

The causal link between financial development and economic growth: empirical evidence from Algeria, 1980-2022

العلاقة السببية بين التطور المالي والنمو الاقتصادي: أدلة تجريبية من الجزائر، 1980-2022

BOUCHENAKI Fatiha¹, BOURAS Nassima²

¹ University of Oran 2 Mohamed Ben Ahmed (Algeria), Laboratoire Management des Entreprises et Développement Economique, bouchenaki.fatiha@univ-oran2.dz

² University of Oran 2 Mohamed Ben Ahmed (Algeria), Laboratoire Management des Entreprises et Développement Economique, bouras.nassima@univ-oran2.dz

Received: 17/11/2024

Accepted: 26/12/2024

Abstract:

Despite the various studies, both theoretical and empirical, the problem of the link between financial development and economic growth remains a controversial issue. The main objective of this article is to clarify the nature of such relationship in Algeria. In this context, the various estimates were carried out using the autoregressive approach with staggered lags (ARDL), for the period from 1980 to 2022. The study reveals that financial development negatively impacts Algeria's economic growth, despite recent sector improvements. The Granger causality test shows a unidirectional relationship between economic growth, commercial bank assets, and M2 money supply.

Keywords : financial development ,economic growth , Algeria, ARDL.

Jel Classification Codes : F43,O11,O55,C32.

ملخص :

على الرغم من الدراسات المختلفة، سواء النظرية أو التجريبية، فإن مشكلة العلاقة بين التطور المالي والنمو الاقتصادي تظل قضية مثيرة للجدل. والهدف الرئيسي من هذه المقالة هو توضيح طبيعة هذه العلاقة في الجزائر. وفي هذا السياق، تم إجراء التقديرات المختلفة باستخدام نهج الانحدار الذاتي مع فترات تأخير متدرجة (ARDL)، للفترة من 1980 إلى 2022. وتكشف الدراسة أن التطور المالي يؤثر سلبًا على النمو الاقتصادي في الجزائر، على الرغم من التحسينات الأخيرة في القطاع. يظهر اختبار السببية غرانجر علاقة أحادية الاتجاه بين النمو الاقتصادي وأصول البنوك التجارية ومعرض النقود M2.

كلمات مفتاحية: التطور المالي، النمو الاقتصادي، الجزائر، ARDL.

تصنيف JEL : F43، O11، O55، C32.

¹ Corresponding author: Bouchenaki fatiha, e-mail: bouchenaki.fatiha@univ-oran2.dz

INTRODUCTION

The financial system is the main engine of all development processes and one of the most significant indicators of economic progress since it is crucial to mobilise the economy and turn it into investments that support economic growth. Therefore, the degree of global financial system development, which includes the banking industry and consumer markets, determines the economic growth rate. These past several years have seen a significant evolution in the theoretical literature on the relationship between the financial sector and economic growth. It is now clear that the financial sector is crucial to meeting fundamental economic needs, regardless of each person's level of sensitivity to the issue of financial development.

The relationship between financial development and economic growth in various countries has been the subject of numerous published studies since the beginning of the 1990s. Research and studies in this area have advanced due to the use of more sophisticated economic approaches and improved indicators to assess financial development. Economists first focus on the banking industry before turning their attention to financial markets. Numerous metrics have been used to assess financial progress, including the depth, diversity, effectiveness, rentability, transparency, accessibility, and stability of the financial system.

However, in this context, some controversial theories have been studied. According to several studies, financial development promotes economic growth (King & Levine, 1993; Atje & Jovanovic, 1993; Levine & Zervos, 1998; Demircuc-Kunt & Maksimovic, 1998). However, Ang & McKibbin (2007) attest that the financial sector's development is driven by economic growth. Studies by Van Wijnbergen (1983), Buffie (1984), and Ram (1999) have shown a negative statistical association between financial development and economic growth, particularly due to the high level of financial instability and crisis. According to other research, finance and growth are correlated in both directions (Demetriades & Hussein, 1996). Actually, there has been a great deal of discussion over these unclear findings in both the political and economic study communities.

Similar to other nations, Algeria implemented significant economic changes in the 1980s to make up for the shortcomings of a managed economy and centralised planning. Algeria also started implementing structural changes at the start of the 1990s, which made the country's economic shift to a market economy more tangible. The creation of the money and credit law in 1990 marked a new turning point, building on the 1989 autonomy of management of public economic organisations. In essence, the goal of this law is to fundamentally alter how the banking industry functions and how the financial system is structured.

We thought it would be interesting to examine in detail how financial development and economic growth are related in this environment. This article's main goal is to examine, both theoretically and practically, the nature of the relationship between financial development and economic growth.

Problematic of the study :

This is the key question at the heart of our issue:

Q : Are financial development and economic growth positively correlated?

Hypothesis of the study :

H: Financial development and economic growth are positively correlated.

Methodology of the study :

We will first present a theoretical analysis, then submit our questioning to empirical validation tests.

Structure of the study :

We divided our work into two axes :

The first axis : Theoretical analysis which includes ;

The contribution of financial systems to economic growth

The role of the financial system and economic growth

The link between financial development and economic growth

Theoretical approaches to the link between financial development and economic growth:

The second axis : Empirical investigation: The causal link between financial development and economic growth: the case of Algeria

1. The contribution of financial systems to economic growth

The idea that financial development generally stimulates economic growth was the focus of most theoretical and empirical research prior to 1990. It was believed that an inadequate financial system could only have a negative impact on economic development and that improving it should be a top priority.

1.1 Concept of economic growth

Many economists and politicians are interested in economic growth since it is one of the most significant economic indicators. This is especially true for emerging nations, which aim to raise their living standards by raising real GDP growth rates per capita.

1.2 Concepts of financial development

Financial development is a dynamic term that is subject to change over time. There are various definitions for the word "financial development."

The definition of "financial development" is not commonly accepted. After McKinnon-Shaw's theory of financial liberalisation made a major contribution in 1973, its proponents believed that financial development and financial sector reform were synonymous. The technique of McKinnon and Shaw is based on tenuous and unrealistic notions, which makes this definition problematic. The underlying premise of these ideas is that the financial market functions in a perfect setting where all players have unrestricted access to information. The financial sector still has significant problems with information asymmetry, thus information is far from free and even less ideal for the participants. In this case, financial development will not result from financial liberalisation. A developed financial sector is not always characterised by liberalisation, complete state deregulation, and openness to competition.

R. Levine (2005) defines financial development as a functional approach to the financial system, where financial instruments, markets, and intermediaries minimize costs of information acquisition, transaction, and contract execution, resulting in improved financial system performance in five primary functions: generating investment opportunities, ensuring control, facilitating transactions, mobilizing savings, and facilitating trade (Levine, R., 2005, p. 869).

2. The role of the financial system and economic growth

The financial development that we have defined occurs when financial institutions are able to reduce the frictions that exist in the financial market and make it easier to mobilise resources. More specifically, financial development should demonstrate how well the system performs each of the primary financial functions. Levine (1997) asserts that the financial system fulfils five key functions that are crucial in explaining economic growth (Levine, R. 1997, p. 691). The five functions are: (1) Information creation about potential investments and allocation of resources; (2) Proficiency in risk management ; (3) Corporate governance and investment monitoring; (4) The mobilisation of savings; (5) Promoting the exchange of goods and services. Economic growth and financial development are therefore closely linked.

2.1 Information creation about potential investments and allocation of resources

The existence of transaction costs in financial markets partly explains why financial intermediaries are so important (Frederic S. M, 2010, p. 48). For savers, the cost of evaluating potential investments and market conditions is high. However, this evaluation is crucial for them to make investment decisions. Uninformed savers are virtually unable to evaluate the companies they want to invest in (Kpodar, K, 2006, p. 5). In this case, high information costs can only affect capital accumulation and, at the same time, economic growth (Azzabi, S, 2012, p. 114). The more accurate information financial intermediaries have about entrepreneurs, the more likely they are to finance productive investments. The relevance of information influences the decision of lenders to allocate their savings to the most profitable projects. Through this function, the financial system can stimulate economic growth (Brou Emmanuel, A, 2005, p. 55).

2.2 Proficiency in risk management

Lenders can reduce their exposure to risk, or the uncertainty about the potential return on their investments, by using a financial intermediary, which constitutes a second advantage (Frederic. S. M, 2010, p. 47). The ability of financial systems to generate data on different economic actors ensures the monitoring of investments. However, by allowing agents to diversify their portfolios and therefore reduce the risk to which they are exposed, financial intermediaries also facilitate the pooling and hedging of risks. In addition, although it finances the riskiest projects, the financial system allows investors to build portfolios composed of more or less risky assets and to optimize their return (Rafael. C, 2012, p. 7). In the same spirit, risk management aims to concentrate funding on promising initiatives. Financial frictions are thus reduced, leading to a better allocation of resources.

2.3 Corporate governance and investment monitoring

Financial intermediaries are essential to keep an eye on the managers of the companies they finance. Due to the potential asymmetry of knowledge between managers and shareholders, this position is even more crucial (Azzabi, S., 2012, p. 118). Corporate governance often protects the interests of managers to the detriment of those of creditors and shareholders, which is not always advantageous for owners of capital. The manager is also able to hide information about the real returns of investments. As a result, financial growth encourages efficient investment financing and makes it possible to lower the management costs of funded investments. The financial system facilitates a better allocation of resources by allowing the

interests of managers to be in line with the success of the company through the maintenance of healthy financial markets (Brou Emmanuel. A, 2005, p 44).

2.4 The mobilisation of savings

By mobilising the epargne of exceptional agents to meet the funding needs of agents with disabilities, financial intermediaries encourage the accumulation of resources. Through enabling private investors to fund significant projects, financial intermediaries enable economies of scale. Another function of financial intermediaries is to lower transaction costs associated with epargne and information asymmetry issues. By lowering the cost of information collection and processing, these intermediaries encourage the evacuation (Demirgüç-Kunt, A., & Levine, R. 2008). Therefore, financial markets make it easier to establish connections between investment and export operations. They make it easier to allocate funds to the most profitable ventures and have a positive effect on economic growth by expanding the opportunities for cross-border risk diversification (Azzabi, S. 2012, p. 124).

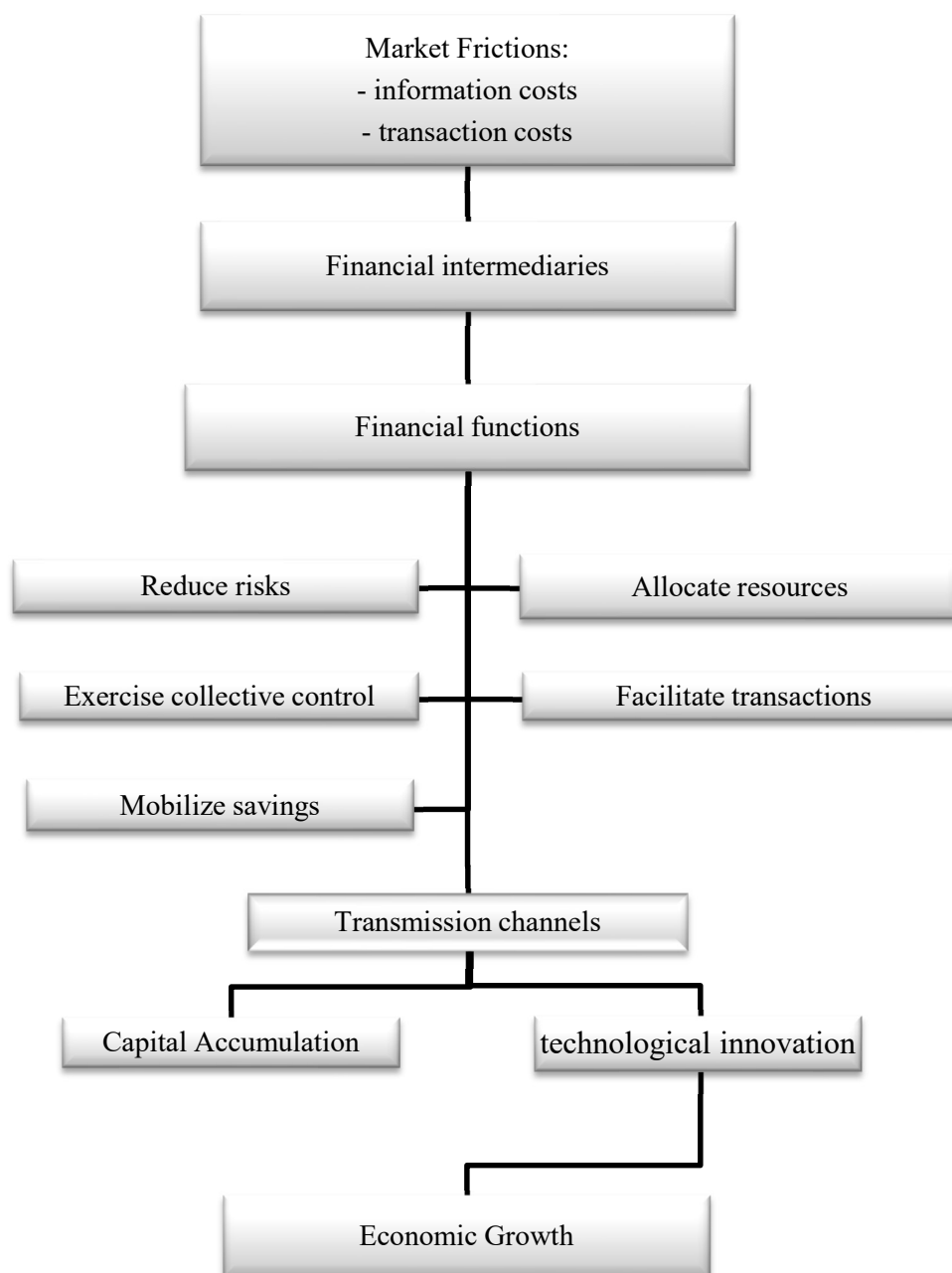
2.5 Promoting the exchange of goods and services

One of the financial system's other main functions is to enable the exchange of goods and services. In this way, financial intermediaries encourage technical innovation, specialisation, and, ultimately, economic growth (Kpodar, K. 2006, p. 78). The interactions among these many variables (facilitating trade, specialisation, innovation, and economic progress) represent the key points made by Adam Smith (1776) in his book *Inquiry into the Nature and Causes of National Wealth*. In fact, according to Adam Smith, the main driver of increased production is specialization or division of labor. Financial contracts that can reduce transaction costs further promote specialization, higher productivity, and sustainable economic growth (Levine, R. 1997, p. 700-701).

3. The link between financial development and economic growth

R. Levine used a functional approach in his 1997 article "Financial Development and Economic Growth: Views and Agenda" to theoretically explain how the financial system influences economic growth through capital accumulation and technological innovation. According to the author, innovation and accumulation are the two main ways that the financial system and economic growth are transferred from one to the other.

Fig.3.1. A theoretical perspective on the relationship between growth and finance



Source: Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature, 35(2), p: 691.

The mechanism by which the financial sector stimulates economic growth is described in the above recapitulative table (Fig. (3.1)) of R. Levine's theoretical approach on finance and growth. According to the author, market frictions lead to the development of financial markets and financial intermediaries (banks) that carry out the five tasks that support economic advancement. According to Diamond (1984), the expenses associated with collecting information create incentives for the creation of financial intermediaries.

More specifically, the centralization of savings collection and mobilization is the primary function of bank and financial market intermediation. By fulfilling this role, the financial system encourages capital formation since it increases the volume of accessible savings, improves the allocation of resources and promotes innovation. Financial intermediaries can exercise control over these companies through this function. In order to ensure that loans are repaid, this control aims to ensure that the companies receiving the credits behave well. By increasing the number of ways to execute contracts, improving the writing of credit contracts, and expanding the range of financial instruments, diversification and risk reduction are made possible simultaneously. Furthermore, the financial system encourages and facilitates the exchange of goods and services by lowering transaction costs and making it easier to access information related to these exchanges. Technological advancements may lead to economic growth, which is seen in the identification of entrepreneurs who supply the most innovative products and manufacturing procedures. Indeed, the innovation brought about by entrepreneurs defined as the development, dissemination, and commercial exploitation of new products and processes is what drives economic growth, according to Joseph Schumpeter (1913). A better collection of epargne and its better distribution to the most profitable and innovative businesses also encourage capital accumulation and investment. Another way that the financial system's operation supports economic growth is through the channel of technological advancements.

4. Theoretical approaches to the link between financial development and economic growth:

The paragraph below provides a brief overview of the three theoretical approaches to explaining the link between financial development and economic growth. Approaches include the Supply Leading approach; the Demand Following approach and the Bidirectional Causality approach. The approaches are discussed below;

4.1 The supply approach (Supply Leading Hypothesis)

The supply-side approach was developed by Schumpeter (1911) and later adopted by researchers such as McKinnon (1973); Shaw (1973); Gupta (1984); Fry (1988); Greenwood and Jovanovich (1990) and Bencivenga and Smith (1991). The supply-side approach suggests that financial development leads to economic growth, as it reduces transaction costs and increases information access. A well-developed financial sector mobilizes savings, facilitates trade, and minimizes risks. This efficient resource allocation, faster accumulation of capital, and technological innovation are all facilitated by a well-developed financial system.

4.2 The Demand Following Hypothesis

Defenders of the demand approach such as Patrick (1960), St Hill (1992) and Pagano (1993), assume the existence of a strong dependence between the development of financial institutions and the degree of demand for financial services by savers and investors. While considering a stable economic environment and regular growth.

The demand approach suggests that changes in the real economy increase demand for financial services, leading to the introduction of new financial institutions and markets. The financial system evolves due to economic development, influenced by the environment, institutional framework, and individual motivations. The growth gap between sectors drives financial intermediaries to channel savings towards profitable sectors, causing passive

development. The demand approach suggests two phases in economic growth: first, economic growth creates demand for financial services, leading to sector expansion, and second, mature financial systems stimulate economic growth by allocating resources to productive sectors.

4.3 The Bidirectional Causality approach

With the theoretical developments of Greenwood and Jovanovic (1990), Saint-Paul (1992); Berthelemy and Varoudakis (1996); and Harrison, Sussman & Zeira (1999), the relationship between financial development and economic growth takes on a new dimension. According to this approach, the relationship between financial development and economic growth is bidirectional. Financial development gradually induces economic growth, which, in turn, causes feedback and induces further financial development. However, this suggests that the two variables influence each other simultaneously. The two-way relationship between financial development and economic growth depends on the stage of economic development. At the early stages of economic development, the supply-side approach can stimulate real capital formation. The development of new financial services creates new opportunities for savers and investors and in turn leads to increased economic growth. The supply-side approach loses its importance as financial and economic development progresses, and gradually the demand-side approach begins to dominate.

5. Empirical investigation: The causal link between financial development and economic growth: the case of Algeria

5.1 Data source and sample

Our goal is to investigate the connection between Algeria's financial development and economic growth. This study's foundation is the annual temporal series analysis for the years 1980–2022. The majority of the data used in our economic analysis comes from the "World Development Indicators" data repository. We will rely on Stata 12.0 to carry out the various steps of our empirical approach in order to achieve this.

5.2 Methodology of empirical estimates

5.2.1 Specification of the econometric model and presentation of the variables used

The study's model is based on works that have been cited in theoretical and empirical literature that has examined the relationship between financial development and economic growth. The works of Levine (1993), Levine & Renelt (1992), Pagano (1993), Gregorio & Guidotti (1994), and Mankiw, Romer & Weil (1992) served as the basis for our economic model. The fundamental equation that will enable us to calculate the causal relationship between financial development and economic growth is:

$$Growth_t = \alpha + \beta DF + \delta X_t + \varepsilon$$

The meaning of the variables used is as follows:

Growth_t: represents the change in real gross domestic product per capita (GDP) in period t;
DF : represents the matrix of financial development indicators;

X_t : represents a battery of control variables often mentioned in the literature relating to the determinants of growth.

ε : Random error term with zero expectation and constant variance.

α : Constant

By observing the evolution of the Algerian financial system from 1980 to 2022, we were able to identify the variables measuring financial intermediation likely to affect economic activity. These are the main currency and credit indicators of the Algerian economy, namely the bank liquidity ratio (M2), and the bank credit ratio (credit). The control variables used are those suggested by theories of endogenous growth, such as trade openness, inflation, and investment.

5.3 Empirical results and interpretations

5.3.1 Unit root tests

In this article, the unit root tests implemented will be that of Augmented Dickey Fuller (ADF). Indeed, a series is said to be stationary if the test statistic (ADF) is greater in absolute value than the critical value. Given the non-significance of the trend and constant, the unit root test was performed without trend or constant. The results recorded in the tables below suggest that at different levels of significance (1%, 5%, 10%), using the ADF test, all the variables Growth, M2, Credit, INF, Trade and INV are stationary in first difference. In addition, the variables in our study are integrated of order I (1) and are not integrated to an order greater than 1, which justifies the use of the Autoregressive Distributed Lag ARDL approach.

Table 1. Stationarity test of the Augmented Dickey-Fuller (ADF)

Stationarity test			
	Level	1 st difference	Order of Integration
Growth	-1.814	-6.607***	I(1)
M2	0.122	-3.334***	I(1)
Credit	-1.946	-2.674***	I(1)
INF	-1.616	-4.940***	I(1)
Trade	-0.481	-5.226***	I(1)
INV	-3.342	-5.931***	I(1)

Notes: A series has a unit root, which is the test's null hypothesis. At the 5% level of significance, the null hypothesis is rejected. Significant at 10%, 5%, and 1%, respectively, are denoted by the symbols (*), **, and ***.

Source: Stata12.0 computation by the authors.

5.3.2 Determination of the optimal delay

Determining the number of delays is necessary in order to monitor the application of the ARDL approach procedures. Several methods exist to make this choice. The most common are the Akaike (AC) and Schwarz (SC) information criteria. The optimal delay number retained in our work is that which makes it possible to minimize the Schwarz information criteria (SC). According to the results recorded in the table below, we will choose the ARDL model (1, 1, 2, 1, 1, 1).

Table 2. VAR Lag Selection Results

Variables	0	1	2	3	4
Growth	4.68762	4.65527*	4.73553	4.82205	4.85842
M2	8.56179	6.6932*	6.69694	6.78754	6.87314
Credit	9.04148	6.75671	6.75076*	6.8134	6.87985
INF	7.14662	6.03518*	6.07288	6.16106	6.22476
Trade	7.58487	6.22448*	6.25247	6.29729	6.36383
INV	5.84527	5.09172*	5.13565	5.16128	5.2549

Source: Stata12.0 computation by the authors.

5.3.3 Cointegration test:

We use the Johansen cointegration test to ascertain the number of cointegrating equations after establishing the right lag period to be one earlier. When the trace statistics are smaller than the crucial value, we accept the null hypothesis that there is no co-integration. According to the table below, cointegration of order one is present because the computed F statistic (4.804) is higher than the upper bounds at the 1% (4.78), 2.5% (4.49), 5% (4.01), and 10% (3.52) thresholds. Thus, the null hypothesis that there is no co-integration is rejected by this study. This demonstrates the long-term correlation between financial development and economic growth.

Table 3. Johansen tests for cointegration

F-statistics	Significance	I(0)	I(1)
4.804***	10%	2.45	3.52
	5%	2.86	4.01
	2.5%	3.25	4.49
	1%	3.74	4.78

Note: At the 1% significance level, *** denotes the null hypothesis' rejection.

Source: Stata12.0 computation by the authors.

5.3.4 Robustness tests of the estimated ARDL model

• The Breusch–Godfrey (LM) serial correlation test

The Breusch-Godfrey test allows us to conclude that the errors are not autocorrelated The probability associated with the P test (0.6071) is greater than 0.05, that is to say that the residuals are independent of each other in our model .

Table 4. Autocorrelation test of residuals

Residues	Breusch-Godfrey LM test for autocorrelation	Prob
		0.6071

Source: Authors computation using Stata12.0.

• The White heteroskedasticity test :

White's heteroscedasticity test provides us with a p-value equal to 0.0707. This p-value is greater than 0.05. Which confirms the absence of heteroscedasticity.

Table 5. Test for heteroscedasticity of residuals

Residues	White test for heteroskedasticity	Prob
		0.0707

Source: Authors computation using Stata12.0.

• The error normality test :

From the table below, we notice that the residuals have a Jarque-Bera statistic equal to 0.656 and the probability of the normality test (0.72029) is well above the 5% threshold. The assumption of normality of the residuals is therefore verified.

Table 6. Normality test of errors

Residues	Jarque Bera	Prob
	0.656	0.72029

Source: Authors computation using Stata12.0.

• The Ramsey functional form test (RESET)

With the Ramsey test (RESET), we see that the probability associated with the test is $0.0776 > 0.05$, we therefore accept H_0 , which means that our model does not lack variables and also that the functional form of our specifications is correct.

Table 7. Ramsey functional form test (RESET)

F-statistics	Prob
2.48	0.0776

Source: Authors computation using Stata12.0.

5.3.5 Estimation of the long-term relationship using the ARDL approach

The long-term relationship between financial development and economic growth is illustrated in the following table:

Table 8. Results of the long-term estimation

Variables	Coefficient	Prob
M2	-0.1661841	0.096
Credit	-0.1884929	0.014
INF	-0.0935403	0.373
Trade	0.0238557	0.822
INV	0.2937657	0.085
C	-0.2355084	0.541
Cointq = Growth – (-0.1661841*M2-0.1884929* Credit -0.0935403 *INF+0.0238557*Trade +0.2937657INV --0.2355084)		

Source: Authors computation using Stata12.0.

The findings in the above table demonstrate that the inflation rate has no effect on economic growth. This finding contradicts the conventional literature that holds that inflation has a

long-term impact on economic growth. The findings also show that the rate of commercial opening (trade) has no bearing whatsoever on economic growth. Additionally, the coefficient associated with investment (INV) has a positive and significant sign for our country, which reflects the work made on the institutional and legislative plan. In order to attract investments and diversify its economy, Algeria has started to implement reforms aimed at improving its investment climate. However, the estimation results shown in Table 8 show that financial development has a significant and negative impact on Algeria's economic growth. Economic growth is significantly and negatively impacted by the rate of financial approximation (M2). Increasing the M2 ratio by a certain amount tends to reduce economic growth by 0.16 percent. This result aligns with the findings of Sekali (2018), whose findings lead to the rejection of any positive impact of financial investment on economic growth rates. The variable (credit) has a negative effect on economic growth as well. If the coefficient of the variable (Crédit) is increased by one point, Algeria's economic growth is likely to be reduced by 0.18 percent. The results of De Grégorio & Guidotte (1995) and Hay (2000) are somewhat consistent with this one. This illustrates the low levels of credit given to the private sector.

5.3.6 Estimation of the short-term relationship using the ARDL approach

To study the short-term impact of financial development on economic growth in Algeria, we estimate the error correction regression.

Table 9. Results of the short term estimation

Selected Model: ARDL (1, 1, 2, 1, 1, 1)

Variables	Coefficient	Prob
D(M2)	-0.1456262	0.007
D(M2(-1))	0.0172816	0.870
D(M2(-2))	0.2054626	
D(Credit)	0.0560293	0.005
D(Credit(-1))	-0.1201073	0.039
D(Credit(-2))	0.1086354	0.066
D(INF)	-0.0590406	0.089
D(INF(-1))	-0.035749	0.488
D(Trade)	0.0712157	0.709
D(Trade(-1))		
D(INV)	0.0048875	0.232

D(INV(-1))	0.1770466	
CointEq(-1)	0.0011476	0.964
R ²	-0.8990095	0.262
	0.7107	0.995
		0.000
F-statistic	1.8687	

Source: Authors computation using Stata12.0.

The error correction coefficient expresses the degree to which the dependent variable (economic growth rate) will be recalled towards the long-term target. It is estimated at (-0.89) for our ARDL model, thus reflecting a relatively rapid adjustment to the long-term target. Nearly 89 percent of imbalances in the previous year's GDP growth readjust to the current year's long-term balance after a short-term shock.

Furthermore, the coefficient of determination $R^2 = 71.07\%$ shows that changes in economic growth can be explained by changes in the variables included in the study, confirming the validity of the chosen model. It is seen that the short-term coefficients of the variables M2 and Crédit are significant. This means that the amount of money and credit given to the private sector promotes short-term economic growth.

5.3.7 Results of Granger causality tests between economic growth and the different variables representing financial development

The main goal of the majority of studies related to our field of study has been to determine whether there is a causal relationship between financial development and economic growth and whether this relationship is bidirectional. In our model, the Granger test of causality will be used to ascertain the degree of causality between the indicators of financial development and economic growth in Algeria.

Table 10. Summary of Granger causality test results

Null hypothesis	F calculat ed	Prob	Decision
M2 does not cause Growth	11.104	0.004	We reject H0
Growth does not cause M2	1.304	0.521	We accept H0
Credit does not cause Growth	6.4929	0.039	We reject H0
Growth does not cause Credit	12.803	0.002	We reject H0

Source: Authors computation using Stata12.0.

A one-way Granger causal relationship between economic growth and M2 money mass (the test's critical probability is $0,004 < 0.05$). It is the monetary mass that affects economic

growth rather than the other way around (Joseph, Raffinot & Venet, 1998). The Granger test of causality reveals a bidirectional causal relationship between the variables credit and croissance. These are the test's critical probabilities: ($0,002 < 0,05$) of Croissance to Crédit and ($0,039 < 0,05$) of Crédit to Croissance. Indeed, the results show that bank loans are one of the key components of economic development. Additionally, as the PIB growth rate per capita increases, more credit is given to agents that require liquidity. This result aligns with the findings of Joseph, Raffinot, and Venet (1998) and Khalfaoui (2002).

Conclusion:

In this article, we attempted to determine the effect of financial development on economic growth in Algeria by applying the ARDL approach to the years 1980–2022. The study's findings show that financial development has a negative and significant impact on Algeria's economic growth, and that despite the financial system's reforms over the past few decades, it has not been able to significantly contribute to economic growth. We also discuss the sense of causality between financial development and economic growth in Algeria. There is a bidirectional relationship between economic growth and private sector credit, and a unidirectional relationship between the mass of money M2, the assets of commercial banks, and economic growth, according to Granger's test of causality.

It appears that in order to reach a level of financial development that will enable an improvement in the level of economic growth and development, the following reforms must be implemented: improving information circulation; developing appropriate accounting standards; diversifying credit products; improving mechanisms for recovering debts; and strengthening incentives for contract compliance.

Reducing the restrictions placed on financial asset transactions will strengthen the financial market. Putting a focus on increasing competition within the banking industry, privatising public banks, and diversifying funding sources to meet the needs of various economic actors.

Bibliography List:

- Asteriou, D., Spanos, K., & Trachanas, E. (2024). *Financial development, economic growth and the role of fiscal policy during normal and stress times : Evidence for 26 EU countries*. *International Journal of finance & Economics*, 29(2), 2495-2514.
- Azzabi, S. (2012). *Intégration financière internationale, développement financier et croissance dans les pays émergents et en développement, sous la direction de Jean Pierre Allégret et Fethi Sellaouti, université de Lumière Lyon 2*.
- Bencivenga, R., & Smith, B.D. (1991). *Financial intermediation and endogenous growth*. *The Revue of Economic Studies*, 58, p: 195-209.
- Berthélemy, J.C., & Varoudakis, A.(1994). *Intermédiation financière et croissance endogène*. In: *Revue économique*, 45(3), p : 737-750.
- Bouras, N. (2021). *Le développement financier et la croissance économique en Algérie*. Université d'Oran 2 Mohamed Ben Ahmed. Algérie.
- Brou Emmanuel, A. (2005). *Le rôle des marchés de capitaux dans la croissance et le développement économique, sous la direction de Jean-Marin SERRE, université d'Auvergne - Clermont-Ferrand I*.
- Courage.M (2024), *Financial Development and Economic Growth: Evidence from Low-Income Nations in the SADC Region*. *International Journal of Financial Studies*, 12, 62 , 1-16;
- De la Cruz. J (2020), *Financial Development and Economic Growth: New Evidence*, *ECONOMIA*, volume 43, issue 85, 47-64 ;
- Demirgüç-Kunt, A., & Levine, R. (2008). *Finance, Financial Sector Policies, and Long-run Growth (Vol. 4469)*. World Bank Publications.
- [Frederic S. M.](#) (2010). *Monnaie, banque et marchés financiers*. Pearson Education France.
- Fry, M. J. (1980). *Money, interest and banking in economic development*, 2nd edition, London, John Hopkins University press.
- Greenwood, J., & Smith, B. (1997). *Financial Market in Development, and The Developme nt of Financial Markets*. *Journal of Economic Dynamics and Control*, 21, p: 145-186.
- Greenwood, J., & Jovanovic, B. (1990). *Financial Development, Growth, and the Distributio n of Income*. *Journal of Political Economy*, 98(5), p: 1076-1107.
- Guru.B.K & Yadav.I.S (2018), *Financial development and economic growth: panel evidence from BRICS*, *Journal of Economics, Finance and Administrative Science*, Vol. 24 No. 47, 113-126 ;
- Harrisson, P., Sussman, O. & Zeira, J. (1999). *Finance and Growth: Theory and Evidence*. Washington, DC: Federal Reserve Board (Division of Research and Statistics), Mimeo
- Hemche, O., & Benallal, B. (2015). *L'effet du développement financier sur la croissance économique : Cas de l'Algérie (1994-2014) - Etude économétrique- Revue Nour des études économiques*, 01, p : 121-139.

- Kpodar, K. (2006). *Développement financier, instabilité financière et croissance économique: implications pour la réduction de la pauvreté, sous la direction de Patrick PLANE, université D'Auvergne –Clermont I.*
- Levine, R. (1997). *Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature*, 35(2), p: 688-726.
- Levine, R. (2005). *Finance and growth: theory and evidence. Handbook of economic growth*, 1, p: 865-934.
- McKinnon, R. I. (1973). *Money and Capital in Economic Development. the Brookings Institution, Washington. D. C.*
- Mengesha. S. T & Berde . E (2023), *Financial development and economic growth in Ethiopia: Is there a causal link?*, *Cogent Economics & Finance*, 11, 2, 1-26 ;
- Oroud, Y., Almahadin, H.A., Alkhazaleh, M., & Shneikat, B. (2023). *Evidence from an emerging market economy on the dynamic connection between financial development and economic growth. Research in Globalisation*, 6, 100124.
- Pagano, M. (1993). *Financial Market And Growth: An Overview. European economic review*, 37, p: 613-622.
- Rafael, C. (2012). *Un nouvel indice du développement financier, document de travail, Université Paris Dauphine*, p : 07.
- Saint-Paul, G. (1992). *Technological Choice, Financial Markets and Economic Development. European Economic Review*, 36(4), p : 763-781.
- Samouel, B. (2009). *Le développement financier pour les pays du sud de la Méditerranée à l'épreuve de la mondialisation financière. Sous la direction de Dominique PLIHON, université de Paris XIII-Nord.*
- Schumpeter, J. (1911). *The Theory of Economic Development, Cambridge, MA : Harvard University Press.*
- Senouci B. I. (2014). *L'impact de l'intégration financière sur la croissance économique : Le cas des pays du Conseil de Coopération du Golfe, sous la direction de Bouteldja Abdelnacer. Université de Tlemcen, - Algérie.*
- Shaw E.S. (1973). *Financial Deepening in Economic Development. New-York, Oxford University Press.* Cité par : Diop, T. (2013). *Le développement financier et croissance économique : la structure financière joue-t-elle un rôle ?*. Mémoire présenté comme exigence partielle de la maîtrise en, p : 5.
- Zaheer. A, Gul. A & Ghulam. M (2022), *The effect of financial development on economic growth and income distribution: an empirical evidence from lower-middle and upper-middle-income countries*, *velopment Studies Research*, 9, 1, 117-128 ;
- Zenasni, S. (2013). *Les effets de l'intégration financière sur la croissance des économies du Maghreb dans un contexte de globalisation et de crises, sous la direction de Benhabib abderrezzak, université Abou BekrBelkaid de Tlemcen.*
- Zenasni, S., & Benhabib, A. (2012). *Capital Account Liberalization and Economic Growth in Developing Economies: An Empirical Investigation. Working Papers on Global Financial Markets.*