unified the definition of an unemployed person as someone who can work, is available for work, and is seeking work at the prevailing wage rate but cannot find employment. This definition applies to those entering the labor market for the first time, as well as to those who were previously employed but have lost their jobs for any reason (ZERBOUT, KARA, & BOUAKEL, 2023, p. 698).

The unemployment rate is calculated as follows: (Office, 2019, p. 06)

$$\text{Unemployment rate} = (\text{Unemployment} / \text{Labor force}) \times 100\%$$

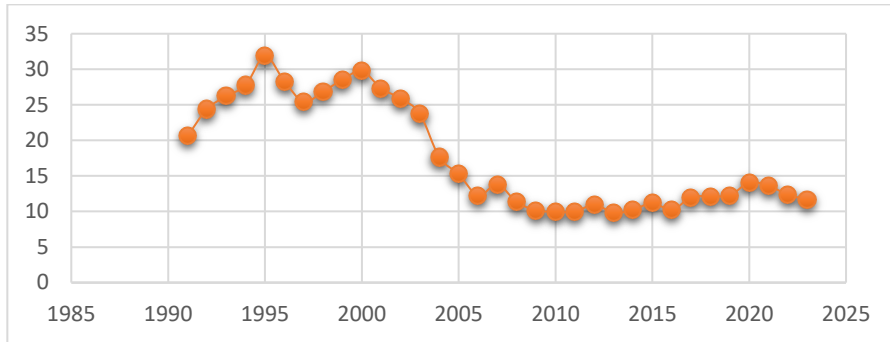
2.2 Types of unemployment

Unemployment can be categorized into several types (Dear Mahnaz & Saeidi, 2017, p. 73) :

- **Frictional Unemployment:** This occurs during transitional periods between jobs when an individual is changing their job.
- **Seasonal Unemployment:** This occurs when there is no demand for labor during certain seasons, such as for agricultural workers and construction workers.
- **Disguised Unemployment:** This occurs when a person is engaged in some form of work and has a source of income, but their work does not contribute positively to the economy.

2.3 Evolution of the unemployment rate in Algeria

Fig.1. Evolution of unemployment rates in Algeria (1991-2023)



Source: Based on World Bank data

Unemployment rates in Algeria between 1991 and 2023 experienced four main phases:

- **1991-2000:** Unemployment increased sharply due to political and security conditions during the "black decade", reaching a peak in 1995, rating of 31.84%.
- **2001-2010:** Unemployment fell significantly due to expansionary economic policies following the rise in oil prices. The rate fell from 27.3% in 2001 to 9.96% in 2011.
- **2012-2020:** The decline continued, reaching its lowest level in 2013 with a rate of 9.82%. However, the rate started to increase again in 2018 due to austerity policies and a freeze on public sector recruitment. This trend increased in 2020, with a rate of 14.04%, due to the fall in oil prices and the COVID-19 pandemic.
- **2021-2023:** Unemployment rates have relatively stabilized, oscillating between 11.81% in 2023 and 12.43% in 2022, despite economic difficulties such as inflation.

3. Empirical study

The macroeconomic variables that influenced the unemployment rates in Algeria from 1991 to 2023 are measured using the ARDL model.

3.1 Model description

To examine the impact of macroeconomic variables on the unemployment rate, relevant variables are selected based on economic literature and previous studies. The data was collected from the World Bank and OPEC. The suggested econometric model is as follows:

$$\text{Ump} = C + \text{Poil} + \text{PRVT} + \text{INF} + \text{GDP} + \text{Govp} + \text{FDI} + \varepsilon_t$$

Given that:

- **Dependent variable:** Unemployment rate
- **Explanatory variables:**
 - Poil: Oil price (in dollars);
 - PRVT: Domestic credit to private sector (% of GDP) ;
 - INF: Inflation (percentage);
 - GDP: GDP growth (in percentage);
 - govdp: General government final consumption expenditure (% of GDP);
 - FDI: Foreign direct investment (percentage).

3.2 Variance Inflation Factor (VIF)

To avoid multicollinearity, some economic variables were removed. This issue is detected using the Variance Inflation Factor (VIF), which measures the level of multicollinearity within a set of multiple regression variables.

Mathematically, the VIF for a predictor in a regression model is the ratio of the overall model variance to the variance of a model that includes only that single independent variable. VIF values indicate which variables might be the source of the

multicollinearity problem, typically identified by values greater than 10. The independent variable with the highest VIF is considered the primary cause of multicollinearity. (Abeer, 2022, p. 145)

Table 1.Results of Variance Inflation Factor (VIF)

Variance Inflation Factors
Date: 05/25/25 Time: 19:18
Sample: 1991 2023
Included observations: 33

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
PRVT	0.003949	4.961584	1.314991
POIL	0.000468	8.642718	2.302204
INF	0.003909	2.709813	1.422110
GOVP	0.055773	75.02378	1.404284
GDP	0.060711	3.552761	1.540536
FDI	1.537566	3.991557	2.159712
C	17.99178	84.81902	NA

Source:Based on Eviews 13 output

The results indicate that the model is free from the problem of multicollinearity, as none of the Variance Inflation Factor values exceeded the threshold of 5. This confirms that all independent variables included in the model do not suffer from multicollinearity.

3.3 Test for the root of unity

Before estimating any model, the stationarity of the series should be first studied based on the Phillips-Perron test, as shown in the following table:

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Table 2. Results of the Phillips-Perron test

UNIT ROOT TEST TABLE (PP)								
<u>At Level</u>		UMP	PRVT	POIL	INF	GOVP	GDP	FDI
With Con...	t-Statistic	-0.8738	-4.9881	-1.5104	-2.1978	-1.9315	-4.2126	-2.0673
	Prob.	0.7835	0.0003	0.5156	0.2109	0.3143	0.0024	0.2584
		n0	***	n0	n0	n0	***	n0
With Con...	t-Statistic	-2.1301	-17.7415	-2.2275	-1.6194	-2.0651	-4.1632	-2.1341
	Prob.	0.5103	0.0000	0.4592	0.7626	0.5447	0.0130	0.5082
		n0	***	n0	n0	n0	**	n0
Without C...	t-Statistic	-0.8691	-2.8152	-0.0709	-2.1067	0.2178	-1.9851	-1.2720
	Prob.	0.3317	0.0064	0.6515	0.0356	0.7430	0.0465	0.1831
		n0	***	n0	**	n0	**	n0
<u>At First Difference</u>								
		d(UMP)	d(PRVT)	d(POIL)	d(INF)	d(GOVP)	d(GDP)	d(FDI)
With Con...	t-Statistic	-4.3804	-21.8546	-5.1900	-5.9297	-4.8081	-11.4186	-6.9617
	Prob.	0.0016	0.0001	0.0002	0.0000	0.0005	0.0000	0.0000
		***	***	***	***	***	***	***
With Con...	t-Statistic	-4.2585	-20.4656	-5.0538	-7.9163	-4.8552	-11.3342	-6.9365
	Prob.	0.0106	0.0000	0.0015	0.0000	0.0025	0.0000	0.0000
		**	***	***	***	***	***	***
Without C...	t-Statistic	-4.3298	-20.5409	-5.1992	-5.9019	-4.8593	-11.5813	-7.0709
	Prob.	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		***	***	***	***	***	***	***

Source:Based on Eviews 10 output

The results in the table above show that all-time series are not stationary at the level and stationary is at the first differences, which indicates an integration of order one I(1) at the 5% significance level. With the exception of GDP growth and Domestic credit to private sector, they are stationary at level I(0). Thus, the ARDL methodology can be applied.

3.4 ARDL Model Estimation

This step is about determining the main economic variables that influence unemployment in Algeria over the period 1991-2023 using the ARDL model developed by Pesaran et al. (2001). This model combines staggered lag models and autoregressive models into one. In this approach, the time series are considered as a function of their lags and the current values of the explanatory variables and their lags on one or more periods (Munaf & Mayson , 2024, p. 442). This model can be applied if the series are I(0), I(1) or a combination of the two (JN & Sheetal , 2024, p. 1142), It is not applicable if the variables are stationary at the second difference I(2), This model is also effective with short time series (Lamzihri & El Kamli, 2021, p. 685), according to the following equation. :(BOUZIANE & BENLAIB , 2018, p. 08)

$$\Delta Y_t = c + \left\{ \sum_{i=1}^n \beta_i \Delta Y_{t-i} + \sum_{i=0}^{q_1} \delta_i \Delta X_{t-i} \right\} + \{\omega_1 Y_{t-1} + \omega_2 X_{t-1}\} + \mu_t$$

Where:

- Δ : first-order difference
- α, β : short-term coefficients
- γ, δ : long-term coefficients
- ε : random error term

3.4.1 Determining Optimal Lag Lengths

Table 3. Determining Optimal Lag Lengths

Model Selection Criteria Table
Dependent Variable: UMP
Date: 03/15/25 Time: 17:05
Sample: 1991 2023
Included observations: 32

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
62	-55.419102	4.026194	4.438432	4.162839	0.956422	ARDL(1, 0, 0, 0, 0, 1, 0)
58	-54.931021	4.058189	4.516231	4.210017	0.955810	ARDL(1, 0, 0, 0, 1, 1, 0)
61	-55.081265	4.067579	4.525622	4.219407	0.955393	ARDL(1, 0, 0, 0, 0, 1, 1)
54	-55.144686	4.071543	4.529585	4.223371	0.955216	ARDL(1, 0, 0, 1, 0, 1, 0)
46	-55.171142	4.073196	4.531239	4.225024	0.955142	ARDL(1, 0, 1, 0, 0, 1, 0)

Source: Based on Eviews 13 output

In objective to determine the optimal periods according to the ARDL model, we rely on the AIC criterion to identify the best model. The following graph shows that the ARDL (1,0,0,0,0,1,0) model is the appropriate model, with a value of 4.03, which is the lowest statistical value to identify the appropriate model.

3.4.2 Bound Test Results for Cointegration

To check the cointegration effect between the unemployment rate and economic variables, we use the limits test according to the ARDL methodology, which is based on the Fisher statistic compared to the tabulated values of Pesaran et al The cointegration relationship is tested through two hypotheses: (Sahed & Toul, 2021, p. 392)

- The null hypothesis: absence of common integration

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

- The alternative hypothesis: existence of common integration

$$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$$

The Fisher test is performed by comparing the calculated Fisher statistic with the tabulated values. If: (Remache & Zouari Ferhat, 2024, p. 538)

- The estimated value is greater than the upper limit, which means that the null hypothesis is rejected.
- The calculated value is less than the lower limit, than we accept the null hypothesis.
- If the calculated value is between the lower limit and the upper limit, there is no decision.

The results show that the estimated Fisher F value (4.19) is greater than the upper limit, which is significant at the 5% level. This confirms that there is a cointegration relationship between the independent variables and the unemployment rate in Algeria, as shown in the following table:

Table 4.Bound Test Results of F-test for Cointegration

Bounds Test

Null hypothesis: No levels relationship	
Number of cointegrating variables: 6	
Trend type: Rest. constant (Case 2)	
Sample size: 32	
Test Statistic	Value
F-statistic	4.191365

Bounds Critical Values

Sample Size	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
30	2.334	3.515	2.794	4.148	3.976	5.691
35	2.254	3.388	2.685	3.960	3.713	5.326
Asymptotic	1.990	2.940	2.270	3.280	2.880	3.990

* I(0) and I(1) are respectively the stationary and non-stationary bounds.

Source:Based on Eviews 13 output

3.4.3 ARDL Model Estimation Results

The results show that the calculated Fisher statistical value is statistically significant ($P = 0.000294$). Therefore, the estimated model examines the relationship between economic variables and the unemployment rate. Furthermore, the value of the coefficient of determination R^2 is estimated at 0.9676, indicating that the independent variables explain 96.76% of the variation in the unemployment rate, as shown in the following table:

Table 5. ARDL Model Estimation Results

Dependent Variable: UMP
Method: ARDL
Date: 03/12/25 Time: 16:29
Sample: 1992 2023
Included observations: 32
Dependent lags: 1 (Automatic)
Automatic-lag linear regressors (1 max. lags): PRVT POIL INF GOVP GDP
FDI
Deterministics: Restricted constant and no trend (Case 2)
Model selection method: Akaike info criterion (AIC)
Number of models evaluated: 64
Selected model: ARDL(1,0,0,0,0,1,0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UMP(-1)	0.605289	0.125227	4.833518	0.0001
PRVT	-0.245915	0.096179	-2.556863	0.0176
POIL	-0.035141	0.017346	-2.025861	0.0545
INF	-0.007380	0.052171	-0.141463	0.8887
GOVP	0.020890	0.186086	0.112260	0.9116
GDP	-0.161525	0.150478	-1.073410	0.2942
GDP(-1)	-0.406248	0.161309	-2.518446	0.0192
FDI	-1.942351	0.976534	-1.989025	0.0587
C	14.15552	6.245237	2.266610	0.0331
R-squared	0.967668	Mean dependent var	17.71700	
Adjusted R-squared	0.956422	S.D. dependent var	7.726284	
S.E. of regression	1.612893	Akaike info criterion	4.026194	
Sum squared resid	59.83272	Schwarz criterion	4.438432	
Log likelihood	-55.41910	Hannan-Quinn criter.	4.162839	
F-statistic	86.04554	Durbin-Watson stat	2.056669	
Prob(F-statistic)	0.000000			

*Note: p-values and any subsequent test results do not account for model selection.

Source: Based on Eviews 13 output

3.4.4 Diagnostic tests for the model

Various diagnostic tests are performed on the estimated model:

- **Autocorrelation Test:** Since $\text{Prob} = 0.86 > 0.05$, the null hypothesis is accepted, which means that the ARDL model indicates the absence of an autocorrelation problem between the residuals.

Table 6.Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 1 lag			
F-statistic	0.027456	Prob. F(1,22)	0.8699
Obs*R-squared	0.039886	Prob. Chi-Square(1)	0.8417

Source:Based on Eviews 13 output

- **Heteroskedasticity Test (ARCH):** Since the probability value of the Fisher F-statistic is greater than 5%, the null hypothesis of constant variance of errors is accepted.

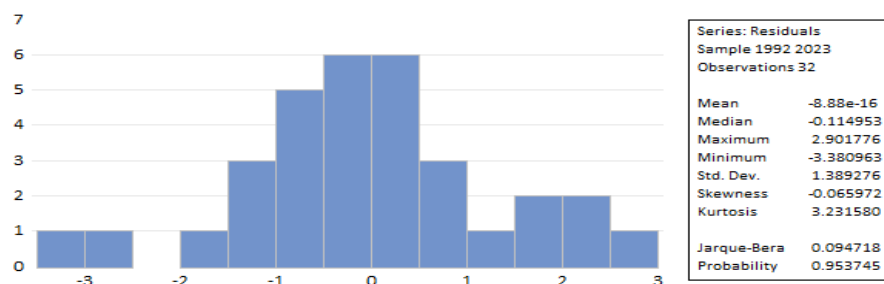
Table 7.Test ARCH

Heteroskedasticity Test: ARCH			
F-statistic	0.524241	Prob. F(1,29)	0.4748
Obs*R-squared	0.550445	Prob. Chi-Square(1)	0.4581

Source:Based on Eviews 13 output

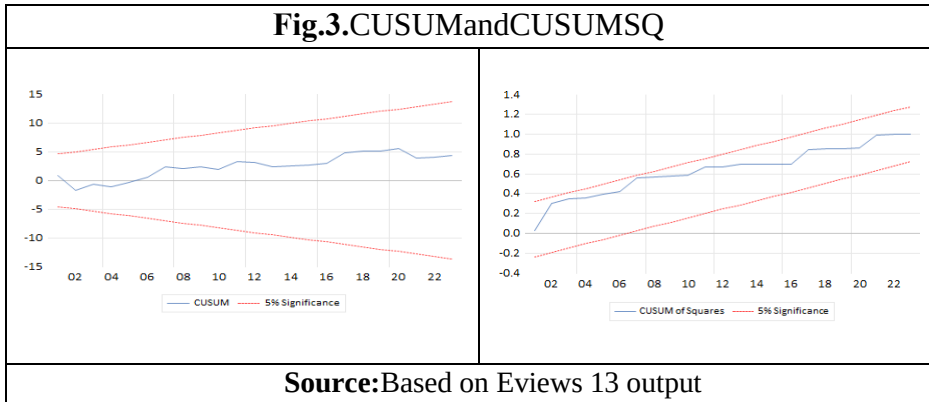
- **Normality Test:**Since Prob = 0.95 > 0.05, the null hypothesis that the errors follow a normal distribution is accepted.

Fig.2.Normality Test



Source:Based on Eviews 13 output

- **Structural Stability Test:**It is notable from the graphical representation that the two forms are median lines within the limits of the confidence interval at the 5% level, which indicates the absence of structural change in the model parameters.



- **Ramsey Reset:**It is observed that the probability value of the calculated F-statistic is 0.12, which is greater than 5%, and therefore, the model does not suffer from a specification problem (the functional form used is correct).

Table 8.Ramsey Reset

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: UMP UMP(-1) PRVT POIL INF GOVP GDP GDP(-1) FDI C

	Value	df	Probability
t-statistic	1.612779	22	0.1210
F-statistic	2.601055	(1, 22)	0.1210
Likelihood ratio	3.575900	1	0.0586

Source:Based on Eviews 13 output

3.4.5 Estimation of error correction model and short-term relationship

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Table 9. Estimation of the error correction model

Dependent Variable: D(UMP)				
Method: ARDL				
Date: 03/12/25 Time: 16:29				
Sample: 1992 2023				
Included observations: 32				
Dependent lags: 1 (Automatic)				
Automatic-lag linear regressors (1 max. lags): PRVT POIL INF GOVP GDP FDI				
Deterministics: Restricted constant and no trend (Case 2)				
Model selection method: Akaike info criterion (AIC)				
Number of models evaluated: 64				
Selected model: ARDL(1,0,0,0,1,0)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.394711	0.059684	-6.613318	0.0000
D(GDP)	-0.161525	0.102152	-1.581227	0.1243
R-squared	0.597935	Mean dependent var		-0.278094
Adjusted R-squared	0.584533	S.D. dependent var		2.190990
S.E. of regression	1.412241	Akaike info criterion		3.588694
Sum squared resid	59.83272	Schwarz criterion		3.680302
Log likelihood	-55.41910	Hannan-Quinn criter.		3.619060
F-statistic	44.61480	Durbin-Watson stat		2.056669
Prob(F-statistic)	0.000000			
* p-values are incompatible with t-Bounds distribution.				

Source:Based on Eviews 13 output

The error correction term EC_{t-1} is negative and statistically significant $Prob < 0,05$, thus the error correction model is accepted, and the short-term relationship is valid. Its value -0.39 indicates that when the dependent variable (unemployment rate) deviates in the short term in period (t-1) from its long-term equilibrium values, about 0.39% of this deviation is corrected in period (t). That is, the imbalance is corrected each year by 39%. In the short term, there is no effect of GDP on the unemployment rate.

3.4.6 Estimating the Long-Run Relationship

Table 10. Estimating the Long-Run Relationship

Cointegrating Coefficients

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
PRVT	-0.623027	0.184092	-3.384313	0.0024
POIL	-0.089030	0.034215	-2.602111	0.0154
INF	-0.018698	0.130855	-0.142891	0.8875
GOVP	0.052925	0.478909	0.110511	0.9129
GDP(-1)	-1.438452	0.672489	-2.138997	0.0424
FDI	-4.920944	1.971709	-2.495776	0.0195
C	35.86298	7.878252	4.552149	0.0001

Note: * Coefficients derived from the CEC regression.

Source: Based on Eviews 13 output

The following observations are drawn from the provided table, which analyzes the long-term effects of various economic factors on unemployment:

- There is a negative correlation between Domestic credit to private sector and unemployment. A one-unit increase in Domestic credit to private sector associates with a 0.062-unit decrease in the unemployment rate. This suggests that when credit expands, businesses can finance new projects, expand operations, and create jobs, particularly in non-oil sectors such as industry, and strengthen the private sector.
- There is a negative correlation between oil prices and unemployment. A one-unit increase in oil prices associates with a 0.08-unit decrease in the unemployment rate. This implies that higher oil prices lead to increased government revenue, enabling greater public spending on investments and development projects, which in turn creates jobs and reduces unemployment. However, this effect may be temporary and tied to price fluctuations due to the non-direction of expenditures towards sustainable productive sectors. Additionally, over-reliance on oil revenue hinders economic diversification efforts.
- government expenditures does not have a significant effect on unemployment. This could be because government expenditures is directed towards current consumption or public sector wages rather than investments that create sustainable jobs. The rentier nature of the economy also makes spending vulnerable to fluctuations in oil revenues, limiting its sustained impact on the labor market.
- GDP and unemployment: A one-unit increase in GDP is associated with a 1.43-unit decrease in the unemployment

rate. This indicates that economic growth leads to enhanced job creation. Hence, this effectiveness depends mainly on economic levels, diversification, and its ability to create sustainable jobs outside the hydrocarbon sector.

- There is a negative correlation between foreign investment and unemployment: A one-unit increase in foreign investment is associated with a 4.92-unit decrease in the unemployment rate. This suggests that foreign direct investment contributes to reducing unemployment by stimulating economic activity, transferring technology, and creating new jobs, especially in non-oil sectors.
- Inflation does not have a significant effect on unemployment: This may be due to the rentier nature of the economy, where inflation often stems from external factors and fluctuations in commodity prices, thus reducing its impact on the labor market.

3.4.7 Cumulative Dynamic Multiplier

To measure the response of the unemployment rate over time to a one-unit change in the independent variables over 15 years, the cumulative dynamic multiplier was used.

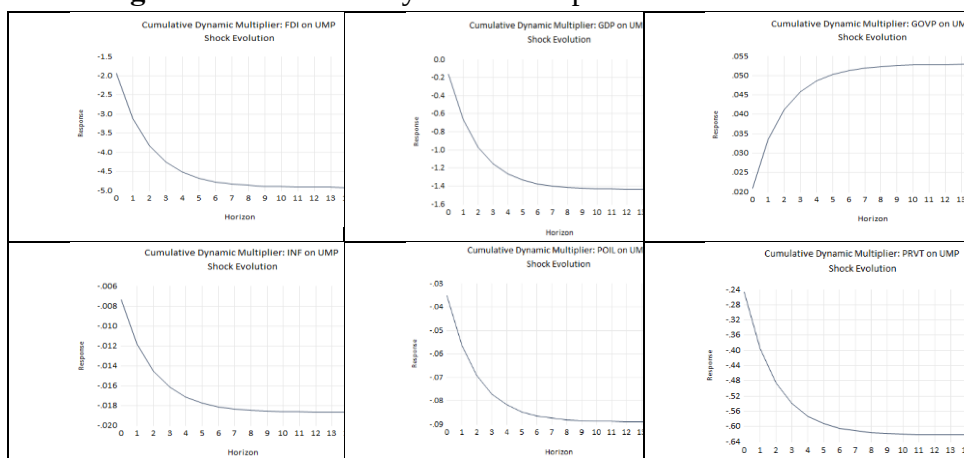
- **PRVT:** The figure shows that a one-unit change in domestic credit provided to the private sector leads to an immediate decrease in the unemployment rate, and a continued negative impact decreasing at a diminishing rate until it reaches a peak of -0.64 units, which represents the long-term dynamic multiplier. Domestic credit contributes to enhancing investment and productivity, thereby increasing sustainable job opportunities.
- **GDP:** The figure shows that a change in GDP growth leads to an immediate decrease in the unemployment rate, and this negative effect continues to diminish at a decreasing rate until

it reaches a peak of -1.41, which represents the long-term dynamic multiplier. This effect reflects the role of economic growth in enhancing economic activity, contributing to an increase in labor demand.

- **POIL:** The figure shows that a one-unit change in oil prices leads to an immediate negative decrease in the unemployment rate, with this effect continuing to decrease at a diminishing rate until it reaches a peak of -0.09 units, which represents the long-term dynamic multiplier. This effect reflects the role of oil revenues in stimulating the economy, as additional revenues lead to increased government spending and investments, thereby increasing job opportunities.
- **FDI:** shows that a change in foreign direct investment by one unit leads to an immediate negative decrease in the unemployment rate. This effect continues to decrease at a diminishing rate until it reaches a peak of 1.5 units, after which the negative effect continues to decrease at a diminishing rate until it reaches -5, which represents the long-term dynamic multiplier. Foreign investment contributes to enhancing technology transfer and supporting the economic development process, thereby creating job opportunities.
- **INF:** The figure shows that a one-unit change in the inflation rate leads to an immediate decrease in the unemployment rate, and the negative effect continues to decrease at a diminishing rate until it reaches a peak of -0.2 units in the long term, which represents the long-term dynamic multiplier. Considering low economic growth, Algeria's rising inflation may limit long-term job opportunities by decreasing purchasing power and raising production costs, which could prevent long-term labor market improvements.

- **GOVP:**he figure shows that a one-unit change in the inflation rate due to government expenditures leads to an immediate increase in the unemployment rate, which continues to rise at a decreasing rate, peaking at 0.05 units. Due to poor government spending targeting and a sluggish labor market response, expenditures do not lower unemployment or generate private sector employment; however, they foster long-term employment through economic diversification.

Fig.5.The cumulative dynamic multiplier : Shock Evolution



Source:Based on Eviews 13 output

4. CONCLUSION

This study aimed to measure the impact of economic variables on Algeria's unemployment rates during 1991-2023 using the ARDL model as well as the Dynamic Cumulative Multiplier. The results demonstrated that economic growth does not affect unemployment in the short term, nor do inflation and public expenditures affect unemployment in the long term. However, other variables such as oil prices, economic growth, domestic credit provided to the private sector, and foreign direct investment affect unemployment, aligning with the economic theory. The results of the cumulative dynamic multiplier (CDM)

indicated that inflation and expenditure shocks did not contribute to reducing unemployment. However, shocks in oil prices, economic growth, local credit provided to the private sector, and foreign direct investment led to decreasing unemployment. These variables are the key factors contributing to alleviating the unemployment issue in Algeria. However, this result remains weak compared to developed countries. Despite the efforts made by the Algerian government to address the unemployment issue, it has faced numerous challenges that continue to hinder its ability to create sustainable jobs due to the economy's reliance on rentier income, leading to increased unemployment rates, particularly among university graduates. Therefore, the country has reinforced its economic diversification beyond the hydrocarbons sector in the long term by directing its expenditures towards productive sectors such as agriculture and industry, and adopting effective economic policies that stimulate innovation and the development of productive sectors. It has also implemented structural reforms that include supporting the private sector, ensuring labor market stability, and raising social welfare levels.

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