The Impact of Financial Development on Economic Growth: Empirical evidence from Algeria

Fekir Hamza[1], Bouras Nassima[2]
[1]University of Mohamed Ben Ahmed oran 2, LAREEM, algeria, fekir.hamza@univ-oran2.dz
[2] University of Mohamed Ben Ahmed oran 2, LAREEM, algeria, bouras.nassima@univ-oran2.dz

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Abstract:
This study investigates the effect of financial development on economic growth in the case of Algeria during the period (1980-2017). A financial development index is built using principal component analysis (PCA). vector error correction model (VECM), Johansen cointegration test and Granger causality are used to achieve the objectives of the study. The findings indicate the presence of a positive and short-run relationship between the economic growth and the index of financial development. Furthermore, the cointegration tests show a statistically significant long run equilibrium relationship between the two variables. Moreover, the Granger causality test shows a unidirectional causality between financial development and economic growth. These results have important implications to academicians and policy makers in Algeria.

Keywords:financial development; economic growth; principal component analysis (PCA); vector error correction model (VECM); Johansen test for cointegration; Granger causality.
JelClassificationCodes:C23, E69,G21, L26.

***Correspondingauthor**:FEKIR Hamza*

1. INTRODUCTION

The concept of financialdevelopmentis the increased accumulation of financialassets in an economy more thanitself. Whensupply of financialassetgrows in an economy, theirvariety of qualitywidens, lendersinvest in the market, and the financial system expandsfurther(SHAW, 1973). Therefore, development of financial system creates a feedback effectbetweenfinancial and real development. So, Financial deepeningstimulateshigherinvestments, fastergrowth and more rapidlyrising living standards.

Algeriaisclassified as an upper middle-income country (World Bank, 2011). The economyremainshighlydependent on hydrocarbonresources, and, despite high foreign exchange reserves, currentspendinggrowthmakes the budget of Algeria more vulnerable to the risk of prolongedlowerhydrocarbon revenues.

The country isfacing a number of problems, including the need to diversify the economy, reinforcepolitical, economic and financialreforms and improve the business climate. In fact, the Algerian government has undertaken a series of financialreformssince the early 1990s in order to adaptfinancial institutions to this new economicparadigm.

The relationshipbetweenfinancialdevelopment and economicgrowthiswellestablished in both the theoretical and the empiricalliterature. A betterunderstanding of thisrelationship has significant implications to researchers, professionals and policymakers. The financial system thusmobilizesreserves and transformsfundsinto productive resources, and thereby leads to economicgrowth. On the other hand, if the relation goesfromeconomicgrowth to financialdevelopment, then, the economicgrowthwillincreasedemand for sophisticatedfinancial instruments, which in turn leads to development in the financialsector(Ross, 2005).

This article aims to investigate the impact of financialdevelopment on economicgrowth over the period (1980-2017). This paperissubsequentlydividedinto five sections. Section one contains the role of the financial system in economicgrowth. Section twopresents the theoretical approaches on the linkbetweenfinancialdevelopment and economicgrowth. Section threereviewsliterature on financialdevelopment and economicgrowth, while section four describes the methodologyadopted for the study, and lastly section five discusses the results of findings and our conclusion.

2. The role of the financial system in economic growth

The financial system plays an essential role in the allocation of resources in any economy since it helps to mobilize savings and direct funds to the most profitable investment opportunities that are needed to support growth. The following are the roles of financial system in the economic growth of a country:

2.1 The relation betweensavings and investment

In order to achieve economic growth, a nation needs more investment and production that can only happen when there is a facility for savings. Here, financial institutions play an important role, because they encourage people to save by offering attractive interest rates. These savings are channelized through loans to diverse enterprises which are involved in production and distribution.

2.2 Financial system helps in development of Trade

The financial system helps to promote domestic as well as foreign trade. The financial institutions and other intermediaries finance traders and the financial market helps in discounting financial

instruments like bills. Foreign trade is supported by commercial banks through per-shipment and post-shipment finance. Letter of credit is issued by commercial bank in the importer's country in favor of the foreign dealer. Thus, the country receives the precious foreign exchange due to the existence of a financial system.

The most important part of the financial system is that there is no meeting between the seller and the buyer and the documents are negotiated through the bank. In this way, the financial system is helping not only the traders but also different financial institutions. As a result of all of these, the growth of the country is accelerated.

2.3 Financial system contributes to infrastructure and Growth

The financial system plays a crucial role in providing funds for the growth of infrastructure industries in the absence of key industries such as coal, power and oil. The financial sector is helping to raise capital for these industries.

2.4 Financial system ensures balanced growth

Economic development requires balanced growth meaning growth across all sectors concurrently. Primary sector, secondary sector and tertiary sector require adequate funds for their growth. The financial system in the country will be designed by the authorities to distribute the available funds to all sectors in such a way that there will be a balanced growth in the sectors of industry, agriculture and service.

2.5 Financial system attracts foreign capital

A dynamic capital market can attract funds from domestic as well as from abroad. With more capital, investment will expand and that will accelerate the economic growth of a country.

2.6 Financial system contributes to fiscal discipline and to economic control

It is through the financial system, that the government can create a comfortable business atmosphere so that there is no excessive experience of inflation or depression. The government, for its part, can raise adequate resources to fulfill its financial commitments so there is no obstacle to economic growth. The government can also regulate the financial system through appropriate legislation so that it can avoid undesirable or speculative transactions. It might also minimize the growth of black money.

3. Theoretical approaches on the link between financial development and economic growth:

Tree theories are usedto describe the link between financial development and economic growth. The theories include the supply leading hypothesis, the demand-following hypothesis and the bidirectional causality hypothesis. The theories are discussed below:

3-1 Supply Leading Hypothesis

This theory was formulated by(Schumpeter, 1911)and later followed by scholars including(KINNON, 1973); (SHAW, 1973) ;(GUPTA, 1984) ; (FRY, 1988) ;(GREENWOOD, 1990) ; (BENCIVENGA, 1991). The theory postulates that financial sector development in any country plays a vital role in facilitating economic growth through mobilization of savings, facilitation of trading and the diversification of risks among others. These important services lead to efficient allocation of resources; a more rapid accumulation of physical and human capital; and a faster technological innovation that ultimately leads to a rapid and long-term economic growth(Schumpeter, 1911).

3-2 Demand Following Hypothesis

This theory postulates that economic growth is a causal factor for financial development. According to this theory, the increasing demand for financial services will spontaneously generate or lead to the introduction of new financial institutions and markets(GURLEY, 1967).On the other hand, (J, 1952) declares that "where enterprise leads, finance follows", meaning that finance does not cause growth, but rather, it responds to demands from the real sector.

3-3 Bidirectional Causality Hypothesis

This theory originally developed by (GREENWOOD, 1990), was supported by(PAUL, 1992); (BERTHELEMY, 1992); and (Harrisson, 1999). The theory of bidirectional causality marries the supply-leading and demand following hypotheses. The financial development and economic growth are causal to each other or bidirectionally. According to this theory, financial development gradually stimulates economic growth, which in turn, leads feedback and induces further financial development. It does suggest, however, that the two variables simultaneously affect one another.

4. Review of Related Literature

The relationship between financial development and economic growth has been examined in a huge amount of literature. The first evidence begins with the most influential works in this subject (Goldsmith, 1969; Mckinnon, 1973; Shaw, 1973). (GOLDSMITH, 1968)examines the effect of financial structure on development in 35 countries over the period (1860-1963). He confirms the positive effect of financial intermediation on economic growth through the efficiency and volume of investment.Accordingly, McKinnon (1973) argues that an increase in financial development promotes savings mobilization which contributes to higher levels of savings, investment, production, growth, and poverty alleviation.(SHAW, 1973)puts in evidence to support that. He shows that financial intermediaries encourage investment and increase output through borrowing and lending. There has been a surge in financial development models that incorporate financial institutions into endogenous growth since the 1980s (Bencivenga and Smith, 1991; King and Levine, 1993b; Pagano, 1993.Different techniques, such as externalities and quality ladders, were employed explicitly in modeling financial intermediation rather than to take it for granted as in Mckinnon and Shaw framework. These models support the finance-led argument by demonstrating that financial development reduces information frictions and improves the efficiency of resource allocation.

Empirical studies on this topic were developed in the 1990s, following the important work of King and Levine (1993a). They study the relationship between financial development and output growth for 80 countries during the period (1960-1989). They document a contemporaneous relationship. They also conclude that the predetermined component of financial development is a good predictor of long-run growth over the next 10 to 30 years.(DARRAT, 1999), investigates empirically the role of financial deepening on economic growth in three middle-eastern countries (Saudi Arabia, Turkey, and the United Arab Emirates) using multivariate Granger causality tests within an error-correction framework. He attempts to determine the causal link between financial deepening and economic growth in order to distinguish between multiple alternative theoretical hypotheses. His findings support the idea that financial deepening is a necessary causal factor for

economic growth. However, the strength of the evidence varies from country to country and from the proxies used to measure financial deepening.

Other studies by (BENHABIB & SPIEGEL, 2000), Levine, Loayza and Beck (2000) and Rioja and Valev (2004) reach the same conclusion that financial development has a positive impact on economic growth. In line with these studies, (CALDERON & L, 2003) use the Geweke decomposition test (Geweke, 1982) on pooled data of 109 developing and industrial countries to investigate the causal direction between financial development and economic growth during the period (1960-1994). They find a bi-directional causality between the two variables. Moreover, they argue that financial development contributes more to the causal relationships in the developing countries than in the industrial countries. In addition, they concluded that financial development stimulates economic growth through both a more rapid capital accumulation and productivity growth, with the latter channel being the strongest.During the period (1989-2001) Alzubi et al (2006) study the relationship between financial development and economic growth using panel data for eleven Arab countries. Their results show that all financial indicators are insignificant and do not affect economic growth. Alternatively, the results indicate the dominance of the public sector in economic activities. The authors suggest that the financial sectors tend to be underdeveloped and require further efforts to be able to exercise their functions effectively in the Arab MENA countries.

The studies for Algeria's case on the correlation between financial development and economic growth are relatively recent. One of the first contributions is by (KHERBACHI, 2011)who developed financial social accounting for the year 2003 in order to apprehend the link between financial development and the economic growth in the Algerian economy. Using a simulation of the increase in credits to the economy as well as a decrease in banking activity, the author concluded that the Algerian banking sector would also contribute to the development of economic growth and that any decrease in banking activity have a negative effect on gross domestic product. Furthermore(BENHABIB & ZENASNI, Les effets de la libéralisation financière sur la croissance économique, 2011), asserts, through the estimation of a sample of 38 observations by the cointegration method of the time series during the period from 1970 to 2007, that financial liberalization promotes the development and deepening of the banking and financial system; thus, it exerts a positive effect on Algerian economic growth.Other studies by Benhabib, A &Zenasni, S (2012) ,Lacheheb, M & al (2013) and Khatar, T &Meftah, S (2014) reach the same conclusion that financial development has a positive effect on economic growth in Algeria.

5. Data and methodology

This study employs annual time series data for the period 1980-2017. The data were mainly extracted from World Development Indicators, provided by the World Bank. The focus of this study is to investigate the nature of the relationship between financial development and economic growth, besides certain other control variables.

In line with the literature, the economic growth is measured as the annual percentage change in the gross domestic product **(GDP)** (Roubini& Sala-i-Martin, 1992; King & Levine, 1993a; Demetriades& Hussein, 1996; Levine et al, 2000).To reflect financial development, this study uses the money supply (M2) to GDP (**M2)**(Beck et al., 1999)**,** domestic credit granted by banks to

private sector divided by the GDP (**Credit**)(Levine et al., 2000), and the total deposits calculated as a percentage of GDP (**Dep**)(King and Levine, 1993).

Several control variables were included since these variables might affect the relationship between financial and economic growth. The following variables are included: inflation (INF) calculated as the percentage change in the consumer price index, the degree of openness (OPEN) measured as the total imports and exports as a percentage of GDP and secondary school enrolment (EDU) is calculated by dividing the number of children enrolled in secondary school by the size of the population of that age.

5.1 Constructing a composite financial development index

This study employs principal component analysis to combine the third selected measures of financial development in to single index.

Principal component factor analysis suggests the following formula to calculate the financial development index:

$$\text{FD Index}=\sum_{i=1}^{n} wi * FSi$$

where the FD, wi and FSi are the composite financial development index, the ratio of explained variance by each financial determinant, the explained variance of all financial determinants and the corresponding factor scores of each financial determinant.

wi can be calculated as follows:

$$\text{wi} = \left(\frac{Vi}{\sum_{i=1}^{n} Vi}\right) * 100$$

wherewi indicates the weight of each ith factor for the financial determinant, vi is the variance explained by each ith factor, and n is the number of factors (Chen, 2010).

5.2 Stationarity test « Unite Root Test »:

One of the methods to test whether series is stationary or not is Augmented Dickey-Fuller test (ADF) (1979). The stationary tests is performed first in levels and then in first difference to establish the presence of unit roots and the order of integration in all the variables. The formula for ADF is given by:

$$\mathbf{\Delta y_t = \alpha + \beta Y_{t-1} + \sum_{j=1}^{k} \lambda_j \Delta y_{t-j} + e_t}$$

Where Δ is the difference operator, y_t is the series being tested, k is the number of lag differences and et is the error term. Δy_t Is the change in series under consideration with respect to the time period t, α is the constant term, β is the vector of coefficient on y_{t-1} ,λ_j is the lag, Δy_{t-j} are the lagged changes. We test the null hypothesis: H0: β= 0 which implies that y_t is non-stationary. So, if calculated t-value of variable is smaller than ADF critical t-value, then H0 is accepted and thus the data is non-stationary.

5.3 Cointegration test

The long-term relationship between financial stability and economic growth was explored using the Johansen Framework Cointegration Test (Johansen 1988), in accordance with the literature. The null hypothes is tested (H0: r = 0) of no Cointegration. Two likelihood ratios are evaluated in the Johansen System Cointegration test, namely the maximum eigenvalue test and the trace test. The Maximum Eigenvalue test performs independent tests on each eigenvalue. This checks the

null hypothesis that the number of co-integrating vectors is equal to r contrary to the alternative of r+1 co-integrating vector. (Brooks, 2008).

$$\lambda Trace(r) = -T \sum_{i=r+1} \ln(1 - \lambda i)$$

$$\lambda max(r, r+1) = -T \ln(1 - \lambda_{r+1})$$

Where: λ Trace is the Trace Test. λ max is the Maximum Eigen Value Test. r is the number of Cointegration vectors. λi is the ith ordered eigenvalue.

5.5 Estimation of short-run coefficients

In order to examine the short run dynamic effect of financial development on economic growth, we employ a vector autoregressive regression as follows:

$$\mathbf{GDP_t = \alpha + \emptyset_1 GDP_{t-1} + .. + \emptyset_p GDP_{t-p} + \beta_1 FD_{t-1} + .. + \beta_P FD_{t-P} + \delta_1 Cont_{t-1} + \ldots + \delta_p Cont_{t-p} + e_t}$$

Where GDP is economic growth; FD is financial development; Cont is control variables, inflation, the degree of openness and education; P is the number of lags. In this study, Akaike Information Criteria is employed to determine the number of lags in the VAR estimation, where the number of lags in this study is found to be 1.

5.6 Causality test

In this study, Granger causality test through the VECM is applied in order to investigate the directions of possible long-run equilibrium relationship among variables. Based on the VECM estimation, the Granger causality tests are conducted as follows:

$$GDP_t = \alpha_1 + \Sigma\beta_i FD_{t-i} + \Sigma\lambda k\ GDP_{t-k} + \varepsilon_t \ldots\ldots\ldots (4)$$

$$FD_t = \alpha_2 + \Sigma\gamma_i GDP_{t-i} + \Sigma\theta k\ FD_{t-k} + \varepsilon'_t \ldots\ldots\ldots (5)$$

6. Empirical Results and Discussion

6.1 Stationarity test « Unite Root Test »:

Table 1 reports the results of the unit root test of the variables used in the analysis. The Augmented Dickey-Fuller (ADF) test was applied to all variables in levels and in first difference in order to formally establish their order of integration. The null hypothesis is that the variable has a unit root, i.e., non-stationarity. The results indicate that all variables are stationary at first difference as the unit root hypothesis could be rejected on all variables. Therefore it is apparent that all the variables are integrated of order one I(1).

TABLE 1 : Augmented Dickey-Fuller (ADF) stationaritytest

Stationarity test			
	Level	**1st difference**	**Order of Integration**
GDP	-3.433	-8.034***	**I (1)**
FD	-1.029	-3.055***	**I (1)**
INF	-1.830	-5.537***	**I (1)**
OPEN	-1.544	-4.712***	**I (1)**
EDU	-2.292	-6.618***	**I (1)**

Notes: *The null hypothesis of the test is: a series has a unit root. The rejection of the null hypothesis is at the 5% level of significance.* (*) Significant at 10%; (**) Significant at 5% and (***) Significant at 1%.
Source: Authors computation using Stata12.0.

6.2 ChoosingLagLength

To ensure that there is no misspecification of the error term, the researcher performed test to select an appropriate lag length. The selection criteria included Sequential modified Likelihood ratio (LR) criterion, the Hannan-Quinn Information Criterion (HQIC), the Schwarz Bayesian Information Criterion (SBIC) the Final Prediction Error (FPE) criterion, and the Akaike Information Criterion (AIC). The model with the lowest value of information criteria is chosen. Therefore, based on the results of the selection information criteria shown in table 2, the study chose one lag length to be used in this model as the optimal lag length.

TABLE 2 : Results of VAR Lag Selection

```
Selection-order criteria
   Sample:  1983 - 2017                        Number of obs      =        35
  +---------------------------------------------------------------------------+
  |lag |    LL      LR      df    p      FPE       AIC      HQIC      SBIC    |
  |----+----------------------------------------------------------------------|
|  0 | -529.424                     1.3e+07   30.5385   30.6152   30.7607  |
|  1 | -413.865  231.12*  25  0.000  72507.5*  25.3637*  25.8239*  26.6969* |
|  2 | -396.259  35.214   25  0.084   121406   25.7862   26.6299   28.2303 |
  +---------------------------------------------------------------------------+
Endogenous:  growth fdinftrdeedu
    Exogenous:  _cons
```

Source: Authors computation using Stata12.0.

6.3 Cointegration test:

After defining the correct lag period to be one earlier, we proceed to determine the number of cointegrating equations using Johansen cointegration test. We accept the null hypothesis of no co-integration when the trace statistics is less than the critical value. From the table below, there is cointegration of order one since it's the trace statistics at r=1 45.4889 is less than the critical value 47.21. This study therefore rejects the null hypothesis of no co-integration. This shows that there is a long-run relationship between economic growth and financial development.

TABLE 3 : Johansen tests for cointegration

```
Trend: constant                                          Number of obs =      36
Sample:  1982 - 2017                                           Lags =       1
------------------------------------------------------------------------------
5%
maximum                                        trace    critical
rankparms       LL       eigenvalue  statistic    value
0      5       -461.8626           .     69.4452    68.52
1      14     -449.88442     0.48596     45.4889*   47.21
2      21     -440.15055     0.41770     26.0211    29.68
3      26     -432.94695     0.32981     11.6139    15.41
4      29     -428.97283     0.19811      3.6657     3.76
5      30     -427.13999     0.09681
```

Note: * indicates rejection of the null hypothesis at 1% level of significance.
Source: Authors computation using Stata12.0.

6.4 Estimation of the vector error correction model (VECM)

A. Long-run estimates

TABLE 4 :Results of the long-run vector error correction model

Variable	Growth	FD	INF	OPEN	EDU
ce_1	-0.4802396	0.0056204	0.4507226	-0.4709783	-0.1580663
Prob	(0.000)	(0.846)	(0.121)	(0.144)	0.862

The results from Table 4 show the VECM model. The error correction term ce1 represent the speeds of adjustment to long-run equilibrium in the model. The sign of the ce_1 is negative and statistically significant at the 1% level of significancefor the variable Growth. This confirms the existence of a positive and long-run relationship between the economic growth and the indicators of financial development during the study period. In other words, it means that the VECM model is below equilibrium and will adjust upwards towards at a speed of 48.02 % towards the long-term equilibrium which means that there is a fast adjustment relation.

B. Short-run estimates

After confirming the existence of a long-term relationship between the variables, we can also assess the short-term relationships between the main variables using VECM.

The findings of the short-term error correction vector model between the different variables are presented in Tables 5. The interpretations of the results are made with respect to GDP only.

TABLE 5 : Results of the short-run vector error correction model

Error correction	Growth	Prob
ce1	-0.4802396	0.000***
D(GDP (-1))	-0.2910228	0.041**
D(FD (-1))	3.219826	0.000***
D(INF (-1))	0.0545273	0.393
D(OPEN (-1))	0.2298656	0.004***
D(EDU (-1))	-0.0046035	0.839
Const	0.0235696	0.937

(*) Significant at 10%; (**) Significant at 5% and (***) Significant at 1%.

Source: Authors computation using Stata12.0.

- ✓ The results from the vector error correction model in the short-run as displayed in Table 5 suggest that the effect of previous year of real GDP per capita on current real GDP per capita is negative and significant. This result confirms one of the central assumptions of the growth models (Barro, 1996), the poorest countries generally grow faster than the richest countries, and therefore tend to catch up with them. This assumption therefore implies that the growth rate of real GDP must be inversely correlated with the level of GDP per capita in the first period.

- ✓ Moreover, it appears from this table that the current rate of economic growth is explained positively and significantly in the short term by the previous index of financial development (FD) confirming the results from the long-run estimation. The magnitude of 3.219826 implies that a 1 percent increase in FD will increase growth by approximately 3.21 percent. This result concurs with findings by(Imen Kouki, 2013; Haguigaet Amani, 2019), However, our findings are contrasting with a recent study for (Zineb &Abderrahim, 2019).
- ✓ Furthermore, the degree of openness rate (OPEN) of the year (t-1) exerts a positive and significant effect on economic growth, so an increase of 1% in the rate of openness leads to an increase in economic growth of 0.22 %. Indeed, the increase in foreign trade improves GDP growth per capita. This result concurs with findings by (MiloudLacheheb& al.: 2013). The study indicates no statistically significant short-term effect of inflation on economic growth. The results accord with the findings of Sidrauskin (1967) who said that an increase in the inflation rate does not change the steady capital stock and economic growth. In addition to inflation, the study also found that in the short-run the secondary school enrolment rate (EDU) exerts no statistically significant effect on economic growth. The result is in line with the study of Kalaitzidakis& al (2001) but contradict the findings by Barro (1991).

5.5 The cointegration equation of VECM

The estimated long-run equilibrium relationship for economic growth derived from the normalised vectors with the t-statistics in brackets is expressed as follows:

Growth= -5.659577+1.411876FD -0.0495421 INF+0.1149812 TRDE -0.0201408 EDU (6)

[0.001] [0.594] [0.119] [0.603]

TABLE 5 : Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1						
growth	1	.	.	.	.	.
fd	1.411876	.4419373	3.19	0.001	.5456949	2.278057
inf	-.0495421	.0928825	-0.53	0.594	-.2315884	.1325042
trde	.1149812	.0737826	1.56	0.119	-.02963	.2595923
edu	-.0201408	.0387651	-0.52	0.603	-.0961189	.0558373
_cons	-5.659577	.	.	.	.	.

Source: Authors computation using Stata12.0.

From equation 6, it can be observed that the index of financial development (FD) have the expected positive sign and exert statistically significant effect on real GDP per capita (Growth) in the long-run.

The positive and statistically significant results of financial development (FD) confirm the theoretical postulation that financial development contributes positively to growth of the economy (real GDP per capita). The coefficient of 1.411876 indicates that a 1 percent change in financial development results in a 1.41 percent change in real GDP per capita. The results accord with the findings of (Adouka, L & Ben Bayer,H. 2015) in the case of Algeria but contradict the findings by (Boularedj, S etTchiko, F. 2015) who find that the financial sectors are still underdevelopment and do not strongly promote economic growth.

The implication of the above findings is that, development of the financial sector has been able to mobilize and allocate resources to some extent to meet up with investment expenditure that will finally translate into meaningful economic growth.

6.6 Granger Causality Test

The authors performed a Granger causality test to determine the direction of influence between financial development and economic growth in Algeria. The causality test results are presented in the following Table.

Table 6 : Granger causality Wald tests

NullHypothesis	**Chi-sq**	**Prob**
FD does not Granger Cause Growth	11.414	0.003***
Growth does not Granger Cause FD	0.07325	0.964

Note: *** indicates rejection of the null hypothesis at 1% level of significance

Source: Authors computation using Stata12.0.

If a p - value > 0.05, we cannot reject the null hypothesis. From Tables 6, the results of Granger causality Wald tests indicate that there is unidirectional causality running from financial development (FD) to economic growth (Growth). The study found that financial development causes economic growth in Algeria at 1% level of significance. Our results are consistent with Levine, Loayzaet Beck (2000)who have concluded that financial development has a causal effect on economic growth.

Overall, the results show that economic growth does not granger cause the financial development. In conclusion**,** our empirical results point to a supply-leading hypothesis which confirms the fact that financial development leads to economic growth in Algeria.

7Conclusion:

This paper examined the impact of financial development on economic growth in Algeria. The study uses annual time series data over the period (1980-2017). Economic growth is measured by the growth rate in GDP per capita. The study makes use of the PCA (Principal components analysis) to construct a financial development index (FD) that serves as a proxy variable of financial development. In the estimation of VECM (Vector error correction model), the results show that the financial development has a positive impact on short-run economic growth in Algeria. On the other hand, the findings confirm the existence of a positive and long-run

relationship between the economic growth and the index of financial development during the study period. Moreover, the direction of causality runs from financial development to economic growth in Algeria which confirming a supply-leading hypothesis. Based on the findings of the study, there should be a determined effort on the part of the monetary authorities should be made to continue with the policy reforms in order to consolidate the growing confidence in the financial system. The financial sector reforms should be stepped up; this will lead to an increase in the level of financial savings and level of financial activities, which will result in increased deepening and thus economic growth.

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