

Financial Development And Economic Growth In Algeria :An Empirical Study

التنمية المالية والنمو الاقتصادي بالجزائر : دراسة قياسية (1995-2021)

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Abstract:

This paper explores the relationship between financial development and economic growth in Algeria over the period of 1995-2021, using the ARDL model. The study found a significant negative error correction coefficient (-0.771548), indicating a long-run cointegration between financial determinants and economic growth. Specifically, the research shows that financial intermediation efficiency has a negative effect of 1.364 and financial depth has a negative effect of 0.7014 on economic growth. Inefficient financial services may lead to reduced loan funding and credit limits, which can impede the ability of individuals and companies to achieve economic growth. On the other hand, financial intermediation has a positive effect of 0.3797 on economic growth due to factors such as increased investment and innovation, better fund distribution, reduced credit costs, and improved access to financing. Therefore, promoting and developing financial intermediation is crucial for enhancing economic growth.

Keywords: Financial development; economic growth; financial depth; financial intermediation; ALGERIA.

JEL Classification Codes: G1, G21, O4, O55.

ملخص:

تبحث هذه الورقة في العلاقة بين التنمية المالية والنمو الاقتصادي بالجزائر خلال الفترة 1995-2021، باستخدام نموذج *ARDL*. وجدت الدراسة ان معامل تصحيح الخطأ سلبي (-0.771548)، مما يشير إلى تكامل طويل المدى بين المحددات المالية والنمو الاقتصادي. وأظهر البحث أن كفاءة الوساطة المالية والعمق المالي لهما تأثير سلبي على النمو الاقتصادي قدره 1.364، 0.7014 على التوالي. حيث قد تؤدي الخدمات المالية غير الفعالة إلى تقليل تمويل القروض وحد الائتمان، مما قد يعيق قدرة الأفراد والشركات على تحقيق النمو الاقتصادي. من ناحية أخرى، فإن للوساطة المالية تأثير إيجابي قدره 0.3797 على النمو الاقتصادي بسبب عوامل كزيادة الاستثمار، وتحسين توزيع الأموال. لذلك، فإن تعزيز الوساطة المالية وتطويرها أمر بالغ الأهمية لتعزيز النمو الاقتصادي.

كلمات مفتاحية: التنمية المالية، النمو الاقتصادي، العمق المالي، الوساطة المالية، الجزائر.

تصنيفات JEL: G1, G21, O4, O55

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Introduction:

Finance and growth emerged as a distinct field of economics over the last three decades. Although Bagehot (1873), Schumpeter (1911) (Kada et Benachour), Gurley and Shaw (1955), and especially Goldsmith (1969) emphasized the importance of the financial system for economic development, economic development and finance remained largely separate fields of inquiry until the 1990s. For example, Levine (1997, 2005) notes that textbooks on economic development written at the end of the 1980s did not seriously examine the role of finance in economic development. In turn, financial economics was largely unconcerned with the impact of financial contracts, markets, and intermediaries on long-run economic growth, technological innovation, poverty alleviation, and income distribution. (Levine, 2021).

Hence, challenges facing economic growth in terms of financial development emerged, Income Inequality, Financial risk management, Access to Capital and Financial Stability. Therefore, financial development entails strengthening financial systems and institutions to enhance economic growth This encompasses expanding financial markets, instruments, and institutions to mobilize savings and allocate resources efficiently. It plays a pivotal role in economic growth by optimizing capital allocation, reducing transaction costs, boosting investments, and enhancing financial system efficiency.

Conversely, an immature and vulnerable financial system reduces the chances of financing of the economy, strengthens financial repression and encourages speculation (Khalfaoui, 2015) The failure of one of its components (e.g., banks, markets, other financial institutions) can spill over to the entire sector and harm the real economy. For example, the financial crises in some Southeast Asian countries in 1997, The Russian Federation in 1998, Turkey in 2001, and the recent global financial crisis, Are all marked with the failure of the financial sector. (Badeeb & Hooi , 2017).

a. Research Problem:

Hence, one crucial question arises here, Does Algeria have a financial system that effectively fosters economic growth over the period 1995 to 2021?

To answer this problem, we ask the following sub-questions :

- What is the impact of Financial Depth on the Economic Growth ?
- What is the impact of Financial intermediation Efficiency on the Economic Growth ?
- What is the impact of Financial intermediation on the Economic Growth?
- What is the impact of Foreign direct investment on the Economic Growth?

b. Research hypothesis :

To answer the questions, the following main hypothesis was introduced :

There is significant impact of Financial Development on Economic Growth in ALGERIA during the period (1995-2021)

- There is significant impact at 5% of Financial Depth on the Economic Growth
- There is significant impact at 5% of Financial intermediation Efficiency on the Economic Growth
- There is significant impact at 5% of Financial intermediation on the Economic Growth.
- There is significant impact at 5% of Foreign direct investment on the Economic Growth .

c. Research Objectives :

Through this research paper, we seek to achieve a set of goals summarized below :

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To contribute to the general body of economic literature on both Financial Development and Economic Growth ;

To investigate into significant relationship between variables in Algeria ;

know the important role as well as the effect of Financial Development on Economic Growth.

d. Research Methodology:

The study covers both theoretical and practical sides. The first one, cites some studies of Financial Development and Economic Growth ;. The second exposes the empirical methodology and data.

Description by the use of the model ARDL over the time period 1995-2021 and this is done using a program called EVIEWS 9.0. The third interprets the economic results to draw conclusion.

And for this research, we used data explored from the World Development Indicator (WDI) .

e. Research Structure:

We divided our work through this research paper into the following axes:

- The first axis: Literature Review.
- The second axis: an applied study
- The third axis: Conclusion and Discuss results.

1- Literature Review :

The issue of financial development has been the subject of numerous studies using different indicators and econometric methodologies. However, the literature on this topic remains inadequate to fully comprehend all its aspects, especially concerning the effects of financial development on economic growth in developing countries like Algeria. Therefore, further research is required to investigate the impact of the determinants of financial development. For instance, (Senhadji & S. Kha, 2000) examined the impact of financial development on economic growth in 159 countries between 1960 and 1999, estimated using the 2SLS and OLS models. The study found that financial depth is one of the crucial determinants of financial development in countries, and that poor countries tend to grow faster than rich countries. Similarly, (Caporale & et al, 2014) aimed to establish the relationship between financial development and economic growth in ten European Union countries between 1994 and 2007, using the GMM-PANEL model. Their findings indicated that stock and credit markets are still lagging behind in these economies, and their contribution to economic growth is limited due to the lack of financial depth. In another study, (Panizza, 2014) focused on the channels through which financing affects economic growth in a group of emerging countries between 1970 and 2010, highlighting the positive impact of financial development through financial innovation services in addition to traditional measures of size and financial intermediation. (Zainudin & Nurnaddia , 2017) aimed to search for the determinants of financial development in four selected ASEAN countries between 1983 and 2013, estimated by the POLS model. The results showed that real income is the most important determinant of financial development only for Singapore and Thailand, while trade

openness is the most important determinant of financial development only for Malaysia and the Philippines. (Guru & Yadav, 2019) investigated the relationship between financial development and economic growth for five emerging economies between 1993 and 2014, using the SYS-GMM model. The results showed that indicators of banking development, such as the size of financial intermediaries, have a significant positive impact on economic growth. Moreover, (Matei, 2020) examined the impact of financial development on economic growth in 11 emerging European countries between 1995 and 2016, estimated by dynamic PMG-PANEL models. The findings showed that financial development has a positive effect on economic growth only in the short term when studying the linear hypothesis, but when studying the nonlinear hypotheses related to the correlation between finance and growth, the relationship has an inverted U-shape between the financial sector and the real sector of the economy. Finally, (TARIQ & et al, 2020). This study aimed to investigate the non-linear relationship between financial development and economic growth in Pakistan from 1980 to 2017, using the OLS method. The results suggest that economic growth exhibits a positive response to financial development when it surpasses a threshold value of 0.151, whereas its impact on economic growth becomes negative when it falls below this threshold. Moreover, the study revealed that economic growth is associated with different forms of financial development, resulting in a U-shaped relationship between financial development and economic growth in Pakistan.

2- Model, Methods, And data

2-1 Empirical Model

In order to account the impacts of role of determinants of financial development on economic growth in ALGERIA, the model for the study is hereby specified as follows :

$$GDP_{it} = \beta_0 + \beta_1 CP_{it} + \beta_2 I_{it} + \beta_3 M2_{it} + \beta_4 FDI_{it} + \varepsilon_{it} \dots \dots (1)$$

Where β_0 is the intercept. $\beta_1, \beta_2, \dots, \beta_4$ respectively are the estimation coefficients to be estimated. It is the error term. Subscripts i and t denote country and year (i = 1, 2,3 ; t = 1, 2, ..., 21). The definitions of variables are presented in Table.

Table (1): Definitions and data sources

Variable	symbol	Measurement	Source
Economic Growth	GDP	GDP growth (annual %)	WDI
Financial depth	CP	Domestic credit to private sector (% of GDP)	WDI
Financial intermediation Efficiency	I	Interest rate spread (lending rate minus deposit rate(%)	WDI
Financial intermediation	M2	Broad money (% of GDP)	WDI
Foreign direct investment	FDI	Foreign direct investment, net inflows (% of GDP)	WDI

2-2 Data and Estimation Techniques

The study employs data for Algeria over the period 1995 to 2021, All the data were obtained from the World Development Indicator (WDI) .

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And employs various relevant methodologies to examine the impact of determinants of financial development on economic growth. Estimation techniques used include investigating stationarity using the Phillips–Perron test, as well as using ARDL model for long-run estimates and short-run parameters.

2-2-1 Descriptive Analysis of Variables

In the following, we present the descriptive statistics of the variables for our model over the period 1995-2021.

Table (2): Dscriptive Statistics

VAR	GDP	CP	M2	I	FDI
Mean	3.157692	14.08131	62.94679	5.013622	0.986620
Median	3.300001	12.89295	63.53974	6.250000	0.889054
Maximum	7.200000	29.69491	96.49804	6.250000	2.033266
Minimum	-0.899997	3.907417	33.00584	1.833333	-0.324012

Source: Author's estimate of results using EViews 9.0

Table 2 gives the summary descriptive statistics of financial development presented by GDP, CP, M2, I, FDI respectively. The table shows GDP also witnessed severe fluctuations from around -0.89% to around 7.20%. The value of the mean and median of the variables were close to each other except M2. This implies normal distribution of the variable. Furthermore, the maximum and minimum of the data were farenough for data analysis. This indicates the increasing trend of the series.

2-3 Empirical Results

2-3-1 Results of Unit Root Test

To investigate the stationary and determine the integration level of the selected variables, we employed developed test, The Phillips-Perron

- H0: variable has unit root
- H1: variable has not unit root

At Level						
	VAR	GDP	i	FDI	CP	M2
Intercept	<i>prob.</i>	(0.000)	(0.309)	(0.017)	(0.998)	(0.979)
Trend and intercept	<i>prob.</i>	(0.001)	(0.507)	(0.0596)	(0.743)	(0.112)
None	<i>Prob</i>	(0.3825).	(0.860)	(0.229)	(0.999)	(0.999)
At First Difference						
Intercept	<i>prob.</i>	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)
Trend and intercept	<i>prob.</i>	(0.000)	(0.000)	(0.000)	(0.012)	(0.002)
None	<i>Prob</i>	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)

Order of integration	I(1)	I(1)	I(1)	I(1)	I(1)
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Table (3): Phillips-Perron unit root tests

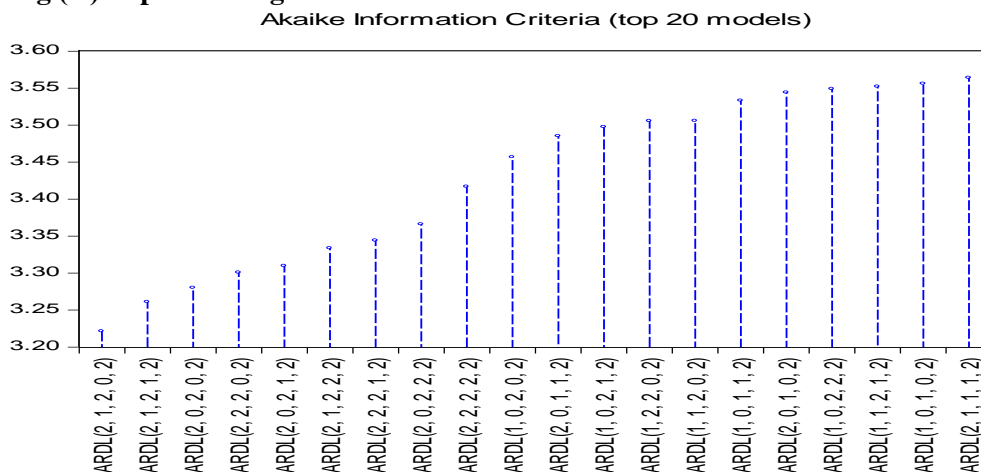
Source: Author's estimate of results using EViews 9.0

Table 3 summarizes the results of the PP unit root tests on the level and first differences of the variables. The results suggested that all the series are stationary in their first differences, indicating that they are integrated of order one I(1) ; hence, the unit root test confirms that the ARDL approach can be applied for the cointegration relationship.

2-3-2 ARDL model

To assess the long-term relationship between the variables, we utilized the autoregressive distributed lag (ARDL) bound testing approach to cointegration, as proposed by Pesaran et al. (2001). Recent studies have shown that the ARDL model is a preferred method for estimating cointegration relationships due to its reliability and applicability, regardless of whether the underlying regressors are I(0) or I(1). Additionally, this approach is suitable for small sample sizes. After examining the time series properties of all variables, we employed the ARDL approach to investigate the potential long-term equilibrium relationship. It should be noted that the number of lags used in this test is a critical factor. Therefore, in consideration of the limited number of observations in our study, we imposed lags of up to two years on the first difference of each variable.

Fig (1): Optimum lag of the model



Source: Author's estimate of results using EViews 9.0

The above figure shows us Optimum lag is (2, 1, 2, 0, 2)

Table (4): Short term ARDL model estimation

Dependent Variable: GDP Selected Model: ARDL(2, 1, 2, 0, 2)

Adj Rsq= 0,576 DW= 2,57 Prob F(0.001)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.167657	0.192613	-0.870432	0.4011
GDP(-2)	0.396109	0.171515	2.309474	0.0395**
CP	-0.183744	0.231687	-0.793069	0.4431
CP(-1)	-0.357427	0.264122	-1.353264	0.2009
M2	0.046626	0.068130	0.684370	0.5067
M2(-1)	0.062187	0.056193	1.106680	0.2901
M2(-2)	0.184144	0.068064	2.705468	0.0191**

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FDI	-0.523281	0.531348	-0.984818	0.3442
I	-0.648883	0.748745	-0.866628	0.4031
I(-1)	0.700298	0.663010	1.056240	0.3117
I(-2)	-1.104536	0.337506	-3.272639	0.0067*
C	-2.173035	2.765008	-0.785906	0.4472

*, **, *** The statistical value of t-statistic, meaning that the parameter is significant, whether At the level of 1%, 5%, or 10%, respectively.

Source: Author's estimate of results using EViews 9.0

The table above presents the results of the short-term estimation, demonstrating a Fisher probability of 0.001 that indicates the quality of the model and the ability of the independent variables, including foreign direct investment, financial depth, financial intermediation, and the efficiency of financial intermediation, to explain 57.6% of the variation in the dependent variable representing economic growth. Notably, some variables show probability levels below 1%, 5%, or 10%, such as the M2 index which displays a positive relationship with economic growth, consistent with economic theory. To check the existence of a long-term relationship, we must do a test (ARDL BoundsTest)

Table (5):ARDL Bounds Test

Test Statistic	Value	Signif	I(0)	I(1)
F-statistic		10%	2.45	3.52
K	8.200	5%	2.86	4.01
	4	2.5%	3.25	4.49
		1%	3.74	5.06

Source: Author's estimate of results using EViews 9.0

The results of the limits test presented in the table above indicate that the calculated F-value of 8.2 exceeds the maximum tabulated values at significance levels of 10%, 5%, 2.5%, and 1%. Therefore, we reject the null hypothesis of no long-term cointegration relationship and accept the alternative hypothesis that there is a cointegration relationship between the variables in the study. This suggests that there exists a long-term equilibrium relationship between the variables, and hence, we can estimate the model parameters in the long run.

Table (6): long-term model parameters

Cointeq = GDP - (-0.7014*CP + 0.3797*M2 -0.6782*FDI -1.3649*I -2.8165)				
ECT_{t-1} = -0.771548 Prob = 0.0135 (5%)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CP	-0.701409	0.328116	-2.137686	0.0538**
M2	0.379701	0.192514	1.972322	0.0721***

FDI	-0.678223	0.747750	-0.907018	0.3822
I	-1.364946	0.732601	-1.863152	0.0871***
C	-2.816462	4.206225	-0.669594	0.5158

*, **, *** The statistical value of t-statistic, meaning that the parameter is significant, whether At the level of 1%, 5%, or 10%, respectively.

Source: Author's estimate of results using EViews 9.0

The error correction coefficient, which is negative (-0.771548), has a probability value of 0.0135, which is less than 5%. This indicates that the condition is significant and confirms the presence of a long-term cointegration relationship between the dependent variable (GDP) and the independent variables (FDI, I, M2 CP). Additionally, the coefficients estimated in the long run were statistically significant at 10% and 5% levels. Except FDI.

2-3-3 Validity test of the model

Table (7):Validity test of the model

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.403405	Prob. F(6,3)	0.2903
Obs*R-squared	5.259970	Prob. Chi-Square(6)	0.0721
Heteroskedasticity Test: ARCH			
F-statistic	2.554714	Prob. F(1,21)	0.1041
Obs*R-squared	4.662384	Prob. Chi-Square(1)	0.0972
Ramsey RESET Test			
	Value	df	Probability
t-statistic	0.548840	11	0.5941
F-statistic	0.301226	(1, 11)	0.5941

Source: Author's estimate of results using EViews 9.0

Based on the test results presented in the table above, we can see that the probability values are greater than 5%. As a result, we accept the null hypothesis, indicating that the model is free from standard issues related to the homogeneity of the residual variance. Therefore, we can assume that the variance of the residuals is constant across different values of the predicted variable, indicating the absence of heteroscedasticity.

Conclusion:

This paper investigates the link between determinants of financial development and economic growth in Algeria. Over the period 1995-2021. The study's empirical results can be summarized as follows:

An inverse effect of 0.7014 for financial depth on economic growth means that an increase of one unit in financial depth would lead to a decrease of 0.7014 units in economic growth. Likewise, a decrease of one unit in financial depth would lead to an increase of 0.70 units in economic growth.

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Financial depth in banks means that they primarily use debt as a source of financing their activities instead of relying on their own funds or even bank deposits. When banks use debt as a source of funding, they typically face higher costs, such as interest on debt and issuance fees, among others. These costs can affect their ability to offer loans at low-interest rates to consumers and companies, meaning that the economy may be more vulnerable to economic and financial disruptions. This can affect companies' ability to hire employees, increase productivity, and generate revenue in the future.

Financial intermediation refers to the use of a financial intermediary such as banks, insurance companies, or financial funds to provide financing or investments for projects and individuals. These financial intermediaries contain a diverse range of financial products that help stimulate economic growth. and we have a positive effect of financial intermediation on economic growth. it means that every one-unit increase in financial intermediation leads to a 0.379701-unit increase in economic growth.

This positive effect of financial intermediation on economic growth can be due to several factors, including stimulating investment and innovation, improving the distribution of funds, reducing credit costs, and improving access to financing. Therefore, promoting and developing financial intermediation is an important factor that can contribute to enhancing economic growth.

A negative effect of 1.364 for financial intermediation efficiency on economic growth means that a decrease of one unit in financial intermediation efficiency would lead to a decrease of 1.364 units in economic growth. Conversely, an increase of one unit in financial intermediation efficiency would lead to an increase of 1.364 units in economic growth.

▪ Recommendations:

Enhance Financial Stability: Strengthening financial system stability through effective regulations and vigilant oversight can boost confidence in the system and attract more investments.

Promote Financial Inclusion: Increasing access for all to financial services, including banking, financing, and insurance, can enhance individuals' and businesses' ability to participate in the economy.

Encourage Financial Innovation: Supporting the development and effective use of innovative financial instruments can enhance companies' ability to grow and expand.

Boost Financial Literacy: Increasing awareness of financial matters and guiding individuals on how to manage their finances better can promote financial development.

Foster Public-Private Partnerships: Enhancing collaboration between the government and the private sector in implementing financial development projects can have a positive impact on economic growth.

Promote Digital Transformation: Leveraging digital technology to deliver financial services can improve access and efficiency.

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