

The Effect of Government Expenditure on Poverty in Algeria During the Period 1990 - 2021

ZERROUKI Djillali ^{*1}, LAIB Yacine ²

¹ Algiers 03 University (ALGERIA), zerrouki.djilali@univ-alger3.dz

² Algiers 03 University (ALGERIA), m.laibyacine18@gmail.com

Received : 20/08/2022

Accepted : 17/10/2022

Abstract:

This research paper deals with the theme of poverty in Algeria during the period of 1990 – 2021 by adopting an econometric model of two independent variables (government expenditure and inflation rate) and wealth index (household final consumption expenditure per capita HFCEPC) as a dependent variable, after confirming the existence of cointegration between the study variables a long-run regression equation was estimated based on Vector Error Correction Model approach VECM.

The study concluded that there exists a significant inverse effect by both government expenditure and inflation rate on the HFCEPC, findings that have been explained by a number of previous empirical studies.

Key Words: *Poverty; government expenditure; household final consumption expenditure per capita; inflation rate; Vector Error Correction Model.*

JEL Classification: *E11, E6, C5*

* - Corresponding author: ZERROUKI DJILLALI, e-mail: zerrouki.djilali@univ-alger3.dz

1. INTRODUCTION

Poverty alleviation ranks high on both economic and social policy makers' priority lists worldwide. Despite the differences amongst the world economies, and particularly their level of development, the world leaders, economists and politicians agree that attention need to be dedicated to the scourge of poverty given (i) the severity it is getting, (ii) the expansion it is gaining and (iii) its effects on citizens and societies in their social and economic life aspects, as well as (iv) its implications on aggregate economic indicators.

Since poverty index reflects explicitly social development level for individuals and communities alike, it draws further more attention from socioeconomic policy makers while designing plans towards ensuring well-being for everyone, where establishing mechanisms and processes to eradicate the poverty scourge or, at least, alleviate it is unavoidable.

During the French colonialism 65% - 75% of the Algerian population were considered poor (Fatima, 2015), one of the hardest circumstances that independent Algeria inherited. Since then, Algeria along the line of other countries, has been paying close attention to its population's poverty rate, by monitoring the number of poor Algerians, how poor they are and how can Algerian governments, over the course of decades, help enhance poverty index amongst many other socioeconomic indicators, where several measures were taken and colossal efforts were harnessed under a centrally planned economy system that ruled until late 1980s and left after-effects that lasted longer, and almost totally relaying on oil revenues, the poverty rate was dramatically reduced until the oil world prices collapsed in mid 1980s. According to the World Bank standards for the fiscal year 2017 (UN, 2017), Algerian economy was classified an upper middle income country, with a GNI per capita of \$ 10.577,7 and 5.5% of Algerian population below the national poverty line.

1.1 Study Problem:

Every year, the Algerian state bears enormous cost and makes major efforts with the view of ensuring better social development outcomes, and, implicitly, reducing the number of poor living in challenging socioeconomic conditions, the purpose for which important amounts, represented as government expenditure, are allocated to consumption support and vital services' provision, to be spent on what's supposed to help enhance the life quality of Algerian citizen and society as well. Hence, the problem this paper attempts to answer can be phrased as follows:

To what extent government expenditure contributes in poverty alleviation in Algeria? What's the nature and what's the direction of this contribution if any?

1.2 Aim of Study:

This study aims to verify, measure and analyze the relationship, if any, between the government expenditure and poverty level in Algeria and to show its role in alleviating this scourge, that is to find out whether or not it has a positive impact on it.

1.3 Importance of the Study:

The importance of this study is derived from the great importance that socioeconomic policies allocates to citizens' life quality in a state that seeks society's well-being and takes, for that, several measures including government expenditure as a tool of considerable usefulness while establishing and implementing economic and social policies, this could provide policy makers with evidence to help them judge how seriously this tool should be considered to alleviate poverty in Algeria.

1.4 Study Hypothesis:

The present study assumes that government expenditure is significantly and inversely correlated to the poverty level in Algeria.

2. Literature Review:

Many studies addressed the phenomenon of poverty, its causes and consequences as well as its interdependence with other social and economic indicators to analyze how they interact, for the purpose of designing and adopting more effective policies in reducing poverty rates. Government expenditure, as one of the most important financial policy tools in this matter, is supposed to be instrumental, where it contributes in the economic growth through stimulating economic activities and increasing the aggregate demand, this leads to create more employment opportunities, that, in turn, help individuals have access to resources they were deprived from, in other words, exiting the poverty circle.

In order to examine the impact of government expenditure to education, health and roads infrastructure on poverty reduction in Indonesia for the period 2006-2015, a study has concluded that education infrastructure expenditure has a negative impact on poverty rate (Arma, Noor, & Sujarwoto, 2018), while health and road infrastructure expenditure has no effect on poverty rate and it was mostly enjoyed by rich people.

Another study conducted on 27 provinces in China to examine the effect of rural expenditure on rural poverty reduction during the period of 2010-2016 (Weilin, Jingdong,, & Rong, 2020), showed that government spending has obvious effect on structural differences in poverty reduction and that government expenditure on education, health care, social security and infrastructure has good poverty alleviation effects, while living environment spending has no significant effect on poverty reduction. The same study found that government spending doesn't only promote poverty reduction in the region, but also reduces poverty in economically and geographically similar areas.

Cordelia O. studied the role of government sectorial expenditure on poverty alleviation in Nigeria from 2000 to 2017, the results indicate that government expenditure on agriculture, building and construction, education and health do not have any significant impact on poverty alleviation in Nigeria, and that government spending on these sectors of the economy is insufficient and recommends that more funds should be budgeted to boost these sectors in order to eradicate the scourge of poverty in the country (Cordelia, 2019).

In the same scope, 33 provinces in Indonesia have been covered by a study for the period 2008-2013, to analyze the relationship between government expenditure and poverty in Indonesia, the researchers found, among other findings, that the higher government spending is, the lower is the poverty level in the provinces and in the time period in question (Hadi & Panji, 2018) .

In 2020, a similar research studied the correlation of government expenditure with income inequality and poverty in Indonesia, 33 provinces participated in this study from 2005 to 2017. The researcher concluded that social aid, subsidy and grant types of government expenditure have a significant effect on reducing both income inequality and poverty in Indonesia (Alamanda, 2020), the same paper suggests that infrastructure type of government expenditure, as well, is significantly and negatively correlated with poverty level in Indonesia where the impact is more obvious in rural over urban areas.

A cointegration analysis addressed the long run and the short run relationship between government expenditure and poverty in Pakistan based on time series data from 1976 to 2010 (Rashid & Sara, 2010), the study results showed that there exist a negative relationship between government expenditure and poverty in the long run as well as in the short run.

Public expenditure on education has a strong long run effect on poverty in adulthood, finding by a study that examined the long run effects of public expenditure on poverty, it was also found that those effects are even more concentrated for individuals who have parents with low level of education (Marisa & Inigo, 2017), the research was based on European Union Countries data obtained from the UNESCO for the period of 2005-2011.

The short run relationship between public expenditure and poverty rate was denied, while a positive correlation was verified in the long run by a study based on a time series data for the period from 1996 to 2020 in the Libyan economy (Yusef & Sami, 2020), also, a one-way causality relationship from poverty rate to public expenditure was confirmed.

The latest mentioned study results agree with those found by a research that examined the relationship between the same variables for the period of 1970 through 2015 in Algeria where no significant effect of government expenditure on poverty rate was found in the short run nor in the long run (Hichem, 2017).

3. EMPIRICAL STUDY:

In this part of our research, the effect of government expenditure on poverty level in Algeria will be estimated during the period 1990 – 2021 based on a set of studies that discussed the subject with divergence of views with respect to the indices that should be considered while measuring poverty as a socio-economic indicator.

3.1 Data Description:

With reference to empirical studies that addressed the evaluation of government policies through their effect on poverty rate, and the effect of government expenditure on poverty in Algeria, the study model is built on two main variables: first, **Government Expenditure** (Gov_Exp) as a percentage of GDP as an independent variable; second, **Household Final Consumption Expenditure Per Capita** (FHCE_PC) as a dependent variable, the model includes the **Inflation Rate** (Inf) as a controlling variable.

3.1.1 Dependent Variable:

We made use of **Household Final Consumption Expenditure Per Capita** (HFCE_PC) as an alternative of poverty rates for the studied years (1990 – 2021) due to unavailability of data; this indicator is widely used in recent empirical studies concerned with poverty in developing countries (Hichem, 2017, p. 100).

3.1.2 Independent Variables:

- . Government Expenditure (Gov_Exp): the sum of government purchases and the government transfer payments.
- . Inflation Rate (Inf): the rate at which the currency is losing value and as consequence, the general level of goods' and services' prices is rising.

Logarithm base-10 was applied on both Household Final Consumption Expenditure per Capita and Government Expenditure variables' values.

Data was obtained from World Bank database, released September 2021.

3.2 Time Series Stationarity Tests:

Stationarity tests aim to examine the time series properties with their respective means and variances in time, stationary time series are those with relatively stable dispersive and centralized properties through time. The application of classical regression model on non-stationary time series often leads to econometrical issues such as spurious regression. One of the most important stationarity tests we have is the **Unit Root Test**, we used **Augmented Dickey Fuller (ADF) Test** and **Philips Peron (PP)**

Test to confirm or refute the unit root. Affirmation of unit root prove the time series non-stationary. Unit root tests results are summarized in a table as follows:

Table 1: Unit root tests results

		Level			1 st Deference		
		C&T	C	None	C&T	C	None
HFCE_PC	ADF Test	-2.624	-0.0467	1.6533	-2.6473	-2.4846	-1.936
	PP Test	-3.373	0.3577	1.8148	-5.5073	-5.0244	-4.855
Inf	ADF Test	-1.779	-1.6406	-1.4409	-5.5917	-5.5423	-5.549
	PP Test	-1.814	1.6019-	-1.4466	-5.9044	-5.5656	-5.565
Gov_Exp	ADF Test	-1.647	-1.9131	-0.7190	-5.5332	-5.7239	-5.824
	PP Test	-1.686	-1.9388	-0.7597	-5.5432	-5.7318	-5.833

Source: Processed by the authors based on Eviews 10 outputs.

Stationarity tests, Augmented Dickey Fuller and Philips Peron tests, show that the three of the tested time series have respectively unit root as long as their statistics are respectively significant (greater than 0.05). The time series non-stationarity situation was treated by taking the first difference where every time series in question is stationary, hence the three of our time series are first order integrated.

3.3 Cointegration Test:

One of the most known cointegration tests used in time series analysis is **Johansen Cointegration Test** that focuses on non-static time series analysis through the determination of the Vector Auto-Regressive for (n) first order integrated variables, and to confirm or refute the hypothesis that supports the existence of cointegration we used Johansen Cointegration Test by adopting optimal lag that was equal to two (**P = 2**) through **Akaike criterion**. We used this test to measure the level of cointegration between the model variables, tests results are summarized in a table as follows:

Table 2: Johansen cointegration tests results.

Included observations: 29 after adjustments				
Lags interval (in first differences): 1 to 2				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.685012	46.40445	29.79707	0.0003
At most 1	0.304844	11.74778	15.49471	0.1694
At most 2	0.027586	0.839202	3.841466	0.3596

Source: Processed by the authors based on Eviews 10 outputs.

According to the table above, the results confirm a first order cointegration between the model variables through the **Trace Test** at confidence level of 1% and there is a long-run impulse response, therefore we can use the **VECM** (Vector Error Correction Model) in a try to estimate the effect of government expenditure on poverty indicator in Algeria.

3.4 Results Discussion:

Based on stationarity and cointegration tests, the best fit model in accordance with VECM approach is realized with the first lag (with reference to minimum Akaike Criteria), the following table shows the results:

Table 3: VECM Model Coefficients.

Log Likelihood	Trace statistic		HFCE_PC	Gov_Exp	Inf	C	CointEq1
	1	1% level					
98.127-	1	5% level	1.00	0.07168	0.0649	11.96-	0.04-
T-Statistic			-	4.049	4.284	-	5.458-
R ² =0.566			F-statistic = 8.171				

Source: Processed by the authors based on Eviews 10 outputs.

The table above shows the existence of long-run equilibrium between the model variables as long as the **Error Correction Coefficient** is negative (ECC = - 0.04), and significant at 5%, we deduced that 4% of model deviation is corrected in the short run. According to VECM approach the estimated model can be written as follows:

$$HFCE_PC = - 11.97 - 0.072 Gov_Exp - 0.065 Inf$$

The increase of government expenditure of 1 unit results in a decrease in the household final expenditure per capita of 0.072 units. While the inflation rate coefficient showed an inverse long-run relationship with the household final expenditure per capita,

if the inflation increases by 1 unit the household final expenditure per capita decreases by 0.065 units.

As long as the effect of inflation can't be excluded, particularly between the study variables in question, current prices in the different markets (goods market, labor market and money market) were affected by government expenditure, inflation absorbed the expected effect on household final consumption per capita pushing them to be inversely correlated instead of showing an effect with the desired intensity and direction.

3.5 Tests related to residuals:

As demonstrated through diagnostic tests, the model residuals follow the normal distribution, they don't have autocorrelation neither heteroscedasticity problems.

4. CONCLUSION:

The concern of enhancing social development indicators in the different countries and particularly developing ones became one of the priorities that economic policies are built on, especially since neutralizing social indicators in the process of taking economic decisions is negatively reflected on the overall evaluation of those policies. Through our try to analyze the effect of government expenditure on poverty rate in Algeria for the period of 1990-2021, we concluded that:

1. There is a significant relationship between government expenditure and household final consumption expenditure per capita on one side, and the inflation rate on the other side.

2. There is an inverse effect of government expenditure on household final consumption per capita, hence a positive effect on poverty rate which negates the study hypothesis.

3. The existence of a long-run equilibrium relationship is confirmed between the study variables, stating a short-run correction of 4% to the model deviations.

4. By including the inflation rate as a controlling variable to the model, it was found that it has a negative effect on the dependent variable hence a positive effect on poverty rate.

Through the cited findings we made the following set of recommendations:

1. In order to target the poorest stratum of the society, it's necessary for the decision makers to adopt a biometric database system to better account for the neediest people to whom support should be more efficiently oriented.

2. Encourage domestic consumption to stimulate local investments, hence, accelerate development.

3. Raise fiscal revenue collection, taking into consideration purchasing power of the poor.

5. Bibliography List

- Alamanda, A. (2020). THE EFFECT OF GOVERNMENT EXPENDITURE ON INCOME INEQUALITY AND POVERTY IN INDONESIA. *INFO ARTHA*, 1-11.
- Arma, N. A., Noor, I., & Sujarwoto. (2018). INFRASTRUCTURE EXPENDITURE AND POVERTY REDUCTION IN INDONESIA. *RJOAS*, 40-51.
- Cordelia, O. O. (2019). Government Sectoral Expenditure and Poverty Alleviation in Nigeria. *Research in World Economy* , 80-90.
- Fatima, L. (2015). Trend of Poverty in Algeria During 1962-2013. *Donnish Journal of African Studies and Development*, 2(1), 1-5.
- Hadi, S., & Panji, K. (2018). Government Expenditure and Poverty in Indonesia. *International Conference on Economics, Business and Economic Education* (pp. 142-153). N/A: KnE Social Sciences.
- Hichem, A. (2017). The Impact of Government Expenditure on Poverty Rate in Algeria During the Period (1970-2015) - Empirical Study Using Simultaneous Integration with Thresholds (Co-Integrationwith Regime Shift). *Journal of Quantitative Economic Studies*, 97-106.
- Marisa, H. H., & Inigo, I. O. (2017). Long-run Effects of Public Expenditure on Poverty. *The Journal of Economic Inequality*, 1-22.
- Rashid, M., & Sara, S. (2010). The Relationship between Government Expenditure and Poverty: A Cointegration Analysis. *Romanian Journal of Fiscal Policy*, 29-37.
- UN. (2017). *Multidimensional Poverty in Algeria*. Beirut: LIMITED.
- Weilin, L., J. L., & Rong, Z. (2020). Rural Public Expenditure and Poverty Alleviation in China: A Spatial Econometric Analysis. *Journal of Agricultural Science*, 46-56.
- Yusef, Y., & Sami, S. (2020). Impact of public spending on the poverty rate- Evidence of Libya during 1996-2020. *Economic Researcher Review*, 48-61.

6. Appendices:

6.1 Appendix 01: Residual Normality Tests:

VEC Residual Normality Tests				
Orthogonalization: Cholesky (Lutkepohl)				
Null Hypothesis: Residuals are multivariate normal				
Sample: 1990 2021				
Included observations: 30				
Component	Skewness	Chi-sq	df	Prob.*
1	-1.048103	5.492603	1	0.0191
2	-0.012187	0.000743	1	0.9783
3	-0.008251	0.000340	1	0.9853
Joint		5.493686	3	0.1390

Source: Processed by the authors based on Eviews 10 outputs.

6.2 Appendix 02: Residual Serial Correlation LM Tests:

VEC Residual Serial Correlation LM Tests						
Sample: 1990 2021						
Included observations: 30						
Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.

1	9.108664	9	0.4273	1.031559	(9, 48.8)	0.4291
2	9.848798	9	0.3629	1.123536	(9, 48.8)	0.3647
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	9.108664	9	0.4273	1.031559	(9, 48.8)	0.4291
2	16.98784	18	0.5239	0.945120	(18, 48.6)	0.5330

Source: Processed by the authors based on Eviews 10 outputs.

6.3 Appendix 03: Residual Heteroskedasticity Tests

VEC Residual Heteroskedasticity Tests (Levels and Squares)		
Sample: 1990 2021		
Included observations : 30		
Joint test:		
Chi-sq	df	Prob.
59.46741	48	0.1240

Source: Processed by the authors based on Eviews 10 outputs.

6.4 Appendix 04: Residual Heteroskedasticity Tests

VAR Residual Heteroskedasticity Tests (Includes Cross Terms)		
Sample: 1990 2021		
Included observations : 30		
Joint test:		
Chi-sq	df	Prob.
163.6988	162	0.4479

Source: Processed by the authors based on Eviews 10 outputs.