The impact of the hidden economy on Algeria's economic growth - Eeconometric Study for the Period 1990-2017

أثر الاقتصاد الخفي على النمو الاقتصادي في الجزائر دراسة قياسية للفترة 1990–2017

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Abstract:

This research aims to study the hidden economy as a phenomenon in Algeria, Which includes all economic activities that are not subject to the control and laws of the state and thus evade paying taxes, In addition to studying the impact of this hidden economy on economic growth in Algeria 1990-2017.

This study concluded that the hidden economy has had a positive effect on the official economy of Algeria during the period 1990-2017. It has played the role of catalyst for economic growth. This is due to the inter-relationships between the parallel economy and the formal economy. To explain more, while Hidden economy uses the inputs that come from the formal economy such as energy and raw materials, it injects extra money into the formal economy and pay wages to its employees. Therefore, parallel economy contributes in some way to gross national product and economic growth.

Keywords: Hidden Economy; Economic growth; GDP Function modeling.

JEL Classification Codes:E26, O47, O17, C3

ملخص:

يهدف هذا البحث لدراسة أثر الاقتصاد الخفي على النمو الاقتصادي في الجزائر للفترة 1990-2017 ؛ ويشمل الاقتصاد الخفي جميع الأنشطة الاقتصادية التي لا تخضع لرقابة وقوانين الدولة وبالتالي تتهرب من جميع الالتزامات المفروضة على النشاط كدفع الضرائب والرسوم وغيرها.

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حيث خلصت الدراسة إلى وجود علاقة طردية موجبة بين الاقتصاد الخفي والنمو الاقتصادي في الجزائر للفترة 1990-2017 ، وأي ارتفاع في الاقتصاد الخفي بنسبة 1٪ سيؤدي إلى ارتفاع في حجم الناتج الداخلي الخام بـ 0.237٪ (في ظل ثبات العوامل الأخرى) عند مستوى معنوية 5٪؛ أي أن الاقتصاد الخفي يساهم بطرق غير مباشرة في زيادة الناتج الداخلي الخام وبالتالي رفع معدلات النمو، أي أنه يلعب دور المحفز للنمو الاقتصادي وذلك راجع للعلاقات المتداخلة بين الاقتصاد الخفي والاقتصاد الرسمي. بحيث يستعمل مدخلات يحصل عليها من الاقتصاد الرسمي كالطاقة والمواد الأولية وبعض المواد الأخرى مقابل أموال تضخ في الاقتصاد الرسمي؛ كما يدفع أجورا لموظفيه يتم إنفاق جزء كبير منها في الاقتصاد الرسمي وبالتالي فهو يساهم بطريقة ما في الناتج الرسمي وفي النمو الاقتصادي.

كلمات مفتاحية: الاقتصاد الخفي، النمو الاقتصادي، نمذجة الناتج.

تصنيفات JEL : E26، O47، O17 ، C3.

1. INTRODUCTION

The ILO (International Labour Organization) was the first to draw attention to the phenomenon of hidden economy in its report on the employment situation in Ghana and Kenya in 1972, where the organization indicated in its study to a group of activities (legal and illegal) that do not pay any taxes nor are they counted and followed up by the state, then "Gutman" published his research on the underground economy in 1977 in which he drew attention to the seriousness of economic transactions that are not recorded in the gross national product then studies and research continued to prove what "Gutman" warned him, there is agreement among economists that hidden economy activities are closely related to society and coexist with the activities of the formal economy it is an expanding and growing network of production, exchange and distribution relationships which accounts for a large proportion of the gross domestic product in most countries, there are also several terms that express activities and transactions that are not recorded in the calculations of the gross product,

such as the hidden economy, the parallel economy, the lower economy, the black economy, and the shadow economy.

The Algerian economy like other economies in the world suffers from the spread and expansion of hidden economy activities that generate huge incomes that are often not included in the official estimates of national income and are not subject to taxes, studies in this field confirm the magnitude of the hidden economy in Algeria. Some estimate that the total volume of hidden economy activities in Algeria can range from 20% to 30% of GDP and that the total money circulating within this sector is between 20% to 30% of the money supply. Whereas, a study by Friedrich Schneider on behalf of the International Monetary Fund indicates Until the size of the hidden economy in Algeria exceeds the threshold of 30% of GDP. (Buehn, 2010, pp. 20-21)

1.1 The problematic:

There is no doubt that the existence of hidden economy activities within the state has many effects on the overall economic indicators of the state, such as output, inflation, unemployment, economic growth, etc. These effects differ according to the type of hidden activities and the nature of the economy As well as the economic index and the country itself.

Accordingly, the problem of study is summarized in the following question:

What is the impact of the hidden economy on Algeria's economic growth?

1.2 The hypothesis :

The study tests the hypothesis that the hidden economy negatively affects Algeria's economic growth.

1.3 The importance of study:

The hidden economy is an economic phenomenon that affects most countries in the world, including Algeria, despite the many studies that dealt with the subject however, only a few of them focused on the relationship of the hidden economy to economic growth, Also, the results were mixed between the negative and positive impact from country to country, This study aims to focus on the impact of the hidden economy in Algeria on their economic growth.

1.4 The objective of the study:

The study aims to analyze the relationship between hidden economy and economic growth in Algeria, and knowing whether the existence of the hidden economy is a catalyst and a contributor to economic growth in Algeria, or, his presence will be frustrating and hindering him.

1.5 The methodology:

To answer the question posed; the study relied on a mixture of analytical and statistical approaches and tools. Where the descriptive analytical approach was used to describe the phenomenon of the hidden economy and determine its most important characteristics, the inductive approach was also used by using statistical and standard tools to extrapolate the statistical data of the study, in order to estimate the relationship between the variables under study (growth and hidden economy) in Algeria for the years 1990-2017.

1.6 Time series:

The reason for choosing the period (1990-2017) is the beginning of the economic reforms in 1990 That is, with the beginning of the application of the monetary and loan law Which constituted the actual launch of economic reforms Which came as an extension of the political reforms launched in 1989; The study continued until 2017, which is the year when data are available.

2. Definition of the Hidden Economy:

The first problem researcher meets with, by approaching this topic, is about the definition and the consequent meanings of the hidden economy (Dell'Anno, 2003, p. 03).

As Tanzi (1999) remarks, exist at least two definitions and thus two measures of the hidden economy. The first, is connected to the production (or income) missed in the official statistics; the other, refers to "…revenue not reported to, and not discovered by, the tax authorities". Consequently, "…the first measure implies that the country is richer than the official statistics show", the second (namely, tax evasion) indicates that the tax administration draws less revenue than it should. (Tanzi, 1999, p. 344)

Feige is also considered that the One of the broadest definitions of it, includes "...those economic activities and the income derived from them that circumvent or otherwise elude government regulation, taxation, or observation." (Feige, 1989, p. 01)

Schneider is considered that the one commonly used working definition is: all currently unregistered economic activities, which contribute to the officially calculated (or observed) Gross National Product. (Schneider, 2003, p. 24)

The hidden economy is known by different names, such as the shadow economy, gray economy, black economy or lack economy, cash economy or informal economy. All these synonyms refer to some type of hidden economy activities. We use the following definition: The hidden economy includes all economic activities which are hidden from official authorities for monetary, regulatory, and institutional reasons. Monetary reasons include avoiding paying taxes and all social security contributions, regulatory reasons include avoiding governmental bureaucracy or the burden of regulatory framework, while institutional reasons include corruption law, the quality of political institutions and weak rule of law. For our study, the hidden economy reflects mostly legal economic and productive activities that, if recorded, would contribute to national GDP (Medina & Schneider, 2018, p. 04), therefore the definition of the hidden economy in our study tries to avoid illegal or criminal activities.

3. Characteristics of the hidden economy :

In very general terms, the informal economy is the hidden economy portion of the market economy that produces goods and services for saleor for other forms of remuneration. The term "hidden economy" thus refers to all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements.

The hidden economy is largely characterized by:

– Low entry requirements in terms of capital and professional qualifications.

– A small scale of operations.

– Skills often acquired outside of formal education.

– Labor-intensive methods of production and adapted technology.

The hidden economy does not comprise the reproductive or care economy, comprised of unpaid domestic work and care activities.

Traditionally, the hidden economy was perceived as comprising mainly survivalist activities. Various negative aspects were used to describe the hidden economy ranging from undeclared labor, tax evasion, unregulated enterprises, illegal and criminal activity. (Horn & Xaba, 2002, p. 11)

Nevertheless, the vast majority of hidden economy activities provides goods and services whose production and distribution are perfectly legal.

In addition, hidden economy activities are not necessarily performed with the deliberate intention of evading the payment of taxes or social security contributions, or infringing labor legislation or other regulations.

The hidden economy can however include restricted illegal and restricted legal operations or legal and irregular operators, but no criminal operators. (ILO, 2002)

The hidden economy should not be confused with the criminal economy.

Due to the heterogeneous character of the hidden economy, numerous definitions have been elaborated. This study cannot cover all the existing definitions of the hidden economy. However, some of the main definitions inuse will be explained in order to illustrate the multitude of perspectives from which the hidden economy can be viewed.

To distinguish the difference between the formal economy and the hidden economy we have the following table.

Table 1. The Difference between the formal economy and the hidden economy

	The main objectives	Market Regulation	Technology
Hidden Economy	-Achieve revenues in the Market -Ease of entry, lack of respect for the rules -Lack of labor legislation -Self-financing -Non-payment of any taxes and fees -Self-employment, payment for the unit	The absence of entry barriers -Counterfeit goods -Markets are not protected	-Traditional, local -Heavy use of the Work -Small production units
Formal Economy	-Achieve the maximum profit Possible -Log codified, the presence of Unions -Application of labor legislation – -Take advantage of national and foreign loans -Payment of taxes and fees -Wages and labor contracts	-barriers at entry (product standards) -Trademarks registered and protected -Protected markets (shares, licenses, fees)	-Modern and imported -Intensive use of capital (machinery) -Large-scale production

Source: Owen Lippert and Michael Walker, The Underground Economy: Global Evidence of Its Size and Impact, The Fraser Institute, Vancouver, British Columbia, Canada, 1997, p05.

The main difference between formal economy and hidden economy is about three essential criteria as we showed in the above table , the main objectives of activists , market regulations respects and the technology used in the economic activities.

4. The impact of the hidden economy on economic growth

Several applied studies indicate a causal relationship between the existence of the hidden economy and the actual economic growth rate (Such as studies: Einste (2000) , Fery (1982), Weckhanneman (1984), kaufmann(1996), shneider (2000,2001,2004,2010), Dell'anno (2003) , Kalibreda (1996)). This is because the hidden economy contributes to distorting or exaggerating indicators of economic policies and economic stability especially if the hidden economy has a large share in economic

activity. these indicators include: Price indicators, inflation and unemployment, economic growth rates, national income accounts, indicators of production, income and expenditure cycles, balance of payments statistics, in addition to the impact of the hidden economy on the real incomes of individuals and reducing state tax revenue, increasing the budget deficit, reducing government expenditure on infrastructure and services that actually contribute to increased production and economic growth and influence the actual labor market and the composition and efficiency of its labor force, however; an adequate quality of labor and productivity growth should go hand in hand with GDP growth to contribute to economic growth, and restrain hidden economic growth.

In contrast, there are several other applied studies (Such as studies:Ginsburg (1998) , Giles (1999), Teeds (1998) , Giles and Tedds (2002) , Bajada (2003). Chatterjee (2003)), concluded that the growth of the hidden economy and the growth of the formal economy are going in parallel or they may outperform each other there was no conflict between them and their roles were complementary and the relationship between them was positive. The proponents of this view believe that the hidden economy is characterized by its competitiveness, production and employment, it has an efficiency that makes it an effective contributor to stimulating economic growth in general. in according to this view, the announced rates of economic growth in Algeria will not be greatly affected by the presence of the hidden economy. This latter may even play a catalytic role for economic growth in recessions and deflation of the formal economy.

On the other hand, there is a broad consensus that economic growth reduces the hidden economy of developing countries in particular, and the achieving targeted rates of economic growth is contingent on the reduction of hidden economy growth rates; but these results at the same time did not prove a consistent relationship between these two rates, this means that the rapid growth of the formal economy does not necessarily entail a faster increase in limiting the growth of the hidden economy, and vice versa.

However, all of these studies are subject to hypotheses concerning the methodology used and the form of the data adopted, and the circumstances

of the countries subject of study, the proper measurement of economic performance must respect all components contributing to its formation, this is not possible in light of disregarding the growth rates of the hidden economy who participates and may acquire many of the essential activities and fundamental forces of economic growth and follow them in a different direction from the general economic path of the state.

Under the confirmation of most economic literature, however, the existence of a hidden economy distorts the economic relations of all components of the economy, wecan't ignore this strong opinion without examining the actual data and making sure it applies to the Algerian economy or otherwise, as long as the rate of economic growth is one of these indicators and the relationships that are very reliable in determining the degree of economic progress, and the success of established economic policies, in addition, taking the consideration that the hidden economy is one of the necessary necessities to achieve efficiency in economic policies, and understanding the mechanism of activity within the economic system, this enables economic management to correct errors and deviations in economic policies that resulted from a lack of proper diagnosis of economic reality that did not taking into account the phenomenon of hidden economy.

There is no doubt that the lack of attention to the activities of the hidden economy (in the formulation of economic policies) makes national accounts does not represent the actual reality of the economy, which results in unrealistic official estimates, low official economic growth rates, and the inflation and unemployment are overestimated. This error and distortions suffered by national accounts due to the neglect of the hidden economy it will move to economic decisions and policies based on it these decisions become ineffective and inappropriate this leads to the failure of economic policies that seek to achieve economic stability.

4.1 Econometric Model

Based on the time series of estimates of the size and proportion of the hidden economy in Algeria (annex 01), the long-term relationship between Algeria's hidden economy and economic growth can be determined through a general model that includes several explanatory variables, by assessing

the quality of relationships between variables of the general model, variables without significant correlation coefficients are then excluded, this process continues until an ideal model is reached which achieves the objectives of the measurement process for model variables.

The model is designed from a traditional Keynesian equation that takes the following form:

$$Y = f(C, I, G) \text{ .....(01)}$$

This function can be reworded to:

$$Y = C + I + G \text{.....(02)}$$

Assuming that (Y) is determined by total consumption rates, and total investment, and government expenditure, these macro variables implicitly carry within them the variables of the hidden economy; so it can be separated into two parts:

$$C = C_f + C_h \text{.....(03)}$$

$$I = I_f + I_h \text{.....(04)}$$

$$G = G_f + G_h \text{.....(05)}$$

whereas:

C_f:Total official consumption؛

C_h : Total hidden consumption؛

I_f : Total announced (official investment)؛

I_h : Total hidden investment؛

G_f : Total government expenditure (official)؛

G_h : Leakage from government expenditure, which reflects the volume of hidden activities in the government sector.

Due to lack of data that determine the volume of total hidden consumption and Total hidden investment and the drop out of government expenditure reflecting hidden activities in the public sector; these three variables will be combined into one variable is the size of the hidden economy (HE) is as follows:

$$HE = C_h + I_h + G_h \text{.....(06)}$$

Accordingly, equation (01) can be reconstituted as:

$$Y = C + I + G + HE \text{.....(07)}$$

whereas :

HE: is the size of the hidden economy.

However, many variables in equation (07) that are involved in the composition of GDP are not compatible with different growth models especially the solo model, thus, one of the growth models (the expanded solo model of growth) will be relied upon to rank the previous equation accordingly.

According to the growth model considerations and after determining the variables of the study, the model can be reformulated as follows:

$$\mathbf{GDP}_t = AK_t^{\alpha} TL_t^{\beta} HE_t^{\vartheta} e^{\varepsilon_t} \ldots (08)$$

By making logarithmic transformations on the model (08), we get a linear shape so as to facilitate the modeling process, and we have:

$$Ln\mathbf{GDP}_t = LnA + \alpha LnK_t + \beta LnTL_t + \vartheta LnHE_t + \varepsilon_t \ldots \mathbf{(09)}$$

• Description of the most important variables

This model includes a dependent variable of economic growth GDP_t, In addition, it includes several independent variables, the hidden economy HE_t, and capital stock K_t, and the combined workload with the technological change rate TL_t, whereas:

GDP_t : rate of change in real Gross domestic product; that is the rate of change in total values of final goods and services Produced by society over a period of time commonly known as a year, it is used to measure the rate of economic growth.

K_t: is the capital stock which can be calculated by the method of permanent inventory according to the following formula: (Raad, 2006, p. 180)

$$K_{t+1} = (1 - \delta)K_t + I_t$$

- K_{t+1}: Capital stock at the beginning of the period$t + 1$.
- K_t : Capital stock at the beginning of the period t..
- δ : Capital depreciation rate during the period t.
- I_t: volume of investment during period t, which is the total fixed capital formation and change in inventory.

This means that the capital stock for the current year is linked to its value for the previous year and the level of investment achieved during the same year.

Primary capital has been determined (K_0) from a study by economists (Nehru & Dhareshwer) to the world bank on the capital stock of 92 countries, including Algeria for the period (1950-1990); the initial capital stock for 1969 was estimated at 391.1 billion DZD. (Nehru & Dhareshwar, 1993, p. 60)

The value of the capital depreciation coefficient (δ) was also determined. One of the studies carried out by the organization for economic Cooperation and Development (OECD) about developing countries, which they defined as: $\delta = 0.05$, so the annual capital depreciation is fixed at 5%. (Zakane, 2003, p. 141)

TL_t: Compact workload with technological change rate where solo assumed that is growing at a constant rate, according to a mathematical sequence where the basis is 1 and the first limit 0 (so $T = t$ variable time). (Chkabakeb, 2008, p. 121)

HE_t: is the hidden economy that considered the most important independent variables that express the purpose of the study the estimates are based on the actual GDP from the table in Annex 01.

With Using Eviews 10, the following outputs were obtained:

Table 2. Estimation of the GDP Function According to the Solo Model by Adding the Hidden Economy: 1990-2013.(PIB=GDP)

Dependent Variable: LPIB
Method: Least Squares
Date: 02/28/18 Time: 10:17
Sample: 1990 2013
Included observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.826841	0.725718	3.895233	0.0009
LK	0.435041	0.100951	4.309405	0.0003
LLT	0.092038	0.030856	2.982780	0.0074
LHE	0.237470	0.092817	2.558482	0.0187

R-squared	0.970719	Mean dependent var	8.196905
Adjusted R-squared	0.966327	S.D. dependent var	0.262534
S.E. of regression	0.048176	Akaike info criterion	-3.076914
Sum squared resid	0.046418	Schwarz criterion	-2.880572
Log likelihood	40.92297	Hannan-Quinn criter.	-3.024824
F-statistic	221.0125	Durbin-Watson stat	1.523255
Prob(F-statistic)	0.000000		

Source: Prepared by the researcher based on the program Eviews.

Based on the results of the estimate, the GDP model in Algeria can be formulated as follows:

$$\boldsymbol{Ln\text{GDP}_t = 2.827 + 0.435LnK_t + 0.092LnTL_t + 0.237LnHE_t}$$

4.2 Statistical evaluation of the model

Statistically, the function of the model is successful, and this trend is supportd :

The value of the coefficient of selection $R^2 = 0.9707$ In other words, the formulated model reflects 97.07% of the relationship between GDP and the explanatory variables represented in both the capital stock, and interactive workforce integrated with technological change and hidden economy.

4.2.1 Fisher test:

Note that the actual value is $F_C = 221.01$ and with compared to the scheduled value at 5% we find, $(F - statistic) = 0.0000$ that is, the probability of error in the estimate is less than 5%, which shows that the equation of representation is good and the value of the coefficient obtained was objective it is suitable for use as a measure to estimate the effectiveness of the regression equation representation for the studied relationship between GDP and explanatory variables.

4.2.2 Student test:

Note that: $t_c = 3.89 \text{ ، } t_{\hat{\alpha}} = 4.31 \text{ ، } t_{\hat{\beta}} = 2.98 \text{ ، } t_{\hat{\vartheta}} = 2.56$ and with Comparing them to the tabular value; we find that the probability of error in estimating these coefficients is less than 5%, this shows the non-random nature of these coefficients, and that they are objective and characterized by statistical significance.

4.2.3 Durbin Watson test:

Depending on the output of the Eviews program, Note that: $d_c = 1.523$ by comparing it to the tabular value $d_l = 1.10,\ d_u = 1.66$ at the level of significance 5% the number of views $n = 24$ the number of independent variables $k = 3$, we find that (d_c) belongs to the domain $]1.10\ ,\ 1.66[$ which means unchecked area, so the Breusch-Godfrey serial correlation LM test is used to make sure that there is or not a self-correlation of errors.

Table 1. GDP Model Self-Correlation Test Using Breusch-Godfrey (LM Test)

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.444338	Prob. F(2,18)	0.6481
Obs*R-squared	1.129154	Prob. Chi-Square(2)	0.5686

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/28/18 Time: 11:25
Sample: 1990 2013
Included observations: 24
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.073194	0.767755	0.095335	0.9251
LK	0.010036	0.105291	0.095312	0.9251
LLT	0.007245	0.035319	0.205147	0.8398
LHE	-0.025707	0.109308	-0.235177	0.8167
RESID(-1)	0.227225	0.250556	0.906885	0.3764
RESID(-2)	-0.076065	0.246879	-0.308108	0.7615

R-squared	0.047048	Mean dependent var	4.89E-16
Adjusted R-squared	-0.217661	S.D. dependent var	0.044924
S.E. of regression	0.049573	Akaike info criterion	-2.958438
Sum squared resid	0.044234	Schwarz criterion	-2.663925
Log likelihood	41.50126	Hannan-Quinn criter.	-2.880304
F-statistic	0.177735	Durbin-Watson stat	1.871193

Source: Prepared by the researcher based on the program Eviews.

The Breusch-Godfrey Serial Correlation LM Test, which refers to the lagrange double test of the residual self-correlation, shows no self-correlation of errors; where the statistic $F_c = 0.44$, which is statistically insignificant at 5% (Prob F-statistic = 0.648), shows no self-correlation of errors; therefore, the model is acceptable.

This estimated model achieves statistical significance for all coefficients, it also does not suffer from the problem of self-association of errors; this leads in principle to accept the model and move to the second phase of the tests which is concerned with its conformity with economic theory.

4.3 Economic evaluation of the model

Economically note that the function of the model is successful and acceptable, and supports this approach:

- the fixed limit signal is positive: $A = 2.827$, which represents the coefficient of productive efficiency; it measures the efficiency of the production process of a country or sector with stability of the rest of the variables consistent with the model, whichis a significant value that reflects

the productive efficiency of the production sector in Algeria (Hydrocarbons sector in light of the high levels of oil prices).

- capital stock coefficient signal is positive which is compatible with economic theory in that it is supportive and not an inhibitor of production, the value of these coefficients was estimated at 0.435This means that any addition in the capital component by 1% while the other elements remain constant will increase the volume of GDP by 0.435%.

-Interactive workload coefficient signal with the rate of technological change is positive which fits with economic theory, the value of these coefficients was estimated at 0.092 This means that any addition in the labor component incorporated by technological change by 1% while the other elements remain constant will increase the volume of GDP by 0.092%.

- Hidden Economy coefficient signal is positive which is compatible with many research studies conducted around the world (Such as studies: Ginsburg (1998) ,Giles (1999), Teeds (1998), Giles and Tedds (2002) , Chatterjee (2003), Schneider and Bajada (2003)), it agrees with the second view of economists that considered the relationship between the hidden and formal economy is positive. The value of this coefficients was estimated at 0.237 means that any increase in the hidden economy by 1% with the other elements remaining constant will increase the volume of GDP by 0.237%.

- As for the coefficient of determination R^2; it indicates that 97.07% of the changes in GDP are explained by the capital stock, and the magnitude of interactively integrated labor by technological change and the hidden economy, the rest is due to other random factors, the value of this coefficient is an indication of the strength of the relationship between the dependent variable and the independent variables.

Judging from the estimated model The nature of return scale characteristic of the Algerian economy can be extracted. By adding together the elasticities of capital, labor, and the hidden economy coefficient Which is estimated as: $\alpha + \beta + \vartheta = 0.435 + 0.092 + 0.237 = 0.764$, Which means that the estimated product function is homogeneous of order 0.764, That is, when the element of labor, capital, and the coefficient of the hidden

economy change simultaneously by H. The volume of production changes in the same direction by $H^{0.764}$, Or, in other words, the increase in capital, labor and the shadow economy coefficient by 1% The volume of output rises by a smaller rate estimated at 0.764%. Or the so-called decreasing return scale.

Based on the above; the estimated model is statistically and economically acceptable, this leads to its adoption as an explanatory model for the behavior of the GDP function in Algeria.

4.4 Historical simulation of the model

With Compensating the values of the explanatory variables for the years 2014-2015-2016-2017 in the estimated model we find:

$$\boldsymbol{GDP_{2014} = 5324.1}$$
$$\boldsymbol{GDP_{2015} = 5496.02}$$
$$\boldsymbol{GDP_{2016} = 5728.72}$$
$$\boldsymbol{GDP_{2017} = 5825.81}$$

According to world bank estimates, the GDP for the years 2014, 2015, 2016 and 2017 is estimated at 5570 billion DZD, 5780 billion DZD, 5970 billion DZD and 6063.8 billion DZD respectively. This gives the impression of the convergence between the estimated and calculated values, and therefore the model used has an acceptable exploratory capability.

From the previous model, the relationship between the hidden economy and growth in Algeria is positive. That the growth of the hidden economy positively affects GDP (1% growth of the hidden economy will lead to the growth of GDP by 0.23%), This is consistent with the applied studies of Ginsburg (1998), Giles (1999), Tedds (2002), Chatterjee (2003),which concluded that there is no conflict between the growth of the hidden and formal economy they run parallel and may outperform each other. The hidden economy is efficient enough to make it an active contributor the economic growth in general; thus, the announced rates of economic growth in Algeria will not be greatly affected by the existence of the hidden economy and it may even play a catalytic role in economic growth, especially during recessions and deflation.

5. CONCLUSION

This study dealt with the hidden economy as an economic phenomenon experienced by most countries of the world, including Algeria, and it aiming to assess the impact of its activities on the economic growth in Algeria for the period from 1990 to 2017, this study also explained the difference in the researchers'findings in their study of the relationship between hidden economy and economic growth; some of them had positive results of the relationship between variables and some of them found the opposite this is due to different countries and methods as well as the type of hidden economic activities deployed in each country and to the type of formal economy itself, the result of the hypothesis test at the beginning of the study that the hidden economy negatively affects the economic growth in Algeria as follows:

This hypothesis has been proved to be wrong; by studying the relationship between the hidden economy and growth in Algeria; the study concluded that the relationship between the hidden economy and economic growth in Algeria is positive. any 1% rise in the hidden economy would increase GDP by 0.237% (Under the stability of other factors) at a significant level of 5%; this means that the hidden economy contributes indirectly to increase the GDP and thus increase the growth rates, this is due to the highly complex interrelationships between hidden and formal economic activities; where the hidden economy uses the inputs of the formal economy (energy, raw materials, technical labor outside the formal working hours, etc.), and pays the use costs in the official economic cycle, also that hidden economy workers spend a large part of their income on goods and services of the formal economy, this ultimately contributes to increasing GDP.

Finally, through the study and its findings, two main recommendations can be made:

- The negative and black perception of legitimate hidden economic activities as unproductive parasitic activities must be changed; and recognize the role of the hidden economy as an engine of economic growth and provide jobs for many of the individuals that the formal economy has failed to employ them, and to view it as a wasted wealth must be utilized by

gaining the trust of its economic actors, and consider them as true producers, their path should be corrected only.

- As the invisible economy accounts for about 30% of Algeria's GDP, and it is a very high percentage; the state must establish centers specializing in the study of the hidden economy and the behavior of individuals and the institutions operating therein; and launch long-term programs based on scientific and realistic foundations to contain hidden economic activities by providing alternatives, incentives and exemptions for these activities, with working to increase the attractiveness of the formal economy, the process must be gradual and long.

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6. Appendices

Some economic indicators in Algeria (1990-2017)

Year	**PIB=GDP** Billion DZD	**HE** Billion DZD	**K** Billion DZD	**g**	**L** million workers
1990	2008	481,92	1716,37	1	4,516
1991	2770	609,4	1740,08	2	4,538
1992	2820	761,4	1753,51	3	4,557
1993	2760	772,8	1760,1	4	4,823
1994	2730	819	1775,67	5	5,154
1995	2840	710	1789,91	6	5,389
1996	2950	737,5	1794,69	7	6,015
1997	2990	926,9	1801,21	8	5,708
1998	3140	924	1824,1	9	5,412
1999	3240	810	1834,08	10	6,073
2000	3360	1233,12	1838,61	11	6,179
2001	3460	1197,85	1867,85	12	6,228
2002	3660	1203,4	1907,2	13	6,916
2003	3920	1259,49	1957,03	14	6,684
2004	4090	1251,13	2020,69	15	7,789
2005	4330	1363,08	2093,92	16	8,044
2006	4400	1485,44	2171,51	17	8,868
2007	4550	1527,43	2257,89	18	8,594
2008	4660	1719,07	2335,7	19	9,146
2009	4740	1668,95	2462,9	20	9,472
2010	4910	1855,48	2613,06	21	9,736
2011	5050	1839,21	2763,65	22	9,599
2012	5220	1659,96	2926,95	23	10,17
2013	5370	1623,88	3108,02	24	10,788
2014	5324	1597.2	3214.5	25	11.592
2015	5496	1593.84	3327.15	26	11.743
2016	5729	1675.5	3502.42	27	11.899
2017	5826	1747.8	3698.14	28	12.047