Financial liberalization effect in Algeria during the period 1980 – 2016: Application of the VECM model

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Summary:
Since the early 1980s, most developed countries are based on the financial liberalization process to increase their economic growth. However, this experience is often accompanied by a banking crisis that undermined the objectives of financial liberalization. The objective of this study is to assess the impact of financial liberalization on the economic growth rates in Algeria, with some financial and macroeconomic conditions. In the study, we used the cointegration method and the Vector Error Correction Model, during the period 1980- 2016.
The results show that there is an inverse relationship between Algeria's financial liberalization policy and its economic growth. This article also shows that, under certain conditions, more external liberalization is low, more a banking crisis can occur. With regard to the private loan, it has a negative relationship with economic growth, which indicates that the Algerian government does not provide credit facilities. The results also indicate a positive relationship between trade openness and economic growth.

Keywords: Financial liberalization ; Economic growth ; Cointegration method ; VECM model.
Jel Classification Codes : C5, F43, G15, G29

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I- Introduction :

The principles of the invisible hand began to fade after the crisis of 1929 and state intervention in economic and financial activities became necessary. The Keynesian theory supported the inevitability of state intervention in economic activity and increased government spending as well as the control of the financial and banking system. This was motivated by the increase in economic growth rates through the reduction of interest rates to encourage investment.

In the 1960s, the government took a more important role through price controls and controls on the flow of capital and control of the banking system and the financial system. This policy is the most compatible with the economic and developmental trends you have defined.

The policy of financial restraint is based on the following principles:

- Directing credit for government activities and state monopoly of various financial and banking activities through strict restrictions on the entry of the domestic private sector and foreign sector into the financial sector;
- Imposition of fees on financial and banking services;
- Increase the compulsory reserve imposed on commercial banks;
- Imposing barriers and restrictions on the movement of capital across borders.

However, the efforts of governments in the success of the policy of financial restraint soon faded, and most countries faced serious problems, the most important reasons being the ineffectiveness of their financial systems and their inability to achieve financial development, in addition to the lack of investment rate and the high volume of external debt. This has led to negative results and consequently the lack of comprehensive economic development.

For these reasons, developing countries have moved to implement financial reforms and liberalize their banking systems, especially at the end of the 1970s and early 1980s, and are considering the necessity of adopting a policy of financial liberalization.

Following the process of financial globalization in the 1970s, developed countries were hit by serious banking crises. Kaminsky and Reinhart (1996) have shown that the majority of banking crises were preceded by financial liberalization policies. The latter is a set of measures taken with the aim of removing restrictions on the financial sector. It concerns the liberalization of the interest rate, the elimination of restrictions on the capital account and the external opening of the financial sector, etc. financial liberalization can strengthen competition between countries, regarding capital flows, without forgetting the existence of the state in the economy which exercises its control and supervision over financial and economic activities, to increase the pace of economic growth.

Financial liberalization has spread rapidly around the world and its role is to participate in the development of the financial system which, in turn, contributes to the development of the economy. It leads to capital inflows, increases investment and growth and develops the national financial market. But, many criticisms have been leveled against it. Thus, banking crises are more likely to occur in liberalized financial systems with weak banking supervision (Demirgüç-Kunt and Detragiache, 1998) since financial liberalization precedes banking crises by five years and sometimes less (Kaminsky and Reinhart, 1999).

The concept of financial liberalization is due to the work of McKinnon and Shaw (1973), who have shown that financial curbing on the banking system impedes economic growth. They believe that interest rate liberalization has a positive effect on economic growth. In the same vein, (Menzie & Hiro, 2005), (Bekaert, Harvey, & Lundblad, 2005), (Kim & Kenny, 2006), (Alfaro & Hammel, 2007)suggest that developing countries should resort to liberalizing their banking sectors in order to achieve economic growth through Better distribution of capital.

The importance of this work is shown through the subject itself, which is situated within the framework of financial globalization and which is the subject of a very intense debate between economists and researchers. Thus, the economic and financial integration policies implemented in several categories of countries have as their objectives the development of the banking and financial systems of the countries which constitute a crucial stage in economic development.

Through this research we will provide a theoretical reading on the subject of the relationship between the policy of financial liberalization and economic growth in various countries. The main objective of the study is to assess the impact of financial liberalization on the economic growth rates in Algeria, in the presence of some financial and institutional conditions as well as macroeconomic conditions. Based on the history of financial reform undertaken by Algeria in 1990, we can ask the following question:

"Does the practice of financial liberalization in Algeria have an impact on economic growth?"

This study is of great importance, so that the subject of financial liberalization is still the subject of debate and debate among many economists and specialists from supporters to exhibitors, this research provides sufficient information on the policy of financial liberalization in Algeria.

In order to answer the problem, we organized our research as follows: The first topic is related to studies related to the impact of financial liberalization on economic growth. Financial integration on economic growth in Algeria from 1980 to 2016 through the application of joint integration method and error correction vector model.

I.1.Literature review

A policy of financial liberalization is defined as a process that involves a series of measures taken to remove restrictions on the financial sector, such as liberalizing interest rates by allowing them to be set according to supply and demand, securing free entry and exit in the financial market, deregulation of capital restrictions. .etc.

The policy of financial liberalization leads to a significant increase in the movement of capital between countries and thus promote competition, by the presence of the state in the economy, which controls the financial and economic activities, given the high potential risks.

The content of financial liberalization lies in two levels: internally and externally. The internal financial liberalization is the liberalization of interest rates, the abolition of the policy of framing the bank credit, the reduction of the compulsory reserve imposed on banks by the Central Bank, the easing of taxes on financial activities, etc. They can be summarized as follows: elimination of restrictions on capital account transactions and balance of payments accounts, easing of restrictions on swaps as well as elimination of restrictions on direct investment.

In recent decades, several theoretical and empirical studies have attempted to address the relationship between financial liberalization and economic growth. These studies have confirmed that financial liberalization is the most successful way to improve the economic growth of countries.

The importance of financial liberalization and its positive impact on economic growth is due to the work of McKinnon and Shaw (1973).

In his model, McKinnon has shown that the real deposit rate is the key element. He justifies why savings levels in developing countries are low because of the constraints imposed by their governments on the financial system. In addition, McKinnon emphasizes the important role that financial savings play in the development of investments for economic growth. The researcher asserts that many fragmented developing economies face severe functional problems, in which case all economic sectors rely on self-financing for their investments.

Shaw concluded that fiscal curbing is detrimental to economic growth, and that financial liberalization paves the way for a better allocation of savings through the expansion and diversification of capital.

After this, many economists tried to confirm McKinnon and Shaw's theory (1973), and proved that a liberalized banking system plays a positive role in financing the economy. (Mathieson , 1979) continued to confirm this result.

(Roubini & Sala-i-Martin, 1995) have continued to research former economists, highlighting the limitations of financial restraint on state economies and the advantages of financial liberalization.

The study of (Bekaert, G; Harvey, C, 1995) suggests that if countries pursue fiscal liberalization, cross-border capital flows will offset the price of risk across all markets and eliminate the spread.

(Levine & Zervos, 1996) pointed out that liberalization is increasing the liquidity of financial markets and this leads to the development of markets since investors do not face difficulties in entering and exiting.

(Quinn, 1997) examined the relationship between external financial liberalization policy, namely capital account liberalization, and economic growth for a sample of 58 countries during the period 1960-89. Financial flows, so that capital flows have a strong impact on real growth in GDP per capita.

(Levine, R, 1997) pointed out that the liberalization of the banking sector, through its impact on the accumulation of funds and productivity, leads to economic growth, and this through the reduction of transaction costs and the costs of obtaining information on the one hand, and financial development on the other. Facilitates the exchange of goods and services.

Levine asserts that financial liberalization helps develop both the financial markets and the banking system, and that liberalization of the banking sector should help to increase competition and allow the transfer of knowledge.

The study of (Klein & Olivei, 1999) evaluates the impact of capital account liberalization on economic growth through a sample of 92 countries over the period 1986-1995. The researchers stress that financial development is a prerequisite for the success of financial liberalization policy.

(Edwards, 2001) examined the relationship between economic growth and capital liberalization by applying the generalized least squares method to a sample of 62 countries between 1980 and 1989. The findings of the study found that financial liberalization had a positive impact on economic growth in Developed countries, while slowing growth in developing countries. Edwards supports Klein and Olivei (1999).

In a sample of 89 countries between 1976 and 1995, (Edison, Klein, Ricci, & Sloek, 2002) emphasize that external financial liberalization positively affects economic growth, so that liberalization of capital flows allows diversification of risks and thus increases the level of savings resulting. To lower the cost of capital, and in turn raise economic growth rates.

(Trabelsi, 2002), through a sample of 69 countries on the road to growth between 1960 and 1990, shows that financial liberalization has a positive impact on economic growth and this through its impact on investment.

(Bekaert, G; Harvey, C R; Lundblad, C, 2005) emphasize a positive relationship between financial liberalization and economic growth so that foreign investors will press domestic institutions to comply with international standards, improving the quality of local corporate governance and reducing the distinction between internal and external financing.

The objective of the study by (Retia & Nekel, 2018) is to study the influence of financial liberalization on economic growth in Algeria during the period 1990 to 2015 by using the VAR model in order to study the links between economic growth and the different variables of financial liberalization, to then analyze the causal relationship between financial liberalization and economic growth. The main results of this article show that financial liberalization does not have a significant effect on economic growth. This means that the opening of the economy to the outside is not a determining factor of economic growth in Algeria.

(GANA, 2019), in his article tried to examine the relationship between the financial report (RF) and financial interaction (FIR) and their application on the financial structure of the Algerian economy, During the period 1981-2011 . Analysis of the results obtained showed that financial development in Algeria is weak, and that the financial system has not undergone the necessary prudential changes for better financial liberalization.

Several studies have denied the hypothesis of a positive relationship between fiscal liberalization and economic growth, including the (Grilli & Milesi-Ferretti, 1995)of a sample of 61 developing countries between 1966 and 1988. The results of the least-squares method indicate that there is no Between external financial liberalization and economic growth.

(Rodrik, 1998), using a sample of 100 developed countries during the period between 1975 and 1989, using the least-squares method, confirmed that there is no effect of capital liberalization on the economic growth of these countries.

(Ben Naceur, Ghazouani, & Omran, 2008) evaluate the relationship between financial market liberalization and economic growth of a sample of 11 MENA countries during 1979-2005, using the generalized square method. The researchers concluded that there is no impact of financial liberalization on the economic growth of the countries of this region, and stressed the need to apply reforms to the local economies of these countries.

Some studies have shown that middle-level economies are more vulnerable to economic shocks. Financial liberalization of these economies can lead to capital flight.

A study by (Rodrik, D; Velasco, A, 1999) shows that openness to capital flows can be seen in the country if not accompanied by appropriate controls and a strong macroeconomic and regulatory environment.

(Johnson, Darbar, & Echeverria, 1997) strong institutions for monetary policy and exchange rate management before embarking on liberalization.

Other studies critical of financial liberalization confirm that it increases the risk of shocks to countries and rather the banking crisis (Kaminsky & Reinhart, 1996), (Ranciere, Tornell, & Westernmann, 2006), (Barell, Davis, & Pomerantz, 2006), (Tornell, Westermann, & Martinez, 2004), (Demirguç-Kunt & Detragiache, 1998), (Daniel & Jones, 2006), (Noy, 2004), (Abaoud, Rachdi, & Elgaied, 2008), (Ben Gamra & Clévenot, 2006), (Bousrih & Trabelsi, 2005), (Miotti & Plihon, 2001), and (Salameh, 2013).

More recently, by applying the method of simultaneous integration to the 44 countries in the period 1973-2005, **(Ang, 2011)**emphasized that internal and external financial liberalization negatively affect economic growth, which in recent years has led to financial and banking crises.

I. 2. The history of financial liberalization in Algeria:

The launch of financial liberalization in Algeria begins with the Law of Monetary and Loan (90/10), through which shifts have taken place in the structure and activities of banks. The most important of this law is the restoration of the Central Bank's role as the first authority responsible for managing the monetary policy of the country. Restoring the Algerian dinar to its traditional functions, setting non-discriminatory conditions between public and private institutions and achieving flexibility in interest rates by banks.

In the 1990s, Algeria began implementing the Structural Adjustment Program (PAS) in agreement with FMI, through which Algeria rescheduled its external debts. The aim of this program was to ensure macroeconomic balances and encourage economic growth, through which the growth rate resulting from the hydrocarbons and agriculture sectors increased to 4% in 1995 and 1996 after the previous two years saw negative rates, in addition to that the external debt was reduced to 32% in 1996. The volume of exchange reserves doubled in 1996 to $ 4 billion from $ 2 billion a year. The deficit was also reduced from 8.7 percent in 1993 to less than 1 percent in 1996.

Despite the high macroeconomic balance indicators, there was a deep deficit and economic crisis characterized by high unemployment rates, the closure of many institutions and low purchasing power.

The year 1999 also witnessed a recovery in the oil markets, which increased the volume of public expenditure of GDP during the following years, reaching about 34.87% in 2003 from 28.31% in 2000. In 2004-2009, Algeria adopted a supplementary program aimed at Improving living conditions, developing infrastructure, supporting economic development, modernizing public services, and developing modern communication technologies. Through this, the external debt has declined by 85% during the period 1999-2009.

Nevertheless, Algeria is still dependent on hydrocarbon revenues, and is obliged to follow non-hydrocarbon-producing sectors to support economic growth.

The period 2010 - 2014 is characterized by the severity of the international financial and economic crisis, which negatively reflected on the Algerian economy, which negatively affected the general exports, where oil revenues declined by 42.5%.

II– Methods and Materials:

II.1. Study variables

In this study, we will measure the impact of financial liberalization on the economic growth in Algeria during the period 1980 - 2016, where we have reached a model that can be expressed as follows:

$$GDP_{it} = \beta_0 + \beta_1 LF_{it} + \beta_2 OPEN_{it} + \beta_3 M_{2it} + \beta_4 CPS_{it} + \mu_{it}$$

With:

- GDP_{it}: per capita of real GDP, which measures the rate of economic growth;
- LF_{it}: Financial liberalization, measured in the KAOPEN index (Chin and Ito 2002), whose value is between – 1,86 and 2,17;
- $OPEN_{it}$: Total exports and imports relative to GDP. This indicator measures the degree of openness of the economy;
- $M2_{it}$: represents the liquidity of banks and reflects the size of the financial sector;
- $CPSi_{t}$: Private Sector Loans;
- μ_{it}: Error terms.

Descriptive summary statistics are put out in Table 1, which includes a report on the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, JarqueBera (JB) test for normality and the number of observations.

Table 1 represents the descriptive statistics of the variables used in our study. The results show that the majority of variables follow the normal distribution since the Jarque Bera probability is greater than 5%. We notice that our sample has different values. In particular, GDP varies between -4.25 and 5.80 per capita, which most often represents the GDP of poor countries. Likewise, LF varies between -1.87 and -1.17. This shows the weakness of financial liberalization in Algeria. On the other hand, OPEN, M_2 and CPS vary between 32.86 and 76.68, 33 and 83.82, 3.90 and 69.31 respectively.

II.2. Unit Root Test

In order to avoid the phenomenon of false deviation, time series independence tests are the most important step to study any phenomenon. We use the Augmented Dickey Fuller Test.

H0: The series contains the root of the unit (the seriesis unstable).

H1: The seriesdoes not contain the root of the unit (the seriesis stable).

The following table shows the results:

Is clear from the table that time series are unstable in the level since the probability value is greater than 5%, and therefore accept the imposition of non-existence based on the existence of the unit root, but after the first difference test we reject the null hypothesis, and therefore the chains in question are integrated first class and This calls for testing a long-term equilibrium relationship between the study variables and this through the Johansen Test for Joint Integration.

II.3. The cointegration Test

Since the time series under study are stable at the first difference, we will use the co-integration method through the Johansen test, but before this we must determine the optimal slowdown period using the VAR test as shown in the table below:

The table shows that the optimal deceleration period for all the criteria is 1. The results of the Johansen cointegration Test based on the impact statistic are shown in the following table:

In the first, second and third tests, the effect value is greater than the critical value at the 5% level, which indicates that there are more than two co-integral relationships. 5% of the H0 null hypothesis indicates that there are three interrelationships. This indicates a long-term relationship between the variables.

III- Results and discussion :

The results of the cointegration method are shown in the table below:

The estimated model is based on the study of the impact of fiscal liberalization policy on economic growth in Algeria between 1980 and 2016, after introducing some explanatory variables. Based on the results shown in the table it can be said that the relationship between the dependent variable and the explanatory variables is somewhat strong through the correlation coefficient R2, which indicates that the results obtained are good.

The results of the study reached the following points:

- The existence of an inverse and moral relationship between financial liberalization and economic growth, liberalization of the Algerian banking system may lead to a banking crisis and this is because of the lack of development of this system. We must rely on a financial system that facilitates the process of saving and investment and thus works on the development of the economy. This is not the case of the Algerian banking system, which still knows some delay, which indicates that Algerian institutions are still hesitant to open their capital, which leads to Weakness in liquidity (M2) and the instability of the banking system, and therefore the lower the M2 the lower the economic growth and vice versa, and this is shown by the positive impact of M2;
- As for the private loan, it has a negative relationship with economic growth, which indicates that the Algerian government does not give credit facilities for foreign direct investment;
- The results also indicate a positive correlation between trade openness and economic growth. The higher the exports, the higher the level of economic growth, and vice versa, the lower the exports, the lower the level of economic growth. One does not have an industrial base. The decline in exports leads to a trade deficit, which makes the country unable to produce a surplus of liquidity leading to a decline in the M2 index.

From the above results it can be said that Algeria is facing the problem of resource allocation, leading to question the effectiveness of financial intermediation, including the role of the financial sector in financing economic development on the one hand, and the profitability of financial investments on the other. This makes us highlight the efforts that should be made to further develop and modernize the financial sector and the banking system.

The above results show that there is a common integration relationship between the dependent variable and the independent variables so that this relationship can be expressed in the error correction model. Passes two phases:

The first stage is to estimate the long-term equilibrium relationship using the least-squares method, and also calculate the residue coefficients;

The second stage is to estimate the equilibrium relationship in the short term by using the Wald test based on the following null hypothesis and alternative hypothesis:

H0: coefficients of independent variables equal to zero: There is no short-term equilibrium relationship between dependent variable and independent variables;

H1: coefficients of independent variables are different from zero: there is a short-term equilibrium relationship between the dependent variable and independent variables.

The results of estimating the error correction vector model are shown in the table below:

The above table illustrates the coefficients of the error correction model for the three co-integral relationships. Inserted into this form. Note that the error correction model coefficients are negative and significant, indicating a long-term parallel relationship between dependent and independent variables and that the economic growth index is due to its equilibrium value of 73.34% in each period of time.

After confirming that there is a long-term equilibrium relationship between economic growth (GDP) and independent variables, we will test this relationship in the short term by using the Wald test as shown in the following table:

The test results show that in the short term there is no relationship between economic growth (GDP) and independent variables: financial liberalization (LF), trade openness (OPEN), liquidity index (M2), as well as loans to the private sector (CPS). See that the parameters of these variables are not significant at 5%. Thus, we conclude that this relationship exists only in the range, which indicates the inefficiency of the Algerian financial and banking system.

IV- Conclusion:

The aim of our standard study is to measure and determine the relationship between financial liberalization and economic growth in Algeria during the period 1980 - 2016, using the standard least squares method.

The study proved that there is a negative impact of financial liberalization on economic growth. The liberalization of the Algerian banking system could lead to a banking crisis. This indicates the state's dependence on the approach of financial liberalization without supporting conditions. The financial sector must be developed in addition to strengthening the role of the central bank as a monetary authority, and a better policy of trade openness with strict measures to combat corruption.

Fiscal liberalization allows the government to raise incomes and finance trade deficits. To be successful, it must be accompanied by a rise in macroeconomic indicators and transparency in financial services. It must also be gradual so that banks can benefit from recent market changes.

Recommendations:

In order for Algeria to succeed in the policy of financial liberalization and this policy has a positive impact on economic growth and achieve better results to activate the role of financial systems and banking systems and improve financial and monetary indicators, the government must adhere to the following points:

- Seeking to develop and liberalize the stock market to bring the savings and financial resources necessary for economic agents;
- Attracting foreign investments through improving political and economic conditions;
- To join the World Trade Organization as soon as possible in order to take advantage of its advantages to liberalize foreign trade;
- Non-interference by the State in financial and banking activities;

- Reducing tax charges on financial and banking services;
- Strengthen the role of the Central Bank in monitoring the banking system to avoid bank shocks;
- The need for transparency in banking transactions;
- Encourage the establishment of private banks and allow them to support investments;
- Rehabilitation of banks and development of banking and financial services and awareness of individuals about banking;
- Encouraging electronic payment.

- Appendices:

Table (1) : Descriptive statistics of variables

	GDP	LF	OPEN	M2	CPS
Mean	0.605713	-1.339734	57.11222	57.94057	28.12439
Median	0.894639	-1.175030	56.94858	59.43375	13.72401
Maximum	5.801787	-1.175030	76.68452	83.82403	69.31185
Minimum	-4.264032	-1.875024	32.68458	33.00584	3.907417
Std. Dev.	2.536440	0.301391	11.09719	12.96521	25.45704
Skewness	-0.247623	-1.248075	-0.283921	-0.057176	0.658545
Kurtosis	2.389362	2.557692	2.332508	2.395002	1.619667
Jarque-Bera	0.875709	9.104074	1.087985	0.537056	5.156730
Probability	0.645420	0.010546	0.580426	0.764504	0.075898
Sum	20.59424	-45.55097	1941.816	1969.980	956.2293
Sum Sq. Dev.	212.3064	2.997598	4063.872	5547.192	21386.02
Observations	34	34	34	34	34

- **Source:** authors' computation

Table (2) : Augmented Dickey Fuller Test (ADF)

Variables	Level			1st difference			I(d)
	Intercept	Trend and intercept	None	Intercept	Trend and intercept	None	
GDP	0,27	0,18	0,31	0,00	0,00	0,00	I(1)
LF	0,42	0,59	0,18	0,00	0,00	0,00	I(1)
OPEN	0,58	0,30	0,57	0,00	0,00	0,00	I(1)
M2	0,59	0,86	0,62	0,00	0,01	0,00	I(1)
CPS	0,75	0,92	0,20	0,00	0,01	0,00	I(1)

The source**:** Preparation of researchers based on the EVIEWS 9 program

Table (3): VAR Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-434.6728	NA	591412.1	27.47955	27.70857	27.55547
1	-314.2547	195.6794*	1554.616*	21.51592*	22.89005*	21.97141*
2	-290.9147	30.63385	1951.141	21.61967	24.13890	22.45472

The source: Preparation of researchers based on the EVIEWS 9 program

Table (4): The Johansen cointegration Test

H_0	H_1	Trace Statistic	Critical Value (5%)	Prob**
r = 0	r > 0	93.54799	76.97277	0.0016

r = 1	r > 1	63.56764	54.07904	0.0057
r = 2	r > 2	36.64884	35.19275	0.0346
r = 3	r > 3	18.76217	20.26184	0.0793

The source: Preparation of researchers based on the EVIEWS 9 program

Table (5): Results of the cointegration Method

Dependent variable: GDP	
Independents variables	**Cointegration method**
Constant	4.840010 *
LF	-2.724112 **
OPEN	0.049318 ***
M_2	0.007991 **
CPS	-0.045888 ***
R^2	0.788793
Adjusted R^2	0.725607

***, **, ***:** Parameter significance at the level is 1%, 5% and 10% respectively
The source: Preparation of researchers based on the EVIEWS 9 program

Table (6): VECM model parameters

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.733405	0.167965	-4.366414	0.0000
C(2)	-0.415123	2.482634	-0.167211	0.0075
C(3)	-0.048282	0.029796	-1.620387	0.0079

R-squared	0.642720	Meandependent var	0.034888
Adjusted R-squared	0.518449	S.D. dependent var	2.490882
S.E. of regression	1.728519	Sumsquaredresid	68.71893
Durbin-Watson stat	2.157372		

Table (7): Wald Test Results

Variables	Prob**
LF	0.2082
OPEN	0.1446
M2	0.0538
CPS	0.0552

The source: Preparation of researchers based on the EVIEWS 9 program

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