International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

The Impact of External Debt on Economic Growth: Empirical Evidence from Iraq

Dr. Younis Ali Ahmed (PhD)[1], Sazan Taher Saeed (MSc)[2], Shvan Jamal Hama Saed (MSc)[3]

[1]Department of Tourism, Faculty of Commerce, University of Sulaimania

[2]Department of Economy, School of Economics and Management, University of Sulaimania.

[3]Department of Economy, School of Economics and Management, University of Sulaimania.

Abstract: ***Iraq has great potential of different resource that may not be available in other countries. The Iraq is one of the areas that have diversity in terms of natural resources and industrial components that date back to thousands of years. Problem Statement: From the latter half of the 1970s to the early 1980s, the Iraqi economy encountered no problems with foreign currency because of the strength of the economy and the huge returns achieved from the export of oil ,however since the Iraq-Iran war, Iraq has suffered from a budget deficit because of the earlier war funding Iraq's history of war, as well as its economic blockade conditions, have contributed to this situation. At present, political and security instability continue to occur. Thus, the government stimulated to borrow from developed countries as well as an international organization to satisfy and meet their local requirements. Significance of the study: The identification and explain why external debt exists as well as determine the nature and extent of relationship between external debt and economic growth of Iraq. Objective: This paper attempts to identify and analysis of the negative impacts of external debts on economic growth currently and in the future in the case of Iraq .Methodology: To achieve this Objective of fulfilling its full potential, present paper adopts ARDL approach to estimate the level of co-integration and relationships between external debt and economic growth as discussed in Pesaran and Shin (1999), and the secondary data for the period of (1980-2014) was used. Results: The empirical result shows that war, political and security instability had negative impacts on both size of external debt and direction of economic growth of Iraq. Findings: This study also found that external debt had a negative impact on gross domestic product (GDP), but this impact in the short-run had a bigger compared to the long-run. Conclusion: This study highlights the reason for the external debt of Iraq. Suggestion: Thus, Iraq government should be given the opportunity to extensively develop the agriculture and industrial sectors, which are important factors to meet the growing gross domestic product (GDP) without depend mainly on oil sector which is directly and indirectly cause to external debt. Contribution of the Study: To the best knowledge of these researchers, no current literature on external debt in Iraq had analyzed long- and short-run relationships. Furthermore, no current literature on Iraqi external debt used new approach, such as ARDL. Thus, the current study is going to fill up some gap by adding at least one more empirical study to the existing number of articles. Our empirical results enable us to find how much the economic growth is influenced by external debt of Iraq in the short and long-term.***

Keywords: External Debt Impacts, Economic Growth ,Economic Analysis, ARDL Approach, Iraq.

1. Introduction

"External debt is the total public and private debt owed to nonresidents repayable in foreign currency, goods, or service" *Government external debt= current account deficit + increase in foreign exchange reserves + gross private short term capital outflow- net long term private capital inflow. According to Hallwood and MacDonald (1994) the increase in a country net external debt is determined only by the size of current account deficit. Compound Interest: Interest paid or earned on any previous interest earned, as well as on the principal borrowed or lent .Future Value Formula:* $FV_n = P_0 (1+i)^n$

P_0*: Deposit today (t=0) or PVo of deposit*
i: Interest Rate per Period.
n: Number of Time Periods.
FV_n *is the future value at time n*

(Hasan and Pervin, 2012).Besides, Dereje (2013) defines external debt is the part of debt in any national economy that is owed to a borrower outside the country; the borrowers can be foreign country, International organizations, corporation or private households. Moreover, the World Bank definition of the external debt "is a debt owed to non-residents repayable in foreign currency, goods, or services".

Kasidi and Said (2013) impose that many developing countries which their income is low are facing lack of saving-investment, so they need to borrow from developed countries and international community to fulfill this lake. On the other hand, Ishan(2006 , 2014) illustrate that some of developing countries want to improve the living standards of population, so to promote investment and to boost their economic growth they need to take debt from the external source .Thus, when the developing countries do not have enough resources or to deficit financing they will encouraged to take external debt as channel to support economic growth.

Hence ,borrowings by countries arise as a result of their inability to generate enough domestic savings to carry out productive activities. Such external borrowings by countries are meant to complement the domestic savings and allow that countries to carry out productive activities (Ezeabasili et al., 2011). The developing countries facing with a current account deficit were stimulated to borrow from developed countries as well as an international community to enhance their economic growth. Furthermore, Gohar et al. (2012)

Licensed Under Creative Commons Attribution CC BY

commended that countries get debt from the external sources for many reasons i.e. they have low national income, with budget deficit or they are having low investments. In addition, Shabbir (2009) illustrate that countries borrow for two broad categories; macroeconomic reasons to either finance higher consumption or higher investment and to circumvent hard budget constraint. This suggests that countries borrow in order to boost economic growth and help the living conditions of the people. Sustainable economic growth is of major concern for all economies, especially for the developing economies which generally face burgeoning fiscal deficits mainly driven by higher levels of debt servicing, particularly external debt servicing and widening current account deficits.

External debt is attained in order to help finance budget deficit and speed up economic activities; hence, external debt should consequence to economic growth of a nation. Countries might have heavy external debt along with relatively higher level of exports that might help them to sustain their level of external debt. Nevertheless, external debt, if not sustainable, imposes higher risk to the economic prosperity, as its servicing which is also an indicator of higher current account deficit, can lead to debt overhang in a country (Shabbir, 2009).Moreover, Hasan and Pervin (2012) impose that it is a contentious issue whether external public debt encourages or retards the growth of economy. Some researchers found positive, some negative and some did not find significant relationship between external debt and economic growth for different economic condition.

Hence, economic development in any country needs financial resources and they came from internal savings (if exist) and internal debt (if possible). Furthermore, external debt (if available). Nevertheless, because of the lack in internal savings and the hardness of getting internal debts (especially in the developing countries) so that in most of the situations developing countries have stimulated to take external debt from developed countries to fulfill the internal financial shortages. Additionally, the external debt has an important role in economic development in any country and that represents cash flow which is the basic needs of development process. On the other hand, that is a heavy overhang on the payment balance, if there is no similar increasing in GDP due to the hard conditional and agreements of the debt services in developing countries (Al-obeidy, 2004).For instance, the problem of external debt is one of the major challenges faced by the developing countries like Iraq.

Iraq is the only country among the Arabic countries that have both of natural resources (oil and gas) and a very wide beneficial land for agriculture. These varieties of wealth have given Iraq a very importance role internationally. According the Unified Arabic Economic Report in 2012, the amount of Iraq oil reserve is around %11 of global oil. Nonetheless, the misrule from the Iraqi economy, wars, and blockade. They were all reasons for wastage of natural resources and destroying infrastructure. All of the reasons made Iraq to stimulate external debt. In fact, this external debt and its burden were became reasons for stopping Iraq from making constructions of infrastructure and investigate the growth process and economic development. Actually, during 1970s, Iraqi economy developed and had stability politically and economically, but the enhancements could not survive for a long time because of the instability from the price of oil internationally. Plus, the first Gulf War started and that made Iraqi economy to go to the backward and accumulating external debt (Al- Saadi, 2000 ; Al-Khafaji, 2005 ; Ahmed, 2013).

Furthermore, in 1980, from 26.4 billion USD from oil revenue and 53 billion USD from Iraqi GDP, almost 19.8 billion USD spent as the military expenditure which it was around %75 of oil revenue and %37 of Iraqi GDP as a result of unstable political situation between Iraq and Iran as well as it was the beginning of the first Gulf War. That ratio from military expenditure increased in 1984 to 25.9 billion USD and that was %54 of the GDP. Thus, external debts increase compare to GDP (For the later years). For instance, in 2011 the amount of debts became %36 of GDP because of internal and external war and economic blockade [The total loss of attacking Iraq-Syria pipeline at that time was 62 billion USD, while %70 of GDP of Iraq was from oil revenue]. Plus, political instability in the country which Iraq suffering from it till now. On the other hand, military expenditure was increased and that growth of real GDP fell down. Besides, financial and economic crises happened; regionally and globally (Al-Nasraoui and Ahmed, 2013).

Based on above points (increasing military expenditure, falling of GDP, falling oil revenue, and irrationality in managing Iraqi economy) they were all major reasons to face a large deficit in public revenue in the Iraqi budget and encouraged Iraq to ask for external debt and accumulating external debts on Iraq's in order to support the army and solve the persistent food gap. Furthermore, providing construction expenditure and supporting Iraqi infrastructure (Ziany,2009).According to the Unified Arabic Economic Report in 2001 from League of Arab States, the external debts of Arabic Countries were $325 billion including 126 billion USD only by Iraq which means the external of Iraq was %40 of the total of external debts by Arabic countries (Al-Abidi, 2004, Unified Arab Economic Report, 2001) [For more information please refer to:
- Www.ClubdeParis.org.php, Www.ClubLondon.org., CBI. www.cbi.iq.

Thus, current study try to shows impacts of external debts on economic growth of Iraq.

The rest of the paper is going to be structured in the following way, beginning with Section I which focuses on the theoretical framework. Section II deals with the contextual/ empirical literature review, while Section III represents methodology and data collection. Section IV presented the empirical results for the impact of external debt on economic growth and discussion based on economic theory and statistical indicators. Finally, Section V shows Summary and Conclusion.

2. Theoretical Framework

The current section focuses on theoretical framework by present some conceptual which related external debt .Hence,

Licensed Under Creative Commons Attribution CC BY

the present study focuses on the macro level and examines how the external debt affects economic growth.

Diallo (2009) illustrates that there are two major opposing schools of thought on the economic theory of external debt and growth, i.e. the Keynesian and the neoclassical. To the Keynesians, indebtedness does not bring about charges either for present generations or future generations as a result of the investments that it generates. "According to this theory, indebtedness, this revives demand, results in a more proportionate increase in investment through the accelerator effect (Diallo, 2009)." This in turn causes to increase in production. By contrast, the classical economists consider indebtedness as a future tax and attribute it to the State. It is a negative connotation because to them, public indebtedness hinders consumption and capital accumulation by present and future generations.

Hence, Agarwal AN and Kundan Lal (1994) illustrate that the neoclassical growth theorists examine capital accumulation (accumulation of savings) as an essential ingredient of the growth of economy. According to them, interest rate is the key to savings as also to investment. Other factors encouraging output-expansion as described by neoclassical economists are population, international trade and technology. Hence, Jain Gopal Lal (1999) explains that some economists believe borrowings appropriate to finance government spending which results in creation of productive capital assets. They consider that foreign debt kills two birds with one stack by helping to bridge the saving gap and foreign exchange.

Moreover, Hausmann and Panizza (2003) external debt as a tool to help the growth of economy had been one of the prominent subjects of debate among economists. Neoclassical economists argue that external debt is one of the most important sources of capital for a country; accordingly the impact of external debt is positive on the economic growth and investment. Some economists contradict this view; they believe external debt as one of the factors hampering the growth of economy. In support of their view they try to describe the problems related with external debt, e.g. debt sustainability, problem of the accumulation of a debt, inability of a country to raise foreign loans in its own currency, inability of a country to meet debt obligations etc.

Rabia and Kamran (2012) explain that the impact of external borrowing on economic growth has been studied by many Economists. In conclusion some researchers found that there is a positive relationship between foreign debt and economic growth, while others found that there is a negative impact of foreign debt on economic growth, due to the inefficient distribution of the resources, they also stated that economic theories suggest that external debt might add value to the country's economic growth if its employed effectively and efficiently.

To sum up, most theoretical studies on the relationship between external debt and growth have been centered mainly on the negative effects of debt overhang. The debt overhang theory presumes that beyond a certain threshold, the effects of external loans are negative on economic growth. This means that additional loans will decrease the probability of repayment.

3. Contextual/ Empirical Literature Review

For better understanding, this section provides an overview of the study of external debt; there are several empirical studies on the impact of external debt on economic growth in developing and developed countries. Nevertheless, these studies show some conflicting results in their conclusions on the impact of external debt on economic growth. For instance, according to Hassan and Mamman (2013) the result of the study expose that external debt contributes positively to the economic growth of Nigeria. Hence, the study recommends that external borrowings should be channeled to the real sectors of the economy for the impact to be felt in the country. Conversely, Alfredo and Francisco (2004) found the relationship between external debt and the growth of economic for some Latin American and Caribbean countries investigated that lower the levels of total external debt were associated with higher growth rates.

Kasidi and Said (2013) in their article found the impact of external debt on economic growth of Tanzania for the period of 1990-2010. Time series data was used on external debt and economic performance. It is supposed that external debt is away to help developing countries to meet developing needs. While debt servicing seeks development by restoring credibility to existing and new creditors. The study revealed that the impact of external debt and debt service on GDP growth is significant. The effect of total external debt stock is positive and the effect of debt service payment is negative. Long run relationship the co-integration test illustrations that the external debt and GDP does not have long run relationship. Likewise, Jayaraman et al. (2009) in their article examined the flow of foreign aid in six Pacific Island countries (PIC) over the period of 1988-2004. These countries had been among the top recipients of foreign aid until early 80s, but later on because of the change in political situation, they could not maintain the level of higher aid inflows thereby subsequently fell into the trap of twin deficits. While assessing whether external debt and the higher flow of foreign aid had ever contributed to economic growth in these countries, the study found that the relationship between external debt and real GDP is significantly positive; and the relationship between higher fiscal deficit and GDP growth is negative.

Hence, according to Ejigayehu, (2013) the impact of external debt on economic growth is empirically found on selected (Eight) heavily indebted poor African countries. The investigations from prior works strongly vary from researcher to researcher in terms of statistical method used, Geographical area and the period of the time. The study has been used annual data for the period of 1991 and 2010. As each the result, the impact of external debt on economic growth is found to be statistically significant in terms of debt crowding out effect. This is the case when indebted poor countries transfer resources, including foreign exchange and foreign aid resources to service their accumulated debt.

Gohar et al. (2012) cited that the repayment or "debt service" makes problems for many countries particularly for

Licensed Under Creative Commons Attribution CC BY

developing countries because a debt has to be serviced are more than the real amount it was taken for. Moreover, Benedict et al. (2003) implied that the impact of foreign borrowing is a positive on investment and growth of a country up to a threshold level but external debt service may potentially affect the growth as most of the funds will go in the debt repayment rather at the investments. Similarly, Benedict, Rina and Toan, (2005) have discussed the pros and cons relation between the external debt and economic growth, they concentrate on that external debt dampen the investment and growth of the country, as the accumulation of debts may lead to inability of repayment the debt in the future, as a result debt levels may be more than the country's output level i.e., override it. Furthermore, high debt levels may raise investor's uncertainty toward government's actions as a result the investors may stay on sidelines and not do investments at least for long run returns. In addition, the government may face a high pressure to repay its debts consequently this may affect the structural and fiscal forms as it might dampen government efforts in building these structures. However, they also stated that not all of foreign debts are harmful, as borrowing at low levels of debt may motivate growth and enhance the productive capacity of the country; in return the government will be more likely to gain higher outputs and more likely to repay its debt.

Safdari and Mehrizi (2011) investigate the effects of external debt on the economic growth in Iran for the period of (1974 – 2007). The results showed that the effect of external debt and imports was negative on economic growth. Besides, variables of private and public investments had a positive effect on the growth of economy. Furthermore,Were (2001) in his article used time series data for the period 1970-95, the empirical results indicated that the impact of external debt accumulation is negative on economic growth and private investment. This confirms the existence of a debt overhang problem in Kenya. Nevertheless, the results also showed that current debt inflows stimulate private investment. Debt servicing does not appear to affect growth adversely but has some crowding-out effects on private investment. Similarly, to examine the impact of Sudan's external indebtedness on economic growth, Mohamed (2005) used a time series data from 1978–2002. The findings of the study expose the existence of debt overhang problem in Sudan, i.e. external debts exceed the country's ability to repay. The study concluded that external debt and inflation prevent the growth of economy, while the impacts of export earnings are positive. Hence, the results of this study support the need of Sudan to be considered for comprehensive debt relief measures.

Ezeabasiliet al.(2011) examines the relationship between Nigeria's external debt and economic growth, between 1975 and 2006. Data availability and the escalation of Nigeria's external debt guided the choice of period. The findings of the error correction estimates are quite insightful. Empirical results show that short-run relationship between economic growth and the present level of external debt is negative in Nigeria. Furthermore, short run relationship between external debt service payment and economic growth is negative. The empirical result of external debt and debt service payment and the growth of economic are in agreement with the results of Iyoha (1999), which confirms that high stock of debt can reduce investment and lower economic growth rate. Moreover, Oyejide (1985) emphasizes that rapid economic growth supposes that public investment might often be necessary at a rate well in excess of public savings. Hence it might become necessary for government to borrowing to supplement public savings and thus fill the resource gap. Debt is a good finance option to simplify economic development process. Furthermore, Ajayi (1991) shows that the size of external debt relative to the size of economy is massive and besides leading to capital flight, also does not encourage private investments.

In the other hand, the effect of external debt on economic growth is statistically insignificant in terms of debt overhang effect. This consequence is against the presumption that was made on Solow theory of economic growth and debt overhang hypothesis, which illustrates that an accumulated debt act as a tax on the output in the future, discouraging productive investment plan of the private sector and adjustment efforts on the part of government (Debt overhang hypothesis) and this in turn will shift inward both investment and production curves in Solow's production function. Beside this, the work also shows that, the total amount of debt relief the countries in the work received is negligible and is not a way to help the countries towards a better economic growth.

To sum up, the major objective of these studies reviewed here is to investigate the empirical evidence regarding the dynamic relationship between external debt and economic growth. Overall, majority of the studies came up with a conclusion that a higher level of external debt is related with a lower level of economic growth; with only few studies that did not find conclusive evidence supporting these hypotheses.

4. Methodology and Data Collection

Several Quantitative methods are available for conducting the co integration ,but Pesaran and Shin (1995) and Pesaran et al. (2001) introduced a new method of testing for co-integration. The approach is known as the autoregressive distributed lag (ARDL) which has several advantage .Thus, this section describes the ARDL approach, which overcomes the regression problem, and is capable of identifying long-run and short-run relationships between external debt and its impact on economic growth of Iraq) Pesaran and Pesaran ,1997). Consequently, an ARDL analysis is used in this study to address the research questions and it is applicable to study available data, and is suitable to achieve study objective. The OLS based autoregressive distributed lag (ARDL) approach has become popular in recent years and numerous empirical studies have applied this method (Bashagi & Muchapondwa, 2009).

One of our objectives is to identify long- and short-run relationships among variables in our economic growth model for Iraq by using annual data from1980 to 2014. Based on the specific economic growth model (1), we consider combining four different variables to fill the gap in the literature. These four variables are the external debt, compound interest, exchange rate, and gross domestic product (GDP) which explains economic growth. All of the

Licensed Under Creative Commons Attribution CC BY

variables of the growth model are transformed to their natural logarithms to reduce variance by transforming a large number to a smaller one and thus to avoid problems of heteroscedasticity.

Hence, to achieve above objective current study employs the ARDL modeling approach to determining the Long- run coefficient for economic growth in Iraq which is related to external debt can be written as follows:

$$\ln RGDP_t = \alpha_0 + \sum_{i=1}^{P} \alpha_1 \ln RGDP_{t-i} + \sum_{i=0}^{P} \alpha_2 \ln ED_{t-i} + \sum_{i=0}^{P} \alpha_3 \ln C...$$

Where:
$\ln RGDP_t$ = natural logarithm of real GDP in Iraq in year t;
$\ln ED_t$= natural logarithm of external debt in Iraq in year t;
$\ln CI_t$= natural logarithm of compound interest on external debt in Iraq in year t;
$\ln ER_t$ = natural logarithm of exchange rate between Iraqi dinar and US dollar in year t;
D_1= dummy variable that represents the effect of the Iraq–Iran War;
D_2= dummy variable that represents the effect of the Gulf War; and
D_3 = dummy variable that represents the effect of the financial crisis in 2008.
t = time period from 1980 to 2014;
P = optimal lag length;
α_0 = the drift component;
α_1-α_4 = lon-run dynamics of the model;
α_5- α_7 = effects of the dummy variables of the model; and
U_t = usual white noise residuals.

The model is formulated based on the integration and co-integration statuses of the variables of interest by applying ARDL bounds testing approach. In this particular objective we should provide a suitable answer to the question .Does the external debt cause economic growth?

5. Empirical Result and Discussion

This study used ARDL method to investigate the impact of external debt on Iraqi economic growth. This section presents the main results of this study as following.

First: Stationary test with ARDL Approach
Stationarity is an assumption about variables in the classical regression model. Despite the ARDL approach does not formally require testing for stationarity, the approach is invalid for variables that have an integration of order 2. The stationary test results are reported in the tables below.

Table 1: Result of Stationary test for variables (GDP – ED – CI – ER)

Unit root test	Unit root test							
	Augmented Dickey-Fuller **and** Phillips-Perron tests **(Level)**				Augmented Dickey-Fuller **and** Phillips-Perron tests **(First Difference)**			
	Augmented Dickey-Fuller		Phillips-Perron		Augmented Dickey-Fuller		Phillips-Perron	
Variables	**Intercept**	**Intercept and Trend**	**Intercept**	**Intercept and Trend**	**Intercept**	**Intercept and Trend**	**Intercept**	**Intercept and Trend**
Ln GDP	0.1809	0.3914	0.5159	0.5352	0.4727	0.4225	0.0000*	0.0004*
Ln ED	0.1302	0.8193	0.0258**	0.9254	0.0000*	0.0000*	0.0000*	0.0000*
Ln CI	0.1546	0.8922	0.0112**	0.9903	0.0000*	0.0174**	0.0000*	0.0000*
Ln ER	0.6745	0.9743	0.6636	0.8926	0.0038*	0.0143**	0.0030*	0.0122**
(*), (**), (***) denotes Significant at 1%, 5% and 10% respectively.								

From table above, all variables (GDP – ED – CI – ER) are stationary in the first difference (Intercept) at the 1% and 5% significance level. The co-integration procedure is performed after validating the relevance in the first order I (I) of the co-integration concept.

Second: Co-integration Analysis with ARDL approach
After the test of stationarity, present study employs the ARDL bounds testing approach to co-integration analysis to investigate the presence of any co-integration between variables in economic growth model. Testing for co-integration intends to (i) determine a genuine long-run relationship between a set of time series data and (ii) estimate the long-run coefficient of the co-integrated series as suggested by economic theory. To investigate the presence of long –run relationship among the (real GDP, ED, CI and ER(bound testing under pesaran et al., (2001) procedure is used ,the bound procedure is based on the F-test .The F-test is actually a test of the hypothesis of no Co-integration among the variables against the existence or presence of Co-integration among the variables. Thus, F-test is employed to perform the ARDL co-integration test to identify the long-run relationship between variables by testing the hypotheses, as follows:
H_0: $\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ (no Co-integration)
Ha: $\alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$ (Co-integration)

For a small sample size (i.e., from 30 to 80 observations) the F-statistics are compared with the critical bounds suggested by Pesaran et al. (2001) and Narayan (2004, 2005), which are tabulated as two sets of appropriate critical values. One set assumes that all variables are I (1) and another assumes that all of them are I (0). Through this step, a band covers all possible classifications of the variables into I (1) and I (0), even those that are factionally integrated. If the calculated F-statistic lies above the upper level of the band, the null is rejected and thus indicates co-integration. Otherwise, the null cannot be rejected, thus indicating the absence of co-integration. However, if the statistic falls within the band, the result is inconclusive.

If these variables are co-integrated, then a stable long-run or equilibrium linear relationship among them exists. The empirical co-integration test results are shown in Table 2.

Licensed Under Creative Commons Attribution CC BY

Table 2: Co-integration Test: An ARDL approach for external debt and economic growth

Level of significance	Critical value		F-statistic	P-Value	Co-integration
Iraq- growth	Lower	Upper	**12.5880**	**[0.004]**	Indicating the co-integration was existing between economic growth and external debt.
1%	**4.428**	**5.816**			
5%	**3.164**	**4.194**			
10%	**2.618**	**3.532**			

Note:
- (*), (**), (***) denotes Significance at 1%, 5% and 10% respectively.
- In the economic growth model the number of independent variables (K) is three, and the number of observations (N) is 35.
- The critical values are taken from Narayan (2005),table case II, restricted in intercept and no trend.

Table 2 shows more than two instances of co-integration between the economic growth model and their determinants, and they emphasize the relevance of the long-run concept. The F-statistic (12.58) is greater than the upper bound critical value (5.81), (4.19), (3.53) at the 1%, 5%, 10% significance level, thus indicating the presence of co-integration between economic growth and its determinants. Therefore, the null hypothesis is rejected.

Third: Long-run and Short-run Estimation for the economic growth model

The empirical co-integration test results enable the examination of long- and short-run relationships in economic growth model. The main advantage of ARDL modeling is that it can estimate the long- and short-run relationships in the economic growth model. The short- and long-run coefficient of the model is estimated simultaneously. The error correction version of the ARDL procedure is then employed to specify the short- and long-run determinants of economic growth is used to test economic theory, which states that external debt is negatively**(or positivity)** related to economic growth in Iraq. The long- and short-run coefficient estimations are reported in Table 3.

Table 3: Long and Short-run estimation for economic growth using the ARDL Approach

Regressors	Coefficient	t.test	p.value
Long-run estimation			
Constant	0.12339	3.2634	[0.005]
External Debt	-0.33499	-2.4047	[0.028]
Compound Interests	0.21905	1.7580	[0.097]
Exchange rate	0.22059	3.7719	[0.002]
Short-run estimation			
Constant	0.20268	3.2873	[0.004]
External Debt	-0.55024	-2.4217	[0.026]
Compound Interest	0.35979	1.7696	[0.094]
Exchange Rate	0.36233	3.7466	[0.001]
ECT_{t-1}	-1.6425	-19.5698	[0.000]
Adjustment Process for Equilibrium (APE)	0.6425	-19.5698	[0.000]
Dummy variables			
Iraqi- Iran war 1980-1988 (D1)	-2.6409	-5.2729	[0.000]
Golf war (1991-1992) (D2)	-4.2993	-10.1219	[0.000]
Financial Crisis (oil price shock) (D3)	0.54186	2.2013	[0.004]

(*), (**), (***) denotes Significant at 1%, 5% and 10% respectively.
Note: Despite the inclusion of three Independent variables (External Debt, Compound Interest and Exchange Rate) as well as three dummy variables (D1, D2, and D3) in the study estimation for economic growth model. Compound Interest and (D1) are either statistically insignificant or significant with an incorrect sign but retained in the final model in accordance with the specific requirements of the ARDL and with the study's purposes. Therefore, only the variables that are statistically significant and have the correct sign are discussed in detail.

Overall, table 3 shows that a majority of the result came up with a conclusion that a higher level of external debt is related with a lower level of economic growth, which is consisting with study hypothesis and some other previous study (Ajayi,1991 ; Alfredo and Francisco,2004).

By applying the value of external debt and exchange rate, it is found that all these variables significantly affect the GDP of Iraq in the long run. However, these effects vary across the two variables. Despite the differences in their coefficients, all variables are considered important.

Table 3 shows that a one percent increases in external debt decreases the Iraqi GDP by 0.33% and a one percent increase in exchange rate increases the GDP of Iraq by 0.22% in the long run. These results also consistent with our expectation.

Table 3 also reports the short-run coefficient estimates for the economic growth of Iraq. Hence, the short-run estimations of economic growth are different from its long-run estimations. Table 3 shows that a one percent increases in external debt decreases the GDP by %0.55 and a 1% increase in exchange rate increases the GDP by 0.36% in the short run.

Licensed Under Creative Commons Attribution CC BY

In sum, therefore, external debt has a greater negative impact on economic growth in the short run compared to the long run. This finding is consistent with that of other researchers who believe that the short run may have a higher accuracy in estimating GDP than the long run (Wu, 2010).

To assess the effect of special internal and external events on economic growth, the implications of some important events (dummy variables) are estimated. These dummy variables (D1, D2 and D3) are introduced in the economic growth model. However, their effect is different from time to time and from one issue to another. Table 3 shows that the Golf war has a highly negative significant effect on economic growth compared to Iraqi- Iran war.

The error correction term is high significant and has the expected sign, thus indicating that the economic growth is adjusted by almost 64% within the first year if the growth is above or below its equilibrium. Therefore, the existing disequilibrium should be reduced over time to maintain long-run equilibrium. The adjustment speed becomes significant and fast when economic growth model experiences any shocks.

Fourth: Diagnostic Checking for Accurate Estimation

To ensure the appropriateness of the model, the last steps of the ARDL procedure are employed to check economic growth model (i.e., external debt and GDP) by using diagnostic checking. Furthermore, this study used several diagnostic tests, including the tests for serial correction, heteroscedasticity, normality, function form, and structure break. The Lagrange multiplier (LM) and The F-statistics and critical values are reported in Table 4.

Table 4: Diagnostic Checking for economic growth model

Diagnostic Test				
Test statistics	**Test statistics**	**LM version**	**F version**	**Decision**
Serial Correlation	LM test (1)	CHSQ(1) = 0.4902 [0.484]	F(1, 16) = 0.2851 [0.601]	good fit
Heteroscedasticity	ARCH test	CHSQ(1) = 1.7406 [0.187]	F(1, 26) = 1.7234 [0.201]	good fit
Functional Form	Ramsey RESET test	CHSQ(1) = 0.0019 [0.964]	F(116) = 0.0011 [0.974]	good fit
Normality	Jarque-Bera	CHSQ(2) = 1.2213 [0.543]	Not applicable	good fit
Stability test	CUSUM test	Structure break Stable	Structure break Stable	good fit
	CUSUMQ test	Structure break Stable	Structure break Stable	good fit
Test statistics	R-Squared	0.94	F- statistic	27.78 [0.000]
	Adjusted R^2	0.90	S.E for Model	0.23
	Number of observation	35	DW-statistic	1.72
Notes: t-value in the parentheses (….) and p-value for diagnostic test in parentheses (*), (**), (***) denotes Significant at 1%, 5% and 10% respectively.				

Table 4 shows that the Lagrange multiplier (LM) and the F-statistic are less than the critical value. As shown in Table 4, there is no evidence of autocorrelation presented in this table. The ARCH tests suggest that the errors are homoscedastic and independent of the repressors. The model passes the normality tests. Therefore, the ARDL model is correctly specified (please refer to Appendix – Table 2).

Table 4 also shows the value of S.E regression given its minimal value, is small. The R^2 and adjusted R^2 show that ARDL models are the most appropriate.

The above discussion related the diagnostic test, and for stability test, the figures show that the statistic plots of CUSUM and CUSUMSQ are within the critical range. Therefore, No evidence of any significant structural instability is observed. The model can be used for policy decision making. The stability tests are presented as follows:

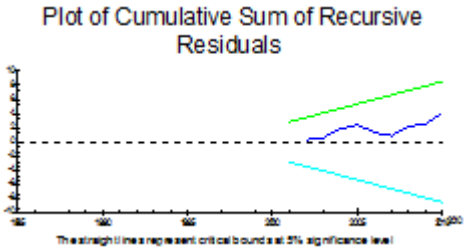


Figure 1: Cumulative sum of Recursive Residuals, Economic growth for Iraq

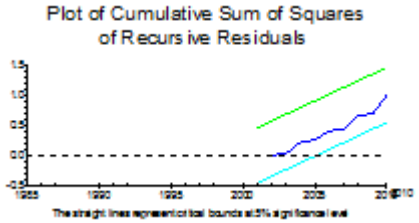


Figure 2: Cumulative Sum of Squares of Recursive Residuals, Economic growth for Iraq

6. Summary and Conclusion

Iraq has a huge endowment of natural resources, specifically oil, because of its geographical location; however it suffers from an increase in the external debt, due to wars and the economic blockade which was imposed on Iraq in the 1990s. Beside the political and economic instability recently. Thus , present study has been motivated by the significant increase in the external debt of Iraq.

This paper has studied the impact of external debt on economic growth in Iraq from (1980-2014) in both short and long runs, by applying ARDL approach to estimate the level of relationships between external debt and economic growth. Based on a specific economic growth model by using four variables namely, external debt, compound interest, exchange rate, and gross domestic product (GDP) which explains economic growth.

Licensed Under Creative Commons Attribution CC BY

The findings of previews studies varies from paper to another, as some studies found a significant (whether positive or negative) relation between external debt and economic growth, while others found no significant relation between them. Nevertheless, this study also found that external debt had a negative impact on gross domestic product (GDP) and study indicates a significant relationship between the independent and dependent variable in the both short- and long run. Hence, this effect in the short run seems to increase as some researchers believe that the short run gives higher accuracy in estimating GDP in the short run.

In addition ,to estimate some of the internal and external factors such as, wars, economic blockade and the political and security instability, three dummy variables has been introduced in this study .Consequently, the results show that both Iraqi- Iran war and Golf war has a negative significant effect on economic growth; the effect was higher in Golf war.

To sum up, this study indicates that increasing military expenditure, falling of GDP, falling oil revenue, and irrationality in managing Iraqi economy; they were all major reasons to government stimulated for external debt and accumulating external debts on Iraq.

References

[1] Ajayi, S. Ibi. (1991). Macroeconomic Approach to External Debt: The Case of Nigeria. African Economic Research Consortium, Paper No.8, Nairobi – Kenya.
[2] Agarwal AN and Kundan Lal (1994), "Economics of Development and Planning", 2nd edition, Vikas Publications, pp-14.1.
[3] Alfredo, S and Francisco, I. (2004). Debt and Economic Growth in Developing and Industrial Countries.Working Paper 2005:34, Columbia University, Department of Economics.
[4] Al- obeidy , S.M (2004). Foreign loans and the problems of developing countries towards them (Arab countries Case Study), Journal of Management and Economics, Issue (51), Al- Mustansiriya University, P 1.
[5] Al-Nasraoui,A(1995). Iraq's economy, oil and development Wars - destruction - Outlook: translation Mohammed Saeed Abdul Aziz, Dar Alknoz Al-Arabiya treasures - Beirut, P 127.
[6] Ahmed, H. K.(2013), Measuring and analyzing the impact of external debt service on some macro-economic variables in selected developing countries for the period (1980-2005), Master's thesis of Economics, Ministry of Higher Education and Scientific Research, Faculty of Economy and Management , University of Sulaimani, PP 109-110.
[7] Al- Saadi, S.Z. (2000). The economic crisis in Iraq and the national project for changing, Journal of New Culture, Issue (297), P 67.
[8] Al-Khafaji, N. A.M(2005). Employment trends in external debt of Iraq and its impact on economic development for the period (1980-2000), Master's thesis, the Ministry of Higher Education and Scientific Research, College of Administration and Economy, Al-Mustansiriya University,p55.
[9] Benedict Clements ,Rina Bhattacharya,Toan Quoc Nguyen.(2005) Can Debt Relief Boost Growth in Poor Countries?. International Monetary Fund.
[10] Bashagi, A., & Muchapondwa, E. (2009). What actions could boost international tourism demand for Tanzania? Journal for Studies in Economics and Econometrics, 33(2): 59-75.
[11] Benedict Clements ,Rina Bhattacharya,Toan Quoc Nguyen.(2005) Can Debt Relief Boost Growth in Poor Countries?. International Monetary Fund.
[12] Benedict, R. Bhattacharya and T. Q. Nguyen, External Debt, Public Investment, and Growth in Low-Income Countries, IMF Working Paper WP/03/249, (2003).
[13] Central Organization for Statistics and Information Technology, Iraq CBI. www.cbi.iq.
[14] Dereje Abera Ejigayehu. (2013). The Effect of External Debt On Economic growth: Department of economics Magisteruppsats 30 hp | Vårterminen 2013.
[15] Diallo, B. (2009), External Debt and Financing of Economic Development in Guinea. National Directorate of Economic Studies and Forecasting ,Ministry of Economy and Finance ,Conakry-Republic of Guinea.
[16] Ezeabasili, V N. Isu, H O. and Mojekwu, J N. (2011), Nigeria's External Debt and Economic Growth: An Error Correction Approach, International Journal of Business and Management Vol. 6, No. 5.
[17] Ejigayehu, D A. (2013). The Effect of External Debt On Economic growth: Department of economics Magisteruppsats 30 hp | Vårterminen 2013.
[18] Faraji Kasidi and A. Makame Said. (2013). Impact of External Debt on Economic Growth: A Case Study of Tanzania. Advances in Management & Applied Economics. . Advances in Management & Applied Economics, vol. 3, no.4, 2013, 59-82.
[19] Gohar, N. A. Bhutto and F. Butt, The Impact of External Debt Servicing on the growth of Low-Income Countries, Sukkur Institute of Business Administration, Proceedings of 2nd International Conference on Business Management (ISBN: 978-969-9368-06-6), (2012). Available at: http://www.umt.edu.pk/icobm2012/pdf/2C-85P.pdf accessed on 15.02.2013.
[20] Hassan, S U. and Mamman, A. (2013), EXTERNAL DEBT AND ECONOMIC GROWTH: EVIDENCE FROM NIGERIA. International Journal of Economics, Business and Finance Vol. 1, No. 10, November 2013, PP: 360 -370, ISSN: 2327 - 8188 (Online), Department of Accounting ,Ahmadu Bello University, Zaria-Nigeria and Department of Business Administration College of Business Administration and Management Studies Kaduna Polytechnic, Kaduan – Nigeria.
[21] Iyoha, M. A. (1999). External Debt and Economic Growth in Sub-Saharan African Countries. Nairobi: African Economic Research Consortium. 1-59.
[22] Ishan,.S. India's external debt : An analysis of growth, Causes, Management and impact. Department of Applied Business Economics Faculty of Commerce DAYALBAGH Educational Institute(Deemed University).
[23] Jayaraman, T.K. Evan Lau. 2009. "Does external debt lead to economic growth in Pacific Island countries", Journal of Policy Modeling, 31: 272–288.

Licensed Under Creative Commons Attribution CC BY

[24] Jain Gopal Lal (1999), "Economic Growth and Development in India and other Developing Countries", Mangal Deep Publication, pp-10-11.
[25] Kasidi, F. and Said, A. M .(2013), Impact of External Debt on Economic Growth: A Case Study of Tanzania. Advances in Management & Applied Economics, vol. 3, no.4, 2013, 59-82.
[26] Mohamed, Mutasim Ahmed Abdelmawla. 2005. "The Impact of External Debts on Economic Growth: An Empirical Assessment of the Sudan: 1978-2001", Eastern Africa Social Science Research Review , 21(2): 53-66
[27] Narayan, P. K. (2004). Reformulating critical values for the bounds F -statistics approach to co integration: An application to the tourism demand model for Fiji . No 02/04, Monash University Victoria , Australia .
[28] Narayan, P. K. (2005). The saving and investment nexus for China: evidence from cointegration tests. Applied economics, 37(17), 1979-1990.
[29] Oyejide, A. (1985). Nigeria and the IMF. Ibadan: Heineman Educational Books Limited.
[30] Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. Journal of econometrics, 68(1), 79-113.
[31] Pesaran, M. H., & Shin, Y. (1998). An autoregressive distributed-lag modelling approach to cointegration analysis. Econometric Society Monographs, 31: 371-413.
[32] Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3): 289-326.
[33] Ricardo Hausmann, and Ugo Panizza (2003), "The Mystery of Original Sin", Kennedy School of Government, Harvard University, and Research Department Inter-American Development Bank, pp-1-5.
[34] Rabia Atique and Kamran Malik .(2012). Impact of Domestic and External Debt on the Economic Growth of Pakistan.. World Applied Sciences Journal 20 (1): 120-129.
[35] Shabbir, S., (2009). Does External Debt Affect Economic Growth: Evidence from Developing Countries. Retrieved 03/03/13 from http://aysps:gsu.edu/ECON_MA_shabbirs.pdf
[36] Safdari, M and Mehrizi, M A. (2011), External debt and economic growth in Iran, Faculty of Economics, University of Sistan and Baluchestan, Iran Islamic Azad University, Mehriz Branch, Iran.
[37] Shah, M.H., and Pervin, S., (2012). External Public Debt and Economic Growth: Empirical Evidence from Bangladesh, 1974 to 2010, Academic Research International 3 (2), 508-515.
[38] Unified Arab Economic Report - League of Arab States, 2001. www.amf.org.ae/content/joint-arab-economic-report.
[39] Were, M. (2001), The Impact of External Debt on Economic Growth in Kenya, Discussion Paper 2001/116, United Nations University/World Institute for Development Economics Research.
[40] WU, C., (2010). Econometric analysis of tourist expenditure, School of Hotel and Tourism management , (Doctoral dissertation, The Hong Kong Polytechnic University).: 1-275.
[41] World Bank, World Development Indicators (2013). www.worldbank.org.
[42] Www.clubdeparis.org
[43] Www.cbsclublondon.org
[44] Zainy, M. A. (2009). Iraqi Economy, past, present and future options-house owners of Arts and Letters, Third edition, P 215.

Appendix

Table 1: Summary of Real GDP and External debt for Iraq from 1980 to 2014

Time Period	Real GDP	external debt (Million Dollar)	Compound interest (Million Dollar)	Exchange rate
1980-1985	40191	5677	454	0.0206
1986-1990	37311	18889	1511	0.0211
1991-1995	9559	54355	4028	30.3940
1996-2000	15451	80113	5895	110.9103
2001-2005	25748	123437	8452	119.3613
2006-2010	106548	65500	8816	118.5020
2011-2014	142337	65500	-	123.5075

Table 2: Summary of all Estimation models in current study

Model Estimation	R^2	Adj. R-squared	Decision
Vector Autoregression Estimates (VAR)	0.66	0.55	Medium
Vector Error Correction Estimates(VEC)	0.40	0.10	Low
Bayesian VAR Estimates (BVAR)	0.28	0.04	Low
Ordinary Least Squares Estimation (OLS)	0.68	0.21	Low
Autoregressive Distributed Lag (ARDL)	0.94	0.90	**Too high and good fit**

Table 3: Tabulation Summary of all variables

Tabulation Summary		Sample (adjusted): 1980 2010	
Variable	Categories	Test Statistics	Prob.
LGDP	3	Pearson X2	0.0000
LED	6	Likelihood Ratio G2	1.0000
LCI	5	df	434
LER	5	Value	720.0741
Note: Expected value is less than 5 in 100.00% of cells (450 of 450).			

Licensed Under Creative Commons Attribution CC BY

Table 4: Test for Equality of Medians between Series

Method	Value	Probability
Med. Chi-square	94.68078	0.0000
Adj. Med. Chi-square	88.17480	0.0000
Kruskal-Wallis	102.9367	0.0000
Kruskal-Wallis (tie-adj.)	102.9748	0.0000
van der Waerden	94.82679	0.0000
* Sample size (1980-2014) * Included observations: 35		

Table 5: Test for Equality of Means between Series

Method	Value	Probability
Anova F-test	114.1059	0.0000
Welch F-test	74.48088	0.0000
* Test allows for unequal cell variances. * Sample size (1980-2014) * Included observations: 35		

Table 6: Test for Equality of Variances between Series

Method	Value	Probability
Bartlett	86.77163	0.0000
Levene	71.79552	0.0000
Brown-Forsythe	10.15960	
* Sample size (1980-2014) * Included observations: 35		

Table 6: Test for some important statistic between all Series

Statistic / variables	LGDP	LED	LCI	LER
Mean	10.17423	10.46330	7.959661	1.237327
Median	10.39145	11.06103	8.373323	4.375552
Maximum	11.81664	12.33094	9.517531	4.897596
Minimum	6.611741	7.690743	5.165015	-3.908924
Std. Dev.	1.047548	1.199642	1.227023	4.051959
Skewness	-1.183451	-0.971550	-0.905265	-0.390481
Kurtosis	5.681213	2.986011	2.844582	1.273303
Jarque-Bera	16.52187	4.877118	4.265306	4.638873
Probability	0.000258	0.087287	0.118522	0.098329
Sum	315.4011	324.3622	246.7495	38.35714
Sum Sq. Dev.	32.92068	43.17421	45.16756	492.5512

Diagram 1: Autocorrelation and Partial Correlation at level

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |****** |	. |****** |	1	0.866	0.866	25.591	0.000
. |***** |	. | . |	2	0.759	0.033	45.892	0.000
. |**** |	.** | . |	3	0.611	-0.214	59.520	0.000
. |**** |	. |* . |	4	0.524	0.135	69.914	0.000
. |*** |	. | . |	5	0.427	-0.045	77.103	0.000
. |**. |	. | . |	6	0.348	-0.064	82.049	0.000
. |**. |	. | . |	7	0.260	-0.044	84.923	0.000
. |* . |	. | . |	8	0.181	-0.042	86.387	0.000
. |* . |	. *| . |	9	0.100	-0.067	86.850	0.000
. | . |	. | . |	10	0.027	-0.050	86.885	0.000
. | . |	. *| . |	11	-0.052	-0.083	87.022	0.000
. *| . |	. | . |	12	-0.096	0.052	87.523	0.000
. *| . |	. | . |	13	-0.139	-0.030	88.628	0.000
. *| . |	. *| . |	14	-0.185	-0.123	90.698	0.000
.**| . |	. | . |	15	-0.215	0.046	93.644	0.000
.**| . |	. *| . |	16	-0.253	-0.081	98.016	0.000

Diagram 2: Autocorrelation and Partial Correlation at first difference

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob

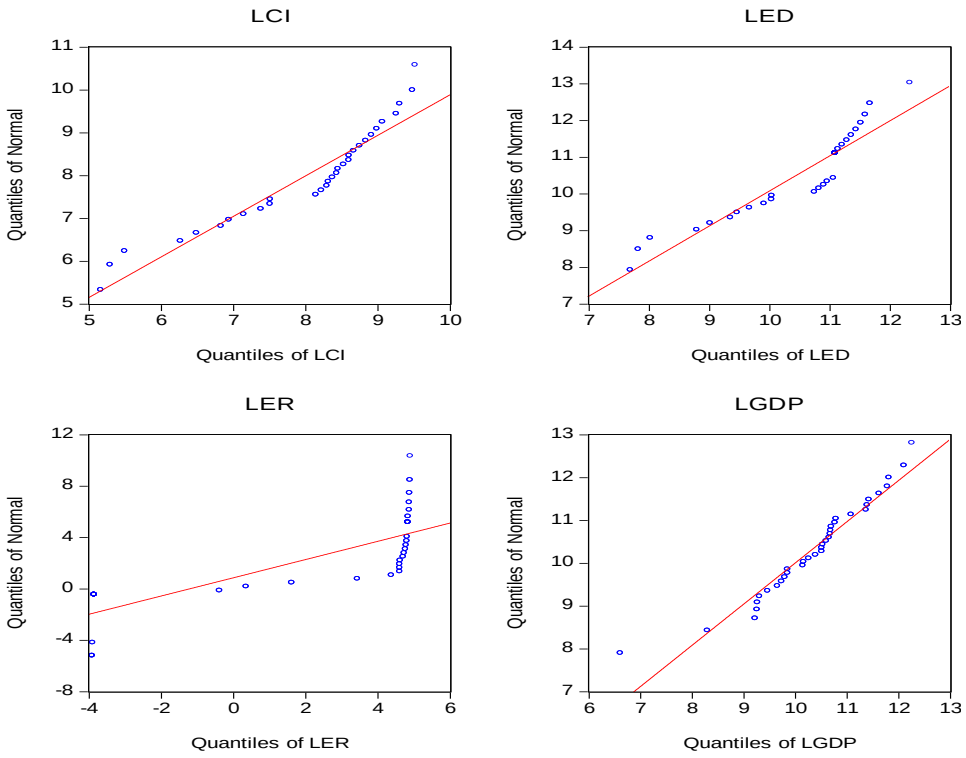
Licensed Under Creative Commons Attribution CC BY

.**| . |	.**| . |1	-0.234	-0.234	1.8197	0.177
. | . |	. | . |2	0.054	-0.001	1.9205	0.383
. | . |	. | . |3	-0.050	-0.040	2.0104	0.570
. |* . |	. |* . |4	0.169	0.157	3.0652	0.547
. | . |	. |* . |5	0.053	0.140	3.1746	0.673
. | . |	. | . |6	-0.009	0.031	3.1779	0.786
. | . |	. | . |7	-0.000	0.008	3.1779	0.868
. |* . |	. |* . |8	0.128	0.114	3.8876	0.867
. | . |	. | . |9	-0.057	-0.036	4.0352	0.909
. | . |	. | . |10	0.009	-0.031	4.0394	0.946
. | . |	. | . |11	0.000	-0.002	4.0394	0.969
. | . |	. | . |12	0.001	-0.048	4.0394	0.983
. | . |	. | . |13	0.043	0.026	4.1450	0.990
. *| . |	. *| . |14	-0.150	-0.136	5.4871	0.978
. |* . |	. | . |15	0.110	0.044	6.2547	0.975
. | . |	. | . |16	0.008	0.052	6.2591	0.985

Diagram 3: Autocorrelation and Partial Correlation at second difference

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
*****| . |	*****| . |	1	-0.637	-0.637	13.010	0.000
. |* . |	***| . |	2	0.165	-0.404	13.917	0.001
. *| . |	***| . |	3	-0.111	-0.444	14.345	0.002
. |* . |	.**| . |	4	0.158	-0.279	15.246	0.004
. *| . |	. *| . |	5	-0.088	-0.184	15.538	0.008
. | . |	. *| . |	6	0.023	-0.117	15.559	0.016
. | . |	. *| . |	7	-0.063	-0.188	15.719	0.028
. |* . |	. | . |	8	0.129	-0.047	16.431	0.037
. *| . |	. | . |	9	-0.102	-0.007	16.899	0.050
. | . |	. | . |	10	0.025	-0.018	16.928	0.076
. | . |	. | . |	11	0.001	0.012	16.928	0.110
. | . |	. *| . |	12	-0.019	-0.089	16.946	0.152

Plot 1, 2, 3, and 4: For all variables (GDP – ED – CI – ER)



Licensed Under Creative Commons Attribution CC BY