



Measure and Analyze the Determinants of the Creditworthiness in Iraq Economy (2004-2017)

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Received September 12, 2019; Accepted December 27, 2019

Abstract

Finance and indebtedness remain major problems for most countries, especially developing countries it therefore requests to stand in front of them to reduce them and prevent their exacerbation, Global rating agencies are a reflection of the urgent need for investors and borrowers to identify factors affecting creditworthiness to bridge the existing information gap. Iraq was approved for the period 2004-2017 using a model (Toda Yamamoto Causality) The desire to provide information on the level of risk before lending to the government or financial and banking institutions to assess the solvency and the desire to meet debts to meet current and future financial obligations in a timely manner, and the degree of rating is not an absolute fact, but expect to the current financial situation may err and may infect, However, creditworthiness indicators remain the most important criteria for assessing the likelihood of the borrower not

repaying the loan amount. The researcher concluded that the most important variable affecting the sovereign creditworthiness of Iraq is debt service, especially in the short term. On the other hand, the availability of liquidity gives great flexibility to Iraq in the payment of its obligations.

Keywords: Creditworthiness; Iraq economy; Growth rate; Liquidity; Debt structure.

Introduction

Creditworthiness represents the amount of external financing that the State can obtain and repay from the financial surpluses generated from investment. The credit rating, especially for governments and financial institutions and banks in the expectation of the risk of non-payment based on quantitative and qualitative criteria note that the degree of classification is an expectation of the financial situation of the institution, as the degree of rating of the institution can change up and down. The main determinants of credit worthiness are In the structure of public debt, liquidity and other less important determinants of the current account and average per capita GDP, public budget and inflation. As for Iraq, it has been heavily indebted under the former regime, and after the change of the political system in 2003 and its openness to the outside world, many foreign debts resulting from wars and economic sanctions were amortized, prompting the international credit rating institutions to put an appropriate rating of the ability of the government and its financial institutions to repay the debt, considering the political and economic conditions that the country is exposed to.

Iraq has suffered and continues to suffer from exceptional conditions in all political, economic and social fields, including weak political and security stability, the volume of indebtedness, low per capita GDP, budget deficit, weak GDP growth, and trade balance deficit, all reflected in a way negative on the position of Iraq in the world credit rating.

Research hypothesis

The research stems from the hypothesis that (there is a direct and uneven impact of the determinants of sovereign creditworthiness such as public debt, liquidity, GDP per capita, current account, inflation, public budget).

First: A conceptual framework for creditworthiness and credit rating

1. Creditworthiness

- A. Concept:** The evaluation made by the lender before the approval of the lending transaction, in which it determines whether the borrower may default on its debt by considering several factors such as repayment date and credit score. In addition to taking

into account the amount of available assets (assets) and the amount of liabilities (liability) to determine the probability of default of the customer, it is important to obtain a high level of creditworthiness to prevent crises that increase the debt of the borrower (Vazirani, 2010, 121-123).

B. Determinants of creditworthiness: These are explanatory variables that affect the capacity of borrowing countries in the repayment of debt, including these determinants (Abual-Fahm, 2005, 119).

(1) Growth Rate: A total measure of economic performance and represents the GDP growth of the state, as used by creditors as an important indicator to measure the creditworthiness of the debtor state.

(2) Liquidity: Is an important determinant of the creditworthiness of borrowing countries in the short term and the lack of liquidity is a factor in the difficulty of servicing external debt arising from cyclical or sudden fluctuations in export earnings, foreign capital inflows, imports and payment obligations payable, liquidity crises arise as a result of the weak productive structure of the state.

(3) Debt Structure: The ratio of total external debt to GNP is used as a major indicator of the evolution of the volume of external indebtedness.

(4) Capital: Foreign capital affects the economic and political situation of the country entering the country, and the reduction of debt service payments to the total cash inflows of the borrowing state contributes to the improvement of the creditworthiness of the country.

2. International credit rating agencies

A. Credit Concept: A measure of the degree of risk when dealing with a person, company or state. Interest rate on loans because the main objectives of the credit rating reports is to guide the investor in how to calculate the returns on the money that will be invested in the form of loans to countries or companies, and the credit rating can be short This refers to the high ability of the state, company or individuals to repay the outstanding loans within one year from the date of issuance of the rating, or it may be long-term and is an expression of the ability to repay for a long time. The top three that dominate the ratings market in the world are Moody's, Standard & Poor's and Fitch, all US corporations (Al-Tamimi, www.mosgcc.com/ma)

B. Reasons for the emergence of credit rating agencies: Jhon Moody was the first to issue indicators of creditworthiness when he rated the bonds of the railway company in America in 1909 and then spread the classification of governments and institutions, while the classification of individuals credit in the 1950s and the reason for the emergence of these

institutions is the need for investors and borrowers to fill the information gap between them and the desire to provide documented information on the level of risk in lending to governments, institutions and individuals (Telfah, 2005, 20):

(1) Investment grade: an indicator of low credit risk and symbols (Aaa, Aa, A, For Standard and Poors, Fitich uses AAA, BBB, and AA).

(2) Degree of speculation: An indication of the high credit risk and take codes (Ba, B, Caa, Ca, C) for Moody's and BB (B, CCC, CC, C) for Standard & Poors, Fitich.

Moody's adds credit rating scores from Aa to Caa that are 1, 2, or 3 and the number 1 indicates the top end of the credit rating. Rating and number 2 are at the middle of the rating and number 3 to the lower end of the rating, while Standard & Poor's and Fitch Ratings (+ or-) add credit ratings from AA to B to reflect the credit quality.

Second: Factors affecting Iraq's sovereign creditworthiness

1. The reality of the credit rating of Iraq

Standard and Poor's Financial Services, one of the three largest companies in the world, has established Iraq's credit rating at (B- / B) with a stable outlook and is not an investment incentive. The foreign exchange at the moment as the degree of classification provides investors with a roadmap for their investments in the country, especially in the process of trading bonds because it determines the scope of trading in global bond markets after the identification of risks, despite this, it is an acceptable stage commensurate with the economic reality of Iraq, which is expected to decline GDP growth to levels below 2% in 2017-2019 due to the negative effects of the government's actions in fiscal policy offset by weak domestic demand contrary to what the Ministry Iraqi planning of deceptive data in addition to the insistence of the Central Bank of Iraq to pursue a monetary policy biased to the foreign product.

The diagnosis of the reasons that prompted the international classification institutions to put Iraq in this degree, including:

- A.** The escalation of violence and instability of security and political, which made the assessment negative.
- B.** Conflicting and irresponsible government statements as a result of wasting billions of dollars of Iraqi money due to rampant financial and administrative corruption with the decline of foreign exchange resources because the central bank lending to the government for the decline of financial resources derived from the sale of crude oil (Almada, 2016, No.3742).

2. Credit worthiness variables

- A. Public debt:** Iraq has entered into negotiations with creditors to reschedule its sponsored debts International Monetary Fund and World Bank And the United States of America in 2004, An international company was commissioned to scrutinize and stabilize Iraq's

external debt, and \$ 120.2 billion was agreed, of which \$ 37.2 billion was for Paris Club countries that agreed to phase out \$ 29.7 billion. Premiums form with a grace period of 6 years, The remaining debts were estimated at \$ 83 billion, of which \$ 20 billion for commercial creditors was scheduled to be \$ 3045 million There are outstanding debts so far that have not been negotiated to withhold the owners, and this debt exceeded 40 billion dollars, From the level recorded in 2015 to reach more than 60 billion dollars in 2017 and 36.1% of GDP compared with 57.6 billion dollars and 32.5% of GDP in 2015, and the reason for the increase is new loans by 3.2 billion dollars and loans to become 8.1 billion dollars Against 4.9 billion in 2015, while the rescheduling loans recorded a decrease of 9.2% with the stability of untreated and commercial debt While the external debt did not increase significantly, but the increase was the amount \$ 248 million is the result of the recent agreement between Iraq and the International Fund for the Credit Readiness Program which began with 2016 under which Iraq will receive about \$ 5 billion in payments and according to the completion of the program, which focuses on reducing dependence on the government and encourage the private sector and according to the agreement with the IMF (Marfin, 2015,6). As for the total debt to GDP, the continuous decline started until 2012 began to return to rise and reach in recent years 2015 - 2016 rose to levels exceeded 50% to indicate the state of anxiety trend and find appropriate solutions, and this indicates the pressure of indebtedness on the economy, but we find that The GDP growth rate in 2017 is greater than the indebtedness rate and continued for 2018 and clearly for the high oil prices (CBI, Economic Report. 2014-2016). Generally, this explains the rise in external indebtedness which means that the debt obligations are not fulfilled with the rise in foreign currency debt which leads to the reverse flow of foreign capital, and weak creditworthiness and that public debt is the main variable for the deterioration of creditworthiness in the short term.

B. Current Account: The balance of payments data clearly show the dominance of oil exports over the export activity and the balance of exports recorded little for the years 2004-2006 , and local and international reports devoid of the structure of Iraqi exports because of its absence and lack of availability, and what is mentioned mainly oil exports and some simple exports have exceeded the first 98% of the total exports and the rest of the exports ranged between 1% - 2% of the total exports, In contrast, imports focus on consumer goods and the absence of productive goods and production inputs. The balance of payments of Iraq is suffering from a deficit in 2004 amounted to (4094949) billion dinars, while the balance recorded a surplus from 2006 - 2014, where in 2012 a surplus of (39019749) billion dinars Due to the growth of the Iraqi economy as a function of the rates of production and the price of oil, i.e., the main commodity exported, the result that can be derived from the index will be closer to the right one, which indicates the absence of diversification in full exports. Due to consumer behavior, widening demand base, loss of

supply base for these non-tradable commodities, deteriorating investment and productive activity and weak infrastructure, these non-tradable commodities have become tradable commodities at the expense of depleting foreign reserves and weak creditworthiness (Mouzher, 2012, 9-10).

C. Deficit and surplus in the budget: The public budget represents the financial position of the country by indicating the size of the surplus, deficit or balance in some rare cases. The deficit in the Iraqi budget can be attributed, first, the increase of public expenditures over public revenues, second, the imbalance of the structure of public expenditures, third, the imbalance of the public revenue structure, fourth, lags behind established tax systems.

Oil revenues increased after the third Gulf War and the economic embargo imposed on the country was lifted after 2003, which led to an increase in public revenues, as the contribution of oil revenues was 85% of public revenues, which led to a surplus in the budget and the ratio of surplus to GDP For the year This surplus lasted until 2005 due to the increase in oil revenues. The surplus for the years 2009 - 2010 (65166564, 70335564) million dinars, respectively, at current prices, and that the reason for this decline is the financial crisis has clearly affected the decline in oil prices and the decline in oil revenues because of its link to the global market, which led to the decline in the exchange rate of the US dollar. In the budget from 2013 - 2016 as it reached (141925772) million dinars and that one of the reasons for this Decrease Public spending on public revenues increased, due to the decline in public revenues due to the decline in oil prices, as well as the deterioration of the security situation and the continuation of military operations against terrorist organizations, and in 2017 the budget surplus increased to reach (147636552) million dinars due to high oil prices and increased export revenues (Al-Issawi & Ghanim, 2016, 88).

D. Inflation: The year 2004-2005 witnessed an increase in inflation rates (26.9% and 36.9%) respectively as a result of increased government spending and the initiation of some services (Al-Rubaie, 2012, 223). Inflation rate continued to rise as it reached high rates (53.2%) in 2006 due to the acceleration in the application of economic reform policies and the lifting of subsidies on fuel and some commodities included in the ration card, While in 2007 saw a decline in the rate of inflation (-10.06%) and this is due to the monetary policy adopted by the Central Bank to target inflation and raise the value of the Iraqi dinar through interest rates (Ali, Mahmoud, 2011, 242). But in 2012 inflation rose to (6.08%) and is caused by the high prices of most paragraphs of the price index resulting from low supply at home and dependence on import to meet the local need. These imported goods are characterized by high prices as inflation is transferred from abroad to these commodities. What is known as imported inflation (AL-Jubouri & Husain, 2017, 144). As for the years 2015 - 2017, there has been a decrease in inflation rates due to the monetary policy able to achieve low rates of inflation within acceptable limits in light of the volatile

security conditions, where the inflation rate in 2017 (2.6%) has contributed a range of international variables and internal factors to influence rates Inflation, including the crisis of global economic recession and the decline in growth rates of economic activities (CBI, 2014, 85).

E. Liquidity: The Central Bank has implemented several measures to control the money supply, including issuing a new currency instead of the old currency with new specifications that limit its counterfeiting. This helped boost the confidence of individuals in it. Individuals in the banking system, due to the stability of the currency value, as these developments led to the stability of monetary demand as well as the abolition of the phenomenon of multiple exchange rates of the Iraqi dinar vis-à-vis foreign currencies (Ghaidan & Hama, 2015, 8). One of the main factors causing foreign debt servicing difficulties was the lack of liquidity that may arise from cyclical or sudden fluctuations in export revenues.

Money supply increased slightly from 2004 to 2005 and was (14355914 and 14888028) million dinars respectively, and this increase is due to the exchange rate adjustment of the Iraqi dinar, as well as the Central Bank's endeavor to address the problem of inflation (Mouzher, 2012, 2). While there was a slight decrease in the rise in 2011-2012, the reason for the situation of monetary stability in the Iraqi economy due to the policy of the Central Bank in achieving balance in Growth for the monetary and real sectors (CBI, 2012, 18). In 2015, money supply declined due to lower growth rates, lower oil revenues, and the economic downturn with a decrease in net foreign assets (CBI, 2014, 31), but in 2016-17, there was an increase in broad money supply, respectively (90466369, 92977333) million, this increase was the result of the expansionary effect of net debt.

F. GDP per capita: GDP is one of the indicators of the economic performance of the state and the analysis of the growth of the product and the sectoral structure is to identify the places of imbalance and address them, while the average per capita GDP is to know the level of well-being of the individual in society, and this indicator is used by creditors to measure the creditworthiness of the debtor state Its ability to use foreign loans optimally use any theoretical conditions For borrowing, this means that the marginal output of the borrowed capital is greater than the marginal cost of the interest rate on foreign loans. The GDP and per capita take similar behavior for the years 2005-2013 to reach \$ 5163. This period was affected by the rise or decrease of the per capita GDP because it is a function of oil prices and revenues achieved in addition to the global and local conditions that occurred during this period of time. It then dropped and reached its minimum for the years 2014-2015 and was respectively (50325, 49843) dollars as the country was exposed to terrorist attacks as well as low oil prices and low oil revenues (CBI, Economic Report. 2004-2018).

Third: Analysis and measurement

- 1. Model Description:** Factors affecting the sovereign creditworthiness of Iraq were identified as independent variables (inflation, GDP per capita, M1, public debt, deficit or surplus, current account), and the dependent variable is creditworthiness as Dummy Variable, annual data has been converted into quarterly data for the purpose of increasing the length of the time series and obtaining more accurate results.
- 2. Test the stationary of time series:** To find out if the time series contained Unit Roots, the Advanced Dicky-Fuller (ADF) test was used. The results showed that the PD and IN series were stationary, while the DS and PC series were stationary in the first difference, while the CA and M1 series were stationary in the second difference.

Table 1. Test results of time series stationary

UNIT ROOT TEST RESULTS TABLE (ADF)							
Null Hypothesis: the variable has a unit root							
						<u>At Level</u>	
PD	PC	M1	IN	DS	CA		
-1.1712	-1.7866	-3.1635	-5.2971	-1.3067	-2.6131	t-Statistic	With Constant
0.6805	0.3831	0.0288	0.0001	0.6202	0.0970	Prob.	
n0	n0	**	***	n0	*		
-3.9208	-2.2859	-2.7080	-3.4553	-1.6824	-0.9874	t-Statistic	With Constant & Trend
0.0179	0.4341	0.2385	0.0563	0.7455	0.9371	Prob.	
**	n0	n0	*	n0	n0		
-2.3662	0.3748	-0.8697	-6.4432	0.8377	2.2801	t-Statistic	Without Constant & Trend
0.0187	0.7891	0.3339	0.0000	0.8890	0.9940	Prob.	
**	n0	n0	***	n0	n0		
						<u>At First Difference</u>	
	d(PC)	d(M1)		d(DS)	d(CA)		
	-2.8028	-0.7985		-3.2013	-2.3503	t-Statistic	With Constant
	0.0645	0.8101		0.0253	0.1605	Prob.	
	*	n0		**	n0		
	-2.9199	-2.0948		-3.3144	-3.4713	t-Statistic	With Constant & Trend
	0.1646	0.5348		0.0748	0.0534	Prob.	
	n0	n0		*	*		
	-2.7752	-0.5240		-2.5512	-0.5159	t-Statistic	Without Constant & Trend
	0.0064	0.4843		0.0116	0.4881	Prob.	
	***	n0		**	n0		
						<u>At Second Difference</u>	
		d(M1)			d(CA)		
		-6.555212			-5.677904	t-Statistic	With Constant
		0.000			0.000	Prob.	
		***			***		
		-7.017348			-5.666175	t-Statistic	With Constant & Trend

		0.000			0.0001	Prob.	
		***			***		
		-6.659640			-9.345608	t-Statistic	Without Constant & Trend
		0.000			0.000	Prob.	
		***			***		
							Notes:
a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant							
b: Lag Length based on SIC							
C: Probability based on MacKinnon (1996) one-sided p-values.							

Source: Eviews 9.5 output

3. Co-integration Test: In order to find out whether there is a long-term equilibrium relationship between the model variables, the Co-integration test was conducted. The results of the Trace and Maximum Eigenvalue tests showed that there is a long-term equilibrium relationship because the Trace and Maximum Eigenvalue statistics are both greater than Critical Values.

Table 2. Results of the Co-integration test

Date: 03/29/19 Time: 20:32				
Sample (adjusted): 2004Q3 2017Q4				
Included observations: 54 after adjustments				
Trend assumption: Linear deterministic trend				
Series: CA CW DS IN M1 PC PD				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
	0.05	Trace		Hypothesized
Prob.**	Critical Value	Statistic	Eigenvalue	No. of CE(s)
0.0000	125.6154	193.2788	0.722785	None *
0.0002	95.75366	123.9988	0.516893	At most 1 *
0.0021	69.81889	84.71291	0.445380	At most 2 *
0.0157	47.85613	52.88138	0.314040	At most 3 *
0.0237	29.79707	32.52679	0.277172	At most 4 *
0.0593	15.49471	14.99927	0.228295	At most 5
0.3161	3.841466	1.004996	0.018439	At most 6
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	0.05	Max-Eigen		Hypothesized
Prob.**	Critical Value	Statistic	Eigenvalue	No. of CE(s)
0.0000	46.23142	69.27993	0.722785	None *
0.0612	40.07757	39.28593	0.516893	At most 1
0.0860	33.87687	31.83154	0.445380	At most 2
0.3171	27.58434	20.35458	0.314040	At most 3
0.1485	21.13162	17.52752	0.277172	At most 4
0.0551	14.26460	13.99428	0.228295	At most 5
0.3161	3.841466	1.004996	0.018439	At most 6
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Eviews 9.5 output

- 4. Optimum Lag:** Before estimating the model and knowing the relationships between the independent variables and the dependent variable, we must know the optimal Lags. This was done by VAR Lag Order Selection Criteria. The result was that all criteria chose the second Lag as the optimal Lag.

Table 3. Optimal Lag selection

VAR Lag Order Selection Criteria						
Endogenous variables: CA CW DS IN M1 PC PD						
Exogenous variables: C						
Date: 03/29/19 Time: 23:10						
Sample: 2004Q1 2017Q4						
Included observations: 55						
HQ	SC	AIC	FPE	LR	LogL	Lag
174.5377	174.6943	174.4389	1.35e+67	NA	-4790.069	0
151.3239*	152.5774*	150.5336*	5.69e+56*	1207.294*	-4083.673	1
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Source: Eviews 9.5 output

- 5. Long-term causality of Toda Yamamota:** Since there is a long-term equilibrium relationship between model variables, we should use the long-term causal (Toda Yamamota). The results of the causality test have shown the following:
- The two main variables that cause creditworthiness are inflation, deficit or surplus.
 - Credit worthiness causes (money supply) only.

Table 4. Causality tests results

VAR Granger Causality/Block Exogeneity Wald Tests			
Date: 03/29/19 Time: 23:17			
Sample: 2004Q1 2017Q4			
Included observations: 55			
Dependent variable: CA			
Prob.	df	Chi-sq	Excluded
0.6555	1	0.199069	CW
0.0267	1	4.913106	DS
0.0209	1	5.332167	IN
0.0030	1	8.786125	M1
0.1540	1	2.032025	PC
0.0019	1	9.646008	PD
0.0000	6	33.90009	All
Dependent variable: CW			
Prob.	df	Chi-sq	Excluded
0.2286	1	1.449304	CA
0.0243	1	5.071374	DS
0.0176	1	5.638200	IN
0.3386	1	0.915603	M1
0.0794	1	3.077309	PC

0.3495	1	0.875146	PD
0.0017	6	21.15938	All
Dependent variable: DS			
Prob.	df	Chi-sq	Excluded
0.4237	1	0.639920	CA
0.0802	1	3.061172	CW
0.0785	1	3.096439	IN
0.0000	1	44.43566	M1
0.7897	1	0.071159	PC
0.0093	1	6.769615	PD
0.0000	6	71.47357	All
Dependent variable: IN			
Prob.	df	Chi-sq	Excluded
0.2326	1	1.424759	CA
0.7662	1	0.088389	CW
0.9532	1	0.003441	DS
0.9002	1	0.015719	M1
0.7765	1	0.080566	PC
0.1936	1	1.690013	PD
0.6665	6	4.075152	All
Dependent variable: M1			
Prob.	df	Chi-sq	Excluded
0.0027	1	8.993782	CA
0.0001	1	15.61771	CW
0.0063	1	7.467191	DS
0.0230	1	5.172238	IN
0.8544	1	0.033654	PC
0.0000	1	20.42556	PD
0.0000	6	33.41377	All
Dependent variable: PC			
Prob.	df	Chi-sq	Excluded
0.7805	1	0.077688	CA
0.4634	1	0.537721	CW
0.0201	1	5.403316	DS
0.7344	1	0.115147	IN
0.9251	1	0.008835	M1
0.5639	1	0.332959	PD
0.2690	6	7.599245	All
Dependent variable: PD			
Prob.	df	Chi-sq	Excluded
0.0118	1	6.339321	CA
0.0593	1	3.555545	CW
0.0000	1	22.68241	DS
0.0000	1	31.44976	IN
0.0380	1	4.305759	M1
0.2453	1	1.350039	PC
0.0000	6	117.3469	All

Source: Eviews 9.5 output

Conclusions

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incentive. The diagnosis of the reasons that prompted the international classification institutions to put Iraq in this degree, including:

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- Conflicting and irresponsible government statements as a result of wasting billions of dollars of Iraqi money due to rampant financial and administrative corruption with the decline of foreign exchange resources because the central bank lending to the government for the decline of financial resources derived from the sale of crude oil.

Generally, this explains the rise in external indebtedness which means that the debt obligations are not fulfilled with the rise in foreign currency debt which leads to the reverse flow of foreign capital, and weak creditworthiness and that public debt is the main variable for the deterioration of creditworthiness in the short term. The deficit in the Iraqi budget can be attributed, first, the increase of public expenditures over public revenues, second, the imbalance of the structure of public expenditures, third, the imbalance of the public revenue structure, fourth, lags behind established tax systems. The Central Bank has implemented several measures to control the money supply, including issuing a new currency instead of the old currency with new specifications that limit its counterfeiting. This helped boost the confidence of individuals in it. Individuals in the banking system, due to the stability of the currency value, as these developments led to the stability of monetary demand as well as the abolition of the phenomenon of multiple exchange rates of the Iraqi dinar vis-à-vis foreign currencies. One of the main factors causing foreign debt servicing difficulties was the lack of liquidity that may arise from cyclical or sudden fluctuations in export revenues. Since there is a long-term equilibrium relationship between model variables, we should use the long-term causal (Toda Yamamoto). The results of the causality test have shown the following:

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Bibliographic information of this paper for citing:

Dubai Abdulmahdi, Abdulkhleq; Ghali Rahi, Mohamed, & Abdul_Aaly Kadhum, Thamer (2019). Measure and analyze the determinants of the creditworthiness in Iraq Economy (2004-2017). *Journal of Information Technology Management*, 11(4), 24-36.