the impact of inflation levels on financial development in Algeria during the period (1991-2022)

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Abstract:

Financial development poses a challenge to central banks that target inflation within their monetary policy, so we aim through this research to measure the impact of inflation levels on financial development in Algeria during the period 1991-2022.

And using the ARDL model, we found that financial development in Algeria is negatively affected, starting from the TAR inflation threshold estimated at 2.927%, the structural nature of the Algerian economy also positively affects the development of the financial sector, making it linked to the degree of economic maturity. Therefore, we recommend promoting diversifying the Algerian economy while taking into account the follow-up of an inflation-targeting monetary policy.

Keywords: financial development; inflation; investment; inflation threshold; model ARDL.

JEL Classification Codes: C32, E31, E58, G21, G24

ملخص:

تشكل التنمية المالية تحديا للبنوك المركزية التي تستهدف التضخم ضمن سياستها النقدية، لذا نهدف ضمن حيثيات هذا البحث إلى قياس اثر مستويات التضخم على التنمية المالية في الجزائر خلال الفترة 1991-2022.

وباستخدام نموذج ARDL، توصلنا إلى أن التنمية المالية في الجزائر تتأثر سلبا ابتداء من عتبة التضخم TARالمقدرة بـ2.927% ، كما أن الطبيعة الهيكلية للاقتصاد الجزائري تؤثر إيجابا على تطور القطاع المالي، مما يجعل هذا الأخير يرتبط بدرجة نضج الاقتصاد، وعليه نوصي بتعزيز التنويع الاقتصاد الجزائري مع مراعاة إتباع سياسة نقدية تستهدف التضخم.

كلمات مفتاحية: التنمية المالية، التضخم، الاستثمار،عتبة التضخم ، نموذج Ardl

تصنيفات JEL: C32، E31، E58، G21، G24

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1. Introduction

Inflation is a common term in economics, as the empirical evidence shows that it has formed cases of instability for long periods of time in many global economies. In the inflationary environment, the continuous rise in prices leads inequitably to a reduction in the purchasing power of consumers, which represents the greatest cost of inflation.

Global economic data after the 2008 global financial crisis and the problems associated with the COVID-19 pandemic suggest that there are clear trade-offs between managing inflation, achieving stability, and financial development, because the sharp rise in interest rates to combat inflation threatens to destabilize the entire financial system. The economic environment in many developed and developing countries alike forces central banks to raise interest rates to combat inflation, and thus not achieve the two goals of stabilizing inflation and achieving financial development, as tightening monetary policy may cause chaos in the financial sector.

For this reason, Algeria, like other Arab countries, has been keen to achieve financial development by implementing a package of reforms that began in 1990, in which it focused on giving monetary policy a prominent role in order to keep inflation within the targeted levels. However, the shocks that the Algerian economy has experienced, especially after the COVID-19 crisis pandemic and the Russian-Ukrainian war, have directly contributed to a sharp rise in the prices of primary goods, and thus an unprecedented rise in inflation levels.

Therefore, and based on the above, we can pose the following main question: What is the impact of inflation levels on financial development in the light of global economic shocks on the Algerian economy?

To simplify and clarify the content of the main question presented above, we present a set of sub-questions as shown in the following points:

-What do we mean by financial development?

-What are the most important indicators for measuring financial development?

-Does the inflationary environment contribute to the occurrence of financial development in Algeria?

Hypotheses: To answer the content of the main question, the following hypotheses should be formulated:

- There is a statistically significant negative relationship between inflation levels and financial development in Algeria;
- There is a positive statistically significant relationship between capital accumulation and financial development in Algeria.

Research importance: The importance of the research stems from the importance of the activity of the financial sector, which is considered one of the most important basic channels for financing the national economy, so the Algerian government, like

other countries in the world, seeks to build and develop effective strategies through which inflation rates are targeted to acceptable levels in order to reach acceptable levels of financial development.

Research objective: The purpose of this research is to measure the effect of inflation levels on financial development in Algeria, as well as to determine the inflation threshold that impedes the performance of financial development activity, based on lagging regression models.

Research limit: Based on the question raised and the hypotheses formulated within it, and in light of the importance of this research and in order to achieve the goal of the study, the temporal and spatial framework is determined in the period from 1991 to 2022, which covers almost the most important reforms that enhance financial development in the Algerian banking market.

Approach: We rely on the descriptive analysis method using statistical indicators for the purposes of inference, analysis and econometrics to find out the relationship between the studied variables.

2. Conceptual and empirical framework for financial development

The majority of countries seek to achieve sustainable development, through the development of many sectors, and perhaps the most important of them is the financial sector, especially in light of global economic developments, In view of the foregoing and in order to understand the content of aspects of financial development, we will address the following elements:

2.1 The concept of financial development

Most of the studies that addressed the topic of financial development varied in their definition of the concept. However, most of them derive their content from the definition provided by the World Bank, which defines financial development as the process of strengthening and expanding the scope of financial services to efficiently and effectively meet the needs of economic units (Bengana & Boughazala, 215, p. 266), Accordingly, the concept of financial development refers to the evolution of the financial sector with the aim of supporting economic growth (Nabil, 2022, p. 29), In other words, it represents continuous improvements in the efficient provision of financial services through the development of financial institutions in all forms and types (Ibtisam & Bader Shehdeh, 2020, p. 30), Furthermore, financial development can be understood within the functional approach of the financial system as providing prior information about investments and capital allocation, financing and supervising investments, facilitating trade, diversifying service provision, mobilising savings, and facilitating the exchange of goods and services (kebir, 2021, p. 33) .

The concept of financial development can be defined within the scope of depth and financial inclusion, as it means from the perspective of financial depth that means the ability of financial institutions in general to mobilize financial resources effectively,

in order to achieve development (Nzotta & Okereke, 2009, p. 57), Defining financial development in terms of financial inclusion, it means a process of promoting affordable, timely and adequate access to a wide range of financial products and services, while expanding their use by all segments of society through the implementation of current and innovative approaches tailored with financial awareness and education in mind. In order to promote financial well-being and economic and social integration (belghalem & ilifi, 2023, p. 320)

In conclusion, financial development can be defined as achieving efficiency and effectiveness in providing financial services amidst financial expansion and evolution.

2.2 Components of the financial development strategy

To achieve financial development during a specific time horizon, a strategy must be built that includes interrelated and simultaneous components. These components can be referred to as follows: (Bengana & Boughazala, 215, p. 266):

- Expansion of the number of institutions operating in the financial sector;
- Diversification of available financial services and the volume of funds intermediated through all financial sector channels;
-The continuous growth in the volume of capital provided by private financial institutions to private sector projects instead of direct government lending provided by state-owned banks;
- Improvement of the financial sector in terms of supervision, regulation, stability, efficiency, and competitiveness;
-Increasing the percentage of individuals who have access to credit and financial services.

In addition to the existence of other strategies represented in (Azzam, 2017, pp. 19-20):

- Sufficiently regulating financial markets to offer a wide range of financial instruments and services, contributing to deepening the market and ensuring efficient mobilisation of financial resources;
-Encourage joint and orderly interaction between policy makers and market participants and move towards a more transparent financial system;
- Easing restrictions on banking institutions, allowing them to own and trade stocks, provide underwriting, and offer loans against shareholders' rights, leading to increased market liquidity, more flexibility for borrowers, and facilitating market investments;
- Providing tax incentives to encourage long-term investments and savings from small investors to attract additional funds into the financial markets.

2.3 Indicators of measuring financial development

Measuring the level of financial development of a particular country is not easy because of the variety of indicators used for this purpose, in addition to the stage of

development that its financial markets have reached. In general, these indicators can be divided into conventional quantitative indicators and structural indicators:

Quantitative indicators: depend on monetary and credit aggregates, and measure the strength of savings and credit intermediation in an economy. These indicators include the following (djouadi & dif, 2021, pp. 229-231) (Hassoun Al Saadi, 2011, pp. 222-224) (Bengana & Boughazala, 215, pp. 267-268) (benkablia, 2016, pp. 138-140):

- Ratio of domestic liquidity $\frac{M_2}{PIB}$: It represents the total monetary mass (time deposits, current deposits and liquid funds) in proportion to the gross domestic product (Ben Yahia & Talhaoui, 2020, p. 239), This indicator reflects the banking system's ability to mobilise financial resources, with a higher value indicating the development of financial intermediation and increased financial development, and vice versa.

- The ratio of loans granted to the private sector to GDP: This indicator measures the extent to which banking institutions contribute to granting loans and facilities to the private sector (Ben Yahia & Talhaoui, 2020, p. 239). An increase in private sector credit relative to GDP indicates the development of banking intermediation, which leads to the promotion of financial development and the strengthening of links between the banking sector and the economy. (Satyanarayana, Suresh Kumar, & Mahendra, 2017, p. 144) .

-Ratio of total deposits to GDP: This indicator is important in expressing the volume of banking transactions and serves as a quantitative measure of financial development. An increase in this ratio indicates the efficiency of financial institutions in mobilizing financial resources, which allows them to expand their services to the economy.

- **Structural indicators**: they are indicators that depend on the structure of the financial system and determine the importance of its various elements, and they include three main indicators:

-Ratio of broad cash to narrow cash: It expresses the extent of the banking system’s progress and the extent to which it is able to mobilize savings, as a decrease in this ratio means an increase in the diversity of financial institutions in providing their services to the economy (Azzam, 2017, p. 37).

-Ratio of instruments in the stock market to broad cash:, The more securities are traded in the market, The financial depth increases.

- Size and number of financial instruments available: the more financial instruments available in the market, this indicates the development of the financial system.

-The cost of transactions: the more complex the financial transactions and the higher their cost, the less deep the financial system, and vice versa.

2.4 Literary reviews

Most of the empirical studies that dealt with achieving financial development have concluded that inflation is one of the most important factors that impede

financial development, and this is confirmed by every study (Haroon, 2015, pp. 42-48), (Batayneh, Salamat, & Momani, 2021, pp. 1-15), (Kim & Lin, 2010, pp. 343-364), (alshuwribji, 2006, pp. 9-23) , (Sani & Ruqaiyat KA'OJE, 2021, pp. 1-10).

The study (Nurettin & KARAGOZ, 2012, pp. 81-87) also found that low levels of inflation contribute to increasing the performance of financial development, while the study (Farahani, Ghabel, & Reza, 2021, pp. 465-475) concluded that high levels of inflation contribute to limiting financial development, because the inflationary situation reduces the real interest rate, and reduces the incentive to save, And thus increasing the withdrawal of deposits from the financial system, which would lead to the destabilization of the financial system.

The high inflation rate also affects financial development by incurring additional costs for financial institutions in order to achieve savings, in addition to affecting nominal interest rates that are controlled by regulatory laws. Therefore, high inflation rates on the one hand and low interest rates necessarily lead to a decrease in the invested funds, and thus a decrease in the returns achieved by financial institutions (OZTURK & KARAGOZ, 2012).

While the study (Loucif, 2021, p. 573), (Sanusi, Meyer, & Slusarczyk, 2017, p. 254) The relationship between inflation and financial development, and showed that high inflation rates lead to a downward trend in the real rate of return for various financial assets, and thus a decrease in the return on invested funds, Which leads financial institutions to reduce the volume of loans granted, Which reflects negatively on the ability of the financial system to allocate credit effectively, so the volume of invested capital decreases, which reflects negatively on financial development in the long term.

A study (Khan, Senhadji, & Smith, 2001) confirmed that high inflation rates impede financial development, because high inflation rates are accompanied by the imposition of various methods of financial restraint by governments in order to impose restrictions on the sector, and among these methods are setting maximum limits for interest rates on deposits and loans, and setting special standards for credit regulation and taxing the profits of intermediary financial institutions (Rousseau & Wachtel, 2001, pp. 309-324) (alshuwribji, 2006, p. 10), which leads to a decline in the activity of financial institutions from performing their tasks in the economy.

3. interpretation of financial development in light of the inflationary environment in Algeria

The majority of empirical studies have proven that achieving levels of financial development depends on controlling inflation indicators. For this reason, the Bank of Algeria sought, starting in 1990, to develop methods aimed at targeting inflation rates within monetary policy, to achieve acceptable levels of financial development and highlight the relationship between inflation and financial growth in Algeria. We will

try to do a standard study within the following steps:

3.1 Study variables and the model used

The following table shows the variables used to estimate the relationship between inflation levels and financial development, as follows:

Table 01: Definition of study variables

symbol	index	variables	Explanation
dependent variable			
y	$\frac{M_2}{\text{pib}}$	financial development	According to the World Bank, this indicator measures the level of financial development from the perspective of financial depth. The higher this indicator, the higher the levels of financial development. Among the studies that relied on this indicator in measuring financial development, we find: (Afangideh, Garbobiya, Umar, & Usman, 2020, pp. 56-64) , (benkablia, 2016, p. 210) , (Teshager, 2021, pp. 1-15) (Ziyad, Hussein, & Ayman, 2015, p. 12)
independent variables			
$\mathbf{x_1}$	The annual change in the consumer price index	inflation	Inflation is defined in various economic literature as representing a continuous rise in the general level of prices, which affects the levels of purchasing power of economic agents (Hamed Abu Ziada, 2021, p. 387) , As the rise of this indicator negatively affects the levels of financial development
$\mathbf{x_2}$	Fixed capital accumulation	investment	It measures the size of the private sector in the economy, and thus the degree of maturity of the economy, that is, the greater the investment, the greater the economic growth. According to the theory of dependent demand, it assumed the existence of a causal relationship heading from economic growth to financial development.

Source: prepared by the researcher

As for the data collection of the variables shown in the table above, we relied on the reports of the Bank of Algeria and the reports of the World Bank.

If we assume the linear formula for the relationship between these variables, the standard model to be estimated can be written as follows:

$$y=\beta_0+\beta_1 x1_t+\beta_2 x2_t+\varepsilon_t \dots\dots\dots\dots\dots (01)$$

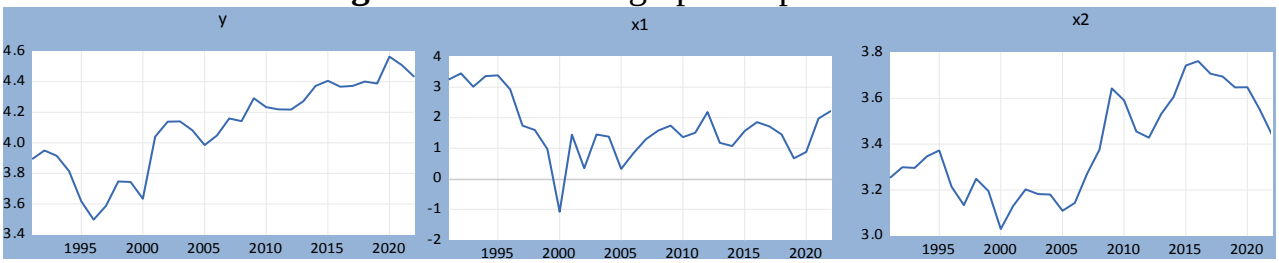
3.2 Model estimation

Many studies that follow the method of ordinary least squares often encounter problems in economic measurement that usually lead to the problem of misestimation, which is due to the time series containing non-random compounds affecting its process, and thus the possibility of influencing the dynamic relationships between different economic variables and for model estimation We follow the following:

3.2.1 A study of the stability of the time series

The study of the stability of the time series is an issue to detect the presence of compounds that cause the emergence of false estimation problems, and among the tests used we find the ADF and PP tests, But before we use them, we're going to graph the chains to take a preliminary idea of their characteristics, The graphic representation of time series of study variables shows that their evolution over time does not take a stable pattern, so we assume that these series are not static.

Fig.01: Time series graphic representation



Source: Prepared by the researcher based on the output of Eviews 12.

In view of what was read from the above figure, here we will resort to the ADF and PP tests to ensure that the time series is not static as shown in the following table:

Table 02: Unit root test results for time series

At level										
time series	ADF test					PP test				
	With Constant & Trend		With Constant		Without Constant & Trend	With Constant & Trend		With Constant		Without Constant & Trend
	b=0	λ=0	c=0	λ=0	λ=0	b=0	λ=0	c=0	λ=0	λ=0
y	0.013	0.215	0.357	0.781	0.877	0.013	0.318	0.357	0.801	0.911
x_1	0.7828	0.2753	0.030	0.069	0.1099	0.782	0.336	0.030	0.087	0.109
x_2	0.0993	0.394	0.199	0.6202	0.7547	0.298	0.6558	0.199	0.5706	0.758
At First Difference										
y_1	0.6733	0.0029	0.508	0.0005	0.0000	0.673	0.0032	0.508	0.0005	0.000
x_1	0.1985	0.0000	0.707	0.0000	0.0000	0.198	0.0000	0.707	0.0000	0.000
x_2	0.8585	0.0181	0.893	0.0033	0.0001	0.858	0.0285	0.893	0.0054	0.000

Source: Prepared by the researcher based on the output of Eviews 12.

Through the outputs of the above table and based on the Dickie Fuller methodology to ensure the unit root in the time series, the stability of the time series can be summarized as follows:

- the money supply/GDP volume series (y) is stable at the first difference with no constant and general trend, and we write: y→I(1);
- The inflation rate series (x_1) is stable at the first difference with the absence of the constant and the general trend, so we write: $x_1 \rightarrow$ I (1);
-Gross capital formation series (x_2) is stable at the first difference with no constant and general trend, and we write $x_2 \rightarrow$ I (1).

3.2.2 cointegration test

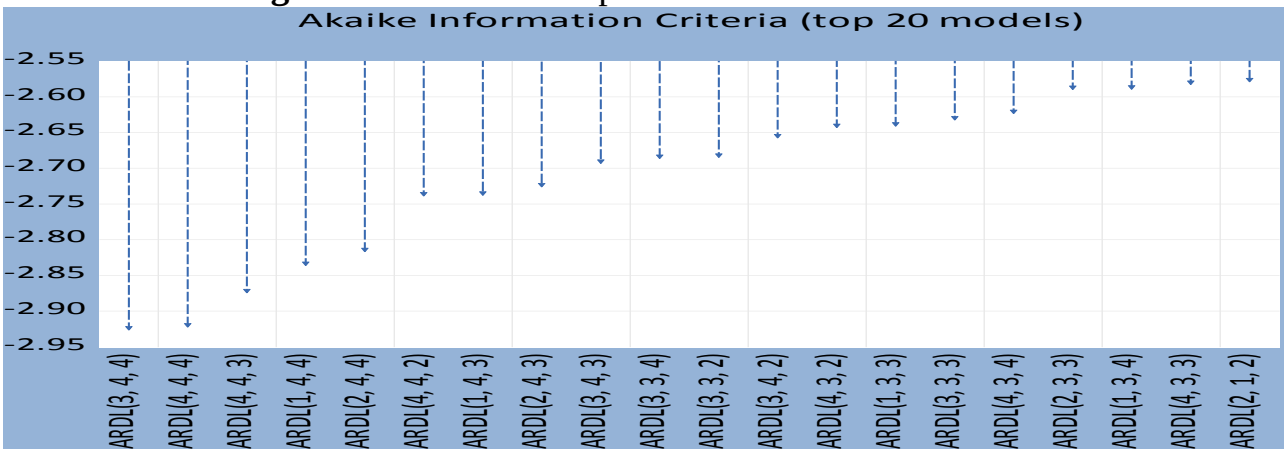
Since the time series is not stable to the same degree, the existence of the cointegration relationship cannot be tested using the Johanson test, so we resort to the technique developed by Pesaran and Shin (1995, 1998) and Pesaran et al (1996, 2001), Since the series used meet the basic condition of this technique, it is possible to track the systematic sequence of this method to ensure the existence of synchronization of the time series in the long term, This technique can be applied through the following steps (Alaa & makid, 2017, pp. 251-252) :

- Choosing the optimal slowing period for the first differences of the variables in the UECM unconstrained model, within the lowest value of Akaike standards (AIC: 1973), Schwarz (SC: 1978), and accordingly the model ARDL (P, q1, q2, q3) is written for the variables included in the model according to for the following relationship:

$$\Delta y_t = \beta_0 + \sum_{i=1}^{P-1} \beta_{1i} \Delta y_{t-i} + \sum_{i=0}^{q_1-1} \beta_{2i} \Delta x_{1_{t-i}} + \sum_{i=0}^{q_2-1} \beta_{3i} \Delta x_{2_{t-i}} + \emptyset_1 y_{t-1} + \emptyset_2 x_{1_{t-1}} + \emptyset_3 x_{2_{t-1}} + \mu_t \dots (02)$$

Here, the appropriate optimal model is chosen for the lowest value of the two criteria mentioned, after estimating this model by adopting different degrees of delay, and with the help of the Eviews12 statistical program, we estimate the various of these models while giving the values of the two criteria mentioned, which facilitates the selection process, as confirmed by the results in the following figure

Fig.02: ARDL model optimization within 20 selected



Source: Prepared by the researcher based on the output of Eviews 12.

It is clear from the figure that the lowest value of the akaike criterion is the one that corresponds to the longest column (because the values are negative), which intersects the ARDL(3,4,4) model, and therefore the model shown in equation (01) can be rewritten according to the delay degrees as follows:

$$\Delta y_t = \beta_0 + \beta_{11}\Delta y_{t-1} + \beta_{12}\Delta y_{t-2} + \beta_{20}\Delta x_{1t} + \beta_{21}\Delta x_{1t-1} + \beta_{22}\Delta x_{1t-2} + \beta_{23}\Delta x_{1t-3} + \beta_{30}\Delta x_{2t} + \beta_{31}\Delta x_{2t-1} + \beta_{32}\Delta x_{2t-2} + \beta_{33}\Delta x_{2t-3} + \emptyset_1 y_{t-1} + \emptyset_2 x_{1t-1} + \emptyset_3 x_{2t-1} + \mu_t \dots (03)$$

- Estimating the model described in Equation No. (03) using the method of ordinary least squares OLS, then verifying the existence of the simultaneous integration relationship using the Wald test, and after conducting this test on the aforementioned model, we obtained the following results:

Table 03: Wald test results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	8.232412	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	28		Finite Sample: n=35	
		10%	2.845	3.623
		5%	3.478	4.335
		1%	4.948	6.028
			Finite Sample: n=30	
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Source: Prepared by the researcher based on the output of Eviews 12.

Comparing the calculated value of the test with the tabular value, as we note from the table that the calculated Fisher statistical value (F-statistic = 8.23) is greater than the tabular upper limit value at all levels of confidence, and therefore we say that there is synchronization between the time series in the long run, which is what It allows us to further estimate the line correction model based on the ARDL technique.

3.2.3 Long term parameter estimation and error correction model

After confirming the existence of a cointegration relationship between the time series under study, we can estimate the parameters of the long and short term, as well as the coefficient of correction or adjustment according to the following:

A- Estimating long-term parameters: We can summarize the results of parameter estimation in the following table:

Table 04: Results of estimation of long-term parameters

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	-0.264858	0.030762	-8.609777	0.0000
X2	1.110224	0.070405	15.76913	0.0000
C	0.796850	0.232089	3.433382	0.0040
EC = Y - (-0.2649*X1 + 1.1102*X2 + 0.7968)				

Source: Prepared by the researcher based on the output of Eviews 12.

It is clear from the table that there is a statistically significant relationship between inflation levels and the financial development index at a significant level of 5%, that is, whenever inflation levels rise by one unit, this leads to a decrease in financial development by 0.264858 units, While there is a statistically significant positive relationship between the fixed capital accumulation index and the levels of financial development, that is, whenever the capital accumulation index increases by one unit, this leads to an increase in the levels of financial development by 1.110224 units.

B-Estimating short-term parameters and error correction model: Error correction models are used to identify the adjustment coefficient that expresses the strength of return to equilibrium in the long term inIn the event of a short-term imbalance, the results of estimating this coefficient were as shown in the table below:

Table 05: Short term parameter estimation results

ARDL Error Correction Regression
Dependent Variable: D(Y)
Selected Model: ARDL(3, 4, 4)
Case 2: Restricted Constant and No Trend
Date: 07/04/23 Time: 12:14
Sample: 1991 2022
Included observations: 28

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y(-1))	0.166614	0.122325	1.362056	0.1947
D(Y(-2))	-0.243754	0.119519	-2.039457	0.0607
D(X1)	0.019154	0.012106	1.582170	0.1359
D(X1(-1))	0.123654	0.031547	3.919700	0.0015
D(X1(-2))	0.096225	0.023883	4.028990	0.0012
D(X1(-3))	0.044563	0.017082	2.608786	0.0206
D(X2)	0.607194	0.103586	5.861728	0.0000
D(X2(-1))	-0.577540	0.129877	-4.446831	0.0006
D(X2(-2))	-0.208686	0.164623	-1.267661	0.2256
D(X2(-3))	-0.317550	0.124237	-2.555999	0.0228
CointEq(-1)*	-0.689057	0.108969	-6.323448	0.0000

Source: Prepared by the researcher based on the output of Eviews 12.

It is clear from Table No. (5) that the value and sign of the error correction coefficient is negative -0.689057, The imbalances included in the proposed model in the short term are automatically adjusted within a eight months.

3.3 Diagnostic tests for the estimated model

These tests are used to ensure the quality of the estimated model. The classic hypotheses of the model are validated and are free from the problems of the harsh economy, so that they can be used for interpretation or prediction. Therefore, there are many common tests in this area, perhaps the most important of which are:

-Test for self-association of errors: The breusch-godfrey test is one of the best tests in this regard, Accordingly, their results can be summarized as follows:

Table 06: Test results for self-correlation of errors

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

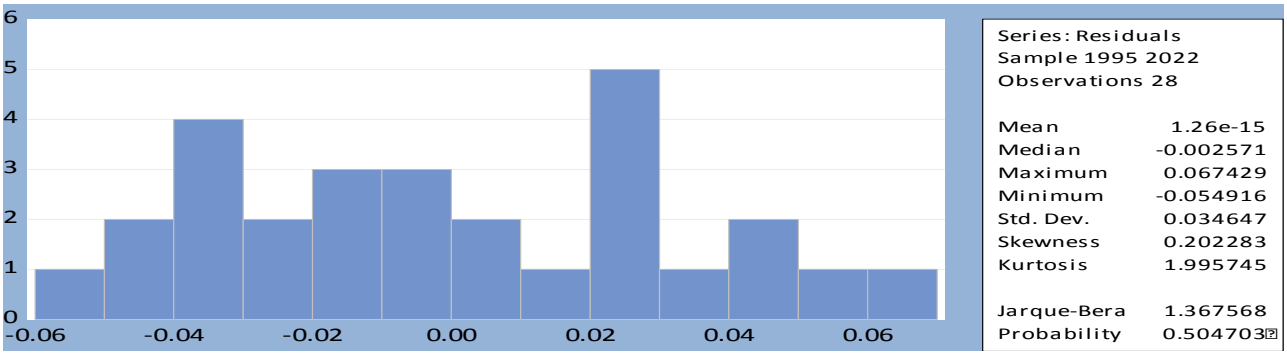
F-statistic	1.313977	Prob. F(2,12)	0.3048
Obs*R-squared	5.030280	Prob. Chi-Square(2)	0.0809

Source: Prepared by the researcher based on the output of Eviews 12.

We conclude from the results of the autocorrelation test for errors that the calculated value of the Fisher test is less than the tabular value, because the probability value is greater than 5%, and therefore we accept the null hypothesis that indicates that there is no autocorrelation between errors for the estimated model.

-The normal distribution test for the remainder of the estimate: This test is used to determine whether the models' discretion follows the normal distribution with zero average errors and with a certain standard deviation. Using eviews12, we have obtained the following results:

Fig.02: Jarque-Bera test results



Source: Prepared by the researcher based on the output of Eviews 12.

It is evident to us through the figure that the graphs of the estimation residuals take a distribution similar to the bell shape of the normal distribution, in addition to that, we find the probability of the Jarque-Bera test (equal to 0.5047) greater than 5%, and therefore we accept the null hypothesis.

-Testing the non-variance hypothesis of the error limit of the estimated model: To ensure the validity of the hypothesis of homogeneity of error variance, we use the ARCH test. Accordingly, the results of this test for the estimated model were as follows:

Table 07: ARCH test results

Heteroskedasticity Test: ARCH			
F-statistic	0.000664	Prob. F(1,25)	0.9796
Obs*R-squared	0.000717	Prob. Chi-Square(1)	0.9786

Source: Prepared by the researcher based on the output of Eviews 12.

ARCH test results show that the calculated value of Fisher test for the estimated model is less than the tabulated value at 05% significance, so we accept the null hypothesis that the error term variance is stable.

-Ramsey Reset test of the estimated model : This test is used to identify the suitability of the model in terms of its functional form to express the relationship between economic variables. The results of this test for the estimated model were as follows:

Table 08: Ramsey Reset test results

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: Y Y(-1) Y(-2) Y(-3) X1 X1(-1) X1(-2) X1(-3) X1(-4) X2 X2(-1) X2(-2) X2(-3) X2(-4) C

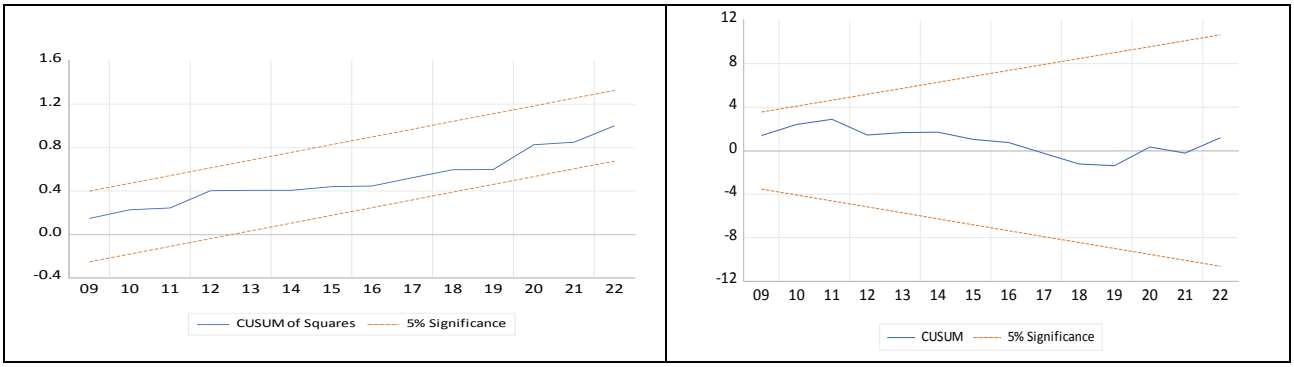
	Value	df	Probability
t-statistic	1.073099	13	0.3027
F-statistic	1.151542	(1, 13)	0.3027
Likelihood ratio	2.376478	1	0.1232

Source: Prepared by the researcher based on the output of Eviews 12.

The proposed functional form can be accepted to express the relationship between the studied economic variables of the estimated model because the probability value of the Fisher test is greater than the 5% level of significance.

- Structural stability test of the estimated ARDL model : It is used to ensure that the data used is free of any structural changes over time, This is done using two tests, the cumulative residuals sum test (Cusum), and the cumulative sum of squares (Cusum Of Squares) test, and after conducting the test, their results were shown as follows:

Fig.04: The cumulative sum of the residuals and the cumulative square sum of the residuals for the estimated model



Source: Prepared by the researcher based on the output of Eviews 12.

It is clear from the structural stability test of the model that the coefficients estimated for the used ARDL model are structurally stable during the study period, which confirms the existence of stability between the study variables and their consistency in the model, because the graphic figure is within the critical limits at a significant level of 5%.

4. Results and Discussion

Based on most of the statistical tests that show that the model does not suffer from standard problems, and based on the results of long-term parameter estimates shown in Table No. (4), the model equation can be written according to the following formula**:**

$$y = 0.796850 - 0.264858x_1 + 1.110224x_2$$

- Through the results of the regression equation and based on the inflation threshold supplement No. (1), the first hypothesis is correct, because there is an inverse relationship between the inflation index (x1) and financial development (y) in Algeria during the period studied, Whereas, whenever inflation rises above the threshold

value, which is estimated at 2.927, the levels of financial development begin to decrease, , because the Algerian economy is characterized by high volume of aggregate demand and inflexibility of the productive apparatus, and the tendency of the central bank to tighten monetary policy to combat inflation leads to a decrease in aggregate demand, and thus a decrease in the activity of the financial sector, and this is what ultimately leads to a decrease in the levels of financial development in Algeria.

- It is evident from the regression model equation that the second hypothesis is correct, and the economic theory agrees, Statistically, an increase in the volume of private investment expressed by the capital accumulation index (x2) by one unit contributes to an increase in financial development in Algeria by 1,110 units, Economically, there are many studies that assumed a causal relationship heading from economic growth to financial development, centered on what is known as the dependent demand theory, The economic institution within a diversified economy is the one that leads financing and increases the demand for different types of financial services, and accordingly the financial system automatically responds to these requests, (Karso, 2018-2019, p. 82) Also, the financial markets do not begin to grow except when the economy begins to approach the middle stages in the process of growth, and these markets develop when the economy becomes mature (Luintel & Khan, 1999, p. 382), and the previous analysis applies completely to the Algerian economy, because the latter is considered an immature economy that has not reached the intermediate stage. It depends entirely on stimulating economic growth on fiscal policy measures through public spending and budget deficit policies, which aim to encourage the private sector, which in turn stimulates financial development.

5. Conclusion

The development of the financial sector is an important pillar in achieving the goals of sustainable development, It expands by increasing levels of investment and stimulating saving, and to achieve it, many factors must be combined, including achieving acceptable levels of inflation, as indicated by many empirical studies that confirmed the existence of a threshold that central banks should not cross, Otherwise, it will become one of the prominent obstacle to financial development. After trying to link inflation levels to financial development in the Algerian economy for the period 1992-2022, which covers an important period of financial development, the results of the regression equation and the inflation threshold showed us the following:

-Financial development in Algeria is negatively affected by inflation levels, starting from the inflation threshold estimated at 2.927;

-The weak diversification of the Algerian economy, expressed in the lack of the private sector, leads to negative consequences for financial development.

Given the characteristics and advantages of the financial system in Algeria, and in order to reach an acceptable level of financial development, we can make some of the following recommendations:

-The Bank of Algeria should follow a monetary policy that targets inflation within an acceptable threshold that contributes to the development of the financial sector;

-Supporting macroeconomic policies with a new package aimed at achieving economic diversification and encouraging the private sector's contribution to economic development, in order to increase the maturity of the Algerian economy;

-Developing and modernizing the financial sector by adopting a strategy that seeks to find tools, services and financing methods that keep pace with the degree of maturity of the Algerian economy.

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7. Appendices

Appendix No 1:model estimation results TAR

Dependent Variable: Y
Method: Discrete Threshold Regression
Date: 07/22/23 Time: 14:07
Sample: 1991 2022
Included observations: 32
Threshold variable: X1
Allow heterogeneous error distributions across breaks

Variable	Coefficient	Std. Error	t-Statistic	Prob.
	X1 < 2.927403 -- 26 obs			
X1	0.024521	0.051018	0.480630	0.6345
	2.927403 <= X1 -- 6 obs			
X1	-0.079979	0.031043	-2.576397	0.0155
	Non-Threshold Variables			
C	1.155288	0.482044	2.396642	0.0235
X2	0.875803	0.148223	5.908683	0.0000

R-squared	0.716624	Mean dependent var	4.099710
Adjusted R-squared	0.686263	S.D. dependent var	0.291954
S.E. of regression	0.163530	Akaike info criterion	-0.667174
Sum squared resid	0.748776	Schwarz criterion	-0.483957
Log likelihood	14.67479	Hannan-Quinn criter.	-0.606443
F-statistic	23.60293	Durbin-Watson stat	0.338901
Prob(F-statistic)	0.000000		