



Economic Development And Social Spending - A Standard Study Using The ARDL Model During The Period 1970/2016

التنمية الاقتصادية و الإنفاق الاجتماعي - دراسة قياسية باستعمال نموذج

ARDL للفترة 2016/1970

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Abstract

The article focuses on the study of the relationship between economic development and social expenditure in Algeria in the long run based on a standard study using the correlation test and the error correction model according to the Auto Regressive Distributive Lags (ARDL) model developed by Pesaran (2001), by studying a range of variables specific to Algeria for the period from 1970 to 2016. The results and the method of studying the relationship between economic development and social spending differ. As for the results of our study, the model of the impact of social expenditure on GDP, we found the negative impact of expenditure on education, expenditure on employment and growth rate of public expenditure on economic growth in the long run. Economic growth was positive, such as spending on the housing sector, spending on the health sector, and social support.

JEL Classification Codes : O10, O38, H51, H52, H53, I38

Keywords

economic development; social spending; support; GDP; ARDL model;

الكلمات المفتاحية

التنمية الاقتصادية ؛ الإنفاق الاجتماعي ؛ الدعم ؛ الناتج الداخلي الاجمالي ؛ نموذج ARDL.

يهدف هذا المقال الى دراسة العلاقة بين التنمية الاقتصادية و الإنفاق الاجتماعي في الجزائر في المدى الطويل بالاعتماد على دراسة قياسية باستعمال اختبار علاقة التكامل المشترك و نموذج تصحيح الخطأ وفقا لنموذج الانحدار الذاتي للفجوات الزمنية الموزعة (ARDL) Auto Regressive Distributive Lags المطور من قبل (Pesaran et al 2001)، من خلال دراسة مجموعة من المتغيرات الخاصة بالجزائر للفترة الممتدة من 1970 إلى 2016. اما نتائج البحث المتوصل اليها بعد اجراء الدراسة القياسية في نموذج لأثر الإنفاق الاجتماعي على الناتج المحلي الإجمالي تشير إلى التأثير السلبي للإنفاق على التعليم، الإنفاق على التشغيل و معدل نمو النفقات العامة على النمو الاقتصادي في المدى الطويل، أما تأثير باقي المتغيرات على النمو الاقتصادي جاء ايجابيا، كالإنفاق على السكن، الإنفاق على الصحة، و الدعم الاجتماعي .

تصنيف JEL : O10, O38, H51, H52, H53, I38

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I.INTRODUCTION:

The results and method of studying the relationship between social spending and economic development differed. Many studies confirm the existence of a strong positive relationship between social policies and economic development and that economic development occurs through the development of social policies, especially through the provision of some basic needs and effectively, While other studies have also found that there is no relationship between social expenditure and economic growth and that economic growth occurs without the development of social policies.

II.Theoretical Approaches:

In a study of the impact of social policies on improving quality of life and standard of living, theoretical approaches and empirical studies show that improvement of some social conditions leads to improved quality of life (Montalembert, 2016:7-12) in a study on the identification of social policies through the improvement of some devices, And for (Crepin 2013:04), which examines the most important challenges and issues of social protection in France. This study aimed to combat poverty and exclusion, and to benefit from social services geared towards the population. Qat marginalized by the year 2020 by taking into account the development of social policies and strategic programs.

In another direction (Nannan and Jong and Storm, 2015:164-173), the problem of inequality in spending and the difference in educational achievement negatively affects growth and economic development. As for the relationship between investment in the health sector, (Weil, 2014) examines the relationship between health and economic growth, and concludes that per capita income is largely correlated with health. In the same context (Lewis, 2014) shows how health expenditures affect economic growth and growth on health expenditure through Providing health benefits as programs aimed at raising educational attainment and productivity, which can stimulate growth. In the last study (Meng-yi, Chi-Chur and Shih-Wen, 2015:32), the effect of growth on health by allocating subsidies to the health sector under the internal growth model found that conditional benefits did not contribute positively to the growth rate . While Gong (Li and Wang, 2012:23) shows that economic growth is linked to both healthy growth and health.

In relation to housing policy, (Alvin 2006) examined the development of social policies in Canada with reference to the housing sector. He concluded that the provision of housing reflects the welfare state and the state's role in organizing because it is a factor in social development. (Narayan , 2004) to the causal relationship between expenditure on housing and real income in China during the period 1960-1999. Using the common integration approach, the subsidy allocated to the housing sector leads to a real increase in real incomes over the long term.

(Medvedev, 2016:327-348) links the priorities of sustainable economic policy and economic growth in Russia with budgetary efficiency, structural reforms and encouragement of entrepreneurship, efficiency of public administration, and modernization of the welfare state. (Torres and Agustín 2015:182) consider social welfare indicators to increase poverty and inequality, and labor force analysis is based on high efficiency in developing countries (Salmann, 2016:01-14), which is attributed to the efficiency of education and the development of scientific research.

III. Model and study data:

The study of the effect of state support on social sectors in Algeria will be carried out through the interpretation of economic growth in Algeria and the interpretation of expenditure on the social variables represented in expenditure on health, education, housing and employment. these variables are based on economic theory and previous studies with Take account of the Algerian reality.

Variable economic growth is the dependent variable in the applied study and the other variables are independent. In theory and previous studies, causality may work in both directions. As for the method of estimation, we used the self-regression method of distributed time gaps (ARDL) to study the relationship in the long term. The ARDL method allows us to study the relationship in the long run, taking into account the effect of the decimal values of the independent variables and the dependent variable on the current values of the dependent variable. The application of co-integration technology to long-term growth analysis is to test whether the dependent variable and independent variables follow a common long-term trend.

Variables for models and their sources are summarized in the following table:

Table (01): Study Variables

Source Series	The name of the string	String Code
World Bank Database	GDP	TPIBG
ONS	spending on education sector	Educequi
ONS	Spending Spending Sector Housing(	Logf
ONS	spending on the housing sector	Logequi
ONS	spending on health sector	Santf
ONS	Spenging Higher Education	Superif
ONS	Expending on the labor sector	Travf
ONS	Social Support	Aideso
World Bank Database	The rate of growth of public spending	Tdepenspub

1. the impact of social spending on GDP

Determining the impact of social expenditure on long-term economic growth will be based on estimating a standard model that explains economic growth by the following independent variables: expenditure on health, education, housing and employment, as well as variable public spending and social support, national solidarity and family. These variables were expressed in terms of processing expenses and administrative expenses from the general budget of the State.

The sample takes the following linear form:

$$\text{PIBG} = f(\text{Logf}, \text{Santf}, \text{Travf}, \text{Educpsf}, \text{Tdepenspub}, \text{Aideso}) \dots\dots\dots(1)$$

To estimate the above-mentioned relationship in the long term, we will use the Auto Regressive Distributive Lags (ARDL) model developed by (Pesaran and others, 2001). This model is considered as an alternative to the common integration tests known, so that this test developed by (Pesaran and others, 2001) is different from the rest of the tests because it does not require that the time series are all integrated from the same class I (0) or I (1). The only condition for applying this test is that the degree of integration of any of the variables I (2) is not. Also, ARDL can be applied if the sample size is small and this is the reverse of most traditional integration tests that require that the size of the sample be large so that the results are more efficient.

The ARDL model enables us to separate the effects of the short term from the long term. In this method, we can determine the integrative relationship of the dependent variable and the independent variables in the long and short term in the same equation. Also in this methodology we can estimate parameters of independent variables in the short and long term. His estimated parameters in the short and long term are more consistent than those in other ways, such as (Engel-Gringer, 1987), (Johansson, 1988) and (Johanssen-Gels, 1990). To determine the length of the distributed deceleration periods, two criteria (AIK) and (SC) are usually used, where the length of the period for which AIK and SC are low is chosen. «

The first step of the ARDL methodology is to test the existence of a common integration relationship, so that the joint integration according to (Pesaran and others, 2001) in ARDL models is based on the following hypothesis test:

$$\begin{cases} H_0 : & \pi_1 = \pi_2 = \pi_3 = \pi_4 = \pi_5 = \pi_6 = \pi_7 = 0. \\ H_1 : & \pi_1 \neq 0, \pi_2 \neq 0, \pi_3 \neq 0, \pi_4 \neq 0, \pi_5 \neq 0, \pi_6 \neq 0, \pi_7 \neq 0. \end{cases}$$

The test statistic is F-statistics (Wald test). The decision is as follows: If F-stat is greater than the upper limit of critical values, we reject the null hypothesis that there is no common integration relationship. If F-stat is less than the minimum critical value, we accept the null hypothesis that there is no common integration relationship. If the calculated value of F is between the upper limit and the minimum values proposed by (Pesaran and others, 2001) then we can not decide.

The minimum value assumes that all variables are static in their original values (at their level), ie they are complementary from the rank I 0 (0). The value of the upper limit assumes that the variables are static in the first differences of their values, meaning that they are integrated from the correct one (I).

The second step is to estimate model parameters in the short and long term. This should be done after ensuring that there is a common integration relationship between the study variables.

Before estimating the equation, the statistical characteristics of the variables should be studied, in particular the study of stability. The goal is to detect the relationship in the long term and to avoid the false estimates that may result if the series used in the estimation are unstable.

The unit root of the model variables was tested by the Augmented Dickey Fuller Test. For the degree of delay, it was determined based on the lowest value of the Akayek and Schwarz parameters (max p = 4) The following table:

Table (02): The degree of integration of time series

Variables	logf	santf	Travf	Tdependpub	Aidese	Tpibg
Degree of integration	I (1)	I (1)	I (1)	I (1)	I (0)	I (0)

Source: Prepared by the researchers depending on Eviews 10

If the critical value (according to Mackinnon ,1996) at a significant 5% is greater than the calculated value of the ADF test (absolute value), this means acceptance of the null hypothesis, ie, the variable contains a unit root, thus the series is unstable. If the calculated value of the DCI is greater than the critical value, the chain is stable.

By making the first differences on the unstable time series, we get stable time series.

After confirming the requirement of applying the ARDL methodology, the degree of integration of the time series of the variables of the study through the unit root test, so that the integration of all the variables is integrated from class I, except the social support series, pibg, Raw per capita pibh which is stable at level I (0). We will experience a common integration relationship.

The ARDL form of the equation is written as follows:

$$\begin{aligned} \Delta PIBG_t = & \alpha_0 + \sum_{j=1}^{p_1} \beta_j \Delta PIBG_{t-j} + \sum_{j=0}^{p_2} \theta_j \Delta TRAVF_{t-j} \\ & + \sum_{j=0}^{p_3} \gamma_j \Delta TDEPENSPUB_{t-j} + \sum_{j=0}^{p_4} \delta_j \Delta EDUCPSF_{t-j} + \sum_{j=0}^{p_5} \lambda_j \Delta SANTF_{t-j} + \sum_{j=0}^{p_6} \theta_j \Delta LOGF_{t-j} + \\ & \sum_{j=0}^{p_7} \mu_j \Delta Aideso_{t-j} + \pi_1 PIBG_{t-1} + \pi_2 TRAVF_{t-1} + \pi_3 TDEPENSPUB_{t-1} + \pi_4 EDUCPSF_{t-1} \\ & + \pi_5 SANTF_{t-1} + \pi_6 LOGF_{t-1} + \pi_7 Aideso_{t-1} + \varepsilon_t \dots\dots\dots (2) \end{aligned}$$

a-Test the relationship of joint integration using the Boundary Approach

$$\begin{cases} H_0 : & \pi_1 = \pi_2 = \pi_3 = \pi_4 = \pi_5 = \pi_6 = \pi_7 = 0. \\ H_1 : & \pi_1 \neq 0, \pi_2 \neq 0, \pi_3 \neq 0, \pi_4 \neq 0, \pi_5 \neq 0, \pi_6 \neq 0, \pi_7 \neq 0. \end{cases}$$

The statistical value of co-integration is $F = 12.99956$ and the limits of the critical values at the various degrees of significance suggested by (Pesaran and others, 2001) are shown in the following table:

Table (03): Boundary Tests

F-statistic =12.99956		
Critical values		
Upper limit	Bottom border	significatif levels
3.23	2.12	10%
3.61	2.45	5%
3.99	2.75	2.5%
4.43	3.13	1%

Source: Prepared by the researchers depending on Eviews 10

The table shows that F-stat is greater than the upper limit of the critical value at different degrees of significance (1%, 5%, 10%) and therefore reject the null hypothesis and accept the alternative hypothesis of a long-term equilibrium relationship.

b-Estimation of the ARDL Model

After ensuring a long-term relationship between the economic growth rate and its determinants, we will estimate the parameters of this relationship according to the ARDL methodology. Based on Schwarz Bayesian Criterion, the deceleration periods were determined, and the model (4, 3, 3, 2, 4, 4, 4) was the optimal model. The short and long term results are shown in the following table:

Table (04): Estimation of the Self-Regression Model for Distributed Time Leaps (4, 3, 3, 2, 4, 4, 4)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob
EDUCPSF	-0.037000	0.000006	-6.778932	0.0000
LOGF	0.668000	0.000108	6.183764	0.0001
SANTF	0.380000	0.000018	2.078646	0.0643
TRAVF	363000-0.	0.000065	-5.598187	0.0002
AIDESO	0.690000	0.000018	3.793505	0.0035
TDEPENS PUB	-0.025957	0.012824	2.024181	0.0205
C	10.923453	1.370078	7.972868	0.0000

Source: Prepared by the researchers depending on Eviews 10

$$y = 10.92 + (-0.03 \text{ educpsf} + 0.66 \text{ logf} + 0.38 \text{ santf} - 0.36 \text{ travf} + 0.69 \text{ aideso} - 0.02 \text{ tdepenspub}), \text{IV}$$

c-Test the stability of the model

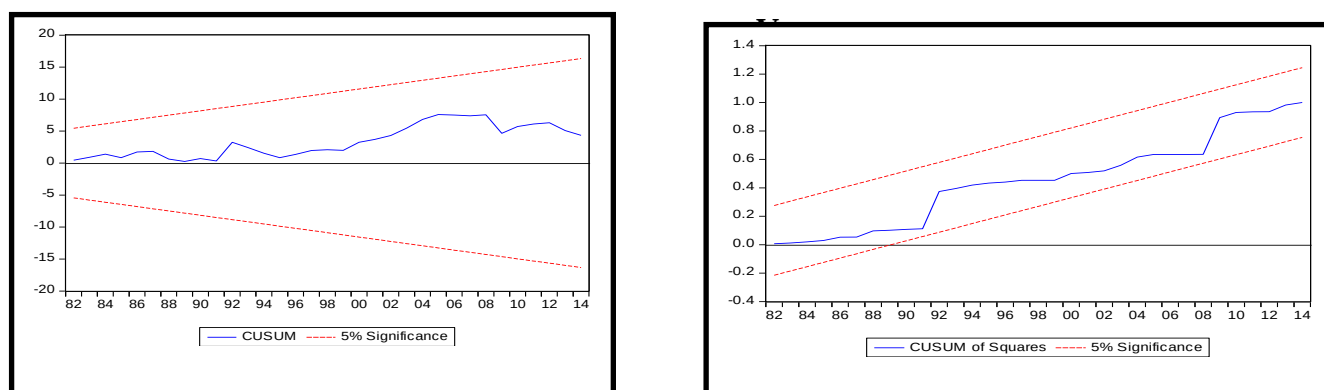
The structural stability test for short- and long-term transactions will be conducted through two tests proposed by (Brown, Durbin, and Evans, 1975) the CUSUM cumulative test and the CUSUM of Squares cumulative test.

These two tests are one of the most important tests in this field because it shows two important things, namely, showing the existence of any structural change in the data, and the stability and consistency of long-term parameters with short-term parameters. Many studies have shown that such tests are always associated with the ARDL method.

The structural stability of the estimated coefficients of the ARDL error correction formula is achieved if the CUSUM and CUSUM of Squares are within the critical limits at a significant level

of 5%. Therefore, these parameters are unstable if the chart of the two tests is passed outside the critical limits at this level.

Figure (01): The graph for the test of the cumulative total of the repeated condensate and the cumulative sum test of the repeated residue boxes



Source: Prepared by the researchers depending on Eviews 10

Both models show that the model's estimated coefficients are structurally stable during the study period, because the CUSUM and CUSUM of Squares are within the critical limits of 5%.

IV- STUDY RESULTS (ANALYSIS AND DISCUSSION) :

For the results of this standard study from 1970 to 2016, after estimating the ARDL model: the impact of social expenditure on GDP), we found that the negative impact on education spending, operating expenditure and the rate of public expenditure on Long-term economic growth. A 1% increase in education spending leads to a drop of 0.03% in economic growth, and a 1% increase in spending on the employment sector leads to a 0.36% decline in economic growth. The proportion of public expenditure by 1% leads to a decline (Nannan, Bo, Jong and Storm, 2015), which sees the problem of inequality in spending and the difference in educational achievement negatively affect growth and economic development. The impact of the rest The variables on economic growth were positive, with a 1% increase in spending on housing, health spending and social support leading to an increase in long-term economic growth of 0.66%, 0.38% and 0.69%, respectively.

This may be explained by the fact that spending on the education sector is consumption rather than investment, and spending on this sector is only taking into consideration the quantitative aspect, without taking into consideration the quality of the sector.

As for the housing sector, the efforts exerted by the state by giving importance to the housing sector and through the reforms and rely on different mechanisms in the financing of housing

projects. The programs have also affected almost all layers of society, especially those target groups that need support to improve their level And improve their quality of life. As well as good guidance for social support policy to achieve social policy objectives.

V.CONCLUSION:

In this paper we tried to study the impact of expenditure on the various social sectors represented in the health sector, education, housing and employment, as well as the rate of public expenditure on economic growth between 1970 and 2016.

After estimating the ARDL model, we obtained the negative impact of spending on education, expenditure on employment, and growth rate of public expenditures on economic growth in the long run. This result is statistically acceptable but may take economic restraint. The impact of the other variables on economic growth was positive. The increase in expenditure on the housing sector, expenditure on the health sector, lead to an increase in the rate of economic growth in the long term.

But it is not necessarily that spending on all social sectors leads to higher economic growth rates. Therefore, it is necessary to increase government spending on activities that stimulate economic growth, such as spending on labor force to increase productivity in terms of education and training, The latter is one of the most efficient outputs to be used in the economic and social field.

In addition to good guidance for the social spending policy to achieve the objectives of social policy aimed at the distribution of income among the community, especially low income.

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