Measurement and analysis of the causal relationship between the hidden economy and the GDP in Iraq for the period(1990 - 2015)

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Abstract:

The phenomenon of the hidden economy is a threat to the economy in most countries because it represents high rates of GDP . The hidden economy is represent by All activities which are carried out by individuals or establishments, with officially registered neither included in national income accounts and not a subject to the administrative and judicial system . This leads to further misleading information and statistics, and does not explain the real economic potential of the country, which negatively affects the distribution of economic resources and national output. The study points out that the border testing of joint integration indicates a long-term equilibrium relationship between the size of the hidden economy and GDP at current prices.The calculated F is greater than the periodic F at a significant level (1%, 5%, 10%). The error correction model indicates that the size of the hidden economy is increasing by one unit which leads to an increase in GDP by 0.52 units, The error correction coefficient was negative and significant (-0.422088) and this confirms a short-term relationship between the two variables, And that the direction of long-term equilibrium relationship is the size of the hidden economy –> GDP, which means the

increase of the hidden economy by one unit will lead to an increase in gross domestic product by 0.53 units in the long term.

Introduction:

The hidden economy is one of the most important economic phenomena that threaten the economic, political and social security of many countries, including Iraq as a result of this phenomenon in the economic variables and social values. The hidden economy has affected the structure of the Iraqi economy during the nineties as a result of integrating the hidden economy with the imposition of economic sanctions on Iraq. As a result the spread of illegal acts such as theft, criminality, industrial and commercial fraud and the black market. The study aims to identify the causal relationship between the size of the hidden economy and the gross domestic product in Iraq, and by knowing this relationship we can identify the success of economic policies used in the management of economic activity in Iraq to achieve the most important goals through studying the activity of both declared and hidden economy :

1.The researcher must explain the concept and definition of Both:

- declined economy

- Hidden economy

Her in the introduction in order to understand the problem of the study .

2.Must write the method of the study (the econometric) with variables and the ways of research .

1/ Previous Studies:

There are many studies on the subject of the hidden economy, both in the Arab world or foreign and the most important foreign studies on the hidden economy can be listed as follows:

1 -The Study of (Schneider & Enste,2000).

2 -The study of (Brambila&Cazzavillan, 2009)

3-the study of (Yin , 2009): Despite the differences between these studies in terms of applied scope, methodological, spatial and temporal, these studies have reached the conclusion that the size of the hidden economy constitutes a large proportion of GDP.

5-the study of (Duc Hong vo&: Thinh HUNG LY, 2014)

The study concluded that there is a relationship between the causes and size of the hidden economy. The study also concluded that reducing the unemployment rate is not enough to guarantee reducing the size of the hidden economy, but to adopt safe economic policies in order to reduce the size of the hidden economy or to benefit from its legitimate activities in achieving economic growth.

There are many Arabic studies that dealt with the subject of the hidden economy, including:

1 – Study of (Ahmed Hussein and Rafa Adnan, 2010): The study found that there is a direct relationship between the phenomenon of the hidden economy and money laundering operations in selected countries.

2- Study of(Bouradah Houriya ,2014): The study found that the informal economy is complementary to the official economy in Algeria. The study also concluded that the parallel exchange market in Algeria is an important source for providing hard currency.

3 - Study (Mohammad Za'alani: 2011): The study found that the reason for the parallel economic growth in Algeria is due to the hasty and unchecked openness of the Algerian economy.

4- the study of (Zahra&Assra , 2015) The study found that rising unemployment is causes the increase the motivation to work in hidden activities and that this conclusion is not accurate, the high unemployment

rate may be due to the recession and low demand for labor, both for declared activities or hidden activities.

But what concerns more to this topic is the studies that dealt with the hidden economy in Iraq, which include:

1 – A Study by (Abdul Jabbar Mohammed: 2005): The study found that the percentage of hidden economy has increased after 2003 because of the deterioration of security and political conditions and the opening of the border, all these things led to the expansion of the size of the hidden economy.

2 – A Study by (Shehab Hamad Sheikhan: 2013): The study found that the size of the hidden economy in Iraq is characterized by fluctuation during the period (1991-2011), which is due to fluctuation in the speed of circulation of money, especially in times of crisis.

2/ Standard methods used:

A/ Testing the stability of time series : Time series analysis is an important step before the stage of estimating and testing the relationship between economic variables. And to ascertain the stability of these variables and therefore to know their statistical characteristics, the data of the series are said to be stable when their variation and their averages are constant over time(Al-Wardi , 1990 ,p.258). And In case the time series are unstable, we will have a problem called spurious regression. Until this problem is processed, the unit root test will be used to check the stability of the variables and determine their degree of integrity, Although there are multiple root unit tests , the study focus on Using two tests: the Dickey and

Fuller 1979 augment test what allows for the inclusion of a number of time gap differences until the problem of self-correlation and phillips-perron's test 1988 disappears.

B/Time Series Stationary Test

Counteraction is used to determine the nature of the equilibrium relationship between variables in the long run, which requires that the variables for this test are unstable to their level but will become stable when taking the first or second difference. The economic theory states that there is a long-term relationship between two or more variables, even if the values of these variables diverge from their equilibrium values in the short term, there are forces that return them to these values and ensure that this relationship is achieved in the long term(Al – Wardi, 1990, p.258) .

To perform the multivariate integration test, the time series of these variables must be integrated from the same rank. Therefore, the objective of the unit root test is to determine the integration rank for each of the variables used in the study. After knowing this level, One can make sure that there's Long-term equilibrium between these variables by means of the common integration test. Therefore, the relationship between these variables cannot be determined unless they are interrelated with a common reaction. This means that even if there are two complementary series of the same rank, Guaranteed They are characterized by the characteristic of common integration.

C / The concept of causal relationship:

Economic theory focuses on studying of the problems arising from the economic problem and the interpretation of the relations between the different economic variables by explaining the causal relations.

This enables us to obtain criteria by which we can test the data that helps explain the various events that have occurred or are likely to occur in the future as a reaction to prior changes(Leithi,1975,p.10).
The concept of causation as defined by Granger refers to the change in the current and past values of a variable that causes change in another variable, that is, the change in current and past Xt values causes a change in the values of Yt. This concept is used to determine the nature and direction of the relationship among the economic variables, these variables do not move in the same direction to achieve the state of equilibrium because they are affected by different conditions and factors. Therefore, there are periods of time regression indicating the time difference in the variable response which follows the change effect of independent variables or vice versa(Hussein , 2002, p.83).
Most of the relations between economic variables are exchange and dependence relationships(Anwar ,1966,p.167) which affect and are affected by each other. Sometimes the dependent variable in one or more of the model equations is independent variable at one time or at another position . Therefore, the appropriate method of analysis is regression analysis, In 1969, Granger introduced a test that provided a statistical method that was widely used in applied and experimental studies to test causal relations. This method was known as Granger Causality, based on the dynamic relationship between time series, and one of the problems in this case is that the time series data of a variable are often interrelated, which means, there is a subjective correlation between the values of one variable over time. And to exclude the effect of this correlation, the values of the dependent

variable for a number of time gaps must be included as an explanatory variable in the causal relationship to be measured , As well as the values of the other explanatory variable for a number of time gaps.

If x , y represents the values of two stable time cycles that reflect the development of two different economic phenomena the simple causal model is formulated as follows :

$$Y_t = \sum_{i=1}^{n} a_i X_{t-i} + \sum_{j=1}^{n} \beta_j Y_{t-j} + \mu_{1t} \quad \text{.....(1)}$$

$$X_t = \sum_{i=1}^{n} \lambda_i X_{t-i} + \sum_{j=1}^{n} \delta_j Y_{t-j} + \mu_{2t} \quad \text{.....(2)}$$

That is :

a_i ، β_j ،λ_i ، δ_j. : Parameters to be estimated

μ_{2t} ، $_{1t}$.μ :*Tow random variables are not connected*

D/ Auto Regregression Distributed lag Model (ARDL)

Contegration tests such as Engle and Granger (1987), Johansen (1988), Johansen and Juselius (1990) require that the variables be integrated of the same class, in this case it cannot be performed with integral variables of varying degrees 1(0), 1 (1). Therefore, the Autoregressive Distributed Lag model (ARDL) has emerged as the best alternative because it does not require that variables have the same rank of integration as other characteristics to be addressed. common integration testing using ARDL is a secl using the Bound Test technique developed by in which the Autoregressive Model (AR) models and distributed decomposition models are integrated . In this

methodology, The time series is a function and it slows down its values and the values of the current explanatory variables and to delay them with one or more periods(Pesaran. ,2001,p.289) . The ARDL method is distinguished from the traditional methods used to test common integration with many advantages .

A. The model (ARDL) can be used regardless of the degree of integration of variables, whether it was in level, or the first difference, or a combination of the two.

B. This model takes a sufficient number of time lag times to obtain the best set of data from the general frame model.

C. Using this model we can obtain the error correction model by simple linear conversion. The error correction model helps us to measure the short-term relationship between variables in the model. Therefore, this model has the ability to estimate the short and long term parameters in the same equation at the same time .

D. It also gives the best results for parameters in the long term.

E. The ARDL model is statistically more important than other models in determining common integration in the case of samples or small observations.

3/ Test the models and analyze the results:

Standard models are one of the measurement tools used in economic studies to deal with economic problems on the one hand and to know the extent to which the assumptions of economic theory can be achieved on the other hand.

Therefore, any economic phenomenon must be expressed quantitatively by following a mathematical formula expressed in symbols and mathematical equations, and these equations reflect the

different relations between the variables that the model contains. This stage is called the stage of description and formulation of the model. This phase includes several steps that can be incorporated as follows:

A/ Build and characterize the model

The model consists of a set of equations. Each equation contains one dependent variable and one independent variable. The Simple Linear Regression model is used to estimate the relationships studied and the model includes the GDP equation. It includes two variables, one dependent of which is the GDP at current prices and is symbolized by the GDP with (26) observations and the other is independent, which is the size of the hidden economy and symbolized by the symbol (HEC) and with (26) observations. The model equation is:

$$\text{Ln } \boldsymbol{GDP = \alpha_1 + \alpha_2 lnHEC + \ell 1} \dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Economic theory, based on the ideas of most economic schools, assumes that there is a positive causal relationship between them, so the α_2 parameter is expected to be positive.

B/ Root unit test using the ADF test:

To verify the validity of the time series of the economic variables used in the analysis in which the extended Dicky-Voller (ADF) method was used to test the unit root for time series, This method is based on the null hypothesis $(H0: \beta = 0)$, which states that the time series of a variable is unstable (in which the root of the unit exists) versus the alternative hypothesis $(H1: \beta)$ which states the stability of the time series. In order to explain this, the probability parameter (Prob.), Which is used as an advanced method, is used instead of

comparing the critical value (t). When the(prob.) value is greater than 0.05, the parameter is not significant than t (which means that , calculated-t is less than t-critical), If it is less than 0.05, then the parameter is significant . The results shown in Table 1 indicate that the GDP time series is not static at the level, (Prob.) Recorded a value higher than (0.05) whether it is a fixed limit or a fixed limit and a general trend, or without a fixed limit and a general trend, which means acceptance of the null hypothesis that states the variable is not static at its levels. When calculating the first differences, the value of Prob. Was less than (0.05) and at a significant level $(1\%, 5\%, 10\%)$ with no fixed limit and general trend, Which means rejecting the null hypothesis and accepting the alternative hypothesis, which means it is integrated from the first rank $1\sqrt{}(1)$, while the time series of the hidden economy (HEC) the results refer to the rejection of the null hypothesis (H0: $\beta = 0$) because the value of Prob. is less than 0.05 at a significant level $(1\%, 5\%, 10\%)$ and in all cases with or without a fixed limit and a general direction, and that the series does not contain the root of the unit which means it is static at the level $(0)\sqrt{1}$.

Table (1)

Statistical results of the unit root test using the (ADF) test

The variables	The level			The first difference		
	A fixed limit only	With a fixed limit and a general trend	without a fixed limit and a general trend	A fixed limit only	With a fixed limit and a general trend	**without a fixed limit and a general trend**
	Prob	Prob	Prob	Prob	Prob	Prob
GDP	0.88	0.36	0.44	0.14	0.5	0.01***
HEC	0.0005***	0.0030***	***0.000	-	-	-

Source: From the work of the researcher based on the results of the statistical program Eviews : 9

* Significant level 1%.

** Significant level 5%.

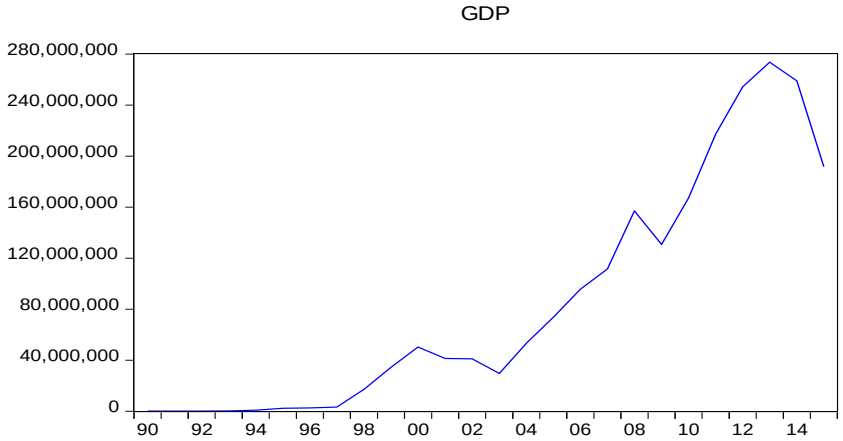
*** Significant level of 10%.

Since one of the variables of the model was settled after taking the first difference, while the second variable is still in the level, it became necessary to use the ARDL model, because the most important features of this model is its ability to estimate the relationship between the variables whether stable at the level or the first difference or combination Of the two, and is more efficient in the case of small samples such as the research sample, as well as , applying this model enables us to obtain the most efficient estimation of long and short term parameters.

Shape (1)

Non-Stationary of the gross domestic product(GDP) of the level

(Million dinars)

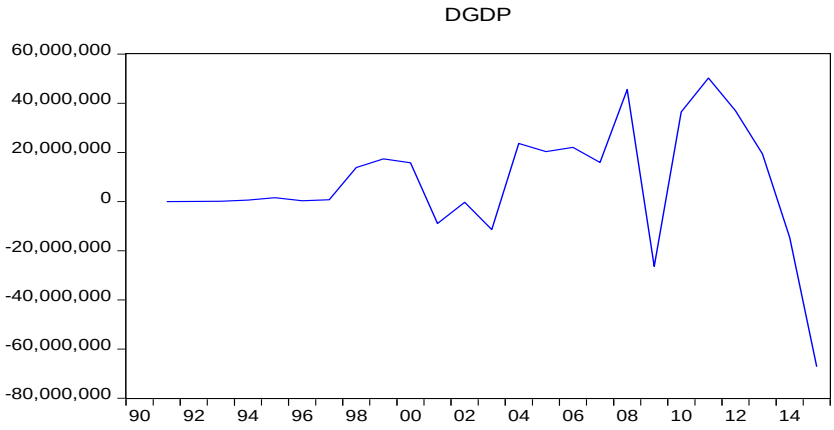


program Eviews : 9

Shape(2)

Stationary of the gross domestic product(GDP) first diffrent

(Million dinars)



program Eviews : 9

C/ The estimation of the model:

The estimated ARDL model is based on the GDP depended variable and the period of time lag (3.4) based on the Akaike values which give the lowest value to this criterion and are automatically determined by the program. (3) Time slowing periods for the GDP variable were determined, and the variable (HEC) has been assigned (4) time lags according to the (Akaike) standard. As shown in Table (2).

Table (2)

Estimation Results of ARDL model of the impact of hidden economy on GDP

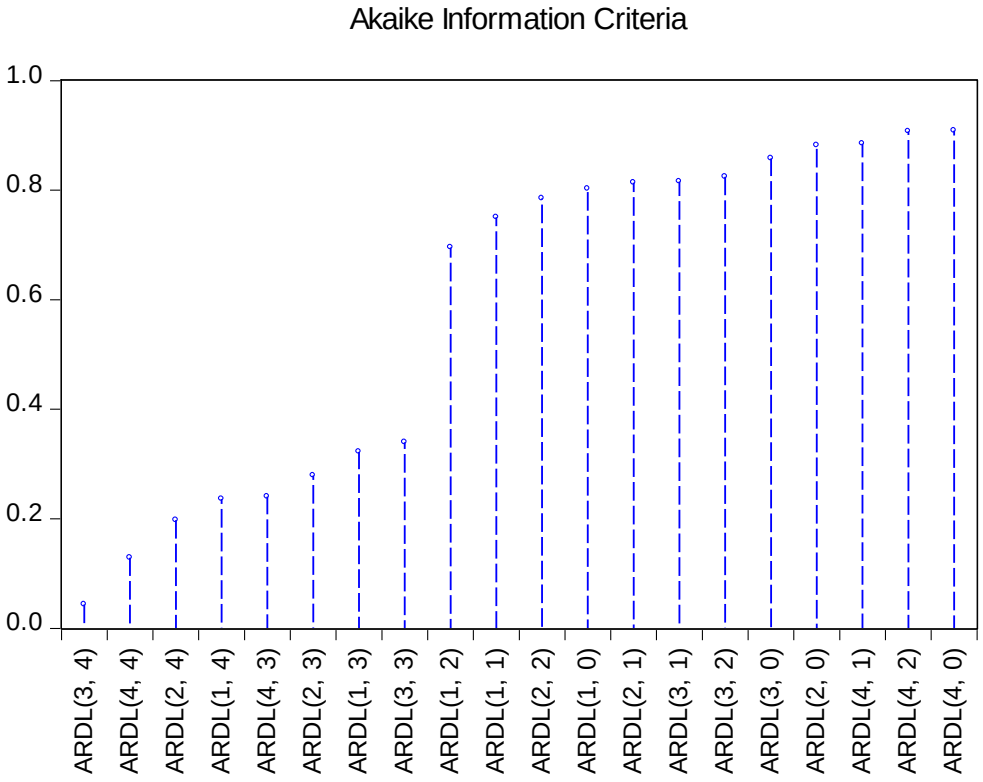
Dependent Variable: LNGDP
Method: ARDL
Date: 06/10/17 Time: 22:45
Sample (adjusted): 1994 2015
Included observations: 22 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LNHEC
Fixed regressors: C
Number of models evalulated: 20
Selected Model: ARDL(3, 4)

Prob.*	t-Statistic	Std. Error	Coefficient	Variable
0.0003	4.953645	0.157162	0.778526	LNGDP(-1)
0.6814	0.419935	0.217576	0.091368	LNGDP(-2)
0.0799	-1.899806	0.153691	-0.291982	LNGDP(-3)
0.0011	4.158887	0.125724	0.522872	LNHEC
0.0971	-1.788011	0.165331	-0.295614	LNHEC(-1)
0.0013	-4.085708	0.177199	-0.723982	LNHEC(-2)
0.0121	2.914131	0.147915	0.431045	LNHEC(-3)
0.0277	2.478982	0.117681	0.291729	LNHEC(-4)
0.0002	4.984337	0.861472	4.293866	C
17.61760	Mean dependent var		0.990505	R-squared
1.725359	S.D. dependent var		0.984661	Adjusted R-squared
0.043469	Akaike info criterion		0.213686	jhfS.E. of regression
0.489804	Schwarz criterion		0.593601	Sum squared resid
0.148612	Hannan-Quinn criter.		8.521846	Log likelihood
2.032792	Durbin-Watson stat		169.5093	F-statistic
			0.000000	Prob(F-statistic)

*Note: p-values and any subsequent tests do not account for model Selection

Source: From the work of the researcher based on the results of the statistical program Eviews : 9

Shape (3)



The statistical tests of the model indicate the significance of these tests and the quality of the model estimated through the modified $R2$ of (0.98) as well as the value of (F - Statistic) of (169.5) and the level of statistical significance (0.0000).

Since the value of the DW test is not reliable in the self-regression models (VAR), we use Durbin'sh-Statistic (DARBIN), which was invented by Darben (1970). And it can be used if the values of the dependent variable which are timely lagged are one of the independent variables , this test takes the following formula:

$$h = (1 - \frac{d}{2}) \sqrt{\frac{n}{1 - n\sigma^2 y}}$$

and:

N: Number of Views.

D: The value of the DW-statistic test is legal.

σ_y^2 : the value of the estimated variance of the dependent variable which is timely lagged .

H: Durbin's h-Statistic statistical test.

Accept the null hypothesis (H0) which means the absence of the problem of self-correlation to reduce the error in the estimated model, If the value of Durbin's statistic is distributed naturally, , If the statistical value of (h) is limited to ($\pm$ 1.96) at a significant level of (5%) and between (3 $\pm$) at a significant level (1%). For the purpose of detecting the presence or absence of a self-correlation problem, we compare the value of (h) calculated with the critical value. , If the calculated value of (h) is less than 3 $\pm$), this means acceptance of the null hypothesis at a significant level (1%). Since the value of Durbin'sh - Statistic statistic for this model is (2.3503) and when compared with the critical value,we find that it is limited between the value of (3 $\pm$) and thus accept the hypothesis of null (H0) at the level of significance (1%),which means that the model does not correlation problem to reduce the error. After examining the significance of the model from the statistical point of view, the diagnostic test is conducted to judge the passing of the model for the standard tests, the results showed that the estimated model was free from the problem of self-correlation in terms of the Breusch-Godfrey Serial Correlation LM Test. , Which amounted to Prob. Chi - square

(0.6447) As shown in Table (3), it is greater than (0.05). We accept the null hypothesis which states that the residuals are not self - correlated, and to make sure that the residuals do not suffer the problem of variance difference we find that the value of Prob. Chi - square for the Heteroskedasticity Test is (0.2328), which is larger than 5% thus we accept the null hypothesis that states the homogeneity of residues and do not contain the problem of heterogeneity of variance.

Table(3)

Testing the problem of self-correlation for the first model

Breusch-Godfrey Serial Correlation LM Test:			
0.7381	Prob. F(1,12)	0.117157	F-statistic
0.6447	Prob. Chi-Square(1)	0.212712	Obs*R-squared

Source: From the work of the researcher based on the results of the statistical program Eviews : 9

Table(4)

Testing the problem of heterogeneity of variance for the first model

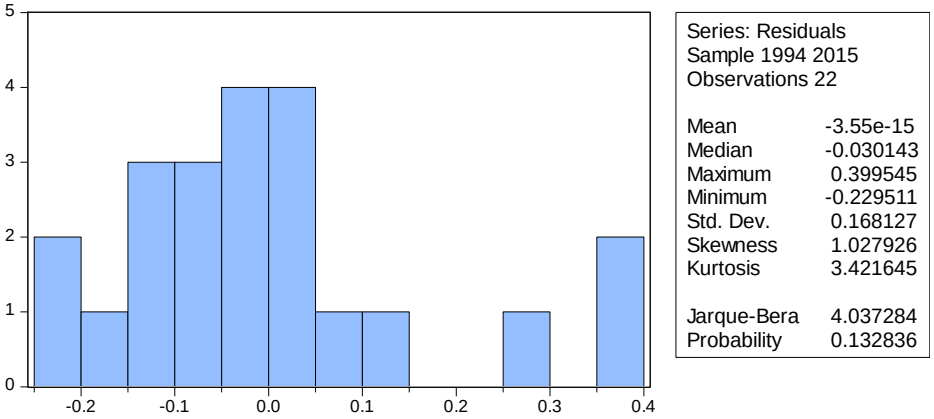
Heteroskedasticity Test: ARCH			
0.2543	Prob. F(1,19)	1.381764	F-statistic
0.2328	Prob. Chi-Square(1)	1.423677	Obs*R-squared

Source: From the work of the researcher based on the results of the statistical program Eviews : 9

In order to clarify whether the residues are distributed naturally, we find that the probability value corresponding to the Jarque-Bera test is 0.1328, which is greater than 5%. Therefore, we can not reject the null hypothesis which confirms that the residues do not contain the normal distribution problem which means that the residues are naturally distributed, As follows:

Shape (4)

Testing the normal distribution for the first model



Source: From the work of the researcher based on the results of the statistical program Eviews : 9

D.The Bound Test Approach to Cointegration:

After estimating the model (ARDL), we do the Bound Test which was proposed by Pesaran et al in 2001 to ascertain whether or not there is a common integration (long-term equilibrium relationship) between variables. One could either choose the null hypothesis or the alternative hypothesis, the null hypothesis states that there's no common integration between them, , While the alternative hypothesis provides for the existence of common integration (long-term equilibrium relationship). This is done using the F-Statistic test after testing (F) for parameters of the variable levels. If the calculated F is greater than the scale, it indicates a common integration and vice versa. If the calculated F value falls between the two values, a decisive decision can not be made, Table(5) shows boundary test model ARDL results.

Table(5)

The results of common Contegration test of the model using the method the limits testing for the first model

K	Value	Test Statistic
1	14.00900	F-statistic
Critical Value Bounds		
I(1) Bound	I(0) Bound	Significance
4.78	4.04	10%
5.73	4.94	5%
6.68	5.77	2.5%
7.84	6.84	1%

Source: From the work of the researcher based on the results of the statistical program Eviews : 9

Table (5) shows the results of the common integration test using the Boundary Testing Method in which it shows that the calculated values of (F-Statistic), is 14.0090), which is greater than the upper bound values of the F statistic according to sample size and degree of freedom at a significant level (1% 5%, 10%) This indicates a common contegration between the variables studied, , which means that we reject the null hypothesis and accept the alternative hypothesis that states there is a long-term equilibrium relationship, after ascertaining that there is a common integration according to the boundary test, and we are going to identify the short-term relationship and the long-term relationship.

4 / Estimation of the short-term relationship: The short-term relationship is represented by the estimation of the error correction model (ECM), which represents the expression of the variables used in the first difference formula With the addition of the error correction threshold slowing for one time period (ECMt-1) as an explanatory variable. The error correction limit measures the speed of adaptation of the short-term imbalance to the long-term equilibrium balance. If the error correction parameter is negative and significant, this indicates a long-term relationship between the two variables. Table (6) shows The results of estimating the impact of the volume of the hidden economy on GDP in the short term.

Table (6)

Results of the short-term relationship for the first model

ARDL Cointegrating And Long Run Form
Dependent Variable: LNGDP
Selected Model: ARDL(3, 4)
Date: 06/11/17 Time: 23:59
Sample: 1990 2015
Included observations: 22

Cointegrating Form

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.1884	1.388372	0.144496	0.200614	D(LNGDP(-1))
0.0799	1.899806	0.153691	0.291982	D(m LNGDP(-2))
0.0011	4.158887	0.125724	0.522872	D(LNHEC)
0.0013	4.085708	0.177199	0.723982	D(LNHEC(-1))
0.0121	-2.914131	0.147915	-0.431045	D(LNHEC(-2))
0.0277	-2.478982	0.117681	-0.291729	D(LNHEC(-3))
0.0004	-4.761471	0.088647	-0.422088	CointEq(-1)

Cointeq = LNGDP - (0.5356*LNHEC + 10.1729)

Source: From the work of the researcher based on the results of the statistical program Eviews : 9

Table (6) shows the error correction model and the short-term parameters of the model variables. The results indicate that the variables have the expected signal, The signal is expected to be positive. The increase in the volume of the hidden economy leads to an increase in gross domestic product by 0.52 units. As for the error correction coefficient, its value was as expected, negative and significance, with a value of −0.422088 and a very low level of significance of a 0.0004. This confirms the existence of a long-term equilibrium relationship between the two variables under study in the short term, The value of the error correction parameter shows that about 42% of the short-term imbalance in the GDP value of the previous period (t−1) can be corrected in the current period (t) to restore the long-term equilibrium state when any change or shock in the explanatory variables occurs.

5.Estimating the long-term relationship: Table (7) shows the effect of the size of the hidden economy on the GDP in the long run, and we note through the table that the effect of the hidden economy on the GDP value is statistically significant, the amount of prob. Is (0.0000), which is less than 1%. Therefore, we reject the null hypothesis and accept the alternative hypothesis which states that there's for a long-term equilibrium relationship. In which And the direction of this relationship is from the size of the hidden economy → to the value of GDP, the increase of the hidden economy by one unit leads to an increase in GDP by (0.53) units in the long term, This shows us the great impact of the size of the hidden economy on the size of GDP. This high level reflects the size of the structural imbalances in the economy , and the failure of the commodity sectors and its inability to satisfy the needs of society and the dependence on the outside in bridging the gap between demand and domestic production.

Table(7)

Results of the long-term relationship for the first model

Long Run Coefficients

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0000	6.271555	0.085394	0.535550	LNHEC
0.0000	6.917296	1.470649	10.172912	C

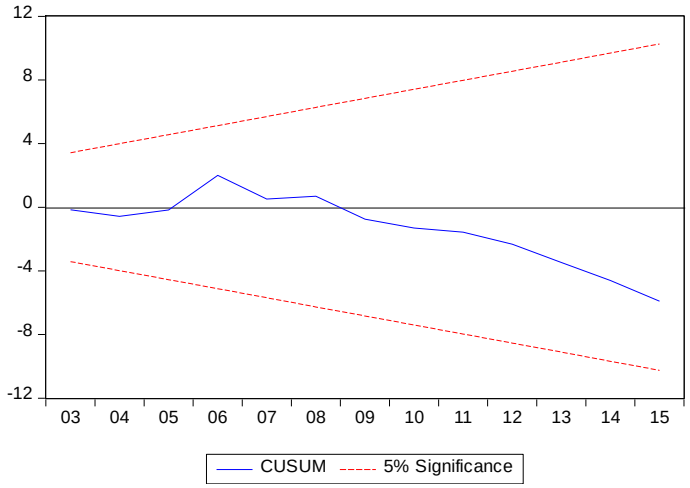
Source: From the work of the researcher based on the results of the statistical program Eviews : 9

6/ model Stability Test:

In order to ensure that the data used in this study are free of any structural changes, especially the parameters of the long and short term relationship during the period used to estimate the ARDL model, You must use one of the appropriate tests for this like: The Cumulative Sum of the recursive residuals (CUSUM) and The Cumulative Sum of recursive residuals Squared (SUSUMQ) which were developed by Broun et al. . The structural stability of the estimated coefficients is achieved by the error correction formula of the self-regression model of the distributed time gaps. , If the graph of the two tests is within the critical limits at 5%. In the light of most studies we have applied these two tests, which were assumed by Broun, Dublin, Evans (1975).

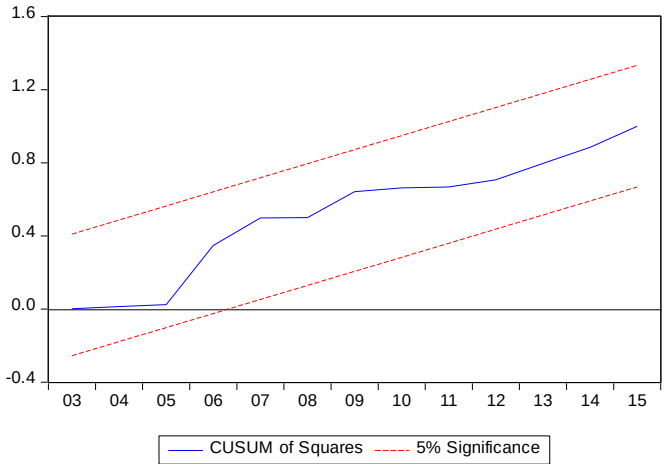
Shape (5)

The Cumulative Sum of the recursive residuals (CUSUM)



Shape (6)

The Cumulative Sum of recursive residuals Squared (SUSUMQ)



Substituted Coefficients:

==========

LNGDP = 0.778526002273*LNGDP(-1) + 0.0913679045579*LNGDP(-2) - 0.291982114263*LNGDP(-3) + 0.522871593779*LNHEC - 0.295614164111*LNHEC(-

1) - 0.723982162699*LNHEC(-2) + 0.431044692679*LNHEC(-3) + 0.291729493284*LNHEC(-4) + 4.2938659953

Cointegrating Equation:

D(LNGDP) = 0.200614209705*D(LNGDP(-1)) + 0.291982114263*D(LNGDP(-2)) + 0.522871593779*D(LNHEC) + 0.723982162699*D(LNHEC(-1)) - 0.431044692679*D(LNHEC(-2)) -0.291729493284*D(LNHEC(-3)) - 0.422088207432*(LNGDP - (0.53555027*LNHEC(-1) + 10.17291154))

Conclusions:

1. The size of the hidden economy is growing and growing as the economic crises in the country are growing, and the delay in dealing with it may prepare the environment for the emergence of a new culture (culture of corruption).in which Negative values prevail at the expense of positive values.
2. The dormancy test shows that the gross domestic product (GDP) did not achieve the dormancy till it took its first difference while the size of the hidden economy was settled at this level, which required the use of the ARDL model.
3. The boundary test for co-integration indicates a long-term equilibrium relationship between the size of the hidden economy and GDP at current prices, where as F calculated higher than the periodic F at a significant level (1%, 5%, 10%).

4. The error correction model indicates that increasing the size of the hidden economy in one unit leads to an increase in GDP by 0.52 units. The error correction parameter is negative and significant at (-0.422088). This confirms a short-term relationship between the two variables.

5. The direction of the long-term equilibrium relationship is the size of the hidden economy → GDP. The increase of the hidden economy by one unit leads to an increase of GDP by 0.53 units in the long term.

6. through the model Stability tests represented by the cumulative accumulation of the relay and the cumulative sum of the ideal residual squares. The structural stability of the estimated coefficients of the error correction and self-regression model of the distributed time gaps the diagram of the two tests within the critical limits occurred at a significant level of 5%.

Recommendations:

1. In view of the growing and expanding size of the hidden economy, it must be tackled and all means must be taken to prevent the growth of its activities by reforming monetary and fiscal policy, addressing the causes of the State budget deficit and achieving transparency in public spending and To prevent wasting the state resources.
2. The Central Statistical Organization should work to give and develop numerical data, albeit in a rough manner, on the activities of the hidden economy, thus encouraging research institutions to prepare researches and studies to ascertain the size of the hidden economy, its types and causes and ways to overcome it.
3. Activation of the economic control work on all transactions that take place within the national economy, in addition to activating the mechanism of controlling the external borders and the accompanying smuggling of some goods and raw materials.

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Annex (1)

HEC/GDP% (5)	HEC (4)	RK (3)	K %(2)	V (1)	Years
12.9	2531	78.1	87.3	1.3	1990
10.8	2517	79.4	88.6	0.9	1991
17.8	11043	72.8	82	1.4	1992
22.5	34733	68.5	77.7	1.8	1993
16.3	130234	74.3	83.5	3.3	1994
17	422331	73.7	82.9	3.5	1995
8.2	228772	Zero	9.2	2.9	1996
10.4	411422	80.4	89.6	3.8	1997
11.5	621449	79	88.2	3.9	1998
14.1	1063942	76.7	85.9	5.1	1999
14.5	1217688	76.1	85.3	4.8	2000
17.5	1844350	73.4	82.6	4.9	2001
14.9	1799630	75.9	85.1	4	2002
19.8	1830091	71	80.2	1.6	2003
29.2	6568498	61.4	70.6	2.2	2004
19.8	6172978	70.7	79.9	2.7	2005
29.4	12577491	61.7	70.9	2.8	2006
34.2	17974721	56.3	65.5	2.4	2007
34.4	27152810	56.4	65.6	2.8	2008
41.5	31048702	49.2	58.4	2	2009
51.5	43842075	37.8	47	1.6	2010
53.5	51279852	36.1	45.3	1.5	2011
51.3	59656003	38.8	48	1.8	2012
51.1	73788400	38.2	47.4	1.9	2013
50.7	73240000	40.4	49.6	2	2014
46.6	61160000	44.1	53.3	2	2015

Calculated by the researcher based on the following equations:

1.$K = C/M1 * 100$

2.$RK = Kt - Kt-1$

3.$V = PGDP / M1$

4.$HEC = V * D$

Annex (2)

Gross domestic product excluding oil	Gross domestic product at current prices	M1 money supply	Net currency in trading C	Year
19600.1	55926.5	15359.3	13412.1	1990
23285.5	42451.6	24670	21873	1991
61992.6	115108.4	43909	36021	1992
153695.2	321646.9	86430	67134	1993
798311.4	1658325.8	238901	199436	1994
2479564.9	6695482.9	705064	584398	1995
2790496.1	6500924.6	960503	88161	1996
3940336.6	15093144	1038097	929828	1997
5379604.6	17125847.5	1351876	1192530	1998
7537258.7	34464012.6	1483886	1275220	1999
8378787.9	50213699.9	1728006	1474321	2000
10515192.3	41314568.5	2159089	1782691.1	2001
12001528.6	41022927.4	3013601.1	2563693.5	2002
9236016.6	29585788.6	5773601	4629794	2003
22426817.1	53235358.7	10148626	7162945	2004
31153813.9	73533598.6	11399125	9112837	2005
42736143.9	95587954.8	15460060	10968099	2006
52437718.9	111455813.4	21721167	14231700	2007
78859660.4	157026061.6	28189934	18492502	2008
74644138.9	131275592.6	37300030	21775679	2009
85116511.4	159607123.6	51743489	24342192	2010
95821550	211309950	62473929	28287361	2011
116155918.5	245186418.5	63735871	30593647	2012
144342000	271092000	73858000	35022000	2013
144408000	260610000	72692000	36072000	2014
131076000	196820000	65435000	34855000	2015

Source : Ministry of Planning, Central Organization for Statistics and Information Technology, Directorate of National Accounts, Statistical aggregates for different years.