

The impact of poverty on economic growth in Algeria, an econometric study 1990-2021

*Samia Keltouma Sayah**

*Mustapha Stambouli University,
(Mascara)*

samia.sayah@univ-mascara.dz

Mohammed Hadj Ahmed

*Mustapha Stambouli University,
(Mascara)*

mohamed.hadjahmed@univ-mascara.dz

Abstract ;

This study aims to analyze the impact of poverty measured by (final consumption expenditure of households and non-profit institutions (NPISH), infant mortality rate (CHIMORT), urbanization rates (URBAN) on economic growth in Algeria (GDP) over the period (1990-2021) using regression model.

The results of the study showed that there is positive effect of the Households and NPISHs Final consumption expenditure on economic growth in Algeria, whereas, there is a negative effect of the Child mortality rate and urbanization rates on economic growth in Algeria. Whereas, a one-unit increase in urban areas (a variable related to urbanization or urban population) is associated with an estimated decrease of 10.92 units in per capita GDP.

Article info

Received

06/03/2025

Accepted

27/04/2025

Keyword:

- ✓ Poverty ;
- ✓ Economic Growth ;
- ✓ GDP growth rate ;
- ✓ Inflation ;
- ✓ Human capital indicators;
- ✓ regression models.

1. Introduction

Poverty is one of the pressing social issues that has drawn significant attention from world leaders, researchers across various fields, policymakers, and international organizations. It stands as a fundamental challenge for nations striving to promote economic growth and achieve sustainable development. The multifaceted nature of poverty poses a direct threat to the economic, social, political, and security stability of any nation, as it fosters conditions where extremism and social deviance can thrive..

As a result, nations worldwide strive to implement essential policies and measures to address and eradicate poverty, aiming to enhance their overall quality of life-a primary objective of sustainable development. While poverty persists across most societies, its prevalence and intensity differ significantly from one region to another..

Algeria, as a developing country striving for economic growth, has taken significant steps to reduce poverty by addressing unemployment and promoting fair income distribution. Since the reforms of 1988 and its shift from a planned economy to a market-oriented one, Algeria has consistently worked within an economic framework that emphasizes a "social dimension" to alleviate poverty and ensure broader economic justice.

On this basis, we will attempt through this research document to answer the following question:

✓ Does poverty affect economic growth in Algeria ?

This study aims to address the concepts of poverty and economic growth and indicate the relationship between them, and conduct a quantitative study to determine the impact of poverty on economic growth in Algeria during the period (1990-2021).

2. Literature review

The impact of poverty on economic growth has been the subject of numerous research, each of which has made a significant scientific contribution. despite the variations in its outcomes.

- (Chenery & All., 1974) demonstrated that although the Third World's average per capita income has grown by 50% since 1960, only around one-third of the population has profited from this quick expansion. The policy and concept of inclusive growth have been questioned due to the very unequal distribution between nations and regions within nations and socioeconomic categories.
- (Angelique G & Nicholas M, 2015) conducted a study to examine the complex relationship between poverty reduction and economic growth in Swaziland over the period 1980 to 2011. Using time series data, along with various statistical methods such as the Dickey-Fuller test, they found a statistically significant link between economic growth and poverty decline. Their findings highlighted that in cases of extreme income inequality, economic growth alone is not sufficient to achieve poverty reduction.
- A study by (Ayad & Belmokadem, 2017) explored the causal relationships between the poverty rate, the inequality index, and the economic growth rate in a sample of developing countries from 1970 to 2013. Utilizing the VAR and Granger causality methodology as outlined by Toda and Yamamoto (1995), the study revealed several key findings. It determined the existence of a two-way causal relationship between the poverty rate and the economic growth rate. However, no significant relationship was identified between the inequality index and either the poverty rate or the economic growth rate. This suggests

that in developing countries, the poor benefit directly from economic growth. Consequently, the study emphasizes the importance of governments focusing on fostering sustained economic growth while also addressing and mitigating inequality.

- While the study of (Benjamin B, 2018) examined the impact of poverty on economic growth and the determinants of economic growth in Nigeria from 1980 to 2013 using error correction model as the estimation technique to analyze the collected time series data. The Solow-Swan growth methodology and cumulative and cyclical theory were adopted as the methodological approach to achieve the objectives of the study. The results revealed that there is a positive and significant relationship between inflation, life expectancy and economic growth, while investment was found to be insignificant. Conversely, poverty, corruption, debt, mortality, human capital development and unemployment showed negative relationships with economic growth. It was also discovered that, with the exception of corruption and the growth of human capital, every variable contributed to poverty in Nigeria. In other words, although some factors aided economic progress, others hampered it, including poverty, corruption, debt, mortality, the development of human capital, and unemployment. Therefore, to raise Nigeria's rate of economic growth, the government should set up reputable organizations and initiatives to reduce poverty.
- (Boutella & Kalleche, 2020) conducted a study to evaluate the effect of economic growth on poverty rates in Algeria over the period from 1970 to 2017. They developed an econometric model in which poverty, represented by average individual consumption, served as the dependent variable, while economic growth, expressed by per capita GDP, acted as the independent variable. The findings revealed a long-term correlation between poverty and economic growth. Specifically, an increase in per capita GDP in Algeria was associated with a rise in average individual consumption, ultimately contributing to a reduction in poverty rates.

3. The study's theoretical component:

3.1. Definition of poverty:

According to the World Bank's 1999 World Development Report, poverty is "the inability to achieve a minimum standard of living.." (World Bank, 1999)

(Konan, 2002) defines it as the denial of human well-being. Because of this, a person can be deemed impoverished if they are unable to acquire enough products and services to cover their fundamental material necessities.

The term "poor" refers to a person who, either permanently or temporarily, finds himself in a state of weakness, dependence, and humiliation that is characterized by the deprivation of many resources, including money, relationships, influence, power, science, technical qualifications, honor of birth, physical vigor, intellectual capacity, freedom, and personal dignity. These resources vary depending on the time and society. He hardly manages to get out of bed without the assistance of others. Such a description is not limited to any one area or setting; it might encompass all those who are frustrated, left behind, asocial, or excluded (Mokdad, 2018, p. 41).

3.2. *poverty in Algeria:*

In Algeria, poverty is defined by the Economic and Social Council as "the state of an individual or a group of individuals faced with a lack of available resources, a decline in their social status and exclusion from the way of life, materially and culturally." (Boutellaa & Kalleche, 2020).

Experts in Algeria have defined poverty as the inability to meet basic needs, such as housing, education, and health, as well as the lack or insufficiency of food consumption in terms of quantity and quality. This means that, in addition to the material aspects of poverty in Algeria, there are immaterial dimensions as well. (Louali & Benchellat, Trends of Poverty in Algeria during 1962-2013, 2016, p. 99).

3.3. *Economic Growth:*

F. Perroux, an economist, claims that economic growth is the amount of consistent increase in the output index in quantity or volume over a period of time or over a number of long-term periods. The phrase expansion, which is the opposite of recession or stagnation, is used by economists to describe the short term (Lawrence, 2001, p. 38).

When compared to a prior period, economic growth is the rise in the production of economic commodities and services during a given time period. It can be quantified in real or nominal terms. Gross national product (GNP) or gross domestic product (GDP) are the traditional measures of aggregate economic growth, while other metrics are occasionally employed (Investopedia, 2024)

3.4. *The relationship between poverty and economic growth:*

There are several economic variables that affect poverty, each of which has a particular impact on poverty rates. Economic growth is a major element among these variables. Many studies have been conducted around the world in the past few decades to examine the relationship between poverty and economic growth. Despite this effort, the results have not been conclusive, perhaps due to the fact that these variables often have indirect relationships with each other.

Since economies with high growth rates have a greater chance of overcoming poverty than economies with low GDP per capita, some studies have shown that high economic growth is an effective tool for reducing poverty in all its forms as much as possible. In other words, GDP growth has diverse effects and is essential for poverty alleviation, especially in the fastest growing countries. However, other perspectives highlight the imbalances that can arise from mismanaging the growth process, especially those imbalances that harm the poor (Boutella & Kalleche, 2020, p. 119). Therefore, how poverty is measured, the capacity of the poor to absorb, the pace and pattern of economic growth, and the equitable distribution of the proceeds of growth all affect the extent to which economic growth succeeds in reducing poverty. Income distribution must be rational and touches all segments of society in order to reduce poverty on a continuous basis. The success of any strategy to eradicate poverty must depend on strong, sustainable economic growth and the good distribution of its proceeds. Without growth, it will be difficult to turn poverty alleviation and employment generation programs into a tangible reality.

With GDP rising 4.1% in 2023, Algeria's economy continued to grow dynamically, propelled by robust results in both the hydrocarbon and non-hydrocarbon sectors. Strong investment growth and private consumption stimulated the economy, which in turn increased imports.

Despite declining hydrocarbon production, Algeria's GDP expanded by 3.9 percent in the first half of 2024 compared to the same time the previous year. This increase was driven by a robust agriculture sector. According to the World Bank's most recent Algeria Economic Update, the nation's price stability significantly improved, with inflation lowering to 4.3 percent over the first nine months of 2024 due to stabilizing fresh food prices, reducing import expenses, and maintaining a stable currency rate (World Bank, 2024).

4. Methodology:

When analyzing the impact of poverty on economic growth in Algeria, it is important to consider a range of explanatory variables that can capture the various factors influencing economic growth.

Before the study and presentation of the results, we will present the variables, the model used in the study, and the statistical data source.

4.1. Variables:

✓ The dependent variable:

Macroeconomic variables: GDP growth rate, (GDPC), Inflation (ICP).

✓ The independent variables:

Poverty indicators:

- Households and NPISHs Final consumption expenditure, PPP (constant 2017 international \$) (NPISH);
- Human capital indicators: Child mortality rate. (CHIMORT), Life Expectancy at Birth (E0) ;
- Infrastructure development: urbanization rates. (URBAN).

Hence, the relationship between the dependent variables and independent variable is:

$$GDPC = f(NPISH, CHIMORT, URBAN)$$

4.2. The Study hypothese:

There is a negative effect between economic growth and the independent variables(NPISH, CHIMORT, URBAN).

4.3. Model:

To measure the impact The impact of poverty on economic growth in Algeria, the multiple regression model was estimated.

The study period covers (1990-2021). And after investigation, the optimal model equation is as :

$$GDPC_t = \alpha_0 + \alpha_1 NPISH_t + \alpha_1 CHIMORT_t + \alpha_1 URBAN_t + \varepsilon_t$$

4.4. Data:

We obtained statistical data related to the study variables from the World Bank database.

5. Results and discussion:

5.1. Descriptive analysis of the study data:

The output in Tab.1 provides statistical measures such as the mean, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera statistic, and associated probabilities for each of the six variables mentioned. These measures help in understanding the central tendency, spread, shape, and normality of the data distribution for each variable

Table 1: Summary statistics of the data.

	HNPI SH	GDPC	E0	CHIMO RT	ICP	URB AN
Mean	1.40E +11	3153.59 7	72.00816	35.37500	8.559 418	63.83 897
Maximum	2.22E +11	5610.73 1	76.47400	51.90000	31.66 966	74.26 100
Minimum	8.90E +10	1466.54 6	67.36100	22.30000	0.339 163	52.08 500
Std. Dev.	4.89E +10	1412.93 8	3.047087	10.23675	9.179 278	6.856 675
Skewness	0.478 883	0.30996 2	-0.15356	0.314832	1.506 134	- 0.1261 57
Kurtosis	1.637 972	1.72730 3	1.709143	1.573204	3.803 783	1.757 831
Jarque- Bera	3.696 584	2.67208 3	2.347513	3.242964	12.95 977	2.142 195
Probability	0.157 506	0.26288 4	0.309203	0.197606	0.001 534	0.342 632

Source : Prepared by researchers, using Eviews 12 program.

Mean: This row represents the mean (average) values for each variable. For example, the mean value for HNPI SH is approximately 1.40E+11, for GDPC it is 3153.597, for E0 it is 72.00816, and so on. **Maximum:** This row shows the maximum values observed for each variable. It provides an idea of the highest value recorded in the dataset. For instance, the maximum value for HNPI SH is approximately 2.22E+11, for GDPC it is 5610.731, for E0 it is 76.47400, and so on. **Minimum:** This row displays the minimum values observed for each variable. It represents the lowest value recorded in the dataset. For example, the minimum value for HNPI SH is approximately 8.90E+10, for GDPC it is 1466.546, for E0 it is 67.36100, and so on. **Std. Dev. (Standard Deviation):** This row indicates the standard deviation of each variable. Standard deviation measures the dispersion or spread of the data points around the mean. A higher standard deviation suggests greater variability. For example, the standard deviation for HNPI SH is approximately 4.89E+10, for GDPC it is 1412.938, for E0 it is 3.047087, and so on. **Skewness:** This row represents the skewness of each variable. Skewness measures the asymmetry of the distribution of data points. A positive skewness value indicates a longer tail on the right side of the distribution, while a negative skewness value suggests a longer tail on the left side. For example, the skewness for HNPI SH is 0.478883, for GDPC it is 0.309962, for E0 it is -0.15356, and so on. **Kurtosis:** This row displays the kurtosis of each variable. Kurtosis measures the "tailedness" of the distribution. High kurtosis values indicate heavy tails or a more peaked distribution compared to the normal distribution. For example, the kurtosis for HNPI SH is 1.637972, for GDPC it is 1.727303, for E0 it is 1.709143, and so on.

Jarque-Bera: This row shows the Jarque-Bera statistic for each variable. The Jarque-Bera test is a test of normality for a given distribution. Higher values suggest a departure from a normal distribution. For example, the Jarque-Bera statistic for HNPI SH is 3.696584, for GDPC it is

2.672083, for E0 it is 2.347513, and so on. Probability: This row provides the probability associated with the Jarque-Bera test for each variable. It indicates the significance level at which the null hypothesis of normality is rejected. A lower probability value suggests a stronger evidence against the assumption of normality. For example, the probability associated with the Jarque-Bera test for HNPISH is 0.157506, for GDPC it is 0.262884, for E0 it is 0.309203, and so on.

Figure 1: Variables dynamics over the study period.



Source: Prepared by researchers, using Eviews 12 program.

5.2. Correlation matrix:

The provided correlation matrix represents the pairwise correlations between different variables. Each row and column in the matrix corresponds to a specific variable. Here is an interpretation of the contents of the correlation matrix:

HNPISH: This variable has a perfect positive correlation with itself, as indicated by the correlation value of 1 (in the diagonal). GDPC: It shows a strong positive correlation with HNPISH (0.867040) and E0 (0.854738), indicating that there is a positive relationship between GDPC and these variables.

E0: It has a high positive correlation with HNPISH (0.951277) and GDPC (0.854738), suggesting a strong positive relationship between these variables.

Table 2: Correlation matrix.

Correlation	HNPISH	GDPC	E0	CHIMORT	ICP	URBAN
HNPISH	1					
GDPC	0.867040	1				
E0	0.951277	0.854738	1			
CHIMORT	-0.970781	-0.881202	-0.986472	1		
ICP	-0.298460	-0.291339	-0.502910	0.443005	1	
URBAN	0.948776	0.830428	0.987244	-0.992151	-0.498260	1

Source: Prepared by researchers, using Eviews 12 program.

There is a strong negative correlation between CHIMORT and HNPISH (-0.970781), GDPC (-0.881202), and E0 (-0.986472). This indicates an inverse relationship, meaning that as CHIMORT decreases, the other variables tend to increase. ICP: It has a weak negative correlation with the other variables. The correlation values with HNPISH, GDPC, and E0 are relatively low (-0.298460, -0.291339, and -0.502910, respectively). URBAN: It has a strong positive correlation with HNPISH (0.948776), GDPC (0.830428), and E0 (0.987244). Additionally, there is a strong negative correlation with CHIMORT (-0.992151). This indicates a consistent relationship where as URBAN increases, the other variables tend to increase (except for CHIMORT).

5.3. Stationary Analysis and Unit-Root test:

For each variable, the table provides three different test scenarios: trend and intercept, intercept only, and none. The p-values associated with each scenario indicate the statistical significance of the ADF test results. The interpretation of the p-values is as follows: If the p-value is less than the chosen significance level (e.g., 0.05), we reject the null hypothesis of the presence of a unit root, suggesting that the variable is stationary. If the p-value is greater than the significance level, we fail to reject the null hypothesis, indicating that the variable is non-stationary.

For HNPISH, and at the level: The p-value is 0.676, which is greater than the significance level. Hence, we fail to reject the null hypothesis of a unit root, suggesting non-stationarity. By first-difference: The p-value is less than 0.0001, indicating that we can reject the null hypothesis and conclude that the first difference of the variable is stationary. For the GDPC variable, at the level the p-value is 0.7208, indicating non-stationarity. After differentiation, the p-value is less than 0.0001, suggesting that the first difference of the variable is stationary. The p-value is 0.7826, suggesting non-stationarity of E0, but for the first difference: The p-value is less than 0.0001, indicating stationarity.

Table 3: ADF test of stationarity.

	Level			First Difference		
	Trend & Intercept	Intercept	None	Trend & Intercept	Intercept	None
HNPISH	0.676	0.3153	0.9999	0.9822	<0.0001	0.2735
GDPC	0.7208	0.8228	0.816	0.0012	<0.0001	<0.0001
E0	0.7826	0.7571	0.9997	<0.0001	<0.0001	0.1102
CHIMORT	<0.0001	0.8719	<0.0001	0.0239	<0.0001	0.4628
ICP	0.2753	0.1058	0.1417	<0.0001	<0.0001	<0.0001
URBAN	0.9998	0.6694	<0.0001	0.9046	0.9993	<0.0001

Source: Prepared by researchers, using Eviews 12 program.

CHMORT, at the level: The p-value is less than 0.0001, indicating stationarity. First Difference: The p-value is 0.0239, suggesting non-stationarity. The p-value is 0.2753, for the ICP indicating non-stationarity. However, the p-value is less than 0.0001, indicating stationarity. The same for the URBAN variable. In summary, the results indicate that variables are non-stationary at the level but become stationary after taking the first difference. This

suggests that differencing can help achieve stationarity and make the variables suitable for time series analysis.

5.4. Estimation Models:

Table 4: Estimation results of the regression model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HNPISH	1.670916	0.414047	4.035570	0.0004
CHIMORT	-7.441643	0.631974	-11.77524	0.0000
URBAN	-10.92245	1.369783	-7.973853	0.0000
C	16.51554	6.966857	2.370587	0.0252
@TREND("1997")	-0.060006	0.008347	-7.189270	0.0000
R-squared	0.971922	Mean dependent var		3.453815
Adjusted R-squared	0.967762	S.D. dependent var		0.204051
S.E. of regression	0.036637	Akaike info criterion		-3.632898
Sum squared resid	0.036242	Schwarz criterion		-3.403877
Log likelihood	63.12637	Hannan-Quinn criter.		-3.556984
F-statistic	233.6482	Durbin-Watson stat		1.742280
Prob(F-statistic)	0.000000			

Source: Prepared by researchers, using Eviews 12 program.

The coefficient of HNPISH (1.67) indicates that a one-unit increase in the natural logarithm of HNPISH is associated with an estimated increase of 1.67 units in GDP per capita, holding other variables constant. The coefficient of -7.44 suggests that a one-unit increase in CHIMORT (a variable related to child mortality) is associated with an estimated decrease of 7.44 units in GDP per capita, holding other variables constant. The coefficient of -10.92 indicates that a one-unit increase in URBAN (a variable related to urbanization or urban population) is associated with an estimated decrease of 10.92 units in GDP per capita, holding other variables constant. The coefficient of 16.51 represents the intercept term or constant. In this case, it suggests that when all independent variables are zero, the estimated GDP per capita is expected to be 16.51 units. For @TREND("1997"), the coefficient of -0.06 suggests that a one-unit increase in time (assuming it represents the year) from the base year 1997 is associated with an estimated decrease of 0.059636 units in GDP per capita, holding other variables constant. Overall, based on the provided results, variables such as LOG(HNPISH), CHIMORT, and URBAN seem to have statistically significant relationships with GDP per capita.

The R-squared value of 0.971 indicates that approximately 97.20% of the variability in the dependent variable (GDP per capita) is explained by the independent variables included in the regression model. It represents the proportion of the total variation in the dependent variable that can be accounted for by the independent variables. The AIC value of -3.634801 is a measure of the model's quality and complexity. It considers both the goodness of fit and the number of parameters in the model. A lower AIC value indicates a better-fitting model with fewer

parameters. F-statistic: The F-statistic of 234.1060 is a measure of the overall significance of the regression model. It tests the null hypothesis that all of the regression coefficients are equal to zero. A high F-statistic with a low p-value (in this case, p-value is 0.000000) suggests that the model as a whole is statistically significant.

Durbin-Watson stat: The Durbin-Watson statistic of 1.742982 measures the presence of autocorrelation (or lack thereof) in the residuals. It takes values between 0 and 4. A value around 2 suggests no significant autocorrelation, while values below 2 indicate positive autocorrelation and values above 2 indicate negative autocorrelation. These measures collectively provide insights into the goodness of fit, predictive accuracy, and statistical significance of the regression model in explaining the variation in the dependent variable.

5.5. Validation of the estimated model:

5.5.1. Serial Correlation of the Residuals:

Table 5: Serial Correlation of the Residuals.

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 3 lags			
F-statistic	1.994231	Prob. F(3,24)	0.1417
Obs*R-squared	6.385223	Prob. Chi-Square(3)	0.0943

Source: Prepared by researchers, using Eviews 12 program.

The provided result in this table is related to the Breusch-Godfrey Serial Correlation LM Test, which is used to examine the presence of serial correlation (autocorrelation) in the residuals of a regression model. The null hypothesis assumes that there is no autocorrelation in the residuals up to 3 lags, indicating that the residuals are independent and do not exhibit any systematic pattern of correlation over time. The F-statistic for the test is 1.994231, which measures the overall significance of the test. It tests whether there is any significant autocorrelation in the residuals at up to 3 lags. The p-value associated with the F-statistic is 0.1417, the p-value is greater than the conventional significance level of 0.05, indicating that there is not enough evidence to reject the null hypothesis. This suggests that there is no significant serial correlation in the residuals at up to 3 lags.

5.5.2. Heteroskedasticity Test: Breusch-Pagan-Godfrey

Table 6: Heteroskedasticity Test: Breusch-Pagan-Godfrey.

F-statistic	2.670484	Prob. F(3,28)	0.0668
Obs*R-squared	7.119025	Prob. Chi-Square(3)	0.0682
Scaled explained SS	5.896327	Prob. Chi-Square(3)	0.1168

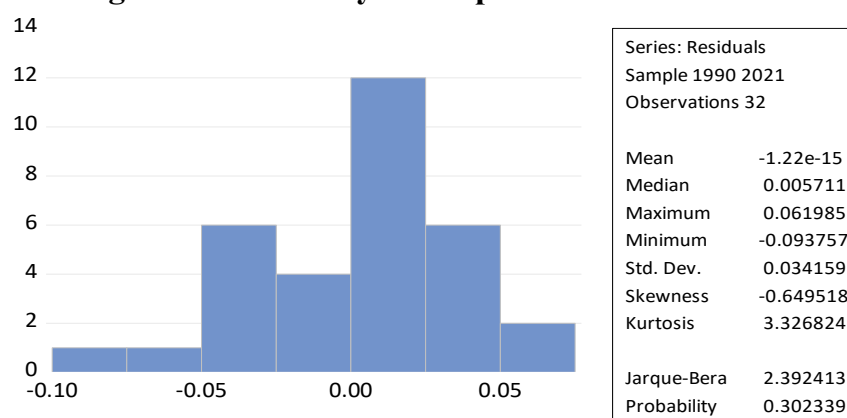
Source: Prepared by researchers, using Eviews 12 program.

The p-value associated with the F-statistic is 0.0668. It represents the probability of obtaining the observed F-statistic (or a more extreme value) if the null hypothesis of no heteroskedasticity is true. In this case, the p-value is greater than the conventional significance level of 0.05, but relatively close to it. This suggests that there is some weak evidence of heteroskedasticity, but it is not statistically significant at the 5% level.

5.5.3. Normality assumption of the residuals:

Based on the results in Fig hereafter, In this case, with a p-value of 0.302, which is greater than the conventional significance level of 0.05, we fail to reject the null hypothesis. This suggests that the residuals in the regression model are reasonably consistent with a normal distribution.

Figure 2: Normality assumption of the residuals.

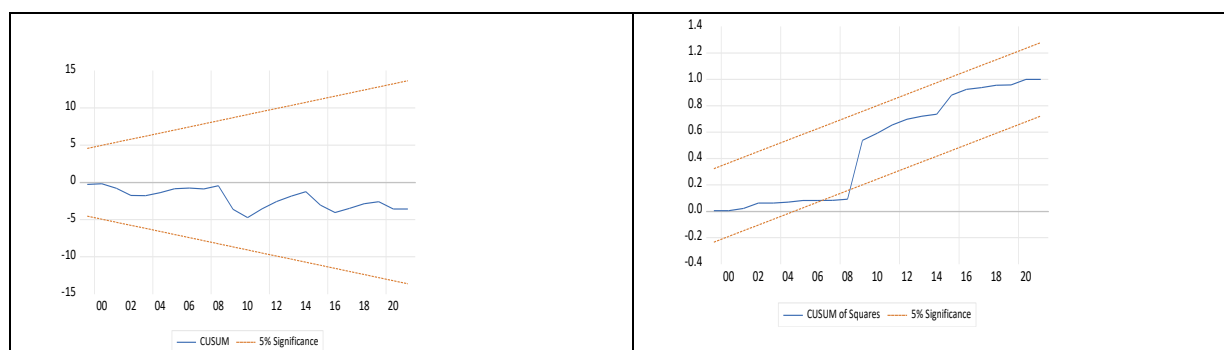


Source: Prepared by researchers, using Eviews 12 program.

5.6. Stability of the model:

The CUSUM test measures the cumulative sum of deviations from the expected values. the CUSUM line remains within the upper and lower critical limits (confidence intervals), it indicates that the data is consistent with the expected patterns. The CUSUM Square test calculates the cumulative sum of squared deviations from the expected values. Similarly, the CUSUM Square line remains within the upper and lower critical limits (confidence intervals), it indicates that the data is consistent with the expected patterns.

Figure 3: Stability of the model.



Source: Prepared by researchers, using Eviews 12 program.

6. CONCLUSION

this study sought to determine how poverty affected Algeria's economic growth between 1990 and 2021 by an applied study using a multiple regression model. We arrived at:

- There is a strong negative relation between CHIMORT and HNPISH (-0.970781), GDPC (-0.881202), and E0 (-0.986472). This indicates an inverse relationship, meaning that as CHIMORT decreases, the other variables tend to increase.
- ICP: It has a weak negative relation with the other variables. The correlation values with HNPISH, GDPC, and E0 are relatively low (-0.298460, -0.291339, and -0.502910, respectively).
- URBAN: It has a strong positive relation with HNPISH (0.948776), GDPC (0.830428), and E0 (0.987244).
- there is a strong negative relation with CHIMORT (-0.992151). This indicates a consistent relationship where as URBAN increases, the other variables tend to increase (except for CHIMORT).

7. Bibliography List:

7.1. Theses:

- Mokdad, Soraya, La pauvreté rurale en Algérie: formes, causes et effets des politiques de lutte contre la pauvreté. Cas de deux communes, Sidi Sémiane et Menaceur (wilaya de Tipaza), Economies et finances, Institut National d'Etudes Supérieures Agronomiques de Montpellier, 2018.

7.2. Journal article:

- Angelique G, Nindi., Nicholas M, Odhiambo (2015), Poverty and Economic Growth in Swaziland: An empirical investigation, *Managing Global Transitions*, 13 (1).
- Ayad, Hicham., Belmokadem, Mustapha (2017, January), The causal relationship between poverty rate, inequality and economic growth in developing countries using the Toda-Yamamoto methodology, *Al-Quds Open University Journal for Administrative and Economic Research and Studies*, 02.
- Benjamin B, Omoniyi (2018), An examination of the causes of poverty on economic growth in Nigeria, *Sabinet african journal*, 6(1).
- Boutella, Mouhamed; Kalleche, Roumaissa. (2020), The impact of economic growth rate on poverty rate in Algeria during the period 1970-2017, *MENA Journal of Economic Studies*, 3(6).
- Chenery, H; All (1974), *Redistribution with growth: policies to improve income distribution in developing countries in the context of economic growth*, Press Oxford University, New York.
- Konan, Arsène Kouadio (2002-11), *Processus du DSRP en Côte d'Ivoire, Réunion du Groupe African de Réflexion sur le Document de Stratégie de Réduction de la Pauvreté (DSRP)*, Nations Unies Commission économique pour l'Afrique, Bruxelles (Belgique).
- Lawrence, schmbri (2001), *Floating exchange rates: A new analysis*, revue de la banque du canada.

- Louali, Fatima; Benchellat, Mostafa. (2016), Trends of Poverty in Algeria during 1962-2013, Journal of Economics and Sustainable Development, 7(2).

7.3. Internet websites:

- IMF, World Bank (2001), Macroeconomic policy and Poverty Reduction, detailed web site : <https://www.imf.org/external/pubs/ft/exrp/macropol/eng/> (consulted on 02/02/2025)
- Investopedia (2024), Economic Growth: What It Is and How It Is Measured, detailed web site : <https://www.investopedia.com/terms/e/economicgrowth.asp> (consulted on 15/02/2025)

7.4. Rapport :

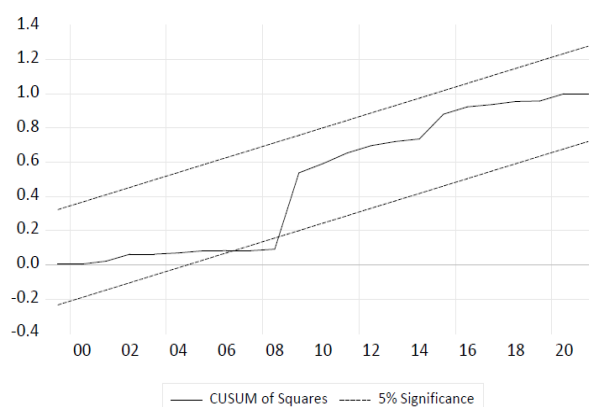
- World Bank (1999), World Development Report, Washington.
- World Bank, Group (2024), Algeria's Economic Outlook.

8. Appendices:

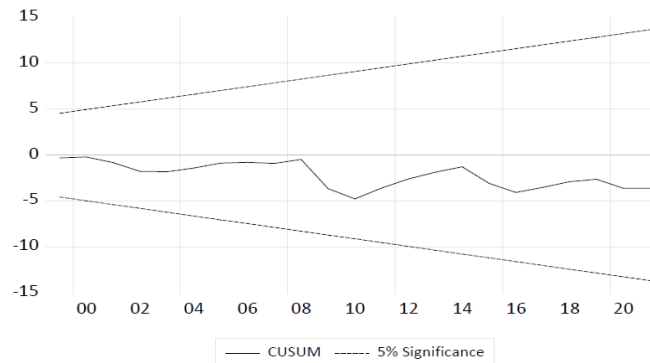
1. Arch test

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
Null hypothesis: Homoskedasticity				
F-statistic	2.681435	Prob. F(4,27)	0.0529	
Obs*R-squared	9.097865	Prob. Chi-Square(4)	0.0587	
Scaled explained SS	7.535299	Prob. Chi-Square(4)	0.1102	
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 06/06/23 Time: 21:24				
Sample: 1990 2021				
Included observations: 32				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.128557	0.576764	0.222893	0.8253
LOG(HNPISH)	0.067776	0.201149	0.336945	0.7388
CHIMORT	-0.068489	0.027763	-2.466875	0.0203
URBAN	-0.100243	0.059892	-1.673715	0.1057
@TREND\$B(1997*)	-0.000547	0.000358	-1.527387	0.1383
R-squared	0.284308	Mean dependent var	0.001130	
Adjusted R-squared	0.178280	S.D. dependent var	0.001752	
S.E. of regression	0.001588	Akaike info criterion	-9.909981	
Sum squared resid	6.81E-05	Schwarz criterion	-9.680960	
Log likelihood	163.5597	Hannan-Quinn criter.	-9.834067	
F-statistic	2.681435	Durbin-Watson stat	1.381022	
Prob(F-statistic)	0.052903			

2. Cusum square.



3. Cusum



4. Estimation outputs

Dependent Variable: GDPC				
Method: Least Squares				
Date: 06/06/23 Time: 21:20				
Sample: 1990 2021				
Included observations: 32				
Indicator Saturation: IIS SIS TIS, 93 indicators searched over 2 blocks				
0 IIS, 0 SIS, 1 TIS variable detected				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HNPISH)	18.75671	4.636127	4.045772	0.0004
C	-10.36323	13.29341	-0.779577	0.4424
CHIMORT	-7.368013	0.639900	-11.51432	0.0000
URBAN	-10.83113	1.380414	-7.846294	0.0000
@TREND(BR("1997"))	-0.059636	0.008250	-7.228288	0.0000
R-squared	0.971975	Mean dependent var	3.453815	
Adjusted R-squared	0.967823	S.D. dependent var	0.204051	
S.E. of regression	0.036602	Akaike info criterion	-3.634801	
Sum squared resid	0.036173	Schwarz criterion	-3.405780	
Log likelihood	63.15682	Hannan-Quinn criter.	-3.558887	
F-statistic	234.1060	Durbin-Watson stat	1.742982	
Prob(F-statistic)	0.000000			

5. Serial

Breusch-Godfrey Serial Correlation LM Test:				
Null hypothesis: No serial correlation at up to 2 lags				
F-statistic	2.761057	Prob. F(2,25)	0.0825	
Obs*R-squared	5.789496	Prob. Chi-Square(2)	0.0553	
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 06/06/23 Time: 21:22				
Sample: 1990 2021				
Included observations: 32				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HNPISH)	-0.816675	4.431799	-0.184276	0.8553
C	2.375165	12.71202	0.186844	0.8533
CHIMORT	-0.053325	0.605110	-0.088124	0.9305
URBAN	-0.189450	1.309296	-0.144696	0.8861
@TREND(BR("1997"))	0.001657	0.007870	0.210583	0.8349
RESID(-1)	0.164514	0.183664	0.895732	0.3789
RESID(-2)	-0.418985	0.185881	-2.254052	0.0332
R-squared	0.180922	Mean dependent var	-1.22E-15	
Adjusted R-squared	-0.015657	S.D. dependent var	0.034159	
S.E. of regression	0.034426	Akaike info criterion	-3.709377	
Sum squared resid	0.029629	Schwarz criterion	-3.388747	
Log likelihood	66.35003	Hannan-Quinn criter.	-3.603097	
F-statistic	0.920352	Durbin-Watson stat	2.100798	
Prob(F-statistic)	0.497056			