

# Evaluating the Path of Financial Editorial in Algeria and its Impact on Economic Growth in Algeria

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**Abstract:** Algeria adopted a market economy system in the early 1990s and embarked on a policy of financial liberalization to enhance economic development. This study aims to evaluate the trajectory of these reforms and measure the impact of financial liberalization on economic growth during the period from 1990 to 2021, using the Autoregressive Distributed Lag (ARDL) approach. Our findings indicate that financial liberalization in Algeria remains partial and lacks the necessary conditions for its promotion, especially in the absence of a robust banking and financial sector and an efficient production base. The success of financial liberalization policy and the achievement of economic development in Algeria depend on stimulating the production apparatus and developing the financial intermediation system.

**Keywords:** Financial Liberalization, Economic Growth, Reforms, Banking and Financial Sector, Autoregressive Distributed Lag (ARDL)

**JEL Classification Number:** O16, O43, E44, G28

## 1. Introduction

Financial liberalization promotes economic development by addressing restrictive government policies, such as interest rate controls and limitations on foreign capital. Measures like price adjustments, exchange rate systems, trade barrier removal, and attracting foreign direct investment aim to mobilize savings, encourage investment, and improve efficiency. However, research on the impact of financial liberalization has yielded diverse conclusions, leading to differing opinions. Decision-makers adopt strategies to gradually liberalize financial systems and integrate into the global economy sustainably. Algeria's market economy system and financial reforms aim to enhance economic development, but challenges persist, including dependence on the hydrocarbon sector and

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difficulty attracting foreign investments. The study evaluates the progress of these reforms and identifies hindrances to economic development. The study revolves around the following research question:

Did financial liberalization policy succeed in achieving economic development in Algeria?

The study is based on two fundamental hypotheses:

**Hypothesis 1:** Algeria has achieved economic growth rates as a result of implementing financial liberalization policy.

**Hypothesis 2:** The success of financial liberalization policy and the achievement of economic development in Algeria depend on stimulating the production apparatus and developing the financial intermediation system.

## 2. Literature Review

Before delving into measuring the impact of financial liberalization on economic growth using the ARDL model, we discuss the concept of financial liberalization and the theoretical models that support its relationship with economic growth. Financial liberalization is defined as the process of removing or reducing restrictions to restructure the financial and banking sector and increase the freedom of capital movement between different countries or within the same economy.

It is also defined as: "Liberating financial market operations from imposed restrictions that hinder the trading of securities at both the domestic and international levels" (Ratia, 2013). Financial liberalization entails granting complete freedom and independence to banks and financial institutions in managing their financial activities by eliminating various constraints on banking operations. It involves taking liberalizing measures regarding interest rates on loans and deposits, abandoning credit guidance policies, opening up the banking sector to domestic and foreign private sectors, and liberalizing financial transactions and balance of payments accounts (external financial liberalization) (Ben Bouziane and Chakouri, 2014). The measures of financial liberalization include the following:

- Removing administrative restrictions on banks, such as credit ceilings or mandatory financing of the public sector.
- Removing imposed caps on interest rates and expanding their range of movement.
- Strengthening the independence of banks and financial institutions in making decisions according to market rules, especially in the lending sector.
- Restructuring and commercializing public banks.

- Enhancing the independence, supervision, and control of the monetary authority to maintain market discipline (Zeroukat and Logani, 2021)

The theoretical models of financial liberalization are based on the works of Shaw (1973), who illustrates in his book "Financial Deepening in Economic Development" the positive impact of financial liberalization in achieving higher levels of economic growth. In addition, the works of McKinnon (1973) extend the theory of Gurley and Shaw (1960) regarding the pivotal role played by financial intermediation in resource allocation and directing savings towards investment in an open economy, which positively affects economic development and growth. McKinnon emphasizes in his book "Money and Capital in Economic Development" (1973) the necessity of liberalizing interest rates and removing restrictions on capital flows to encourage savings and foreign investment inflows, thereby accelerating capital accumulation (Saadi, 2015). The objective of financial liberalization policy is to:

- Mobilize domestic and foreign financial resources to finance the economy and enhance economic growth.
- Enhance the efficiency of financial markets to strengthen the role of financial intermediation and enable them to compete internationally and engage with foreign financial markets, creating new investment and financing opportunities.
- Foster competition in the monetary market and reduce financial and banking monopolies to improve the financial and banking environment.

Multiple studies conducted on the impact of financial liberalization on economic growth in Algeria have yielded similar conclusions. Miloua and Arzi (2021), Benallal (2014), Benyahia and Mahfoud (2019) and Dekkiche and Mezouri (2021) all found that financial liberalization did not have a positive impact on economic growth in Algeria. These studies emphasize the need for additional factors, such as developing the financial sector, ensuring macroeconomic stability, and activating key sectors for economic growth. They also highlight the constraints in Algeria's monetary policy, including interest rates, exchange rates, and trade exchanges, which hinder the positive effects of financial liberalization. Overall, these studies stress the importance of addressing these factors and achieving stability for financial liberalization to contribute effectively to economic development in Algeria.

### **3. Standard Study: Modelling the Relationship between Financial Liberalization Indicators and Economic Growth in Algeria during the period of Economic Openness**

The study aims to measure the impact of certain indicators that reflect the degree of financial liberalization on economic growth in Algeria during the period 1990-2021. The selection of the most commonly used indicators was based on previous empirical studies

that examined this relationship, and the annual data published by the World Bank was utilized. The selected variables are as follows:

### **3.1. Dependent Variable**

**GDP:** Represents the annual growth rate of Gross Domestic Product and is considered one of the key indicators reflecting the development of economic activity.

### **3.2. Independent Variables**

**CREDIT:** Represents the ratio of loans provided by banks and financial institutions to the private sector to the Gross Domestic Product. It signifies the level of financial intermediation in the economy resulting from the development of the banking system as a result of financial liberalization and the entry of private and foreign banks into the monetary market.

**IDE:** Represents the ratio of Foreign Direct Investment (FDI) to Gross Domestic Product and reflects the degree of freedom in attracting and attracting foreign investments.

**INTEREST:** Represents the interest rate and is considered one of the key indicators of financial freedom that leads to economic growth. McKinnon and Shaw argue that interest rate stabilization negatively affects economic growth by reducing savings and stabilizing investment.

**INF:** Represents the inflation rate and is used as a measure of overall stability. Its increase has a negative impact on investment and economic growth.

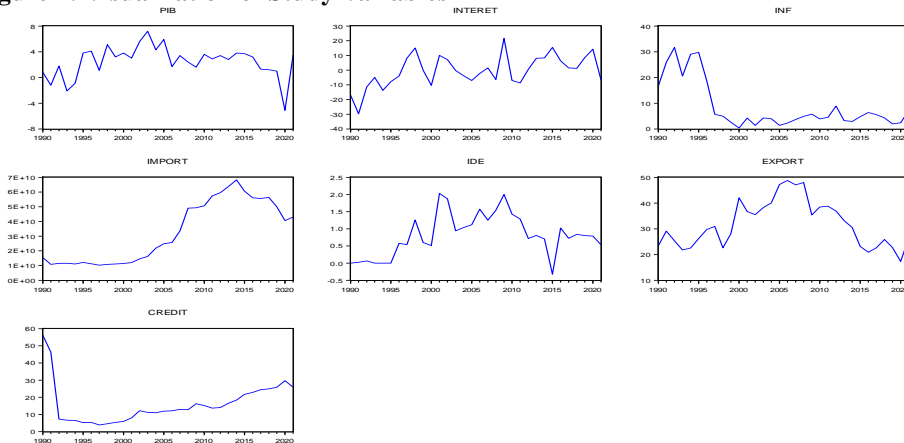
**EXPORT:** Represents exports, which are goods and services produced locally by residents of a particular country and exported to the world.

**IMPORT:** Represents imports, which is the process of transferring products from an external source to the country.

The sum of exports and imports as a percentage of total Gross Domestic Product represents the level of trade openness in the economy and directly affects the level of economic growth by stimulating and diversifying exports and rationalizing imports.

From Figure 1, we observe before studying the time series stability, its graphical representation shows that it is oscillating without a clear increasing or decreasing trend.

**Figure 1: Visualization of Study Variables**



Source: Prepared by the Researchers based on EViews 10 data.

**4. Time Series Stability Analysis**

Testing time series stability is crucial before modelling to identify unit roots and general trends. Unstable time series can lead to misleading relationships (spurious regression). Popular unit root tests include the augmented Dickey-Fuller and Phillips-Perron tests, assessing hypotheses (Gujarati, 2011).

**H0:** If the calculated t-value is greater than the critical t-value, the series has a unit root.

**H1:** If the calculated t-value is smaller than the critical t-value and its significance level is smaller than 0.05, the series is stable.

**4.1. Determining the Lag Order of the Study Variables**

- We determine the lag order of the variables to use in the Dickey-Fuller tests.
- The Schwarz criterion and the Akaike criterion are commonly used when testing the stability of time series. In this study, we rely on the Schwarz criterion to reduce the lag periods of the model.

**Table 1: Lag Order of the Study Variables**

Variables	GDP	IDE	CREDIT	EXPORT	IMPORT	INTEREST	INF
Schwarz information criterion	0	1	1	1	4	0	0
Akaike information criterion	2	1	1	9	10	0	10

Source: Prepared by the Researchers based on EViews 10 data.

**4.2. Unit Root Tests**

The series is initially tested at the level, and if it is not stationary, it is tested at the first difference or the second difference.

**Table 2: Unit Root Tests**

First Difference				Level				Variable
Phillips-Perron		Augmented Dickey-Fuller		Phillips-Perron		Augmented Dickey-Fuller		
Prob	t-Statistic	Prob	t-Statistic	Prob	t-Statistic	Prob	t-Statistic	
				0.0054	-3.909849 -3.661661 -2.960411 -2.619160	0.0061	-3.864256 -3.661661 -2.960411 -2.619160	<b>GDP</b>
0.0000	-8.389388 -3.670170 -2.963972 -2.621007	0.0000	-7.264320 -3.670170 -2.963972 -2.621007			0.0668	-2.821804 -3.661661 -2.960411 -2.619160	<b>IDE</b>
0.0007	-5.377834 -4.296729 -3.568379 -3.218382	0.0015	-5.120944 -4.309824 -3.574244 -3.221728			0.7013	-1.756227 -4.284580 -3.562882 -3.215267	<b>EXPORT</b>
0.0006	-3.706247 -2.644302 -1.952473 -1.610211	0.1389	-1.431246 -2.650145 -1.953381 -1.609798			0.6913	-1.771530 -4.323979 -3.580623 -3.225334	<b>IMPORT</b>
0.0002	-5.904094 -4.296729 -3.568379 -3.218382	0.0004	-5.591414 -4.296729 -3.568379 -3.218382			0.6903	-1.779408 -4.284580 -3.562882 -3.215267	<b>INF</b>
				0.0000	-18.56320 -4.284580 -3.562882 -3.215267	0.0002	-5.810734 -4.284580 -3.562882 -3.215267	<b>CREDIT</b>
0.0000	-15.02556 -4.296729 -3.568379 -3.218382	0.0000	-7.292618 -4.296729 -3.568379 -3.218382			0.0106	-4.260683 -4.284580 -3.562882 -3.215267	<b>INTERET</b>

**Source:** Prepared by the Researchers based on EViews 10 data.

The following table indicates that:

- The GDP variable is stable at the level.
- The Foreign Direct Investment (IDE) variable is first-order stationary.
- The Export variable is first-order stationary.
- The Import variable is first-order stationary.
- The Interest Rate (INTERET) variable is first-order stationary.
- The Inflation (INF) variable is first-order stationary.
- The Private Sector Credit variable is stable at the level.

The ARDL model is suitable for this study due to its ability to handle different time series stability degrees and lags. It is robust to lag orders and sample size, making it powerful even in small samples. Additionally, the ARDL model allows for the separation of short-term and long-term effects, identification of cointegrating relationships, and estimation of parameters in both short and long terms (Kremers, Ericsson and Dolado, 1992 and ATTIA, 2005).

**4.3. Joint integration using the Autoregressive Distributed Lag (ARDL) approach is performed**

An ARDL model is estimated to determine the optimal lag orders for each variable based on the Akaike information criterion. The bounds test is conducted to confirm the presence of a cointegrating relationship among the model variables. The optimal lag orders for the study variables are as follows:

**Table 3: The Optimal Lag**

Variables	GDP	IDE	CREDIT	EXPORT	IMPORT	INTEREST	INF
The optimal lag period	2	1	0	2	0	1	2

Source: Prepared by the Researchers based on EViews 10 data.

**4.4. Error correction methodology and Bounds test for ARDL model**

After estimating the model, we evaluate the estimated parameters and determine their economic significance.

**Table 4: Bounds test**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.323311	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Prepared by the researcher based on EViews 10 table, ARDL Error Correction Regression.

Based on the proposed significance levels, the study accepts the alternative hypothesis of a long-term equilibrium relationship and cointegration. The error correction coefficient of -0.509505 is significant ( $p < 0.05$ ), indicating the presence of cointegration and short-term adjustment towards long-term equilibrium.

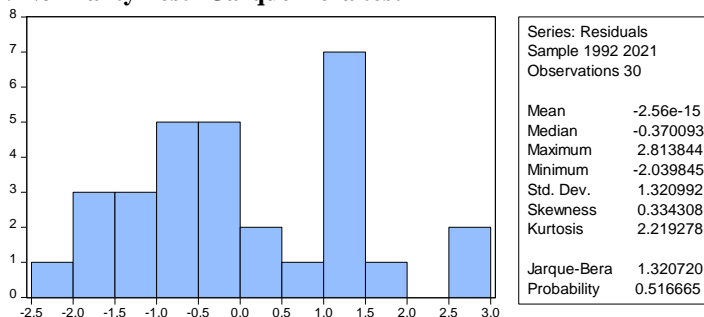
**4.4. Model Validity Tests**

It is necessary to ensure the soundness of the model from statistical issues in order to adopt it for interpreting the short-term and long-term relationship between economic growth and various variables representing the level of financial liberalization in Algeria.

**4.5. Normality Test: Jarque-Bera test**

The Jarque-Bera test examines the normal distribution of residuals in the regression model, which are the differences between the actual values (observations) and the values produced by the regression model. These residuals should follow a normal distribution, and their significance level should be greater than 5%.

**Table 5: Normality Test - Jarque-Bera test**



Source: Prepared by the Researchers based on EViews 10 data.

According to the Jarque-Bera test, the probability value is 0.51, which is greater than the significance level of 5%. This indicates that the residuals follow a normal distribution, and therefore, the model is valid for analysis.

**4.6. Serial Correlation Test: Breusch-Godfrey serial correlation LM test**

To accept the model, the residuals (errors) should be independent of each other. The Breusch-Godfrey serial correlation LM test is used to examine the presence of autocorrelation in the residuals.

**Table 6: Serial Correlation Test - Breusch-Godfrey serial correlation LM test**

F-statistic	1.416169	Prob. F(2,13)	0.2777
Obs*R-squared	5.366873	Prob. Chi-Square(2)	0.0683

Source: Prepared by the Researchers based on EViews 10 data.

The table shows that the significance level of the F-statistic is 0.27, which is greater than 5%. This indicates that the model does not suffer from the problem of serial correlation in the residuals, and thus, it is valid for measuring the relationship between the variables.

**4.7. Heteroscedasticity Test: ARCH (Autoregressive Conditional Heteroscedasticity) test**

For the ARDL method, we choose the ARCH test to examine the presence of heteroscedasticity in the residuals. The test has a significance level of 0.17, which is



greater than 5%. This implies that the residuals of the model do not suffer from heteroscedasticity, as shown in the following table:

**Table 7: Heteroscedasticity Test**

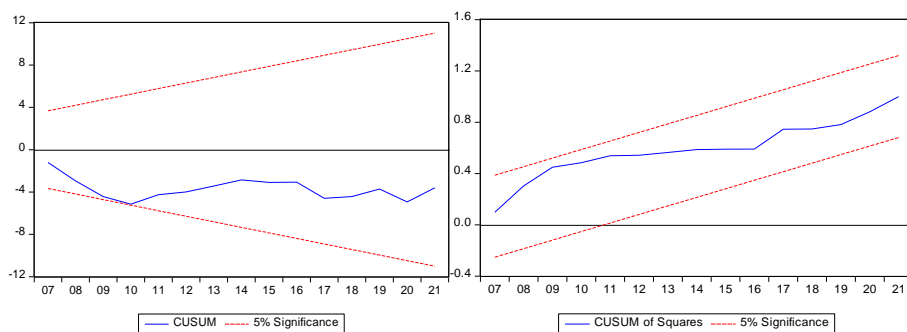
F-statistic	1.875167	Prob. F(2,25)	0.1743
Obs*R-squared	3.652456	Prob. Chi-Square(2)	0.1610

Source: Prepared by the Researchers based on EViews 10 data.

**4.8. Structural Stability Test: CUSUM and CUSUMSQ Tests**

Structural stability tests always accompany the ARDL model, including the Cumulative Sum (CUSUM) test and the Cumulative Sum of Squares (CUSUMSQ) test. These tests are conducted to ensure the absence of structural changes over time and to demonstrate the extent of stability and coherence between long-term parameters and short-term parameters. Structural stability is achieved when the graphical representation of the test falls within the critical boundaries at a significance level of 5%.

**Table 8: Structural Stability Test for Model Parameters (CUSUM and CUSUMSQ)**



Source: Prepared by the Researchers based on EViews 10 data.

The graphical representation shows that the blue line is within the test boundaries, indicating a compatibility between short-term and long-term parameters and overall stability of the model.

**4.9. Test Results**

The results of the standard modeling indicate the presence of a common integration and a long-term equilibrium relationship. The bounds test allows us to infer the relationship through the negative error correction coefficient (-0.509505) with a significance level of 0.0000. This indicates the existence of a long-term integrative relationship and an automatic error correction mechanism from the short term to the long term. It also reflects

the adaptation of variables and the transition from short-term disturbances to long-term equilibrium. Furthermore, this parameter reflects the speed of variable adaptation, which is 50%. This means that a shock occurring in a specific variable, leading to a deviation in GDP, returns to its equilibrium value, and GDP adjusts by 50% within the first year and eliminates its effects within the second year.

**4.10. Estimation of Long-term Relationship**

The bounds test for the ARDL methodology allows us to infer the long-term relationship through the following equation:

$$EC = GDP - (0.9054*INTERET + 0.0000*IMPORT + 0.5634*INF - 0.0130*EXPORT + 2.6907*IDE - 0.6717*CREDIT + 0.3740 )$$

As for estimating the long-term coefficients, it can be done using the following table:

**Table 9: Estimation of Long-term Coefficients using ARDL methodology**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTERET	0.905430	0.679845	1.331818	0.2028
INF	0.563375	0.584754	0.963439	0.3506
IMPORT	1.58E-10	1.30E-10	1.213232	0.2438
IDE	2.690673	3.768492	0.713992	0.4862
EXPORT	-0.013046	0.207237	-0.062951	0.9506
CREDIT	-0.671656	0.469851	-1.429508	0.1734
C	0.373979	8.716742	0.042904	0.9663

**Source:** Prepared by the Researchers based on EViews 10 data.

The table indicates the following:

- There is a positive relationship between foreign direct investment (FDI) and economic growth, where a 1% increase in FDI leads to a 2.69% increase in the GDP growth rate.
- There is an inverse relationship between export volume and GDP growth rate.
- There is an inverse relationship between loans granted to the private sector and GDP growth rate.

**4.11. Causality test in the short and long run**

We begin with the Granger test, which allows us to identify causal relationships in the short run. The test reveals that there is no causality between any of the independent variables reflecting the degree of financial liberalization and short-term economic growth. The **Toda-Yamamoto** test can be used to extract both long-term and short-term relationships and test for cointegration. The model followed is **TYDL**, and the following steps are taken:

- Determining the optimal lag length, which should be determined before conducting any tests and is the minimum value given by the Schwarz and Akaike criteria for the model, which is 1.
- Determining the highest order of integration for the time series, which is 1 (the variables are integrated at the level and of the first order).

**Table 10: VAR Granger Causality/Block Exogeneity Wald Tests** (Dependent variable: PIB)

Excluded	Chi-sq	df	Prob.
INTERET	0.991252	3	0.8034
INF	1.790148	3	0.6171
IMPORT	2.177559	3	0.5364
IDE	2.031742	3	0.5658
EXPORT	0.389506	3	0.9424
CREDIT	5.217625	3	0.1565
All		15	-

**Source:** Prepared by the Researchers based on EViews 10 data.

The test indicates the absence of long-term causal relationships between the independent variables and economic growth in the long run. However, there is a causal relationship between the variables as a whole and the imports variable. This means that the GDP growth rate, inflation, interest rates, private sector loans, foreign direct investment, and export volume are among the main drivers of increasing import volume in Algeria, as shown in the following table:

**Table 11: VAR Granger Causality/Block Exogeneity Wald Tests** (Dependent variable: IMPORT)

Excluded	Chi-sq	Df	Prob.
PIB	2.966507	3	0.3968
INTERET	0.924940	3	0.8194
INF	3.123902	3	0.3729
IDE	5.009373	3	0.1711
EXPORT	4.989414	3	0.1726
CREDIT	4.832068	3	0.1845
All	39.83847	18	0.0022

**Source:** Prepared by the Researchers based on EViews 10 data.

### 5. Analysis of Study Results

The study has yielded several findings. It can be concluded that there is statistically significant evidence of a long-term cointegration relationship between financial liberalization and economic growth. However, this relationship is not significant, indicating that financial liberalization has not contributed significantly to promoting

economic development in Algeria. It is observed that loans directed to the economy have a negative impact on GDP growth rates in the long run. This can be attributed to several factors, including continued control of the banking system by the public sector despite the implementation of financial liberalization since 1990, the continued direction of loans by the government (under economic stimulus programs), implicit interest rate ceilings, the elimination of consumer loans, and the prevalence of informal economic activities outside the banking system.

Additionally, exports also have a negative impact on GDP growth rates in the long run, indicating that they do not contribute significantly to economic growth. This can be attributed to their heavy reliance on the hydrocarbon sector (rent-based economy) and the lack of a productive apparatus capable of meeting the economy's needs for goods and services, creating value-added, and attracting hard currency through global market penetration.

The study's findings are consistent with previous research that has been relied upon, indicating that financial liberalization in Algeria remains partial and lacks the necessary conditions for its enhancement, particularly in the absence of an efficient banking and financial sector and a productive base. The research hypotheses can be tested as follows:

- 1) Algeria has not succeeded in achieving acceptable rates of economic growth due to the implementation of financial liberalization policies.
- 2) The success of financial liberalization and the achievement of economic development in Algeria depend on stimulating the productive apparatus and developing the financial intermediation system.

## **6. Conclusion**

In conclusion, the studies discussed in the previous paragraphs have examined the impact of financial liberalization on economic growth in Algeria. While some studies have found no positive impact, emphasizing the need for certain conditions and enhancing financial development, others have highlighted the limitations of the adopted policies and the lack of compliance with the necessary conditions for success. The ARDL model has been used to analyze the relationship between variables, considering their different stability degrees and lags. The findings suggest the presence of a long-term equilibrium relationship and cointegration between the dependent and independent variables, as well as short-term adjustments towards long-term equilibrium. These conclusions emphasize the importance of considering specific conditions and implementing comprehensive reforms to achieve sustainable economic growth in Algeria.

## References

- Attia, M., 2005, *Modern econometrics between theory and practice*. 2nd edition, Alexandria University House.
- Ben Bouziane, M. and Chakouri, S., 2014, Financial Liberalization and its Impact on Economic Growth: A Case Study of Algeria (1999-2015). *Dirassat Journal Economic Issue*, 8(3), 161-182.
- Benallal, B., 2014, The Role of Financial Development in the Success of Financial Liberalization Policy Implemented in Developing Countries: A Standard Study of the Case of the Algerian Financial and Banking System (1990/2011). *Journal of Economic and Financial Research*, 277-304.
- Benyahia , Y. and Mahfoud, M., 2019, The Financial Liberalization and its Impact on Economic Growth in Algeria, Empirical Study During (1990-2016). *Al Bashaer Economic Journal*, 72-90.
- Bouchentouf, N. and Fettane, T., 2019, The impact of financial liberalization on Algeria's economic growth A standard study during the period 1990-2016. *les cahiers du mecas*, 99.
- Dekkiche, D. and Mezouri, E., 2021, The impact of financial liberalization on economic growth in Algeria under the use of the KAOPEN index; an empirical study during 1990-2016 using ARDL model. *Journal of Business and Trade Economics*, 337-350.
- Gujarati , D., 2011, *Econometrics by examples*. London: Palgrave Mcmillan.
- Kremers, J., Ericsson, N. and Dolado, J., 1992, The Power Of Cointegration Tests. *Oxford Bulletin of Economics and Statistics*, 332. <https://doi.org/10.1111/j.1468-0084.1992.tb00005.x>.
- Miloua, S. and Arzi, F., 2021, The impact of financial liberalization on economic growth in the process of modern globalization Econometric study using ARDL model in Algeria from 1990 to 2020. *Revue des Sciences Economiques, de Gestion et Sciences Commerciales*, 50-70.
- Pesaran , M., Shin, Y. and Smith, R., 2001, Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-3326.
- Ratia, M., 2013, Financial Liberalization and Economic Growth in Arab Countries. *Revue d'économie et de statistique appliquée*, 111.

Saadi, H., 2015, The Impact of Financial Liberalization Policy on Economic Growth: A Standard Study of the Case of Algeria 1990-2013. Master's Thesis submitted to obtain the degree of Academic Master in Economics, University of Oum El Bouaghi.

Zeroukat, K. and Logani, M., 2021, The Impact of Financial Liberalization Policy on Economic Growth in Algeria for the Period 1990-2020. Master's Thesis submitted to fulfill the requirements for the degree of Academic Master in Quantitative Economics. University of Tebessa.