

Financial Inclusion and Economic Development in Iraq

Ammar Hamad Khalaf¹, Azhar Hassan Ali²

¹Assistant Professor (Ph.D.), Head of Financial Stability Department, Central Bank of Iraq

²Instructor (Ph.D.), Department of Economics, University of Baghdad

Abstract: *This paper investigates the nexus between financial inclusion and economic development in Iraq. It uses two dimensions of financial inclusion the first is the access of financial services and the second is the usage of the financial services, while GDP per capita used as proxy for economic development. The paper finds low level of financial inclusion index in Iraq estimated by (10%). In addition, by using the Autoregressive Distributed Lag Model (ARDL) for cointegration the paper finds unfortunately no relationship the financial inclusion indicators and economic growth during the period 1990-2016. This fact emphasizes that more efforts need to be done to enhance and extend the financial inclusion in Iraq through financial literacy, costumers protection, providing financial services to rural area, and engage of low income people in the formal financial services especially via microfinance products.*

Keywords: financial inclusion, economic growth, ARDL, Iraq

JEL Classification: G02, O16, C50

1. Introduction

Iraq is an oil economy where the oil revenues constitute more than 90 per cent of the total public budget's revenues, it also dominated by the state-owned enterprises. This feature undermined the role of intermediation institutions of supply more financial services due to the lack of demand. Many attempts have undertaken by Iraqi government to increase the financial system's role in the economic development and poverty reduction. This started from the liberalization of financial system since 2004 and allowing private and foreign banks to open business to the enabling and expanding the private sector's participation in the economy. However, the linkage between the real sector and financial sector still weak although 56 banks are working in the Iraqi economy in 2017 compare to 23 banks (6 state-owned and 17 privately owned) in 2003, relaxing of credit control and interest rates by banks. Moreover, the central bank of Iraq launched a strategic plan for the period 2016-2020 and make the financial inclusion in the country a strategic priority seeks to achieve.

State of the problem

The financial inclusion is becoming a priority strategy in Iraq to provide adequate funds to the neglected segments of the economy, small and medium scale enterprises as well as to finance other economic activities. Could the Central Bank of Iraq achieve its goal (inclusive financial system) via creating an active financial system that can engage with the real sector and set up new financial infrastructure.

Objective of the Study

The paper aims to measure the financial inclusion level in Iraq through different dimensions and assess its role in economic development during the period 1990-2016 by applying ARDL approach for cointegrations.

The paper divided to eight sections: section 1 the introduction, section 2 reviews the concept of financial inclusion, section 3 reviews the selected indicators used in literature, section 4 shows the literature on financial inclusion and economic growth, section 5 viewed the initiatives of financial inclusion in Iraq, section 6 reviews the indicators of financial inclusion in Iraq, section 7 measured the index of financial inclusion in Iraq, and section 8 econometrically measured the impact of financial inclusion on economic growth in Iraq.

2. Conceptual Framework

Financial inclusion represents the ease of access to and use of financial services by adults from the formal financial institutions at affordable cost. Financial inclusion is a state in which all adults have access to appropriate, desired financial products and services to manage their money effectively (Leyshon and Thrift, 1995). Sarma (2010, p5) defined the financial inclusion as the ease of access, availability and usage of the formal financial system by all members of the economy. The World Bank (2014) points out, the concept of financial inclusion could range from "access and use of services provided responsibly and sustainably" to "delivery of financial services at affordable costs to disadvantaged and low-income segments of society". It also defined as the access to and use of formal financial services (Ratna Sahay *et al*, 2015, p8). It also means that adults have access to and can effectively use a range of appropriate financial services. Such services must be provided responsibly and safely to the consumer and sustainably to the provider in a well-regulated environment (AsliDemirguc-Kunt, Leora Klapper and Dorothe Singer 2017).

Therefore, the financial inclusion characterized by the following features: Ease access and use of financial services, availability of financial services and products to neglected segment of the society, and, providing financial services at affordable cost.

3. Measurement of Financial Inclusion

Researchers have used a variety of indicators to measure the level of financial inclusion in a nation. The variation of using such indicators refer to the availability of data and the degree of financial system development. For instance, Sarma (2010) used three indicators to measure financial inclusion represented in banking penetration measured by (number of bank accounts to total population), availability of the banking services measured by (number of bank branches per 1000 population and number of ATM per 1000 population) and usage of the banking system measured by (volume of credit and deposits to GDP). Sharma (2015, p23) used the following indicators:

(1) **Penetration** of banking institutions includes:

- a) number of deposit accounts held by commercial banks per 1,000 adults.
- b) number of loan accounts held by commercial banks per 1,000 adults.

(2) **Availability** or access of banking services include:

- a) bank branches per 1,000 km.
- b) bank branches per 0.1m adults.
- c) ATMs per 1,000 km.
- d) ATMs per 0.1 m adults.

(3) **Usage** of banking services includes:

- a) outstanding deposit per cent GDP.
- b) outstanding credit per cent GDP.

Beck *et al.* (2008) measured the banking access by the two indicators ease and cost indicators as follows:

1) **Ease Indicators includes:**

- Locations to open deposit account.
- Locations to submit loan applications.
- Minimum amount to open checking account.
- Minimum amount to be maintained in checking account.
- Number of documents to open checking account.
- Minimum amount consumer loans.
- Days to process consumer loan applications.

2) **Cost Indicator includes:**

- Annual fees checking account (percent of GDP per capita).
- Fees consumer loans (percent of GDP per capita).
- Cost to transfer funds internationally (percent of \$250).
- Fee for using ATM Cards (percent of \$100).

Gupte *et al.* (2013) used four indicators to measure the inclusiveness of financial system namely outreach, usage, ease, and cost. Each indicator includes many variables as follows:

1) **Outreach Indicators:**

- Number of branches per one lakh population.
- Number of ATM's per one lakh population.
- Accounts per 1000 adults.
- Number of branches per 1000 sq. km.
- Number of ATM's per 1000 sq.km.

2) **Usage indicator:**

- Volumes of deposits and loans % of GDP.

3) **Ease indicators:**

- Locations to open deposit accounts.
- Minimum amount to open checking a/c (% of GDPPC).
- Minimum amount to open savings a/c (% of GDPPC).
- Minimum amount to be maintained in checking a/c (% of GDPPC).
- Minimum amount to be maintained in savings a/c (% of GDPPC).
- No. of documents to open checking a/c.
- No. of documents to open savings a/c.
- Locations to submit loan applications deposit a/c.
- Minimum amount of Consumer loan (% of GDPPC).
- Minimum amount of Mortgage loan (% of GDPPC).
- Days to process consumer loan application.
- Days to process mortgage loan application.

4) **Cost Indicators:**

- Fees consumer Loan (% of GDPPC).
- Fees mortgage Loan (% of GDPPC).
- Annual fee checking A/c (% of GDPPC).
- Annual fee saving A/c (% of GDPPC).
- Cost to transfer funds internationally (% of \$250).
- Amt of fees for using ATM cards (% of \$ 100).

The Alliance for Financial Inclusion developed two indicators as quantitative measures of financial inclusion are access and usage, and many variables used to measure each indicator. The access indicator includes i) number of access point per 10000 adults and segmented by type and relevant administrative units, ii) percentage of administrative units with at least one access point, and, iii) percentage of total population living in administrative units with at least one access point. Usage indicators includes the number of deposit account per 10000 adults and number of loan accounts per 10000 adults (Alliance for Financial Inclusion, 2011, p3).

4. Literature Review

No one can deny nowadays the role of financial system in economic development. There is a mountain of research contributions since 1911 emphasized this relationship between finance and economic growth. Schumpeter is the pioneer who discovered the importance of banker in the process of development besides the entrepreneur. The researcher thereafter disagreed about the direction of affect between the financial system and economic growth, and mostly divided in two major categories. The first called supply-leading phenomena and the second is demand-follow which means that when economic activities flourish increase the demand for new financial services and product and spur financial system to be breadth and depth (Patrick 1966).

The traditional empirical works used indicators reflect the size and depth of the financial system to gauge either the financial system is sophisticated or not such as credit to private sector divided by the GDP and others (King and Levine, 1993). However, the recent research used a wider span of indicators to assess the development of financial system include access, efficiency, and stability. The dimension of access which include bank's branch and ATM density, average loan to deposit size, loan and deposit accounts per capita percentage of people with bank account,

collateral needed for loan, and percentage of firms with financing constraints is imply the financial inclusion (World Bank,2006, p1).

A study by (ThessISMUN, 2017) revealed that more access to financial products can promote financial inclusion and achieve sustainable development goals such as high level of education, poverty reduction, gender equality, and in general improve the living standard of poor.

JishaJoseph and Titto Varghese (2014) examined the role of financial inclusion which include (number of bank branches, offsite and onsite ATM, usage of debit card and credit cards) introduced by 10 banks from public and private sector on the economic growth. They found thatthe number of people with access to the products and services offered by the banking system continues to be very limited, even years after introduction of inclusive banking initiatives in India. They also concluded that the financial inclusion contributes much to the development of Indian economy and there is further scope for achieving inclusive growth.

Sharma (2015) studied the nexus between the vast dimensions of financial inclusion and economic development of the emerging Indian economy. By applying VAR model and Granger Causality test she found a positive nexus between economic growth and various dimensions of financial inclusion particularly banking penetration, availability of banking services and usage of banking services in terms of deposits. The Granger causality analysis reveals a bi-directional causality between geographic outreach and economic development and a unidirectional causality between the number of deposits/loan accounts and gross domestic product. Simply the paper concluded that the financial inclusion is a driver of economic growth.

Onaolapo A. R. (2015) Empirical examined the relationship between financial inclusion and economic growth in Nigeria and found that there is a significant relationship between financial inclusion and economic growth in Nigeria in the period 1980-2012 by applying Ordinary Least Square (OLS) method.

OyewoBabajide Michael andOyewoleOyedayo Sharon (2014)studied the relationship between financial inclusion and economic development in Nigeria and found out that financial inclusion has a positive impact on economic development. The estimated variables in this study are Gross Domestic Product (GDP) to measure economic development and the following variables as proxies of financial inclusion *viz.* Deposits attracted by rural branches of Commercial Banks, Loans& advances of rural branches of Commercial Banks and, Commercial Banks Loans to Small Scale Enterprises respectively for the period of 1992 to 2007.

Oroo Julie A. (2013) also studied the relationship between financial inclusion and economic growth in Kenya during the period 2002-2012. He used the OLS method to estimate the effect of financial inclusion proxied by (branch networks, number of mobile money users/ accounts, number of automated teller machines in the country and bank lending rates) on economic growth proxied by GDP growth.

He found a positive impact of the variables of financial inclusion *viz.* branches network and bank loan rate on economic development and other variables were not.

Abiolaet. al. (2015) examined the effect of financial inclusion on economic development in Nigeria by using OLS method. The results of their research paper show that financial inclusion is a significant determinant of the total factor of production, aswell as capital per worker, which invariably determines the final level of output in the economy.

Lawrence(2017) studied the effect of financial inclusion on economic growth and development in Nigeria over the period 1986-2015 using the Ordinary Least Squares technique. Financial inclusion was measured in the study using loan to deposit ratio, financial deepening indicators, loan to rural areas, and branch network. Measures of financial deepening adopted in the study are ratios of private sector credit to GDP and broad money supply to GDP. Economic growth was proxied as growth in GDP over successive periods while per capita income was adopted as a measure of poverty, hence an index of development. The study shows that (i) credit delivery to the private sector has not significantly supported economic growth in Nigeria (ii) financial inclusion has promoted poverty alleviation in Nigeria through rural credit delivery. The monetary authorities should deepen financial inclusion efforts through enhanced credit delivery to the private sector as well as strengthen the regulatory framework to ensure efficient and effective resource allocation and utilization.

Asliet. al. (2017) explained that financial inclusion can help reduce poverty and inequality by helping people invest in the future, smooth their consumption, and manage financial risks. The relationship between financial inclusion and inequality and macroeconomic growth is not yet well understood because of data availability. Establishing such a relationship requires a sufficiently long time-series on financial inclusion measures. Analysis of the factors shaping macroeconomic growth and inequality often requires decades of data.

5. Initiatives of Financial Inclusion in Iraq

For creating an inclusive financial sector in Iraq, many initiatives are undertaken since 2003 till present.

a) Establishing Microfinance Institutions

In post conflict period in 2003 the formal financial institutions mainly commercial banks halted in providing the necessary funding to resume and expand economic activities in Iraq. This triggered 14 (2 international and 12 national) microfinance institutions (MFIs)to be established aftermath 2003 as effective demand -driven financial intermediaries of quality offering a middle path – an alternative to inaccessible formal financial institutions and exploitative traditional money lenders (Tijara 2010, p7).Those microfinance institutions heavily relied on the international grants from donor countries leded by USAID. The MFIs could serve considerable segment of the unbanked people estimated by (63000) clients by granting over (197000) loans of more than (\$453.2) million as in 2010 with

repayment rate (99%)(Tijara 2010, p7).However, the activities of MFIs in Iraq have declined remarkably since 2012 by clients and portfolio outstanding as the chart (1) reveals that.This is because of funding to those institutions had dwindled from donors since 2012 after the moderately improvement in economic situation in Iraq resulted from their rise in oil prices at that time.

in 2009; 17% and 14%, respectively, in 2012, with a steeper decline witnessed over the second half of 2012 and 2013 (Teymour and Peter, 2014). At least four microfinance institutions operating in IS-controlled region have stopped their lending operations – eliminating more than (20000) active clients and resulting in (42000) lost job opportunities (Long, 2017).

The growth rates in both outstanding portfolio and number of clients are declining more than 48% and 52%, respectively,

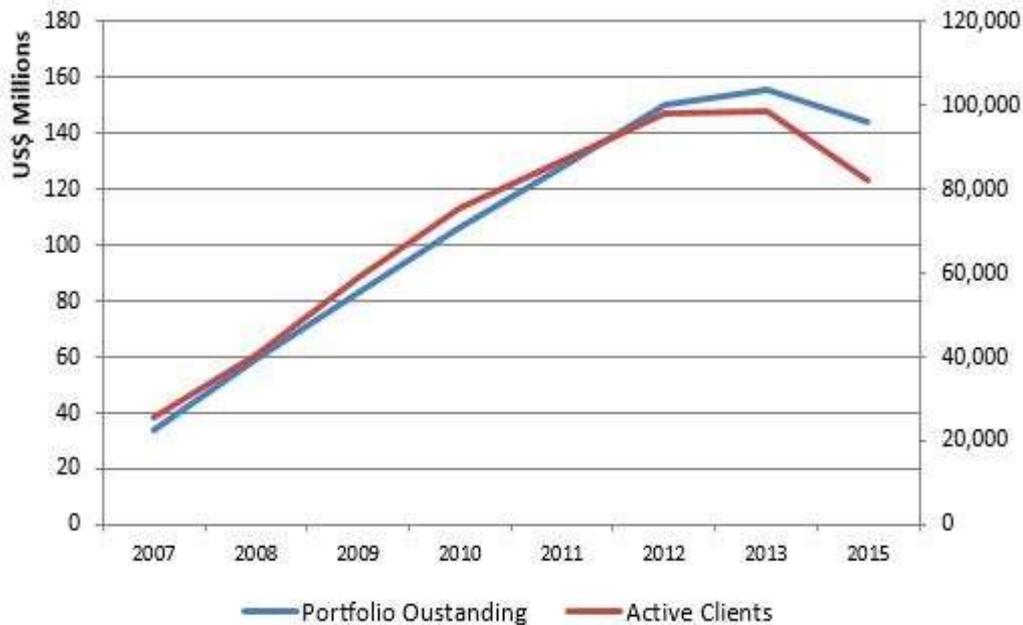


Chart 1: Development of Iraq's Microfinance Sector

Source: Teymour Abdel Aziz, Alaa Abbassi, Nadine Chehade, and Kate Lauer (2016), “The legal and regulatory framework for microfinance in Iraq”, World Bank and CGAP Report

b) Initiative of Ministry of Labor and Social Affairs

The first official initiative in offering loans to unbanked low income and poor people instead of banks implemented by the Ministry of Labor and Social Affairs (MoLSA) since 2007. According to the law of supporting small earning enterprises issued in 2012 established a fund worth (IQD 150) billion for loans ranging from (IQD 5 to 20) million, it is currently implementing a new SME loan program.

seeks to provide the necessary funds for different economic sectors and small enterprises to increase the productivity and reduce the unemployment and poverty and create new jobs for adults.

c) Specialized Institutions

In addition, there are two institutions, owned by commercial banks, providing and guaranteeing loans to SMEs: The first is the Iraqi SME Finance Company, which was established in 2009 and disbursed about (3900) loans, with a portfolio of (US\$ 62) million and created about (6000) jobs (directly and indirectly). The second is the Iraqi Bank Guarantees Company, which was established in 2006 with Central Bank of Iraq's support and guaranteed about (7864) loans with an accumulated portfolio of (IQD 90) billion (Teymour et. al., 2015, p7).

In addition, the Central Bank of Iraq recently launched his strategic plan for the period 2016-2020 which includes inter alia the necessity to promoting the financial inclusion in Iraq. A national committee has been appointed to survey and measure the level of financial inclusion in Iraq. A strategic plan for promoting financial inclusion will emerge based on the results of this survey.

d) Central Bank of Iraq's Initiative:

Central Bank of Iraq has presented his initiative for financing the small, medium and large enterprises and an amount of one trillion Iraqi Dinar has been specified for small enterprises and other worth five trillion specified for medium and large enterprises since 2016. This initiative

Moreover, one could not deny the role of conventional banks in spur the financial inclusion in Iraq either by mobilizing savings or granting loans. According to the international estimations in 2016 about (89%) of Iraqis are unbanked (World Bank 2014). Thus, more efforts need to be done by these banks to promote the access and usage of financial services because they are the most important formal financial institutions in Iraq with wide branches network around country.

6. Measuring of Financial Inclusion in Iraq

There is not a consensus among researcher and international institutions about type and number of indicators used in

gauge of the level of financial inclusion in a nation. The literature registered a variety of indicators as shown earlier of this paper. This paper has adopted the widely used indicators such as access and usage of financial services offered by formal financial institutions mainly commercial banks as follow:

- 1- **Access:** it includes the following variables:
 - a) Number of banks' branches to number of population (100000) persons (*bankingspread*).
 - b) Number of ATM to number of adults.
 - c) Number of branches to (1000) km².
 - d) Number of ATM to (1000) km².
- 2- **Usage:** it includes the following variables:
 - a) Loans and deposits to GDP (*banking depth*).
 - b) Number of bank loan account to number of adults.
 - c) Number of bank deposit account to number of adults.

6.1 Access to Financial Services:

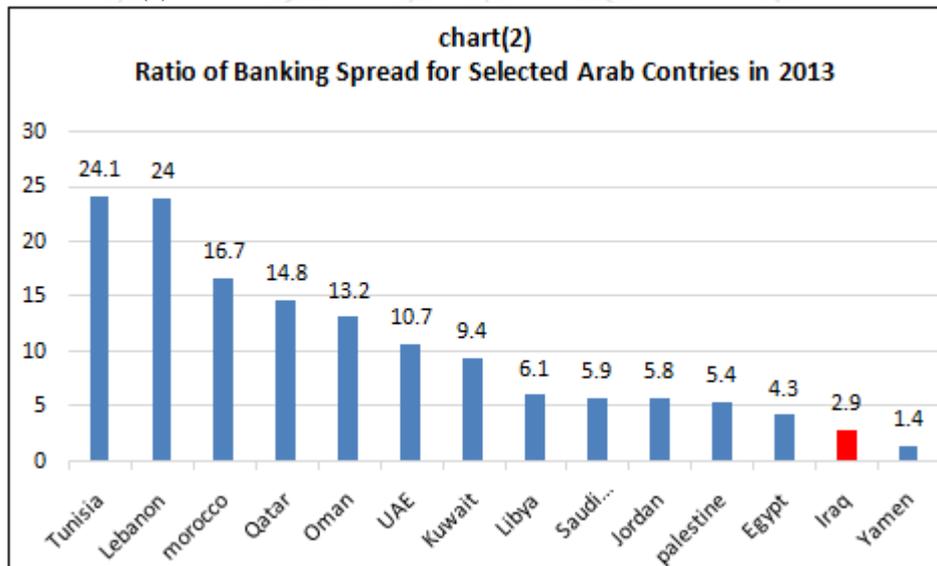
Table (1) shows the low level of banking density and spread in Iraq. The banking spread did not exceed (4) during the period 2010-2016, which means about (3) branches for (100000) persons. This ratio is very low compare to other Arab countries as shown in chart (2).

Table 1: Banking Density and Spread in Iraq 2010-2016

Years	No. of Population (1000) person	No. of Banks' Branches	Banking Density	Banking Spread
2010	32489	912	35.6	2.80
2011	33338	929	35.9	2.78
2012	34207	990	34.6	2.89
2013	35095	1042	33.7	2.96
2014	36004	1204	29.9	3.34
2015	36933	1213	30.4	3.28
2016	37883	1068	35.5	2.81

Source:
 - Central Bank of Iraq (2017), Annual Financial Stability Report 2016, Department of Financial & Monetary Stability.
 - Ministry of Planning, Central Bureau for Statistics.

Note:
 a- Banking spread = $\frac{\text{No. of Branches}}{\text{Population (100000) person}}$
 b- Banking Density = $\frac{\text{population (1000) person}}{\text{No. of Branches}}$



Source: Arab Monetary Fund (2014), Joint Arab Economic Report, Abu Dhabi, p152. (Arabic)

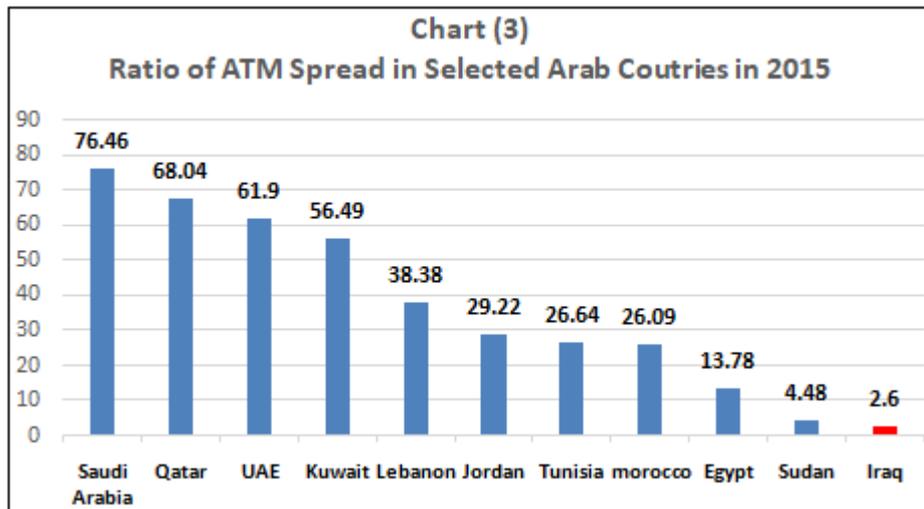
The banking density ratio also registered low level indicate that there is one branch serve about (30000) persons, and this ratio very low compare to Lebanon for instance which accounted one branch per (4600) persons (Arab Monetary Fund 2006, p177).

The ATM's spread ratio also was low in Iraq and could not excess (4) indicating less than (4) ATM for (100000) adults during the period 2011-2016 as shown in table (2). However, the same ratio registered (76), (68) and (56) in Arabia Saudi, Qatar, and Kuwait respectively as in 2015 (World Bank 2015).

Table 2: Banking Spread for ATM in Iraq (100000 person)

years	Adults (more than 15 year)	No. of ATM	Ratio of Spread
2010	19303	--	--
2011	19929	467	2.3
2012	20569	467	2.2
2013	21227	647	3.1
2014	21926	337	1.5
2015	22082	580	2.6
2016	22654	660	2.9

Source: - Central Bank of Iraq, Payment Department.
 - Ministry of Planning, Central Bureau for Statistics.



Source: World Bank Data 2015, <http://data.worldbank.org/topic/financial-sector?>

The geographic spread of banks and ATM were low in Iraq as shown in table (3), which it did not exceed (3) branches per (1000) km². This ratio incomparable with the same ratio in Singapore, for instance, which registered (636) branches per (1000) km² as in 2004 (The Economist, Dec. 2005). In addition, the ATM spread per (1000) km² accounted less than (2) ATM during the period 2011-2016 indicating difficulties in access to financial services and severely affect the financial inclusion in Iraq.

Table 3: Geographic Spread for Banks (1000 km²)

years	Bank Branches	No. of ATM	Branches for 1000 km ²	ATM for 1000 km ²
2010	912	--	2.09	--
2011	929	467	2.14	1.07
2012	990	467	2.28	1.07
2013	1042	647	2.39	1.48
2014	1204	337	2.77	0.77
2015	1213	580	2.79	1.33
2016	1068	660	2.45	1.52

Note: Iraq's area is (435052 km²).

Source: - Central Bank of Iraq, Department of Statistics and Research.

- Central Bank of Iraq, Payment Department.

- Ministry of Planning, Central Bureau for Statistics.

6.2 Usage of Financial Services:

As mentioned earlier the level of financial services usage can be measured by analysis three variables *viz.* credit and deposits of private sector to GDP, number of deposits account to number of adults, and number of loans account to number of adults.

The indicator of banking depth as measured by credit and deposits to private sector to GDP generally increased. The ratio of credit to private sector to GDP increased from (5.2%) to (9.2) for the period 2010-2016. At the same time, the ratio of deposit of private sector to real GDP also increased from (8.5%) in 2010 to (12.1) in 2016 as shown in table (4).

Generally, the depth of banking sector in Iraq is undeveloped and the proportion of banking sector is weak in

the GDP. This indicate lack of supply and demand for banking services and considerable segment of population depend on the informal banking services provided by relatives and friends. However, the World Bank estimations reveals that the ratio of banking sector reached over (100%) as in Australia and Malaysia, at the meantime, this ratio registered over (50%) in some Arab countries like Lebanon, Kuwait and United Arab of Emirates during the period 2010-2015 (World Bank Data 2015).

Table 4: Measure of Banking Depth in Iraq 2010-2016 (Million QID, percentage)

years	Credit to Pvt. Sector	Deposits of Pvt. Sector	GDP	Ratio of Banking Depth (1/3)	Ratio of Banking Depth (2/3)
2010	8527131	13711185	13711185	5.2	8.5
2011	11356308	18192612	18192612	5.2	8.4
2012	14650102	21115540	21115540	5.7	8.3
2013	16947533	24450014	24450014	6.2	8.9
2014	17745141	24702632	24702632	6.8	9.5
2015	18070058	23636904	23636904	9.4	12.3
2016	18164883	23697049	23697049	9.2	12.1

Source:

- Central Bank of Iraq, Department of Statistics and Research.

- Ministry of Planning, Central Bureau for Statistics.

7. Measuring the Financial Inclusion Index

The paper relies on the methodology adopted by the Central Bank of Iraq initially suggested by Alliance for Financial Inclusion. The process of construction the financial inclusion index in Iraq as follows:

- 1) Identify the targeted values of each indicator, it means that we must specifying the desired values that can be achieved in Iraq as strategy plan.
- 2) Identify weights for variables which reflect the importance of those variables, and give equal weights for sub-indices.
- 3) Sum the sub-indices in an index represents the financial inclusion in Iraq. The value of the aggregated index between (0-1), the greater value the higher level of financial inclusion.

Table (5) reveals that financial inclusion in Iraq is very low and the value was (0.101) in 2015 and 2016. This ratio indicates the necessity of undertaken more efforts for increase the financial inclusion in Iraq.

Table 5: Financial Inclusion Index of Iraq 2015-2016

Indicator	Variables	2015 (A1)	2016 (A2)	Weights (W)	Target Values (T)	Sub-index X1= A1/T	Sub-index X2= A2/T	Index D1= $\sum W \cdot X1$	Index D2= $\sum W \cdot X2$	Equal Weights For Indices ($\tilde{\omega}$)	Aggregated Index (FII)2015= $\tilde{\omega} \cdot D1$	Aggregated Index (FII)2016= $\tilde{\omega} \cdot D2$
Access	Ratio of Banking Spread	3.28	2.81	0.5	25	0.13	0.11	0.065	0.055	0.5	0.107	0.104
	Number of ATM to number of adults.	2.6	2.9	0.25	50	0.05	0.06	0.01	0.0125			
	Number of branches to (1000) km ²	2.79	2.45	0.13	25	0.11	0.09	0.014	0.011			
	Number of ATM to (1000) km ²	1.33	1.52	0.12	25	0.05	0.06	0.006	0.007			
				1				0.095	0.088			
Usage	Loans and deposits to GDP (banking depth)	21.7	21.3	0.25	75	0.29	0.28	0.075	0.07	0.5	0.107	0.104
	Number of bank deposit account to number of adults	6.5	6.6	0.5	75	0.09	0.09	0.045	0.045			
	Number of bank loan account to number of adults	0.2	0.2	0.25	40	0.005	0.005	0.0012	0.0012			
				1				0.12	0.12			

Source: Central Bank of Iraq, Annual Report of Financial Stability 2016, Department of Financial & Monetary Stability, 2017

8. Model, Data Source and Methodology

8.1 Model

Based on the literature for instance, (Nwagwugwu 2008), (Onaolapo 2015), and (Lenka & Sharma 2017) and taking in account the constraints relating to data availability particularly unavailability of financial inclusion index data for long span in Iraq, the following equation is estimated.

$$\text{Per capita GDP} = f(\text{depth, Density}) \dots\dots\dots (1)$$

Per capita GDP (a proxy for economic growth) is used to measure of the total output of a country, an increase in this indicator signals growth in the economy and tends to reflect an increase in productivity. Depth (a proxy for banking services' usage) measured by dividing the sum of the private sector deposits and credit to private sector by GDP. Banking deepening refers to the increase providing of banking services in both dimensions deposits and credit services with a wider choice of services geared towards the development of all levels of society (Nwagwugwu, 2008). The economic growth increase as long as this indicator increase. Banking density (a proxy for banking services' access) measured by (number of population per 1000 to the number of bank branches). The expand of banking structure through open more bank branches will increase the banking services to neglected segments of population and this increase their productivity.

8.2 Data Source

The present study uses annual time series data for the period 1990-2016. The amounts of deposits and credit and number of bank branches extracted from the Central Bank of Iraq. The values of GDP and number of population obtained from the Ministry of Planning

8.3 Methodology

This paper aims to measure the impact of financial inclusion on economic growth in Iraq during the period 1990-2016. Based on the time series nature used in this paper which are integrated from different order I(1) and I(0), we apply the Autoregressive Distributed Lag (ARDL) approach to cointegration as outlined by Pesaran and Pesaran (1997) and Pesaran and Shin (1998) to achieve the objective of the paper. The advantages of the ARDL model are summarized in the following: i) it accepts variables of different order, ii) it takes a sufficient number of lags to capture the data generating process from a general to specific modeling framework iii) it yields superior estimates of long-run coefficient, and the diagnostic tests of the estimated equation are more reliable, iv) from the ARDL model, one can derive a dynamic error correction model (ECM) through a simple linear transformation, and v) the ARDL model is a more appropriate measure in the case of a smaller sample (Khalaf and Sanhita 2009). The dynamic ARDL model is described as follows:

$$\Delta Y = \alpha_0 + \sum_{i=1}^p \beta_1 Y_{t-i} + \sum_{i=1}^p \beta_2 \Delta X_{1t-i} + \sum_{i=1}^p \beta_3 \Delta X_{2t-i} + \lambda_1 Y_{t-1} + \lambda_2 X_{1t-1} + \lambda_3 X_{2t-1} + \mu_t$$

where:

Y = Per capita GDP, X₁ = Banking Depth, X₂ = Banking Density,

Δ = 1st difference of a variable,

α₀ is a constant,

p is a maximum lag order,

β₁, β₂, β₃ represent the short-run coefficients (error correction dynamic),

λ₁, λ₂, λ₃ correspond to the long-run relationship,

i time trend, and,

μ_t is the white noise error

The ARDL approach tests null hypothesis of long run relationship between variables is ($H_0: \lambda_1, \lambda_2, \lambda_3=0$) which reveals the nonexistence of the relationship between variables in long-run. On the other hand, the alternative hypothesis shows the existence of long-run relationship (co-integration) between financial inclusion's variables and economic growth, irrespective of whether the regressors are I(0) or I(1). This can be gauged by applying F-bounds test for cointegration. The estimated model being cointegrated if the estimated value of F-bounds test exceeds the upper critical value, then the null hypothesis of no cointegration is rejected, otherwise we accept null.

8.4 Empirical Analysis

Unit Root Test

Table (6) shows the results of Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test for unit root. It indicated that the both series viz. per capita GDP and banking depth are I(1) while the series banking density is I(0) and no one of them is I(2).

Table 6: Unit Root Results

Regressor	I(0)		I(1)	
	P-value			
	ADF	PP	ADF	PP
Per capita GDP	0.2515	0.5399	0.0474**	0.0476**
Banking Depth	0.8530	0.8674	0.0317**	0.0001***
Banking Density	0.0499**	0.0499**	0.0013***	0.0013***

Notes: (i) ***, ** and * indicates significant at 1%, 5% and 10% critical level. (ii)

Probability values for ADF and PP test are as per MacKinnon one-sided p-values.

Source: This table estimated by the authors based on (EViews9) package.

Diagnostic Tests:

To ensure the accuracy of the estimation we run diagnostic tests for Heteroskedasticity, Serial Correlation, Functional Form, and Normality. Table (7) shows that our estimated model is reliable since it passed all these tests.

Table 7: Diagnostic Tests of Estimated ARDL

Tests	F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square
Heteroskedasticity Test: Breusch-Pagan-Godfrey: F(9,15)	2.083616	0.1004	13.88973	0.1263
Breusch-Godfrey Serial Correlation LM Test: F(2,13)	0.626622	0.5498	2.198173	0.3332
Functional Form: F(1,14)	8.460033	0.0114		
Normality Tests: Skewness: Kurtosis: Jarque-Bera Prob.			-0.069 2.566 0.215 0.897	

F-bounds Test for Cointegration:

This test examines the null hypothesis (H_0) of absence of long run relationship among estimated variables against the

alternative hypothesis (H_1). The results of table (8) shows the existence of long run nexus among the variables as the estimated F-bounds is significant at (10%).

Table 8: F-Bounds Test for ARDL Model

Estimated F-Statistics	5.61	
Significance	10 Bound	11 Bound
10%	4.19	5.06
5%	4.87	5.85
2.5%	5.79	6.59
1%	6.34	7.52

Long Run and Short Run Estimations:

Table (9, 10) shows that the low level of financial inclusion did not affect the economic growth in Iraq during the period 1990-2016 either in the long run or short run. This result is expected since the main source of financing the economic growth is the oil revenues through the fiscal policies and high level of financial exclusion which estimated around (90%). This implies that more efforts need to be done to increase the financial inclusion in Iraq. One of the objective has been taken by the Iraqi government is salary domiciliation and expected to increase the financial inclusion by more than (50%) in short period. Statistically speaking that the error correction term is significant and shows that around (63%) of the disequilibrium in the previous year is corrected in the current year, and the specified relationship returns to equilibrium relatively fast.

Table 9: Short Run Estimations of ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PERCAPITA(-1))	0.70	0.27	2.58	0.0209
D(DEPTH)	-15.86	7.98	-1.98	0.0654
D(DEPTH(-1))	9.13	5.63	1.62	0.1255
D(DEPITY)	-0.02	0.03	-0.54	0.5914
D(DEPITY(-1))	-0.03	0.02	-1.33	0.2033
D(@TREND())	0.22	0.06	3.70	0.0021
ECT(-1)	-0.63	0.24	-2.65	0.0182

Note: Dependent variable is PERCAPIYA and ARDL model (2,2,2) is selected based on Schwarz Bayesian Criterion.

Table 10: Long Run Estimations of ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEPTH	-4.26	8.63	-0.49	0.6284
DEPITY	-0.07	0.05	-1.41	0.1762
C	1.63	3.00	0.54	0.5934
@TREND	0.35	0.091	3.90	0.0014

Note: Dependent variable is PERCAPITA and ARDL model (2,2,2) is selected based on Schwarz Bayesian Criterion.

Finally, to investigate the stability of the long-run and short-run relationships of our ARDL model for the whole period, the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) of the recursive residual test for structure stability, proposed by Brown et al (1975), have been used. These two tests examine the null hypothesis that the estimated coefficients are stable. We accept the null hypothesis if the plotted CUSUM and CUSUMSQ remains within the 5 per cent critical bound. These two tests are presented in Charts 4 and 5 and indicate acceptance of null hypothesis that confirm the stability of the estimated ARDL model.

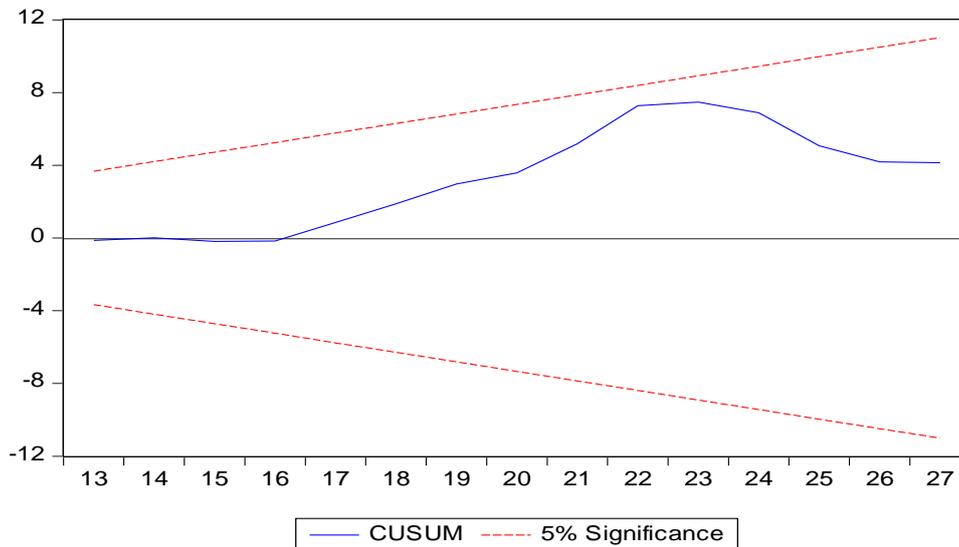


Chart (4) Plotting of CUSUM Statistics for Stability Test

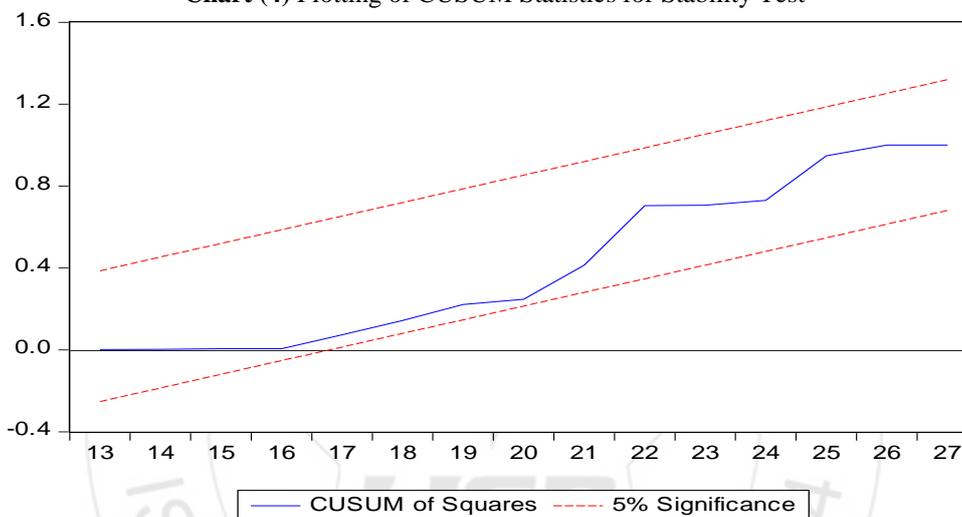


Chart (5) Plotting of CUSUMSQ Statistics for Stability Test

9. Conclusions

The financial inclusion is accounted as a priority objective by the Central Bank of Iraq and many attempts have been undertaken to enhance it to increase the financial depth and contribution of financial sector in economic growth and poverty reduction as well. Unfortunately, the level of financial inclusion is low as estimated by (10%) which means (90%) of Iraqis are unbanked and do their financial transactions away of formal financial sector. The econometrics results discovered that absence of the relationship between the financial inclusion indicators *viz.* banking depth and banking density and economic growth proxied by the per capita GDP.

This fact emphasizes that more efforts need to be done to enhance and extend the financial inclusion in Iraq through financial literacy, costumers protection, providing financial services to rural area, and engage of low income people in the formal financial services especially via microfinance products.

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