Impact of economic welfare on economic growth - The Case Study of Algeria-
أثر الرفاهية الاقتصادية على النمو الاقتصادي– دراسة حالة الجزائر–

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Received: 10/01/2022 **Accepted:** 31/03/2022 **Published:**31/03/2022

Abstract:

The current investigation seeks to determine the impact of economic welfare indicators on economic growth rates in Algeria through a econometrics study in which we relied on the methodology of co-integration and took as independent variables both the rate of family spending, the rate of spending on health, and the rate of unemployment as indicators of economic well-being. As for the dependent variable, we took the gross domestic product (GDP) per capita as a reflection of economic growth. The study was conducted during the period 1990-2019, and we found a positive impact for both family spending and the proportion of expenditure in the health sector on economic growth, as well as a negative impact of unemployment rates on economic growth**.**

Keywords: economic welfare, economic growth, family spending, health spending, unemployment rate.

JEL Classification Codes : C22, I1, I1

ملخص:

تهدف هذه الورقة البحثية الى دراسة تأثير مؤشرات الرفاهية الاقتصادية على معدلات النمو الاقتصادي في الجزائر، من خلال دراسة قياسية اعتمدنا فيها على منهجية التكامل المشترك واخدنا كمتغيرات مستقلة كل من معدل الانفاق العائلي ، نسبة الانفاق على الصحة و معدل البطالة كمؤشرات للرفاهية الاقتصادية ، اما المتغير التابع فأخذنا الناتج الاجمالي المحلى للفرد يعبر عن النمو الاقتصادي، تمت الدراسة خلال الفترة 1990– 2019 ، توصلنا لإيجاد اثر موجب لكل من الانفاق العائلي و نسبة الانفاق في القطاع الصحي على النمو الاقتصادي و كذلك تأثير سلبي لمعدلات البطالة على النمو الاقتصادي.

كلمات مفتاحية: الرفاهية الاقتصادية، النمو الاقتصادي، الانفاق العائلي، الانفاق على القطاع الصحي، معدل البطالة.

تصنيفات JEL : C22 ,I1,I3

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INTRODUCTION:

Among the goals that the governments of the countries are working on is achieving a level of economic and social well-being for all members of society, through the careful management of the various financial and economic resources, as well as the fair distribution of the nation's wealth. It is worth noting that one of the reasons for increasing the people's productivity is their enjoyment of economic and social well-being, which is what characterizes most of the developed countries that have achieved high and stable economic growth rates. It is also clear that there is a general correlation between economic growth and social well-being in the short and long term, as economic growth determines the level of social well-being. , if growth is weak, unemployment rises, incomes increase toward recession, consumption constraints increase, and the overall level of well-being becomes lower on average than it was in times of strong economic growth and income.

But GDP is what it implies that in determining the level of well-being is that it does not take into account non-economic factors that can affect the well-being of the population, such as the quality of the natural and cultural environment, the quality of social relations and working conditions of the active workers, good or bad, etc. So, through research, the field of variables that take into account the measure of well-being via the development of indicators that measure the level of economic well-being of communities has been expanded. Empirically, the majority of research has highlighted the relationship between social welfare factors such as spending, education and health levels, and spending on social services with economic growth, as well as the causal relations between these variables.

STUDY PROBLEM

"The problem is to see how some indicators of economic well-being relate to economic growth in Algeria, by determining their impact."

STUDY HYPOTHESIS

The research hypothesis is based on the fact that well-being is a basic requirement that must be provided in society, which inevitably leads to better conditions for the individual and all economic agents, which necessarily increase economic growth rates.

1- LITERATURE REVIEW:

Economic growth is one of the oldest subjects in economics and one of the youngest. Existing literature concerning the study of the connection between welfare and economic growth is going on actively. Because the relationship between economic growth and well-being has a long and complex linkage or inter-connection, especially linking them with maintainable development, several studies have addressed the impact of economic well-being on economic growth rates and tried to find the relationship between indicators of well-being and economic growth.

As it is known that a welfare state takes the responsibility for contributing to welfare of people of its society to sustain development economically. In general, welfare include efforts to provide a basic level of well-being through free or supported social services such as healthcare, education, vocational training and public housing , a support for those in old age, support for the maintenance of children, medical treatment, parental and sick leave, unemployment and disability benefits, and support for sufferers of occupational injury

(Vrooman, 2009). Based on this definition, previous studies focused on this relationship in terms of such range of social services described before.

Since health is a major component of human welfare, economists have long been interested by the connection between health and economic growth. (Costa & Steckel, 1997)investigated the evidence on economic growth and health as measured by stature and mortality rates in the nineteenth and twentieth centuries in the United States. They relied on the anthropometric variables that are useful predictors of both overall and disease-specific mortality and morbidity at later ages and provide them with a more complete picture of past health than stature and mortality rates alone. The results showed that the progression of health and economic growth diverged in the nineteenth century and converged in the twentieth. These variables in both the nineteenth and the twentieth centuries enabled them to understand the factors underlying the twentieth-century improvement in health and to improve their predictions of future trends. Hence, it is evident that individuals in better health are able to increase their productivity and output.

Economically, some researchers claimed that public welfare ought to be in accordance with the economic growth level of a country. Therefore, economic progress will be destabilised if the governments fail to provide enough welfare for the individuals as growth occurs (Sardar M. N. & Matthew, 2002). The authors addressed how welfare economics can make a positive contribution to development economics through the application of just one specific tool; cost benefit analysis. In doing so, a cost benefit analysis adjusted GDP becomes a more significant measure of welfare than unadjusted GDP. The approach was applied to Thailand. The results showed welfare increased but not regularly with depressions and falls perhaps related to an increase of inequal income distribution. The benefits of economic growth were positive but the costs of this growth also were accounted for. Therefore, they ascertained that the CBAGDP SWF measure of welfare is a suitable welfare indicator.

Because a skilled, well-trained workforce is more productive and produces a high-quality output that adds efficiency to any economy, it is axiomatic that education surely affect the growth of any economy. This is evident by Miller who mentioned that Richard Lynn and Tatu Vanhanenn, in their book IQ and the Wealth of Nations (Lynn & Vanhanen , 2002), investigated on how far variances in intelligence can explain the differences in economic development between nations. Miller claimed that they do not only put forward this hypothesis, but tested it in different countries. He wrote that "the theory helps significantly to explain why some countries are rich and some poor" (Miller, 2002)

As well, Heiner Rindermann asserts that cognitive abilities have an important impact on the economic and non-economic success of individuals and societies. For international analyses, they supplemented and meliorated the collection of IQ-measures from Lynn and Vanhanen by data from international student assessment studies (IEA-Reading, TIMSS, PISA, PIRLS). The results show that the cognitive level of a nation is highly correlated with its educational level (r=0.78, N= 173). In international comparisons, it also shows a high correlation with gross domestic product (GDP, r=0.63, N= 185). In longitudinal analyses with

various samples of nations, education and cognitive abilities appear to be more important as developmental factors for GDP. Thus, education and intelligence are also more relevant to economic welfare than vice versa (Rindermann, 2008).

Additionally , in the study of)Al-Jubouri و Khudair(2014 ،, researchers identified the type of causal and reciprocal relationship between the Social Welfare Index and the Economic Growth Index in Iraq using the VAR model. During the 1980-2012 study period, three indicators of social well-being were adopted: expenditure on education, health and social protection, concluding that increased spending on the components of social well-being would lead to economic growth rates, as well as a causal trend from economic growth to social welfare.

Unemployment is a negative phenomenon in any society as it unfavourably affects in different dimensions and directions. Generally, recent studies show that the relationship between economic growth and unemployment is one of the most debated issues of the economist literature. This happens because most of the countries have to deal with the problem of unemployment. Generally, most of the existing literature on the topic is undertaken to provide the underpinnings of the relationship in terms of the impact of economic growth on employment. However, the current research examines the relationship between employment as a measure of welfare and economic growth, but more precisely the effects of unemployment on this economic growth.

Mehrnoosh and Feizolah investigated the role of inflation and unemployment on economic growth from 1996 to 2012, particularly in Iran. The authors examined the effect of inflation and unemployment on economic growth in two short-term and long-term phases using Autoregressive Distributed Lag (ARDL) Model. The results showed the significant and negative effect of inflation and unemployment on economic growth in long term. The outcomes also indicated that inflation and unemployment decreased economic growth in long term. This revealed that authorities should carefully endeavour and plan to reduce and control inflation and unemployment. The results of this study can be used so that they could attempt to reduce and control unemployment and inflation in order to achieve economic growth (Mehrnoosh & Feizolah, 2016)

Another study desired to investigate the trends and impact of unemployment on economic growth in South Africa using quarterly data over the period 1994Q1 to 2016Q4. In order to determine the existence of the long run linkage among the variables, the researchers applied The Auto Regressive Distribution Lag (ARDL) bounds test approach. The results from the ARDL model suggested that there was a long run relationship between unemployment and economic growth. The results obtained confirmed that there is a negative relationship between unemployment and economic growth both in the long and short run. (Makaringe & Khobai, 2018)

Richardson made a study to analyse the relationship between economic growth and welfare in Nigeria. In view of the findings, he asserted there should be a radical change

of the economic system through reforming, improving the social situation and abilities of the poor, investing in basic and technical education to increase the supply of well-trained labour, improving social health care in order to encourage of good governance for a well- economic progress. (Richardson, 2018)

Still, economists, scientists and researchers, in general, aimed and still have an objective at ascertaining the relationship between welfare and economic growth. As evidence, we referto Bação, P. and Simões, M. who conducted a study to look for the relationship between the welfare state and economic growth in Portugal over the period 1980–2018. They estimated a VAR model based on a standard aggregate Cobb–Douglas production function. To contribute to the transparency and robustness of the results on the link between the welfare state and economic growth, they provide a comprehensive robustness check by means of specification-curve analysis to their VAR model. The results showed that welfare spending in Portugal increased over this period as a percentage of GDP. They concluded that steps taken were marked by the creation of the National Health System (NHS), the expansion of the public education system and the introduction of a public social security system for all citizens . Thus, the welfare state may have the ability to influence economic growth. (Bação & Simões, 2020).

Some authors consider social spending to be the most important public expenditure because it ultimately affects the well-being of the population. For (De vanWalle, 1999) , one of the most important goals of public expenditure is to improve the well-being of the population and in particular that of the poorest. For this author, the evaluation of expenditures can be done using two groups of methods. The first group studies the impact of public spending; the second group adopts behavioral approaches.

As for the second group of studies on the relationship between education spending and economic growth, it shows, among other things, that a marginal increase in public education spending is a source of sustainable growth and poverty reduction in Peru (Gustavo, Castro, Beltràn, & Càrdenas, 2009).

Similarly, (Coulibaly, 2013)shows that in the Ivory Coast the increase in public spending on education has a significant positive impact on economic growth.

Accordingly, in this paper, we focused on Social welfare, family spending, spending on the health sector, unemployment (referring to education as having a relationship to some extent with unemployment) as variables affecting economic growth.

2- THEORETICAL LITERATURE

2-1 THE CONCEPT OF ECONOMIC WELL-BEING

Well-being is defined as the amount of benefit and happiness that enables and helps the individual to feel contentment, sufficiency and satisfaction from consuming a group of goods and services that lead to the satisfaction of his diverse and increasing desires (Yunus Hussein, 2010). It is also defined as a condition that affects the life of the individual and the group and

works to satisfy the basic biological needs of the human being such as food, clothing and housing, and the needs required by social life such as education, culture, medical services and social security. This can be summarized by saying that well-being is the achievement of a decent level for society in all aspects of its life (Asmaa & Bella, 2019).

Economic well-being is the main goal of economic development in any developed or developing society, and it is embodied in a decent standard of living that meets the material and moral needs of human being and achieves social satisfaction, based on a fair distribution of income between the various regions of the country and among the various segments of society (Ahmed Jassim & Odeh, 2014).

As for the welfare economy, it is concerned with studying and evaluating the economic efficiency and the systems related to the distribution of resources, which leads to achieving the greatest amount of social benefit and providing the conditions through which economic policies can be based in achieving the welfare of the community. These policies call for intervention to encourage productive projects and distributive justice. Through taxes, production increases and needs are satisfied (Hussein, 1999).

2-2 PROSPERITY AND ECONOMIC GROWTH

Economic growth and economic well-being are generally associated. In the short term, it is disputable that economic growth determines effectively the level of social welfare. If growth is weak, unemployment increases, incomes tend to stagnate, the constraints on consumption become stronger and, in total, the level of well-being is on average lower than in periods of strong growth in the economy and income. However, one can argue about the relevance of using per capita GDP to measure the evolution of well-being over a long period.

The usual criticism of the use of this indicator is based on the limited nature of the information it synthesizes. In fact, the calculation of the GDP excludes part of the activities outside the market or which fall within the informal world of domestic work or volunteering. The calculation of GDP also excludes taking into account the environment in which individuals live. so that the growth of polluting or harmful activities from the point of view of health, increases the GDP by the amount of additional production without any adjustment for environmental degradation (Cornilleau, 2005).

To take these limits into account, studies have sought to extend the field of variables taken into account for the measurement of well-being. They led to the establishment of so-called "human development" indicators published since 1990 by the United Nations Development Program. However, these indicators are relatively difficult to read and their implementation implies very strong assumptions about the weight of the various “factors” of well-being. GDP per capita also remains one of the main sub-indicators of human development, without further reflection on the information it conveys from the point of view of well-being (Cornilleau, 2005).

2-3WELL-BEING INDICATORS

Well-being is measured by a number of variables, some quantitative and others not. As for quantitative variables, they depend on the level of consumer spending or the pattern of this spending, whether it is on food or non-food commodities and the level of health, entertaining and educational services. As for the per capita GDP, it is above all an indicator of production. In fact, it measures the economic, market and non-market products produced over a period of time. But it is usual to refer to it, at least implicitly, when it comes to comparing two or more countries in terms of their economic situation (Cornilleau G. , 1996).

With regard to non-quantitative variables, the most important of them is the right to participate in making decisions that determine the relationship of individuals to each other, such as the ability to enjoy democracy, justice and tranquillity (Yunus Hussein, 2010). According to (Osberg & Sharpe, 2002), there are four components that characterize economic well-being.

Four components characterize economic well-being: (1) actual consumption flows per capita, which include consumption of market goods and services, actual per capita flows of non-market goods and services, and changes in leisure time practice; (2) the net accumulation in society of stocks of productive resources, including the net accumulation of tangible goods and housing stock, the net accumulation of human capital and investments in Research & Development (R&D), environmental costs and the net change in the level of external debt; (3) the distribution of income, according to the Gini index of inequality, as well as the extent and impact of poverty; finally (4) economic security against unemployment, and diseases (Osberg & Sharpe, 2002).

3- EXPERIMENTAL STUDY

During the experimental study, we will try to measure the impact of economic well-being on economic growth in Algeria during the period 1990-2019, we relied on individual spending (symbolized by: ci), health spending (symbolized by: ds), and Unemployment rate (symbolized by: ct), as independent variables, plus GDP per capita as the dependent variable(symbolized by: GDP). We obtained the data from the WDI[2] database, after entering the logarithm on all-time series, we obtained the model to be estimated represented by the following equation:

$$\ln(pib) = c + \propto_1 \ln(ci) + \propto_2 \ln(ds) + \propto_3 \ln(ct) + \varepsilon_t$$

With:

c : is a intercept

$\propto_i$: are the coefficients of the explicative variables

ε_t : is an error term

3-1 TIME SERIES ANALYSIS

[2] World Development Indicators

Experimental methods will be used in the analysis of time series through the co-integration analysis methodology, through a set of statistical tests for the time series of the study variables. These tests are as follows:

3.1.1 Stationary test:

Before testing the existence of a long-term equilibrium relationship between the model variables, it is necessary to analyse the stationary of the time series to find out the rank of their stationary and to know the methodology used to estimate the appropriate model. There are several tests for unit root such as (Test Dickey-Fuller Simple ,Augmented Dickey-Fuller, Phillips-Perron,Dickey-Pantula , KPSS,Elliot-Rothenberg and Stock,Ng-Perron) and we will use the Augmented Dickey Fuller test (ADF,1981). (Bourbonnais & Terraza, 2010)**.** This test depends on estimating three equations as follows:

- The first is without an intercept and without time tendency:

$$\Delta Y_{t} = \alpha\, Y_{t-1} - \sum_{j=2}^{p} \phi_{j}\, \Delta Y_{t-j+1} + \varepsilon_{t}$$

- The second with an intercept and without a time tendency:

$$\Delta Y_{t} = \alpha\, Y_{t-1} - \sum_{j=2}^{p} \phi_{j}\, \Delta Y_{t-j+1} + c + \varepsilon_{t}$$

- The third with an intercept and a time tendency:

$$\Delta Y_{t} = \alpha\, Y_{t-1} - \sum_{j=2}^{p} \phi_{j}\, \Delta Y_{t-j+1} + c + \beta\, t + \varepsilon_{t}$$

After adopting the expanded third model, we obtained the following results:

Table (1): ADF test results.

Variables	in the level			The first difference		
	Calculated value	critical value 5%	pro	Calculated value	critical value 5%	pro
GDP	3.6793	-2.9677	- 0.0173	3.2799	- 3.6891	- 0.0257
ci	2.3855	- 2.9810	- 0.1552	4.8407	-3.6891	- 0.0006
ds	1.0921	-2.9677	- 0.7051	5.3116	-3.6891	- 0.0002
ct	0.5099	-2.9677	-0.8757	4.4086	- 3.6891	-0.0017

Source: Prepared by researchers depending on the program (Eviews **10**)

Table N° 01 shows the results of the unit root test for the variables under study, and from it, it is clear that the values of the time series of all variables are not stationary in their level, as the test values ADF are less than the critical values at the 5% level. Therefore, the hypothesis of the existence of a unit root at the level cannot be rejected. And accordingly, we made the first difference on the time series, where it was found that all the time series are stationary after making the first difference, which means that they are integrated of the first degree I (1). Through these results we will test for the existence of co-integration since all the stationary series from same degree.

3.1.2 Co-integration test

According to (Engle & Granger, 1987), it is possible to generate a linear mixture characterized by static from the not stationary time series of the variables and therefore the regression between the variables is not biased. The multivariate co-integration test requires that the time series of the variables be integrated of the same rank, and therefore the goal of conducting the unit root test is to determine the rank of integration for each of the variables so that the co-integration test can be applied between these variables.

Before conducting the co-integration test, it is necessary to determine the appropriate period of lag. Table N°. 02 shows the criteria that were used to determine the lag period, based on the AIC[3] and SC[4] criteria.

Table (2): Determination of the optimum lag rank according to the AIC and SC criteria

Lag	AIC	SC
0	-5.0778	-4.8842
1	-13.7044	-12.7367*
2	-13.8569	-12.1149
3	-14.1925 *	-11.6763

Source: Prepared by researchers based on outputs (Eviews **10**)

[3] Akaike information criterion
[4] Schwarz information criterion

It is noted from the previous table that the optimal number of slowdown periods according to the two mentioned criteria is estimated at one period for the SC criterion and three periods for the AIC criterion, and accordingly we choose the lowest one, which is one period.

There are several co-integration tests such as: Test Granger – Engle, and the Durban - Watson test (Test CRDW), but the Johansen test is superior to the previous two tests in that it is suitable for small samples as well as in the case of multiple regression. Therefore, this test will be adopted in our research. Where two statistics can be relied on in the test:

The first test: the test of trace, and it depends on the following statistic:

$$\lambda_{\text{trace}} = -n \sum_{i=r+1}^{k} \ln(1 - \lambda_{\text{i}})$$

With:

n: is the number of observations
λ: is the eigenvalue of the matrix
k: is the number of variables
r: is the rank of the matrix.

The test of trace works by ruling out alternative hypotheses:

matrix rank r = 0, we test the null hypothesis H0: r = 0 against H1: r > 0, if H0 is rejected we pass to the next test (λ"trace" is greater than the critical value), otherwise the procedure is stopped and the matrix rank is r = 0.

If after rejecting different hypotheses H0 at the end of the procedure, we test, H0: r = k-1 against H1: r = k. If we reject H0, the rank matrix is r = k and there is no co-integration relationship because the variables are all stable in the level.

The second test: Test Values Maximum and depends on the following statistic:

$$\lambda_{\text{max}} = -n \log\ (1 - \lambda_{\text{r+1}}\ )$$

Like the test of trace, this test is performed sequentially by excluding alternative hypotheses. If the two tests are inconsistent, i.e. the effect and the maximum values, we prefer to the test of trace whose strength is higher (Bourbonnais & Terraza, 2010).

Table (3): The Test of Trace

Hypotheses	Statistical Trace	Critical Value 5%	Probability
There is not	61.5612	47.8561	0.0016
at most 1	28.9605	29.7970	0.0622
at most 2	10.5542	15.4947	0.2405

Source: Prepared by researchers based on outputs (Eviews **10**)

Table (4): Great Potential Test

Hypotheses	Statistical Great Potential	Critical Value 5%	Probability
There is not	32.6007	27.5843	0.0104
at most 1	18.4062	21.1316	0.1154
at most 2	7.8043	14.2646	0.3984

Source: Prepared by researchers based on outputs (Eviews 10)

Through the two tests, we reject the null hypothesis in the first stage, that is, there is no co-integration relationship and we accept the alternative hypothesis and the existence of at most one relationship (61.5612 is greater than 47.8561 for the trace test and 32.6007 is greater than 27.5843 for the maximum possibility test), while in the second stage we accept the null hypothesis That is, the existence of one co-integration relationship and we reject the alternative hypothesis that there are at most two relationships (28.9605 is less than 29.7970 for the trace test and 18.4062 is less than 21.1316 for the maximum potential test).

3.2 ESTIMATING THE COINTEGRATION RELATIONSHIP

Through Johansen's test, we showed a co-integration relationship between the variables, through which the following equation can be developed:

$$\ln(pib) = 6.0731 + 0.1565\,.\ln(ci) + 0.0573\,.\ln(ds) - 0.1307\,.\ln(ct)$$

SE		(0.1843)	(0.0375)	(0.0551)
t-statistics	**[6.0900]**	**[2.8496]**	**[1.5255]**	**[-2.3732]**

Through the previous equation, we conclude that every increase in individual family spending by 1% leads to an increase in the economic growth rate by 0.15 with a standard error of 18%, and every increase in the percentage of health spending by 1% leads to an increase in the economic growth rate by 0.05, With a standard error of 3%, and every increase in the unemployment rate by 1% leads to a decrease in the economic growth rate by 0.13, with a standard error of 5%. We also note that there is a statistical significance for the parameters of the model by comparing Student's statistic with the tabular value, except for the health expenditure coefficient.

3.3 MODEL QUALITY ANALYSIS

Statistical tests of the estimated model indicate that it is free from the problem of autocorrelation of residuals, through the LM-Test (Breushe godfrey coorelation) test, we note that the probability value exceeded the threshold of 0.05, and thus we accept the null hypothesis which states that the residuals are not autocorrelated. Also, through the Jarque-Bera test, we note that the residuals follow a normal distribution due to the probability value exceeding the 0.05 threshold.

Fig (1): LM test

VEC Residual Serial Correlation
LM Tests
Null Hypothesis: no serial correlation at lag order h

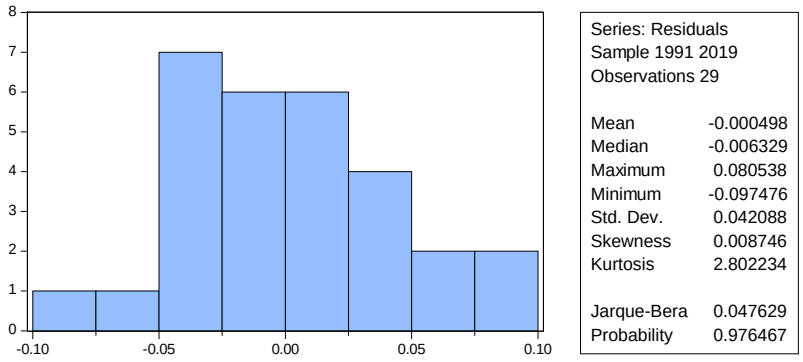
Sample: 1990 2019
Included observations: 27

Lags	LM-Stat	Prob
1	16.46290	0.4211
2	19.47685	0.2447
3	13.69256	0.6216

Probs from chi-square with 16 df.

Source: Prepared by researchers based on outputs (Eviews 10)

Fig (1): Jarque-Bera test



Source: Prepared by researchers based on outputs (Eviews 10)

CONCLUSION

Based on what we discussed in this study, which dealt with the impact of the components of welfare on economic growth rates in Algeria, we found a relationship between welfare indicators, which were limited to consumer spending, spending in the health sector and unemployment rates on economic growth, as it was found that each increase In individual family spending by 1% leads to an increase in the economic growth rate by 15% with a standard error of 18%, and every increase in the percentage of health spending by 1% leads to an increase in the economic growth rate by 5% with a standard error of 3%, and Each increase in the unemployment rate by 1% leads to a decrease in the economic growth rate by 13%. Through this study, we can suggest some recommendations that will improve the economic growth rates, which are basically dealing with improving indicators of economic well-being:

- The necessity of distributing income equitably throughout the country in order to raise the level of individual consumption.
- Increasing the purchasing power in order to increase the consumption of the family individual and thus increase the production.
- - Increasing spending on the health sector to improve the level of public health and thus reduce sick leave and increase productivity.
- Improving the educational level by increasing and rationalizing the education budget in an effort to improve education outcomes in all its phases, which has a direct and positive impact on improving economic growth rates.
- Creating permanent and temporary jobs to reduce the phenomenon of unemployment, which is reflected in increased production and increased spending.

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