Determinant of the Exchange rate of the Iraqi dinar: An applied study for the period 1990-2020

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Abstract

This paper seeks to examine the determinant of the exchange rate of the Iraqi dinar against US dollar. Exchange rate in Iraq has passed through two phases, the first one is adopting fix exchange rate that started from 1990 to 2003 and the other one that comes after is floating exchange rate. This paper is an attempt to examine the determinant of exchange rate in Iraq for the period of 1990 – 2020, by employing ARDL bounds test approach to explore the long-run and short-run relationship between exchange rate, interest rate, money supply and GDP. The results show that there is a short run and significant relationship between exchange rate and interest rate, money supply and GDP. Accordingly, controlling exchange rate needs a mixture of fiscal and monetary policies. The findings shed some new insights for policymakers on dealing with exchange rate in Iraq.

Keywords: Exchange rate, Inflation rate, Money supply, GDP, ARDL approach, Iraq

1.   1. Introduction

Exchange rate is the price of one currency in terms of another currency. Currency prices can be determined in two main ways: a floating rate or a fixed rate. A floating rate is determined by the open market through supply and demand on global currency markets. Therefore, if the demand for the currency is high, the value will increase. If demand is low, this will drive that currency price lower. Of course, several technical and fundamental factors will determine what people perceive is a fair exchange rate and alter their supply and demand accordingly. A fixed or pegged rate is determined by the government through its central bank. The rate is set against another major world currency (such as the U.S. dollar), to maintain its exchange rate, the government will buy and sell its own currency against the currency to which it is pegged. It can be seen that the exchange rate in Iraq has passed through two phases, the first one is adopting fix exchange rate that started from 1990 to 2003 and the other one that comes after is floating exchange rate.

The existent research is aiming at testing whether a straightforward method of the conversion rate model for the Iraq in terms of the United States of America (USA) relies on financial essentials of money provision, price increases, Gross Domestic Budget-GDP and percentage of interest. The perception underlying the unpretentious financial simulation model is quite striking methodically. Moreover, the supply and demand for money in a country identifies a country's price level, and the level of price in

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

diverse republics needs to have the similar value when articulated in conjoint money. This model acts as a standard mechanism for assessment of the conversion rates between two countries' currencies.

It has been extensively recognized that the percentage of exchange has a fundamental role in intercontinental commerce since it is beneficial to associate the prices of properties and facilities generated in various nations. Furthermore, based on a study conducted by Sloman (2003), the rate of exchange is the amount in which one currency businesses for another on the foreign exchange market. For example, if the rate of exchange amid new Iraqi dinar and U.S. Dollar is 0.005 this implies that 1 IQD is equal to 0.005 US$. Moreover, a vibrant perception regarding diverse categories of rate of exchange and their determinant factors is very serious because the exchange rate is a significant inconstant which will have an impact on the universal business, productions and additional monetary essentials. There are two kinds of exchange rate including nominal and real. The former demonstrates the price of a unique unit of foreign money with respect to national money whereas the latter is similar to the nominal exchange rate when accustomed for the proportion of consumer price index-CPI among two nations. The two types of exchange rates stated earlier are significant economically. While trades between two states are occurring the nominal exchange rate is clearly visible. The actual rate of exchange is likewise imperative in the perspective of that it reproduces the factual value of money alongside the others. In this current review the exchange rate and its determinant factors have been taken in to account. The research has also explained how the rate of exchange has been identified during the last three decades (1990-2020). Exchange rate is a vibrant inconstant which it's actions are identified by variety of factors like economic, monetary, governmental and communal determinants, the most substantial inducing influences are encompassing money source, interest rate, rate of price rises, steadiness of expense and gross domestic budget. Identifying of the rate of exchange remains as one of the substantial problem both for the strategy specialists and financial proficient. Nevertheless, we will not have the ability to consider the whole descriptive parameters of the rate of exchange identification for the current experiential research. For implementing the research we have applied a number of variables as independent or descriptive inconstant specifically money source, gross domestic budget-GDP, rate of price inflation, and percent of interest. We have correspondingly presented the rate of exchange station in the present investigation which denotes how the rate of exchange is impacted through altered parameters and in sequence, how the rate of exchange impacts on other financial restrictions. The channel of exchange rate can be considered as one of the portions of the financial strategy program appliances. Moreover, the rate of exchange are impacted by expansionary financial strategy since when the rate of interest reduces, credits denominated in external currency become more good-looking as compared to the payments recognised in internal money. Accordingly, the worth of credits designated in internal currency declines as compared to that of foreign money and the currency denigrates. This devaluation makes imported properties more costly that raises request for internal merchandises and accumulate products to increase. Currently it is going to deliver a momentary indication regarding the various classes of exchange rate systems. The rate of exchange systems can be classified in to many different categories including: static exchange rate, spontaneously floating exchange rate, managed float and hard-peg. For the current research the exchange rate in Iraq has accepted via two stages, the first step is approving fix exchange rate that initiated from 1990 to 2003 and the second phase is commenced after 2003 till now which is known as floating exchange rate.

As revealed previously, the existing study is intending to examine the contributing factor of the Rate of Exchange of the Iraqi dinar and applying the financial methodology of identifying the exchange rate (monetary approach for exchange rate-MAER). Based on MAER three types of models can be applied which includes elastic price, sticky-price and factual interest discrepancy archetypal. Exchange-rate is an extremely powerful mutable inconstant in Global and Mega-economics since it can impact on the majority of the interior and exterior variables of an economy. For instance, it has the effect on the inland price, equilibrium of imbursement and product degree and wealth market of an enterprise. The rate of exchange, sequentially, is affected by the currency provision, interest rate and gross domestic budget-

GDP of a state. Strategy-makers and financial expertise frequently deal with the rate of exchange as considered as substantial components of financial strategy of a domestic administration. Because of the significance of the rate of exchange in finances we have made a decision to behavior a research on the identifying of the rate of exchange amid the moneys of the Iraq and the United states of America (NID/US$). Besides, there have been only insufficient researches on the identification of the rate of exchange between New Iraqi Dinar and US$. It is thought that the existing investigation is intending to restock some gap by accumulation at minimum one more experiential research to the prevailing number of reviews. Our experimental outcomes empower us to review how much the rate of exchange is impacted by financial strategy of the Iraqi government.

The exchange rate of Iraqi dinar has a great contribution to deteriorate due to the internal and external variables, particularly exporting oil, which on the one side is a primary income based on the foreign currency, and the government's insistence on working on a rate of exchange set regime with several formal amounts of exchange, which, on the other hand, could be featured as an exchange structure of multiple fixed.

As a regard to the economic conditions that Iraq faced in the 1990s and until 2003, it is necessary to emphasize the economic fact, which reveals that policy of monetary solely might not produce the required stability for the local currency's exchange rate. Since this will result in the central bank's foreign currency reserves being depleted. To benefit the national currency through promoting consumption and raising production, the policies of economic should be aligned with policy of monetary (Central Bank`s report in 2003 on the Annual Economic of Iraq).

Nevertheless, following the Law of the Central Bank Independence that was passed in 2003, the value of the Iraqi currency increased as a result of the administration of the foreign currency auction and the introduction of a controlled floating system under which the rate of exchange is dictated by mechanisms of demand and supply, while it was with the Central Bank`s control and oversight (Dagher & Atwan, 2012, p.8). The exchange rate of Iraqi dinar against the US dollar improved as a result of this.

As a consequence of the unsteadiness of the security condition on the time that, one dollar became 1453 Iraqi dinars in 2004 and in 2005 lasted to deteriorate, reaching 1472 dinars. Nevertheless, in the 2007 and 2008, it improved again, reaching 1267 and 1203, respectively. The exchange rates of dinar achieved impressive steady in the market of central for exchange of parallel market and the exchange in the years during 2009 to 2012, reaching 1182 to 1233 dinars, respectively. Furthermore, the rise in the price of the Iraqi dinar in this time span enhanced people's reliance on the Iraqi currency. Nevertheless, as a mean for the years 2013 to 2015, the exchange rate of dinar had reached to 1226 (Central Bank`s report in 2003 on the Annual Economic of Iraq).Moreover, in 2018 and 2020 reaching 1182.7 and 125.500 dinars.

2.Significance Of The Study

The significance of the study comes from estimate how the changes **(increase or decrease)** in the determinant of exchange rate in Iraqi Dinar will have impacted on macroeconomic variables in Iraq.

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

3.Review Of Related Studies

Though there are numerous investigations on the financial model of conversion rate recognition on diverse states, there have been only scarce high-class researches on Iraq. For previous collected review I have considered the researchers conducted on the Iraq and on further republics to deliver a complete synopsis on the perception of financial archetypal of conversion rate identification and its helpfulness in diverse economies. Therefore, I have encompassed experiential researches on both the industrialized and emerging nations.

According to a study conducted by **Adaramola and Dada (2020)** concerning the effect of price increases on economic development in Nigeria, applying ARDL prototypical, designated that the price increases and factual rate of exchange impacts damagingly on financial progress, while the rate of interstate and money source have a positive impact on monetary development. The other parameters in the model presented no effect on Nigeria's financial development. A particular course between the rate of interest, rate of conversion, government ingesting expenses and –Gross Domestic Budget-GDP, exemplified underlying connection, nonetheless, the price increases and "the gradation of directness" portrays no underlying association with Gross Domestic Budget-GDP.

 In another study by **Liew et al. (2009)** examined the long-term connection of the rate of exchange with its contributing factor under the elastic-price financial model. Multi-variant co-integration method is applied to accomplish the overall aims of the research. They also have attained prearranged information from Intercontinental Monetary measurements circulated by IMF-International Monetary Fund. The specimen duration determined the duration from January 1977 to March 2006. The experimental findings reinforced the financial method to interchange rate for an open and minor developing finance specifically Thailand. Additionally, the research also recognized the rationality of the fundamental expectations of the financial attitude to the identification of the rate of exchange. The exceeding results indicate that the rate of exchange performers might meritoriously predict and observe the undertaking of the rate of exchange by means of the provisions of currency, revenue and rate of interest parameters of both nations including Japan & Thailand. Above and beyond, the outcome confirms that one needs to focus on the expansion of Japanese finance who is a foremost companion of Thailand to distinguish the rate of exchange undertaking for Thailand. What's more, the results perform to sum up modern visions to supplement previous researches that recognized the noteworthy effect of United States in the evolving Asian commercial markets.

Moreover, according to **Adawo and Effiong (2013),** financial rate of exchange model is a long-term occurrence in the background of Nigerian economy. Engaging the **Johansen (1991) and Juselius (1990)** multi-integration method the research examines the long-run rationality of the economic altercation rate archetypal for elastic rate of exchange organization. They have utilized from the trimestral statistics between the periods of (1987 - 2008). The investigation has confirmed a distinctive long-term association between the outdated financial basics (money source, differences of rate of interest, and productivity) and minimal rate of exchange. The standards of the multi-incorporating constants were originated dependable with the financial exemplary. Furthermore, they have been similarly important from statistical point of view excluding for the production discrepancy. The overall findings profoundly assist the economic rate of exchange prototypical in Nigeria. The source of currency discrepancy has a constructive impact on the rate of exchange as anticipated and represents that an enlargement in comparative internal source of currency will cause the devaluation of the nominal naira-dollar conversion rate. Upsurge in the national currency source prompts escalations the national phase of price in comparative standings, which, consecutively, declines transnational effectiveness of national properties and consequently, worsening in the commerce equilibriums. The estimated constant of the provision of currency discrepancy is adjacent to unanimity, denotes that financial strategy has a substantial location in defining the comportment of Nigeria's altercation rate in the long-term. The rate of interest discrepancy encourages the anticipated (+)

signs and is noteworthy. One will conclude that the national interest has declined in comparative term, resulting in the devaluation of the nominal rate of exchange. Oppositely, the discrepancy of revenue has undesirable and unimportant impact. Furthermore, the research findings indicated that the parameters of real subdivision like the development of finance and the evolution of production have non-temporary impact on the rate of exchange. An increase in comparative national production leads to indebtedness of the nominal rate of exchange and it correspondingly results in an enhancement in intercontinental affordability and the stability of business owing to a decline in the internal stage of price. On the other hand, it is inconsequential which implies that comparative national revenue has no impact on the undertaking of long-term rate of exchange in Nigeria. This result is permissible provided the pathetic output base and small revenue level in the Nigerian financial enterprises. Despite of the fact that revenue discrepancy inconstant is unimportant, the hypothetical uniformity of the projected outcomes delivers maintenance for the financial rate of exchange prototypical for Nigeria in the long-term economy. Additionally, in the long-term the naira-US$ conversion rate is obstructed mostly by the national source of money and rate of interest as compared to the comparative level of revenue.

Wilson (2009) reported the financial method to determine the rate of exchange and delivers a short chronological appraisal on money request applied in this research. Identifying the rate of exchange by the financial technique has come a lengthy way. The uncomplicated model has been advanced in the 1970s and taken preliminary elaborations, however has not been hold up under upcoming experimental investigation. With the progression of econometric examination and enhanced investigation design, succeeding research commenced to rebuild upkeep for the prototypical at minimum as a long-term occurrence. The impact of monetary parameters is a limitation of fiscal method to conversion rate identification perceived up to now in the collected works, in addition to government variations on the request for currency. The calculated modulus of the currency provision is not +ve denoting that upsurges in the source of money declines the worth of the US&. This consequence could be for the reason that, as upsurge in the provision of currency, there will be an estimated increase in price increases over the long-run, reductions the request for US$, and denigrates the US$. In addition, rate of interest, administration expenditure, and greater shortage per Gross Domestic Budget-GDP have a -ve constant. Escalation in shortage per Gross Domestic Budget-GDP reduced request for US$; and for that reason, devalues the US$. The real revenue has a +ve constant representing that upsurges in revenue level escalate the US$. This consequence opposes the conservative belief that a greater revenue produced by a greater demand for importations and devaluation in the money worthiness. The foreign rate of interest has a (-ve coefficient) in other words, escalation in the external interest rate devalues the worthiness of US$. The calculated coefficient of the unresolved debit per Gross Domestic Budget-GDP is not (-ve), it has an incorrect indication, nevertheless it is mathematically inconsequential. The computed constant of the debit investment via foreign capitals is not (+ve), nonetheless inadequately substantial (at 10 % level of consequence). As an upsurge in debit economics outwardly raises the demand for US$ and results in an indebtedness.

Based on a study performed by **Zamanian et al. (2013) Mundell- Fleming** exemplary of open finance mega-economics emphasizes that the course of the pivotal connection between the provision of currency and the rate of exchange relies on the rate of exchange command. In reality, the constant rate of exchange generates dual-directional fundamental connection between the dualistic inconstant whereas floating rate of exchange regime constructs one-directional contributing connection between them. The study also found this issue about Iranian rate of exchange regimes. Periodical time successions documents are applied for parameters. This connection has been discovered throughout different stages including: January-1974 to April-1992, January-1993 to April-2001 and January-2002 to April-2008). Toda-Yamamoto interconnection examination results demonstrate that in the constant rate of exchange regime or leading period underlying connection between the stock of currency and market rate of exchange is dual-directional (Rial/ Dollar) in Iran. In the 2nd phase when no constant rate of exchange supervises have

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

been succeeded regarding the rate of exchange regime, the consequences implied that there has been no substantial connection between the parameters. Similarly, in the 3rd phase, based on the floating regime, contributory connection between the parameters is dual-directional. Truthfully, escalation in the provision of money upsurges the rate of exchange and produces a downgrading of national currency. Subsequently, the principal bank is not permitted to alter the rate of exchange in the structure of constant rate of exchange; the central bank is enforced to sell overseas exchange. Since of marketing foreign exchange in contradiction of getting national currency through the central bank, the national provision of currency declines and consequently, in constant rate of exchange system financial strategy is incompetent. Additionally, in free floating conversion rate regime, market powers identify rate of exchange and crucial bank does not impact on the market. Essentially, floating rate of exchange regime in Iran was accomplished in the method of administered float. In this management, the key dynamics in identifying the rate of exchange are provision and request forces and the rate of exchange occasionally can be changed by the central bank.

Azali et al. (2000) examine the long-run association between the rate of exchange and the request for money in Malaysia. The Johansen- Juselius (1990) probability proportion checks support the importance of the rate of exchange in m2 but not m1 request for money function. The Johansen- Juselius (1993) probability proportion tests, nonetheless, found particular indication of unpredictability in the long-run restrictions and this might be due to the current economic predicament in this district. Complete investigation has provided support to the experiential outcomes of an unchanging long-run association between the rate of exchange and the request for currency.

Civcir (2003) directed a research on the financial prototypical model of exchange rate under great price increases in the background of long-run connection and disarrangement of Turkish Lira. He customs the Johansen multi-integration method to investigate the rationality of the financial model of identifying the rate of exchange as a illumination of the TL- US$ connection from January- 1987 to December-2000. He used the vector error correction model (VECM), in which, the whole coefficients have expected sign and are noteworthy. Extents of currency and the discrepancy of revenue parameters are in a line with the financial prototypical model. The discrepancy of the rate of interest has a (-ve sign) which displays that an increase in the Turkish IR comparative to US-IR leads to an increase of TL. The computed value of the discrepancy of the IR equation is 0.002 which it is extremely small which indicates a very rapid proportion of the price level alteration. These outcomes are in arrangement with the sticky price exchange rate financial prototypical model. The discrepancy of price increases has a +ve sign which demonstrates an upsurge in the price rises comparative to US outcome in devaluation of national exchange. Lastly, the inconstant of the comparative price has a +ve sign and is substantial.

Some previous works could be found about this topic. **Eas (2013)** looks at the inflation trends in Iraq from 2000 to 2010. Its aim is to understand the relationship among inflation and the Dinar's exchange rate against the US dollar through calculating the function's model through suitable methods of statistical and analyzing the findings with the SPSS software. According to the research, there is a connection among the two factors; throughout the 1990s, the Dinar's market value was lower than it should have been. Furthermore, the USD started to play a part in the economy of Iraq after that, with the majority of deposits and industrial transactions taking place through it. In Iraq, the peak rate of inflation was 53.1 percent in 2006, owing to great prices of derivatives of oil (it could be seen from the bulletin information of the statistics central bureau for the records of data). Moreover, thanks to a decrease in the petroleum goods and changes price in the national currency, Iraq's inflation rate dropped to 2.5 percent in 2010.and also increase inflation rate to 0.8% in 2020. Besides, the lack of customs taxes, the reduced levels of annual food rates, and the prices of rental housing all contributed to an inflation rate of lower.

4.Objectives Of The Study

1. To determine and elucidate the channels of the rate of exchange.
2. To identify the scope and amount of connection between money provision, interest percentage, rate of price increases, gross domestic budget and the rate of exchange in Iraq during 1990 to 2020.
3. To explicate hypothetically how the rate of exchange impact on other parameters in the finance.

5.Hypotheses Of The Study

- there is not one co-integration relationship (no long- run relationship between variables) variables which include (exchange rate, inflation rate, money supply ,interest rate and GDP
- there is at least one co-integration (long- run relationship between variables)
- The exchange rate and GDP are positively related but negatively related with inflation rate.

6..Data Analysis and Interpretation

6.1 DATA

The study used the ARDL bounds testing approach with its assumptions in order to investigate the determinant of the exchange rate of the Iraqi dinar: An applied study for the period 1990-2020 .The data main source is "World Development Indicators published by the World Bank and available at: databank.worldbank.org. Also, interest rate is obtained from International Monetary Fund (IMF), moreover the inflation rate obtained from www.macrotrends.net. ARDL bounds testing approach is a cointegration method developed by Pesaran et al. (2001) to test presence of the long run relationship between the variables. This procedure, relatively new method, has many advantages over the classical cointegration tests. Firstly, the approach is used irrespective of whether the series are I(0) or I(1). Secondly, error correction model (ECM) can be derived from the ARDL bounds testing through a simple linear transformation. This model has both short and long run dynamics. Thirdly, the empirical results show that the approach is superior and provides consistent results for small sample. (Nkoro,E.Uko.,&Aham,),

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

This study has one dependent variable called Exchange rate In contrast, four independent variables have been employed which consist of inflation rate, interest rate, money supply and GDP. These variables have long time series which we can employ for our model for empirical analysis.

6.2 The model

According to the economic and monetary theory, exchange rates are a monetary phenomenon influenced by the supply of money, inflation, and rate of interest. The current study is going to employ a model like:

Exr= B0+ B1 Inr+B2 Infr +B3 Ms+ GDP +U (Ɛ) 1

Where:

 Ex=exchange rate

Inr= is the interest rate;

GDP = is the growth domestic product;

M2= money supply

Infr= inflation rate;

Ut= is the error term (Or other factors that affect Exchange rate)

In sum, in this study the following steps are performed to estimate the impact of inflation on economic growth in Iraq for time period 1990 to 2020:

First: *Unit root* tests can be used to determine if trending data should be first differenced or regressed on deterministic functions of time to render the data **stationary.**

Second: **cointegration** test is used to establish if there is a correlation between several time series .

Third: Using **Diagnostic** Checking for Accurate Estimation.

Fourth: **(CUSUM Test)** tests can be used to test the constancy of the coefficients in a model.

6.3 The Empirical Results

The empirical outcomes and explanations are reported in this section.to estimate the impact of inflation on economic growth in Iraq for time period 1990 to 2020, to find the result.(Roman,K. 2009;Wang,J.2011; Griffiths,H.2018; Startz,R. 2019)

Table (1): Unit root test

Variables		Level		1st difference		2nd difference	
		C	C&T	C	C&T	C	C&T
Exchange rate	ADF (T-test)	0.409820	-1.78369	-2.82856	-2.93316	-4.87699	-4.96824
	p- value	0.9801	0.6874	0.0667	0.1674	0.0005	0.0022

Determinant of the Exchange rate of the Iraqi dinar: An applied study for the period 1990-2020

GDP	ADF (T-test)	-1.68064	-1.75385	-7.98845	-9.35980	-10.1942	-9.90016
	p- value	0.4305	0.7015	0.0000	0.0000	0.0000	0.0000
Money supply	ADF (T-test)	-1.5955	-5.39021	-1.94887	-8.30711	-10.5246	-10.5929
	p- value	0.4694	0.00125	0.3055	0.0000	0.0000	0.0000
Real interest rate	ADF (T-test)	-0.55626	-3.90586	-3.89394	-3.95592	-6.23831	-6.1237
	p- value	0.8660	0.0248	0.0059	0.0222	0.0000	0.0001
Inflate rate	ADF (T-test)	-2.55048	-3.03143	-5.03701	-4.95531	-6.53036	-6.58092
	p- value	0.1143	0.1407	0.0003	0.0022	0.0000	0.00001

C: intercept, T: trend

Interpretation of table-1.

As shown in the table (1) that in the GDP, it is no stationary in the level for (intercept, trend and intercept) because the p-value for both were greater than 0.05 but in the second difference it is going to be stationary for (intercept, trend and intercept) because the p-value for both were less than 0.05. Moreover, most of variables were no stationary in the level for (intercept, trend and intercept) because the p-value for both were greater than 0.05 but in the first difference it is going to be stationary for (intercept, trend and intercept) because the p-value for both were less than 0.05 and. On the other hand, in the exchange rate, it is no stationary in the level and first difference for (intercept, trend and intercept) because the p-value for both were greater than 0.05 but in the second difference it is going to be stationary for (intercept, trend and intercept).

Table (2): Autoregressive distributed lag (ARDL) model

Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): RIR MS IR GDP
Fixed regressors: C
Selected Model: ARDL(4, 4, 4, 3, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
XC(-1)	0.351497	0.255626	1.375043	0.2628
XC(-2)	-0.595827	0.200071	-2.978075	0.0587
XC(-3)	0.776561	0.352802	2.201123	0.1151
XC(-4)	-0.497029	0.330873	-1.502172	0.2301
RIR	-273.2861	42.82975	-6.380755	0.0078
RIR(-1)	500.5938	95.72722	5.229378	0.0136
RIR(-2)	-323.3872	90.74283	-3.563777	0.0377

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

RIR(-3)	228.7104	71.02940	3.219940	0.0486
RIR(-4)	33.96700	67.67554	0.501910	0.6503
MS	-0.015304	0.007010	-2.183016	0.1170
MS(-1)	0.007399	0.016677	0.443672	0.6873
MS(-2)	-0.017296	0.016784	-1.030538	0.3786
MS(-3)	-0.027963	0.031615	-0.884483	0.4416
MS(-4)	0.079452	0.029967	2.651265	0.0769
IR	0.297154	0.705158	0.421401	0.7018
IR(-1)	0.837071	0.533671	1.568515	0.2148
IR(-2)	-0.039607	0.553340	-0.071577	0.9474
IR(-3)	0.289635	0.397126	0.729328	0.5186
GDP	0.008609	0.002953	2.915795	0.0617
GDP(-1)	-0.005468	0.002321	-2.355752	0.0998
GDP(-2)	0.006095	0.001616	3.771951	0.0326
GDP(-3)	-0.008708	0.003457	-2.518848	0.0863
GDP(-4)	-0.005708	0.005305	-1.076048	0.3607
C	-203.7086	2227.926	-0.091434	0.9329

R-squared	0.992845	Mean dependent var	1504.399
Adjusted R-squared	0.937994	S.D. dependent var	548.9264
S.E. of regression	136.6879	Akaike info criterion	12.25383
Sum squared resid	56050.74	Schwarz criterion	13.40569
Log likelihood	-141.4267	Hannan-Quinn criter.	12.59634
F-statistic	18.10070	Durbin-Watson stat	2.362763
Prob(F-statistic)	0.017519		

Interpretation of table-2.

it can be seen in the table (2) that the dependent variable is Exchange rate (XC) and independent variables are Real interest rate (RIR), Money supply (MS), Inflate rate (IR) and GDP. The maximum dependent lags which can be chosen for independent variables are four and the result above is short- run of the dependent and independent variables. The R- squared is quite high which is 99 percent and also the Adjusted R- square equals 93 percent which means that the models is a best- fit. F-statistics equals to 18.10070 and the p-value is 0.017519 which is less than 0.05. This means that the whole overall model is significant. Moreover, Real interest rate is statistically significant relationship with exchange rate because p-value of it was less than 0.05. This means that the coefficient of real interest rate is -273.2861 if it increase by one point then the exchange rate will decrease by 273.2861 but it is going be positive effect in first, third and fourth lags. Money supply is statistically insignificance relationship with exchange rate in first, second and third lags but it is significant relationship with exchange rate in fourth lags when alpha is in 0.10. Inflate rate is statistically insignificant relationship with exchange rate because p-value were greater than 0.05. Finally, GDP is statistically significant relationship with exchange rate in first, second and third lags because p-value of it was less than 0.05. This means that the coefficient of real interest rate is 0.008609 if it increases by one point then the exchange rate will increase by 0.008609.

Table (3): F-Bounds Test

F-Bounds Test	Null Hypothesis: No levels relationship

Determinant of the Exchange rate of the Iraqi dinar: An applied study for the period 1990-2020

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.129477	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Interpretation of table-3.

it is clear in the table (3) that F-statistics is 6.129477 then it is above the value of upper bound (5%). There exists a long- run relationship between one spending of all independent variables and exchange rate. Thus, the result of F-Bound Test is inconclusive

Table (4): The Johnson test

Null hypothesis	characteristic value	Statistic	5% critical value	P value
None*	0.799486	46.59924	33.87687	0.0009
At Most 1	0.598169	26.43998	27.58434	0.0695
At Most 2	0.424589	16.02745	21.13162	0.2232
At Most 3	0.293098	10.05903	14.26460	0.2081
At Most 4	0.058007	1.732952	3.841466	0.1880

Interpretation of table-4.
Table (4) shows the Johnson test in co-intergration test under the confidence level 95%. The null hypothesis (there is not one co-integration relationship (no long- run relationship between variables) because the p-value were less than 0.05 or the value of statistics were greater than 5% critical value and accepts the alternative hypothesis (there is at least one co-integration). As a result, there is long run association among variables.

Table (5): Normality test (Jarque-Bera)

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

Mean	Median	Maximum	Minimum	Std.Dev	Skewness	Kurtosis	Jarque-Bera	Probability
-0.002	0.0081	0.763757	-1.68396	0.3878	-0.72654	3.86245	3.2564	0.27532

Interpretation of table-5.

It is indicated in the table (5) that the value of Jarque- Bera equals to 3.2564 and the probability of it is 0.27532 which is greater than the common alpha 0.05. Thus, residuals are normally distributed.

H_0: there is not one co-integration relationship (no long- run relationship between variables)

H_1: there is at least one co-integration (long- run relationship between variables)

Table (6): Multicollinerity test

Variables	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.700675	125.1486	NA
GDP	0.010132	200.8945	3.259449
inflate rate	0.000716	2.242126	1.554332
Money supply	0.004457	67.18480	5.674689
Real interest rate	0.001140	17.80046	2.027588

Interpretation of table-6.

As shown in the table (6) that the multicollinerity problem were not exist of the data because the value of VIF in Centered of all explanatory variables (GDP, interest rate, Money supply, Real interest rate) equals to (3.259449, 1.554332, 5.674689, 2.027588) respectively which were less than 10. As a result, there is no severe multicollinearity exists in the model.

Table (7): Breusch-Pagan-Godfrey

F-statistic	1.893522	Prob.F(4, 26)	0.0517
Obs*R-squared	11.549046	Prob. Chi squar (4)	0.0587
Scaled explained SS	2.154320	Prob. Chi squar (4)	0.5542

Interpretation of table-7.

It is clear in the table (7) that there is no heteroskedasticity problem exists in the model because the prob. Chi squar (4) of Obs*R-squared were greater than 0.05.

**Table (8): Diagnostic test (Breusch-Godfrey Serial Correlation LM Test)**

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.495465	Prob. F(2,24)	0.6154
Obs*R-squared	1.229199	Prob. Chi-Square(2)	0.5409

Interpretation of table-8.

It is clear in the table (8) that the null hypothesis (there is no serial correlation exist in the model) were accepted because p-value of Obs*R-squared were greater than the common alpha 0.05 and rejected alternative hypothesis (there is serial correlation exist in the model). In conclusion, there is no serial correlation exist in the model.

Figure (1) Stability of the model: Recursive Estimates, Cusum Test

This test helps to detect the structural changes; it is used to confirm of the stationary of the estimated coefitients via Cusum Test. Wich the line of the model should lay between the two boundary lines. The figure (1) proves that the estimated coefietents.

Shanaz Hakim Mhamad[a], Turgut Tursoy[b]
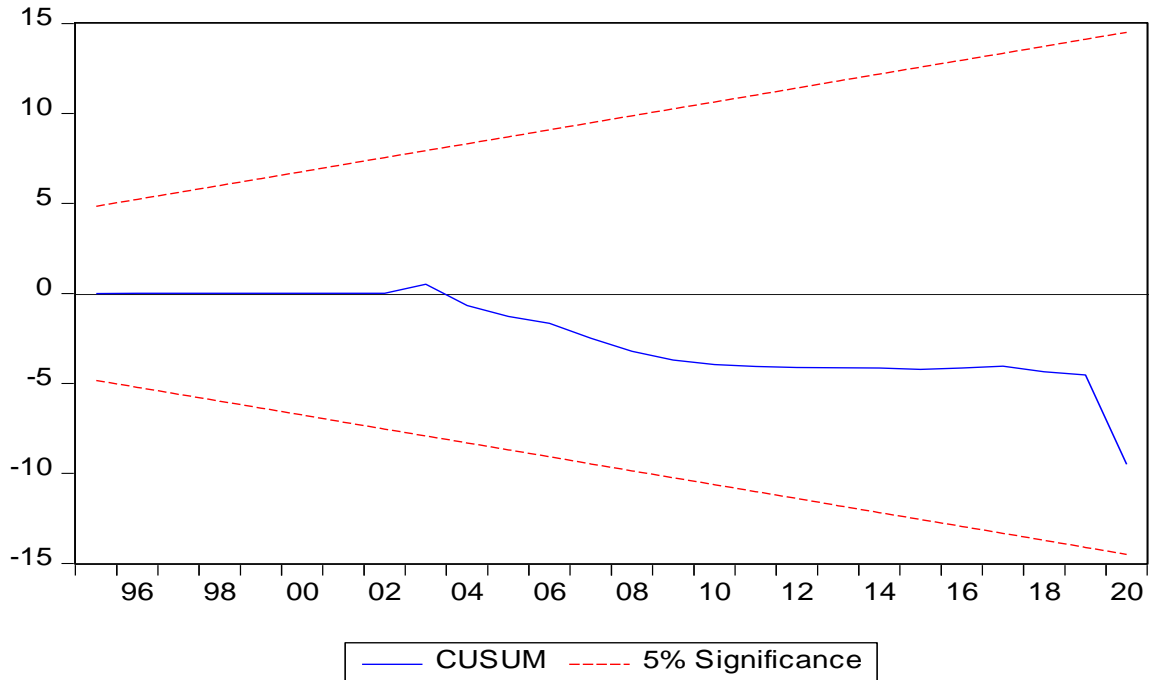
Figure (1): Cusum Test

It can be seen in the figure (1) that cusum test helps to show if coefficients of regression are changing systematically. The null hypothesis is parameters are stable and the alternative hypothesis is parameters are not stable. As a result, the blue line is within the red lines this means that the parameters are going to be stable.

7.Recommendations

Expanding processes to help committees and honesty agencies, as well as reducing corruption financial and administrative, which limits volatility in exchange rates foreign currencies (especially the euro and dollar) and their impact on the prices of different products in the market of Iraq. There is a requirement for cooperation among policies of general economic and policy of exchange rate, and policy of exchange rate necessitates action by Central Bank of Iraq for limiting variations in the Iraqi dinar's exchange rate, as well as their effects on local and international products rates.

8.Conclusion

This research aimed to affirm the economic hypothesis that exchange rate and GDP are positively related but negatively related with inflation rate. The dependent variable in this study was exchange rate and also the independent variables were inflation rate, GDP interest rate and money supply for Iraq from 1990 to 2020. According to economic theory and several other researches, the findings of this analysis were investigated that the whole overall model is significant. Moreover, Real interest rate is statistically significant relationship with exchange rate because p-value of it was less than 0.05. This means that the coefficient of real interest rate is -273.2861 if it increase by one point then the exchange rate will decrease by 273.2861 but it is going be positive effect in first, third and fourth lags. Money supply is statistically insignificance relationship with exchange rate in first, second and third lags but it is significant relationship with exchange rate in fourth lags when alpha is in 0.10. Inflate rate is statistically insignificant relationship with exchange rate because p-value were greater than 0.05. Finally, GDP is statistically significant relationship with exchange rate in first, second and third lags because p-value of it was less than 0.05. This means that the coefficient of real interest rate is 0.008609 if it increases by one point then the exchange rate will increase by 0.008609.

Exchange rate changes cause customers to lose faith in the local money (the Iraqi dinar) that affects their attitudes and convictions, increasing their appetite for products in the economy based on a trade-off among goods of consumer and capital. The research discovered, based on an examination of the development patterns of the exchange rate of Iraqi dinar against foreign currency, in which there has been a stable deteriorating in the currency between 1995 and 2000, due to the external and internal variables, particularly oil exports, as well as Iraq's exceptional situations. Nevertheless, from 2003 to 2020, the importance of the currency of Iraq enhanced and its distribution against foreign currency rose due to the Iraqi Central Bank's project that used auctions on the foreign currencies, besides its entry as a buyer and seller of foreign currency, particularly the USA dollar that enhanced people's trust in their national currency. The need for adequate stability in the policy of exchange rate to cope with structural developments brought about by negotiating with other governments in international trade, in order to limit variations in Iraqi dinar as an exchange rate of local currency in the front of currencies of other countries.

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Shanaz Hakim Mhamad[a], Turgut Tursoy[b]

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