

Estimate the Impact of Financial Inlusiveness on Economic Growth in Egypt Econometric Study

Dr. Doaa Wafik

Higher Institute of Administrative
Sciences Egypt. doaawafik@gmail.com

Dr. Mona Omar

Ain Shams University.
mo.omar49@bus.asu.edu.eg

I. Abstract:

Financial inclusion allows each member of the community to easily access all financial services by channeling savings (Deposits Channel) to good investment opportunities through formal channels (Loans or credit channel), and helps to establish projects and create more jobs.

This study aims to assess the impact of financial inclusion on economic growth in Egypt during the period 1980-2019. This is done using the standard model analytical method [ARDL and ECM] using time series, and financial inclusion indicators (loans-deposits) were used as independent variables and (GDP) as dependent variable.

The results of the standard study, using ARDL models, have demonstrated the moral and positive implications of financial inclusion for Egypt's economic growth.

Key words: Financial inclusion, Economic growth, Social growth and Sustainable Development, ARDL and ECM models

II. Introduction:

The World Bank defines financial inclusion in its 2014 report, entitled the Global financial development report as "the proportion of people who use financial services"

Financial inclusion refers, according to the Arab Monetary Fund's common report and the indicative Group for helping the poor was published in January 2017 under the heading "measuring Financial inclusion in the Arab World" to support individuals, including low-income people, companies, including the smallest, with effective access and benefit (for reasonable prices) from a wide range of high quality official financial services (payments, transfers, savings, credit, insurance, ... Etc.), they are provided in a responsible and sustainable manner by a variety of financial service providers operating in a legal and regulatory environment suitable". (Han and Melecky, 2013)

The spreading of financial services is a key foundation for the development of the Bank Group's objectives to end poverty by 2030. The World Bank has called to generalization financial services for all in 2020, and this means that access is necessary on the core services provided by the formal financial system of all through discount cards or mobile phones. This can be achieved through the development of ambitious goals and reforms that countries lead technology, innovation and data for transformation fundamental to business models, and engorging public-private initiatives. The aim is to rapidly expand access to financial services, which includes savings, credit, and insurance services, in addition to transactions and payment services. (Pearce, 2011)

In this regard, the Bank Group is currently expanding its scope of services financial, knowledge, advisory and technical support to reach one billion new customers. It also serves with partners such as development institutions, donors, government counterparts and sector companies special to accelerate progress in the dissemination of financial services.

In order to verify the assessment of financial inclusion impact on GDP, the hypothesis that there is a positive relationship

between total loans and GDP must be tested as well as the validity of the impact must be tested through the hypothesis that there is a negative and statistically non-significant relationship between total deposits and GDP. (Camara and Tuesta, 2014).

III. Literature Review

For a long time, several studies illustrate the financial inclusion as a financial sector development and its positive impact relationship such as capital accumulation, Investment, savings, and financial technology innovation led to affect the development of the economic growth. (e.g., Romer, 1986; King & Levine. 1993; Akinboade,1998; Arestis, P., et al., 2000; Erlando et al., 2020;).

Most studies have confirmed the importance, positive relationship and impact between financial inclusion and economic growth. Moreover findings show that financial inclusion leads to more extended and effective impact on macroeconomic sectors. In other words grow saving and balanced base of retail deposits; lead to increase Economic Growth. (Vo et al., 2020).

The global policy community in a few past years reveals that financial inclusion is embraced and considered as an objective for the financial sector and Economic Development. G.20 first agreed on the agenda of financial inclusion in 2008, and in 2010 the agenda had established. The alliance Financial Inclusion (AFI) was founded as an institution as a peer exchange body for regulators from developing countries. In AFI all policies, developed strategies, and specific national Financial Inclusion of governments was investigated by AFI. Arun and Kamath (2015),

In Beck, Kunt and Levine (2000), the importance of financial development on GDP was examined by introducing a new database that measures the financial development that include indicators of the size, activity, efficiency of banks, non-banks institutions and markets to comprise financial structure and financial development. The statistical results assure that there is

an impact of these indicators on financial sector and on Economic Growth for 175 countries over time period 1960 to 1997. [Odhiambo \(2004\)](#),

Investigate the relationship between financial development that expressed by the ratio of broad money (M2) to gross domestic product (GDP), Currency ratio (M1) that's represent the sum of currency and demand deposits, and the ratio of bank claims on private sector to nominal GDP and the economic growth that expressed by GDP. The relation examined by estimated the direction of causality between variables using time series data of south Africa against real GDP per capita and a proxy for economic growth. The study uses Johansen-Juselius cointegration technique and vector error correction mechanism (ECM). The results explain that's there is a appositive impact of the demand side of financial development on economic growth.

The review in [Arena \(2008\)](#) introduced insurance market activity as a proxy of financial inclusion and its contribution as a financial intermediary and as a protection instrument that indemnification the households and firms from risk transfer by using the amount of saving effectively; that lead to achieve dynamics effect on Economic Growth. Using the Generalized Method of Moments (GMM) for dynamic models of panel data for 55 countries for the period 1976 - 2004, the results asserts that both life and nonlife insurance have a positive and significant causal effect on economic growth.

Later, [Arora \(2012\)](#) suggests a new approach to examine the relationship between Financial Inclusion and Development in Asia using human capital that influence on the efficiency of financial inclusion and increasing the utilization of financial services. In his article three stages of methodologies were used, the first methodology implements the multidimensional indicators to build a Financial Development Index (FDI) and Education Development Index (EDI) for sample of 21 countries of developing Asia for the period 2000-2010. Then, in the second methodology he conducting the Principal Components Analysis (PCA) to shortlist variables, finally in the third one he examined

the relationship between financial inclusion and human capital using Ordinary Least Squares (OLS). Results assert that there are different ranks between countries in educational development and financial development, moreover a strong positive relationship between physical access to banks and expected years of schooling and mean years of schooling was proved, and a negative significant between (FDI) and (EDI).

[Kunt and Klapper \(2013\)](#), investigates the indicators that measure the financial inclusion like countries save, borrow, make payments, and manage in 148 countries, using the data that represents the share of population which uses formal financial services and examined the significant country and individual variation level in how adults use financial formal and informal accounts. Results find a formal account in banks have a lot of benefits (e.g., encourage saving, open access to credit, make transfer wages easier, remittances, government payments), furthermore, broad based penetrate is accessible and affordable. As well as the increasing formal account considered financial inclusion; encourage the achieving of income quality and higher Economic Growth.

[Zulfiqar, Chaudhary and Aslam \(2016\)](#), introduced the empirical evidence that, financial inclusion in Pakistan that led to access to credit will have been increasing gradually the share of employment of females; which increase the productive power in their economics, also is allowed to reduce the poverty alleviation and income inequality. Finally, the financial inclusion has increased the sharing of women's employment and their productivity which affect positively the Economic growth in the long run in Pakistan.

[Chauvet and Jacolin \(2017\)](#), Turning to firms in developing in 79 emerging countries to illustrate the impact of financial inclusion and the consist of concentration on the performance of 55,596 firms, results assert Primarily, there's a positive effect with less concentration in banking system. Secondly, the competitive banks favor the firms that have less financial inclusion, because it will have achieved more growth. Finally, the

Financial Inclusion as a banking system led to develop the quality and performance of firms, if there are limited Deeping financial in these countries.

After global financial crises, the Financial Inclusion became most important for public policy to follow. [Ahmed and Mallick \(2019\)](#), examined A sample of 2635 banks in 86 countries up to 2004 to 2012; they found that higher level of financial inclusion contributes to achieve greater bank stability. Furthermore, [Neaime and Gaysset \(2018\)](#), investigate with empirical evidence that create the Financial Inclusion for 8 MENA countries at the period from 2002 to 2015 using Econometric Models: Generalized Method Moments (GMM) and Generalized Least Square (GLS); have firstly, a positive impact in reducing inequality income; Although the inflation and the size of population led to increasing income inequality. Secondly, there's no impact of Financial Inclusion on Poverty though there's an impact of inflation, size of population and trade openness had an increase to poverty. Finally, by using Financial Integration as a factor to Financial Instability in MENA countries; the results found that Financial Inclusion affect positively on achieve Financial Stability.

If the Researcher analyze the factors that implied affecting on Financial Inclusion in developing economies of 43 countries as [Kabakova and Plaksenkov \(2018\)](#), considered as three factors [high socio-demographic factors like social welfare using (social health), Technological (Digital) Factors like use digital methods: electronic payments, mobile banking. [Dekoker and Jentzsch \(2013\)](#), and economic factors like Economic growth or economic development.

[Ander and Kapoor \(2010\)](#), find that mobile banking as a technological factor as a financial inclusion don't allow to develop economies without asset a good quality of info-structure like high quality mobile network in place.

[Bolbol, Fatheldin and Omran \(2005\)](#), illustrates in their article the relationship between Financial Structure and total factor productivity (TFP) in Egypt. For the period from 1974 to 2002.

Results asserts that the widening in securities market as a financial sector will have achieved benefits to TFP and develop the Economic Growth in Egypt.

Abu-Bader and Abu-Qarn (2008), measures the financial development in Egypt. using four variables: the ratio of money stock (M2Y), M2 to nominal GDP(M2/GDP), the ratio of bank credit to the private sector to nominal GDP(PRIVY), and the ratio of credit issued to non-financial private firms to total domestic credit (excluding credit to banks) (PRIVATE), and examined the significant effect for these variables as an independent on economic growth as a dependent variable up to the period 1960-2001with utilizing VAR and Granger causality tests using the cointegration and vector error-correction (VEC) methodology. The results explain that a bi-directional Granger causality between economic growth and financial development in Egypt.

Whereas, Sayed, Abbas and Touny (2020), analyzes the impact of financial inclusion on Economic Growth in Egypt, utilize Descriptive analysis and secondary data for the Number of ATMs and the Deposits in various financial institutions as independent variables and its impact on GDP as dependent variable using fully modified least square (FMOLS) method up to the period 2007 to 2018. The Results of this article revealed to there were a positive correlation between GDP and the number of ATMs also, there's a negative relationship between GDP and total deposits.

From the Literature review, it is observable that the existing studies concentrated on the various economically and econometrically ways used to analyze, investigate and examined the impact of financial development, financial inclusion with different Indicators on economic growth in different countries. Consequently, its necessary to introduce this study that seeks to fill the gap by determining the Impact of Financial Inclusion on GDP in Egypt.

IV. The basic conditions proposed to be met in the financial inclusion indicators

There are six basic conditions should be checked to determine financial inclusion indicators (Kunt and Klapper, 2012). (Beck, Kunt and Honohan, 2008), (Alber, 2019), these conditions are summarized as:

Benefit and relevance: Selection of indicators that help to develop national fiscal-inclusiveness policies.

Consistency: Ensuring consistency of measurement and comparability in time and place.

Balance: Dealing with the financial coverage of the supply (access to financial services) and demand (utilization of these services).

Pragmatism: Relying as much as possible on available data to reduce cost and effort.

Resilience: Achieving financial inclusion is undoubtedly linked to the economic, geographic, social, and cultural context the state, circumstances and resources differ among States. Therefore, the basic conditions proposed in calculating the financial inclusion Index enables countries to have sufficient flexibility in the selection of tariffs and/or use alternate indicators.

Determination: Measuring financial inclusion accurately, additional efforts and resources may be required to meet the prerequisites as well. However, in terms of flexibility and pragmatism, alternative indicators can be adopted if the basic indicators can't be obtained.

V. Dimensions of financial inclusion according to the World Bank methodology

The most important five components of financial inclusion according to the World Bank methodology are as follows:

The use of bank accounts

The proportion of adults with a financial account in official institutions such as banks, post offices, and finance institutions minor. (Singh, 2017).

The purpose of the accounts (personal or commercial).

The number of amalgamation (deposit and withdrawal).

Access to bank accounts (such as ATMs, branches of the bank)

Saving

The percentage of adults who have propped up for the past 12 months using official financial institutions (e.g., banks, post offices, etc.).

The percentage of adults who have saved in the past 12 months using an informal savings institution or anyone outside the family.

The percentage of adults who save otherwise (for example, at home) within 12 months Past. (Amidzic, Massara and Mialou, 2014).

Insurance

The percentage of adults securing themselves.

The percentage of adults working in agriculture, forestry, or fishing and securing their activities (Their crops and livestock) against natural disasters (precipitation and storms). (CGAP and Arab Monetary Fund, 2017).

Payments

The percentage of adults who have used an official account to receive government wages or payments in 12 months past.

The percentage of adults who have used an official account to receive or send money to family members who live elsewhere in the past 12 months. (Global partnership for Financial Inclusion, 2011),

The percentage of adults who used the mobile phone to pay bills, send, or receive money in 12 months past.

Borrowing

The percentage of adults who have borrowed in the past 12 months from an official financial institution.

The percentage of adults who have borrowed in the past 12 months from traditional informal sources (including those who have borrowed from traditional sources) including borrowing from the family and friends. (LeyshtonandThrift,1993).

VI. The reality of financial inclusion

According to the World Bank's Global Financial Services Dissemination Index (FINDEX), about 38 percent of the total world's adult population has access to official financial services. (Hannig and Jansen, 2010). Some detailed data was provided for the Arab countries and Egypt as below:

For the Arab countries:

Less than a quarter of adults with accounts at financial and banking institutions have savings accounts.

72% of adults have access to formal financial services. Only 5% of adults, without regard to the Gulf Cooperation Council (GCC) countries, borrow from official channels. (Sethi and Sethy, 2019).

For Egypt:

40% of adults have Account ownership at a financial institution or with a mobile-money-service provider at 2017. (World Development Indicators,2020).

Automated teller machines (ATMs). (per 100,000 adults) is 20.07017591 at 2019. (World Development Indicators,2020).

Number of branches 38 at 2018. (Annual report of central bank of Egypt, 2018-2019).

Depositors with commercial bank. (Per 1,000 adults) is 541.6274885 at 2019. (World Development Indicators,2020).

Borrowers from commercial bank, (per 1,000 adults) is 123.5066775 at 2019. ([World Development Indicators,2020](#)).

VII. Research methodology

Estimate the impact of financial inclusion by total deposits (d) and total loans (l) on gross domestic product (GDP) in Egypt by ARDL bound test for the period (1980 to 2019) to test the existence of a relationship between variables in levels regardless the underlying regressors are purely I (0), purely I (1) or mutually cointegrated (e.g., Pesaran, M. H., Chin, Y. & Smith, R. J ,2001). This methodology used Wald or F-statistic in a generalized Dicky–Fuller type to test the significance of lagged levels of the variables under consideration in a conditional unrestricted equilibrium-correction model (ECM).
by using EViews (v.10).

1. Data set

In this research the Egyptian annual data from 1980 to 2019 has been used. The sample period, which shown in Table (1), is determined by the availability of the following variables, Gross Domestic Product (GDP), total Deposits (d), total loans (l), interest deposits (di), interest lending (li), money measures (m2) which also can represent liquidity and wealth (financial assets), inflation (INF), real exchange rate (RER). All variables are natural logarithm of real values. However, both interest rates and inflation are nominal variables. While Table (2) shows the descriptive analysis for all variables, and when take variance inflation factor test to independent variables (VIF). In Table (3) the results provides that there isn't relationship between independent variables at 10% significant level. So, there's no multicollinearity between independent variables and its validity to test.

Table (1): Variables, definitions and sources

Variablies	Symbol	Definitions	Source
Dependent	GDP	Gross Domestic Product.	http://data.worldbank.org/country/egypt-arab-republic
Independent	d	Total deposits.	https://fred.stlouisfed.org/series/BOGZ1FA794100005A
	l	Total lending.	https://www.cbe.org.eg/ar/EconomicResearch/Publications/Pages/AnnualReport.aspx
	di	Deposite interest rate.	http://data.worldbank.org/country/egypt-arab-republic
	li	Lending interest rate.	http://data.worldbank.org/country/egypt-arab-republic
	M2	Broad money.	http://data.worldbank.org/country/egypt-arab-republic
	inf	Inflation.	http://data.worldbank.org/country/egypt-arab-republic
	RER	Real exchange rate.	https://www.bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database/

Source: by authors

Table (2): Descriptive Statistics. (Values: billions)

Variables	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis
Gdp	1930	1720	3860	657	952	0.45	1.89
D	11.2	1.79	65.5	0.05	19.5	1.67	4.24
L	42.2	4.29	1510	2.89	239	6.08	38.02
Di	0.09	0.1	0.12	0.06	0.02	-0.27	1.64
Li	0.15	0.14	0.2	0.11	0.03	0.6	2.38
M2	7.19	5.56	14.9	2.58	3.59	0.63	2.14
INF	0.12	0.12	0.3	0.02	0.06	0.44	2.89
RER	144.65	137.78	281.38	84.2	50.39	1.29	4.02

Table (3): Variance Inflation Factor (VIF)

Variable	Coefficient	Uncentered	Centered
		VIF	VIF
d	0.000192	620.6226	4.684109
l	0.000229	791.3281	1.376349
di	2.789667	181.0108	7.958927
li	2.387843	365.4814	10.19632
M2	0.002939	10375.23	4.914581
INF	0.076655	9.870381	2.104359
RER	9.68E-08	15.67574	1.658331
C	2.13465	14776.22	NA

Source: for table 2 and 3 - Output of E-Views.

The GDP can be represented as a function of the other variables as follows:

$$\text{GDP} = f(d, l, di, li, m, inf, rer) \text{ Equation (1)}$$

By taking the first difference to all variables, the results provides that all variables are stationarity, so it provides the validity of use test.

Table (4) Unit root test

variables	ADF - test						PP - test					
	Level			Difference			level			Difference		
GDP	-2.56887	2	T	-	2	C	-2.5674	2	T	-	2	C
				4.524817*						4.507861*		
d	-1.61956	0	C	-	0	-	-1.61953	3	C	-	3	-
				6.730898*						6.709641*		
l	-1.12665	2	C	-	3	-	1.771132	3	C	-	4	-
				5.997176*						2.411590*		
di	-1.29683	2	C	-	2	-	-1.55523	3	C	-	2	-
				4.993780*						-4.417178*		
li	-2.68509	1	T	-	1	C	-1.94569	3	T	-	2	C
				4.696703*						3.787371*		
M2	-0.87127	1	C	-	1	-	-0.86626	2	C	-	0	-
				3.122847*						4.276727*		
INF	-3.29031	1	C	-	0	-	-3.30356	3	C	-	2	-
				9.817290*						10.46557*		
RER	-3.30089	1	C	-	1	-	-2.17207	1	C	-	1	-
				4.804264*						3.735380*		

source: Output of E-Views.

Note: (*), (**) and (***) mean that the variable is stationary at 1%, 5% and 10%, respectively. The numbers beside the critical values represent the number of lags, while t, c, and the critical values represent the variant of the series trend and constant, constant, and no constant or trend, respectively.

By conducting the Unit Root Tests on Table (4). the time series are stable, at level I (0) or in the first difference I (1), depending on the ADF - Test and PP - Test, and then it was made sure that There are stable variants above the first difference which enable completion of the remaining steps of the ARDL model. (Tung, 2015).

2. ARDL model

$$\Delta y_t = \beta_0 + c_0 t + \sum_{i=1}^q \zeta_i \Delta y_{t-i} + \sum_{j=0}^p \omega_j \Delta x_{t-j} + \gamma_1 y_{t-1} + \gamma_2 x_{t-1} + \varepsilon_t$$

. (Haq and Larsson, 2016).

$$\begin{aligned} \text{GDP} = & 0.22 \text{gdp}_{t-1} + 1.06 \text{gdp}_{t-2} - 0.42 \text{gdp}_{t-3} - \\ & [0.38] \quad [1.94] \quad [-1.68] \\ & 0.006 l_t + 0.13 l_{t-1} + 0.09 l_{t-2} - 0.15 l_{t-3} \\ & [-0.23] \quad [2.25] \quad [0.72] \quad [-1.02] \\ & - 0.21 l_{t-4} - 0.003 d_t + 0.014 d_{t-1} - 0.003 d_{t-2} \\ & [-2.71] \quad [-0.34] \quad [1.87] \quad [-0.48] \\ & - 0.019 d_{t-3} - 0.022 d_{t-4} + 0.17 m_t - 0.08 m_{t-1} \\ & [-3.09] \quad [-2.68] \quad [0.93] \quad [-0.32] \\ & + 0.20 m_{t-2} + 0.32 m_{t-3} - 1.04 M_{t-4} - 1.61 \text{inf}_t \\ & [0.90] \quad [0.36] \quad [-2.36] \quad [-0.88] \\ & - 1.08 \text{inf}_{t-1} - 4.88 \text{inf}_{t-2} - 1.18 \text{inf}_{t-3} \\ & [-0.48] \quad [-2.03] \quad [-0.11] \\ & + 1.77 \text{inf}_{t-4} - 0.45 \text{rer}_t - 0.34 \text{rer}_{t-1} \\ & [2.31] \quad [-2.13] \quad [-1.31] \\ & - 0.63 \text{rer}_{t-2} + 0.60 \text{rer}_{t-3} + 0.39 \text{rer}_{t-4}. \quad \text{Equation (2)} \\ & [-1.48] \quad [2.26] \quad [1.42] \\ \sigma = & 0.46 \quad \text{RSS} = 0.0010 \quad \text{R}^2 = 0.99 \quad \text{F} = 1692.893 [0.00] \quad \text{R}^2_{\text{adj}} \\ = & 0.99 \end{aligned}$$

Table (5): ARDL Test

Dependent Variable: LN_GDP				
Sample (adjusted): 1984 2019				
Included observations: 36 after adjustments				
Maximum dependent lags: 3 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (4 lags, automatic): LN_L LN_D LN_M2 INF RER				
Fixed regressors: C				
Selected Model: ARDL(3, 4, 4, 4, 4)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ln GDP(-1)	0.215804	0.566352	0.381043	0.7145
ln GDP(-2)	1.061788	0.547888	1.937964	0.0938
ln GDP(-3)	-0.41806	0.249228	-1.677412	0.1374
ln l	-0.0061	0.026344	-0.231502	0.8235
ln l(-1)	0.130714	0.058092	2.25011	0.0592
ln l(-2)	0.093902	0.130773	0.718054	0.496
ln l(-3)	-0.14729	0.144732	-1.017664	0.3427
ln l(-4)	-0.2141	0.07888	-2.714206	0.03
ln D	-0.00322	0.009356	-0.344285	0.7407
ln D(-1)	0.01436	0.007669	1.872418	0.1033
ln D(-2)	-0.00302	0.006349	-0.475925	0.6486
ln D(-3)	-0.01932	0.006246	-3.093153	0.0175
ln D(-4)	-0.02205	0.008236	-2.677399	0.0317
ln M2	0.167682	0.179725	0.932988	0.3819
ln M2(-1)	-0.07534	0.231856	-0.324935	0.7547
ln M2(-2)	0.204996	0.228765	0.8961	0.4
ln M2(-3)	0.31817	0.882535	0.360518	0.7291
ln M2(-4)	-1.04427	0.441752	-2.363938	0.0501
INF	-1.6E-09	1.83E-09	-0.877537	0.4093
INF(-1)	-1.1E-09	2.25E-09	-0.480369	0.6456

INF(-2)	-4.9E-09	2.4E-09	-2.029996	0.0819
INF(-3)	-1.2E-09	1.05E-08	-0.111712	0.9142
INF(-4)	1.77E-08	7.67E-09	2.309329	0.0542
RER	-0.45336	0.212831	-2.130155	0.0707
RER(-1)	-0.33953	0.259116	-1.310346	0.2314
RER(-2)	-0.62513	0.421313	-1.483754	0.1814
RER(-3)	0.595891	0.263708	2.259657	0.0584
RER(-4)	0.387681	0.273417	1.417911	0.1992
C	17.25738	6.633436	2.601575	0.0353
R-squared	0.999852	Mean dependent var	28.25367	
Adjusted R-squared	0.999262	S.D. dependent var	0.458906	
S.E. of regression	0.012469	Akaike info criterion	-5.957637	
Sum squared resid	0.001088	Schwarz criterion	-4.682025	
Log likelihood	136.2375	Hannan-Quinn criter.	-5.512414	
F-statistic	1692.893	Durbin-Watson stat	2.378116	
Prob(F-statistic)	0			

source: Output of E-Views.

The results of the model;

In Table (5), all variable total loans, total deposits, broad money, inflation and real exchange rate explain the model by 99% for the change of gross domestic product. In addition, we can notice that: There is a positive statistical significance relation between gross domestic product with two lags and gross domestic product at 5% significance, so, when the lagged gross domestic product

increased by 100% there is an excess in gross domestic product by 106%.

There is a positive statistical significance relation between total loans with one lag and gross domestic product at 5% significance, so, when the lagged total loans increased by 100% there is an excess in gross domestic product by 13%.

There is a positive statistical significance relation between total deposits with one lag and gross domestic product at 10 % significance, so, when the lagged total deposits increased by 100% there is an excess in gross domestic product by 1%.

There is a negative statistical significance relation between broad money as a wealth with four lags and gross domestic product at 5% significance, so, when the lagged broad money increased by 100% there is decreased in gross domestic product by 104 %.

There is a positive statistical significance relation between inflation with four lags and gross domestic product at 5% significance, so, when the lagged inflation increased by 100% there is an excess in gross domestic product by 177 %.

There is a negative statistical significance relation between real exchange rate and gross domestic product at 5% significance, so, when the real exchange rate increased by 100% there is decreased in gross domestic product by 45 %.

3.ARD Long Run Form and Bounds Test

Table (6): F-Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.547747	10 %	2.08	3
K	5	5 %	2.39	3.38
		2.5 %	2.7	3.73
		1 %	3.06	4.15

source: Output of E-Views.

The results of F-Bounds Test, Table (6): illustrate the value of F= 4.55; its greater than upper pound I (1) at 1% significance that = 4.15 %. that's assert there is long-run equilibrium relation between gross domestic product and determinants of financial inclusion (total loans, total deposits). (Abdelkader,2013).

4.Error Correction Form. (Haq and Larson, 2016)

$$\begin{aligned}
 \Delta Gdp = & -0.64 gdp_{t-1} + 0.42 gdp_{t-2} - \Delta 0.01 l + 0.27 l_{t-1} + \\
 & [-3.42] \quad [3.89] \quad [-0.94] \quad [6.41] \\
 & 0.36 l_{t-2} + 0.21 l_{t-3} - \Delta 0.01 d + 0.04 d_{t-1} + 0.04 d_{t-2} \\
 & [5.17] \quad [4.21] \quad [-1.13] \quad [6.55] \quad [6.65] \\
 & + 0.02 d_{t-3} + \Delta 0.17 m + 0.52 m_{t-1} + 0.73 m_{t-2} + \\
 & [4.94] \quad [1.81] \quad [4.32] \quad [5.93] \\
 & 1.04 m_{t-3} - \Delta 1.62 inf - 1.16 inf_{t-1} - 1.65 inf_{t-2} - \\
 & 1.77 inf_{t-3} \\
 & [5.29] \quad [-1.70] \quad [-7.07] \quad [-7.84] \quad [-5.08] \\
 & - \Delta 0.45 rer - 0.36 rer_{t-1} - 0.98 rer_{t-2} - 0.39 rer_{t-3} \\
 & [-4.82] \quad [-3.85] \quad [-6.35] \quad [-3.25] \\
 & \quad \quad \quad - 0.14 ECM_{t-1}. \text{Equation (3)} \\
 & \quad \quad \quad [-7.69] \\
 \sigma = & 0.01 \quad RSS = 0.0010 \quad R^2 = 0.91 \quad R^2_{adj} = 0.77
 \end{aligned}$$

Table (7): Error Correction Model

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LN_GDP(-1))	-0.643731	0.188375	-3.417283	0.0112
D(LN_GDP(-2))	0.418057	0.107357	3.894104	0.0059
D(LN_L)	-0.006099	0.006493	-0.939232	0.3789
D(LN_L(-1))	0.267483	0.041732	6.409484	0.0004
D(LN_L(-2))	0.361385	0.069941	5.166982	0.0013
D(LN_L(-3))	0.214096	0.050887	4.207304	0.004
D(LN_D)	-0.003221	0.002859	-1.126661	0.297
D(LN_D(-1))	0.044394	0.006774	6.553484	0.0003
D(LN_D(-2))	0.041372	0.006221	6.650254	0.0003
D(LN_D(-3))	0.022052	0.004462	4.941555	0.0017
D(LN_M2)	0.167682	0.092821	1.806511	0.1138
D(LN_M2(-1))	0.521108	0.120649	4.319224	0.0035
D(LN_M2(-2))	0.726104	0.12239	5.932686	0.0006
D(LN_M2(-3))	1.044274	0.197444	5.288972	0.0011
D(INF)	-1.61E-09	9.45E-10	-1.699312	0.1331
D(INF(-1))	-1.16E-08	1.65E-09	-7.066347	0.0002
D(INF(-2))	-1.65E-08	2.11E-09	-7.835204	0.0001
D(INF(-3))	-1.77E-08	3.49E-09	-5.076034	0.0014
D(RER)	-0.453364	0.093942	-4.826015	0.0019
D(RER(-1))	-0.358446	0.093024	-3.853289	0.0063
D(RER (-2))	-0.983572	0.155864	-6.310439	0.0004
D(RER (-3))	-0.387681	0.119293	-3.249828	0.0141
Coint Eq (-1) *	-0.140465	0.018268	-7.688999	0.0001

R-squared	0.914024	Mean dependent var	0.04381
Adjusted R-squared	0.768526	S.D. dependent var	0.019018
S.E. of regression	0.00915	Akaike info criterion	-6.29097
Sum squared resid	0.001088	Schwarz criterion	-5.27928
Log likelihood	136.2375	Hannan-Quinn criter.	-5.93786
Durbin-Watson stat	2.378116		

source: Output of E-Views.

The results from table (7) and equation (3); explain that the coefficient of error correction model ECM_{t-1} is negative value, and significant and we can correct mistakes in the first year by 14% and correct the rest 86% in the future 6 years. (Abdelkader, 2015; Nkoro and Uko, 2016).

5. Residual tests

The ARDL model passed the Residual tests at four lags periods with a significant level of 5%, so it passed the Serial Correlation LM test, so there is no serial correlation (LM test) between the variables. As the statistical significance is greater than 0.05; It was 0.17. The illustration is shown in Table (8) as follows:

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

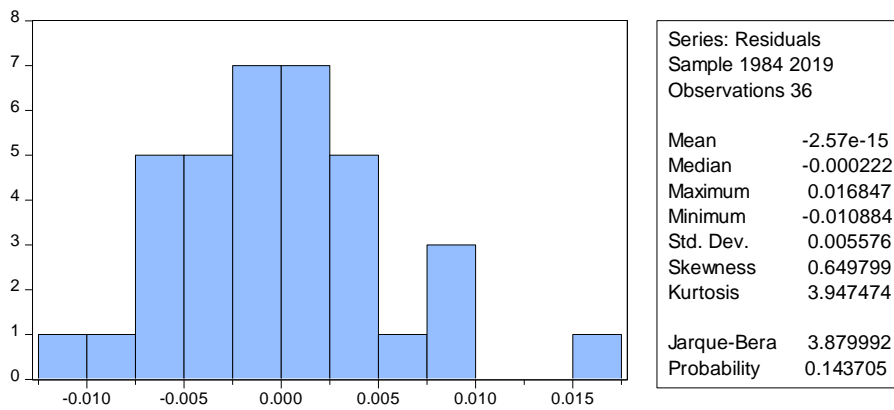
F-statistic	3.360784	Prob. F (4,3)	0.1735
Obs*R-squared	29.43191	Prob. Chi-Square (4)	0

source: Output of E-Views.

In addition, the model passed the Normality test, so the distribution probability of Jarque-Bera was 0.14, which is greater than the significance level 0.05; this indicates that the Residual of

the model are subject to a normal distribution. (Alimi, 2014). The illustration is shown in Figure (1) as follows:

Figure (1): Normality Test



source: Output of E-Views.

The model also passed the Heteroscedasticity test, as its probability was greater than 0.05, amounted to 0.63. (Alimi, 2014), The illustration is shown in Table (9) as follows:

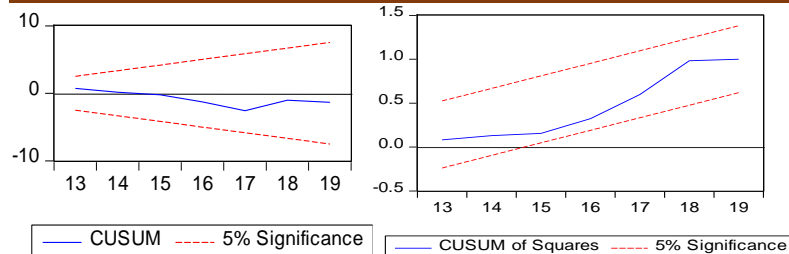
Table (9): Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.883927	Prob. F (28,7)	0.6278
Obs*R-squared	28.06298	Prob. Chi-Square (28)	0.4611
Scaled explained SS	1.563669	Prob. Chi-Square (28)	1

source: Output of E-Views.

6. stability test

The data that used of the ARDL model haven't any structural changes to confirm the validity and accuracy of the model results, by using (CUSUM test) and (CUSUM of square test), and if the curve for each of the two tests is within the range of critical bounds at the level of significance 5%; The null hypothesis that the variables are static will be accepted.



It is evident from the figure that each of the two graphical tests is within the range of critical bounds, and therefore these tests demonstrate the stationarity of the short and long-term parameters of the ARDL model. (Haq and Larson, 2016).

VIII. Conclusions

1. The first hypothesis has been validated, there is a positive and moral relationship between total loans and GDP, In agreement with the theory if the total loans increases by 100%, the higher the GDP by 36%.
2. The second hypothesis was proved incorrect, there is a positive and moral relationship between total deposits and GDP. In contrary with the theory if the total deposits increase by 100%, the higher the GDP by 4%.
3. The long-term equilibrium state of the model and the quality of its predictability can be reached after 6 years; by correcting mistakes in the first year by 14% and the other 86% should by corrected in the next 6 years.

IX. Recommendations:

1. Increasing the number of branches and financial services provided to different locations will increase the total volume of deposits which increases the volume of loans provided, consequently both the GDP and economic growth will increase.

2. The need to strengthen the basic pillars of financial inclusion, especially with regard to the financial infrastructure to support outreach geography of banks, financial institutions and systems of means for payment and settlement.
3. Integrating financial education between the public and private sectors, and spreading the financial awareness to enhance financial inclusion.
4. Creating modern tools at low cost to deliver banking services to all segments of society including women and youth who contribute to achieving financial inclusion.
5. The Union of Arab Banks should increase efforts to encourage innovation and creativity, designing financial products that fit the needs of all individuals, and innovate financial tools and services to meet the needs of low-income categories and women.

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ملخص:

يتيح الشمول المالي لكل فرد من أفراد المجتمع إمكانية الحصول على جميع الخدمات المالية بسهولة من خلال توجيه المدخرات نحو الفرص الاستثمارية الجيدة من خلال قنوات رسمية، كما انه يساعد على تأسيس المشروعات وخلق المزيد من فرص العمل . تهدف هذه الدراسة إلى تقدير أثر الشمول المالي على النمو الاقتصادي في مصر خلال الفترة 1980 - 2019. ويتم ذلك باستخدام الأسلوب التحليلي الخاص بالنماذج القياسية [ARDL و ECM] باستخدام السلاسل الزمنية في الفترة من (1980 - 2019) ، واستخدمت مؤشرات الشمول المالي (القروض - الودائع) كمتغيرات مستقلة و(الناتج المحلي الاجمالي) كمتغير تابع . ولقد أظهرت نتائج الدراسة القياسية من خلال استخدام نموذج ARDL معنوية وإيجابية مؤشرات الشمول المالي على النمو الاقتصادي في مصر.

كلمات مفتاحية: الشمول المالي ، النمو الاقتصادي، النمو الاجتماعي والتنمية المستدامة، نماذج ARDL ونماذج ECM.